SECONDARY PREVENTION OF STROKE FOLLOWING TRANSIENT ISCHAEMIC ATTACK: A MIXED METHODS STUDY

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Secondary prevention of stroke following Transient Ischaemic Attack: a mixed methods study

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Thesis abstract

The purpose of this thesis was to inform the development of a complex intervention for improving secondary stroke prevention in people who have experienced a Transient Ischaemic Attack (TIA). The work was guided by the Medical Research Council (MRC) framework for the development and evaluation of complex interventions.

A mixed methods approach was taken, incorporating three inter-related studies. The first study was an audit investigating the quality of secondary stroke prevention in primary care following diagnosis of TIA in a specialist clinic. The second study was a systematic review of randomised controlled trials evaluating the effectiveness of stroke service interventions for secondary stroke prevention. The third study was a qualitative study, involving 20 interviews with TIA patients, using a discursive psychology approach to explore barriers and facilitators to secondary stroke prevention.

Key findings:

- Results of the audit demonstrated that monitoring and achievement of risk factor control in primary care was suboptimal; potential areas for quality improvement included blood pressure (BP) control, lipid control and provision of dietary and exercise advice.
- Findings from the systematic review indicated that organisational interventions were associated with significant reductions in mean systolic BP, diastolic BP and body mass index (BMI).
- The qualitative study, through an analysis of the 'action-orientation' of participants' accounts, identified discursive features that functioned to justify adherence or non-adherence to recommendations for secondary stroke prevention.

The key findings from these studies indicated that an organisational intervention should be developed based on the principles of integrated care. The qualitative study provided insights for understanding and optimising the intervention. Based on these findings, recommendations are made for further intervention development work. The findings also have relevance to the development and application of the MRC framework; efforts should be directed towards developing practical guidance for the integration of mixed methods research.

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List of Contents

List of Tables

List of Figures

List of Abbreviations

ACEI	Angiotensin converting enzyme inhibitor
AHA	American Heart Association
ASA	American Stroke Association
ARB	Angiotensin II receptor blocker
BMA	British Medical Association
BMI	Body Mass Index
BNI	British Nursing Index
BP	Blood pressure
CCB	Calcium channel blocker
CCM	Chronic Care Model
CENTRAL	Cochrane Central Register of Controlled Trials
CHARISMA	Clopidogrel for High Atherothrombotic Risk and Ischemic Stabilization, Management, and Avoidance
CHD	Coronary heart disease
CHEP	Canadian Hypertension Education Program
CI	Confidence interval
CKD	Chronic kidney disease
CVD	Cardiovascular disease
DESMOND	Diabetes education and self-management for ongoing and newly diagnosed (an intervention programme)
DAFNE	Dose adjustment for normal eating (an intervention programme)
ESO	European Stroke Organisation
GP	General practitioner
GPC	General Practitioners Committee
HDL	High-density lipoprotein
HPS	Heart Protection Study
HR	Hazard ratio

IQR	Interquartile range
LDL	Low-density lipoprotein
MD	Mean difference (i.e. difference in means)
MRC	Medical Research Council
nGMS	New General Medical Services
NAO	National Audit Office
NICE	National Institute for Health and Care Excellence
NIHSS	National Institutes of Health Stroke Scale
NRAF	Non-rheumatic atrial fibrillation
NSS	National Stroke Strategy
NSSA	National Sentinel Stroke Audit
OR	Odds ratio
QOF	Quality and Outcomes Framework
PAR	Population attributable risk
PATS	Post-stroke Antihypertensive Treatment Study
PCT	Primary Care Trust
PRoFESS	Prevention Regimen for Effectively Avoiding Second Strokes
RCP	Royal College of Physicians
RCT	Randomised controlled trial
SD	Standard deviation
SE	Standard error
SIGN	Scottish Intercollegiate Guidelines Network
SMR	Standard Mortality Ratio
SPARCL	Stroke Prevention by Aggressive Reduction in Cholesterol Levels
TC	Total cholesterol
TIA	Transient ischaemic attack
WHO	World Health Organisation

Chapter 1. Introduction

This chapter provides an introduction to the topics of Transient Ischaemic Attack (TIA), stroke and secondary prevention. Over 46,000 people living in the UK experience a TIA each year and this significantly increases their risk of stroke[1,2]. A stroke that occurs in people who have already experienced a previous stroke or TIA is referred to as a 'secondary stroke'. This chapter will provide a context to the programme of work contained in this thesis by (1) describing the association between TIA and stroke; (2) highlighting the importance of secondary stroke prevention; and (3) outlining current deficiencies in secondary stroke prevention following the occurrence of a TIA. Subsequently, the research objectives for this thesis will be outlined and an overview of the component chapters will be presented.

1.1. Impact of stroke

In 2010, stroke was the fourth leading cause of death in the UK[1,3]. When healthcare costs, income loss and social benefit payments are taken into account, the total cost of stroke in the UK is estimated at £8.9 billion per year[4]. This represents around 5% of the NHS budget[4]. Furthermore, stroke is often associated with personal costs such as reduced quality of life and loss of functional independence[5,6]. Although acute treatments for stroke have been developed, there is no 'panacea' and it has been recommended that strategies to reduce stroke burden should focus on stroke prevention[7]. Thus, stroke prevention represents a major UK healthcare priority[8].

Managing the impact of stroke in the UK

In 2007, the National Stroke Strategy (NSS) publication outlined a vision for improving

the quality of stroke care in the UK[9]. Twenty quality markers were developed to guide improvements in the prevention, treatment and management of stroke over a time frame of ten years[9]. Additionally, the establishment of stroke networks (i.e. "bringing together key stakeholders and providers to review, organise and improve delivery of services across the care pathway") was recommended as these were identified as "a clear lever for change"[9]. In 2010, the National Audit Office (NAO) published a report concluding that although the NSS had led to improvements in acute stroke care, progress in other areas such as post-hospital support, rehabilitation and stroke prevention were more limited[10]. In order to support ongoing improvements in stroke care, the Royal College of Physicians (RCP) National Clinical Guideline for Stroke 2012 contains evidence-based recommendations on the topics of secondary prevention, rehabilitation and long-term management of stroke, in addition to acute-phase care[11].

1.2. Definitions

Defining stroke and TIA

Stroke and TIA are closely related cerebrovascular diseases that are caused by interruptions in the blood supply to the brain. Sudden disturbances in neurological function occur as brain cells become damaged or destroyed in the absence of an adequate oxygen supply. Common symptoms of stroke and TIA include numbness, weakness or paralysis on one side of the body; visual disturbances; loss of coordination; difficulty forming speech or difficulty comprehending language. The World Health Organisation (WHO) define stroke as "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or

longer or leading to death, with no apparent cause other than of vascular origin"[12]. A TIA has traditionally been defined as a disturbance in brain function, of presumed vascular origin, lasting for less than 24 hours[13,14]. This was based on an assumption that complete resolution of symptoms within 24 hours equated to the absence of permanent brain injury, however advances in brain imaging techniques have shown this assumption to be inaccurate[13]. In 2009, an alternative definition of TIA was endorsed by the American Heart Association/American Stroke Association (AHA/ASA)[14]. This definition omits the arbitrary 24 hour criterion for symptom duration and specifies instead that TIA, unlike stroke, occurs without acute infarction (cell death) as assessed using brain imaging scans.

Aetiology of ischaemic stroke and TIA

Ischaemic strokes, accounting for approximately 80% of all stroke cases, occur due to cerebral blood vessel occlusion[15]. Ischaemic strokes can be further sub-divided according to underlying aetiology: 1) large-artery atherosclerosis; 2) cardioembolism; 3) small-vessel occlusion; 4) stroke of other determined aetiology; and 5) stroke of undetermined aetiology[16]. Similarly, TIAs are caused by the same pathogenic mechanisms as ischaemic stroke[14]. Conversely, haemorrhagic strokes, accounting for 10-15% of stroke cases, are caused by a ruptured blood vessel bleeding within the brain[15].

The majority of ischaemic strokes and TIAs are caused by a disease process known as atherosclerosis; this describes the hardening of arterial blood vessel walls due to the formation of atheromatous plaques, characterised by progressive accumulation of

macrophages, cholesterol crystals and fibrous connective tissue[17]. Atherosclerosis can lead to ischaemic stroke or TIA through cerebral blood vessel occlusion due to thrombosis (formation of blood clots) or stenosis (narrowing of the arteries). Another significant cause of thrombosis is nonrheumatic atrial fibrillation (NRAF). It has been estimated that individuals with NRAF are four times more likely to experience a stroke than individuals without NRAF[18].

Due to similarities in disease aetiology, ischaemic stroke and TIA share a number of common cardiovascular risk factors including modifiable factors (e.g. hypertension, lipid abnormalities, diabetes, atrial fibrillation, obesity, physical inactivity, diet, alcohol consumption and smoking) and non-modifiable factors (e.g. increasing age, family history, gender and ethnicity)[19]. The findings of a case-control study, involving 3000 case-control pairs from 22 countries, indicate that ten modifiable risk factors and medical conditions are associated with 90% of stroke risk[20].

1.3. Prevalence of stroke and TIA

Cardiovascular diseases (CVDs), including stroke and TIA, are classified as chronic non-communicable diseases[21]. These diseases place a huge burden on global public health, particularly in low and middle income countries where chronic disease is often neglected as infectious disease is prioritised[22]. Between the years 2000 and 2008, stroke incidence rates in low to middle income countries first exceeded rates in high income countries, by a margin of 20%[23]. This is largely a result of 'demographic shifts' that have taken place in developing countries: urbanisation and industrialisation have led to increases in life expectancy and a higher prevalence of lifestyle risk factors that

predispose individuals to CVD (e.g. unhealthy diet, physical inactivity and smoking)[24]. In 2000, the WHO endorsed a Global Strategy for Prevention and Control of Noncommunicable Diseases in order to raise the priority of noncommunicable diseases and target the shared risk factors of "tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol"[21 (p10)].

A review of population based studies from 1970 to 2008 has shown that stroke incidence has decreased by 42% in high-income countries[23]. Similarly, the Framingham study reported that the incidence of first stroke decreased between 1950 and 2004. This prospective cohort study, involving individuals of predominantly European descent, determined stroke incidence per 1000 person-years for three consecutive intervals. Between 1950-1977, 1978-1989 and 1990-2004 stroke incidence per 1000 person-years was 7.6, 6.2 and 5.3 in men and 6.2, 5.8 and 5.1 in women, respectively[25]. In the UK, improvements in cardiovascular risk factors at a population level have been associated with the declines in stroke incidence over recent decades[26]. However, although stroke incidence has declined, lifetime stroke risk has not decreased to the same degree, possibly due to increases in life expectancy[25]. Increasing age is the most important risk factor for stroke with three quarters of all strokes occurring in adults aged ≥ 65 years[10].

In the UK, cerebrovascular disease currently remains a major health problem with approximately 152,000 strokes and more than 46,000 TIAs occurring every year[1,2,27]. Furthermore, the prevalence and incidence of TIA are expected to be frequently underestimated due to a lack of recognition of the symptoms[14]. For example, it has been reported that a substantial proportion of adults experience TIA symptoms but

do not seek medical advice (3.2% in a population survey of over 10,000 adults) and thus do not receive a physician-confirmed diagnosis[28].

1.4. TIA as a risk factor for stroke

Each year in the UK, it is estimated that 30% of ischaemic strokes are recurrent cerebrovascular events[8]. A TIA indicates a possible instability in cerebral blood supply; this may subsequently lead to a stroke if not properly treated[29]. Thus, TIA should be considered an early warning sign for stroke. Easton et al reported that the percentage of stroke patients with prior TIA ranges from 7% to 40%, varying according to the "how TIA is defined, which stroke subtypes are evaluated, and whether the study is a population-based series or a hospital-based series"[14 (p2278)]. The findings of a large population-based cohort study (16,409 participants) suggested that 15% of diagnosed ischaemic strokes were preceded by a TIA[30]. This study also showed that stroke patients with previous TIA were more likely to be older and to have cardiovascular co-morbidities. Conversely, stroke patients without previous TIA were more likely to die while in hospital and less likely to be discharged home. The authors speculate that findings in the latter group of patients may be due to a lack of prior ischaemic preconditioning[30,31].

Epidemiological estimates of stroke risk following TIA are anticipated to vary according to participant characteristics, study methods, setting and classification of disease. More specifically, participant characteristics are expected to differ between studies since TIA patients are identified using varying diagnostic criteria[14]. Furthermore, the risk of early stroke following TIA may be frequently underestimated

due to the exclusion of patients experiencing a stroke during the interval between onset of TIA symptoms and study enrolment[32,33]. Observational evidence also indicates that secondary stroke risk is influenced by early treatment: urgent treatment of TIA in a specialist clinic is associated with lower rates of secondary stroke compared with other modes of treatment[34,35].

The risk of secondary stroke is highest during the first 7 days following a TIA[36]. Furthermore, it has been estimated that approximately half of the strokes occurring during this interval take place within 24 hours of onset of TIA[37]. A meta-analysis of 18 studies assessing stroke risk within 7 days of TIA demonstrated a pooled stroke risk of 5.2% at 7 days. Significant between-study heterogeneity was observed but the authors report that this could be almost entirely attributed to "differences in study method, setting, and treatment, with lowest risks in studies of emergency treatment in specialist stroke services"[38 (p1063)]. A second meta-analysis considering three early time-points post-TIA reported a secondary stroke risk of 9.9%, 13.4%, and 17.3% at 2, 30, and 90 days, respectively[39].

Observational studies have demonstrated that, although the risk of secondary stroke steadily declines during the weeks and months following TIA, the risk of vascular events remains increased for several years afterwards. Pooled data from 39 studies involving patients with TIA and ischaemic stroke reported annual risks of 2.2% and 2.1% for myocardial infarction and non-stroke vascular death, respectively. The risk remained approximately constant over a 5 year period; however the authors state that early vascular risk could not be reliably estimated since the study involved patients that were generally included "several weeks to months after their initial

event"[40 (p2753)]. A prospective cohort study by van Wijk et al has provided more detailed information regarding the timing of secondary cardiovascular events following TIA[41]. This study, involving 1714 patients with TIA, reported that the 10 year risk of all secondary vascular events was 35·8%. The results showed that the risk of stroke and total vascular events was highest shortly after the index TIA and subsequently declined over the following 3 years. During the time period of between 3 and 7 years post-TIA, the annual risk of stroke remained fairly constant whereas the risk of total vascular events increased gradually.

1.5. Stroke prevention

Primary stroke prevention refers to healthcare strategies that are directed towards preventing the initial occurrence of a stroke. Conversely, secondary stroke prevention refers to individualised strategies that aim to reduce the risk of recurrent vascular events in people who have already experienced a stroke or TIA. Secondary prevention strategies, directed towards established stroke risk factors, can be implemented in acute care settings, stroke prevention clinics and community settings[42].

It has been argued that strategies directed towards secondary stroke prevention are more likely to be cost-effective than those directed towards primary stroke prevention, since the reductions in absolute risk are larger[43,44]. Similarly, limited success of health promotion interventions in patients at low risk of cardiovascular events has led Ebrahim to conclude that CVD prevention strategies should be 'retargeted at secondary prevention'[45,46]. The effectiveness and cost-effectiveness of the NHS Health Checks programme, a primary prevention initiative to identify and

treat individuals at high risk of CVD in England, have not yet been established[47]. However, several challenges to the implementation of this programme have been identified, including uncertainty over the relevance of criteria that are used to select individuals for screening in the context of a diverse UK population (for example, screening thresholds do not account for variations in CVD risk between White European and South Asian populations)[47], and reports of low uptake of Health Checks among individuals at high risk of CVD[48]. Whereas the target populations for primary stroke prevention are diverse and may be difficult to access, the target populations for secondary stroke prevention are easily identifiable through contact with specialist health services (e.g. stroke units and TIA clinics) and primary care registers. The occurrence of TIA or stroke therefore represents an important opportunity to address vascular risk factors in order to reduce the likelihood of recurrent vascular events.

A number of effective measures have been identified for the secondary prevention of stroke. These include lifestyle modification, blood pressure (BP) lowering, cholesterol lowering and the use of antithrombotic or anticoagulant medication. Further information regarding evidence-based stroke prevention is provided in Chapter 2 (section 2.2). In the UK, comprehensive recommendations for secondary stroke prevention are included in RCP National Clinical Guideline for Stroke[11]. The general practice Quality and Outcomes Framework (QOF), a voluntary pay-for-performance scheme for UK general practices, also recognises the achievement of indicators for secondary stroke prevention[49]. Further information about the RCP guideline and QOF indicators is presented in Chapter 2 (section 2.1).

Secondary prevention of stroke identified as an area for improvement

In 2007, the Department of Health published the National Stroke Strategy: a vision for improving stroke care in the UK[9]. The strategy included recommendations on the topics of acute stroke care, long-term recovery and stroke prevention. Acute stroke care has been a major focus of recent clinical research and intervention. All hospital trusts in England now have a stroke unit to improve early outcomes[10,50] and rapid access to thrombolytic therapy has also improved[10,51]. However, there remain some areas where stroke care remains suboptimal, including post-hospital support and stroke prevention[10]. There is consensus that substantial benefits stand to be gained from improving the use of effective secondary stroke prevention strategies[8,52]. More specifically, it has been predicted that an 80% cumulative risk reduction in recurrent vascular events could be achieved by combining dietary modification, exercise, aspirin, a statin, and an antihypertensive agent[53].

1.6. Current status of secondary prevention management

Several studies in patients with cerebrovascular disease have indicated that secondary prevention management is often suboptimal. In a population of stroke and TIA patients attending a stroke prevention clinic, 14% of hypertensive patients (BP > 140/90 mm Hg) and 51% of patients with hyperlipidaemia were inadequately managed after one year of healthcare follow-up[54]. Similarly, a review of patients six months after stroke, TIA or carotid endarterectomy found that 72% did not attain a BP target of ≤ 130/80 mm Hg, 78% had a total cholesterol above the target of < 4.0 mmol/L and 15% remained current smokers[55].

Few studies have examined the status of secondary prevention specifically among patients with TIA. However, the management of specific risk factors may differ in TIA patients compared to those with stroke. For example, Ramsay et al found that a diagnosis of TIA, as opposed to stroke, was associated with lower usage of blood pressure lowering medication in a cohort of older British men with a history of cerebrovascular disease[56]. Additionally, serious disability caused by stroke may have an impact on secondary stroke prevention. Rudd et al showed that stroke patients with more severe disability (Barthel score ≤ 14) were less likely to receive appropriate secondary prevention than those with mild or no disability (Barthel score 15 to 20)[57]. Self-reported medication non-adherence in mixed populations of TIA and stroke patients varies widely from 14%[58] to 41%[59]. Difficulties with adherence to new medications are common[60], and it is possible that adherence may be especially problematic in stroke patients with physical or cognitive disabilities. Further research is therefore required to determine the status of secondary stroke prevention specifically among TIA patients.

Barriers and facilitators to stroke prevention

A number of potential barriers and facilitators to stroke prevention following TIA will be identified from a review of relevant literature in Chapter 2 (section 2.3). These include numerous factors relating to patients, healthcare professionals and health service organisation. However, there is a lack of information concerning the experiences of stroke prevention among individuals following a TIA. As discussed further in Chapter 2 (section 2.3.2), it is anticipated that the meanings that patients attach to TIA and secondary stroke prevention will have an impact upon their

adherence to secondary prevention medications and healthy lifestyle behaviours. Additional research is therefore required to identify those barriers and facilitators to secondary stroke prevention that are relevant to the perspectives and experiences of TIA patients.

1.7. In summary: rationale for and organisation of this thesis

1.7.1. Rationale for programme of work

It is recognised that the occurrence of TIA represents an important opportunity to address secondary stroke prevention through the management of modifiable stroke risk factors (e.g. hypertension, hypercholesterolaemia and lifestyle factors)[29]. As measures for secondary stroke prevention are not optimally implemented, substantial benefits stand to be gained from improving the use of effective interventions[52]. Health service interventions used for other conditions, particularly secondary prevention of ischaemic heart disease, may be relevant to the secondary prevention of stroke[61]. However, more direct evidence is needed to guide improvements to stroke services for patients who experience a TIA. The main purpose of this thesis is to inform the development of a stroke service intervention to improve secondary stroke prevention following a TIA. The development of such an intervention is likely to be challenging, since outcomes are anticipated to be influenced by numerous interacting behavioural and organisational factors. The Medical Research Council (MRC) has developed a pragmatic framework in order to guide research involving complex interventions[62] (see Chapter 3, section 3.1). Thus, it was considered appropriate to use the MRC framework to underpin the programme of work in this thesis.

Consideration of relevant literature (relating to the topic of secondary stroke

prevention following the occurrence of a TIA) suggests that existing research has not provided the data required in order to progress with intervention development according to the recommendations outlined by the MRC framework[62]. To date, no systematic reviews have considered the impact of stroke service interventions on risk factor control for the secondary prevention of stroke. An assessment of the quality and outcomes of previous studies in this field will inform the development of new interventions. Additionally, no published studies have identified the current status of secondary stroke prevention specifically among TIA patients, although this information is necessary in order to guide improvements in patient care. Finally, few studies have investigated the barriers or facilitators to secondary stroke prevention that relate specifically to the perspectives of TIA patients. However, this information is expected to facilitate an understanding of behavioural change in the context of a complex intervention[62]. On the basis of this, the following research objectives can be outlined:

- To investigate the quality of secondary prevention following a diagnosis of TIA, in order to identify areas for quality improvement.
- To assess the effects of stroke service interventions on modifiable risk factor control for the secondary prevention of stroke.
- To explore the barriers and facilitators to secondary stroke prevention that are relevant to the perspectives of TIA patients

The above objectives will be used to develop a research design for this thesis that is described in Chapter 3 (section 3.4). Although these objectives are interlinked by the MRC framework, each will be considered separately for philosophical and

methodological reasons. The results form separate research studies will then be integrated in Chapter 8 in order to develop recommendations for the design of a stroke service intervention. The organisation of this thesis is summarised below:

1.7.2. Organisation of the thesis

Chapter 1 has outlined the rationale for the thesis and the overall programme of work. The following chapters cover the remainder of the thesis:

Chapter 2 outlines key evidence underpinning international guidelines for secondary stroke prevention, and subsequently provides an overview of the factors influencing stroke prevention following a TIA.

Chapter 3 begins with a description of the MRC framework for developing and evaluating complex interventions, followed by an overview of quantitative, qualitative and mixed methods research. The rationale for the methodological approach taken in this thesis is then described. Philosophical and practical implications of using mixed methods research in this context are also discussed.

Chapter 4 describes an audit study and identifies the current status of modifiable risk factor control in TIA patients according to according to standards identified from UK national stroke guidelines and QOF indicators.

Chapter 5 presents a systematic review synthesising evidence on the effectiveness of stroke service interventions for risk reduction in the secondary prevention of stroke

Chapter 6 begins with an overview of discourse analysis and an introduction to the

field of discursive psychology. Subsequently, the second part of this chapter describes the methods of a qualitative study to explore the barriers and facilitators to secondary stroke prevention from the perspective TIA patients.

Chapter 7 presents the findings from the qualitative study and places these in the context of other relevant research.

Chapter 8 summarises and integrates the key findings from this thesis in order to provide recommendations for continuing intervention development. Additionally, as a consequence of the research carried out in this thesis, recommendations are made for the future development of the MRC framework for developing and evaluating complex interventions.

Chapter 2. Background

The previous chapter provided a rationale for this thesis and outlined the overall programme of work. This chapter contains more detailed background information on topics that are of relevance to subsequent research in this thesis. First, UK guidelines and the wider evidence base for secondary stroke prevention are summarised. This is necessary to inform the design and interpretation of the audit (Chapter 4), and systematic review (Chapter 5) studies. Second, this chapter provides an overview of the barriers and facilitators to stroke prevention following a TIA, in order to inform the design of a qualitative study (Chapters 6 and 7).

2.1. Development of UK guidelines and QOF indicators

International evidence-based stroke guidelines provide recommendations for the efficient and cost-effective management of stroke; however different guidelines may sometimes contain conflicting recommendations, making it difficult for clinicians to decide on optimal management strategies[63]. The Royal College of Physicians (RCP) National Clinical Guideline for Stroke (4th edition) makes recommendations on most aspects of stroke management[11] and is considered the 'gold standard' for stroke care in the UK[64]. The Quality and Outcomes Framework (QOF) is a voluntary pay-for-performance scheme introduced in 2004 for UK general practices[65]. This scheme offers financial incentives in return for achieving clinical targets relating to 10 chronic conditions, including stroke and TIA[49]. Since the introduction of QOF, a greater proportion of stroke and TIA patients receive secondary prevention treatment; however practice variation has been reported in the achievement of QOF indicators[9]. In this section, consideration is given to the development of UK guidelines and QOF

indicators that relate to the secondary prevention of stroke.

Development of RCP guidelines

The RCP stroke guidelines were developed by the Intercollegiate Stroke Working Party through a collaborative process, involving experts from a range of disciplines together with service users and their families[11]. A pragmatic approach was used to obtain and assess available evidence within time and resource constraints. Since the guidelines are updated every four years, the most recent 4th edition guideline was built upon the foundations of three previous editions[66-68]. The first edition identified research evidence through a relatively informal search strategy up to 1999[66]. For the second addition, research published since 1999 was identified through literature searches carried out by an information librarian and it is reported that literature searches for new areas were conducted from 1966 onwards[67]. Since the area of TIA management was introduced in the second edition, evidence-based recommendations for this condition were derived from formal literature searches dating from the period of 1966 onwards.

According to methodology reports[11,67,68], guideline developers (members of the Intercollegiate Stroke Working Party) sought research evidence that specifically focused on stroke. However, where evidence in this area was unavailable, research studies involving patients with other relevant diseases were considered. It is reported that evidence from relevant Cochrane systematic reviews and meta-analyses were used when these had been published within the previous 1-2 years. Individual randomised controlled trials (RCTs) included in the reviews were not assessed. In

areas where no RCTs had been conducted, evidence from uncontrolled studies was considered. Qualitative research was also considered where this was deemed appropriate or if this was the only research available in the area under consideration. The quality of individual studies and systematic reviews were appraised by the Working Party, although the tools used for this purpose differed according to the guideline edition for which published articles were first identified and considered. Research evidence was reviewed and discussed by members of the Working Party who then derived recommendations by consensus methods.

Development of QOF indicators

The QOF was first introduced as part of the new General Medical Services (nGMS) contract in 2004[69]. The concept of the QOF was developed from earlier quality improvement initiatives that were established in the 1990s; these involved payments for vaccination and screening targets that were derived from national guidance or professional consensus[70]. The first QOF indicators were developed by an expert group who gave consideration to healthcare practices and the best research evidence available at the time when the nGMS contract was introduced. The QOF is updated annually and an 'expert panel' with members from a range of organisations (academic bodies, NHS Employers and the General Practitioners Committee (GPC) of the British Medical Association (BMA)) was initially responsible for updating QOF indicators from 2006[71]. From 2009, responsibility for the QOF indicators was transferred to the National Institute for Health and Clinical Excellent (NICE) who remain currently responsible for developing and prioritising new indicators, reviewing previous indicators and consulting stakeholders[72]. NICE publish a 'menu of indicators' each year

that are based on current clinical and cost-effectiveness evidence (national guidelines are used where available); this menu is then used to inform negotiations between NHS Employers and the GPC on annual changes to QOF indicators, along with other relevant NICE guidance[49].

2.2. Evidence base and recommendations for the secondary prevention of ischaemic stroke and TIA

Sacco et al argue that "the distinction between TIA and ischaemic stroke has become less important in recent years because many of the preventive approaches are applicable to both groups"[73 (p410)]. In line with this statement, international stroke guidelines generally present secondary prevention recommendations collectively for patients with ischaemic stroke and TIA. Conversely, recommendations for haemorrhagic stroke patients are usually presented separately, since differences in stroke aetiology result in alternative approaches to risk factor management. A summary of research evidence for the secondary prevention of stroke, in patients with ischaemic stroke or TIA, is presented below. UK RCP guideline recommendations[11] and QOF indicators[49] are also described. Additionally, secondary prevention recommendations from a selection of wider international guidelines are presented in tabular format.

2.2.1. Acute care and early initiation of secondary prevention therapy

The diagnosis of TIA is problematic[74] and usually requires specialist assessment and imaging[13], while the benefits of rapid assessment and intervention are well-recognised[34]. The findings of the EXPRESS study suggested that early initiation of

secondary treatment following TIA could reduce the 90 day risk of recurrent stroke by approximately 80%[34]. A review of specialist TIA clinics has concluded that these are cost-effective when compared with other models of service delivery[35]. In line with this, the RCP guideline recommends that all patients with a potential TIA should be assessed at a specialist clinic either within 24 hours (ABCD2 score of 4 or above) or within one week (ABCD2 score of 3 or below) of symptom onset[11].

Table 2-1: BP lowering following ischaemic stroke or TIA

Guidelines	Target BP	Choice of agent	Notes
QOF 2013[49]	≤ 150/90 mm Hg	Not stated	---
RCP 2012[11]	< 130/80 mm Hg	CCB or thiazide: patients ≥ 55 years old; black patients of any age ACEI or ARB: patients < 55 years old	Combination therapy recommended if targets not achieved with monotherapy
American Heart Association/American Stroke Association (AHA/ASS) 2011[75]	Absolute target is "uncertain and should be individualised" but normal BP considered < 120/80 mm Hg *Comorbidities* *Diabetes: ≤ 130/80 mmHg*[76]	Choice of agent should be individualised Supports use of diuretics; combination of diuretics and an ACEI *Comorbidities* *Diuretics, ACEIs, beta-blockers and ARBs are recommended for patients with diabetes*[76]	Most patients will require > 1 agent.
European Stroke Organisation (ESO) 2008[77]	Absolute target is "uncertain and should be individualised" but normal BP considered <120/80 mm Hg	Not stated	---

Guidelines	Target BP	Choice of agent	Notes
Canadian Stroke strategy 2010[42]/Canadian Hypertension Education Program (CHEP) 2011[78]	< 140/90 <u>*Comorbidities*</u> *Diabetes: < 130/80 mm Hg* *CKD: < 130/80 mm Hg*	Thiazide; beta-blocker (patients < 60 years old); ACEI (non-black patients); CCB; ARB	Combination therapy should be used if "target blood pressure levels are not achieved with standard dose monotherapy"
National Stroke Foundation (Australia) 2010[79]	Not stated	Not stated	"All stroke and TIA patients, whether normotensive or hypertensive, should receive blood pressure lowering therapy, unless contraindicated by symptomatic hypotension"
Scottish Intercollegiate Guidelines Network (SIGN) 2008[80]	< 140/85 mm Hg <u>*Comorbidities*</u> *Diabetes: < 130/80 mm Hg*	ACEI (e.g. perindopril) and thiazide (e.g. indapamide)	"All patients with a previous stroke or TIA should be considered for treatment with an ACEI and thiazide, regardless of blood pressure, unless contraindicated"
Chinese guidelines for the secondary prevention of stroke and TIA 2010[81]	≤ 140/90 mm Hg, ideally 130/80 mm Hg <u>*Comorbidities*</u> *Diabetes: < 130/80 mm Hg*	Choice of agent should be individualised <u>*Comorbidities*</u> *ACEIs and ARBs recommended for patients with diabetes*	Either monotherapy or a combination of medications

2.2.2. Blood pressure (BP) targets

Hypertension is a major risk factor for stroke and TIA[82] and BP lowering is associated with reductions in stroke risk[83]. Following a TIA, RCP guidelines recommend an optimal BP target of 130/80 mm Hg, with a slightly higher target (systolic BP of 130-150 mm Hg) advocated in the presence of severe bilateral carotid artery stenosis (>70%)[11]. The QOF indicator for BP following TIA (< 150/90 mm Hg) is considerably higher than corresponding targets recommended by international guidelines. However, it should be emphasised that QOF indicators are audit standards rather than recommendations for optimal risk factor control in individual patients.

There is broad consensus among international guidelines that a BP target of between 120-140/80-90 mm Hg is appropriate following stroke or TIA (see Table 2-1). The evidence for these targets has largely come from the PROGRESS trial, which is the largest study to have demonstrated the benefits of BP lowering for the secondary prevention of stroke[84]. In the PROGRESS study, 6105 individuals with previous stroke or TIA were treated with active treatment (perindopril with the addition of indapamide at the discretion of the treating physician) or placebo for a mean duration of 3.9 years. Active treatment reduced BP by 9/4 mm Hg and the relative risk of stroke was reduced by 28% (95% CI 17 to 38). The effects of active treatment were similar irrespective of baseline BP, indicating that hypertensive and non-hypertensive patients benefit equally from BP lowering[85]. Trial results provided evidence to support BP goals of between 130–140/ 80–90 mm Hg for stroke and TIA patients; furthermore, intensive BP lowering (to approximately 115/75 mm Hg) was associated with the greatest reductions in the risk of recurrent stroke, leading trialists to endorse

a BP target of 115/75, if well tolerated[85].

Mant et al argued that there were important differences in the demographic characteristics of participants included in the PROGRESS trial and cerebrovascular patients in primary care populations[86]. Primary care patients were significantly older than the PROGRESS participants and a longer time had elapsed since their cerebrovascular event. Consequently, it was concluded that the PROGRESS trial results may not be applicable to primary care settings and further research in appropriate populations was recommended[86]. However, the incorporation of evidence from the PROGRESS trial in most international guidelines and the adoption of recommendations in clinical practice suggest that the translation of results from this trial are largely supported by clinicians at the present time.

A systematic review of seven RCTs evaluating antihypertensive therapy for secondary prevention, including the PROGRESS study, indicated that reductions in stroke risk were "associated positively with the magnitude by which BP is reduced"[87 (p2741)]. Thus, available evidence suggests that the majority of stroke and TIA patients would benefit from antihypertensive therapy irrespective of their baseline BP. It is generally recommended that all stroke and TIA patients, whether normotensive or hypertensive, should receive BP lowering therapy. However, intensive BP lowering may not be feasible in primary care settings[86]. There is also evidence that antihypertensives can reduce cerebral blood flow beyond a critical level, leading to cerebral ischaemia and recurrent stroke in some individuals[88,89]. Thus, optimal targets for BP lowering have not yet been conclusively established. It is anticipated that an RCT (ongoing at the time of writing this thesis) may help to establish these by

evaluating the effects of treating stroke and TIA patients to different targets in a primary care setting (Fletcher et al)[90].

Antihypertensive agents

Several classes of agent can be used to lower BP. These include angiotensin converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARB), thiazide diuretics, calcium channel blockers (CCBs) and beta-receptor blockers (beta-blockers). The optimal drug regime for blood pressure reduction in secondary stroke prevention remains uncertain and this is reflected in the differing recommendations of international guidelines (see Table 2-1). In a systematic review of RCTs investigating BP lowering for the secondary prevention of stroke, Rashid et al conducted subgroup analyses to examine the relative effects of different antihypertensive agents[87]. The review included data from seven RCTs involving 15,527 patients with ischaemic stroke, haemorrhagic stroke or TIA[87]. Review findings indicated that beta-blockers and ACEIs alone produced no significant reductions in the risk of secondary stroke, whereas diuretics had a significant protective effect when compared with placebo or control (OR 0.68; 95% CI 0.50 to 0.92). Furthermore, the combination of a diuretic and ACEI produced even greater reductions in stroke risk (OR 0.55; 95% CI 0.44 to 0.68). The combination of a diuretic/ACEI was also associated with comparable risk reductions for myocardial infarction (OR 0.55; 95% CI 0.38 to 0.79) and all secondary vascular events (OR 0.57; 95% CI 0.48 to 0.68). Another systematic review of RCTs investigated the efficacy of different classes of antihypertensive drugs for the prevention of stroke in patients with and without a history of CVD[91]. The review concluded that CCBs were associated with a reduced likelihood of stroke occurrence

(RR 0.92; 95% CI 0.85 to 0.98) when compared to other classes of antihypertensive medication (thiazides, beta-blockers, ACEIs and ARBs). Conversely, beta-blockers were found to have a lesser preventive effect on stroke when compared to other drug classes (RR 1.18; 95% CI 1.03 to 1.36), although evidence of disadvantage was weakened when trials comparing beta-blockers directly with CCBs were excluded from the analysis (RR 1.11, 95% CI 0.86 to 1.44).

In accordance with the evidence outlined above, international guidelines for the secondary prevention of stroke often recommend antihypertensive monotherapy or combination therapy with ACEIs, diuretics and CCBs. Beta-blockers are not usually recommended unless there are specific clinical indications (see Table 2-1). Additionally, in line with UK hypertension guidelines[92], the RCP guidelines recommend specific antihypertensive agents in different patient subgroups[11]. Calcium-channel blockers or thiazide-type diuretics are recommended as the first line of therapy in hypertensive patients aged ≥ 55 years old and black patients of any age. Conversely, ACEIs (or ARBs if ACEIs are not tolerated) are recommended for hypertensive patients < 55 years old. These recommendations are based upon research into the pathophysiology of hypertension in different patient subgroups. Hypertensive Caucasian adults aged < 55 usually have higher concentrations of the hormone 'renin' in comparison to hypertensive Caucasian adults aged ≥ 55 or black patients of any age[92]. Renin, produced by activation of the renin-angiotensin system, initiates hormonal cascades that lead to increases in BP (through mechanisms involving blood vessel constriction and sodium retention)[93]. ACEIs, ARB or beta-blockers are considered the most appropriate first line of therapy in hypertensive patients with

higher renin concentrations since they reduce BP through suppression of the renin-angiotensin system. Conversely, patients with lower renin concentrations are less sensitive to drugs that act in this way; diuretics and CCBs are recommended for these patients since they lower BP through alternative mechanisms[92,94]. Therefore, although renin concentration is not routinely measured in the context of stroke prevention, consideration of an individual's age and ethnicity can facilitate the selection of appropriate antihypertensive agents.

Table 2-2: Cholesterol lowering following ischaemic stroke or TIA

Guidelines	Target cholesterol		Choice of agent	Notes
	TC	**LDL**		
QOF 2013[49]	TC ≤ 5mmol/L	Not stated	Not stated	---
RCP 2012[11]	TC < 4.0 mmol/L	LDL < 2.0 mmol/L	Statin e.g. simvastatin	"All patients who have had an ischaemic stroke or TIA should be offered treatment with a statin drug unless contraindicated" "Treatment should be intensified if a total cholesterol of < 4.0 mmol/L or an LDL cholesterol of < 2.0 mmol/L is not attained with initial therapy."
AHA/ASA 2011[75]	Not stated	LDL < 1.8 mmol/L <u>*Comorbidities*</u> *LDL < 2.6 for patients with CHD and optional target of LDL < 1.8 mmol/L "for persons considered to be at very high risk"*[95]	Statin	---
ESO 2008[77]	Not stated	Not stated	Statin	"Statin therapy is recommended in subjects with non-cardioembolic stroke"

Guidelines	Target cholesterol		Choice of agent	Notes
	TC	**LDL**		
Canadian Stroke strategy 2010[42]/CHEP 2011[78]	Not stated	LDL < 2 mmol/L (also consider a 50% reduction in LDL concentration)	Statin	---
National Stroke Foundation (Australia) 2010[79]	Not stated	Not stated	Statin	"Therapy with a statin should be used for all patients with ischaemic stroke or TIA"
SIGN 2008 [80]	Not stated	Not stated	Statin e.g. atorvastatin; simvastatin	"A statin should be prescribed to patients who have had an ischaemic stroke, irrespective of cholesterol level"
Chinese guidelines for the secondary prevention of stroke and TIA 2010[81]	Not stated	LDL $\leqslant$ 2.6 mmol/L or a 30–40% reduction in LDL <u>*Comorbidities*</u> *LDL < 2.1 mmol/L for patients with stroke/TIA and multiple risk factors or a reduction of > 40% in LDL*	Statin	---

2.2.3. Cholesterol targets

The relationship between lipid profile, including total cholesterol (TC), low-density lipoprotein (LDL), high-density lipoprotein (HDL) and triglycerides, and the risk of recurrent stroke is complex and has not yet been conclusively established. Increasing LDL concentrations are associated with an increased risk of atherothrombotic and lacunar strokes, but with a decreased risk of cardioembolic strokes[96]. Furthermore, lower cholesterol levels have also been associated with an increased risk of haemorrhagic stroke among older individuals[97]. There are variations between international guidelines (and QOF indicators) in terms of the specification of cholesterol targets: several do not specify cholesterol targets and of those that do, absolute targets for TC and LDL vary between 4-5 mmol/L and 1.8-2.6 mmol/L, respectively (see Table 2-2).

Early evidence of the benefits of cholesterol lowering for secondary stroke prevention came from the Heart Protection Study (HPS)[98]. This RCT investigated the effects of cholesterol lowering among 20,536 UK participants at high risk of coronary heart disease (CHD), including 3280 patients with a history of cerebrovascular disease. Participants were randomly allocated to treatment with simvastatin (40mg daily) or placebo. During the 5 year follow-up, treatment with a statin reduced LDL by an average of 1.0 mmol/L, with an average LDL cholesterol of 2.2 and 3.2 mmol/L among participants in the intervention and control groups, respectively. Treatment with a statin reduced the rate of major vascular events (defined as 'major coronary events, strokes of any type, and coronary or non-coronary revascularisations') by 24% (95% CI 19 to 28). Data indicated that risk reductions were independent of pre-treatment

cholesterol values, suggesting a benefit of cholesterol lowering with simvastatin regardless of baseline cholesterol levels. Additional analyses, involving only those participants with previous stroke/TIA, demonstrated that statin therapy did not significantly reduce the rate of secondary stroke but did produce a 20% (95% CI 8 to 29) reduction in the rate of major vascular events[99].

The SPARCL study is the only study to have investigated the effects of cholesterol lowering specifically for secondary stroke prevention[100]. The study recruited 4731 participants within one to six months of stroke or TIA. Additional eligibility criteria specified that participants must have LDL cholesterol levels of between 2.6 and 4.9 mmol/L and patients with a history of CHD were excluded. Participants were randomised to 80 mg of atorvastatin per day or placebo. The mean LDL cholesterol levels during the trial were 1.9 mmol/L and 3.3 mmol/L in the intervention and control groups, respectively. Atorvastatin therapy was associated with significant reduction in the risk of stroke (hazard ratio (HR) 0.84; 95% CI 0.71 to 0.99). A post-hoc analysis of the SPARCL trial showed that, compared with no change or an increase in LDL, a 50% reduction in LDL cholesterol was associated with a 33% reduction in the risk of ischaemic stroke(HR 0.69, 95% CI 0.55 to 0.87), a 37% reduction in the risk major coronary events (HR 0.63; 95% CI 0.52 to 0.86) and no statistically significant increase in the risk of haemorrhagic stroke (HR 1.04; 95% CI 0.61 to 1.78)[101].

A recent meta-analysis of lipid-lowering therapy for the secondary prevention of stroke included data from both the HPS and SPARCL, along with six additional RCTs[102]. Results demonstrated that intensive cholesterol lowering, although only 'marginally' beneficial for stroke prevention, had significant benefits for the prevention of

cardiovascular events and is therefore recommended for ischaemic stroke and TIA patients. Currently, there is consensus among most international guidelines that lipid-lowering therapy should be used following ischaemic stroke or TIA (see Table 2-2).

Lipid-modifying agents

There remains uncertainty regarding the optimal choice of lipid-lowering therapy to be used following a TIA. One meta-analysis comparing the effects of different lipid lowering drugs found that statins were associated with the largest reductions in stroke risk due to their greater effectiveness in lowering blood cholesterol[103]. Atorvastatin is the only statin with direct evidence of benefit for secondary stroke prevention; however the wide availability and low cost of simvastatin means that this is often used as an alternative[104].

Table 2-3: Antiplatelet therapy following ischaemic stroke or TIA

Guidelines	Choice of agent (patients not requiring anticoagulation)	Choice of agent (patients requiring anticoagulation)
QOF 2013[49]	Not stated in the audit standard	Not stated
RCP 2012[11]	Clopidogrel as standard treatment; combination of aspirin and modified-release dipyridamole for patients who are intolerant of clopidogrel; aspirin for patients who are intolerant of clopidogrel and modified-release dipyridamole; modified-release dipyridamole for patients who are intolerant of aspirin and clopidogrel	Not stated
AHA/ASA 2011[75]	Aspirin monotherapy; combination of aspirin and extended-release dipyridamole; clopidogrel monotherapy "The selection of an antiplatelet agent should be individualised on the basis of patient risk factor profiles, cost, tolerance, and other clinical characteristics"	Warfarin
ESO 2008[77]	Combined aspirin and dipyridamole; clopidogrel alone "Where possible, combined aspirin and dipyridamole, or clopidogrel alone, should be given. Alternatively, aspirin alone, or triflusal alone, may be used"	Not stated

Guidelines	Choice of agent (patients not requiring anticoagulation)	Choice of agent (patients requiring anticoagulation)
Canadian Stroke strategy 2010[42]/CHEP 2011[78]	Aspirin, combined aspirin and dipyridamole, or clopidogrel are "all appropriate options and selection should depend on the clinical circumstances"	Warfarin or dabigatran
National Stroke Foundation (Australia) 2010[79]	Aspirin and dipyridamole, or clopidogrel alone "Aspirin alone can also be used, particularly in people who do not tolerate aspirin plus dipyridamole or clopidogrel"	Not stated
SIGN 2008[80]	Aspirin and dipyridamole; clopidogrel monotherapy	Warfarin
Chinese guidelines for the secondary prevention of stroke and TIA 2010[81]	Aspirin (50–325 mg daily) or clopidogrel monotherapy "Dual antiplatelet therapy is not recommended for routine secondary stroke prevention"	Not stated

2.2.4. Antithrombotic therapy

A meta-analysis conducted by the Antithrombotic Trialists' Collaboration provided evidence of net benefits of antiplatelet therapy for the secondary prevention of stroke[105]. In comparison with placebo, it was demonstrated that long-term antiplatelet medication in those with a history of previous stroke/TIA was associated with 36 (standard error (SE) 6) fewer serious vascular events per 1000 patients. The authors report that "antiplatelet therapy produced an absolute excess of 1.9 (SE 1.0) haemorrhagic strokes per 1000 patients, which was counterbalanced by an absolute reduction of 6.9 (SE 1.4) fewer ischaemic strokes per 1000, yielding an overall reduction in the risk of any further stroke (including those of unknown cause) of 5.4 (1.9) per 1000)"[105 (p77)]. Hence, according to this analysis, the benefits of antiplatelet therapy appear to outweigh the risks. Antiplatelet therapy has now become a "mainstay of secondary prevention of ischaemic strokes"[106 (p49)] and this is reflected by consensus among international guidelines (and QOF indicators) that antiplatelet therapy should be prescribed following an ischaemic stroke/TIA unless there is an indication for anticoagulation (see Table 2-3).

Anticoagulation therapy is generally recommended for TIA patients who are at increased risk of ischaemic stroke due to cardiac disease (cardioembolic stroke). Evidence of effectiveness has been demonstrated by a Cochrane systematic review comparing anticoagulant therapy with control or placebo in patients with non-rheumatic atrial fibrillation and a history of previous stroke/TIA. Findings indicated that anticoagulants were associated with a protective effect on the outcomes of recurrent stroke (OR 0.36; 95% CI 0.22 to 0.58) and recurrent vascular events (OR

0.55; 95% CI 0.37 to 0.82)[18]. There is no evidence of effectiveness of anticoagulants in patients with minor ischaemic stroke or TIA of presumed arterial origin[107].

Antiplatelet agents

Several different types of antiplatelet agents may be used for the secondary prevention of stroke, including aspirin, dipyridamole and thienopyridines (e.g. clopidogrel and ticlopidine).

Aspirin

A report from the Antithrombotic Trialists' Collaboration demonstrated that aspirin therapy, when compared with no antiplatelet therapy, was associated with a significant reduction in the risk of ischaemic stroke (RR 0.78, 95% CI 0.61 to 0.99) and serious vascular events (RR 0.81; 95% CI 0.75 to 0.87) among participants with occlusive vascular disease (including stroke or TIA)[108]. Aspirin therapy was also associated with a non-significant increase in the risk of haemorrhagic stroke (RR 1.67; 95% CI 0.81 to 3.44). However, analyses were not conducted separately for the subgroup of participants with stroke or TIA.

Clopidogrel

A meta-analysis of four trials has demonstrated that, among patients with previous TIA or stroke, thienopyridines (clopidogrel and ticlopidine) reduced the risk of secondary stroke slightly more than aspirin (OR 0.89; 95% CI: 0.80 to 1.0)[109]. This reduction in risk equates to the avoidance of an additional 10 strokes (95% CI 0 to 20) for every 1000 patients receiving thienopyridine treatment during a time frame of two

years[109].

Dipyridamole

A meta-analysis of 29 trials comparing dipyridamole therapy with aspirin therapy, among patients with vascular disease, demonstrated that dipyridamole reduces the risk of secondary vascular events with similar efficacy to aspirin (RR 1.02; 95% CI 0.88 to 1.18)[110]. Similarly, in an RCT comparing the effectiveness of aspirin and dipyridamole therapy specifically for the secondary prevention of stroke, no significant differences in medication efficacy were found[111].

Combination therapy

The MATCH trial was designed to examine the effectiveness of combination therapy with aspirin plus clopidogrel, versus monotherapy with clopidogrel alone, among patients with stroke or TIA[112]. The trial demonstrated no significant benefits of combination therapy over monotherapy. Furthermore, combination therapy was associated with a significant increase in the rates of major bleeding events. On a similar theme, in a subgroup analysis involving 3245 participants with previous ischaemic stroke from the Clopidogrel for High Atherothrombotic Risk and Ischemic Stabilization, Management, and Avoidance (CHARISMA) trial, treatment with clopidogrel and aspirin was associated with a significant reduction in the composite outcome of cardiovascular death, myocardial infarction or stroke, when compared to treatment with placebo plus aspirin (HR 0.78; 95% CI 0.62 to 0.98)[113]. However, patients with previous symptomatic vascular disease (myocardial infarction, stroke or peripheral arterial disease) from the CHARISMA trial demonstrated an increased risk

of moderate bleeding events with dual antiplatelet therapy in comparison to treatment with aspirin plus placebo (HR 1.60, 95% CI 1.16 to 2.20)[113].

The findings of another systematic review, based on data from 13 trials involving patients with vascular disease, indicated that a combination of aspirin plus dipyridamole was associated with a reduction in the risk of vascular events when compared with aspirin alone (RR 0.87; 95% CI 0.79 to 0.96)[110]. Additionally, the comparison did not demonstrate any statistically significant increase in the risk of major bleeding complications with combination therapy (RR 1.08; 95% CI 0.75 to 1.54). The benefits of this combination therapy also apply specifically to patients with cerebrovascular disease: a study comparing aspirin plus dipyridamole versus aspirin alone, in patients with stroke or TIA, demonstrated additional benefits of combination therapy for the primary outcome of vascular death (HR 0.80; 95% CI 0.66 to 0.98)[114]. The Prevention Regimen for Effectively Avoiding Second Strokes (PRoFESS) trial compared the efficacy of extended release dipyridamole plus aspirin versus clopidogrel monotherapy in patients with previous stroke or TIA. After 2.5 years, there were no significant differences between the two arms of the PRoFESS trial in the numbers of participants who experienced recurrent stroke events (HR 1.01, 95% CI 0.92 to 1.11)[115]. Thus, many international guidelines recommend treatment with aspirin plus dipyridamole, or clopidogrel alone, following an ischaemic stroke or TIA (see Table 2-3).

2.2.5. Lifestyle risk factors

Few studies have investigated the association between lifestyle risk factors and the secondary prevention of ischaemic stroke or TIA. The RCP guideline acknowledges

that lifestyle recommendations for secondary stroke prevention are derived largely through the extrapolation of data from studies investigating the primary prevention of vascular events[11]. Since ethical considerations often preclude the use of RCT designs for the investigation of associations between lifestyle risk factors and stroke incidence, much of the evidence in the following section has been obtained from observational studies.

Elevated BMI and abdominal obesity

Body mass index (BMI) is positively associated with the risk of primary ischaemic stroke and the effects of increased BMI appear to be largely mediated by the cardiovascular risk factors of hypertension, diabetes and elevated cholesterol[116,117]. The findings from an observational study indicated that abdominal obesity (defined in terms of an elevated waist-to-hip ratio) is also an independent risk factor for ischaemic stroke[118]. In this study, waist-to-hip ratio was categorised into quartiles; compared with individuals in the first quartile, risk of primary ischaemic stroke was significantly greater among individuals in the third quartile (OR 2.4; 95% CI, 1.5 to 3.9) and fourth quartile (OR, 3.0; 95% CI, 1.8 to 4.8), after adjustment for BMI and other risk factors[118]. The authors of this study concluded that waist-to-hip ratio may act as a stronger risk factor for ischaemic stroke than BMI[118]. However, another observational study concluded that abdominal adiposity (defined in terms of waist circumference or waist-to-hip ratio) is a risk factor for ischaemic stroke in men but in not women[119]. Although there is no direct RCT evidence linking weight reduction with secondary stroke prevention, it is generally accepted that weight reduction is beneficial in this context since it has been associated with significant improvements in BP[77,120], fasting

blood glucose and lipid profile[121].

Smoking cessation

A meta-analysis of findings from observational studies has indicated that smokers have approximately double the risk of experiencing an ischaemic stroke in comparison to non-smokers (RR 1.92; 95% CI 1.71 to 2.16)[122]. This meta-analysis also identified a dose-response relationship between stroke risk and number of cigarettes smoked[122]. Furthermore, it has been estimated that up to one quarter of all stroke cases are directly attributable to cigarette smoking[123]. Studies have indicated that the effects of smoking on stroke risk are likely to be mediated by changes in vascular dynamics[124] and blood vessel stenosis[125].

Epidemiological studies have helped to elucidate the effects of smoking cessation on ischaemic stroke risk. For example, an observational study of the effects of smoking cessation in a female population (aged 30 – 55 years) demonstrated that the risk of primary ischaemic stroke declined rapidly from two to four years following cessation[126]. Consequently, the excess risk of stroke among former smokers, in comparison to individuals who had never smoked, was largely negated[126]. Similarly, in a cohort men and women (aged between 36 – 68 years) assessed as part of the Framingham Heart Study, the risk of stroke among former smokers decreased to the level of non-smokers after 5 years of quitting[127]. In accordance with these findings, the benefits of smoking cessation for stroke prevention are widely recognised, although there is a lack of evidence regarding the effectiveness of smoking cessation interventions in the context of secondary stroke prevention[128]. However, in more

diverse populations of adult smokers, several Cochrane reviews have demonstrated the efficacy of smoking cessation interventions such as nicotine replacement therapy[129], behavioural counselling[130] and nurse-led interventions[131].

Physical activity

Meta-analyses have demonstrated associations between physical activity and ischaemic stroke risk[132,133]. In addition to producing beneficial effects on established cardiovascular risk factors (e.g. BP and cholesterol), exercise may also contribute independently to stroke risk reduction through undetermined mechanisms[133]. However, the optimal nature, intensity and frequency of exercise required to produce reductions in ischaemic stroke risk remain unclear. While most studies have demonstrated that moderate and high levels of physical activity lower stroke risk, results from a few studies suggest that stroke risk increases at high levels of physical activity: clarifying the association between physical activity and stroke risk is complex because the classification of physical activity levels differs across individual studies[133]. Conversely, sedentary (sitting) behaviour is more easily quantified and a meta-analysis of 18 observational studies has indicated that greater sedentary time is associated with an increased risk of cardiovascular disease (RR 2.47; 95% CI 1.44 to 4.24)[134]. Although optimal exercise intensities for stroke patients varies according to stroke-induced disability, there is consensus that regular, moderate-level physical activity is likely to be beneficial for the prevention of secondary stroke[135,136].

Diet

Dietary interventions may facilitate stroke risk reduction through moderation of

established cardiovascular risk factors (e.g. BP and cholesterol)[137]. It has been reported that dietary advice can lead to improvements in numerous cardiovascular risk factors over a time frame of approximately 10 months: a meta-analysis of RCTs demonstrated that interventions providing verbal or written dietary advice were associated with reductions in TC (mean difference (MD) -0.16 mmol/L; 95% CI -0.06 to -0.25), LDL (MD -0.18 mmol/L; 95% CI -0.1 to -0.27), systolic BP (MD -2.07 mm Hg; 95% CI -0.95 to -3.19) and diastolic BP (MD -1.15 mm Hg; 95% CI -0.48 to -1.85), but were not associated with significant effects on HDL or triglycerides[137].

Epidemiological evidence has demonstrated that ischaemic stroke risk is significantly lowered among individuals who consume > 5 servings of fruit and vegetables per day in comparison with those who consume < 3 servings per day (RR 0.72; 95% CI 0.66 to 0.79)[138]. Additionally, the findings from a prospective study have indicated that increased consumption of dietary whole grain may be beneficial for ischaemic stroke prevention, since a significant inverse association between whole grain intake and risk of ischaemic stroke was observed[139]. Pooled results from observational studies have indicated that increased consumption of long-chain Ω-3 polyunsaturated fatty acids (present in fish and fish oil) reduces the risk of ischaemic stroke[140,141]; however, a meta-analysis of RCTs investigating the effectiveness of long chain omega 3 fatty acid supplements found that these were not associated with improvements in the primary or secondary prevention of stroke[141]. Finally, reductions in salt intake have been associated with a significant reduction in BP among both hypertensive and normotensive individuals, indicating that this dietary modification may be beneficial for stroke prevention[142].

Alcohol

Several observational studies have described a 'J-shaped' relationship between alcohol consumption and the incidence of ischaemic stroke: individuals with moderate alcohol consumption have a lower risk of ischaemic stroke in comparison to individuals who abstain from alcohol or those with heavy alcohol consumption[143-145]. Moderate alcohol intake may reduce the risk of ischaemic stroke through increases in HDL levels and beneficial effects on blood clot formation/ dissolution[75,146]. Conversely, higher levels of alcohol consumption have been associated with alcohol-induced hypertension and an increased risk of atrial fibrillation[75,147,148].

A meta-analysis of observational studies has quantified the relationship between daily alcohol consumption and ischaemic stroke risk: compared with abstainers, the relative risk of ischaemic stroke was 0.80 (95% CI 0.67 to 0.96) among individuals consuming less than one drink (12 - 24g of alcohol) per day and 0.72 (95% CI 0.57 to 0.91) among individuals consuming of 1 – 2 drinks (12 - 24g of alcohol) per day. This study also found that the risk of ischaemic stroke increased at levels of alcohol consumption above two drinks per day; the highest relative risk of ischaemic stroke (1.69; 95% CI 1.34 to 2.15) was observed in the category of individuals with the highest levels of alcohol consumption (> 5 drinks, or > 60g of alcohol per day), in comparison to abstainers[149]. There is consensus among guidelines that heavy drinking should be discouraged following an ischaemic stroke, while light/moderate alcohol consumption (< 1 or 2 drinks per day) may be reasonable[11,42,75,79,80].

The importance of targeting multiple risk factors

According to an international case-control study, five modifiable risk factors (hypertension or blood pressure >160/90 mm Hg; smoking status; waist-to-hip ratio, diet risk score; physical activity) account for 82% of the population attributable risk (PAR) for stroke[20]. Furthermore, a large prospective cohort study has concluded that that a combination of factors indicative of a healthy lifestyle, (defined as "never smoking, consumption of between 4 and less than 10.5 alcoholic drinks per week, exercise 4 or more times weekly, a BMI lower than 22, and a healthy diet") are associated with a significant reduction in the risk of primary ischaemic stroke (RR 0.29; 95% 0.14-0.63)[150]. In the context of secondary prevention following an ischaemic stroke or TIA, one modelling study has predicted that an 80% cumulative risk reduction in recurrent vascular events could be achieved by combining dietary modification, exercise, aspirin, a statin, and antihypertensive agent[53]. Thus, available data indicate that the largest reductions in stroke risk can be achieved by combining multiple preventive strategies, including secondary prevention medications and healthy lifestyle behaviours.

2.3. Barriers and facilitators to secondary stroke prevention

The achievement of optimal risk factor control after TIA is dependent upon several factors involving patients, healthcare practitioners and the organisation of healthcare services. For example, evidence-based recommendations may not be translated into clinical practice due to patient non-adherence, organisational barriers, ineffectual continuing educational programs or poor access to guidelines[151]. The importance of

identifying and addressing specific barriers to change has been recognised in the context of developing healthcare interventions[152,153]. Both quantitative and qualitative research (see Chapter 3, section 3.2 for a comparison of research methods) may be used in order to identify and address potential barriers to change.

2.3.1. Patient factors

A large number of factors can potentially influence patients' adherence to medical recommendations for secondary stroke prevention. A variety of demographic factors (e.g. age, gender, ethnicity, socioeconomic status and level of education), disease factors (e.g. presence/absence of symptoms, illness severity and comorbidities) and psychosocial factors (e.g. knowledge, health literacy, beliefs, motivation and attitude) have been evaluated in reviews of patient adherence to therapeutic recommendations[154,155]. This section will discuss the ways in which these factors may affect adherence to secondary prevention medication and lifestyle recommendations in patients who have experienced a TIA.

Demographic factors

Few studies have examined the impact of demographic factors on secondary stroke prevention among TIA patients. However, demographic factors have been shown to influence stroke prevention more generally. Numerous studies have revealed that older patients with cerebrovascular disease are less likely to receive or adhere to secondary prevention medication[56,156,157]. Additionally, an analysis of the relationship between socioeconomic status and secondary stroke prevention demonstrated a positive association between level of education and control of hypertension and

diabetes mellitus[158]. Some ethnic groups are reported to differ with respect to patterns in certain behavioural risk factors for stroke. For example, a survey of behavioural risk factors demonstrated that White respondents were significantly more likely to smoke (31.2%) and to drink alcohol (18.8%) when compared with Black Caribbean and Black African respondents[159]. Furthermore, lower levels of physical activity have been reported among UK South Asians in comparison to the general population and high levels of saturated fat are present in some traditional South Asian diets[160,161]. Combined, these findings indicate that there remains scope for optimising stroke prevention among particular patient subgroups. In the context of stroke service delivery, it has been argued that concepts of personal and social identity (i.e. the ways in which patients represent themselves to healthcare professionals and, in turn, healthcare professionals' perceptions of patients) could mediate the influences of socioeconomic status or ethnicity on the provision and uptake of stroke services[162 (p411)]. Consequently, "patients' views of clinicians and community professionals, and vice versa" have been highlighted as a potential means through which health inequalities could be further explored[162 (p411)].

Disease factors and comorbidities

O'Neill argues that cerebrovascular disease should be regarded as a chronic disease with acute events, although it struggles to find recognition as such[163]. It is expected that many of the issues relating to medication adherence in patients with chronic disease will also apply to patients with TIA[164]. However, a distinguishing factor likely to influence the behaviour of TIA patients is the absence of residual symptoms following a TIA. Medication adherence may be compromised as a result of a concept

known as 'deferred benefit'[165]: patients may not perceive any direct benefits from taking medications in the short-term, since stroke risk factors such as hypertension and hyperlipidaemia are largely asymptomatic[166,167]. However, it has been demonstrated that stroke and TIA patients with a previous medical history of hypertension and dyslipidaemia were more likely to adhere to secondary prevention medications than those without; one suggested explanation for these findings is that familiarisation with medication regimes may support adherence[58].

Psychosocial factors

In the context of secondary stroke prevention, patient adherence to therapeutic recommendations has often been studied in terms of mediating cognitive processes: knowledge, attitudes and beliefs. From the perspective of cognitive theory, it is assumed that social behaviour is driven by internal mental processes[168 (p13)]. It is therefore assumed that the measurement of knowledge, attitudes or beliefs can reveal underlying mental representations of the world that impact upon individuals' behaviour. In line with this approach, it has been demonstrated that many patients with stroke and TIA display knowledge gaps relating to the treatment of vascular risk factors[169]. Furthermore, among stroke patients, poor knowledge and awareness of cardiovascular risk has been shown to correlate with suboptimal secondary prevention[170]. Although information provision can improve patient knowledge after stroke[171], it has been reported that health professionals' use of language may act as a barrier to the comprehension of medical advice[172].

Aside from TIA patients' knowledge of stroke prevention strategies, their underlying

attitudes and beliefs are expected to have an impact on behaviour change[173]. Accordingly, it has been reported that stroke patients' behavioural beliefs (perceived understanding of healthy lifestyle behaviour) and normative beliefs (perceived expectations of others in relation to healthy lifestyle behaviour) influence their intention to engage in specific behaviours for secondary stroke prevention (e.g. smoking cessation)[174]. Similarly, it has been argued that it is necessary to address individuals' beliefs about stroke (relating to causation, prevention and recurrence) before providing health education about secondary stroke prevention[172]. However, other studies involving patients with previous stroke or TIA have revealed considerable disparities between patients' risk reduction behaviour and their reported attitudes and beliefs relating to secondary stroke prevention[173,175]. Furthermore, as discussed in the following section, the use of cognitive theory as a means of explaining peoples' actions has been criticised and an alternative perspective has been developed in direct response to this.

2.3.2. Social and discursive factors

Discursive psychology is a discipline in which language is understood as a form of social action[176-178]. Proponents of discursive psychology have criticised the assumption that social actions (e.g. adherence or non-adherence to therapeutic recommendations) can be explained or predicted in terms of underlying internal cognitive processes[177,178]. The main criticism levelled at this assumption is that the variations and contractions apparent in peoples' everyday talk are inconsistent with key premises of cognitive theory[178]. Therefore, it has been argued that studies of peoples' attitudes and beliefs are not the most effective means of predicting or

explaining their actions[179,180].

Instead, it has been proposed that social action in specific contexts is constituted by discursive activities (i.e. situated language use)[176-178]. Thus, secondary prevention may be affected by the social context in which this takes place. Of particular relevance here is the concept of discourse. A discourse has been defined as "a set of meanings, metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of events"[181 (p32)]. According to a social constructivist perspective, discourses are determined socially and have social consequences[181]. More specifically, it has been claimed that "discourses have implications for what we can do and what we should do"[181 (p75)]. This concept is expanded upon in the section below.

Discourse and social action

Through a process known as 'positioning', individuals negotiate and take up temporary identities or 'subject positions' within discourses (see Davies and Harré (1990) for an account of positioning theory)[182]. The subject positions taken up by individuals can affect their possibilities for action. For example, in the context of medical consultations, it is expected that individuals occupying the subject positions of 'doctor' and 'patient' should speak and act in particular ways that are determined by wider social discourses[179 (p41)]. Consequently, aside from the psychosocial factors discussed above, it is possible that discourses - and the positioning of individuals within these discourses - influence secondary stroke prevention behaviour in patients with TIA. An understanding of the discourses that individuals draw upon when talking

about TIA and secondary stroke prevention, and the subject positions that they adopt, may therefore contribute towards an understanding of their actions in terms of adherence or non-adherence to therapeutic recommendations.

There is a lack of research exploring the discourses that are drawn upon in the context of TIA or secondary stroke prevention. Only two published interview-based studies exploring the peoples' accounts of TIA and secondary stroke prevention have been identified[183,184]. The study by Gibson and Watkins (2012) explored the subjective experiences of TIA patients and their perceptions of secondary stroke prevention[183]. The findings from this study indicated that the occurrence of TIA changed peoples' perceptions of their health and, in some cases, prompted them to adopt secondary prevention behaviours in order to reduce their risk of stroke[183]. Similarly, Kamara and Singh (2012) reported that individuals who perceived TIA as a serious event were more likely to engage in secondary prevention activities than those who did not consider themselves at risk of future TIA or stroke[184]. However, the conclusions of these studies rest on the assumption that qualitative interview data accurately represents participants' internal perceptions and external realities. From the perspective of discursive psychology, it can be argued that these studies adopt a cognitive approach and are therefore limited as described above in relation to studies measuring attitudes or beliefs[178]. An alternative way of viewing participants' accounts is in terms of the discourse that is produced (i.e. accounts can be regarded as contextual and socially constructed rather than factual). It is expected that an understanding of the discourses used in individuals' accounts of TIA and secondary stroke prevention could facilitate the development of health promotion

interventions[185].

In a study conducted by Redfern et al, social influences on the management of secondary stroke prevention were identified through a qualitative analysis of doctor-patient interactions at two outpatient stroke clinics[186]. One important finding revealed that "medical authority influenced patients' attempts to voice their concerns and participate in decision-making, and professionals' attempts to focus on patients' priorities"[186 (p123)]. In this study, medical authority was considered mainly in relation to rigid consultation formats. For example, doctors were observed to assume control of consultations by asking questions in specific sequences, resulting in limited opportunities for patients to interject and introduce their own agendas. In contrast, from the perspective of discursive psychology, patients' opportunity for participation in healthcare consultations can be considered instead in terms of the discourses and subject positions that they draw upon. For example, it is possible that the ways in which participants were positioned by discourses inhibited them from speaking or acting in particular ways. Another finding reported by Redfern et al was that participants were expected to fulfil a patient role, and that this role was represented in a particular way (e.g. in terms of compliance with doctors' instructions). This finding indicates that underlying discourses may be positioning individuals in particular ways with consequences in terms of the actions that they are expected to perform. Thus, the study by Redfern et al provides insights to suggest that doctor-patient discourses may influence the management of secondary stroke prevention. A number of different discourses that may be mobilised in the context of TIA and secondary stroke prevention are discussed below.

Discourses of relevance to secondary stroke prevention

The clinical management of patients with TIA is concerned with minimising the risk of future stroke events[11]. Consequently, TIA can be conceptualised as a chronic disease due to the requisite ongoing risk factor management[163]. It has been argued that notions of 'risk'[187,188] and 'chronic disease'[189] are constituted through modern discourses. Therefore, according to a discursive psychology perspective[177,178], the ways in which 'risk' and 'chronic disease management' are represented through discourse are expected to have an impact upon the socially constructed phenomenon of secondary stroke prevention. Over recent decades, there have been significant changes in healthcare delivery, with concomitant changes in the discourses associated with this social practice. This section will provide an overview of these changes in order to highlight the social influences on secondary stroke prevention. Several ways in which evolving discourses may constitute barriers to secondary stroke prevention are also discussed.

Discourses in chronic disease management

Discourses surrounding chronic disease management have evolved as models of healthcare delivery have undergone significant changes during recent decades[189]. The traditional medical model (acute care) was commonly applied to chronic disease management prior to the early 1990s[190,191] when new healthcare policies were introduced advocating self-care approaches for patients with long-term conditions[192]. Within the traditional medical model, chronic disease management followed a compliance-orientated approach to patient care: patients were expected to follow the

recommendations of healthcare professionals without actively participating in treatment decisions themselves[190]. Discourses of medical dominance therefore located responsibility for health and healthcare decisions with physicians rather than with patients[193]; consequently physicians were represented as "dominant, authoritarian figures"[194 (p26)] whilst patients were viewed as "passive, accepting, compliant and dependent on the physician's medical knowledge"[190 (p413)]. The term 'compliance' is now widely considered to be synonymous with this paternalistic model of healthcare delivery[195-197].

The traditional medical model is associated with Parson's (1951)[198] concept of the 'sick role'. Here, the sick role is conferred to legitimate patients by healthcare professionals. Patients who enter the sick role are consequently expected to conform with a particular set of rights and obligations: (1) individuals become exempt from certain normal social activities and responsibilities in a way that is dependent upon the nature and severity of their condition; (2) patients are absolved from responsibility for their condition; (3) patients are expected to try to become well; (4) patients are expected to fully cooperate with healthcare professionals in a way that facilitates their recovery (see Parsons (1951) for a detailed account of the sick role[198]). Hence, the sick role locates the overall responsibility for the management of patients' illness with healthcare professions, and patients themselves are expected to show passive co-operation with treatment recommendations.

During the previous two decades, an alternative discourse termed 'patient empowerment' (concerned with enabling people to take control over the factors that affect their health[199]) has emerged in UK health policy and has encouraged patients to

take a more active role in the management of long-term conditions through self-care practices[190,200]. Consequently, in contemporary chronic disease management, the traditional medical model has now largely been replaced with approaches to healthcare delivery that involve collaborative patient-professional partnerships[200,201]. Within this partnership model of healthcare delivery, it is recognised that "professionals are experts about disease" while "patients are expert about their own lives": the combination of both forms of knowledge are considered necessary to enhance self-care[200 (p2470)]. In line with this changing approach to healthcare delivery, the term used to denote patients' behaviour in the context of medical advice has also evolved: the term 'adherence' is now often preferred to that of 'compliance' as it signifies the recognition of patients' right to participate in shared decision making and to exercise autonomy over the management of their own health[195,202,203]. Additionally, the term 'concordance' has been introduced to denote the process of establishing agreement on healthcare treatment and goals, via a partnership approach between patients and healthcare professionals[204].

Emergence of the Expert Patients Programme

In the context of chronic disease management, and in line with notions of patient empowerment and self-care, the 'Expert Patients Programme' has been established as a self-management program for patients with chronic disease[192,204]. Aims of the program include helping patients to manage their conditions effectively, improving their quality of life and improving access to healthcare services[205]. The 'expert patient' discourse constitutes patients as "active, informed and knowledgeable" about their condition[206]. Central to the Expert Patients Program are discourses of self-care. The

concept of 'self-care' has been defined by the NHS in the following terms:

"Self-care includes the actions people take for themselves, their children and their families to stay fit and maintain good physical and mental health; meet social and psychological needs; prevent illness or accidents; care for minor ailments and long-term conditions; and maintain health and wellbeing after an acute illness or discharge from hospital."[207] (p1)

Another predominant discourse in the context of the Expert Patients Programme is that of shared decision making[208]. This approach to decision making brings together evidence-based clinical expertise and informed patients' preferences regarding the management of their condition. It has been argued that this discourse represents subjects as rational individuals "who calculate risk probabilities and act upon them"[209] (p78).

A number of structured education programs, based upon the above discourses of patient empowerment, self-care and shared decision making, have been established for patients with specific conditions. For example, the diabetes education and self-management for ongoing and newly diagnosed (DESMOND) program[210-212], the diabetes X-PERT program[213] and the dose adjustment for normal eating (DAFNE) program[214] aim to enable patients with diabetes to assume a greater degree of responsibility for the management of their condition; these programs have been associated with improvements in clinical outcomes, diabetes knowledge and treatment satisfaction when evaluated in RCTs[210-214]. However, no similar structured educational programs have yet been evaluated specifically among patients who have

experienced a TIA.

Wider discourses on health, disease and management of risk

The above changes in the clinical management of chronic disease have occurred in parallel with changes in the wider discourses surrounding health, disease and management of risk. In general, modern discourses have increasingly located responsibility for health, and the management of health-related risk, with individuals (i.e. self-care) rather than with the state[215]. The increasing medicalisation of peoples' everyday lives was first termed 'healthism' by Crawford (1980), who argued that political ideology "situated the problem of health and disease at the level of the individual"[216 (p365)].

The culture of healthism emerged in association with 'health promotion' discourses, initially deployed by media campaigns, that encouraged people to take responsibility for their health through the adoption of healthy lifestyle behaviours and voluntary adherence to health-related targets or goals[215]. Furthermore, the cultural changes of healthism occurred in the context of an increasing societal emphasis on risk, a phenomenon that has been denoted as the 'risk society theory'[187,188]. It has been argued that health promotion discourses constituted citizens as having a social responsibility or duty to engage with health promotion practices and to manage health-related risks[215,217]. Consequently, health promotion discourses have been criticised by some as functioning as a means of social control through the regulation of lifestyle behaviour[218]. More specifically, it has been proposed that health promotion discourses associated the notion of a 'healthy citizen' with that of a 'good

citizen' who demonstrated self-control and self-regulation[215]; conversely, illness was represented as a potential form of social deviance due to assumptions that it could be caused by unhealthy or risky behaviours[219]. More recently, the concept of health promotion has been framed within discourses that promote greater individual choice and freedom[220]. This includes the freedom of patients to exercise non-adherence to medication or lifestyle recommendations[221].

Tensions and uncertainties arising from changing discourses

The above section has outlined a range of competing discourses that are available to speakers when constructing accounts about the management of chronic disease and health-related risk; these discourses may be therefore be drawn upon in the context of secondary stroke prevention. Literature focusing on how patients and healthcare professionals deal with changing discourses has documented the emergence of resulting tensions. These tensions may represent a potential barrier to secondary stroke prevention following a TIA.

First, it can be argued that patients speaking about secondary stroke prevention face a dilemma due their ability to draw upon contradictory discourses. On the one hand, medical dominance and health promotion discourses charge individuals with responsibility to comply with medical recommendations and adopt healthy lifestyle behaviours[215,220]. On the other hand, patient empowerment and resistance discourses provide individuals with the opportunity to participate in treatment decision making or to choose an alternative of non-adherence to medical recommendations[199,222]. In contemporary healthcare practice, research has indicated that many individuals with

chronic disease draw upon patient empowerment discourses, as evidenced by their expectation to assume an active role in their treatment, specifically with regards to the adoption of healthy lifestyle behaviours[223]. Conversely, other research has demonstrated that many patients express a preference not to engage in empowerment discourses in the context of shared decision making, instead preferring to be asked for their options with final decisions left to physicians[224]. It is therefore apparent that tensions exist in terms of patients being encouraged to assume empowering discourses when this may be against their preferences.

Another example of conflict between the discourses of medical dominance and patient empowerment can be seen in relation to clinical guidelines. To exemplify this two extracts from different healthcare guidelines (see Figures 2-1 and 2-2) are considered below:

Figure 2-1: Extract from NICE guideline[225]

Clinical Guidelines and Evidence Review for Medicines Adherence: involving patients in decisions about prescribed medicines and supporting adherence (2009)[225]:

"Adherence presumes an agreement between prescriber and patient about the prescriber's recommendations. Adherence to medicines is defined as the extent to which the patient's action matches the agreed recommendations….Non-adherence should not be seen as the patient's problem. It represents a fundamental limitation in the delivery of healthcare, often because of a failure to fully agree the prescription in the first place or to identify and provide the support that patients need later on".

Figure 2-2: Extract from RCP guideline[11]

RCP National Clinical Guideline for Stroke (2012)[11]:

"Changes in lifestyle are as important in secondary prevention as they are in primary prevention. This requires changes in behaviour by the patient in areas such as smoking, exercise, eating and alcohol intake. Although it is the responsibility of the person to change his or her own behaviour, the health system has the responsibility of giving accurate advice and information and providing support for patients to make and maintain lifestyle changes. Wider society also has some responsibility in enabling behaviour change".

It can be argued that NICE guidance (Figure 2-1) describes medication adherence in a way that corresponds with discourses of patient empowerment[199] and shared decision making[208]. This extract implies that patients and clinicians should make joint decisions about medication prescription. Conversely, the approach to secondary prevention described in the RCP guideline extract (Figure 2-2) alludes to a discourse of medical dominance, as it implied that patients should rely on clinicians to give them instructions about secondary prevention management and then follow this advice in a more passive approach. Thus, there may be some incongruence between the modern discourses of patient empowerment and shared decision making, and the nature of the recommendations outlined in clinical stroke guidelines.

Furthermore, while shared decision making is advocated in healthcare policy, it is not widely adopted in practice; possible barriers may include resistance of healthcare

professionals, time and knowledge limitations and structural barriers[226]. It has also been observed that resources for patient education and facilitation of shared decision making are frequently not addressed by guideline developers[227]. Additionally, it has been argued that shared decision making in clinical practice is more aligned with medical dominance discourse than with patient empowerment discourse, since it "appears to work to maintain a biomedical 'GP as expert' approach rather than one in which the patient is truly involved in partnership"[228 (p79)].

In clinical practice, the consequences of shifting discourses, and subsequent changes in the behaviour and expectations of healthcare professionals and patients, means that a lack of clarity or consensus may exist with regards to who should assume responsibility for ensuring optimal control of stroke risk factors. For example, in the context of medical consultations, healthcare professionals preferring to maintain professional responsibility and accountability may resist the location of power and control with patients[229,230]. Conversely, it has been argued that discourses of patient empowerment may enable clinicians to withdraw from responsibly in the area of chronic illness[231]. The discourses that are drawn upon by TIA patients, in the context of secondary stroke prevention, will be explored in Chapter 7.

2.3.3. Healthcare professional factors

Responsibility for secondary stroke prevention lies at the interface between primary and secondary care services; patients may be given initial prescriptions and information in the hospital setting, but ongoing prescriptions and lifestyle advice are usually provided by primary care. The delivery of secondary prevention in primary care may be managed by GPs or practice nurses. The establishment of nurse-led

secondary prevention clinics in primary care represents one model of service delivery that may be implemented to promote the systematic follow-up of patients with CVD[232,233].

Clinical inertia, described as "failure of healthcare providers to initiate or intensify therapy when indicated"[234 (p825)] is likely to be one of the issues surrounding the management of cardiovascular risk factors in TIA patients. Although most patients will require at least two antihypertensive drugs to reach BP goals[92], it is apparent that a large proportion of patients with elevated BP are not prescribed combination therapy[56]. In addition, some healthcare professionals may be reluctant to adhere to lower BP targets owing to concerns about adverse effects in elderly patients[235]. On the same theme, healthcare professionals may be unsure of the most appropriate BP target or medication regimen. A survey among general practitioners (GPs) identified knowledge deficits regarding the management of hypertension and hyperlipidaemia in TIA patients; the establishment of practical guidelines and GP training were highlighted as potential strategies for delivering improvements in TIA patient care[236]. Additionally, the management of secondary stroke prevention may be limited by the time available for consultations. For example, in a survey of community healthcare providers, over half reported that lack of time was a barrier to addressing lifestyle modification in patients with hypertension and hyperlipidaemia[237].

2.3.4. Health service organisational factors

Access to TIA services

Following the occurrence of a TIA, secondary stroke prevention is facilitated by urgent

assessment and early initiation of treatment[34]. In the UK, specialist neurovascular/TIA clinics have been established for this purpose (see Chapter 4, section 4.1.1 for an overview of TIA clinics). However, the 2010 National Sentinel Stroke Audit (NSSA) reported that TIA patients at high risk of stroke were not receiving specialist assessment quickly enough: it was found that only 10% of NHS trusts provided an outpatient neurovascular clinic that was open 7 days per week and only 10% of trusts enabled high-risk TIA patients to access carotid imaging services on the same day[238]. Thus, it is concluded that timely access to TIA clinics and carotid imaging services could be improved in order facilitate adherence to secondary prevention standards outlined in the RCP guideline[238].

However, a systematic review has reported that many patients delay seeking medical attention following a TIA[239]: for example, consideration of UK studies indicated that the majority of TIA patients initially sought medical attention from their GP, while only 10 -26% attended an emergency department[239-241]. Additionally, one UK study found that 25% of TIA patients who presented to their GP waited two days or longer before seeking medical attention[239,241]. Therefore, if the benefits of rapid access to neurovascular clinics are to be realised, is apparent that patient-related delays in seeking medical attention need to be addressed. Studies have shown that poor recognition of particular TIA symptoms (e.g. leg weakness and visual loss)[242], and delays in contacting medical services when TIA symptoms are recognised[239], represent barriers to timely access to neurovascular clinics and public education campaigns have been recommended as a strategy to overcome these[239,242].

Ongoing management of risk factors in primary care

A structured approach to stroke management in general practice (e.g. record keeping, formal delegation of preventive tasks and guideline compliance) can facilitate stroke prevention[243]. However, a survey of 204 general practitioners (GPs) concluded that "general practices were not fulfilling their potential to provide stroke prevention and long-term management"[244]. This was attributed to a lack of time, inadequate staffing and issues related to funding and lack of protocols/guidelines[244]. A study involving qualitative interviews with GPs identified a further barrier of difficulties in applying generic guidelines to patients with complicated risk profiles[245]. This observation was made in the context of aspirin prescribing for the secondary prevention of stroke, but could equally be expected to apply to the management of TIA patients. Thus, the nature and presentation of risk information available to GPs could be improved[245]. GPs also need support in assessing the risks and benefits of prescribing for patients with multiple risk factors and at high risk of side effects[246]. A systematic management approach involving both primary and secondary care practitioners could bridge knowledge gaps and help to optimise the management of vascular risk factors following TIA[246].

Inconsistencies between stroke guidelines and audit standards

It has been demonstrated that the quality of secondary stroke prevention measured according to the QOF may not always correspond well with adherence to the RCP stroke guideline, and further research is required to investigate how QOF might be better aligned with delivering best practice[64]. Achievement of QOF criteria may not be

sufficient for the effective secondary prevention of stroke and it has been recommended that more emphasis could be placed on adherence to RCP guidelines[10]. Furthermore, it is possible that variations between international guidelines, in terms differing risk factor targets and recommendations for medical management (see section 2.2 for a summary of guideline standards), may influence clinicians' perceptions of guideline credibility[247] and further research is therefore required to establish whether inconsistencies between guidelines have an impact on the quality of care provided to patients[248].

2.4. Chapter conclusion

TIA is associated with an increased risk of secondary stroke and other vascular events. This chapter has indicated that substantial risk reductions are achievable through implementation of evidence-based recommendations. TIA patients are identifiable through their contact with healthcare services, thus providing an important opportunity to address secondary stroke prevention. However, there is a need to evaluate the quality of secondary prevention in a local population of TIA patients (see Chapter 4) and to determine whether stroke service interventions can optimise the implementation of evidence-based guidelines (see Chapter 5). A number of barriers and facilitators to secondary stroke prevention that relate to patients, healthcare professionals and health service organisation have been outlined in this chapter. Additionally, there is a need to explore the wider social and discursive barriers and enablers to the secondary prevention of stroke (see Chapters 6 and 7). The following chapter will provide an overview of the methodology that will be used to conduct three research studies that are informed by the literature considered in this chapter.

Chapter 3. Consideration of mixed methods research in the context of complex intervention development

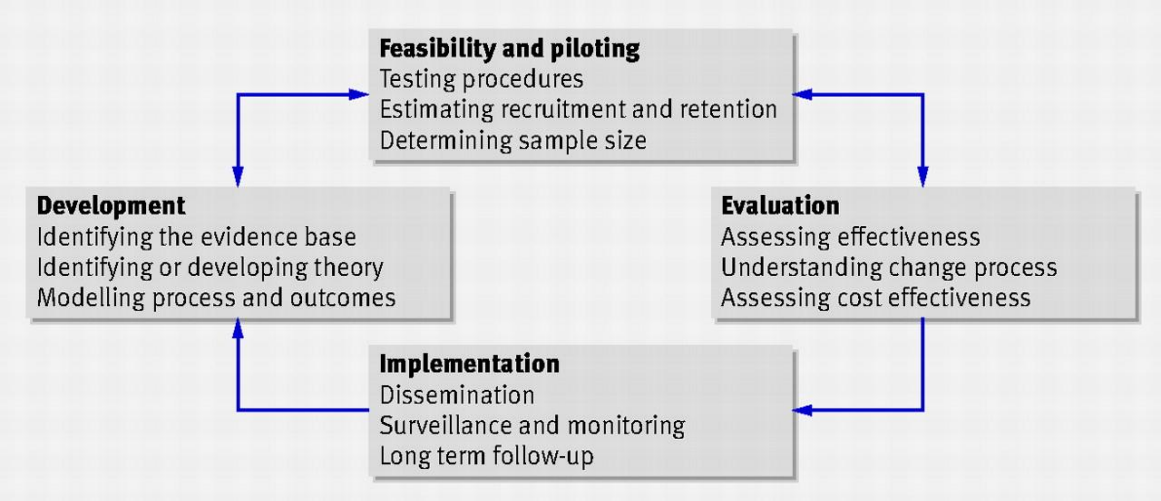
This thesis presents three correlated studies that aim to inform the development of a complex intervention for secondary stroke prevention following a TIA. The following chapter is split into two sections. The first section will provide an overview of the MRC framework for developing and evaluating complex interventions[62], and of qualitative, quantitative and mixed methods research. Subsequently, this information will be used to justify the rationale for the design, analysis and integration of the studies contained within this thesis: a multi-phased research design will be outlined and discussed in relation to the PhD objectives rationalised in Chapter 1. The second section considers the implications of applying mixed methods research in the context of the MRC framework. Some specific challenges to integrating research findings in this context are considered and strategies for overcoming these are developed.

The MRC first published "a framework for development and evaluation of RCTs for complex interventions to improve health" in 2000[249]. Subsequently, the MRC issued revised guidance in 2008[62,250]. According to the MRC, although complex interventions are usually defined as "interventions that contain several interacting components", a number of other factors can give rise to complexity[250 (p979)]. These factors include complex behavioural requirements, a diverse range of outcomes or flexible implementation strategies. This thesis will address two phases of MRC complex intervention development: (i) "identifying existing evidence"; and (ii) "identifying and developing theory". The results from phases (i) and (ii) will be then be used to make some recommendations for the remainder of the development process.

3.1. Developing interventions using the MRC framework

The MRC framework sets out detailed recommendations for the development of complex interventions[62]. Specifically, these recommendations pertain to three phases that need not necessarily follow any particular sequence: "identifying existing evidence; identifying and developing theory; modelling processes and outcomes" (see Figure 3-1)[62]. An overview of the phases is presented here to provide a context to the work contained within this thesis.

Figure 3-1: MRC guidance for the development of complex interventions[250] reproduced with permission from BMJ Publishing Group Ltd



"Identifying existing evidence"

The MRC recommends that relevant research evidence should be considered during the process of complex intervention development[62]. The main purpose of this task is to identify the probable outcomes of a complex intervention. A research strategy recommended by the MRC for achieving this objective is known as a 'systematic review'. This term is used to describe the process of locating, appraising and synthesising evidence that is relevant to a particular clinical issue or research

question[251]. A systematic review can be used to assess the benefits and harms of interventions that have been evaluated through research studies. The outcomes of interventions are usually summarised descriptively (qualitative synthesis) or numerically (quantitative synthesis or meta-analysis). Additionally, consideration may be given to the research methods that have been used to evaluate interventions[62]. For example, interventions can be evaluated using qualitative or quantitative research methods and this has implications for outcome assessment, as discussed further in section 3.2.

"Identifying and developing theory"

A theoretical understanding of the process of change should also be sought when developing complex interventions[62]. It is necessary to establish "the rationale for a complex intervention, the changes that are expected, and how change is to be achieved"[250 (p981)]. For example, specific barriers to the achievement of optimal clinical outcomes could be identified in order to inform the design of a complex intervention intended to overcome these. The importance of addressing specific barriers to change has been recognised when developing interventions that aim to change practitioner or patient behaviour[151,252]. A mixture of qualitative and quantitative research methods may be required for these purposes (see section 3.2 for a comparison of research methods).

"Modelling processes and outcomes"

The MRC framework recommends the use of modelling exercises in order to inform the design and evaluation of complex interventions, before full scale

implementation[62]. Modelling exercises are expected to improve researchers' understanding of individual intervention components and how these interact. For example, causal modelling approaches have been developed to explain the impact of complex interventions on patients' behaviour and the changes in outcomes measures associated with this[253]. Modelling processes can also be used to generate possible explanations regarding the success or failure of interventions[254]. Additionally, economic modelling may be used to predict the cost-effectiveness of an intervention prior to implementation[62].

3.2. Comparison of qualitative and quantitative research methods

In order to adhere to the MRC framework recommendations outlined in the previous section, complex intervention development may include several parallel studies involving different research methods. For example, existing evidence should be identified through a high quality systematic review[62]. Additionally, interviews or focus groups may be used to identify potential barriers and enablers to change that are relevant to interventions aimed at bringing about changes in patient or healthcare professional behaviour[151,252]. This section will consider the implications of using different research methods, in order to inform the overall research design for this thesis.

Broadly speaking, research methods can be categorised as either qualitative or quantitative. Qualitative research methods involve the study of things in their natural settings, with the aim of interpreting phenomena in terms of the meanings that people bring to them[255]. Consequently, qualitative research is often exploratory with

a focus on developing in-depth understandings of individual cases. Although context-dependent theories may be developed from qualitative research, attempts are not usually made to generalise findings beyond the cases studied. Conversely, quantitative research methods frequently involve the verification or falsification of hypotheses, and experimental techniques may be used to manipulate phenomena under investigation[256]. Additionally, generalisations and predictions about cause-effect linkages are often derived from quantitative research[256].

3.2.1. Paradigm positions

The above differences between qualitative and quantitative research methods are a consequence of their association with different paradigms. A paradigm has been defined as a "basic set of beliefs that guides action"[257 (p17)]. These beliefs encompass the inter-related concepts of epistemology, ontology and methodology[256]. Epistemology refers to the nature of knowledge and how this is acquired. Ontology addresses the nature of reality or existence. Finally, methodology considers the most appropriate approaches for gaining knowledge. The position that a researcher adopts in relation to these concepts is expected to exert an influence on the research that they conduct[255]. For example, a researcher's paradigmatic beliefs are likely to influence the types of research questions asked, the nature of research methods used and interpretation of study findings.

3.2.2. Positivist and social constructivist paradigms

A range of alternative paradigms have been described and these can be considered to represent a spectrum of positioning in terms of epistemology, ontology and

methodology[256]. At one end of the spectrum, a positivist paradigm is associated with beliefs that there is a single objective reality that can be verified through observation and experimental methods. Positivistic enquiry is often characterised by the study of causes and effects and it is assumed that enquiry is objective and independent of the values of the researcher[256]. At the other end of the spectrum, the interpretivist or social constructivist paradigm is associated with beliefs that reality is 'constructed' through social practices[258]. According to this perspective, the world is seen to consist of multiple realities that are generated and considered meaningful through diverse individual and group interactions. Additionally, it is assumed that enquiry within a social constructivist paradigm is influenced by researchers' values, since these are considered to have a role in 'creating' study findings[256].

It is now acknowledged by many researchers that both quantitative and qualitative research involve a degree of researcher influence, in terms of the selection of research questions and interpretation of study findings[259 (p3)]. However, assumptions about the degree of researcher influence and the nature of the 'truths' that can be established remain disputed by researchers holding different paradigmatic views.

Association between paradigms and research methods

The assumption that paradigms should necessarily be linked with particular research methods has been widely debated[260]. Generally, quantitative enquiry is often positioned towards the 'positivist' end of the paradigm spectrum whereas qualitative enquiry is frequently located within a constructivist paradigm. Thus, positivist research tends to involve the collection of numerical data using quantitative research

methods such as questionnaires or experimental observations. Typically, numerical data is analysed in order to make statistical inferences. Conversely, constructivist research frequently involves qualitative research methods, such as interviews or case studies. Descriptive or linguistic data are collected through interpretive approaches. These data are generally analysed in terms of contextual meaning and experiences.

3.2.3. Rigor in qualitative and quantitative research

The concept of 'ensuring rigor' is relevant to both qualitative and quantitative research, since it is associated with the production of credible research[261]. However, interpretations of this concept and its assessment vary considerably according to paradigm position. The criteria of internal validity (the degree to which a study measures what was intended), external validity (the ability to generalise from a study beyond the cases studied), reliability (the degree to which findings could be replicated or corroborated by others) and objectivity (absence of researcher bias) are often used to assess the rigor of positivist research[256]. While these criteria were originally developed for use in quantitative research, it has been argued that they are not applicable to qualitative research, since this is generally conducted within a different paradigm (constructivist paradigm)[257,262,263]. For example, objectivity is often of no relevance to qualitative research since, according to a constructivist perspective, knowledge is considered to be dependent on the researcher's subjective experiences[258]. Similarly, it has been argued that the positivist notions of reliability and validity should be redefined in order to be used in qualitative research[264].

Trustworthiness and qualitative research

During the 1980s, Guba and Lincoln were instrumental in developing alternative interpretations of the concept of 'rigor' in qualitative research. They replaced the term 'rigor' with 'trustworthiness' and specified four associated criteria: credibility (the degree to which research findings or interpretations are considered to demonstrate truthfulness); transferability (the potential for application of research findings beyond a particular study), dependability (the quality of research processes), and confirmability (the degree to which research processes are appropriately accounted for)[265]. Additionally, specific methodological strategies were defined for addressing these criteria, such as "peer debriefing" (exploring analytic matters with peers), "negative case analysis" (using exceptional cases to revise hypotheses), "audit trail" (accounting for research processes), "member checks" (checking or verifying results and interpretations with study participants) and "referential adequacy" (archiving unanalysed data for examination at a later time, in order to test conclusions)[265 (p301)]. Other methodologists have suggested alternative criteria that may also be used to evaluate the trustworthiness of qualitative research. For example, Koch et al claim that reflexive research accounts can help to establish trustworthiness through demonstration of a researcher's "ongoing self-critique and self-appraisal"[263 (p882)]. Similarly, Davies and Dodd argue the 'rigor' of qualitative research should be described in the context of terms such as "attentiveness, empathy, carefulness, sensitivity, respect, reflection, conscientiousness, engagement, awareness and openness"[262 (p279)].

The criteria developed by Guba and Lincoln have been criticised by others who argue

that their refusal to "acknowledge the centrality of validity and reliability in qualitative methods" has caused qualitative research to be perceived generally as unreliable or invalid[261 (p4)]. Morse et al rationalise that positivist criteria for rigor have an impact upon the course of research inquiry and are therefore correlated with attainment of rigor[261]. Therefore, it is asserted that positivist criteria of validity and reliability should similarly be applied to the process of constructivist research[261]. Morse et al argue that parallel constructivist criteria for assessing trustworthiness are "post-hoc evaluations" and "procedures that are external to the research process itself"[261 (p6)]. This is exemplified by their consideration of audit trails as a method of assessing rigor:

"For example, audit trails may be kept as proof of the decisions made throughout the project, but they do little to identify the quality of those decisions, the rationale behind those decisions, or the responsiveness and sensitivity of the investigator to data. Of importance, an audit trail is of little use for identifying or justifying actual shortcomings that have impaired reliability and validity. Thus, they can neither be used to guide the research process nor to ensure an excellent product, but only to document the course of development of the completed analysis."[261 (p6-7)].

In practice, the many available appraisal tools for assessing the quality of qualitative research differ in terms of their criteria, with some based largely on constructivist principles[266], positivist principles[261] or an integration of both[267,268], and some focusing more on the quality of reporting rather than on paradigmatic assumptions[269]. Other researchers argue that there is "no unified qualitative paradigm" and therefore no unified criteria by which it is appropriate to judge the quality of qualitative research[270 (p304)]. Instead, Rolfe proposes that quality judgements should be made about

individual studies through subjective appraisal of individual research reports[270]. However, while the pragmatic view may be taken that there no universal criteria for judging the trustworthiness of qualitative research, it can be acknowledged that traditional paradigms represent useful conceptual constructions for guiding research practice (see section 3.3.4 and 3.3.5). Therefore, it can be argued that the distinctions often drawn between qualitative and quantitative research are of lesser consequence when studies are considered on an individual basis, since appropriate quality criteria can be chosen to correspond with the unique characteristics of each study.

3.3. Overview of mixing research methods

In order to adhere to MRC recommendations, complex intervention development may include several parallel studies involving different research methods (see section 3.1). Complex intervention development may therefore be defined in some instances as 'mixed methods research', defined as "the application of two or more sources of data or research methods to the investigation of a research question or highly linked research questions"[271 (p677)]. The following section discusses different positions on the combination of qualitative and quantitative research methods, and considers mixed methods research in more detail.

3.3.1. Qualitative and quantitative research as incommensurable methodologies

It has been argued that opposing philosophical assumptions make different paradigms fundamentally incommensurable[265,272]. That is to say, according to this purist stance, qualitative and quantitative research methods cannot be combined within a single

study since there are no common grounds on which comparisons can be made. Tashakkori and Teddlie (1998) use the phrase "paradigm wars" to describe the debates that took place between the 1960's and 1990's with regards to paradigm assumptions in the social and behavioural sciences, when theorists argued for the "superiority" of one paradigm over another[273 (p3)]. This has been described as the "mono-methods" era, since researchers generally adopted either a quantitative or qualitative approach to research design according to their paradigm beliefs[273 (p41)]. This was a consequence of an underlying assumption that paradigms were linked with particular research methods[260 (p175)].

3.3.2. Emergence and definitions of mixed methods research

The concept of mixing qualitative and quantitative methods emerged as some researchers proposed that both approaches could be applied to social research. For example, Brewer and Hunter (1989) argued that although the assumptions of different paradigms are fundamentally incompatible, this does not preclude mixed methods studies if independent methods are implemented within the different paradigms[274]. They argue that the use of different research methods can lead to better solutions to social research problems by capitalising on strengths of individual research methods whilst reducing the effects of their limitations[275]. Furthermore, Reichardt and Rallis (1994) adopted the perspective that qualitative and quantitative research share enough fundamental values to "form an enduring partnership"[276 (p85)].

Research methods have been combined in several ways and this has given rise to numerous interpretations and definitions of mixed methods research[260,273,277,278]. Qualitative and quantitative approaches may be mixed at different phases of a

research study e.g. data collection, analysis or interpretation of findings. However, there is no consensus with regards to the level at which 'mixing' can occur[279]. For example, Tashakkori and Teddlie distinguish between "mixed method" studies and "mixed model" studies[273]. In conjunction with Creswell (2003)[260], they refer to "mixed method" studies as those where qualitative and quantitative approaches are combined within the methodology of a single or multiphased study so that mixing of paradigms is minimal (e.g. by conducting sequential or parallel qualitative and quantitative phases)[273]. In contrast, "mixed model" studies describe the combination of qualitative and quantitative approaches at different stages of the research process so that mixing of paradigms occurs at a much higher levels: for example, in the context of an experimental (quantitative) study design, resultant qualitative data could be converted into numerical data and then analysed statistically[273].

3.3.3. Advantages of mixed methods research

Several advantages of mixed methods have been proposed. First, the combination of research methods via triangulation techniques[255] may be used as a strategy to improve the validity or credibility of research results through demonstrating convergence of findings[280]. Denzin (1978) described four different types of triangulation methods: data triangulation, investigator triangulation, theory triangulation and methodological triangulation[281]. Methodological triangulation, an approach commonly used mixed methods research, describes the use of both qualitative and quantitative methods in order to study the same phenomena[280].

Second, studies may be designed so that the main research approach is facilitated by findings obtained from an alternative approach. For example, Morgan (2006)

discussed research designs where the findings from qualitative research were used to inform or modify quantitative research questions, and vice versa[282]. Similarly, Green (1989) identifies "complementary" research designs where one research method is implemented in order to "elaborate, enhance, or illustrate the results from the other" [277 (p266-7)]. Thus mixed methods research can provide an opportunity to fill in the knowledge gaps left by a dominant research approach.

Third, combining different research methods can produce a greater understanding of complex phenonmena[283]. Qualitative and quantitative approaches may be used in parallel, and with equal emphasis, in order to study complex social research questions that mono-method approaches cannot adequately address. In this way, mixed methods research can bring a wider perspective in order to explore different aspects of phenomena[274]. Greene et al introduced the term "expansion design" to denote studies that use mixed methods research for these purposes (i.e. to "extend the scope, breadth and range of inquiry by using different methods for different inquiry components")[277 (p269)]. This concept is illustrated by a study that explored the factors impacting upon the quality of diabetes care in general practices: qualitative methods (e.g. focus groups with patients; interviews with healthcare professionals) were combined with quantitative methods (e.g. clinical audit; systematic literature review) to identify a wide range of factors, with some overlaps in the findings obtained via different research approaches[284]. The authors of this study concluded that the design generated greater insights into the research topic and also compensated for the potential deficiencies and biases of individual research approaches[284].

3.3.4. Pragmatism paradigm

It has been argued that mixed methods research could be represented as a third methodological paradigm (along with qualitative and quantitative research) that is based on the philosophy of pragmatism[285]. Bryman observed that research is often driven by pragmatic issues rather than by paradigmatic assumptions[286]. Although pragmatists may view traditional paradigms as useful conceptual constructions, they argue that research practice should be guided primarily by the context and characteristics of the research question[273]. Thus, according to this perspective, paradigms are viewed as "descriptions of, and not prescriptions for, research practice"[287 (p8)]. Those adopting a pragmatist position combine qualitative and quantitative approaches in a way that best addresses a particular research problem[273]. Consequently, the theoretical dichotomy drawn between qualitative and quantitative research approaches is often not discernible in practice: different research approaches are united in order to meet the practical requirements of inquiry; paradigm differences are of lesser importance. Nowotny adds that research questions may be formulated outside of traditional disciplinary structures[288]. In turn, this facilitates a new transdisciplinary approach to knowledge production where novel approaches to problem-solving evolve within specific contexts of inquiry[288]. As Armitage (2007) asserts, mixed methods research designs that are conducted within a pragmatist paradigm have now become common in mainstream research[279].

3.3.5. Summary: strategy for mixing methods in this thesis

Despite the philosophical differences between quantitative and qualitative approaches to research, mixed methods studies are common in health services

research, since different research approaches can be used to address multi-faceted research problems[289]. Similarly, the purpose of mixing methods in this thesis is to provide a breadth of data relating to the barriers and facilitators to secondary stroke prevention following a TIA, in order to inform the development of a complex intervention according to the MRC framework[62]. The pragmatist perspective (introduced in section 3.3.4) will be adopted to enable the design of this research to be largely driven by the research objectives of the overall programme of work.

Three specific research objectives in relation to the topic of this thesis were defined in Chapter 1 (section 1.7.1). An "expansion design"[277 (p269)] (see section 3.3.3) was considered appropriate to meet the demands of this research: the main advantage of adopting this design is that different research approaches can be implemented independently in order to explore different research questions. Therefore, this mixed methods research design incorporates three parallel studies that explore complementary aspects of the phenomenon of secondary stroke prevention.

This thesis assumes the pragmatist view that paradigms represent useful concepts for research practice (see section 3.3.4). Therefore, different research questions have been mapped to appropriate paradigms for the purposes of guiding inquiry[286]. Although the three studies in this thesis are inter-related through the MRC framework for complex interventions, each study will be presented separately (i.e. qualitative analysis and inference; quantitative analysis and inference[273 (p54)]) before the findings are integrated in Chapter 8. The separation of individual studies will be made in order to facilitate consideration of underlying paradigm assumptions for each research approach, since it is recognised that paradigm positions can contribute to choice of

methodology and evaluation of research quality[260]. Therefore, the most appropriate criteria for attending to the validity or trustworthiness of individual studies within this thesis will be considered in terms of the respective paradigms in which the studies are located.

3.4. Developing a multi-phased research design from thesis objectives

As discussed above, this thesis presents three inter-related studies. The following section describes the rationale for the choice of methodology used in each study, in order to best address the research objectives outlined in Chapter 1 (section 1.7.1). Additionally, underlying paradigm positions are described to inform evaluation of research rigor or trustworthiness within each of the three studies.

3.4.1. Objective 1

To investigate the quality of secondary prevention following a diagnosis of TIA, in order to identify areas for quality improvement

As discussed in Chapter 2 (section 2.1), the RCP National Clinical Guideline for Stroke is considered to represent the 'gold standard' of care with regards to secondary stroke prevention in the UK[64], whereas the QOF indicators are used in a pay-for-performance scheme involving UK general practices[65]. Therefore, it was decided to frame the research approach for the above objective around evidence-based recommendations outlined in the RCP stroke guidelines and audit standards outlined by QOF (2011/12 QOF standards[71] and the 2008 RCP guideline[68] corresponded with the time frame during which this audit was conducted). In line with this, an evaluation study was designed to assess of the achievement of RCP recommendations and QOF

indicators. A quantitative audit was identified as the most appropriate research approach, since this allows generation of statistical inferences[256] that can be used to generalise or make claims about achievement of guideline recommendations. However, a considerable limitation of this research approach was the lack of opportunity to explore possible explanations for achievement or non-achievement of guideline recommendations or QOF indicators[290]. In order to be informative to the development of a complex intervention for local implementation, a sample of TIA patients were identified retrospectively from a regional specialist TIA clinic. The quality of secondary prevention care received 12-24 months following TIA diagnosis was evaluated via a review of clinical records.

It was decided that postal questionnaire represented the most appropriate method of data collection, since it allowed a large number of general practices to be surveyed in a relatively short time frame. Clinical audits are generally evaluated using positivist criteria. For example, validity is considered to be enhanced through the development of relevant and unambiguous audit standards[291]. Additionally, reliability is increased through the use of standardised data collection forms and clear identification of data sources[291]. The piloting of data collection tools can be used to improve validity and reliability by ensuring that audit standards are clearly defined and measurable[292]. It is acknowledged that self-completion of data collection forms, via postal survey, may reduce the validity of the study by introducing non-response bias[293]. In this context, non-response bias could occur if participants (individuals for whom data is received) differ from non-participants in terms of their demographic or health status characteristics. However, follow-up strategies involving telephone reminders have

been demonstrated to improve response rates[294] and consequently represent an opportunity to minimise the impact of non-response bias. Further details of the audit study methods are presented in Chapter 4 (section 4.3).

3.4.2. Objective 2

To assess the effects of stroke service interventions on modifiable risk factor control for the secondary prevention of stroke

As discussed in section 3.1, the MRC framework recommends that evidence of intervention effectiveness should be considered during the process of complex intervention development, and a systematic review is identified as an appropriate research strategy for achieving this[62]. A quantitative systematic review of RCTs allows causal relationships between interventions and outcomes to be established via statistical analyses (meta-analyses) or descriptive synthesis. Chapter 5 presents the results of a systematic review that evaluated the effects of stroke service interventions on risk factors for secondary stroke prevention.

Conventional methodology for quantitative systematic reviews has been largely developed within the positivist paradigm. Thus, criteria for assessing rigor include objectivity, reliability and validity[295]. For example, it is generally accepted that the internal validity of a systematic review can be maximised by limiting included studies to RCTs, since this reduces the risk of bias or random error. Additionally, pre-specification of research objectives and methods are considered to improve the validity of systematic review findings[295]. Numerous strategies may also be used to enhance the objectivity of a systematic review: duplication of study selection by

independent reviewers; validation of data extraction by independent reviewers; synthesis of data according to pre-defined methods[296]. However, Torgerson (2003) argues that systematic reviews are not "value-free" as researchers have to make subjective judgments at many phases of the research process, including study selection and interpretation of included studies[297 (p11-12)].

A Cochrane systematic review is intended to provide high-quality evidence for healthcare decision making. The systematic review presented in this thesis follows recommendations produced by the Cochrane Collaboration. These recommendations address methodological rigor in the following contexts: development of research questions; identification and selection of studies; collection and analysis of data; interpretation of results[298]. A full description of systematic review methodology is provided in Chapter 5 (section 5.3).

3.4.3. Objective 3

To explore the barriers and facilitators to secondary stroke prevention that are relevant to the perspectives of TIA patients

When designing a research study to address the above objective, it was recognised that peoples' experiences of TIA and secondary stroke prevention are likely to represent highly subjective phenomena. Although relevant data could be collected via a number of research approaches, including quantitative interviews or questionnaires, a qualitative research approach was considered most appropriate. It was anticipated that qualitative research methodology would facilitate an understanding of this complex issue through an in-depth analysis of rich and descriptive data[256]. For the

purposes of this research, semi-structured interviews were conducted (see Chapter 6, section 6.4.2 for a further discussion of qualitative interviews) since they allow shared meanings to be negotiated between the interviewer and the research participant. Furthermore, semi-structured interviews provide an opportunity for the interviewer to ask probing questions and to verify interpretations[299].

Research was located within the constructivist paradigm[258] since an understanding of socially constructed barriers/facilitators to secondary prevention was sought (see Chapter 2, section 2.3.2 for rationale). According to a social constructivist perspective, "human experience, including perception, is mediated historically, culturally and linguistically" and language is considered to be of particular importance in the construction of social experience[259 (p7)]. Thus, one approach to the exploration of social phenomena is through the analysis of language. The "analysis of talk and text" has been broadly defined as discourse analysis[177 (p27)]. Discursive psychology was the chosen approach for this research since it allowed analysis of the ways in which TIA patients use language to construct their experiences of secondary stroke prevention (see Chapter 2, section 2.3.2). In turn, it was anticipated that this might reveal ways in which these constructions facilitate or oppose secondary prevention behaviour.

Numerous approaches to establishing the 'rigor' or 'trustworthiness' of qualitative research were discussed in section 3.2.3. In common, several of these approaches advocate a consideration of the extent to which findings represent the true nature of phenomena under investigation (i.e. the validity or credibility of research findings)[261,265]. However, from a discourse perspective, all versions of social reality are products of human interaction and are therefore considered meaningful[258].

Therefore, no versions of social reality are considered more 'true' than others. Additionally, discursive psychology involves researchers' interpretations of language, rather than "reflecting reality in any simple way"[300 (p113)]. It is therefore apparent that alternative criteria are required to establish the trustworthiness of discourse analysis research. These criteria attend to notions of transparency and validity[178,179,301] that are considered to be relevant to the field of discourse analysis. Several criteria are discussed in more detail below, and have been applied to the qualitative study contained within this thesis (see Chapter 6, section 6.4.3).

Transparency

As assessment of trustworthiness in discourse analysis is facilitated by transparency of analytical procedures[178,179,301]. This involves presenting sufficient empirical data to allow readers to assess the researcher's interpretations and claims about discursive patterns[178,179,301]. Furthermore, it is necessary to document the analytical steps connecting empirical data with analytical conclusions, so that readers can assess whether conclusions are logical and well-grounded in the data[178,179,301].

Coherence

A criterion orientated towards validity involves the presentation of a comprehensive[179] and coherent[178] analysis. Therefore, the analysis should present a complete response to the research objectives addressed by the study[179]. In addition, Potter and Wetherell (1987) recommend that a coherent analysis should demonstrate "how the discourse fits together and how discursive structure produces effects and functions"[178 (p170)]. Variation is considered a desirable feature of discourse analyses,

and is actively sought in the data, since the identification of diversity across participants' accounts indicates that a more complete range of accounting has been uncovered[178]. Nevertheless, it is important that any data that conflicts with broad patterns (negative cases) should be adequately explained. If there is a particular feature of these negative cases that distinguishes them from the other cases then support for the existing analytical framework is attained[178]. Conversely, hypotheses need to be reconsidered if negative cases cannot be explained in terms of their differentiating features[178]. In this way, the search for patterns and exceptions to patterns can help to refine and strengthen hypotheses while at the same time discounting alternative analytical possibilities[301].

Fruitfulness

A second criterion for addressing validity in discourse analysis relates to the ability of the analytical framework to "generate novel explanations"[178 (p171)]. This refers to the potential of analyses to generate new solutions to existing problems[178]. An alternative way to define 'fruitfulness' is in terms of its potential to develop new perspectives on existing issues in order to 'reframe' these in more helpful ways[302]. Therefore, it is important to consider the practical implications of a discourse analysis for the wider body of work in which the same problem has been addressed.

3.5. Challenges to applying mixed methods research in the context the MRC framework

Although the MRC framework for complex interventions advocates the use of qualitative and quantitative research methods, no guidance is provided on the design,

execution and integration of mixed methods research. The first part of this chapter has therefore given consideration to mixed methods theory in order to guide the development of an appropriate research design for this thesis. This section will now consider some context-specific barriers that relate directly to applying this research design to develop an intervention in accordance with the recommendations in the MRC framework. Broadly speaking, these barriers relate to three issues surrounding the integration of mixed methods research: (1) fundamental paradigm differences between qualitative and quantitative research approaches and their associated research methods; (2) consequences arising from the broad and complex nature of the phenomenon studied (e.g. a diverse set of research questions, lack of corresponding data sets and unit of analysis issues); (3) inconsistent research findings.

3.5.1. Paradigm differences

It is argued here that the development phase of the MRC framework for complex interventions is largely underpinned by positivist assumptions, and that this creates challenges when attempting to integrate qualitative research findings into intervention design. More specifically, the MRC framework requires that the empirical research and theory considered during the development phase should lead (relatively unproblematically) to the generation of a correct and coherent set of recommendations that can be used to guide intervention design. In accordance with this stance, the positivist paradigm (underpinning the audit and systematic review studies within this thesis) is associated with an assumption that there is a single objective reality and that research findings can be generalised beyond the cases studied, provided that criteria for establishing rigor are met (see section 3.2.3).

Therefore, the audit (Chapter 4) and systematic review (Chapter 5) studies in this thesis concur with the overall goal of MRC complex intervention development. Conversely, the constructivist paradigm (underpinning the qualitative study within this thesis) assumes that there are multiple subjective realities and the results of qualitative studies are seldom generalised. Consequently, it is expected to be problematic to combine the positivist audit and systematic review studies with the constructivist qualitative study (Chapters 6 and 7), in order to arrive at definitive set of recommendations that are applicable to the development of a complex intervention.

3.5.2. Complexity of phenomenon studied

The phenomenon of secondary stroke prevention following a TIA is multifaceted. Several complementary elements of this phenomenon can be distinguished: e.g. those involving patients, healthcare professionals and the organisation of health services. In order to generate a broad perspective on this issue, necessary for guiding intervention development, the research questions included in this thesis address different aspects of the phenomenon. However, this approach to mixed methods research is associated with several interpretive challenges. Firstly, the research findings from individual studies cannot easily be compared or integrated where they relate to non-overlapping issues (i.e. incommensurable findings). For example, the results from the TIA audit study are not expected to provide a perspective on the effectiveness of interventions evaluated in the systematic review. This precludes some common approaches to integration in mixed methods research, such as triangulation, where the results of studies are compared in order to determine how convergent or divergent they are[281].

Instead, another approach to integration is required so that the results of component studies are related to each other in a way that is "mutually illuminating"[303 (p21)]. A description of how this will be addressed in this thesis is provided in section 3.6.2.

A second interpretive challenge resulting from the mixed methods approach adopted in this thesis relates to non-corresponding samples and different units of analysis[304]. It has been recommended that the sample used in any given strand of a mixed method study should ideally be nested within that of another strand so that integration is facilitated; further, it is asserted that a common unit of analysis (e.g. individual, population or organisation) is necessary in a mixed methods study because it "holds a study together"[304 (p43)].

It is argued here that the inclusion of different samples and different units of analysis are necessary in this thesis, in order to produce the breadth of data required to adhere to the MRC recommendations for complex intervention development[62]. In the context of the MRC framework, a systematic review is recommended to identify existing evidence on interventions. The results of intervention studies can be pooled together in a meta-analysis to produce positivist generalisations about the effectiveness of alternative interventions. However, meta-analysis does not provide an in-depth understanding of the mechanisms underlying an effective intervention in order to "develop a theoretical understanding of the likely process of change" – a second requirement of the MRC framework[250 (p981)]. This is because contextual factors and very detailed descriptions of interventions are seldom reported in research publications[305]. Instead, it may be necessary to generate a theoretical perspective through primary qualitative research[250]. The recommendations specified in the MRC

framework can therefore lead to both divergent samples and different units of analysis[304]. In the case of this thesis, the individuals included within the systematic review will necessarily differ from those included within the qualitative study. Further, due to differences in research approaches, the systematic review study and TIA audit study will aggregate data at population levels, whereas the qualitative study will consider data at the individual level.

However, although the individual studies in this thesis contain non-corresponding samples and different units of analysis, the purpose of this research is not to produce findings that can be generalised immediately to any particular population. Rather, the aim is to develop some principles for complex intervention development that will be tailored to a specific population during further modelling and pilot work[62]. In this way, the integration of studies involving different samples and units of analysis may be justified in the initial development phase of complex interventions.

3.5.3. Inconsistent research findings

Corroboration is a frequently cited reason for conducting mixed methods studies[285]. However, the effective integration of results from mixed methods research can be problematic if the findings obtained from different research approaches conflict[306]. The MRC framework provides little practical guidance on the subject of integration of evidence and theory. The logic behind the framework is that evidence and theory considered during each phase should align/converge and contribute to a broader understanding of the intervention.

Where it is possible to compare data relating to common issues, consideration should

also be given to the possibility that findings may be inconsistent or divergent. In the context of this thesis, the challenge of successful integration is to reconcile inconsistent findings in a way that produces a coherent set of recommendations for complex intervention development. Alternatively, it may be that such findings reveal gaps in a conceptual framework underlying intervention development. These knowledge gaps may need to be addressed in future research. A strategy of dealing with inconsistent research findings in the context of this thesis is described in section 3.6.2.

3.6. Integration of mixed methods research in practice

In order to explore how empirical research and theory could be integrated in practice, the following section considers illustrative examples relating to this issue. As discussed in section 3.1, the MRC framework cites "identifying the evidence base" and "identifying and developing theory" as key steps during the development of complex interventions[62]. However, of 67 studies reporting the development of complex interventions in stroke care, Redfern et al reported that only 14 were theoretically "well grounded" - as evidenced by the conduct of a literature review in addition to the use of an established theoretical framework or empirical research[307]. The majority of these 14 well-grounded studies can be categorised as mixed methods research since they employ both qualitative and quantitative approaches to investigate inter-related research questions[271]. However, as O'Cathain and others have discussed, few mixed methods studies in health services research demonstrate adequate integration of qualitative and quantitative components[308,309]. Furthermore, the generation of appropriate inferences from these studies can also be problematic, since it was noted

that some "inferences were based disproportionately on one method rather than the findings from all the methods"[308 (p96)].

Bryman argues that there are few examples of 'best practice' that researchers can draw upon to inform their own mixed methods research[303]. Similarly, Woolley asserts that "substantial integration of quantitative and qualitative data and findings in mixed methods studies is seldom seen" and cites "an absence of exemplars" as one important factor that hinders progress in this respect[309 (p7)]. The following section will provide an overview of the ways in which previous mixed methods studies have been integrated specifically for the purposes of MRC complex intervention development. In line with the approach taken in this thesis, several studies adopting an "expansion design"[277 (p269)] (see section 3.3.3) will be considered in order to illustrate some specific strengths and limitations of the different approaches used.

3.6.1. Consideration of studies with a similar methodological approach

Studies reporting the merging of parallel qualitative and quantitative components, for the purpose of developing an intervention according to the MRC framework, can be considered to adopt an "expansion design"[277 (p269)], in line with the approach taken in this thesis. However, publications arising from these studies do not always describe how the findings from different research approaches were combined to inform the design of an intervention[310,311]. Therefore it is not possible to make a detailed comparison of research findings in terms of their consistency or consistency, or to evaluate the reliability of the resultant inferences generated.

Integration via matrix tables

Other publications provide detailed descriptions of intervention development, using the findings obtained from parallel components of mixed methods studies. This frequently involves the creation of a matrix or table that summarises separately the inferences emerging from the quantitative and qualitative components. An 'inference' denotes the process of making sense of research findings[312]. However, the effective integration of fragmented inferences often proves problematic. Investigators commonly describe mapping separate research findings to intervention development. For example, Lovell et al combined quantitative (systematic review and meta-regression) and qualitative (meta-synthesis) evidence through the creation of a matrix table detailing their separate inferences for intervention development, but reported that ambiguities in the findings from different research approaches "raised new questions" and that this approach was "unable to deliver specific answers on important clinical and service delivery issues"[313 (p92)]. Similarly, Redfern et al collated separate findings from qualitative and quantitative research phases to generate a set of emergent issues[314]. However, the investigators discussed that not all issues could be addressed by the resultant intervention, illustrating the difficulties of mapping divergent findings to intervention development[314]. In the above cases, consensus exercises were used to resolve the issues arising from divergent findings. The consensus exercises involved study investigators alone[314] or in collaboration with members of the target population[313]: participants engaged in discussion[314] or completed questionnaires of their views[313] in order to arrive at an agreement on intervention components. One limitation of this approach is that the outcome of

consensus processes may be dependent to a varying extent on the preferences of the research team, in terms of the weight given to data obtained from particular research approaches[308]. Thus, the validity of the integration process may be compromised[315]. As Bazeley states, lack of integration can be problematic since it can lead to "invalid or weakened conclusions through a failure to consider all available information together"[315 (p814)]. Correspondingly, Lovell et al identify the consensus process as a potential limitation of their intervention development, since they state that it was "rudimentary" due to funding and time limitations[313 (p106)].

Integration via narrative synthesis

Some programmes for intervention development have integrated mixed methods research via narrative synthesis. For example, Faes et al synthesised inferences from several different strands of empirical research: a cohort study, literature review and qualitative interviews[316]. Similarly, others have synthesised empirical research findings and formal theoretical frameworks[317-319]. These studies all present narrative syntheses that contain largely convergent results. Although divergent findings are neither identified nor discussed in these syntheses, the publications do not present a comprehensive set of findings from empirical evidence and theory, and it is therefore not possible to make a full comparison of findings in terms of their convergence/divergence[316,317,320]. It is possible that selective findings were drawn upon to produce coherent accounts, although gaps in research evidence were frequently highlighted. However, it has been argued that one of the hallmarks of a fully integrated account is the consideration of divergent or problematic findings[280]. An illustration of this approach can been seen in a narrative synthesis of interview and

economic modelling data carried out to inform the development of an intervention for glaucoma screening[321]. This synthesis identified "equality of access" and "cost-effectiveness" as competing issues that were raised by the interview and economic modelling data, respectively. The publication also discusses a process of negotiation in order to achieve an "appropriate balance" between these opposing issues[321 (p61)].

3.6.2. Strategies for integrating mixed methods research in this thesis

The above examples demonstrate some ways in which mixed methods research can represent a challenge to the development of complex interventions. It is apparent that there are challenges in terms of dealing with inconsistencies and omissions in research findings, and in deciding which findings to prioritise, when developing the intervention components and making implementation decisions. In general, studies have derived intervention components by mapping inferences from individual study findings rather than mapping inferences from a whole programme of work. However, Moran-Ellis et al assert that "the challenge of an analysis that is integrated in any sense lies in developing some form of common analysis of a diverse set of data without losing the characteristics of each type of data"[322 (p54)]. They argue that integration can successfully occur at different levels of the research process: e.g. at the level of methods, analysis or theoretical interpretation[322]. It is argued here that in the context of this thesis, it is preferable to integrate the findings from mixed methods research *before* mapping inferences to intervention development. This section will therefore outline some of the ways in which development work for complex interventions could be more fully integrated before mapping inferences to intervention components.

According to Moran-Ellis et al, it is important for researchers to define "a theoretical position concerning the intended purpose of brining the mixed methods together" since this has a bearing on the outcomes and success of integration[322]. As discussed in section 3.3.5, the purpose of integrating qualitative and quantitative research in this thesis has been conceptualised from a pragmatist position[273]: mixed methods research is integrated with the overall aim of informing the development of a complex intervention. Greene and Caracelli (1997) state that the pragmatist position "honours both the integrity of the paradigm construct and the legitimacy of contextual demands, and seeks a respectful, dialogical interaction between the two in guiding and shaping evaluations in the field"[287]. For pragmatists, integration of mixed methods research may reveal several competing versions of the 'truth' and the selection of one explanation over another depends upon which is better at producing the desired outcome[273].

Successful integration of mixed methods research

For pragmatists, successful integration has been defined in varying terms by several different researchers but with some notable similarities. Bryman argues that genuine integration depends upon whether the conclusions of a mixed methods study offer more than the component parts: qualitative and quantitative strands should be "mutually illumintating"[303 (p21)]. Similarly, Greene and Caracelli discuss that tensions and contrasts should be seen as a route to generating new insights and deeper understandings[287]. As part of a framework developed to guide the quality of mixed methods research, Tashakkori and Teddlie denote "integrative efficacy" as a term that refers to "the degree to which inferences made in each strand of mixed methods

study are effectively integrated into a theoretically consistent meta-inference"[323 (p305)]. In this context, integration is defined as "making meaningful conclusions on the basis of consistent or inconsistent results…[and incorporates] elaboration, completeness, contrast, comparison and the like"[323 (p305)]. Tashakkori and Teddlie go further and propose a strategy for resolving inconsistent findings. They argue that valid but divergent research findings should be carefully examined to establish 1) whether they reveal different aspects of the same phenomena, or 2) whether they are both plausible explanations for a single question (i.e. more than one plausible reality exists)[324 (p116)].

Overall, it can be concluded from the above recommendations that successful integration should blend the findings obtained from different research methods into a coherent whole by relating these together in a way that generates new insights. At the same time, divergent findings should be explored and reconciled by considering possible explanations or by using these as a route to explore complexity. In Chapter 8, key findings from each study will be integrated following a pragmatist perspective, in order to overcome some of the barriers to applying mixed methods research in the context of complex intervention development. The convergence or divergence of research findings, and the implications of these, will be discussed.

3.7. Chapter conclusion

This chapter has outlined a mixed methods research design for the purposes of informing the development of a complex intervention. A mixed methods approach enables this thesis to address three different research objectives that are relevant to

complex intervention development, in a way that a mono-method research approach would not allow. However, it is apparent that several challenges arise as a consequence of adopting a mixed methods approach in the context of applying the MRC framework[62]. In this chapter, consideration of mixed methods theory has enabled a strategy to be developed for addressing these challenges. The remaining chapters of this thesis will present the methods and findings from three component studies before the key findings from each are integrated (Chapter 8) according to the approach developed here.

Chapter 4. Audit study: quality of secondary prevention measures in TIA patients

This chapter addresses the current status of stroke risk factor control in a local population of patients diagnosed with TIA. An audit was carried out at the interface between primary and secondary care. Initially, the rationale for the study and an overview of TIA clinics are described (section 4.1). The objectives (section 4.2), methods (section 4.3) and results (section 4.4) of the study are then presented. Finally, the discussion (section 4.5) places the results in context of other research findings and addresses the strengths and weaknesses of the study. The findings are used to make suggestions for the development of a complex intervention in Chapter 8. This research has been published in the Postgraduate Medical Journal[325] (see Appendix D for further details) and represents an important indicator of the need to improve secondary prevention among this patient group[326].

4.1. Introduction

As discussed in Chapter 1 (section 1.6), observational evidence suggests that the status of secondary stroke prevention is suboptimal in patients with ischaemic cerebrovascular disease. However, the management of vascular risk factors has not been well defined in TIA populations. Previous studies have investigated the short-term outcomes of treating TIA patients at specialist TIA clinics (e.g. 3 month data on stroke incidence)[34,327]. However, no studies could be identified that have investigated the long-term management of vascular risk factors following discharge from these outpatient clinics (i.e. in the community setting). This audit study is therefore assumed to be the first to evaluate longer-term data (12 to 24 month data) relating to

the quality of secondary stroke prevention among a population of TIA patients recently diagnosed in a specialist TIA clinic.

The Leicestershire TIA clinic provides services for patients across Leicester, Leicestershire and Rutland. Population estimates from the Office for National Statistics (2009) illustrate the multi-ethnic diversity of these regions (see Table 4-1)[328]. National statistics also show that the Asian population in Leicester City has the highest proportion of people of Indian origin (19%) when compared to Asian populations in other UK local authorities[329]. A review of UK epidemiological data has shown that mortality from ischaemic stroke is higher among South Asians (defined as people "originating from the Indian subcontinent") when compared to White Europeans: more specifically, it was reported that "the average standard mortality ratios (SMR) in South Asians were 55% and 41% higher in males and females, respectively, when compared with the white population"[330 (p418)]. The reasons for these population differences in stroke mortality have not been conclusively established. Data from epidemiological studies has indicated that the impact of conventional cardiovascular risk factors (e.g. hypertension, hyperlipidaemia) on CVD risk may differ between South Asian and White European populations[160]. Although it is likely that differences in cardiovascular risk factor profiles represent one contributory factor, possible environmental, genetic, and socioeconomic factors have not been adequately explored[330]. The aim of the audit study presented in this chapter was to benchmark the current quality of secondary stroke prevention among a local TIA population with a high proportion of South Asians, in order to inform the development of a complex intervention to improve secondary stroke prevention.

Table 4-1: Ethnic diversity of the regions served by the Leicestershire TIA clinic (estimates mid-2009)[328]

	% White	% Mixed	% Asian or Asian British	% Black or Black British	% Other
Leicester	64.1	2.9	26.1	3.8	3.1
Leicestershire and Rutland	90.8	1.4	5.6	1.0	1.3
Total: Leicester, Leicestershire and Rutland	82.6	1.8	11.9	1.9	1.8

4.1.1. Overview of TIA clinics

The occurrence of TIA represents an important opportunity to address secondary stroke prevention, particularly if patients access healthcare services promptly following onset of symptoms. The EXPRESS study indicated that early initiation of secondary prevention treatment following TIA could reduce the 90 day risk of recurrent stroke by approximately 80%[34]. In 2007, the National Stroke Strategy (NSS) integrated this evidence into a strategic vision for improving UK stroke services between 2007 and 2017[9]. The NSS emphasised the importance of timely access to specialist TIA services in order to facilitate early diagnosis, imaging and initiation of treatment[9]. The NSS recommendations are also reflected in the RCP National Clinical Guideline for stroke[11], which states that all patients with a potential TIA should be

assessed at a specialist TIA/neurovascular clinic either within 24 hours (ABCD2 score of 4 or above) or within one week (ABCD2 score of 3 or below) of symptom onset.

A 2010 report from the National Audit Office indicated that regional NHS funding has successfully been used to reconfigure TIA care pathways in the UK, since 95% of acute trusts now offer a specialist neurovascular clinic[10]. An economic study estimated that this service reconfiguration is likely to be cost-effective: it was estimated that the annual avoidance of over 8000 secondary stroke events in the UK will more than offset the medication, diagnostic and staffing costs associated with the provision of outpatient clinics[331]. Furthermore, a review of specialist TIA clinics has concluded that these are cost-effective when compared with other models of service delivery[35]. However, a recent NHS improvement report highlights that further gains could be made with regards to TIA services by "developing more imaginative models than standard outpatient clinics", with suggestions including the provision of "mobile services in rural areas" and the development of "paramedic assessment and triage"[332 (p8)].

The Leicestershire TIA Clinic (established on 1st October 2008) was highlighted as an example of good practice by the National Audit Office[10] and has been used as a sampling frame for this study. In 2010, this service assessed 66% of high risk patients within the recommended 24 hour window[332]. Further details about the Leicestershire TIA Clinic are outlined in Table 4-2.

Table 4-2: Characteristics of the Leicestershire TIA Clinic

Service organisation	• Provides a single point of assessment for suspected TIA for all patients living in Leicester, Leicestershire and Rutland, UK (187 general practices, population of 957,821) • Located in secondary care • Open 7 days per week
Access	• Referral from GP, Emergency Department or Emergency Admissions Unit • Risk-assessment using the ABCD2 tool required prior to referral
Health professionals involved	• Stroke consultant, clinic nurse, immediate access to vascular surgical consultant for same day assessment
Investigations performed	• Same day imaging and reporting (Carotid Doppler ultrasound and MRI, where indicated), ECG; blood tests; BP monitoring; BMI calculation
Advice provided to patients	• Diagnostic and prognostic information • Counselling on lifestyle modification for the secondary prevention of stroke
Follow-up	• No routine follow up at TIA clinic • TIA patients discharged back to primary care where general practitioners are advised to manage patients in line with RCP guidelines • RCP targets for BP (≤ 130/80 mm Hg) and cholesterol (<4 mmol/L) are routinely set out in discharge letters

4.2. Objectives

The objectives of this audit study were:

- to describe the quality of secondary prevention care received by TIA patients, following diagnosis at a specialist TIA clinic, according to standards identified from the 2008 RCP guideline[68] and 2011/12 QOF indicators[71] (standards were chosen to correspond with the timing of this study [2011/12])
- to identify areas for quality improvement

4.3. Methods

4.3.1. Design

This study was carried out as part of a local audit of TIA patient care. Audit approvals were obtained from University Hospitals of Leicester NHS Trust, Leicester City Primary Care Trust (PCT) and Leicestershire Country and Rutland PCT. Copies of the full audit report were made available to Leicester City PCT and Leicestershire County and Rutland PCT. A one page summary audit report was distributed to all general practices located within these PCTs (see Appendix A).

Patients were identified retrospectively using hospital records held on the Leicestershire TIA clinic database. All patients who attend the Leicestershire TIA clinic are entered onto this database. The study included patients aged ≥ 18 who were diagnosed between 1st February and 31st October 2009. The following patients were excluded:

- Patients who had left their registered general practice since their TIA
- Patients who had died between the date of TIA and date of follow-up data collection

4.3.2. Audit criteria

Evidence-based recommendations for the secondary prevention of stroke have been discussed in Chapter 2 (section 2.2). Subsequently, Chapter 3 (section 3.4.1) outlined the rationale for the methodological approach used in this study, in terms of auditing the quality of TIA patient care against standards outlined in the RCP guidelines[68] and QOF indicators[71]. In summary, the optimal standard for the medical management of

UK TIA patients is considered to be defined by the Royal College of Physicians (RCP) National Clinical Guideline for Stroke[68]. This comprehensive guideline includes recommendations that address all elements of secondary stroke prevention (see Figure 4-1). In contrast, the general practice Quality and Outcomes Framework (QOF) is a pay-for-performance scheme involving a narrower range of less stringent standards for secondary stroke prevention: BP (≤ 150/90 mm Hg), total cholesterol (≤ 5.0 mmol/L), smoking cessation and the use of antiplatelet or anticoagulant medication[71]. Discrepancies between RCP targets and QOF indicators may represent an organisational barrier contributing to suboptimal secondary prevention[64]. While RCP recommendations are considered 'gold standard' in terms of quality of stroke care, QOF indicators are regarded as 'relatively simplistic' measures of quality[64]. However, it should be noted that QOF indicators are audit criteria rather than evidence-based standards for patient care.

Figure 4-1: Secondary prevention themes included in the RCP guideline[68]

- Identifying risk factors
- A personalised, comprehensive approach
- Lifestyle measures
- Blood pressure (target ≤ 130/80 mm Hg)
- Antithrombotic treatment
- Lipid-lowering therapy (target total cholesterol < 4.0 mmol/L *and* LDL cholesterol < 2.0 mmol/L)

As discussed previously in Chapter 3 (section 3.4.1), the validity and reliability of clinical audits are generally assessed according to positivist criteria. Audit standards are considered to be valid if they are relevant to the aim(s) of the audit and can be used to make meaningful inferences about the quality of care[291]. For the purposes of this study, relevant audit criteria were derived from UK national guidelines[68] and QOF

indicators[71]. This ensured that audit standards covered all relevant aspects of clinical practice and were underpinned by a comprehensive and peer-reviewed evidence-base[291].

An audit criterion has been defined as "a systematically developed statement that can be used to assess the appropriateness of specific healthcare decisions, services and outcomes"[333 (p2)]. QOF indicators are presented in the form of audit standards and were therefore used directly in this study to evaluate the quality of patient care[71]. Audit criteria were also derived from RCP guidelines[68] so that these recommendations could be applied to clinical record review. Figure 4-2 provides an example to demonstrate how RCP recommendations on BP control were translated into audit criteria:

Figure 4-2: Translation of RCP recommendations into audit criteria

Blood pressure (BP) control

RCP recommendations[68]

- "Patients should have their risk factors reviewed and monitored regularly in primary care, at a minimum on a yearly basis."
- "All patients should have their blood pressure checked, and should be treated in keeping with national guidelines"
- "An optimal target BP for patients with established CVD is 130/80 mmHg"

Audit criteria

- "The patient record shows that:
    a. Blood pressure has been documented in the last 12 months
    b. Most recent blood pressure ≤ 130/80 mm Hg"

4.3.3. Data collection and analysis

Baseline data were extracted from TIA clinic records (see Figure 4-3). Follow-up data were collected on secondary prevention care received 12 to 24 months after TIA diagnosis. For this purpose, structured data collection forms were posted to general practitioners (GPs) for completion using information held on general practice records. If GPs failed to respond to the letter after 3 weeks, a second letter was sent to the practice manager. One reminder telephone call was made to non-responding practice managers after two weeks. Since all blood analysis was carried out in secondary care, follow-up data for total cholesterol (TC) and low-density lipoprotein (LDL) were extracted from hospital databases. Data were analysed descriptively using frequencies and percentages to evaluate the achievement of quality standards. All statistical analyses were performed using SPSS version 18.

Figure 4-3: Data collected at baseline and follow-up

Baseline Data

- Demographic variables (age, gender, ethnicity)
- Blood pressure (BP)*
- Cholesterol (TC, LDL)*
- Random blood glucose*
- BMI*
- Smoking status*
- Prescriptions at discharge (antithrombotic, antihypertensive and lipid-lowering medications)¶
- Co-morbidities (hypertension , hypercholesterolaemia, diabetes, ischaemic heart disease, atrial fibrillation, previous stroke/TIA, peripheral vascular disease)

Follow-up Data

- Print out of current prescriptions (antithrombotic, antihypertensive and lipid-lowering medications)
- Date and result of last BP measurement
- Date and results of last cholesterol measurements (TC, LDL)
- Date of most recent lifestyle advice (diet, exercise, smoking cessation)

*Risk factor data were measured at the TIA clinic

¶ Prescription data refers to the medications that a patient was discharged on (i.e. following a review of existing medications and including any new medications prescribed at the TIA clinic)

4.4. Results

4.4.1. Study population

A total of 722 patients visited the Leicestershire TIA clinic between 1st February and 31st October 2009 and of these, 233 (32%) were diagnosed with TIA. Twenty three patients were subsequently excluded due to death (n=9), relocation to another general practice (n=7), unavailability of follow-up data (n=3), and the absence of documentation regarding TIA diagnosis in general practice records (n=4). Complete data were obtained for 163 patients from 72 general practices. This represents 70% of the original audit sample (see Figure 4-4). The mean (SD) number of patients per practice and per GP were 2.3 (2.3) and 1.3 (0.6), respectively.

Follow-up data were collected between 12 and 24 months following TIA diagnosis with a mean (SD) follow-up duration of 18 (± 3) months. Time frames for consideration of QOF and RCP standards were 12 months and 15 months, respectively. All 163 patients were followed up ≥ 12 months post-TIA. Of these, 121 patients were additionally followed up ≥ 15 months post-TIA. The baseline characteristics of the study population are shown in Table 4-3.

Figure 4-4: Collection of follow-up data

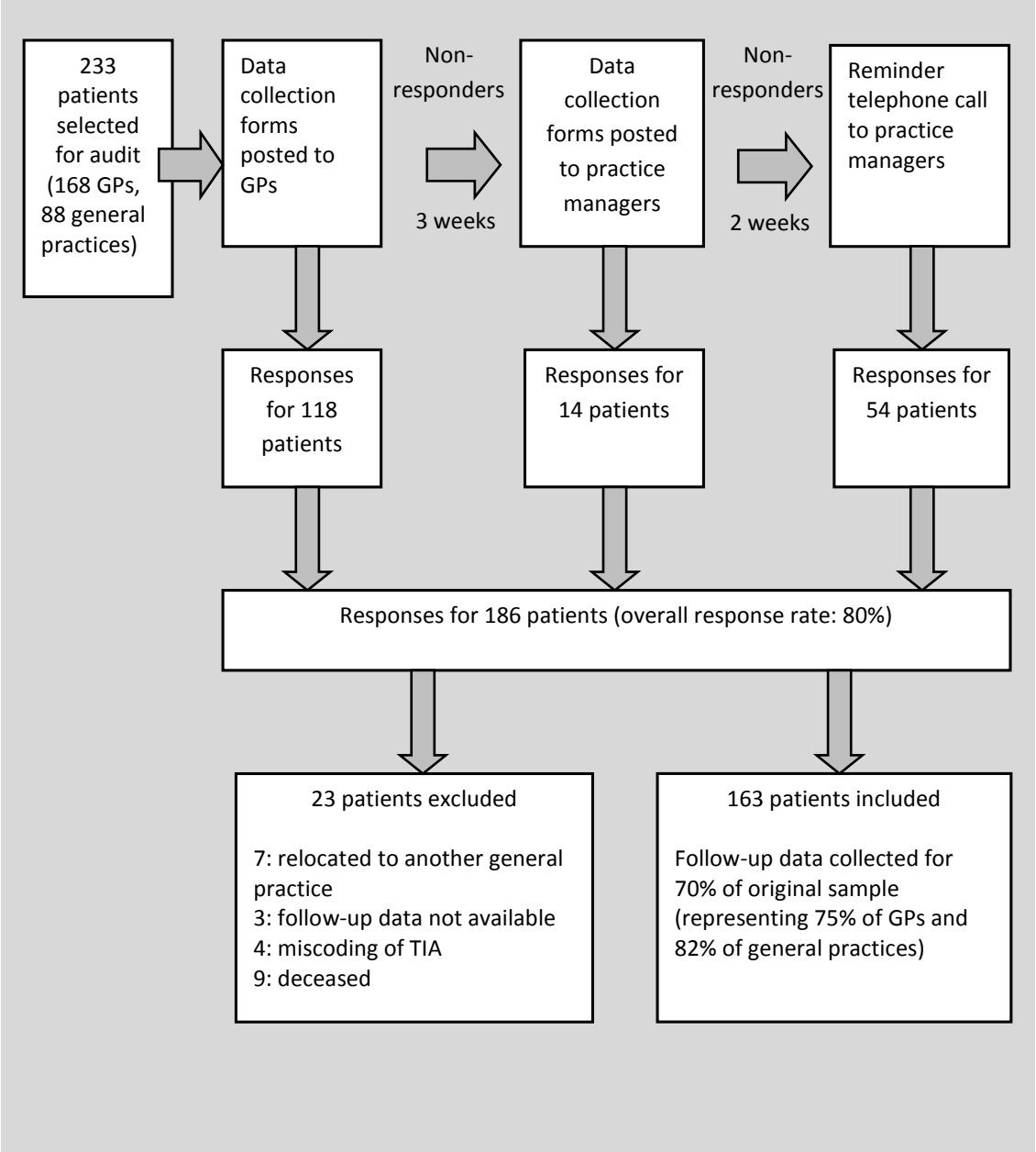


Table 4-3: Baseline characteristics of 163 patients diagnosed with TIA in a specialist TIA clinic

Characteristics of patients at baseline	% or mean (SD)	Missing Data %
General practice data		
Number of patients per GP, mean (SD)	1.3 (0.6)	
Number of patients per practice, mean (SD)	2.3 (2.3)	
Demographic data		
Age, mean (SD)	71.5 (12.4)	
Male (%)	54.6	
Ethnicity (%)		
Caucasian	85.9	4.9
Asian	9.2	4.9
BMI, mean (SD)	27.7 (4.7)	7.4
Self-reported smoking status (%)		
Current	19.0	0.6
Previous	38.7	0.6
Never	41.7	0.6
Co-morbidities: past medical history at initial diagnosis (%)		
Hypertension	50.9	
Hypercholesterolaemia	31.3	
Diabetes	13.5	
Ischaemic heart disease	6.1	
Atrial fibrillation	6.7	
Previous stroke/TIA	17.8	
Peripheral Vascular Disease	2.5	
Achievement of RCP standards		
Most recent BP ≤ 130/80 mm Hg (%)	25.2	
Most recent total cholesterol <4 mmol/L (%)	23.9	2.5
Antihypertensives are prescribed if BP >130/80	73.0	
Antithrombotics are prescribed: *aspirin and dipyridamole, aspirin alone, clopidogrel or anticoagulation* (%)	97.5	
Statins are prescribed if total cholesterol >3.5 mmol/L (%)	88.9	
Achievement of QOF Standards		
Most recent BP ≤ 150/90 mm Hg (%)	62.6	
Most recent total cholesterol ≤ 5 mmol/L (%)	57.9	2.5
Antithrombotics are prescribed: *aspirin, clopidogrel, dipyridamole or a combination; or an anti-coagulant* (%)	99.4	

4.4.2. Achievement of quality standards

Achievement of quality standards are shown in Tables 4-4 and 4-5.

Table 4-4: Achievement of Royal College of Physicians (RCP) audit standards (n=163 patients followed up for ≥ 12 months)

	Quality Standard: **The patient record shows that:**	**Total number of patients with available data**	**Total number of patients meeting quality standard**	**Quality standard achieved for patients with available data (%)**	**Quality standard met for all patients (%)[a]**
1a	BP has been documented in the last 12 months	163	147	90.2	NA
1b	Most recent BP ≤ 130/80 mm Hg	147	57	38.8	35.0
2a	Total cholesterol has been documented in the last 12 months	163	110	67.5	NA
2b	LDL has been documented in the last 12 months	163	90	55.2	NA
2c	Total cholesterol *and* LDL have been documented in the last 12 months	163	90	55.2	NA
2d	Most recent total cholesterol <4 mmol/L	110	45	40.9	27.6
2e	Most recent total cholesterol <4.0 mmol/L *or* 25% reduction in total cholesterol, whichever achieves the lowest absolute value	106	17	16.0	10.4
2f	Most recent LDL <2 mmol/L	90	37	41.1	22.7
2g	Most recent total cholesterol <4.0 mmol/L *and* most recent LDL <2.0 mmol/L	90	26	28.9	16.0
3a	Antihypertensives are prescribed if BP >130/80 mm Hg: ACE inhibitor or ARB or CCB or thiazide-type diuretic	90	64	71.1	67.0
	Calcium channel CCB	64	29	45.3	NA
	Thiazide diuretic	64	17	26.7	NA
	ACE inhibitor	64	32	50.0	NA
	ARB	64	15	25.0	NA
	1 class of antihypertensive	64	39	60.9	NA
	2 classes of antihypertensive	64	21	32.8	NA
	3 classes of antihypertensive	64	4	6.3	NA

	Quality Standard: **The patient record shows that:**	**Total number of patients with available data**	**Total number of patients meeting quality standard**	**Quality standard achieved for patients with available data (%)**	**Quality standard met for all patients (%)[a]**
3b	Antithrombotics are prescribed: aspirin and dipyridamole, aspirin alone, clopidogrel or anticoagulation	163	151	92.6	NA
	Aspirin and dipyridamole	163	57	35.0	NA
	Aspirin alone	163	60	36.8	NA
	Clopidogrel alone	163	15	9.2	NA
	Other antiplatelet(s)	163	8	4.9	NA
	Anticoagulant	163	14	8.6	NA
	No antithrombotics prescribed	163	9	5.5	NA
3c	Statins are prescribed if total cholesterol >3.5 mmol/L, *or* LDL >2.5 mmol/L (i.e. both measured)	72	58	81.0	77.9
4a	Documented in the last 12 months:				
	Smoking status	163	140	85.9	NA
	Dietary advice	163	48	29.4	NA
	Exercise advice	163	55	33.7	NA
	BMI	163	72	44.2	NA
	Smokers have been given Cessation advice	19	17	89.5	NA
	Overweight (BMI≥25) and obese (BMI≥30) patients have been given weight loss advice (dietary or exercise advice)	58	27	46.6	NA
5a	Combined risk factor control: Most recent BP ≤ 130/80 mm Hg *and* most recent total cholesterol <4.0 mmol/L *and* most recent LDL <2.0 mmol/L *and* antithrombotics are prescribed: *aspirin and dipyridamole, aspirin alone, clopidogrel or anticoagulation*	87	12	13.8	7.4
5b	Combined secondary prevention medication: *prescribed an antihypertensive, a statin and an antithrombotic*	163	90	55.2	NA

[a] assuming that patients with unavailable data did not meet the quality standard

Table 4-5: Achievement of Quality and Outcome Framework (QOF) audit standards (n=121 patients followed up for ≥ 15 months)

	Quality Standard: **The patient record shows that:**	**Total number of patients with available data**	**Total number of patients meeting quality standard**	**Quality standard achieved for patients with available data (%)**	**Quality standard met for all patients (%)[a]**
1a	BP has been documented in the last 15 months	121	115	95.0	NA
1b	Most recent BP ≤ 150/90 mm Hg	115	99	86.1	81.8
2a	Total cholesterol has been documented in last 15 months	121	94	77.7	NA
2b	Most recent total cholesterol ≤ 5 mmol/L	94	74	78.7	61.1
3a	Antithrombotics are prescribed: aspirin, clopidogrel, dipyridamole or a combination; or an anti-coagulant	121	114	94.2	NA
	Aspirin and dipyridamole	121	45	37.2	NA
	Aspirin alone	121	43	35.5	NA
	Clopidogrel alone	121	11	9.1	NA
	Other antiplatelet(s)	121	8	6.6	NA
	Anti-coagulant alone	121	7	5.8	NA
	Not prescribed antithrombotics	121	7	5.8	NA
4a	Smoking status has been documented in the last 15 months	121	85	70.2	NA
4b	Smoking cessation advice has been offered to patients who smoke	9	9	100	NA
5a	Combined risk factor control: Most recent BP ≤ 150/90 mm Hg *and* most recent total cholesterol ≤ 5 mmol/L *and* antithrombotics are prescribed: *aspirin, clopidogrel, dipyridamole or a combination; or an anti-coagulant*	93	66	71.0	54.5

*assuming that patients with unavailable data did not meet the quality standard

Antithrombotic medication

At follow-up, RCP and QOF standards for the prescription of antithrombotic medications were achieved by 93% and 94% of patients, respectively. Excluding the 14 (9%) patients on warfarin, there were 137 patients who were prescribed antiplatelet medication; 42% received both aspirin and dipyridamole, 11% received clopidogrel alone and 44% received aspirin alone.

Blood pressure (BP) targets and antihypertensive medication

Ninety five percent of patients had their blood pressure documented within the previous 15 months and 82% achieved the QOF target of ≤ 150/90 mm Hg. Additionally, 90% of patients had their blood pressure documented in the previous 12 months and 35% achieved the RCP target of ≤ 130/80 mm Hg.

Seventy one percent of patients were prescribed antihypertensive medication according to RCP standards. Overall, 50% were on an angiotensin-converting enzyme inhibitor (ACEI), 45% were on a calcium channel blocker (CCB), 27% were on a thiazide diuretic and 25% were on an angiotensin receptor blocker (ARB). Sixty one percent of patients on antihypertensive medication were prescribed one class of medication, whereas 39% were prescribed two or more recommended medications. Twenty nine percent of patients with BP > 130/80 mm Hg were not prescribed any antihypertensive medications (RCP recommendation: initiate antihypertensives if BP > 130/80 mm Hg).

Cholesterol targets and statin medication

Overall, 78% of patients had their total cholesterol (TC) documented in the previous 15 months and 61% achieved the QOF standard of TC ≤ 5.0 mmol/L. In accordance with RCP guidelines, 55% of patients had their TC and low-density lipoprotein (LDL) documented within the previous 12 months, with 16% achieving RCP standards of TC <4.0 mmol/L and LDL <2.0 mmol/L.

RCP guidelines recommend that patients should achieve a TC < 4.0 mmol/L or a 25% reduction in TC, whichever achieves the lowest value[11]. In this study, a 25% reduction in TC was calculated from the time of TIA diagnosis. Although 28% of patients achieved an absolute target of < 4.0 mmol/L, only 10% met the full RCP standard when lower targets were considered (i.e. also satisfying the criteria of 25% reduction in TC from baseline). Excluding the 31% of patients with a past medical history of hypercholesterolaemia at TIA clinic presentation did not substantially change the proportion of patients achieving the full RCP standard (11%).

A total of 72 patients (80% of those with TC and LDL documented in the previous 12 months) were eligible for statins according to RCP guidelines (TC > 3.5 mmol/L or LDL > 2.5 mmol/L). Statins were prescribed in 81% of these cases. However, 73 patients did not have their TC or LDL documented in the previous 12 months. Assuming that these patients were all eligible for statins, 78% of a total of 145 potentially eligible patients met the RCP standard for the prescription of statins.

Lifestyle risk factors

Overall, 34% and 29% of patients were reported to have exercise or dietary advice documented in their primary care record during the previous 12 months, respectively. In addition, 72 (44%) patients had their BMI documented within the same 12 month period. Of these, 36 (50%) were overweight (BMI ≥ 25) and 22 (31%) were obese (BMI ≥ 30). Forty seven percent of overweight or obese patients had weight loss advice (dietary or exercise advice) documented. Smoking status was documented for 140 patients (86%) during the previous 12 months, of whom 19 (14%) were smokers, with 17 (90%) documented to have received cessation advice.

Combined risk factor control

Of the 87 patients with available data, 12 (14%) achieved the combined RCP standards of BP≤ 130/80 mm Hg, TC < 4.0 mmol/L, LDL < 2.0 mmol/L and prescription of antithrombotic medication. When all patients were considered (n=163), 7% achieved this combined standard if it is assumed that patients with missing data failed to achieve the recommended standards. Overall, 55% of patients were prescribed all three classes of secondary prevention medication (a statin, an antihypertensive and an antithrombotic).

4.5. Discussion

4.5.1. Main findings

This study is believed to be the first to evaluate the quality of secondary stroke prevention among a population of TIA patients recently diagnosed in a specialist TIA clinic. The results suggest that the achievement of RCP quality standards was

suboptimal, whereas achievement of QOF standards was good overall. There were various missed opportunities for maintenance of optimal secondary prevention in this high risk population, and potential areas for quality improvement are identified below.

Antithrombotic medication

Although the use of antithrombotic medication was good overall, with 94% of patients prescribed at least one recommended medication, roughly half of those patients on aspirin were not on concomitant dipyridamole (as recommended in the 2008 RCP guideline[68]). While a combination of aspirin and dipyridamole has been shown to be more effective for the prevention of ischaemic stroke than aspirin alone[110], adverse effects leading to medication discontinuation occur in approximately 16% of patients[115]. However, this does not account for the high proportion of patients not prescribed dipyridamole in this study (50%). Instead, this finding may be attributable to the concept of clinical inertia, defined as the "failure of healthcare providers to initiate or intensify therapy when indicated"[234 (p825)]. However, it should be noted that while the 2008 RCP guideline recommended aspirin and dipyridamole as the standard secondary prevention therapy following TIA (i.e. the audit standard used in this study), the most recent 2012 RCP guideline[11] now recommends clopidogrel as the standard treatment.

Blood pressure targets and antihypertensive medication

Less than 40% of patients reached the RCP BP target of ≤ 130/80 mm Hg and of these, almost 30% were not prescribed an antihypertensive medication in accordance with

RCP guidelines. Reducing BP in TIA patients would have significant clinical benefits for the secondary prevention of stroke since a 9/4 mm Hg reduction in BP reduces the risk of stroke by 28%[334]. It is likely that more than one medication will be required to bring BP under control in around 65% of patients[335]. Thus combination therapy is recommended from the outset by some authorities[92], though this is uncommon in clinical practice, as in this study (61% on monotherapy). This makes a strong case for initiation with or progression to combination therapy to improve target BP achievement.

Cholesterol targets and statin medication

At follow-up, only 28% of patients achieved a TC < 4 mmol/L (RCP standard) whereas 61% achieved a TC ≤ 5 mmol/L (QOF standard). These data suggest that GPs may not lower TC aggressively once QOF indicators have been met. Furthermore, nearly half of all patients (45%) did not have their LDL measured within the previous 12 months, and only 23% achieved the RCP standard (LDL< 2 mmol/L). Intensive cholesterol lowering, although only 'marginally' beneficial for stroke prevention, has significant benefits for the prevention of cardiovascular events and is therefore recommended in TIA patients[102].

The 2008 RCP guideline recommended a 25% reduction in TC or a target of TC < 4.0 mmol/L, whichever achieved the lowest absolute value[68]. Similarly, a 30% reduction in LDL or a target of LDL < 2.0 mmol/L was recommended[68]. However, baseline TC and LDL values were not defined; these could be interpreted as pre-treatment values or the values at the time of TIA diagnosis. The resulting ambiguity, combined with the

need for GPs to set individual patient targets, may have contributed to suboptimal cholesterol lowering observed in this audit study. The more recent 2012 RCP guideline[11] recommends intensified statin treatment if TC remains ≥ 4.0 mmol/L or LDL remains ≥ 2.0 mmol/L, but no longer recommends percentage reductions in cholesterol (see Chapter 2, Table 2-2). Therefore, simplified treatment guidelines may facilitate GP adherence to the 2012 RCP recommendation.

Lifestyle risk factors

The documentation of lifestyle advice in primary care was generally poor. Lifestyle data is likely to be entered in electronic patient records as free-text and is generally of lower quality than coded data (e.g. prescribing and diagnostic data)[336]. However, available data from this audit study indicated that, of the 72 patients who had their BMI documented within the previous 12 months, a large percentage (81%) were overweight or obese and meta-analysis findings have demonstrated that this puts patients at high risk of stroke[337]. More needs to be done to improve awareness of lifestyle risk factors for stroke, since a recent survey of stroke patients conducted by the National Audit Office (2010) indicated that 20% of patients were not aware that lack of exercise increased their risk of stroke[10]. Implementation of the NHS Health Checks programme, which incorporates strategies for weight management and communication of risk, could facilitate the management of TIA patients[338].

4.5.2. Comparison with other studies

This audit study evaluated the status of secondary prevention in primary care following diagnosis of TIA at one regional TIA clinic. Although such clinics are widely

implemented, their precise characteristics are subject to regional variation and may be expected to differ in terms of access to services, comprehensiveness of services, and service providers[339]. Since no other studies could be located that investigated long-term outcomes following treatment in a specialist TIA clinic, further research is required to establish whether the results of this study are generalisable to other TIA populations who are diagnosed and treated in comparable service settings.

In the context of alternative settings, few studies have examined the status of secondary prevention specifically among TIA patients. Rather, studies have presented combined data for heterogeneous populations of stroke and TIA patients. For example, in a cohort of stroke and TIA patients attending a rapid access stroke clinic or undergoing carotid endarterectomy, only 28% of patients achieved a BP ≤ 130/80 mm Hg and 22% achieved a TC < 4.0 mmol/L[55]. Although the proportions of patients achieving these standards are lower than those reported in this audit study (35% and 28% respectively), data were collected 6 months post-TIA (compared to 12 to 24 months post-TIA in this audit study) with less time therefore available to achieve risk factor targets. Moreover, the cohort study[55] collected data in 2004-2005 compared to the more recent data presented in this chapter from 2011-2012. In another study involving stroke and TIA patients who were identified from general practice records, it was observed that mean systolic BP and total cholesterol values were substantially higher than the RCP thresholds in 2004[64]. Additionally, it was reported that the proportions of patients exceeding 2004 RCP threshold[67] for total cholesterol (≥ 3.5 mmol/L) and the overweight threshold (BMI > 27.8 kg/m^2) were ≥77% and ≥35%, respectively[64].

Comparison with UK national audits

The National Sentinel Stroke Audit (NSSA) evaluates the quality of stroke care against the RCP National Clinical Guideline for Stroke[238]. The areas covered by this audit include patient assessment, acute care and discharge planning. However, the evaluation does not extend to the quality of post-discharge secondary stroke prevention. Instead, national audits of stroke care have reported the quality of secondary stroke prevention in terms of achievement of QOF indictors[10,340]. Since the introduction of QOF, a greater proportion of stroke and TIA patients have been shown to receive secondary prevention treatment, although practice variation has been reported in the achievement of QOF indicators[340]. However, there are currently no national or regional benchmarks for the quality of secondary prevention with respect to RCP standards.

4.5.3. Strengths and limitations of the study

This study used follow-up data collected from general practices. A short (5 minute) data collection form was devised and resulted in a response rate of 80%. Similar surveys of UK general practices have reported response rates ranging from 46%[341] to 70%[342]; the high response rate achieved in this study was facilitated by the use of a short questionnaire with repeat mailing and follow-up telephone contact[294].

Despite the high response rate, a limitation of this study concerned the self-selection of general practices: non-responding practices may have differed systematically from responding practices[293]. Secondly, data on medication contraindications were not documented in this study. Adverse drug effects are common in primary care settings

and may result in medication discontinuation[343]. It is therefore likely that this study has underestimated the proportion of patients who were prescribed appropriate secondary prevention therapy. Finally, this study did not collect details on the specific nature of lifestyle advice provided to TIA patients for the purposes of secondary stroke prevention. Consequently, the content and comprehensiveness of lifestyle advice cannot be evaluated in relation to RCP guidelines.

4.6. Chapter conclusion

In the UK, Department of Health initiatives have led to the widespread implementation of rapid-access TIA clinics, which have been shown to reduce the short-term risk of stroke and are cost-effective[35]. However, this study has demonstrated that subsequent monitoring and optimisation of vascular risk factor management in primary care remains suboptimal. The findings exclusively in people who have had a TIA are in agreement with previous research in more heterogeneous groups (including people with TIA or stroke) in highlighting inconsistencies between the achievement of QOF indicators and RCP targets[64]. A 2010 report from the National Audit Office offers a possible explanation for this in suggesting that "there are necessarily differences between what is recommended as best practice for treating individual patients, and what is appropriate, realistic and measurable for a population of patients"[10 (p41)]. It is anticipated that an ongoing RCT will establish whether or not it is feasible to lower BP intensively (< 130/ 80 mmHg) in primary care settings[90]. The implications of this audit study for the development of a complex intervention to improve secondary stroke prevention are discussed further in Chapter 8.

Chapter 5. Systematic review: stroke services for risk reduction in the secondary prevention of stroke

This chapter is concerned with establishing the optimal mode of health service delivery for implementing evidence-based recommendations for secondary stroke prevention. The protocol for this study has been published by the Cochrane Collaboration[344] (see Appendix D for further details) and the Cochrane Handbook[298] has been used to guide the overall research methodology. The introduction (section 5.1) outlines the role of stroke services in the implementation of evidence-based guidelines for stroke prevention. The objectives (section 5.2) and methods (section 5.3) of the systematic review are then described. Finally, the findings of the review are presented (section 5.4) and implications discussed (section 5.5).

5.1. Introduction

Chapter 2 (sections 2.2.1 to 2.2.5) presented a wide range of interventions for secondary stroke prevention that have been supported by some convincing evidence from RCTs. However, the challenges of translating research findings into practice are well documented and success is often dependent upon overcoming numerous social, political and structural barriers to change[345]. Clinical guideline implementation is influenced by numerous factors that can be categorised as intrinsic (those concerning the guideline itself) or extrinsic (those concerning the clinical environments in which the guidelines are intended to be used)[346]. Potential intrinsic barriers to guideline implementation include limited instructions on implementation procedures[227] and the specification of complex recommendations that are difficult to understand[347].

Additionally, extrinsic factors include patient and healthcare provider behaviours, organisation of healthcare services, availability of resources, and the effectiveness of communication between healthcare providers and patients[346].

Considerable evidence-practice gaps have been highlighted in the context of stroke prevention[348]. The purpose of the systematic review described in this chapter was to evaluate the effectiveness of interventions that were intended to improve secondary stroke prevention through better implementation of existing evidence-based recommendations. To reflect the diverse nature of intrinsic and extrinsic factors affecting guideline implementation, this review considered organisational, educational and behavioural interventions that were developed in line with this purpose. Secondary stroke prevention can be addressed in a variety of healthcare settings[349]. Thus, to provide a context for the interventions that will be evaluated in this systematic review, an overview of stroke services with a role in secondary stroke prevention is outlined in the following section.

5.1.1. Secondary stroke prevention in the context of stroke services

The National Audit Office identifies four providers of stroke care: "primary care (GP) services; acute (ambulance and hospital) services; rehabilitation services (hospital and community); social care services (private, NHS and third-sector)"[10 (p15)]. For the purposes of this review, stroke services are considered to include all services responsible for providing acute and follow-up care to stroke and TIA patients. Generally, responsibility for secondary stroke prevention care lies at the interface between acute and primary care services; patients may be given initial prescriptions and information in the hospital setting, but ongoing prescriptions and lifestyle advice

are usually provided by primary care.

Acute stroke services include organised inpatient (stroke unit) care and specialist TIA clinics[11,50]. Recommendations for secondary stroke prevention can be initiated as part of a coordinated treatment program during acute hospitalisation[350] or outpatient clinic review[34]. Subsequently, primary care services are well placed to monitor patient risk factors, encourage lifestyle change and review secondary prevention medications on an ongoing basis[11]. Primary care aims to be characterised by person-centredness, comprehensiveness, continuity of care and community participation[351,352]. Social care services and voluntary sector organisations can also work in partnership with primary care to deliver healthy living support[340]. For example, support workers may adopt a "navigation role" that enables them to "provide practical advice, information, signposting, advocacy and emotional support on a short- or long-term basis both to individuals who have had a stroke and to their carers"[9 (p19)].

5.2. Objectives

The objective of this review was to assess the effects of stroke service interventions on modifiable risk factor control for the secondary prevention of stroke. Poor medication adherence can compromise secondary prevention by reducing the clinical benefits of long-term therapies[353]. In the context of this review, 'modifiable risk factors' therefore refer to:

- Clinical conditions (hypertension, hyperlipidaemia, atrial fibrillation, diabetes and obesity);
- Patient non-adherence to secondary prevention medications.

5.3. Methods

5.3.1. Criteria for considering studies for this review

Types of studies

This review included published or unpublished randomised controlled trials (RCTs) with a minimum follow-up of three months after the start of the intervention. Parallel group trials, cluster-randomised trials and cross-over trials were eligible for inclusion.

Types of participants

Adults (aged 18 and over) with a confirmed diagnosis of ischaemic stroke, haemorrhagic stroke or TIA were included in this review.

Types of interventions

For the purposes of this review, stroke service interventions are defined as alternative models of care that are implemented in order to improve patient outcomes following stroke or TIA. Stroke service interventions are considered complex interventions since they often contain several interacting components and may require complex behaviours, organisational change or the assessment of numerous outcome measures[62,307]. This review included stroke service interventions that were intended to improve modifiable risk factor control through increased adherence to existing recommendations for secondary stroke prevention (e.g. recommendations in international stroke guidelines). The following categories of interventions were considered in this review:

- Educational and behavioural interventions for patients

- Educational and behavioural interventions for stroke service providers
- Organisational interventions: subdivided into the following categories developed by Wensing et al[354]:

  - Revision of professional roles, e.g. involvement of non-physician staff in prevention clinics;
  - Collaboration between multidisciplinary teams, e.g. interventions promoting effective liaison between primary and secondary care teams;
  - Integrated care services, e.g. disease and case management programs where patient care follows protocols for screening, education and treatment/monitoring;
  - Knowledge management systems, e.g. computerised decision support on medication prescribing, shared medical records;
  - Quality management, e.g. guideline and protocol development;
  - Financial incentives, e.g. Quality and Outcomes Framework[71].

Interventions that were intended to improve physical rehabilitation or knowledge of stroke in general, surgical interventions and interventions testing new pharmacological therapies were excluded from the review. Exercise training programs for stroke or TIA patients were also excluded, as these are the subjects of other Cochrane reviews[355,356].

Types of outcome measures

Primary outcomes

- Quantitative changes (or target achievement) in BP, lipid profile (TC, LDL, HDL, and

triglycerides), glycaemic control in diabetes mellitus (Hb1Ac), BMI or validated cardiovascular risk score.

- Any indicator of patient adherence to secondary prevention medications e.g. self-reported medication adherence or medication persistence, medication possession, individual patient data on prescriptions, pharmacy claims, electronic monitoring, drug tracers in blood or urine.

Secondary outcomes

- Secondary cardiovascular events: stroke, myocardial infarction or vascular death.

5.3.2. Search methods for identification of studies

Search strategies involved no language restrictions and arrangements were made for translation of relevant papers published in languages other than English.

Electronic searches

The following electronic databases were searched to identify relevant trials:

- Cochrane Stroke Group Trials Register (April 2011);
- Cochrane Effective Practice and Organisation of Care Group Trials Register (June 2011);
- Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, issue 6);
- MEDLINE (1950 to June 2011) (Appendix B);
- EMBASE (1981 to June 2011);
- CINAHL (1981 to June 2011);

- AMED (1985 to June 2011);
- British Nursing Index (BNI) (1985 to June 2011);
- Web of Science Conference Proceedings Citation Index- Science (1970 to June 2011);
- Index to UK theses (http://www.theses.com/);
- BiblioMap (health promotion research) (http://eppi.ioe.ac.uk/webdatabases/Intro.aspx?ID=7).

In addition, searches were conducted in the following databases of ongoing trials and grants registers:

- ClinicalTrials.gov (http://www.clinicaltrials.gov/);
- Current Controlled Trials (www.controlled-trials.com);
- Stroke Trials Registry (www.strokecenter.org/trials/);
- WHO International Clinical Trials Registry Platform (http://apps.who.int/trialsearch/).

The MEDLINE search strategy (Appendix B) was adapted to search other databases.

Searching other resources

The Science Citation Index Cited Reference Search was used to search for studies citing included trials. Reference lists of included trials, relevant systematic reviews and relevant meta-analyses were also checked. Authors and trialists involved in included trials were contacted in order to facilitate the identification of ongoing trials and unpublished studies.

5.3.3. Data collection and analysis

Selection of studies

Titles, abstracts and keywords of all records retrieved from the search strategy were assessed for eligibility. The full text of all potentially relevant papers were obtained where the information given suggested that the study:

- was a randomised controlled trial;
- restricted participants to TIA or stroke patients, or reported outcomes separately for TIA or stroke patient subgroups;
- evaluated a stroke service intervention;
- stated or clearly implied that the intention of an intervention was to improve modifiable risk factor control;
- assessed one or more of the defined outcome measures;
- did not include any of the following interventions: physical rehabilitation programs, new pharmacological therapies, surgical procedures, exercise training programs, educational programs intended to improve knowledge of stroke in general.

Full text articles were obtained if there were any doubts about eligibility. Two review authors carried study selection at all stages. One review author reviewed all records and this was independently duplicated by a second review author. Disagreements regarding study eligibility were resolved by discussion between all review authors.

Data extraction and management

Two review authors independently extracted outcome data for each eligible trial using a pre-specified data extraction form. One review author extracted data for all eligible studies and a second review author independently repeated data extraction for each study. Disagreements were resolved by consensus with review authors referring back to the original article.

The following information was recorded for each study.

- General information: published/unpublished, title, authors, journal/source, publication date, country of origin, publication language.
- Study methods: unit of randomisation (and method), allocation concealment (and method), blinding (outcome assessors), validation of questionnaires.
- Participants: sampling (random or convenience), place of recruitment, total sample size, numbers randomised, inclusion criteria, exclusion criteria, demographic characteristics (age, gender, ethnicity, socioeconomic or sociodemographic status), disability (modified Rankin score, Barthel score), co-morbidities, similarity between groups at baseline, drop-out and withdrawal rates.
- Intervention details: components, length, frequency, location, mode of delivery, personnel responsible for delivery, timing post-stroke, details of control protocol.
- Outcomes: pre-specified outcomes defined above, follow-up intervals from start of intervention, units of measurement, missing data.
- Results: results for pre-specified outcomes, number of participants assessed, method of analysis (intention-to-treat analysis, per protocol analysis).

- Intervention category: pre-specified in the review protocol
- Assessment of risk of bias in included studies

The quality of all eligible trials was assessed by one review author. The review author was not blinded to study details (e.g. author, journal, results) when assessing its methods. The quality of each randomised trial was assessed according to the Cochrane Collaboration's tool for assessing risk of bias[357]. The blinding of participants and healthcare providers was excluded from the assessment since these criteria are unlikely to be met given the nature of the interventions under consideration. The risk of bias was assessed across six domains (sequence generation, allocation concealment, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and other sources of bias) and summarised narratively. Study authors were contacted to retrieve missing information. If study authors did not provide the requested information, the relevant items on the risk of bias assessment were recorded as 'unclear'. The risk of bias has been summarised according to the following criteria[357]:

- Low risk of bias: low risk of bias for all domains.
- Unclear risk of bias: unclear risk of bias for one or more domains.
- High risk of bias: high risk of bias for one or more domains.

Measures of treatment effect

A mixture of continuous outcomes and dichotomous outcomes were reported by studies included in this review. Where possible, effect sizes are reported in terms of mean difference (MD) and 95% confidence interval (CI) for continuous data. For

dichotomous data, risk ratios (RR) or odds ratios (OR) and 95% CI are reported. The Cochrane Collaboration's Review Manager software (RevMan 5.0) was used to carry out statistical analyses[358].

Unit of analysis issues

This review included two cluster RCTs[359,360]. Cluster RCTs were analysed by reporting effect estimates from analyses that accounted for the cluster design. Where necessary, effective sample sizes were calculated for cluster RCTs and combined with parallel RCTs in meta-analyses. Where studies included repeated measurements for participants at several time points, outcomes recorded at the end of the study per protocol have been reported.

Dealing with missing data

Authors of included studies were contacted in order to request missing data. Sensitivity analyses were performed where appropriate to explore the effects of including or excluding studies with incomplete data. Missing summary data (e.g. standard deviations) were imputed based on recommendations in the Cochrane Handbook for Systematic Reviews of Interventions[357]. Only one study[361] did not report standard deviations required for meta-analysis and the mean standard deviation from other relevant studies (i.e. those included in the same meta-analysis) was imputed. Sensitivity analyses were used to investigate the effect of entering assumed values: it was found that changing the assumptions made when imputing missing standard deviation values (e.g. imputing the highest standard deviation from all studies included in the meta-analysis) had no significant impact on findings.

Assessment of heterogeneity

Heterogeneity was identified from forest plots using the Chi^2 test and significance level of alpha = 0.1[362,363]. Heterogeneity was also quantified using the I^2 statistic, where I^2 values of 50% or more indicate a substantial level of heterogeneity[362,363]. Where appropriate, possible sources of heterogeneity were assessed using sensitivity analyses.

Assessment of reporting biases

Funnel plots were used to assess publication bias. Visual inspection suggested no asymmetry.

Data synthesis

Studies identified by the review were heterogeneous in terms of interventions, settings, patient characteristics and outcome measurements. Consensus methods were used to decide whether meta-analysis of study results was appropriate. Where there were sufficient comparable data, results were combined for each outcome to give an overall estimate of treatment effect. Where meta-analysis was not possible or appropriate, a qualitative synthesis of intervention effects has been presented.

Subgroup analysis and investigation of heterogeneity

Subgroup analyses were planned according to the following criteria:

- Patient age (under 65 years, 65 years and over).
- Condition (ischaemic stroke, haemorrhagic stroke or TIA).

- Stroke severity (e.g. according to National Institutes of Health Stroke Scale (NIHSS) score[364]) or disability (e.g. according to Barthel score[365] or modified Rankin score[366]).
- Specific risk factor management strategy (e.g. BP lowering interventions).

However, subgroup analyses were not possible since relevant data from included studies were not available.

Sensitivity analysis

Where appropriate, sensitivity analyses were conducted to consider whether the following factors were associated with different effect sizes:

- repeating analyses excluding unpublished studies;
- repeating analyses excluding studies at high or unclear risk of bias;
- repeating analyses excluding very large studies to investigate the extent to which they dominate the results;
- repeating analyses using different measures of effects size (risk difference, odds ratio etc.) and different statistical models (fixed-effect and random-effects models);
- repeating analyses to investigate whether conclusions are affected by assumptions made when dealing with missing data.

5.4. Results

5.4.1. Description of studies

See Appendix B for tables: Characteristics of Included Studies; Characteristics of

Ongoing Studies; Characteristics of Studies Awaiting Classification; Characteristics of Excluded Studies.

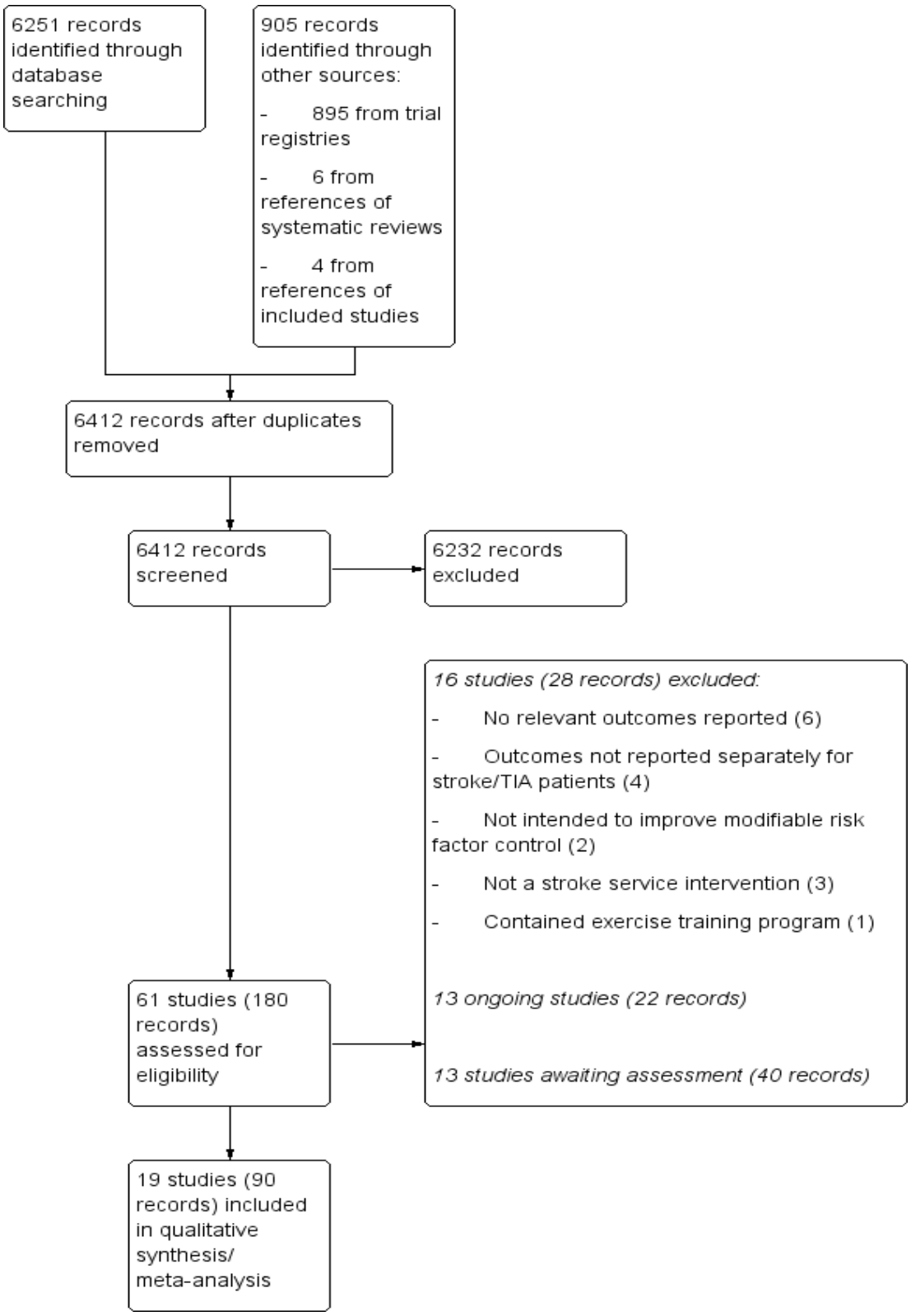
Results of the search

Searches were carried out from April to June 2011. A total of 6412 records were identified after the removal of duplicates (see Figure 5-1). Title and abstract screening identified 61 studies (180 records) that were potentially eligible for this review.

Six potentially eligible studies reported collective outcome data for participants with several different types of CVD. Study authors were contacted to request outcome data separately for stroke/TIA patients. Two authors provided unpublished outcome data for stroke/TIA patients and these studies were included in the review[359,367]. The remaining authors did not respond to requests for additional data and four studies were subsequently excluded from the review[368-371].

A further 27 studies of potential relevance to this review were not associated with any manuscripts containing relevant outcome data[372-399]. We therefore attempted to obtain information about the status of these studies by contacting the main study authors. One author supplied unpublished data and this study was included in the review[375]. There were 13 completed trials for which further study information was unavailable[387-399] (see Characteristics of Studies Awaiting Classification Table in Appendix B). Correspondence with study contacts confirmed the status of eight ongoing trials[376,377,380-385] and a further five studies have been classified as ongoing due to their status on clinical trial registers[372,374,378,379,386] (see Characteristics of Ongoing Studies Table in Appendix B).

Figure 5-1: Study flow diagram



Included studies

Nineteen randomised controlled trials (RCTs) met the inclusion criteria for this review, of which 17 used a parallel group design[361,367,375,400-413] and two used a cluster design[359,360]. Detailed information on each can be found in the Characteristics of Included Studies Table (see Appendix B).

Participants

The trials included a total of 6888 participants with cerebrovascular disease. The mean or median age of participants ranged from 60 to 73 years. Four studies included participants with a diagnosis of ischaemic stroke[360,401,403,405] whereas three studies included participants with either ischaemic or haemorrhagic stroke[409,413] or did not specify stroke subtype[412]. Seven trials included a broader range of participants with a diagnosis of either stroke or TIA[361,375,402,406-408,411] with the proportion of TIA patients ranging from 1%[375] to 30%[361]. Three studies focused only on individuals with minor stroke or TIA[400,404,410]. Other studies included participants with a history of CVD or elevated cardiovascular risk factors, and provided separate unpublished data for stroke/TIA patients[359,367].

Location

Three of the included trials were conducted in the USA[360,361,401], two in Canada[367,411], eight in Europe[359,400,402,406,407,409,410,413], two in Australia[375,408] and three in Asia[404,405,412]. One study was a multi-centre trial conducted in 5 centres in China and Europe[403].

Setting

The majority of studies were set in primary care or community settings[359,361,367,400-404,407,411,412]. Three studies were set in outpatient clinics[405,406,413] and one was incorporated into a TIA service that provided screening and diagnostic work-up in a single day[410]. Another intervention was performed during hospitalisation for acute stroke[360]. Three further studies were initiated in the hospital setting[375,408,409] with two subsequently continuing the intervention in the community[375,408].

Interventions

See Appendix B (Characteristics of Included Studies Table) for details of interventions (components, length and frequency).

To facilitate analysis and interpretation of study results, interventions have been described according to categories pre-specified in the review protocol (educational and behavioural interventions for patients; educational and behavioural interventions for healthcare providers; organisational interventions as defined according to the taxonomy developed by Wensing et al[354]). The categorisation of interventions is summarised in Table 5-1. All but two studies included educational or behavioural interventions for patients. Fifty eight percent of studies included integrated care services where patient care was delivered according to protocols for screening, education and treatment/monitoring. Thirty two percent of studies included educational or behavioural interventions for healthcare providers, which usually involved the provision of guidelines or specification of individual patient targets. Less common intervention elements included revision of professional roles (changes in the

tasks carried out by pharmacists), collaboration between multidisciplinary teams, knowledge management systems and quality management. No studies included interventions involving financial incentives.

The majority of interventions were multifaceted and contained components that were associated with more than one category. However, in order to summarise evidence effectively, interventions were categorised according to their predominant components. Final category assignments were decided by consensus (discussions between review authors). Two broad categories of interventions were identified: educational/behavioural interventions for patients and organisational interventions. Predominant intervention categories are highlighted in Table 5-2. Several interventions included organisational elements with varying amounts of education (directed towards patients or healthcare professionals). These have been categorised as predominantly organisational interventions since organisational elements were considered to have facilitated or permitted the delivery of education (e.g. patient education is often a component of integrated care services[354]). Conversely, interventions have been classified as predominantly educational/behavioural interventions for patients if they were implemented without changes to the organisation of patient care. A summary of the interventions in each category is provided in the following sections.

Table 5-1: Table of intervention categories

Study	Educational/ behavioural interventions for patients	Educational/ behavioural interventions for service providers	Organisational interventions						
			Revision of professional roles	Collaboration between multidisciplinary teams	Integrated care services	Knowledge management systems	Quality management	Financial incentives	Predominant intervention category
Allen 2002[361]	X	X		X	X				Organisational
Allen 2009[401]	X	X		X	X				Organisational
Boter 2004[402]	X				X				Organisational
Brotons 2006[359]	X	X			X				Organisational
Ellis 2005[406,414]	X				X				Organisational
Evans 2010[367]	X		X		X				Organisational
Hornnes 2011[407]	X				X				Organisational
Johnston 2010[360]		X					X		Organisational
Joubert 2009[408]	X	X		X	X	X			Organisational
Markle-Reid 2011[411]		X		X	X	X			Organisational
Wang 2005[412]	X				X				Organisational
Welin 2010[413]	X				X				Organisational
Adie 2010[400]	X								Educational/behavioural intervention for patients

Study	Educational/ behavioural interventions for patients	Educational/ behavioural interventions for service providers	Organisational interventions						
			Revision of professional roles	Collaboration between multidisciplinary teams	Integrated care services	Knowledge management systems	Quality management	Financial incentives	Predominant intervention category
Boysen 2009[403]	X								Educational/behavioural intervention for patients
Chanruengvanich 2006[404]	X								Educational/behavioural intervention for patients
Chiu 2008[405]	X								Educational/behavioural intervention for patients
Eames 2010[375]	X								Educational/behavioural intervention for patients
Lowe 2007[409]	X								Educational/behavioural intervention for patients
Maasland 2007[410]	X								Educational/behavioural intervention for patients

a) Educational or behavioural interventions for patients

Seven studies involved educational/behavioural interventions for patients[375,400,403-405,409,410]. None of these interventions incorporated organisational elements. The content of five interventions was largely focused on modifiable risk factors for stroke[400,403-405,410]. Two interventions delivered education about secondary stroke prevention as part of broader stroke education programs[375,409].

b) Organisational interventions

The remaining 12 studies involved predominantly organisational interventions. Five interventions addressed secondary stroke prevention as part of a wider set of study aims encompassing post-stroke rehabilitation (interventions with a broad focus)[361,401,402,411,413]. Although these organisational interventions generally provided some patient education about secondary stroke prevention, this appeared to be delivered on only one occasion[361,401] or on an opportunistic basis[402,413]. Conversely, secondary prevention was the main aim of the remaining seven organisational interventions (interventions specifically targeting secondary prevention)[359,360,367,406-408,412]. Six of these interventions included an element of patient education or behavioural counselling directed towards secondary stroke prevention[359,367,406-408,412]. The remaining intervention did not specify the inclusion of patient education elements and was aimed at promoting the use of stroke discharge orders among healthcare professionals[360].

<u>Timing</u>

Fifteen studies recruited participants immediately following diagnosis of acute stroke

or TIA. These studies initiated interventions prior to hospital discharge[360,375,408-410], within one week post-discharge[361,401,402,412], within one month post-discharge[400,407] or within three months post-discharge[403,404,406,413]. Three studies recruited participants from primary care or community settings[359,367,411]. Two of these studies initiated interventions within 12 months[359] or 18 months[411] of stroke/TIA diagnosis, and one did not specify intervention timing[367]. One study recruited participants from outpatient clinics at a tertiary hospital and initiated the intervention when participants had been attending clinics for at least 12 months[405]. Two studies involved interventions that were delivered on a single occasion[409,410]. The remaining studies implemented interventions over a time frame ranging from 3 to 36 months. The majority of interventions (84%) had a duration of between 3 and 12 months.

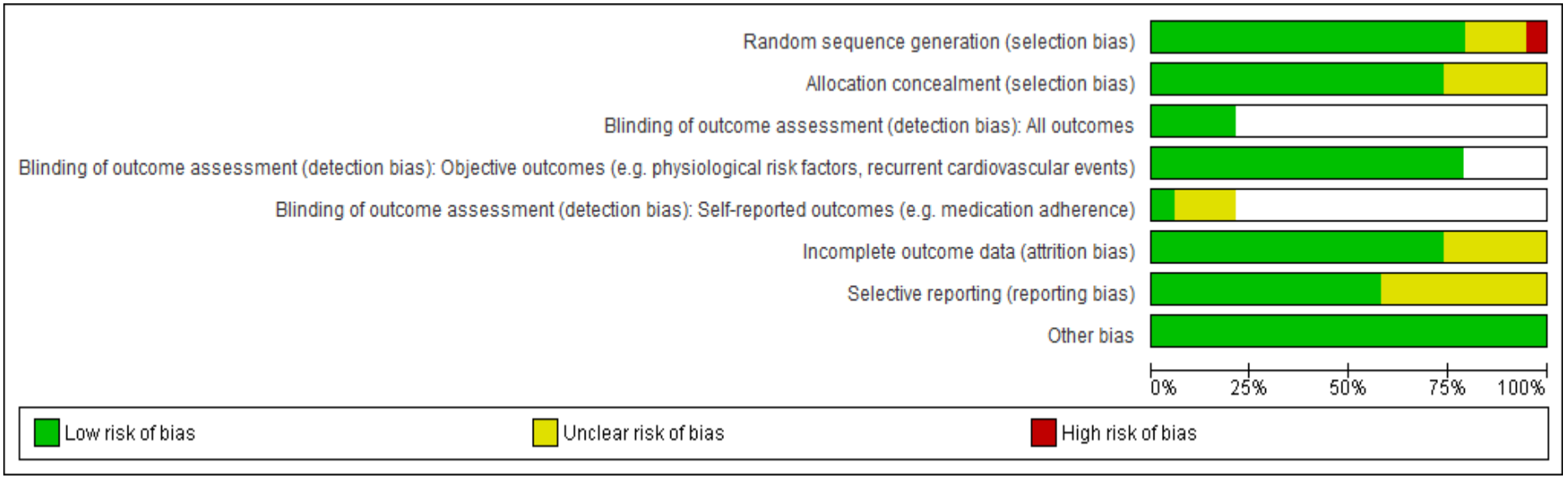
Outcomes

Details of outcomes are provided in the Characteristics of Included Studies Table (see Appendix B).

Risk of bias in included studies

The risk of bias was assessed according to the Cochrane Collaboration's tool for assessing risk of bias[357]. For each study, information was extracted about method of randomisation and allocation concealment, blinding of outcome assessors, incomplete outcome data, selective outcome reporting and any other potential sources of bias. A detailed assessment of the risk of bias for individual studies is presented in the Characteristics of Included Studies Table (see Appendix B). Summary assessments are shown in Figure 5-2 and described in the following section.

Figure 5-2: Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.



Allocation (selection bias)

Inclusion criteria for this review required studies to be randomised. All but three studies reported adequate generation of allocation sequence. Two studies were reported as RCTs, but did not provide details of randomisation methods[404,405]. One study reported that participants were 'randomly divided into intervention group (146 cases) and control group (52 cases)'[412]. Although the use of randomised methods can be inferred from this statement, the large imbalances in group size were not explained and this study has therefore been included but considered at high risk of bias.

Criteria for adequate allocation concealment were met by all but four studies. Three trials failing to report randomisation methods also provided no information about allocation concealment[404,405,412]. Another study with adequate sequence generation contained no information about allocation concealment[361].

Blinding (detection bias)

Only six studies reported blinding of outcome assessors for all outcomes[375,401,402,406,407,411]. A further three studies reported blinding during assessment of selected outcomes[360,361,413]. The review authors judged that non-blinding of outcome assessors was unlikely to affect objective outcomes such as physiological data (e.g. blood pressure) or information extracted from medical records[359,367,400,404,405,412,412]. However, it was unclear whether non-blinding could have affected outcomes obtained from participants via self-report (e.g. adherence to medication)[359,367,400,404,405,408,412,413].

Incomplete outcome data (attrition bias)

The proportion of study participants completing follow-up ranged from 70%[359] to 100%[400]. Two studies did not report the proportion of participants completing follow-up and therefore information about missing outcome data was unavailable[405,412]. Fifteen studies reported reasons for missing outcome data and the review authors judged that reasons were unlikely to be related to the study outcomes[359,360,367,375,400,402-404,406-411,413]. The two remaining studies did not provide enough information about missing outcome data to permit judgment[361,401].

Selective reporting (reporting bias)

Protocols were obtained for 12 of the 19 studies, and 11 appeared to be free of selective outcome reporting[359,367,375,400-404,407,410,413]. One study reported primary outcomes in the pre-specified way, although some secondary outcomes were not reported[360]. Protocols could not be obtained for the remaining seven studies[361,405,406,408,409,411,412].

Other potential sources of bias

No other potential sources of bias were identified.

5.4.2. Effects of interventions

Blood pressure

Fifteen studies reported data on BP, of which five evaluated educational/behavioural interventions for patients[400,404,405,409,410] and 10 evaluated organisational interventions[359-361,367,401,406-408,412,413].

Educational/behavioural interventions for patients

Pooled data from four studies[400,404,405,410] indicated that educational/behavioural interventions for patients were associated a significant reduction in mean systolic blood pressure (MD -7.45 mm Hg; 95% CI -10.73 to -4.16) and a reduction in mean diastolic blood pressure that bordered on statistical significance (MD -1.94 mm Hg; 95% CI -4.06 to 0.18). However, only the study by Chiu et al[405] was independently associated with significant reductions in blood pressure and consequently pooled results were associated with a high level of statistical heterogeneity (I^2>50%). Chiu et al[405] only reported outcome data for a subgroup of participants with hypertension, so that baseline blood pressure levels were higher and therefore easier to improve upon. When this study was removed from the analysis, pooled data from the remaining three studies[400,404,410] did not indicate any intervention effects and statistical heterogeneity was eliminated (I^2=0%). The two studies that reported achievement of blood pressure targets (BP < 140/90 mm Hg or < 130/80 mm Hg) found no significant improvements in terms of blood pressure control[400,405]. A fifth study reporting median change in blood pressure found no significant differences between intervention and control groups[409].

Organisational interventions

Organisational interventions were associated with significant reductions in mean systolic blood pressure (MD -3.15 mm Hg; 95% CI -5.22 to -1.09)[359,367,406-408,413] and mean diastolic blood pressure (MD -1.60 mm Hg; 95% CI -2.92 to -0.28)[359,361,367,406-408,413]. All of these studies had in common the intervention elements of integrated care and patient education. The two studies associated with largest effect size for

systolic BP reduction (MD -8.30 and -6.00 mm Hg)[406,408], and the study associated with the largest effect size for diastolic BP reduction (MD -4.00 mm Hg)[407], combined integrated care with comprehensive patient education (involving promotion and tracking of adherence to medications and healthy lifestyle behaviours for secondary stroke prevention). These studies focused specifically on secondary stroke prevention and involved regular patient appointments (with a nurse or GP) and review of stroke risk factors (by a nurse case manager)[406-408]. Nurses informed participants[406,407] or their GPs[408] if risk factors deviated from recommended targets (although nurses themselves did not influence medication prescribing). Consideration of other studies included in the meta-analyses for systolic BP and diastolic BP showed that these evaluated interventions that were not focused specifically on secondary stroke prevention due to wider study aims: two interventions limited the delivery of secondary prevention education to one occasion or provided this on an opportunistic basis[361,413] and two included participants with other types of CVD[359,367].

Six studies evaluating organisational interventions reported data on blood pressure control[359,360,401,407,408,412]. Blood pressure targets varied by study and according to participant comorbidities (however the majority of studies used a blood pressure target of < 140/90 mm Hg or < 130/80 mm Hg for patients with diabetes). No significant intervention effects were seen when these data were pooled[359,360,401,407,408,412]. However, one study independently demonstrated that a larger proportion of intervention group participants attained a target systolic BP of < 140 mm Hg at follow-up, when compared with control group participants (OR 2.19; 95% CI 1.16 to 4.15)[408].

Lipid parameters

a) Total cholesterol

Ten studies reported cholesterol data, of which four included educational/behavioural interventions for patients[400,404,405,410] and six included predominantly organisational interventions [359,367,401,406,408,412].

Educational/behavioural interventions for patients

Studies involving educational/behavioural interventions for participants were not associated with a significant reduction in mean total cholesterol[400,404,405,410]. Only one study reported achievement of total cholesterol targets (total cholesterol ≤4 mmol/L) and found no significant difference between intervention and control groups[400].

Organisational interventions

Organisational interventions were not associated with improvements in mean total cholesterol[359,367,406,408]. In the three studies that reported on the achievement of total cholesterol targets[401,408,412], a significant intervention effect was seen, suggesting that organisational interventions were associated with improved cholesterol control (OR 1.80; 95% CI 1.31 to 2.48). However, the high levels of statistical heterogeneity observed in this analysis (I^2=83%) mean that results should be interpreted with caution. It should be noted that the outlying study with the largest effect size in this meta-analysis was considered at high risk of bias due to concerns about the adequacy of randomisation procedures[412]. Furthermore, the authors of this trial did not specify risk factor targets, stating instead that the results of blood lipid tests were classified as

either qualified or disqualified[412]. When this study was removed from the meta-analysis, a trend towards improved total cholesterol control was seen in the remaining studies and heterogeneity was eliminated, although statistical significance was lost (OR 1.32; 95% CI 0.91 to 1.91)[401,408].

b) LDL

Four studies reported LDL data, of which two evaluated educational/behavioural interventions for patients[405,410] and two evaluated organisational interventions[359,367].

Educational/behavioural interventions for patients

Pooled data from two studies reporting mean LDL levels indicated a trend towards risk reduction, but this did not reach statistical significance (MD -0.27 mmol/L; 95% CI -0.58 to 0.04)[405,410]. Only one of the two studies was individually associated with improvements in LDL levels (MD -0.39 mmol/L; 95% CI -0.73 to -0.05), however data were only presented for a subgroup of study participants with hypercholesterolaemia (i.e. those with the greatest potential for improvement)[405]. The second study reported significant reductions in LDL during the course of the study for both the intervention and control groups, with no significant differences between the groups[410]. One study presented data on the achievement of LDL targets (LDL < 2.6 mmol/L or, if LDL not available, TC < 4.1 mmol/L) and no significant improvements were reported[405].

Organisational interventions

There were no significant effects of organisational interventions on mean LDL levels[359,367]. No studies evaluating organisational interventions reported data on the

achievement of LDL targets.

c) HDL

Three studies reported data on HDL, of which one evaluated an educational/behavioural intervention for patients[404] and two evaluated organisational interventions[359,367].

Educational/behavioural interventions for patients

One study reported mean HDL levels and no significant intervention effect was observed[404].

Organisational interventions

No significant intervention effects on mean HDL levels were observed when data from two studies were pooled[359,367].

d) Triglycerides

Four studies reported data on triglycerides. Two studies involved educational/behavioural interventions for patients[405,410] and two involved organisational interventions[359,367].

Educational/behavioural interventions for patients

There were no effects of patient educational/behavioural interventions on mean triglyceride levels[405,410].

Organisational interventions

There were no effects of organisational interventions on mean triglyceride levels[359,367].

HbA1C

Five studies reported data on HbA1C outcomes[367,401,405,406,412]. These outcomes were not restricted to individuals with diabetes. One study evaluated a patient educational/ behavioural intervention[405] while four studies evaluated organisational interventions[367,401,406,412].

Educational/behavioural interventions for patients

No studies reported mean HbA1C levels. One trial reported an outcome relating to HbA1C target achievement (HbA1C < 7% or fasting blood glucose <126 mg/dL or random postprandial blood glucose < 200 mg/dL) and no significant differences between the intervention and control groups were observed[405].

Organisational interventions

There were no effects of organisational interventions on mean HbA1C levels[367,406]. Data from two studies could be pooled for achievement of HbA1C targets and a significant intervention effect was seen (OR 2.86; 95% CI 1.92 to 4.27), although a high level of statistical heterogeneity was present (I^2=97%)[401,412]. However, only one of these studies independently demonstrated a significant intervention effect: this study was considered to be at high risk of bias and targets for individual risk factors were not stated[412].

BMI

Four studies reported BMI results, of which one evaluated a patient educational/behavioural intervention[410] and three evaluated organisational interventions[359,408,412].

Educational/behavioural interventions for patients

One study reported data on mean BMI and no significant intervention effects were observed[410].

Organisational interventions

Pooled data from two studies indicated that organisational interventions were associated with a significant reduction in mean BMI (MD -0.99 kg/m^2; 95% CI -1.92 to -0.06)[359,408]. These interventions included common intervention elements of integrated care and patient education[359,408]. Only one organisational intervention measured the achievement of BMI targets and, although the intervention was associated with improvements in BMI that bordered on statistical significance (OR 1.93; 95% CI 0.97 to 3.81), the study was considered at high risk of bias and the BMI target was not specified[412].

Cardiovascular risk score

No studies measured cardiovascular risk scores.

Adherence to secondary prevention medications

Eight studies measured adherence to secondary prevention medications, of which

two involved educational/behavioural interventions for patients[375,410] and six involved organisational interventions[360,401,402,406-408].

Educational/behavioural interventions for patients

Data from two studies reported the effects of patient education on adherence to secondary prevention medications[375,410]. These data could not be pooled due to methodological heterogeneity (differences in outcome measurements). Eames et al measured the proportion of participants taking secondary prevention medications as prescribed (self-reported outcome assessed by interview) and found no significant intervention effects[375]. Maasland et al measured participants' adherence to specific medication classes (self-reported outcome assessed by interview) and reported no significant differences in adherence to anticoagulants, lipid-lowering medications or antihypertensive medications[410]. It should be noted that only Eames et al reported adequate blinding of outcome assessors[375]. It is judged that non-blinding of outcome assessors may have influenced the adherence data collected by Maasland et al[410]. Please see Characteristics of Included Studies Table for full evaluations of the risk of bias for included studies.

Organisational interventions

Three studies reported data on patient adherence to warfarin therapy[360,408] or anticoagulants[401]. Two studies measured patient adherence to antihypertensive medication[360,407] and one measured adherence to statin medication[360]. Two further studies reported the proportion of participants using collective secondary prevention medications as prescribed[402,414]. Medication adherence was either measured through

participant self-report[401,402,407,408,414] or through an analysis of filled prescription data/ INR blood test records[360]. Four of the five studies reported blinding of outcome assessors when collecting data on medication adherence[360,402,407,408,414], whereas Joubert et al[408] did not provide any information regarding this. Data were not pooled since there was substantial heterogeneity in the methods that were used to obtain outcome data. No individual study reported significant differences in medication adherence between intervention and control groups.

Secondary cardiovascular events

Eight studies reported data on secondary cardiovascular events and all evaluated organisational interventions[359,361,403,406,407,411-413].

a) Secondary stroke

Three studies recorded the proportion of participants who experienced at least one recurrent stroke. Pooled data suggested that organisation interventions were associated with significant improvements in secondary stroke prevention (OR 0.48; 95% CI 0.29 to 0.78)[361,412,413]. However, the only study showing an independent intervention effect was considered at high risk of bias[412], and the reliability of this data is therefore questionable. When this study was removed from the analysis, no intervention effect was seen (OR 1.41; 95% CI 0.63 to 3.13)[361,413].

Three studies provided data on the number of secondary strokes that occurred during follow-up (measured at end of study per protocol)[403,407,411]. These data were pooled as rate ratios[415] and no significant intervention effect was observed (OR 1.19; 95% CI

0.70 to 2.03)[403,407,411]. One study carried out an additional follow-up after a mean duration of 3.6 years and found that the number of self-reported strokes were similar between groups (OR 0.72; 95% CI 0.12 to 4.32), although a significantly higher number of TIAs were reported in the intervention group (OR 2.49; 95% CI 1.18 to 5.22)[414]. The trialists state that "one patient in the intervention group reported 10 possible transient ischaemic attacks in the interval between studies" and that "no objective confirmation of these reported symptoms was possible"[414 (p102)].

b) Secondary cardiovascular events

One study reported data on the proportion of participants who experienced at least one secondary cardiovascular event during follow-up[359]. No significant intervention effect was observed.

Two studies reported data on the number of secondary cardiovascular events that occurred during follow-up[407,414]. One study observed no differences between intervention and control groups in the number of cardiovascular events occurring before the end of the study per protocol[407]. In the second study, a significantly higher number of cardiovascular events were observed in the intervention group when an additional follow-up interview was conducted after a mean duration of 3.6 years (OR 2.08; 95% CI 1.06 to 4.06); this is likely to reflect the increased number of TIAs observed (discussed in the previous section)[414].

c) Myocardial infarction and ischaemic heart disease

Two studies reported the number of myocardial infarctions that occurred during

follow-up (measured at end of study per protocol)[403,407] and no significant intervention effect was seen. McManus et al observed no differences in the number of ischaemic heart disease events in an additional follow-up conducted after a mean duration of 3.6 years[414].

d) Vascular death

Two studies reported data on the number of vascular deaths that occurred during follow-up[123,403]. In both studies, no significant differences were observed in the number of vascular deaths occurring in the intervention and control groups[123,403].

5.5. Discussion

5.5.1. Main findings

This review produced mixed findings regarding the effectiveness of stroke service interventions for the secondary prevention of stroke. Meta-analyses were performed (where appropriate) for the outcomes of blood pressure, lipid profile HbA1C, BMI and recurrent cardiovascular events. A qualitative analysis was carried out for medication adherence outcomes.

Educational interventions were not associated with improvements in any of the review outcomes, with one notable exception. The pharmacist education program evaluated by Chiu et al[405] was associated with significant improvements in mean systolic blood pressure, mean diastolic blood pressure and mean LDL levels. However, this study only presented data for a subgroup of participants with hypertension or hypercholesterolaemia, who therefore had the greatest potential for improvement. It may be that educational interventions are more effective for participants with

uncontrolled risk factors, and these participants could be targeted in future studies. However, the studies currently included in this review do not contain sufficient data to evaluate this.

Organisational interventions appeared to be effective in lowering mean systolic and diastolic blood pressure when compared with usual care. This is likely to be associated with improved clinical outcomes, since the Post-stroke Antihypertensive Treatment Study (PATS) provided evidence that blood pressure lowering of 5/2 mm Hg with indapamide treatment reduced the incidence of secondary stroke by 29%[416]. In the systematic review presented here, the largest reductions in blood pressure were associated with interventions that contained common elements of integrated care and comprehensive patient education (involving promotion and tracking of behaviours for secondary stroke prevention). Another finding from this review is that organisational interventions (including common elements of integrated care and patient education) were associated with a significant but clinically small reduction in BMI. Organisational interventions may also be associated with significant improvements in the achievement of BMI and total cholesterol targets. However, the results of one trial complicated the analyses of the two previously mentioned outcomes since it was considered at high risk of bias (due to uncertain randomisation methods)[412]. When this study was removed from the analyses, only a non-significant trend towards improved control of total cholesterol remained.

5.5.2. Comparison with other studies

Buckley et al conducted a systematic review of the effects service organisation interventions for the secondary prevention of ischaemic heart disease[61]. Only

interventions delivered in primary care were included. The review found that interventions involving certain elements (regular planned patient appointments, patient education and monitoring of medication/risk factors) may be associated with improved control of total cholesterol and blood pressure levels. However, the authors recommend that results should be interpreted with caution due to significant clinical and statistical heterogeneity. In contrast to Buckley et al, this systematic review included interventions that were not delivered in primary care, and therefore different types of interventions were included (e.g. implementation of discharge orders). However, the conclusions of this review are in accordance with Buckley et al, since organisational interventions including elements of integrated care and patient education were associated with improvements in certain outcomes (blood pressure and BMI).

The positive effects of integrated care services in this review are also supported by the findings of another review of organisational interventions. Wensing et al reported that "integrated care services are particularly promising" when considering strategies to improve patient care[354]. This is attributed to the typical multifaceted nature of these interventions. The authors suggest that the incorporation of numerous intervention components may "address a wide range of potential barriers for change". They also state that "further work should focus on analysing the contributions of the specific components in integrated care services, to identify which particularly contribute to their effectiveness"[354].

5.5.3. Strengths and limitations of the study

A strength of this study was the robust processes that were used to identify RCTs of

potential relevance to the review: in addition to a comprehensive search strategy, the authors of all included trials were contacted to identify further published, unpublished and ongoing studies. Visual inspection of funnel plots did not raise any concerns regarding publication bias. All eligible RCTs were included regardless of publication language (the full translation of one study not published in English was arranged)[412].

A limitation of included studies was the lack of consistently used outcome measures (e.g. some studies measured mean blood pressure whereas some measured target achievement with a variety of acceptable ranges). Combining all results in meta-analyses was therefore problematic. A second limitation related to variations in study follow-up duration. This review pooled data collected at the end of the study per protocol. However, follow-up duration varied from 3 to 36 months. The results should therefore be interpreted with some caution, since shorter studies may not allow enough time for interventions to produce an impact on modifiable risk factors.

Intervention intensity is a poorly defined concept[417,418], although it may incorporate factors such as "total number of contacts, total contact time, duration of the intervention and the number of behaviour change techniques used"[418 (p125)]. Differences in intervention intensity are considered to represent a potential source of heterogeneity in the context of complex interventions[419]. Correspondingly, the stroke service interventions included in this review were found to differ considerably in terms of aims (e.g. degree of focus on secondary stroke prevention), duration, components and mode of delivery. Pre-determined strategies for categorising intervention intensity may therefore facilitate the synthesis of future research

findings[420]. However, systematic reviews of complex interventions to date have failed to demonstrate consistent associations between intervention intensity and effectiveness[418,420,421]. It has been asserted that methods for adequately describing and understanding complex interventions need to be "further developed and tested with the expectation that they will complement existing systematic review methodology"[422 (p4)].

5.6. Chapter conclusion

This chapter has presented the methods and results of a systematic review to evaluate the effects of stroke service interventions on modifiable risk factor control for secondary stroke prevention. Mixed findings were produced but notable conclusions were that organisational interventions (including common elements of integrated care and patient education) were associated with significant reductions in blood pressure and BMI, whereas educational interventions for patients were not generally associated with improvements in any of the review outcomes. The implications of these and other findings will contribute to a discussion on complex intervention development in Chapter 8.

Chapter 6. Qualitative study I: background & methods

This chapter reports the methods of a qualitative study to investigate the barriers and facilitators to secondary stroke prevention that are relevant to the perspectives of TIA patients. An overview of the methodological approach is first outlined (sections 6.1 and 6.2). The methods section then describes the recruitment of participants and the conduct of the interviews (sections 6.4.1 and 6.4.2). Finally, the chapter turns to the procedure of discourse analysis and outlines the strategies that were used to interpret qualitative data in Chapter 7 (section 6.4.3).

6.1. Introduction

Qualitative research studies focusing on patients' adherence to recommendations for secondary stroke prevention have considered demographic, disease-related and psychosocial factors (see Chapter 2, section 2.3.1). However, aside from these so called 'internal' factors operating at the level of individuals, wider external social discourses are expected to influence the socially constructed phenomenon of secondary stroke prevention[176,177,180].

As discussed in Chapter 2 (section 2.3.2), there is a lack of knowledge about the discourses that individuals draw upon when constructing accounts of secondary stroke prevention following a TIA. Evidence from a recent qualitative study suggests that some patients represent the occurrence of a TIA as a positive event that enabled them to implement measures to prevent a stroke, whereas other patients report that knowledge of stroke risk produced a negative impact on their quality of life[183].

However, the mechanisms used by patients to construct these accounts were not explored in depth in this particular study. An understanding of the mechanisms by which patients produce such accounts is expected to facilitate the development of strategies to promote secondary stroke prevention (see Chapter 2, section 2.3.2). This section outlines the methodological approach that was used to conduct a study in order to achieve this aim.

Overview of discourse analysis

The overall methodology for collecting and analysing data in this study was based on a discourse analysis approach[176-178]. The rational for choosing this research approach was discussed in Chapter 3 (section 3.4.3) and will be expanded upon in this chapter. In accordance with the pragmatist perspective outlined in Chapter 3 (section 3.3.4), the research practices described in this chapter were guided by the objectives of the research question and the context of enquiry. In summary, discourse analysis enabled consideration of the ways in which individuals use language to construct their experiences of TIA and secondary stroke prevention. In turn, this will inform complex intervention development through the identification of discursive barriers and facilitators to stroke prevention that are relevant to patients with TIA (see Chapter 7 for study findings and discussion).

Origins of discourse analysis

The early origins of discourse analysis are located in the fields of linguistic philosophy and social constructivism. In Tractatus-Logico-Philosophicus (1933)[423] and Philosophical Investigations (1953)[424], Wittgenstein challenged the widely held view

that language was a passive process that represented reality in an unambiguous and objective way. Instead, he argued that language had a more active role in representing everyday experience and he proposed that the meaning of language could be interpreted in different ways depending on social context. Wittgenstein represented language as a collection of tools that can be used to perform a diverse range of functions[424]. In contrast to the traditional Western view of language as a means of communicating internal psychological states (e.g. thoughts, attitudes and beliefs), Wittgenstein re-conceptualised language as orientated towards social activities (i.e. 'performative') and emphasised that language use is practical in nature[424].

Others have subsequently taken up Wittgenstein's representation of language as performative. Austin's Speech Act Theory (1962) reinforced and expanded upon this more 'active' view of the role of language in social interaction. Austin proposed that all sentences have both performative and constative (descriptive) parts, demonstrating that as well as describing things, language also has the capability to 'do' things [425]. This concept is exemplified by Potter in the following extract:

"when we say 'can you pass the salt', we are not asking a question about abilities, we are making a request for the salt to be passed; while if we are making an offer we often couch it as a request: have a drink'."[176] (p12)

Social psychologists became interested in Austin's conception of language as constituting action, since this provided a novel way to study the social functions of language[178]. Austin's empirical and theoretical work has been of particular importance

in developing the field of discourse analysis[176]. Following the approach taken by Austin, discourse analysts do not attach paramount importance to philosophical issues of the truth or falsity of language, but instead consider how utterances function in practice[176].

Further, the field of discourse analysis has been influenced by Michael Foucault's work on the sociology of knowledge. Importantly, Foucault argued that discourse has a role in the production of knowledge, rather than simply operating in a representational way[426]. As a consequence of Foucault's claim about knowledge production, discourse analysts view the concept of 'truth' as something that is created discursively, rather than as a reflection of an underlying reality that exists outside of discourse. From this perspective, it is not considered possible to gain access to a 'universal truth' since we can only 'know' about reality through discourse[179].

Foucault's work also suggested that discourses produced by institutions could lead to the formation of new objects and subjects. This view on the discursive construction of subjects is very different from the traditional Western understanding of the subject as an autonomous entity because it suggests that there are limits on individuals' freedom for action within discourse[179]. Discourse analysts have built upon this perspective by examining the ways in which subjects are constituted by discourses - and the consequences of this in terms of social action. The following extract from Potter (1996) illustrates the concept of constructing subjects through discourse:

"The medical discourses of examination, questioning, diagnosis, prescription and so on constitutes a range of objects….However, that discourse also constitutes the doctor as

a particular person. The doctor is produced as a subject with particular authority, knowledge, skills and so on."[176] (p86)

Defining discourse analysis

As discussed above, the field of discourse analysis has diverse origins in areas such as linguistic philosophy and sociology. Consequently, numerous interrelated varieties of discourse analysis can be distinguished: these all share the same broad assumptions about how language and subjects should be understood, but they differ in terms of their more specific philosophical and theoretical perspectives, and also in their empirical focus[179,301]. In the area of healthcare research, one framework for categorising different approaches to discourse analysis has been outlined by Hodges et al[427]. Briefly, this categorisation outlines three different approaches to discourse analysis: 'formal linguistic discourse analysis' refers to the study of the communicative functions of words and sentences; 'empirical discourse analysis' considers the social uses of language by examining the ways in which individuals use discourse to create action and meaning; 'critical discourse analysis' studies the role of discourse in constructing the social world and shaping possibilities for how individuals can think, speak and act[427].

Approach to discourse analysis taken in this thesis

This thesis follows a largely 'empirical' approach to discourse analysis; however consideration will also be given to the discursive resources that are available to TIA patients (e.g. 'medical discourse')[427]. This approach to discourse analysis has been termed 'discursive psychology' and was initially developed in the field of social

psychology as a direct challenge to cognitivism[179]. Informed particularly by the works of Wittgenstein[424], Austin[425] and Foucault[426], Potter, Edwards and Wetherell[176-178] have made highly influential contributions in the development of theory and methods in discursive psychology. Their approach is considered particularly well suited to the aims of this thesis in three ways. First, the empirical focus of discursive psychology centres around the action-orientation of situated language use: this provides an opportunity to evaluate the functions of discourse in relation to the actions of adherence or non-adherence to therapeutic recommendations for secondary stroke prevention. Alternative approaches to discourse analysis, such as critical discourse analysis, study language use in a more abstract context and are therefore not as well suited to this thesis' aim of understanding barriers and facilitators to patients' actions in a specific context.

Second, as discussed in Chapter 2 (section 2.3.2), discursive psychology challenges the view that cognitive processes can adequately explain social action. In accordance with this perspective, cognitive research in the field of secondary stroke prevention is limited to a certain extent by disparities between measurements of cognitive entities (e.g. attitudes and beliefs) and risk reduction behaviour for secondary prevention[173,175]. Discursive psychology provides an opportunity to generate research questions that enable the barriers to secondary stroke prevention to be studied from a non-cognitivist perspective. It may be more productive to view patient-related barriers to secondary stroke prevention as social processes rather than as individual cognitive processes. Research questions formed in field of discursive psychology are well placed to evaluate the role of social processes (discursive activities) in secondary

prevention.

Third, it can be argued that the approach of discursive psychology, perhaps as a result of being developed within the field of social psychology, lends itself more directly to the development of interventions when compared with other approaches to discourse analysis. Several researchers have attempted to incorporate the findings from discursive psychology into therapeutic interventions[185]. Due to a focus on situated language use and the negotiation of subject positions (see section 6.2.1), discursive psychology can be used to design interventions that facilitate empowerment through the repositioning of subjects[185 (p148)]. This application of discourse analysis may be more problematic from the perspectives of formal linguistic discourse analysis or critical discourse analysis, since these approaches do not share the same assumptions as discursive psychology with regards to the action-orientation of discourse[427].

6.2. Discursive psychology: analytical concepts

The following section will outline three interrelated analytical concepts that have been developed in the field of discursive psychology and are relevant to the approach adopted in this thesis. First, discursive psychology is associated with particular assumptions about the concept of 'identity'; these assumptions mean that individuals are considered in terms of the 'subject positions' that they occupy within discourses[182]. Second, discursive psychology focuses on the action-orientation of text and talk; discourse is therefore analysed in terms of its 'rhetorical organisation' (i.e. use of language to perform particular functions)[176]. Third, text and talk are considered

to be built using 'interpretive repertoires' or closely related sets of categories that are often organised around metaphors[176,178].

6.2.1. Identity and subject positioning

The concept of 'identity' that is advocated in discursive psychology corresponds with a particular set of theory and methods for the analysis of talk and text[176-178]. Unlike the traditional Western view of an individual's identity as a fixed inner essence, discursive psychologists represent identity as a phenomenon that is socially produced[258] and therefore changeable across different interactional contexts[179]. Temporary identities or subject positions are jointly constructed and negotiated through discursive practices (i.e. identity is 'relational') and individuals actively take up or resist subject positions within different discourses[182]. The following quote from Davies and Harré (1990) defines the process of subject positioning:

"The discursive process whereby selves are located in conversations as observably and subjectively coherent participants in jointly produced story lines. There can be interactive positioning in which what one person says positions another. And there can be reflexive positioning in which one positions oneself. However it would be a mistake to assume that, in either case, positioning is necessarily intentional."[182]

The process of subject positioning has implications for the concepts of personal agency and autonomy in discursive psychology. Personal agency has been defined as "the way in which people are understood as relatively active or passive beings"[428 (p262)] while autonomy is conventionally understood as the "performance of a rational choice from a range of alternatives by independent autonomous individuals"[429 (p8)].

According to discursive psychologists, personal agency and autonomy are constructed and negotiated in discursive practice. For example, discourses may increase or decrease people's possibilities for action by producing "subjects as active or passive, as rational or irrational, as powerful or powerless"[430 (p165).] In this way, subject positions have implications for the actions that individuals are "entitled or expected to perform"[431 (p148)]. Therefore, in the context of discursive psychology, consideration is often given to the ways in which individuals manage agency with regards to the performance of particular actions[228,428,432]. Furthermore, it can be argued that relational understandings of autonomy are appropriate when decision making is viewed as contextual process that is shaped by interaction[429,433,434].

6.2.2. Rhetorical devices

Discursive psychology explores how people use language persuasively in order to achieve particular outcomes (although not necessarily intentionally). For example, individuals use "rhetorical devices" (discursive techniques) to construct representations of the world that appear to be factual[176 (p102)]. Conversely, rhetorical devices may be used at the same time to undermine contradictory or competing representations of the world[176]. One form of rhetorical device is known as "footing": a reference to the "range of relationships that speakers and writers have to the descriptions they report"[176 (p122)]. For example, individuals may warrant the factuality of a description by producing it as a quote from a reliable speaker, or by referencing objective evidence, in order to adopt a "distanced footing"[176 (p148)] from the description. In turn, this makes descriptions more difficult for others to undermine or falsify[176 (p123)]. Similarly, the rhetorical device of "category entitlement" can be used to

build up factuality: this refers to the idea that certain categories of people (for example, doctors) are "entitled to know particular sorts of things, and their reports and descriptions may thus be given special credence"[435 (p114)].

6.2.3. Interpretive repertoires

Interpretative repertoires are considered to be the building blocks that are used by people to construct particular versions of the social world[176,178]. More specifically, repertoires have been defined as "recurrently used systems of terms used for characterising and evaluating actions, events and other phenomena"[178 (p149)]. These repertoires are both familiar and understandable to people because they consist of what "everybody knows" about particular topics[436 (p48)]. Interpretive repertoires are not fixed, and people can select different repertoires to construct different versions of particular objects, subject positions or experiences[176,178]. For example, analyses of scientists' accounts demonstrated how formal 'empirical repertoires' were used by scientists to support the process of objective fact construction[437].

6.3. Objectives

The analytical concepts of discursive psychology will be utilised in a qualitative study with the following objectives:

- To consider discourses relating to individuals' experiences of TIA and secondary stroke prevention
- To explore the consequences of these discourses for the actions of adherence and non-adherence to recommendations for secondary stroke prevention

6.4. Methods

6.4.1. Participants: sampling, recruitment, consent and confidentiality

Ethical approval

Ethical approval was sought and granted from Nottingham Research Ethics Committee 1 (see Appendix C for documentation relating to the qualitative study).

Eligibility criteria

The study recruited patients with a physician-confirmed diagnosis of TIA at the Leicestershire TIA clinic. Detailed information about TIA clinics has been presented in Chapter 4 (section 4.1.1). Patients were eligible for inclusion in the study if they had been diagnosed with a TIA (index TIA) within a time frame of 6 to 24 months prior to the date of recruitment. This time frame was chosen in order allow sufficient time for the initiation and establishment of strategies for secondary stroke prevention. Patients with terminal illness or severe mental illness were excluded from the sample. Participants were limited to English-speaking TIA patients due to funding constraints. Full details of eligibility criteria are outlined in Figure 6-1.

Sampling and recruitment

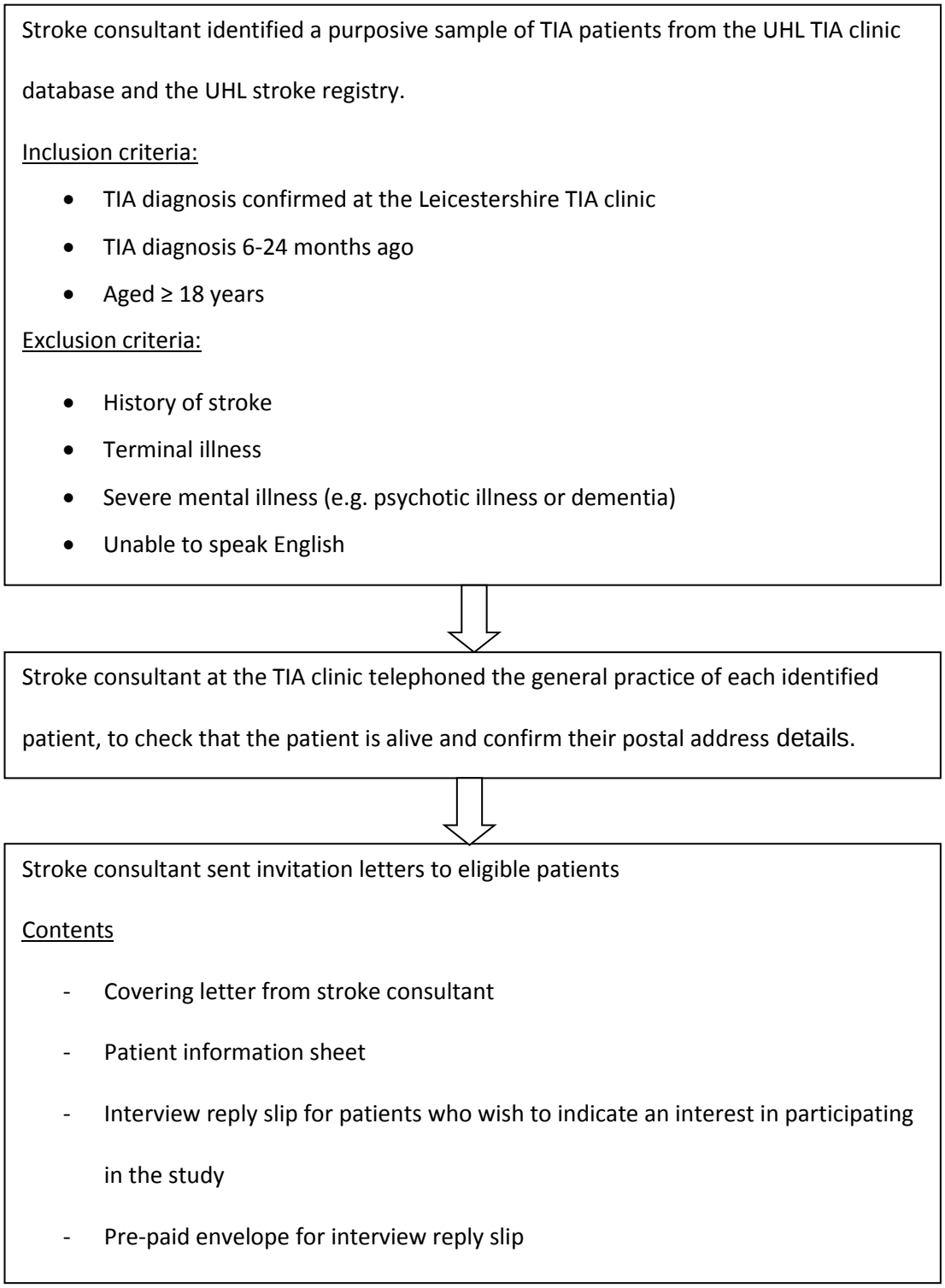
Sample size in qualitative research is often determined by the notion of saturation. In grounded theory, saturation was first defined by Glaser and Strauss as the point at which the addition of data does not contribute to the development of categories or their properties[438]. However, in the context of discourse analysis it has been argued that "the concern is not so much with exhausting categories as with identifying some

of the ways that people use language and working through these in detail"[301 (p81)]. Thus, it has been proposed that participants should be recruited until a sufficient number of well-ground arguments have been identified[301]. In this study, sampling and recruitment therefore continued until the analysis was considered to be thorough in this respect.

All patients seen in the TIA clinic have their information recorded in the University Hospitals of Leicester (UHL) TIA clinic database. The database contains clinical data, demographic data, patient contact details and GP contact details. A stroke consultant at the TIA clinic used this database to identify a sample of eligible patients. Purposive sampling was used to include a range of participants in terms of age, gender, ethnicity, experience of multi-morbidities and time elapsed since index TIA. The UHL stroke registry was cross-checked in order to exclude any patients that had experienced a stroke. A stroke consultant also telephoned the general practice of each identified patient, to check that the patient was alive and confirm their postal address details.

A stroke consultant wrote to eligible patients who were identified according to the procedures described above. The contents of the letter are outlined in Figure 6-1. Patients who were interested in participating were required to return a reply slip or telephone a researcher at the University of Leicester. Interested patients were contacted by telephone to arrange a convenient time and place for an interview. Interviews were either conducted in participants' homes or at the University of Leicester.

Figure 6-1: Flow diagram summarising participant identification and recruitment



Informed consent

Full informed consent was taken immediately prior to starting the interview by a researcher (the author of this PhD thesis) who had undergone training in consent procedures. The researcher went through the patient information sheet (a copy is provided in Appendix C), explained the study in detail and answered any questions. If individuals decided to participate in the study, they were asked to sign and date two copies of the informed consent form. One copy of the informed consent form was stored securely in a locked filing cabinet at the University of Leicester. The second copy of the informed consent form was given to participants to keep for their information. Participants were made aware that they could withdraw consent at any time during the study. If patients decided to take part in the study, they were asked to provide (optional) consent for their GP to be informed of their participation in the study. If patients gave consent for their GP to be informed, a stroke consultant sent a standard letter to their GP summarising the details of the study.

Confidentiality

Audio-recordings of interviews and interview transcripts were labelled with study identification numbers only. Audio-recordings and personal data recorded on paper were stored in locked filing cabinets at the University of Leicester; participant contact details were stored separately to audio recordings and interview transcripts. Computerised files containing personal data were password protected and stored on a university computer. Participants were pseudonymised (i.e. a false name was used in place of the participant's real name) in any formal and informal reports of the

findings. Personal data were destroyed at the earliest opportunity during the study.

6.4.2. Data collection

Interview procedure

The rationale for using qualitative interviews was outlined in Chapter 3 (section 3.4.3). Qualitative interviews are flexible to varying degrees and may be described as either unstructured or semi-structured[439]. During unstructured interviews, participants are encouraged to speak freely on a given topic with the interviewer simply responding with follow-up questions at certain points[439]. In contrast, the areas to be covered during structured interviews are more clearly defined beforehand since the interviewer uses a pre-specified topic guide[439]. However, participants still have the opportunity to respond to questions posed during semi-structured interviews with a great deal of flexibility. Additionally, the content of semi-structured interviews may deviate from the topic guide as the interviewer follows up on additional areas introduced by participants. In this study, in-depth semi-structured interviews were judged to be the more appropriate methodological choice since they allowed specific topics relating to secondary stroke prevention to be addressed with different participants, while still allowing participants to elaborate on their views and introduce new aspects of experience[178].

An initial interview topic guide was developed following a review of literature surrounding patients' experiences of secondary stroke prevention. Areas of interest were identified and several main questions were then formulated to initiate discussion during the interviews. Several follow-up questions, or prompts, were then

devised for each main question. A copy of the topic guide can be found in Appendix C. The topic guide was used flexibly and adapted during the course of the study to allow emergent analytic themes to be incorporated into subsequent interviews. The topic guide was piloted with researchers, TIA patients, stroke patients and their carers. This resulted in some minor changes to the topic guide in order to improve the flow of the interviews. Pilot interviews also provided an opportunity for the researcher to familiarise themselves with the questions and practice the skills required for successful interviewing e.g. steering the interview; interpreting participants' statements; responding to inconsistencies in participants' replies etc[439].

The aim of interviewing in discourse analysis studies is to "generate interpretive contexts in the interview in such a way that connections between the interviewee's accounting practices and variations in functional context become clear"[178 (164)]. This means that the interviewer should provide opportunities for the participant to produce accounts within different contexts and also with an awareness of alternative possibilities[178]. During this study, the above aim was achieved in two ways. Firstly, participants were asked questions about secondary stroke prevention in relation to three different topics: medications, lifestyle changes and medical appointments. The responses produced in these different contexts were then used to identify more general patterns in participants' accounts (see section 6.4.3). Secondly, the interviewer introduced alternative views or facts during the course of the interviews so that participants were encouraged to consider other (potentially problematic) possibilities. For example, the following prompt was used in order to introduce another perspective to discussion about medication adherence: "sometimes, people

have said that they don't want to take prescribed medications because they think they will cause side effects." A conversational style of interviewing was used to facilitate the introduction and discussion of these alternative perspectives[301].

Reflective practice

Reflexivity is a term used to describe the processes by which a researcher evaluates their own role in the research process, in terms of their values, experiences and feelings. During a discourse analysis study, it is recognised that the researcher will inevitably influence participants' responses since "the researcher's questions are seen as active and constructive and not passive and neutral"[178 (p165)]. Additionally, it is acknowledged that the characteristics of the interviewer are likely to affect the construction of meanings within different interview contexts. The interactional nature of the interview process means that the researcher and participants are located within a social setting that is structured by age, gender, social class, ethnicity and other ascriptive characteristics[255]. Furthermore, as Kvale (1996) asserts, there is usually an asymmetry of power during research interviews since the interviewer leads the questioning and therefore retains responsibility for the overall structure of the interview[439]. During the course of the study, the researcher reflected on the impact of these factors on processes of data collection and interpretation. Following each interview, the researcher reviewed the interview process and made unstructured notes in a reflexive diary that were used to inform subsequent interviews and data analysis. Areas generally covered by the reflexive diary included reflections on interview interactions, interview context, interpretations or assumptions made (including possible alternatives) and emerging ideas relevant to data analysis. The

researcher held regular debrief meetings with an academic supervisor to discuss the reflexive diary and consider how the research process may have influenced data collection.

Recording and transcription

All interviews during the study were digitally audio-recorded and transcribed verbatim. The interviews were transcribed by an experienced professional transcriber and included a level of detail sufficient to conduct an in depth discourse analysis[178,301]. The researcher then reviewed these transcripts for accuracy. Further details of transcription notation are presented in Figure 6-2.

Figure 6-2: Transcription notation

…	Short pause or hesitation (less than one second)
…(1.2)	Timed pause (numbers in brackets used to indicate length of pause in seconds)
[word]	Square brackets indicate brief comments made by other person
word	Underlining indicates emphasised speech
“word”	Quotation marks indicate reported speech or thoughts
(word)	Parentheses used to indicate uncertainty on the transcriber’s part i.e. represents the likely utterance when speech is unclear
( )	Empty parentheses indicate inaudible speech
Wor-	Hyphen indicates speech truncated words or speech that is broken off

((word))	Double parentheses indicate transcriber's efforts to describe events that are not easily represented phonetically (e.g. sigh; laugh). Double parentheses also used to describe the context of speech, when relevant.
°word°	Degree signs indicate quiet speech

6.4.3. Data analysis

The aim of discourse analysis is to identify regular patterns in language use that clearly perform various functions or achieve particular effects[178,301]. This study presented in this thesis was guided by three analytical concepts of discursive psychology that have been outlined in this chapter: 'subject positions'[182] (section 6.2.1), 'rhetorical devices'[176] (section 6.2.2) 'and 'interpretive repertoires'[176,178] (section 6.2.3). The researcher listened to interview audio-recordings on numerous occasions and transcripts were read and reread for purposes of familiarisation with the data. During the first analytical phase, the researcher sought to identify and interpret broad patterns in the discourse, in terms of variations and consistencies in the discursive features of accounts[176]. In particular, this analysis focused on the discursive features that appeared in participants' accounts at the point where actions were being rationalised (i.e. described, explained, justified or planned).

Subsequently, during the second analytical phase, consideration was given to the action orientation of participants' accounts[176]. Hypotheses were generated with regards to the possible functions or consequences of discursive patterns for secondary stroke prevention. Particular attention was given to negotiation of agency

and autonomy in the context of actions of adherence or non-adherence to recommendations for secondary stroke prevention. Hypotheses were then tested by searching for supportive and contradictory evidence (negative cases) in the discourse. Negative cases were accounted for either by adapting hypotheses or by demonstrating that these cases represented an exception to the pattern[176]. Regular peer debriefing meetings were held with an academic supervisor as analytical constructs were developed. The final analytical framework was informed by purposive sampling, adaption of the interview topic guide, and further interviewing, until arguments were considered to be adequately grounded in the data[301].

Transparency and validity

As discussed in Chapter 3 (section 3.4.3), the 'rigour' or 'trustworthiness' of discourse analysis can be addressed through concepts of transparency[178,302], coherence[178,301] and fruitfulness[178,302]. In line with these concepts, the analysis presented in the following chapter includes extended extracts from participants' accounts to allow the reader sufficient access to empirical material for evaluating the researcher's claims. Extracts were chosen to represent diverse features that were identified across participants' accounts. All extracts are followed by a detailed analysis linking specific empirical data with interpretations. Negative cases have been identified and explained in terms of their differentiating features. Finally, the findings have been considered in the context of other relevant research to generate a broader perspective on the issue of secondary stroke prevention.

6.5. Chapter conclusion

This chapter has outlined the methods for a qualitative study to explore the experiences of secondary stroke prevention from the perspective of TIA patients. Background information relevant to the analytical position was presented before research methodology was described in more detail. The following chapter will present the results of the study and a discussion of the research findings.

Chapter 7. Qualitative study II: participants' accounts of TIA and secondary stroke prevention

The previous chapter has discussed the theory and methods of discursive psychology, as well as the design of a qualitative study to explore individuals' accounts of TIA and secondary stroke prevention. In this chapter, interview text will be used to consider how discursive features are utilised in participants' accounts. The terms 'subject position'[182], 'rhetorical device'[176] 'and 'interpretive repertoire'[176,178] will be employed to describe specific discursive features (explanations of these terms were provided in Chapter 6, section 6.2). The consequences of discursive features for actions of adherence or non-adherence to secondary prevention behaviour will be explored. Participants' accounts contained more subject positions, interpretative repertoires and rhetorical devices than will be described in here. As discussed in Chapter 6 (section 6.4.3), the aim of this analysis is to illuminate discursive features that were used in specific instances where actions were being rationalised. The analysis will include participants' speech (presented in quotation marks) to illustrate how empirical data were linked with analytical claims.

It is necessary in this chapter to distinguish between several frequently used terms. For purposes of consistency, the following definitions of terms will apply for the remainder of this thesis (i.e. Chapters 7 and 8): *participant* refers to a person who took part in the qualitative study; *patient* refers to a person under medical care or receiving treatment; *'patient'* (with quotation marks) refers to a specific subject position outlined in this thesis.

7.1. Outline of chapter

This chapter presents the analyses of extracts that were taken from 20 interviews with participants who had experienced a TIA within the previous 24 months (see Table 7-1). The analysis considers the construction and action orientation of participants' accounts in relation to TIA and secondary stroke prevention. Two broad themes, associated with dominant subject positions, are identified:

- 'Patient' subject positions: adoption of a 'patient' position facilitates the management of secondary stroke prevention by providing a justification for behavioural changes or an entitlement to access healthcare services
- 'Resistant' subject position: resistance to a 'patient' position leads in some cases to the rationalisation of non-adherence to secondary prevention behaviour; in other cases adherence to secondary prevention behaviour is successfully rationalised in the context of this resistance

Examples of negative cases are also considered to illustrate some exceptions to this pattern of subject positioning. Negative cases refer to instances when individuals attempted to place the largely incompatible 'patient' and 'resistant' subject positions, and concomitant interpretive repertoires, alongside each other. Finally, this analysis concludes by considering the interactional and situated context of the interviews, and identifies possible implications of this in terms of the discourse produced.

Table 7-1: Characteristics of the sample

Age at time of interview (participants answer)	Gender	Participants description of their ethnic origin	Time since index TIA (months)	Pseudonym
54	Female	White British	11	Janet
59	Male	White English	23	Albert
59	Female	White Irish	22	Louise
59	Male	British: second generation Indian born in Africa	21 (experienced a second TIA 2 weeks later and a 3rd TIA 5 weeks later)	Shafiq
60	Female	Pakistani Asian	10	Yasmin
63	Female	White British	22	Emma
65	Male	White British	13	Joseph
65	Female	White British	11	Sharon
67	Male	White British	6	Steven
67	Female	White English	12	Paula
68	Female	White Irish	24 (experienced 2 TIAs prior to this)	Ann
68	Male	White British	10	Jack
71	Female	White English	6	Marie
72	Male	English	21	Dennis
74	Female	White British	12	Florence
74	Female	White English	12	Sarah
77	Male	White British	8	William
77	Female	British	24 (experienced first TIA approximately 6 years ago)	Alice
77	Male	British	6 (experienced first TIA approximately 2.5 years ago)	George
80	Male	White British	12 (experienced first TIA 5 years ago)	Richard

7.2. Uncertainty of TIA diagnosis

The diagnosis of TIA is not always entirely straightforward because symptoms can overlap with other illnesses or injuries. There are currently no definitive tests that can confirm or refute the occurrence of a TIA. Therefore, an appropriate place to begin this analysis is with the account of one participant who illustrates the discursive construction of uncertainty with regards to a diagnosis of TIA:

Extract 1

Interviewer: So you did think it might be something connected with a stroke did you or [no] TIA? No, you didn't.
Janet: No I didn't. No [*yeah*] because I'd got ... and I still don't to be quite honest…[*mmm*]... erm because I've got a bad neck…[*right*]… and because ... like the Christmas before I'd ... I'd ... I'd fallen in the slippy weather and really hurt my neck and since then I've had a lot of funny peculiar feelings …[*mmm*]... never particularly that one but I've had a lot of pins and needles in my ... you know in my neck and head, so no, and I personally still don't think I've really had one…[*right*]... but that's what they diagnosed so ...

Some lines omitted…

Interviewer: Okay. And how did you feel about that, that ... ((referring to TIA diagnosis))
Janet: I was a bit shocked really and I kept saying "are you sure because, you know, obviously this does affect me and I've already got a pacemaker and I'm being la- you know" but he felt ... he felt sure ... well he didn't feel sure, he said he didn't know, I said "but everything's come back negative…[*mmm*]… and if that's what you think I totally agree with you but I do feel there is error to waiver because I do see a chiropractor and I do see a chiropractor quite often for my

neck and my back, you know I've pulled it around for years, you know I've been in nursing for years", and erm ... so yeah I'm still a bit ... I'm still a bit heartened but ... because they put me on aspirin ...[*right*]... for two weeks…and I came home and my G ... oh they put me on aspirin and I went, after the two weeks I ... a high dose for two weeks, which I ... which I did take and then I ... I was told to go to my GP, and I do know my GP and he went "it's a load of rubbish, you're coming off them, I don't want you on them, I don't feel there's a need for you to go on them, come off" and he wouldn't ... he said "no". [*Right, okay*]. So I've never taken the aspirin either, just for the first two weeks [*okay*]. He felt there was a mis-justice basically ... [yeah]... he ... he said "I don't" ... he ... he didn't personally agree ...[*mmm*]... because he knew my history. I said "I wouldn't have" ... I personally wouldn't have even gone to the hospital if I hadn't have been at work but they insisted, I'd have just sort of left it and thought "mmm, you know it's not good today".

In the above extract, Janet constructs an account that works to undermine the credibility of the TIA diagnosis that she has received. She begins by producing an alternative account of the 'TIA' where her symptoms are attributed instead to a fall that she had several months earlier (lines 1-9). Further, Janet corroborates[176] this counterclaim by describing her GP's response to the TIA diagnosis and aspirin prescription (lines 23-28). More specifically, the membership category[435] of 'GP' is invoked to indicate professional knowledge and expertise; this repertoire is used as a powerful rhetorical devise to strengthen Janet's claim that the TIA diagnosis is inaccurate ('he didn't personally agree…because he knew my history'; lines 27-28). Furthermore, through the rhetorical repetition of her GP's opposition to the prescription of aspirin ('he went "it's a load of rubbish, you're coming off them, I don't want you on them…"'; lines 23-24), Janet constructs an argument that aspirin

medication is unnecessary. By paraphrasing her GP's response, Janet makes the doctor's suggestion difficult to challenge and this works to make a stronger case for non-adherence to aspirin medication.

Another interesting discursive feature of Janet's account is a description of the impact of TIA diagnosis on subject positioning. Janet works to undermine the legitimacy of the TIA diagnosis in order to resist repositioning herself as a 'patient'; however she acknowledges that other people may not accept this alternative version of events. The consequences of TIA diagnosis for the negotiation of subject positions is first alluded to when Janet states that 'obviously this does affect me and I've already got a pacemaker and I'm being la- ... you know' (lines 13-14). Janet expands upon this in the extract below:

Extract 2

1 Interviewer: Has the experience of having a TIA changed the way that other
2 people ...[Yes, it has]... erm ... treat you and ...
3 Janet: Er ... not necessarily treat me ...
4 Interviewer: ... See you?
5 Janet: But yes, see me, yes they do, they ... they do tend to think "ooh", you
6 know, ...
7 Interviewer: What just telling you to be more careful and things like that?
8 Janet: Not necessarily be more careful but you know if like I say "I've got ... oh,
9 I've got neck ache" or something, oh "are you sure you're okay", you know, I sort
10 of get ...[*yeah*]... and people go "ahh TIA you be care-" ... and they go ... you
11 know they tell me to be careful and ...[*mmm*]... and people er ... er ... people
12 tend to think I smoke and I've never sm- ... I think I had two puffs when I was
13 about fifteen and thought "no thank you". You know so ...
14 Interviewer: Yeah, so all kinds of assumptions.

15 Janet: Yeah, assumption ... and people ... very often people say to me as well
16 now "oh well you ought to lose weight", well they want to try losing weight and
17 keeping it off, it's hard enough keeping a steady weight ...[*mmm*]... you know.
18 Interviewer: Yeah. What kind of people is that's erm ... saying these things to you
19 about losing ...[it's fam -] weight, is it ... family?
20 Janet: It's family. It's family tend to say it, and I come from a very big family
21 …[*right*]... there's nine of us.
22 Interviewer: Okay. so people you haven't seen for while ...[yeah]…and they're all
23 ...[yeah er ... yeah]…saying ...
24 Janet: I think people presume TIA's are for elderly people which they aren't, or
25 people that smoke or drink a lot, you know ((amused tone)), that's what people
26 tend to think…

In relational sociology, references to social norms can compromise an individual's capacity to account for their own agency[440]. For example, publically shared norms may be used to hold an individual as morally responsible for changing their behaviour[440]. This is well illustrated in the above extract where Janet invokes a repertoire of social expectation: she describes how others have implied that she should change her lifestyle in order to fulfil a 'patient' role following a diagnosis of TIA ('very often people say to me as well now "oh well you ought to lose weight"'; lines 15-16). This argument draws upon 'healthism'[216] and 'health promotion'[217] repertoires that function to formulate the responsibility for health at the level of the individual in terms of making appropriate lifestyle changes (see Chapter 2, section 2.3.2). Furthermore, evidence of stigma associated with the diagnostic label of 'TIA' is seen in this extract, since Janet indicates that TIA patients may be positioned as people who engage in unhealthy lifestyle behaviours ('I think people presume TIA's are for elderly people which they aren't, or people that smoke or drink a lot, you

know ((amused tone)), that's what people tend to think…'; lines 24-26). Conversely, Janet resists this subject positioning when she states that 'people tend to think I smoke and I've never sm-… I think I had two puffs when I was about fifteen and thought "no thank you"' (lines 11-13): in this account, Janet breaks off 'never sm-' to provide a more detailed account of her avoidance of smoking in order to falsify this assumption with greater emphasis.

Although the above extracts illustrate some of the problems surrounding TIA diagnosis, most participants in this study constructed accounts that demonstrated an acceptance of a TIA diagnosis. The next section will focus on the discursive constructions used by these participants to negotiate subject positions following a TIA. The implications of these subject positions for the rationalisation of secondary prevention behaviour will be discussed.

7.3. Patient positions

Many participants constructed a TIA as a warning sign that they were at increased risk of future stroke. Through this mechanism, TIA was treated as a symptom of a chronic condition and participants consequently positioned themselves as 'patients'. This has been defined as medicalisation: "the process whereby an object or a condition becomes defined by society at large as an illness . . . and is thereby moved into the sphere of control of the medical profession"[441 (p276)]. Further, subject repositioning was often accompanied by the use of interpretive repertoires that relate to 'patient' entitlements. Importantly, subject repositioning and the use 'patient' repertoires were often instrumental in rationalising secondary prevention behaviour. Consider

the following extract:

Extract 3

Paula: It was mentioned very briefly a long time ago erm ... and I ... I was reluctant to go onto statins, or anything else for that matter, because I am a reluctant medication person ((laughs)) erm ... so I don't like don't like taking tablets unless it's one hundred percent necessary to do it. Erm ... but I was on ... I was on ... on tablets to lower my blood pressure [*okay*]. And when I'd been to the TIA clinic that's when I came back with this package of other things and you've got to take these all the time ((laughs))…[*yeah*]. So ... so I do accept that because my body doesn't or I should say perhaps my body is prone to building up cholesterol levels ...[*mmm*]... whatever I do er ... that I probably will need some sort of statins forever…

In this extract, Paula initially positions herself as 'a reluctant medication person' who will only take tablets if 'it's one hundred percent necessary to do it' (lines 1-4). It is the occurrence of a TIA that enables Paula to construct her cholesterol levels as problematic and therefore reposition herself as a 'patient'. This subject repositioning is demonstrated when Paula states that she now 'accepts' that her 'body is prone to building up cholesterol levels' (lines 7-9). Consequently, the membership category[176] of 'patient' is used to warrant the category-bound activity of adherence to medication ('I probably will need some sort of statins forever'; lines 9-10). For the purposes of this thesis, the term 'sick role' repertoire will be used to refer to a particular set of patient rights and obligations that are consistent with Parson's 'sick role' theory[198] (see Chapter 2, section 2.3.2). This repertoire is drawn upon in the above extract when Paula references an obligation to comply with medication recommendations ('you've

got to take these all the time'; lines 6-7).

Furthermore, Paula implies that there is an element of permanence in her subject repositioning (i.e. the adoption of a 'patient' position) since she states that she will probably need statin medication 'forever' (line 10). The permanent quality of this statement is justified by Paula's construction of a TIA as indicative of a chronic condition: for example, she makes refers to instructions to take medications 'all the time' (line 7) and cholesterol levels that are 'building up' (lines 8-9). Thus, the construction of a TIA as a chronic condition gives legitimation to ongoing medication adherence. Another example of a participant positioning themselves as a 'patient' can be seen in the following extract:

Extract 4

Steven: I was seen by a consultant, I don't know who, and he said you have had a TIA. Erm ... you should stop smoking, erm ... and that was really it. He ... he was in ... you know "would you like to give me your cigarettes now and I'll put them in the bin?" sort of thing. Erm ... I said "no, but I will be stopping". Erm ... I took seven days actually to stop and I've been stopped just over a year now and it wasn't difficult when you've got your life threatened. I'd tried many times before unsuccessfully erm ... one outcome of that, which is beginning to worry me, is a twenty one pound in one year weight increase all on my belly. That's it. Erm ... as far as other follow ups, if you like, the only follow ups were my GP called me in at some point after that, I c- ... I can't remember how long, I'm sorry, wasn't very long maybe in a week or three, erm ... because obviously the medications were given to me at the TIA clinic so you have to go to your GP to get them formalised for future use, if that's the right word. Erm ... n- ... the only thing that surprised me was I wasn't really given any dietary instructions as in you know "low cholesterol, blah blah". Erm ... I was called in quite some time later, months later,

for a cholesterol test and it had gone down significan ... it was never high by the way, at the time of being diagnosed at the TIA clinic I was four point nine and they more or less said to ... you know "that would be perfectly alright if you hadn't had a TIA", erm ... when I had the test eventually at the GP's I was about three point two, so my understanding is, and you might know the answer to this, the tablets are so good they deal with your cholesterol even if your diet doesn't.

Some lines omitted…

Steven: My cholesterol had gone from four point nine to three point two yeah.
Interviewer: That's very good ...
Steven: So I'm saying that maybe the GPs know that the tablets are so good they don't have to talk to you about your low fat diet because nobody ever did with me, erm ... so there you go.

Some lines omitted…

Steven: Erm ... anything else I could do to lessen the pro ... possibility of a stroke, that was the original question wasn't it, yeah. ((Makes dismissive noise)) I could probably improve my diet erm ... but whilst my cholesterol is reading so low I don't think I'm going to. Erm ... it's interesting that you're doing this interview but you're actually doing it without a lot of the medical knowledge aren't you. You ... you could be sitting there and saying to me "well you ought to be changing your diet, you ought to be not drinking" but you don't feel you're in a position of enough medical knowledge to actually say that. Okay. Right, carry on.

In his description, Steven constructs smoking cessation as the principal secondary prevention behaviour that is rationalised by the occurrence of a TIA ('you have had a TIA. Erm…you should stop smoking, erm…and that was really it'; lines 1-2). In the context of smoking-related illness, subject repositioning can alter an individual's

possibilities for action by "closing down the option of smoking and/or opening up the possibility of change"[442 (p481)]. In the same way, Steven positions himself as particularly vulnerable following the experience of a TIA and this serves as a rhetorical device to justify the action of smoking cessation as a necessity: 'it wasn't that difficult when you've got your life threatened' (lines 5-6). Steven draws upon a 'sick role' repertoire since he implies that smoking cessation was initiated because of an obligation to comply with the advice of his doctor ('you should stop smoking'; line 2).

Another interesting feature of Steven's account is his speculation about GPs' views on the management of cholesterol. Steven again draws upon a 'sick role' repertoire, constructing himself as reliant upon his doctor's expertise, when he says that 'maybe the GPs know that the tablets are so good they don't have to talk to you about your low fat diet' (lines 24-25). However, the legitimacy of GPs' views are supported by a description of successful cholesterol lowering in the absence of dietary changes (lines 15-21). By drawing upon biomedical objects (the results of objective cholesterol tests; lines 16-20), Steven is able to adopt a distant footing[176] in order to generate an argument that dietary changes are unnecessary ('I could probably improve my diet erm ... but whilst my cholesterol is reading so low I don't think I'm going to'; lines 28-30). Furthermore, Steven's account functions to locate agency for the initiation of dietary changes with his doctor: 'the only thing that surprised me was I wasn't really given any dietary instructions as in you know "low cholesterol, blah blah' (lines 13-15). Thus, although it is implied that the experience of TIA might provide a rationale for healthy eating, the absence of dietary instructions from his doctor means that Steven is absolved from the responsibility of changing his diet. Lack of information provision

from his GP allows Steven to draw upon a repertoire where cholesterol medication (biomedical solution) is considered more effective than diet (lifestyle solution). However, this reliance on medication can be problematic if people are unwilling to assume a 'patient' position following a TIA (see section 7.4).

Rather than constructing 'patient' positions that rationalise passive cooperation with healthcare professionals, some participants constructed more active 'patient' positions that enabled them to assume a greater degree of agency over the management of secondary prevention. The concept of developing 'expert patients' was introduced into UK health policy in 2001, when it was proposed that promoting patient expertise and self-management skills could result in patient empowerment, enhanced self-efficacy and improved disease outcomes[204] (see Chapter 2, section 2.3.2 for a discussion of 'expert patient' discourse). An 'expert patient' discourse is illustrated in the extract below:

Extract 5

Interviewer: Right okay. erm ... and what about factors like blood pressure and cholesterol?
Albert: Both are well down.
Interviewer: Both are well down now on what they were before?
Albert: Yeah.
Interviewer: Okay. So do you think that they might have contributed ...[oh yes] ...in any way?
Albert: They probably had done yeah.
Interviewer: Yeah. Did you ...
Albert: Well my cholesterol level wasn't that high, it was under six when they tested it at the TIA clinic, which for normal people is not deemed bad ...[*no*]… but

the minute that I had ... I'd had the TIA they wanted it down to three point five ((laughs)) ...[*right. Ahum*]…in other words the goal posts move with the consequences of the ... of the TIA health requirement goalposts are moved. Does that make sense?

Some lines omitted…

Interviewer: …Some people have, use personal targets for their cholesterol and blood pressure, do you have this approach?

Albert: No. No.

Interviewer: You just think that the lower the ...

Albert: I just keep it down basically.

Interviewer: Just keep it down.

Albert: Yeah. Yeah. I know what the targets (are) they set after it so I've got to aim to make sure I stay underneath those.

Interviewer: Yeah. So you know what the targets are.

Albert: The target was three and a half for erm ... cholesterol and I think they wanted it under ninety ... one twenty over ninety basically.

Interviewer: Your blood pressure.

Albert: Yeah.

In this extract Albert contrasts his position as a TIA patient with that of 'normal people' (line 11) and describes how the health requirement 'goal posts' have been 'moved' as a consequence of experiencing a TIA (lines 13-15). The moving of goalposts might be expected to construct a sense of unfairness or blame; however examination of Albert's account does not provide any evidence that this is the case here. Rather, by positioning himself as a 'patient' in possession of knowledge of specified health targets, Albert is able to rationalise actions that allow him to satisfy various 'health requirements' (line 14). During the interview, Albert positions himself as an active

agent by describing a number of actions that he has taken in order to meet medically constructed blood pressure and cholesterol targets: adhering to medications; purchasing a home blood pressure monitor; taking more exercise; cutting down on unhealthy food. The extract below illustrates how this subject positioning is used to rationalise secondary prevention behaviour:

Extract 6

Albert: No I took the results into the G ... I've seen the GP two or three times erm ... at least one was Dr Jones because er ... I did a set of blood pressure readings to see whether the drugs had pulled it down and ... when was that, latter part of last year, probably six months afterwards and they decided it was alright. I then did some more, which I took in in ... April, May time ...[*ahum*]... I had to go and see him about other things so normally if I go I ... if I go in for any other reason I will always try and get a series of blood pressure readings beforehand so they can ... saves them having to say "oh we need to have some readings", here you are a set done.

Interviewer: Yeah. And how do you get those readings?

Albert: I've got a blood monitor, a blood pressure monitor…[*okay*]…I bought it after the TIA.

Interviewer: Right. And was that on advice or did you just decide to do that?

Albert: I decided to do that

This extract represents a significant departure from those of Paula (extract 3) and Steven (extract 4), since it constructs a sense of joint agency over the management of secondary stroke prevention that is based on an 'active partnership'[194] between Albert and his GP. Albert positions himself as an informed and pro-active 'patient' who is involved in the management of his blood pressure. The interpretive repertoire

of ‘expert patients’ formulates “proactive and organised” patients who engage in “clear and succinct” communication with doctors[206 (p430)]. This repertoire is invoked by Albert when he anticipates which information his doctor needs (‘saves them having to say “oh we need to have some readings”’; lines 8-9), provides the relevant information (‘here you are a set done’; lines 8-9) and monitors whether or not the medication is effective (‘see whether the drugs had pulled it down’; line 3). The ‘expert patient’ repertoire therefore works here as a rhetorical device to warrant Albert’s actions. The reference to self-monitoring (lines 2-3) is particularly interesting as it signifies the active role that ‘expert patients’ are expected to play in managing their health[192,204]. Albert repetitively uses the word ‘I’ and this functions to emphasise the control that he exerts over his blood pressure management. For example, when asked about whether or not he was prompted to buy a blood pressure monitor, Albert’s response (‘I decided to do that’; line 14) with an inflection word ‘I’ serves to further reinforce his assertion. Thus, an ‘expert patient’ repertoire enables Albert to successfully construct a sense of autonomy and agency over his actions for secondary stroke prevention.

7.4. Resistant positions

The following section will establish that accounts of TIA and secondary stroke prevention are not always associated with the adoption of ‘patient’ subject positions. As illuminated in the accounts below, several discursive features functioned to resist the uptake of ‘patient’ positions. The adoption of a ‘resistant’ position did not always preclude secondary prevention behaviour. However, in contrast to the above extracts, secondary prevention behaviours were not justified in this context through the use of

'patient' repertoires, such as those of the 'sick role' or the 'expert patient'. Instead, participants drew upon alternative interpretive repertoires that functioned to warrant healthy lifestyle behaviours.

Some participants avoided the repositioning of themselves as 'patients' by avoiding the use of medical repertoires. In the extract below, Dennis has the opportunity to provide a description about the possible causes of his TIA. Unlike many participants, he does not mention any terms from a medical repertoire, such as 'blood pressure' or 'cholesterol'. Instead, he produces an account about his general health and his disbelief at experiencing a TIA:

Extract 7

Interviewer: Can you remember what they told you ...about what had caused the blockages in your neck, in these blood vessels?

Dennis: Not really no. They didn't say what caused it, they just said that that's what it is ... that's caused the stroke ...[*yeah*]... they didn't actually tell me you know as if I was ... I mean we ... we eat sensibly both the wife and myself [*yeah*]. Er ... I used to have fry ups, and then when I had that I packed them in, ...[*yeah*] …at least once a week but whether that's caused them or not I don't know 'cos I've always kept fit, I played football 'til I was thirty eight and I couldn't believe I'd had a stroke, mini-stroke, you know ...[*mmm*] ... 'cos I always dig my garden, Iay ... I laid all them slabs and everything out there [*mmm*]. But erm ... [*okay*]…just ... just couldn't believe I had a stroke.

Interviewer: No. Erm ... so what were your main concerns at the time when you were having this stroke, when you'd been told that you'd had this mini-stroke?

Dennis: I was hoping I wasn't gonna be invalid for the rest of my life, you know, in a wheelchair or anything.

Interviewer: Mmm. And how has that changed now since the symptoms have

gone and you've had the operation ((referring to carotid endarterectomy)), do you still have any worries about ...[no]…having another one or ...

Dennis: No. I don't, I just carry on ...[*okay*] with my life now as normal. I don't worry about it or anything, I just get on with it. [*Okay. Erm ...].* I'm back to doing all my gardening and everything as I did before ...[*good*]... and we do eat sensibly still. I don't have fry ups.

Interviewer: And has the experience of having the TIA changed the way that other people in your life see you or treat you…or not?

Dennis: Erm ... how do they treat me ... no, they seem, you know, er ... all quite worried about me like really, you know, 'cos I'm pretty popular, play a lot of darts and things like that, you know, and erm ... they all say how well you look since I've had all this TA ... TIA done you know, says "you're looking well now, you ... you know as if nothing's happened to you". I say "well I don't let it get me down and carry on with my life

When asked about whether he has any concerns about the possibility of having another TIA, Dennis responds by stating that 'I don't worry about it or anything, I just get on with it…I'm back to doing all my gardening and everything as I did before' (lines 19-21). The disruption to his subject positioning at the time of the TIA ('I was hoping I wasn't going to be invalid'; line 14) has been reconstructed with a focus on returning to a 'normal' routine, which allows Dennis to resist taking up a 'patient' position (lines 19-22). However, his admission in lines 21-22 about eating 'sensibly' and not having 'fry-ups' suggests that Dennis is taking responsibility for his health, in line with 'healthism'[216] and 'health promotion'[217] repertoires that construct individuals as morally responsible for adopting healthy lifestyles[215]. Towards the end of extract, Dennis describes himself as a sociable person ('I'm pretty popular, play a lot of darts and things like that'; lines 26-27). He displays a commitment to maintaining an

unchanged subject position following the TIA ('I say well I don't let it get me down and carry on with my life'; lines 29-30). The opinions of others ("you're looking well now…you know as if nothing's happening to you"; lines 28-29) function to demonstrate that it is possible to resist a 'patient' position due to the absence of residual symptoms following TIA. However, one problematic consequence of retaining an unchanged subject position following his TIA is that some medications interfere with Dennis' social life:

Extract 8

Interviewer: And some people have said that they sometimes forget to take their medications, is that something that you've experienced?

Dennis: I do go one or two days sometimes ...[*okay*]... I ... I have missed a whole day ...[*mmm*]... of not taking any you know ...[*yeah*]... depending on what I'm doing that day ...[*yeah*]... 'cos I don't think things I do at night time, playing darts and having a pint …[*mmm*]... mixes with them.

Interviewer: Okay. So you ... you ...

Dennis: So I don't have any when I ...

Interviewer: You make the decision on that day ...[yeah]…Not to take ... okay.

Dennis: But then I take them the next day back to normal again ...[*yeah*]…to two a day or one a day.

Interviewer: Is that because it says on them don't mix with alcohol ...

Dennis: Alcohol yeah.

Interviewer: Or is that ... does it say that ...

Dennis: That's right yeah.

Interviewer: *Right, okay.*

Dennis: On some of them it does yeah, not on all of them.

Alcohol can interact with some medications to cause harmful effects, and it is

therefore recommended that people should not consume alcohol when taking certain medicines. Dennis therefore attends to two competing interests in this extract with regards to the taking of medication: retaining his social subject position ('I don't think things I do at night time, playing darts and having a pint …[*mmm*]... mixes with them'; lines 5-6) and managing his health through medication adherence ('I take them the next day back to normal again'; line 10). Dennis accounts for his non-adherence to medications by constructing this as a rational consequence of his participation in social activities ('playing darts and having a pint'; lines 5-6). Thus, repertoires of social norms work here to provide a justification for medication non-adherence. This extract works to position Dennis as an autonomous agent in a rational decision making process. He attends to the possibility that non-adherence will be perceived negatively by following this admission with statement referring to usual medication adherence ('I take them the next day back to normal again'; line 10). Another example of a different participant's reluctance to assume a 'patient' subject position is shown below:

Extract 9

Interviewer: …and what about emotionally then 'cos you said that you felt a bit down for a while afterwards ((referring to the experience of having a TIA))?
Shafiq: Yeah for about a month or so erm ... the first month was really er ... er ... er ... lost hope basically ...[mmm]... erm ... but then the second month I said no, that's not the way to go ahead because I er ... I could sense that the remaining children were feeling ... you know I think they reflect ... I could see in their faces, so I said that's not right, then ev ... and everybody was treading really carefully around me ...[mmm]... and that's what I didn't like…[mmm]… I didn't like that at all. Er ... so I sort of ... I think I sort of gathered my own strength and I think support by my wife we sort of just began to more or less come up. So initially for

11 the first few months or so we could see my children sort of erm ... tried not to
12 show that they have been too soft er ... how shall I say, not make me feel
13 helpless …[mmm]... so they sort of pretended but now ... now it's back to normal
14 ...[back to normal]... sort of back to normal yeah because ...[that's ...]... er ... they
15 know I'm not making it up and I know they're not making it up, it's ... it's ... it's
16 genuine.

In this extract, Shafiq constructs a more problematic account of coming to terms with the experience of having a TIA ('the first month was really er…er…er…lost hope basically'; lines 3-4). He draws upon a relational repertoire of gathering his 'own strength' with the support of his wife, which functions to construct a relational account of autonomy[433] ('I think I sort of gathered my own strength and I think support by my wife we sort of just began to more or less come up'; lines 9-10). However, the consequences of a TIA also appear to cause relational tensions in the above account. For example, Shafiq states that his children tried to 'not make me feel helpless…so they sort of pretended' (lines 12-13). Through this statement, the consequences of adopting a 'patient' position (feeling 'helpless'; line 13) are seen to conflict with the demands of a 'paternal' position. By repositioning himself away from a 'patient' position, Shafiq is able to re-instate his family role unproblematically ('they know I'm not making it up and I know they're not making it up, it's…it's genuine'; lines 14-16). Having worked up an account describing the problematic nature of adopting a 'patient ' position, in terms of disruption to family roles, Shafiq uses this as a rhetorical device to rationalise his decision to take medications three times a week rather than every day:

Extract 10

Shafiq: Okay. Let me put it this way to you. I started taking these medications regularly because the hospital dispensed it to me …[yeah]... and between the hospital and the doctors they worked out the right dosage and I thought that it is important I take it or else my life is at stake…[*mmm*]. So I took it because of that [*yeah*]. But now to be really honest, and this is strictly between you and me, I'm taking this Mondays, Wednesdays and Fridays, cut it down from every day ...[*yeah*]... to three times a week [*right*]. The reason for that is not because I'm scared it's gonna do any much damage or er ... er ... how should I put it, I ... I'm still ((sighs heavily)) ... you know side eff ... every medication has side effects ...[*mmm*]... and I don't want to lead one side effect to another, to another, to another ...[*yeah*] ... I wanna be er ... if ... if ... if I do ... if I am able to grow very old I want to be as useful to myself and I want ... still wanna be able to ... I don't wanna feel helpless.

Some lines omitted…

Shafiq: Erm ... so that's the reason why ... I mean I ... if ... if somebody says "you have to take it every day" I'll take it …[*mmm*]**…**I'm not gonna resist that 'cos then it's for my own safety, but I personally think that three times a week should take care of it for me, er ... I could be wrong [*mmm*]. If I'm wrong I'm responsible for my actions so I'm not gonna hold anybody responsible.

Interviewer: Have you discussed that with your GP or with the chemist?

Shafiq: I haven't ((sighs))…[*no*]. I haven't, I'll be honest, I haven't [*yeah*]. I would like to but I'm worried that they're gonna say "go back to your daily routine" ah ((*sighs*)) ... huh ...

In this extract, Shafiq describes only taking medication on three days of the week, rather than the recommended daily dosages (lines 5-7). Shafiq discursively constructs

medication as disempowering since he implies that it leaves him feeling 'helpless' (line 13). In contrast, a decision of partial-adherence enables Shafiq to take up a position of personal autonomy ('I personally think that three times a week should take care of it'; lines 16-17) and responsibility ('I'm responsible for my actions so I'm not gonna hold anybody responsible'; lines 17-18). However, in relation to medication, he states that 'if somebody says "you have to take it every day" I'll take it' (lines 14-15). Furthermore, Shafiq ultimately locates the authority for medication decisions with his GP: he describes not discussing his partial non-adherence with his GP, as he fears that he would be instructed to "go back to your daily routine" (line 21). In this context, the resistance of a 'patient' position signifies a resistance to the power-relations implied by a 'sick role' repertoire (i.e. a lack of patient control over healthcare decision making). Shafiq neglects to invoke alternative repertoires that position patients as empowered[199] or able to participate in shared decision making[208] (see Chapter 2, section 2.3.2). Interestingly, although Shafiq constructs a preference for minimal medication, lifestyle modification is not constructed as problematic, as illustrated in the extract below:

Extract 11

Shafiq: That's the time he mentioned, he says "three things affect your blood pressure, one is exertion ...[*yeah*]... the other is your emotional state, if you've had an argument on the road with ... with another driver or somebody" …[*mmm*]… ... erm ... and you know er ... so these things do make a difference to your blood pressure as well. And er ... so he says "you've got to try and balance your life er ... physically and emotionally as well", and he says "the tablets will help but they will not always be the answer".

Some lines omitted…

Shafiq: Yeah so ... no, no what I'm saying is my decision to take this three times a week is partly because I'm doing both, I'm ... I've cut down that from daily to three times a week ...[*ahum*]... same thing with the food as well. I've cut down my sugars, cut down on my heavy intake of fats and other stuff as well, so I'm combining the two ...[*mmm*]... and I'm gonna combine a third item and that is swimming and er ... gym, well swimming I was doing until just before winter ...[*yeah*]... but when I became ill I stopped so I'm gonna start again swimming, so I was just thinking now that if I'm getting better I want to start swimming I'm gonna just see the GP and ask him for his advice (...) (00:06:42) taking gym classes.

Interviewer: Yeah. That sounds ...

Shafiq: Does ... does he feel that I ... I may need supervision or does he think it may be (strenuous) for me or shall I go for it. So emotionally I'll be happy and not that I am forcing for it and I can make time er ... you know er ... for that it's not a pro ... problem, so I can combine these three things so three times a week ...[*yeah*]... control my intake of the ... of stuff I love huh ...[*mmm*]... and ... and a bit of that and maybe the three combined together maybe help me stabilise that way rather than take this daily and not doing exercise and eat what I wanna eat [*yeah*]. Er ... er ... you know er ... I've seen people who will carry on doing what they wanna do and they take a huge amount of tablets and hope it's gonna ha ... well I don't know, I ...

Shafiq recalls a conversation with his chemist in order to claim that emotional and physical factors can have an effect on his blood pressure (lines 1-7). The membership category[176] of 'chemist' is used as a rhetorical device to justify Shafiq's decision to compensate for missed medication doses by increasing physical activity levels ('so he says "you've got to try and balance your life er ... physically and emotionally as well",

and he says “the tablets will help but they will not always be the answer”’; lines 5-7). In contrast to medication adherence, lifestyle changes enable Shafiq to assume the position of active agent (‘I can make time er ... you know er ... for that it’s not a pro ... problem’; lines 21-22) rather than leading to feelings of helplessness. Furthermore, physical activity is described in terms of emotional well-being (‘emotionally I’ll be happy’; line 20). The notion of ‘health’ in this account is constructed as multifaceted (i.e. a matter of physical, emotional and social wellbeing).

Shafiq uses repetition to construct stronger arguments about his decision to take control over the management of his health and avoid being helpless: he states that he will address secondary prevention by making three different behaviour changes (‘I can combine these three things’; line 22). He also cuts down on the taking of medication ‘from daily to three times a week’ (lines 9-10). Thus, Shafiq constructs a high sense of agency over his health by advocating a preference for a specific, self-directed course of action. Although an ‘expert patient’ repertoire might be expected to facilitate the construction of this autonomous account of self-management, it is not made available in this extract to the presence a contradictory ‘sick role’ repertoire.

Another strategy employed by participants to resist medicalisation was to construct TIA as a transient event constrained to the past, with no lasting symptoms, rationalising the fact that it can be ‘ignored’. The extract below shows how this repertoire is used to retain autonomy and exercise the right to make decisions that go against secondary stroke prevention recommendations.

Extract 12

George: The... the doctors have not sort of really said anything ...*[okay*]... has actually caused it. Er ... I suppose it brings up into your mind that erm ... one might drink a little bit too much ...[*ahum*]... may have caused it *[yeah*]. But erm ... I'll be quite honest I'm too old ... too old really to change my habits [*okay*]. I'm not gonna change my habits for a couple of years or ...[*ahum*]... whatever it may be.

Some lines omitted…

Interviewer: Some people have spoken about the risk of having another TI- ... another mini-stroke or stroke in the future, is that something that you've come across at all?

George: Oh it's been commented ... and well I did have another er ... mini-stroke [*yeah*]. But erm ... no I have no worry about it ...[*ahum*]... er ... or ... or if it should cause er ... cause me to have a stroke. I think I know what, you know, the symptoms are ...[*right*]... but if ... that's always if you're in company when it happens isn't it?

Interviewer: Mmm. Yeah. Erm ... and is that something that you've spoken to anyone else about, like your GP or your family?

George: No. No. No. I said ... as I said to you before the wife and I just go on, we've ... we ignore the problem ...[*okay*]... and erm ... no I haven't spoken to the GP about and neither has he spoken to me ...[*okay*]... about a ... a risk. I ... I suppose when they were talking about the erm ... medication I was to go on that was er ... said to be ... sort of preventative ...[*yeah*]… of a reoccurrence, but erm ... nothing in depth.

Some lines omitted…

Interviewer: Erm ... so is ... can you think of anything that could be done to improve the care that you've received at your general practice with regards to the mini-stroke?

George: No I can't. I can't 'cos as I say really er ... they acted very quickly and got me into that clinic ...[*mmm*]... and really ever since then and this other one that er ... again caused no after effects at all there hasn't really been anything to talk about ...[*mmm*]... you know if ... doesn't happen again then it's not really a worry.

George speculates that drinking 'a little bit too much' (line 3) may have caused his TIA, however the credibility of this claim is weakened because it is not corroborated[176] by the opinions of doctors ('doctors have not really said anything…has actually caused it'; lines 1-2). He then positions himself as unwilling to change this habits (I'm too old…too old really to change my habits'; line 4) and invokes a relational repertoire that functions to actively resist behavioural changes that accompany a 'patient' position ('the wife and I just go on, we've…we ignore the problem'; lines 17-18). Furthermore, the adoption of a 'patient' position is constructed as unnecessary on the grounds that a TIA is not a problem that requires ongoing intervention ('caused no after effects at all there hasn't really been anything to talk about ...[mmm]... you know if ... doesn't happen again then it's not really a worry'; lines 28-29). This 'resistance' repertoire functions as a rhetorical device that enables George to dismiss the need for follow-up care from care his general practice by exercising relational autonomy ('we ignore the problem ...[okay]... and erm ... no I haven't spoken to the GP about and neither has he spoken to me; lines 18-19).

The above examples have shown that the rejection of a 'patient' position following a diagnosis of TIA can lead to non-compliance with secondary prevention

recommendations. However, there were exceptions to this. Consider the abstract below:

Extract 13

Interviewer: Very good. Erm ... so just moving onto the next section, why do you think you experienced a mini-stroke?
Richard: Why?
Interviewer: *Yeah. Why?*
Richard: Well I've no idea. How can I answer that?
Interviewer: *Erm ...*
Richard: Don't know.
Interviewer:... Just thinking about the possible causes, erm ... I don't know if anyone's spoken to you about the factors that can influence...[possibly] risk or ...
Richard: Yeah, you tell me them ...
Interviewer:... Just thinking things like ...
Richard: ... and I'll tell you.

Some lines omitted…

Interviewer: Yeah. Erm ... so has your GP tried to encourage you to go for any regular healthcare checks for example cholesterol or blood pressure checks?
Richard: Yes, yes, I've had those [*okay*]. The blood pressure is slightly high ...[*yeah*]... and I believe the cholesterol is a bit high.
Interviewer: Very slightly high. erm ...
Richard: Yes. I've got a ... a tester as well somewhere.
Interviewer: Oh is that for blood pressure or ...[yes]... cholesterol?
Richard: Blood pressure.
Interviewer: Blood pressure.
Richard: Yeah. But just where it is at the moment for that ... that's another thing I put in the cupboard and I ... I ... I try not to think about it.

In the above extract, Richard initially avoids engaging in a conversation about the causes of a mini-stroke ('how can I answer that?'; line 5). The discursive absence of 'patient' repertoires from Richard's account could function as a 'coping' position to distance the idea of risk[443], or as rhetorical device to resist a 'patient' position. However, later in the extract it becomes clear that Richard is aware that he has 'slightly high' blood pressure and cholesterol (lines 15-16). The admission 'I try not to think about it' (line 23) suggests that he may be aware that blood pressure is a risk factor for stroke or TIA. Some patients are reluctant to acknowledge risk but, as highlighted by Weaver et al, this does not "necessarily imply lack of understanding or unwillingness to take medically appropriate health-related actions"[443 (p637)]. In accordance with this perspective, Richard still describes engaging with secondary prevention behaviour despite having previously distanced himself from risk:

Extract 14

1 Richard: I take the view that if the doctor's prescribed them for you should take
2 them ...[*mmm*]... and that's it.

Some lines omitted…

3 Richard: Yes but there's nothing really I can change, if I smoked I could say I'm
4 not gonna smoke ...[*mmm*]... or if I had beer or wine and that I'd say well I'll cut
5 that out ...[*yeah*]... but being as I don't do either it doesn't really make any
6 difference.

Richard positions himself here as a 'patient' who has entered a 'sick role'[198] and consequently follows the instructions given to him by his doctor. For example, his

views about medication adherence ('I take the view that if the doctor's prescribed them for you should take them'; lines 1-2) are stated as an opinion with no room for negotiation ('…and that's it'; line 2). He also positions himself as leading a healthy lifestyle with no potential for improvement. He draws upon a 'health promotion'[217] repertoire to position himself as health-literate and responsible in terms of making healthy lifestyle choices ('if I smoked I could say I'm not gonna smoke ...[mmm]... or if I had beer or wine and that I'd say well I'll cut that out'; lines 3-4).

7.5. Negative cases

A number of negative cases[444] were identified where the adoption of a 'patient' subject position was problematic. Several participants positioned themselves as inhibited from assuming a 'patient' position as a consequence of lack of healthcare follow-up. Consequently, individuals possessed relatively few opportunities for action. This is well illustrated in the extract below:

Extract 15

1 Louise: I ... I did know it meant a mini-stroke. Well they did say, they did say
2 "TIA" and they wrote it down on paper as a TIA but they say that "that was a
3 mini-stroke" [*yeah*]. That's ... but erm ... I was quite surprised that there wasn't
4 more follow up to the whole thing ...[*mmm*]... I kind of felt a little bit abandoned
5 at the end of it all ...[*yeah*]... 'cos you're signed off, that's it, bye-bye, give you an
6 aspirin and off you go, you know it ... it did f ... I have thought in the ... when ...
7 when your paperwork came through I thought "well at least somebody's
8 following this thing up", you know it's on somebody's record somewhere that
9 I've had this thing you know.
10 Interviewer: Yeah. Did ... did you go and see your GP afterwards?

11 Louise: Yes but then all I'm doing with my G- ... well he's ... he's ... he is er ... very
12 good, bless him, but he just checks my blood pressure every so many months and
13 you know so there's ...[mmm]. It feels as though it's an episode that didn't
14 happen if you know what I mean, sometimes you think ...[yeah]… "mm".

In this account, Louise directs agency for the management secondary stroke prevention towards healthcare professionals. She uses role discourse[176 (p216)] to imply that doctors should provide patients with support and follow-up ('I was quite surprised that there wasn't more follow-up to the whole thing'; lines 3-4). Subsequently, blame is formulated through a description of the negative consequences of this role not being fulfilled ('I kind of felt a little bit abandoned at the end of it all'; lines 4-5). Louise constructs an account indicating that she has a good relationship with her GP ('he is er…very good, bless him'; lines 11-12) and this positive assertion functions to suggest that she has no other motive[176 (p110-111)] for criticising the provision of healthcare post-TIA. The description of her GP's actions ('but he just checks my blood pressure every few months and you know so there's…'; lines 12-13), which she ends by tailing off, is used to imply that these routine checks are not sufficient now that she has had a TIA. Although Louise struggles to find recognition as a legitimate 'patient' in need of greater follow-up care, the extract below shows that she has still tried to minimise the risk of future stroke:

Extract 16

1 Interviewer: So how did you find out about the things that can sometimes
2 happen to people in the future after they've had a TIA? So I know you've ...
3 you've said there might be a ... an increased risk of having a stroke ...

Louise: Well I ... I ... that's just because I ... I'm a carer and I work in that environment and you think "well one ... a mini-stroke has got to be something on the same line as a big stroke". It's only ... it's only my own imag ... it's only me thinking these things rather than ... I don't know any positive ... I haven't had any positive ...[*mmm*]... knowledge of it.

Interviewer: Mmm. Is there anything that you think you can do to reduce the risk of having a stroke in the future?

Louise: ((sighs heavily)) Erm ... well I ... I ... of course I've ... I've got a bit of weight on but I have lost about three and a half stone so erm ... I would presume that would ... should have helped a bit but I ... I've no idea what else I should be doing.

Interviewer: Mmm. You say that you've lost three and a half stone ...[mmm]... is that since you've had a TIA?

Louise: Oh yes, in the last ...[*so you]…*year.

Interviewer: ... You made that decision did you then to ...

Louise: Well I ... yeah I thought "well look this weight's got to go 'cos it can't be good for carrying ... you can't ... you know it can't be good for you carrying weight, this kind of weight around, it has got to be bad with my blood pressure for a start". I have ... I am on blood pressure pills and I have been for quite a number of years [*mmm*]. Erm ... so I knew I couldn't ... when ... the extra weigh ... I don't smoke and I don't drink to a ... a great extent, erm ... so the only thing I knew I could do something about was weight.

Some lines omitted…

Interviewer: Is there anything ... any one thing that you would have liked more information about and more advice about?

Louise: Just how not ... how ... what do I do to try and prevent doing ... it happening again ...[*mmm*]... and how likely am I going ... is ... is there that I would have a big stroke ...[*okay*]... after having something like a m ... a mini-stroke ...[*mmm*]... or a couple of mini-strokes and does it increase my risks of having a major stroke that drastically.

Although Louise has lost weight, she is concerned that there are other things that she could be doing to lessen the risk of stroke, of which she is unaware: this uncertainty inhibits Louise from taking up the position of an 'active agent' in relation to secondary stroke prevention ('I've no idea what else I should be doing'; line 13). Knowledge gaps are constructed in terms of a lack of definitive information ('It's only ... it's only my own imag ... it's only me thinking these things rather than ... I don't know any positive ... I haven't had any positive ...[mmm]... knowledge of it'; lines 6-8). Louise also positions herself as someone who could accommodate[443] knowledge about the risk of secondary stroke by stating that she would like to know 'how likely am I going…is…is there that I would have a big stroke' (line 28-29). In turn, this might help her to reposition herself as a legitimate 'patient'. Another example of problematic subject positioning is illustrated in the extract below:

Extract 17

1 Interviewer: Okay. Erm ... right are you aware of any things that can sometimes
2 happen to people after they've had a TIA?
3 Jack: (…) (2.6) No.
4 Interviewer: All consequences? Erm ... some people have talked about the risk of
5 another TIA or a stroke ...[right]... I know you mentioned that, is that something
6 that you've talked to anyone else about, the doctor or ...
7 Jack: Erm ... only insomuch as er ... asking how long I'd gotta stay on the tablets
8 for [yeah]. And which I've been told ...[*mmm*]... for the rest of my life ...[*mmm*]...
9 but erm ... that's the only time [Yeah. Erm…]. Er ... that's ... I mean I ... I've got ... I
10 will be honest, that's one thing that I've ... have a little bit concerns with that
11 there doesn't seem to be any follow up ...[*okay*]... you know I would ... I was

hoping that probably the doctors might call me back ... back and say I think we'd better just have ... review what's happening and ... and ... and stuff like that.

Some lines omitted…

Interviewer: ... And how has that made you feel about then taking medications in general, are you still happy to?

Jack: I'm ... I'm happy ...

Interviewer: ... Now?

Jack: ... I'm happy to take them, I'm ... I not ... I don't think I'm worried so much about the side-effects 'cos I lucky in that I went back and they actually changed them.

Interviewer: That's good. Mmm, got it sorted out.

Jack: But I think my only concern is ... is being told I'm gonna have to take them for my rest of my life and ... and if it's never reviewed how do I know I've gotta take them for the rest of my life?

Interviewer: Right. Erm ... okay, so you ... you would like a ... ideally ...[I would…]... You'd like to see your GP and ...

Jack: Well I'd like somebody to talk to me probably after a year and say erm ... you're gonna have to continue on the tablets and this is why.

Interviewer: Right. I see, yeah you would ...

Jack: And ... and then er ... probably again, reviewed again at some other point as you go through your life rather than just thinking you know they've just been given to you and ... and that's it.

Interviewer: *Mmm. Okay.*

Jack: I mean I don't know whether you can impro ... get to the point where you don't need them but it would be nice to think you ... maybe you can.

For Jack, a preference to adopt of a 'patient' position ('I was hoping that probably the doctors might call me back'; lines 11-12) is made problematic by a lack of healthcare

follow-up ('there doesn't seem to be any follow up'; line 11). The resultant discursive tension is illustrated as uncertainty when Jack questions the necessity of continuing with medication: 'if it's never reviewed how do I know I've gotta take them for the rest of my life?' (lines 23-24). This tension is resolved by introducing the possibility of getting 'to the point' where he will not need medications (lines 34-35). This allows Jack to rationalise current adherence to secondary prevention medication without committing to a 'patient' subject position. However, this could cause tension in the future if a 'patient' position is not confirmed through healthcare follow-up, potentially resulting in discontinuation of secondary prevention medication.

7.6. Moving through the positioning spectrum

The positions adopted by patients were not necessarily constant or fixed throughout the interview, and varied depending on the context and action-orientation of the discourse as described below. Participants also often displayed a mixture of secondary prevention behaviour (e.g. adherence to medication but a reluctance to modify lifestyle risk factors and vice versa). One example of subject re-positioning is shown below. In this extract, Emma shifts between occupying 'patient' and 'resistant' subject positions in relation to the interview context:

Extract 18

((Husband present))

1 Interviewer: Okay. Erm ... and when you were told that having a TIA increases
2 the risk of stroke how did you feel about that?
3 Emma: Not very happy but er ...[*mmm*]... there isn't a lot you can do about it
4 really ...[*mmm*]... is there.

Interviewer: And did you discuss that with anyone, any healthcare professionals?

Emma: No because er ... I never thought there was anything to discuss, it's a fact and how can you change it ...[*mmm*]... really was the way that I looked at it.

Husband: It wasn't put to you as something that was up for discussion was it ...

Emma: No.

Husband: ... it was a straightforward ...

Emma: No ... it was a fact (*mmm*). This is now a risk (*okay*). Yes, you do realise that you will have increased risk of stroke in the future, but nothing was said ... that would encourage me to have said well what can I do about that. [*Right, okay*]. It was as if there isn't anything you can do about it, do you know what I mean?

Some lines omitted…

((Husband absent))

Interviewer: Ah. But there's nothing else that perhaps ... have your family treated you any differently or ... or perhaps advised you ...[Oh actually yes]…to ... to do things differently or ...[yes]…take it easy or ...

Emma: Yes. My husband has treated me differently.

Interviewer: Okay. In what way?

Emma: Tries to do everything for me.

Some lines omitted…

((Husband absent))

Emma: ... it's just an automatic response to someone who perhaps isn't er ... I don't know how to explain it, it's not ... if someone is ill you do try and do as much for them as you can and the frustrating thing for me is I'm not ill and he knows I'm not ill but nevertheless he still tries to do too much for me ...[*mmm*]... and maybe he would do that anyway, I don't know, but it seems to ... he tries to do more than he used to, I'm sure.

In this extract, Emma initially suggests that there are no benefits from positioning herself as a 'patient' because the risk of stroke is not something that can be modified ('it was as if there is anything you can do about it''; line 14). She therefore appears to resist subject repositioning in relation to TIA and secondary stroke prevention. However, situated interview contexts may influence the discourse that is produced[445]. Emma's husband was in the room when this account was produced, and when he later leaves the room, Emma states that 'the frustrating thing for me is I'm not ill and he knows I'm not ill but nevertheless he still tries to do too much for me' (lines 24-25). Her earlier account ('I never thought there was anything to discuss'; line 6) may have functioned to construct a 'coping' position in order to avoid the adoption of a problematic 'patient' position. This is supported by the extract below, again taken from later in the interview when Emma's husband had left the room, when she suggests that she would like a six-monthly check with her own doctor:

Extract 19

((Husband absent))

Emma: If I'm at the Warfarin clinic and I bring up something medically to do with the situation they'll say "oh you'll have to see your own doctor about that" (*okay*). So I'm kind of ... I think the Warfarin clinic is excellent but they're not doctors so they can't talk about any linked medical condition but likewise my own doctor if it's anything to do with the Warfarin ...(*mmm*)…so it's very difficult that situation ...(*mmm*)... and I would like ... what I would appreciate actually, I think, would be a six- monthly ... just to check it with my own doctor [*mmm*]. Not a yearly one, a six-monthly one, and I say that because I think ... I think sometimes a year is just too long to go ...[*mmm*]... and I do think ... I do also think

that people are different in the winter from the way they are in the summer [yeah]. Thinks ... you know ...[*yeah*]... some people affected ... are affected by the seasons erm ... and become much more erm ... lacking in energy, lethargic in the winter [*mmm*]. Erm ... so for my own sort of peace of mind and I think peace of mind is as important as your medical state ...[*mmm*]... erm ... I would like ... I like the idea of being able to talk through any problems with my doctor.

Emma constructs a preference for assuming a 'patient' position when she states that 'I like the idea of being able to talk through any problems with my doctor' (lines 14-15). It is possible that she may have constructed this alternative version of subject repositioning earlier in the interview if her husband were not present. Alternatively, expectations about appropriate behaviour following TIA may have been unintentionally constructed by the interviewer. For example, the interviewer asked questions at an earlier point in the interview that described the possibility of taking certain actions with regards to risk factor reduction (e.g. 'has anyone spoken to you about links between blood pressure and the risk of TIA or stroke, or cholesterol and the risk of TIA?'). In response to this questioning, Emma could be could be positioning herself as a person who is willing to take responsibility for her own health. We cannot know what Emma is referring to when she mentions 'peace of mind' (lines 13-14) or when she describes health with reference to the seasons ('some people affected ... are affected by the seasons erm ... and become much more erm ... lacking in energy, lethargic in the winter'; lines 11-13). However, a likely possibility is Seasonal Affective Disorder and her own response to the seasons. Through her lack of reference to TIA, and the discussion of warfarin medication and seasonal health instead, Emma invokes a 'patient' repertoire but she distances this from the experience of TIA.

7.7. Discussion

7.7.1. Main findings

This study has presented a range of accounts of TIA and secondary stroke prevention. The focus for the analysis has been on the ways in which discursive features are used to warrant actions of adherence or non-adherence to secondary stroke prevention recommendations. The results identified two broad themes that were closely associated with participants' reported secondary prevention behaviours: the adoption of, or resistance to, 'patient' subject positions. The first theme explored how the adoption of a 'patient' position functioned generally to justify actions of adherence to secondary prevention recommendations. The functions of the second theme were more mixed, since participants rationalised both adherence and non-adherence to secondary stroke prevention behaviours while at the same time constructing resistance to a 'patient' subject position. Two extracts, highlighted as negative cases, fell between the two themes, and can be seen to illustrate the inherent contradictions in the interpretive repertoires invoked within each theme. The deployment of the two themes varied throughout participants' accounts, demonstrating that discursive devices such as subject positions and interpretive repertoires were not fixed, but rather they were invoked in order to perform particular actions in context-specific ways. In the final part of the analysis, it was demonstrated that participants shifted through contrasting subject positions in relation to the interview context; participants' language exhibited variability depending on what social action they were performing at the time.

The first theme demonstrated how the adoption of a 'patient' subject position often

functioned to warrant adherence to secondary prevention behaviour. Participant constructions of 'patient' positions provided a viable rationale for adherent behaviour, by enabling participants to draw upon powerful patient repertoires that are difficult to dispute, such as the repertoire surrounding the category-bound[176] activity of adherence to medication. The findings from this study echoed those of Lumme-Sandt et al in demonstrating that, through the use of a patient repertoire, the expert recommendations of doctors were often used to warrant the need for medications[446]. It does not necessarily follow that the adoption of a 'patient' position should be consistently associated with adherence to secondary prevention behaviour; however, it is clear that the adoption of this position provides a relatively straightforward basis for the rationalisation of adherent behaviour.

Consideration of the first theme also revealed that, of those individuals in the sample who took up a 'patient' position, participants invoked two contrasting interpretive repertoires: those relating to the concepts of the 'sick role'[198] and 'expert patients'[192,204] (see Chapter 2, section 2.3.2 for further information regarding these repertoires). As discussed above, both repertoires largely functioned to facilitate secondary prevention behaviour, since they provided opportunities to justify actions that are implicated by membership within a 'patient' category[176]. However, the difference between 'sick role' and 'expert patient' repertoires was characterised by the degree of personal agency constructed by participants over their secondary prevention behaviour. In accordance with the traditional patient role[447], the 'sick role' repertoire functioned to locate agency for the initiation and management of secondary prevention measures with doctors, whereas the 'expert patient' repertoire

served to construct a sense of joint agency between doctors and patients. This suggests that in relation to the adoption of a 'patient' position following a TIA, different repertoires are available as a result of evolving discourses in the context of chronic disease management (see Chapter 2, section 2.3.2). This finding may offer insights in terms of developing models of health service delivery that are likely meet the preferences of different patients, in terms of their interactions with healthcare professionals[448]. For example, it is possible that some participants invoking a 'sick role' repertoire expect, and perhaps prefer, healthcare to be delivered in ways that concur with the traditional medical model (see Chapter 2,section 2.3.2). Thus, as exemplified in Steven's account (see section 7.3), an absence of directive instruction may provide participants with a rationale for not changing their lifestyle behaviour to reduce stroke risk.

Tensions between discourses of medicalisation and patient empowerment are often referred to in sociological and medical literature[449-451]. Salmon and Hall (2003) argue that such tensions have arisen because "the discourse of the patient as an active agent in managing illness and healthcare… has combined with earlier discourses in a way that allows clinicians to withdraw from responsibility for areas of patient need that are problematic for medicine, such as unexplained symptoms, chronic disease and pain"[231 (p1969)]. However, the medicalised 'expert patient' repertoire identified in this study appeared to be empowering for some participants since it provided a legitimacy for self-care behaviours that enabled them to gain control over the management of stroke prevention. This supports the findings of Wilson et al who reported that the Expert Patients Programme empowered a number of participants to

gain a sense of control over their condition by providing them with active coping skills[206].

The second theme demonstrated that 'patient' positions were not always taken up by participants. Instead, 'resistant' positions functioned to rationalise both adherence and non-adherence to behaviours for secondary stroke prevention, depending on the context in which they were constructed. Three powerful rhetorical devices were seen to warrant 'resistant' positions. First, alternative subject positions (e.g. 'social' position; 'coping' position; 'paternal' position) were constructed as incompatible with a 'patient' position. Second, repertoires of personal agency or autonomy were discursively positioned against a (disempowering) 'sick role' repertoire. Third, TIA was constructed as an acute event that did not warrant ongoing medical follow-up.

Consequences of resistance to a 'patient' position included the rationalisation of (partial) non-adherence to medication and lifestyle changes for secondary stroke prevention. The dominant repertoires drawn upon to justify actions of 'non-adherence' related to knowledge gaps and rational decision making. These repertoires served as empowering rhetorical devices that enabled individuals to resist behavioural changes for stroke prevention. However, some participants adopting a 'resistant' position invoked alternative 'healthism'[216] and 'health promotion'[217] repertoires that functioned to confer individuals with responsibility to engage in healthy lifestyle behaviours (e.g. physical activity, healthy diet and non-smoking behaviour). Thus, health was constructed in this context as multifaceted and more than just an issue of secondary stroke prevention.

Finally, negative cases were identified where the adoption of a 'patient' position was problematised by a lack of healthcare follow-up. On the one hand, these individuals constructed preferences for adopting 'patient' subject positions that functioned to locate agency for the initiation and management of secondary prevention measures with their doctors. On the other hand, healthcare professionals were simultaneously constructed as not taking up the position of the 'agent'. Further, participants themselves were unable to draw upon a more empowering 'expert patient' repertoire due to a lack of knowledge about secondary prevention management. In some instances, the unavailability of alternative positions led individuals to assume a 'resistant' subject position. Discursive tensions identified in the accounts of negative cases can be seen as a conflict between contrasting 'patient' and 'resistant' repertoires. It is clear that a number of different, and sometimes incompatible, subject positions are available within discourses of TIA and secondary stroke prevention and that these have to be managed.

Discursive psychology provides insight into the multifaceted ways that individuals position themselves in relation to stroke and TIA, and the interpretative repertoires that circulate in this particular context. A finding of this study is that participants generally constructed 'patient' or 'resistant' positions, and drew upon several distinct interpretive repertoires, in relation to TIA and secondary stroke prevention. However, this does not mean that other individuals with TIA, and perhaps study participants themselves, could not occupy more diverse subject positions and draw upon different repertoires when speaking about stroke prevention in other interactions and different contexts. However, given the regularity with which the particular discursive features

in this study occurred, it can be said that the majority of participants interviewed appeared to attend to these in some way.

To some extent, uncertainties surrounding the nature and diagnosis of TIA may be problematic for the discursive representation of TIA and for negotiating category entitlements. TIA diagnosis is often regarded as problematic: by definition, symptoms are transient and are often consistent with a range of differential diagnoses (e.g. metabolic disturbances; migraine). Knowledge about the causes and symptoms of TIA are reported to be poor among both the general public[28] and TIA patients[169]. The uncertain nature of TIA diagnosis is further demonstrated by the low agreement between stroke physicians when asked to rate the likelihood that patients' symptoms were consistent with TIA[452]. Therefore, some individuals may find it difficult to reconcile the transient nature of TIA symptoms and uncertainties surrounding diagnosis with requirements for ongoing medical follow-up, leading to difficulties in warranting the adoption of a 'patient' subject position. In order to improve health services for TIA patients, it is necessary to consider how contrasting 'patient' and 'resistant' subject positions intersect with healthcare access and delivery. In general, the analysis presented here suggests that a 'patient' subject position is more compatible with accessing healthcare follow up and warranting secondary prevention behaviour than a 'resistant' position. Subject positions, along with other discursive features may therefore be indicative of likely barriers or facilitators to secondary prevention behaviour. Thus, the design of effective healthcare interventions could be facilitated by a consideration of the ways in which TIA patients are positioned during their interactions with healthcare professionals. It is appropriate to consider the

application of discourse analysis findings for the purposes of complex intervention development in a context-specific way, in relation to other key findings from this thesis, and therefore this application will be discussed in Chapter 8.

7.7.2. Comparison with other studies

The findings from this study need to be understood in the context of other relevant research. The patient-related barriers and facilitators to changing behaviour for secondary stroke prevention were discussed in Chapter 2 (section 2.3.1); these have been generally studied at the level of individual patient characteristics (e.g. demographic factors; disease factors and comorbidities; knowledge, attitudes and beliefs) that are considered to be either fixed or relatively stable in the short-term. The possibility that wider social and discursive factors might correspond with secondary stroke prevention behaviour has so far remained unexplored. However, in contrast to previous research, this study has described participants' accounts of adherent and non-adherent behaviour in terms of highly variable discursive practices that change according to social context. This information provides new insights into how secondary stroke prevention may be optimised: for example, by designing health interventions around an understanding of the relationships between language use during clinical consultations, subject positioning and individuals' possibilities for social action.

Several studies have used a discursive psychology approach to investigate the management of medical conditions. Much of this work has focused on the identification of subject positions and interpretive repertoires, rather than an exploration of how these discursive features warrant specific actions[446,448,453]. This

study therefore adds to the literature by analysing the discursive features that appeared in participants' accounts at specific instances where actions of adherence or non-adherence to stroke prevention behaviour were being rationalised. In a similar study with comparable aims, O'Parry et al demonstrated that patients constructed 'active' and 'passive' subject positions in relation to the management of diabetes. Their findings echo those of this study, by demonstrating that the 'passive' position served to locate responsibility for disease management with healthcare professionals and absolved patients from responsibility, whereas the 'active' position functioned to warrant self-management actions and allowed patients to take full responsibility for disease management[454]. O'Parry et al observed that the 'passive' position identified through their study was "wholly at odds with the current medical prescription of active patient involvement in matters of disease management"[454 (p102)]. The findings from the study in this chapter suggest that 'passive' patient positions are accomplished, and made possible, because participants locate agency for disease management with healthcare professionals by drawing upon a 'sick role' repertoire[198], a predominant discourse before those of 'patient empowerment'[199] and 'expert patients'[192,204] were introduced.

As Lupton (1997) observes, 'passive' patient positions can be "viewed as undesirable because of the implications for dependency and unquestioning compliance to an authoritative Other… such compliance deviates from current dominant and privileged notions in Western societies about the importance of the autonomous self"[448 (p374)]. However, through a qualitative exploration of lay-peoples' perspectives on their interactions with doctors, Lupton (1997) demonstrated that, in some instances,

individuals preferred to take on a 'passive' or 'dependent' patient subject positions in contrast to a more 'active' alternative[448]. Similarly, Lumme-Sandt et al reported that a 'passive' version of the patient repertoire was the main one invoked by individuals in a study of older peoples' accounts of medication use[446]. Correspondingly, the findings of this chapter demonstrated that some participants actively construct representations of themselves as occupying a 'sick role'[198] and this supports other research in suggesting that not all individuals prefer to be positioned as rational actors who participate in healthcare decision making[209,224]. According to Henwood et al, one possible explanation for this finding is that individuals do not want to assume the responsibilities that accompany more 'active' patient roles (e.g. information seeking and decision making)[455]. It is therefore likely to be important for healthcare professionals to understand the role that patients prefer to adopt in relation to the management of their healthcare.

The 'expert patient' repertoire identified in this study has similarities with the repertoire surrounding the 'consumerist' position identified by Lupton (1997): both repertoires appear to construct "rational, autonomous" patient actors in the context of the medical encounter[448 (p374)]. However, the consumerist position also represented a position from which individuals could challenge the recommendations of healthcare professionals[448]. In contrast, the 'expert patient' repertoire identified in this chapter represented the concept of collaborative partnerships between patients and their doctors, and no evidence was found of a more authoritative patient stance. Conversely, it can be suggested that the authoritative facet of the 'consumerist' position was demonstrated in the study conducted by O'Parry et al, since a patient

with diabetes described successfully initiating a treatment change that illustrated how "medical professionals defer to his expertise in diabetes management" [454 (p101)]. It is possible that a 'consumerist' repertoire was not identified in the study reported in this chapter because of the demographic characteristics of the sample. For example, it has been observed that people in older age groups appear less likely to engage in consumerist behaviour[448,456].

It can be argued that the 'resistant' position and the negative cases identified in this study problematised some aspects of secondary prevention management. It is necessary to acknowledge that individuals may be exercising agency in choosing not to adhere to secondary prevention behaviours. However, as Willig (1999)[457] suggests, it is also possible that individuals' discursive possibilities for actions were constrained by the limited subject positions available to them; opening up more empowering subject positions to these individuals might represent an important opportunity to increase their possibilities for action. For example, individuals' opportunities for assuming particular subject positions may be limited by the information available to patients; in a qualitative observational study investigating social barriers to secondary stroke prevention, Redfern et al reported that "professionals did not routinely appear to share information with patients that would enable them to understand how to prevent a recurrence"[186 (p129)]. This finding may represent a potential barrier to the uptake of 'patient' positions, and thus participants' use of arguably more empowering repertoires such as the 'expert patient' repertoire.

7.7.3. Strengths and limitations of the study

A strength of this study was that it enabled an in-depth exploration of participants'

accounts in relation to their experiences of TIA and secondary stroke prevention. Qualitative interviews provided rich data from which to explore the barriers and facilitators to stroke prevention from a discursive perspective. The findings generated new insights on how language use can be understood as warranting specific behaviours. It is recognised that discursive psychology is an interpretive process and that interview text could be interpreted in multiple ways. However, the validity of the interpretations presented in this study is attended to via the use of a number of strategies that are commonly adhered to in discourse analysis studies (see Chapter 6, section 6.4.3).

It is necessary to adopt a reflexive perspective in relation to this qualitative study to assess its limitations. For example, it is recognised that participants' accounts were context-specific (since discourse was co-constructed by the interviewer and participants during the interview process) and therefore it follows that the data obtained from this study cannot be used to provide a perspective on the discursive interactions that occur between patients and healthcare professionals. It would be necessary to conduct additional research, for example an ethnographic study, to establish whether the discursive features identified during this study are present in the context of medical consultations. It is possible that individuals who have experienced a TIA may position themselves differently, and draw upon alternative repertoires, in different situations and contexts.

Further, in the above analysis, discourse is regarded as performative, although an acknowledged limitation of this approach is that there may be dissonance between the actions that participants report in relation to secondary prevention behaviour and

the actions that they carry out. For example, it is possible that social and cultural norms led participants to limit their disclosure of non-adherence to healthcare providers' recommendations[458]. However, in support of a more straightforward correlation between language use and outcomes, Amrhein et al demonstrated that participants' use of action-orientated language during motivational interviewing sessions was predictive of drug use outcomes[459].

Another limitation of this study is that the analytic method of discursive psychology can only offer a partial view of the social barriers and facilitators to secondary stroke prevention. As discussed in Chapter 2 (section 2.3), other social factors such as demographic characteristics, and access to healthcare services, are likely to impact upon this phenomenon. However, it is possible that there is some correspondence between these social influences, since demographic factors may contribute to the subject positions that people take up. For example, "younger, better educated patients and women" were demonstrated to "prefer a more active role in [medical] decision making"[460 (p102)]; these individuals may therefore be more likely to adopt particular subject positions within medical discourses.

It is also important to consider the challenges that were encountered during the process of recruiting participants for this study. As discussed in Chapter 6 (section 6.4.1), this study aimed to recruit a range of participants in terms of age, gender, ethnicity, experience of multi-morbidities and time elapsed since index TIA, in order to be informative for complex intervention development. However, the recruitment of South Asian patients proved to be challenging due to a low response rate to study invitation letters, an observation that has also been reported in other research

contexts[461]. Consequently, the interview sample was not adequate for enabling an exploration of the similarities and differences in discursive constructions produced by patients of different ethnic origin. This is an important limitation, since a study by Galdas et al demonstrated that ethnicity was an important influence on South Asian men's health-related behaviour[462]. This study was unable to provide a perspective on this issue. Further, due to funding limitations, this study did not recruit participants who were unable to speak English; further research is therefore necessary in order to explore the perspectives of these individuals.

7.8. Chapter conclusion

Discursive psychology represents a theoretical and methodological framework which could inform improvements in secondary stroke prevention. This study aimed to contribute to understandings of behaviour change (and resistance to change) by exploring how discourses affect individuals' possibilities for action. Discursive features (i.e. subject positions; interpretive repertoires; rhetorical devices) that were 'action-orientated' towards secondary stroke prevention behaviour functioned to propose, justify, explain or describe actions of adherence or non-adherence to secondary prevention behaviours. An insight into these discursive features suggests that they could be applied to intervention development in several ways. First, it enables an understanding of the roles that individuals prefer to adopt in relation to the management of their healthcare; this could be used to guide improvements in healthcare interactions. Second, it may be possible, through means specific intervention, to increase individuals' possibilities for secondary prevention actions by opening up more empowering subject positions and interpretive repertoires. Third,

improvements in follow-up practices for secondary stroke prevention could be facilitated by an understanding how different subject positions intersect with healthcare access and delivery. The application of these findings for the specific purpose of intervention development will be considered in Chapter 8.

Chapter 8. Discussion and Recommendations for Complex Intervention Development

Mixed methods study designs are increasingly used in health services research in order to develop complex interventions[463]. In this thesis three parallel studies have explored complementary aspects of the phenomenon of secondary stroke prevention. Different elements of this phenomenon (contextual audit data, systematic review of intervention effectiveness data and patient discourse) have been studied and analysed separately, using methodological approaches that are commensurate with the different paradigms in which individual research questions have been located[278]. Therefore, this thesis adopts a mixed methods design that can be categorised as an "expansion design", since the purpose of the research approach was to "extend the scope, breadth, and range of inquiry by using different methods for different inquiry components"[277 (p269)] (see Chapter 3, section 3.3.3). Consequently, it is necessary in this final chapter to integrate the research findings from the component studies included within this thesis. The overall aim is to produce an integrated and multifaceted picture of secondary stroke prevention following TIA so that this can be used to guide the development of a complex intervention leading to improvements in patient care.

This chapter will begin with a summary of the three component studies within this thesis. Key findings from each of the studies will then be integrated into a conceptual framework that illustrates barriers and facilitators to secondary stroke prevention following TIA. The integration of component studies of this thesis will be considered in the context other relevant research. Subsequently, the findings will be used to

generate a number of principles for the development of a complex intervention. Wider literature will be drawn upon to provide a broader perspective on issues of complex intervention development that are implied by the integration of key findings from this thesis. Finally, recommendations for future research and the development of the MRC framework for complex interventions[62] will be outlined.

8.1. Summary of research findings

Chapter 1 provided an introduction to the research topic and outlined the rationale for the overall programme of work in this thesis. Chapter 2 provided more detailed information relating to the topic of secondary stroke prevention. Chapter 3 provided background information on the MRC framework for complex interventions[62] and mixed methods research. This information was used to develop the methodological approach for the design, implementation and integration of the component studies in this thesis.

Chapter 4 described an audit study that identified the current status of modifiable risk factor control in a local population of TIA patients. The results demonstrated that monitoring and optimisation of risk factor control in primary care was suboptimal. Only a minority of TIA patients achieved RCP guideline standards[68] whereas QOF standards[71] were generally well achieved. Potential areas for quality improvement included blood pressure control (BP ≤ 130/80 mm Hg), cholesterol lowering (TC < 4.0 mmol/L) and provision of dietary and exercise advice.

Chapter 5 presented the results of a systematic review synthesising evidence on the effectiveness of stroke service interventions for secondary prevention. Although some

clinical and methodological heterogeneity was present, findings indicated that organisational interventions were associated with clinically significant reductions in mean systolic blood pressure, diastolic blood pressure and BMI. Organisational interventions that involved integrated care services, together with comprehensive patient education, were associated with the greatest improvements in systolic BP and diastolic BP. Interventions involving patient education alone were not associated with improvements in any of the review outcomes, with the exception of one study that reported data for a subgroup of patients with uncontrolled risk factors.

Chapters 6 and 7 presented the methods and findings of a qualitative study involving participants who had been diagnosed with a TIA. The discourse analysis (conducted according to a discursive psychology approach[176-178]) revealed a range of subject positions that participants took up with regards to TIA and secondary stroke prevention. Several participants constructed accounts that enabled them to position themselves as 'patients'. As a consequence of this subject positioning, participants were able to rationalise secondary prevention behaviour by drawing upon sociocultural expectations that apply to patients. Conversely, other participants constructed accounts that were characterised by resistance to 'patient' positions (i.e. 'resistant' positions). In some cases, this led to the rationalisation of non-adherence to secondary prevention recommendations. A number of negative cases were also identified where the adoption of a 'patient' position was problematised by a lack of healthcare follow-up. Briefly, a negative case represents data that conflicts with the broad patterns identified during the analysis (see Chapter 3, section 3.4.3 for an explanation of negative cases). Negative cases identified in the qualitative study were

characterised by tensions arising from difficulties with subject repositioning and uncertainty about secondary prevention behaviour.

8.2. Integration of research findings

A method for synthesising key research findings from this thesis was outlined in Chapter 3 (section 3.6.2), following a consideration of mixed methods theory (see section 3.3) and a review of the strengths and limitations of studies that have adopted similar research designs (see section 3.6.1). The discussion in Chapter 3 highlighted a need for a more integrated approach when using mixed methods studies to inform complex intervention development. In an attempt to meet these challenges, this thesis will first integrate the evidence and theory from component studies into a coherent explanatory framework.

In this integration of mixed methods research, the findings from the qualitative study provide a more nuanced perspective on the population level analyses in the systematic review and audit studies. Similarly, the findings from systematic review and audit provide new insights on the different subject positions identified during the qualitative study. However, the interpretation of contrasts and divergence between these studies is complex and ambiguous. All interpretations should be considered as hypotheses that may be equally valid and it is therefore difficult to decide which explanation should be given primacy. However, in line with a pragmatist perspective[273], alternative explanations will be considered on the grounds of application (i.e. which is more useful in informing the development of a complex intervention).

Impact of integrated care/patient education interventions in the context of secondary stroke prevention

The findings from the systematic review demonstrated that although patient education alone was generally not associated with risk factor modification, interventions that delivered patient education in the context of organisational change (integrated care) were associated with significant improvements in systolic BP, diastolic BP and BMI. Furthermore, the largest reductions in systolic BP and diastolic BP were seen when the intervention components of integrated care and comprehensive patient education (involving promotion and tracking of behaviours for secondary stroke prevention) were combined. The findings from the qualitative study provide a perspective on these observations and can be used to generate possible explanations. First, it is possible that integrated care helps individuals to reposition themselves as 'patients' and consequently enables them to rationalise adherence to secondary prevention behaviour. Davies and Harré assert that subject positions are produced during social interactions[182]. Therefore, regular follow-up appointments or contact with healthcare providers may present individuals with opportunities to draw upon discourses that locate TIA as a chronic condition and facilitate the repositioning of themselves as 'patients'. This hypothesis is supported by findings from the qualitative study suggesting that the adoption of a 'patient' subject position was problematic for participants who described difficulties in accessing healthcare follow-up services after experiencing a TIA (see Chapter 7, section 7.5).

Individuals who adopt 'patient' subject positions are potentially more receptive to medical education. This hypothesis is supported by the observation that participants

in the qualitative study who repositioned themselves as 'patients' drew heavily upon learned biomedical discourse when rationalising behaviour for secondary stroke prevention. Therefore, integrated care programmes (as a consequence of enabling 'patient' positions to be taken up) may represent a particularly effective context in which to deliver health education. In accordance with this conclusion, literature reviews have reported that traditional patient education alone is generally ineffective in improving health status in patients with long-term conditions, whereas education delivered in the context of organised systems of patient review is often associated with positive clinical outcomes[464,465]. Additionally, as a consequence of the findings of this thesis, it can be hypothesised that patient education delivered in the absence of integrated care may be unsuccessful because discursive barriers to change (e.g. interpersonal and sociocultural issues) are not addressed by the intervention (see Chapter 2, section 2.3.2 for an overview of discursive influences on secondary stroke prevention). Hence, discourses surrounding integrated care are expected to be bound up with the socially constructed phenomenon of secondary stroke prevention.

On a similar theme, it is possible that integrated care provides an opportunity for optimising health education by opening up an 'expert patient' repertoire (see Chapter 7, section 7.3) for individuals to draw upon as a consequence of information that is provided through processes of regular risk factor screening, treatment or monitoring. The discourses surrounding integrated care may therefore increase some individuals' opportunities for change. In support of this, the qualitative study demonstrated that participants who drew upon an 'expert patient' repertoire frequently used rhetorical devices[176] such as quantifying blood pressure and cholesterol levels to warrant

adherence to secondary prevention behaviours (see Chapter 7, section 7.3). Therefore, for individuals who are prepared to draw upon an 'expert patient' repertoire, it might be beneficial for secondary stroke prevention interventions to include a discussion of individual patient data on modifiable risk factors. This suggestion is supported by the findings reported in other literature: studies have demonstrated that the provision of individualised risk estimates may improve individuals' uptake of recommended health behaviours, although the underlying causal mechanisms are not fully understood[466,467].

The potential of qualitative study findings to account for variation in intervention effectiveness

The qualitative study findings may provide an explanation for some of the clinical heterogeneity present in the systematic review findings (i.e. discursive constructs may represent an insight into the 'black box' of interventions). For example, organisational and educational interventions included in the systematic review may have been more effective for a subset of individuals who positioned themselves as 'patients' and drew upon an 'expert patient' repertoire. The qualitative study identified participants who were unwilling to position themselves as 'patients' following a TIA (see Chapter 7, section 7.4). For these individuals, interventions involving systematic follow-up and/or patient education may be problematic. Additionally, the qualitative study demonstrated that some participants represented themselves as 'patients' by drawing upon a 'sick role' repertoire rather than an 'expert patient' repertoire; the two repertoires were used to construct different accounts of secondary prevention management (see Chapter 7, section 7.3).

Thus, it is possible to conclude that different discursive constructions of secondary stroke prevention may be associated with variation in intervention effectiveness or acceptability. This hypothesis can be used to generate some important considerations for intervention development. Firstly, for some individuals whose discursive possibilities for actions are constrained by the limited subject positions available to them (e.g. because of knowledge gaps), an 'expert patient' repertoire may represent a more empowering discourse that can be made available to participants through an intervention (see Chapter 7; section 7.7.2). However, it can also be deduced that interventions with an emphasis on 'patient empowerment' or 'self-care' discourses may be not be effective for individuals who are unwilling to be recruited to 'patient' positions following a TIA, and for those who actively resist drawing upon an 'expert patient' repertoire. Consequently, it may be beneficial to tailor the delivery and contents of an intervention in order to suit a number of alternative subject positions and interpretive repertoires (i.e. provide more than one variation of the intervention).

Impact of clinical follow-up on secondary stroke prevention

The audit study provides contextual data showing that local TIA patients often do not attain evidence-based RCP targets for modifiable risk factor control. Interpretation of these findings suggests that current follow-up practices may not be adequate for the achievement of RCP targets[68]. The audit findings also revealed deficiencies in the provision of lifestyle advice to TIA patients. Indeed, health services have been criticised for focusing predominantly on the pharmacological management of cardiovascular risk factors instead of giving patients the option of accomplishing their goals through lifestyle changes[468,469]. It is therefore likely the constraints of current

primary care practice mean that usual consultations cannot provide the intensity of risk factor management and lifestyle advice that are required for optimal secondary stroke prevention. The negative cases identified in the qualitative study demonstrated that healthcare follow-up that does not meet individuals' expectations (in terms of frequency of risk factor review and provision of secondary prevention advice) prevented individuals from adopting 'patient' subject positions; furthermore, this was associated with problematic consequences for the management of secondary prevention (see Chapter 7, section 7.5). Thus, for individuals who have experienced a TIA, constraints relating to current follow-up practices may problematise the negotiation of 'patient' positions. Consequently, it is likely that a specific health service intervention is needed to optimise secondary prevention. In line with this conclusion, integrated care services such as a disease management programmes may be particularly well suited to the ongoing management of TIA patients because these often promote lifestyle change as well as adherence to medication and self-monitoring[470].

The results of the audit study are ambiguous in terms of whether QOF targets represent a potential facilitator to secondary stroke prevention. Longitudinal and retrospective observational studies have linked financial incentives with improvements in the quality of patient care[471,472]. The findings from the qualitative study, demonstrating that some participants resist positioning themselves as 'patients' following a TIA, provides a potential explanation as to why QOF targets were not attained by all individuals in the audit study. Thus, QOF targets may not be sufficient to influence stroke prevention among a subset of people who have

experienced a TIA.

On the other hand, since the attainment of QOF targets is driven largely by organisational and healthcare professional factors, these targets may represent an important enabling factor contributing to risk factor control among individuals who draw upon a 'sick role' repertoire. Insights from the qualitative study demonstrated that the 'sick role' repertoire functioned to locate overall responsibility for secondary prevention with healthcare professionals. Conversely, use of the 'expert patient' repertoire enabled individuals with TIA to assume a greater degree of responsibility for the management of secondary stroke prevention (for example, by pursuing optimal risk factor targets themselves). Therefore, in comparison to individuals who draw upon an 'expert patient' repertoire, those drawing upon a 'sick role' repertoire may benefit to a greater extent from structured clinical follow-up (as mandated by QOF). Consequently, it is possible to hypothesise that QOF targets represent a structural facilitator to secondary stroke prevention, particularly among individuals who draw upon a 'sick role' repertoire following a TIA. Therefore, financial performance targets that reflect evidence-based RCP guidelines for secondary stroke prevention may facilitate the achievement of optimal risk factor control in this subset of individuals. However, further empirical research is required to test this hypothesis.

Implications of findings for the development of a complex intervention

In conclusion, this mixed methods study has produced the beginnings of a conceptual framework for optimising secondary stroke prevention (see table 8-1). However, it has also generated some ambiguous findings regarding the barriers and facilitators to

stroke prevention following TIA. One possible method for facilitating secondary prevention is through integrated care and comprehensive patient education. This particular conclusion is consistent with one set of interpretations involving all three component studies of this thesis. However, systematic follow-up and educational interventions were identified as potentially problematic (rather than facilitatory) for individuals who resist 'patient' positions. This can be resolved by considering the findings from a pragmatist perspective. It is argued here that integrated care and comprehensive patient education are both likely to represent useful facilitators when developing a complex intervention. However, it can also be acknowledged that these facilitators are unlikely to be effective in practice for all TIA patients. It is not possible from this mixed methods study to quantify the subset of individuals for whom this approach might be acceptable or problematic. Thus, it is likely that this discrepancy can only be identified and addressed through further research to explore whether these facilitators are acceptable to a wide spectrum of patients (see section 8.6.2). Furthermore, it may be possible to tailor an intervention in order to meet the individual preferences of TIA patients (see section 8.4.1).

Table 8-1: Summary and integration of multi-level findings from this thesis

Key findings arising from this thesis	Conclusions derived from an integration of key findings
Organisational factors (findings from systematic review)	
- Pooled data showed that organisational interventions were associated with significant reductions in mean systolic blood pressure, diastolic blood pressure and BMI. Organisational interventions that involved integrated care services, together with comprehensive patient education, were associated with the largest effect sizes.	- Organisational change should be implemented in the context of integrated care; intervention should include an element of comprehensive patient education
Patient factors (findings from qualitative study)	
- Discursive features present in participants accounts (e.g. 'patient' and 'resistant' subject positions and their associated interpretive repertoires) were used to rationalise adherence or non-adherence to secondary prevention behaviours	- Intervention design should take into account the influence of socio-cultural discourses on secondary stroke prevention and aim to meet needs of individuals who adopt different subject positions/ draw upon different interpretive repertoires - An understanding of the contextual use of discursive features may help to unpack the 'black box' of an intervention and account for some of the between-participant variation in intervention effectiveness or acceptability
Moderating effects of 'resistant' subject positions :	
- Individuals may adopt a 'resistant' position due to the unavailability of alternative subject positions and interpretive repertoires	- An intervention should aim to increase individual autonomy by providing opportunities for individuals to access alternative (potentially more empowering) subject positions and interpretive repertoires
- Individuals may exercise agency in adopting a 'resistant' position in order to warrant non-adherence to specific behaviours for secondary stroke prevention	- Consideration should be given to the moderating effects of 'resistant' subject positions when evaluating intervention effectiveness (e.g. the identification of 'resistant' positions may provide an explanation for clinical heterogeneity)

Moderating effects of 'patient' subject positions: - an 'expert patient' repertoire enabled individuals to share responsibility for secondary prevention with healthcare professionals - a 'sick role' repertoire functioned to locate responsibility for secondary prevention with healthcare professionals	- Integrated care encounters may open up an 'expert patient' repertoire for individuals to draw upon; however, this could be problematic for individuals who prefer to draw upon a 'sick role' repertoire - At least two variations of an integrated care intervention should be developed: these should be tailored to meet the needs of individuals who prefer to draw upon different interpretive repertoires (i.e. 'expert patient' and 'sick role' repertoires)
Healthcare professional factors (findings from the audit study)	
- Local provision of follow-up care for patients with TIA does not meet evidence-based recommendations outlined in the RCP National Clinical Guideline for Stroke[68]; QOF indicators[71] were generally well achieved	- An intervention should establish protocols to facilitate the achievement of RCP recommendations for secondary stroke prevention - The provision of financial incentives for the attainment of RCP targets may be beneficial for a subset of individuals who draw upon a 'sick role' repertoire

8.3. Comparison with other studies and discussion of findings

It has been observed that research publications of educational, behavioural and organisational interventions often do not include details of the intervention components[305,473] or information about how these were components were developed or derived[307,474]. Similarly, the research publications identified from the searches conducted for the systematic review (Chapter 5) seldom provided information about the theoretical frameworks or empirical evidence on which interventions were based, or the processes by which theory and evidence were linked with particular intervention components. Consequently, there is a limited evidence base with which to compare the findings from this thesis.

It is increasingly common for journals to make detailed reports of intervention components available online as supplementary electronic files (e.g. intervention manuals) and it has been recommended that this practice should be adopted universally[473]. However, in the absence of information about the context in which interventions are developed, the findings of complex interventions are potentially more difficult to interpret and less generalisable[475]. Although the MRC framework reports that work has been conducted to standardise the reporting of intervention components (e.g. though graphical representation[476] or the development of standardised taxonomies[477]), the same consideration has not yet been given to the reporting of intervention development. It is anticipated that further research in the area of complex interventions would benefit from more comprehensive or standardised reporting of intervention development processes (see section 8.6.3).

In the context of secondary stroke prevention, only two research publications provide comprehensive information on the systematic development of intervention components from empirical evidence and theory. The following section will place the findings from this thesis in the context of these two interventions; the first of these was developed according to an approach known as 'intervention mapping'[382] and the second was developed in accordance with the MRC framework[314]. At the time of writing this thesis, only the second intervention had been evaluated in a RCT[478], while a RCT of the first intervention was ongoing[382].

The TOOLS study[382]

Consistent with the broad aims of the MRC framework, intervention mapping is a tool for guiding the development and evaluation of locally tailored, evidence-based intervention programmes[479]. The development of interventions according to an intervention mapping approach includes the following steps: (1) a needs assessment; (2) development of 'change objectives' to guide intervention planning; (3) selection of theory based intervention methods and delivery strategies; (4) design of an intervention programme in conjunction with target users[479]. The 'Teaching Others tOLive with Stroke (TOOLS)' programme for optimising secondary stroke prevention was designed in accordance with these steps[382] (see Table 8-2). The design of the TOOLS programme was established by selecting an intervention delivery strategy to match each identified 'change objective' (see Table 8-2). However, the rationale for selecting between different intervention delivery strategies (i.e. strategies identified from the literature versus strategies suggested by target users) is not considered during the process of intervention mapping[382,479]. Therefore, it can be argued that the

intervention mapping tool[479] exhibits a similar limitation to the MRC framework[62] (see Chapter 3, section 3.5), in that it does not provide a strategy for integrating multiple, fragmented findings from theory and empirical evidence before mapping to intervention design.

Table 8-2: Summary of the development of the TOOLS intervention[382] according to an intervention mapping approach[479]

Intervention mapping step	Description of research processes
1) Needs assessment	Semi-structured interviews were conducted with target users of the programme (multiple healthcare providers involved in different aspects of stroke care; stroke patients and their carers) to identify perceived barriers to secondary stroke prevention and elicit preferences for intervention design.
2) Development of 'change objectives'	'Change objectives' were established by crossing 'performance objectives' (identified from evidence-based guidelines for secondary stroke prevention) with 'determinants' (personal and external factors that may influence outcomes) in a matrix whereby "each cell typically contains a change or leaning objective that identifies what needs to be learned relating to this determinant to achieve the proximal performance objective"[382 (p103)].
3) Selection of theory-based intervention methods and delivery strategies	Theoretical models were selected to correspond with 'change objectives'. Subsequently, intervention delivery strategies (e.g. provider training; establishment of a stroke support group) were selected from existing literature and from the suggestions of target users.
4) Design of intervention programme	Intervention delivery strategies were organised into components of the TOOLS programme. This process involved consultation with target users in order to incorporate their preferences into programme design. Programme materials and protocols were developed. Programme components were pre-tested (through 'tracking' their delivery) prior to full-scale implementation of the programme.

Figure 8-1: Components of the TOOLS intervention[382]

Intervention components directed towards stroke patients:

- Patient self-management programme
- Peer support group
- Provision of standardised educational materials

Intervention components directed towards healthcare professionals:

- Information provision about local services to support risk factor management
- Development of an electronic 'prescription pad' to facilitate appropriate referrals
- Provision of hospital discharge templates to encourage secondary prevention education
- Training sessions on motivational interviewing and goal setting techniques (for use during patient consultations).

A preliminary description of the TOOLS intervention referred to a number of intervention components that are outlined in Figure 8-1[382]. The findings of this thesis can be drawn upon to suggest that the intervention components of 'patient self-management' and 'provision of standardised educational materials' may be beneficial for stroke patients who can be recruited to subject positions from which they are able to assume an active role in the management of their healthcare. The inclusion of a 'peer support group' may facilitate access to these particular subject positions by providing opportunities for patients to meet others who manage the same condition effectively[454,480]. Similarly, the potential benefits of peer support for TIA patients will be discussed in section 8.4.1.

The TOOLS intervention also incorporated numerous elements that were directed towards healthcare professionals. This thesis does not provide an insight into the needs of healthcare professionals when supporting secondary stroke prevention in patients following a TIA; further research is therefore required to determine whether

interventions directed towards healthcare professionals would be beneficial in this context (see section 8.6.1).

It is of interest that the development of the TOOLS programme did not identify a need to incorporate an element of integrated care. More specifically, the TOOLS intervention did not establish post-discharge protocols for ongoing risk factor screening and treatment/monitoring. Conversely, the findings from this thesis indicate that integrated care interventions represent a particularly effective context in which to deliver secondary stroke prevention care, due to the discourses that circulate in this particular context (see section 8.2). However, the usual care provided to individuals participating in the TOOLS programme could not be established from the available study publications[382,481]. It is possible that usual care in the TOOLS study setting includes regular monitoring of modifiable stroke risk factors. Additionally, the 'patient self-management' component of the programme may include an element of clinical follow-up, although it is not possible to discern this from study publications[382,481].

The Stop Stroke study[314,478]

This thesis sought to inform the development of an intervention for secondary stroke prevention according to the MRC framework for complex interventions. At present, only the 'Stop Stroke' study has been developed according to comparable principles[314,478]. This intervention has been evaluated in a randomised controlled trial[478]; however, it was not included in the systematic review presented in this thesis (Chapter 5) because data relating to the pre-specified review outcomes measures

were not available. However, it is appropriate to place the integration of key findings from this thesis in the context of the findings from the Stop Stroke intervention. The Stop Stroke study was informed by a comprehensive evidence base that was generated through quantitative and qualitative approaches (systematic review; interviews with stroke patients; professional observation study; quantitative analysis of management of secondary prevention in local stroke patients; content analysis of patient information literature). As discussed in Chapter 3 (section 3.6.1) findings were synthesised to develop an integrated care intervention that included several components: identification of stroke patients and their risk factor status via a disease register; generation of individual patient care plans using computer algorithms; provision of evidence-based guidance to general practitioners, patients and their carers; ongoing systematic risk factor monitoring[314]. The recommendations pertaining to integrated care and patient education are in broad agreement with the findings of this thesis (see section 8.2), although the Stop Stroke intervention was developed based on the needs of a different patient population.

During the Stop Stroke study, participants in the intervention group were provided with 'secondary prevention packages' (containing individualised risk factor data, advice on secondary prevention management and relevant information sheets)[314]. The secondary prevention package aimed to "empower stroke survivors by providing them with information to help them engage in active decision making about secondary prevention choices in the consultation and to make educated decisions about self-management"[314 (p208)]. It can be suggested that this intervention promoted the active involvement of patients in risk factor management, in line with the concept

of 'expert patients'[192,204]. Therefore, patient education was based upon the premise that empowering patients would enable them to take up recommended behaviours for secondary stroke prevention.

However, the outcomes of the stop stroke trial did not demonstrate improvements in primary or secondary outcome measures: "although the trial demonstrated an impact on the process of secondary prevention management (receipt of written information about stroke), process change did not affect outcomes (improved risk factor management)"[478 (p2474)]. The trialists suggest several possible explanations for this, including ceiling effects and insufficient power to detect improvements in outcome measures[478]. In addition, it is suggested that the intervention approach may have been "insufficient to influence routine access to health services or to encourage those with suboptimal risk factor management to challenge GPs about inappropriate decisions"[478 (p2474)]; potential barriers to patient engagement with GPs (in the context of risk factor management following stroke) have previously been described in terms of communication constraints arising from medical authority: rigid consultation structure; limited consideration of patients' agendas; healthcare professionals' lack of information sharing practices[186].

As a consequence of the findings in this thesis, it is possible to hypothesise that, while the intervention in the Stop Stroke study functioned to promote an 'expert patient' repertoire, the constraints of predominant styles of medical consultation within the trial meant that this was difficult to accomplish. It is also possible that some participants actively resisted a 'patient' subject position or were unable to be recruited from their preferred use of a 'sick role' patient repertoire (see Chapter 7,

section 7.7.2). In the context of the Stop Stroke trial, secondary stroke prevention may have been limited by the discursive subject positions that participants adopted in consultation settings, and therefore the actions that they were "entitled or expected to perform"[431 (p148)] . Therefore, it is possible that integrated care designs may be facilitated in the future by a consideration of the moderating effects of participants' subject positions.

8.4. Consideration of wider literature: implications for complex intervention development

Consideration of key findings from component studies in this thesis (see section 8.2) suggested that an organisational intervention to improve stroke prevention following TIA should be developed based on the principles of integrated care, in association with patient education. It was beyond the scope of the systematic review, presented in Chapter 5, to provide a perspective on the successful components of integrated care interventions. Further, integrated care interventions are often described only in general terms, making it difficult to determine the 'active ingredients' of effective interventions[470,482]. Therefore, this section will consider wider literature that provides a perspective on the components of integrated care interventions. This information will be used to establish some principles to guide the development of an integrated care intervention (see section 8.5).

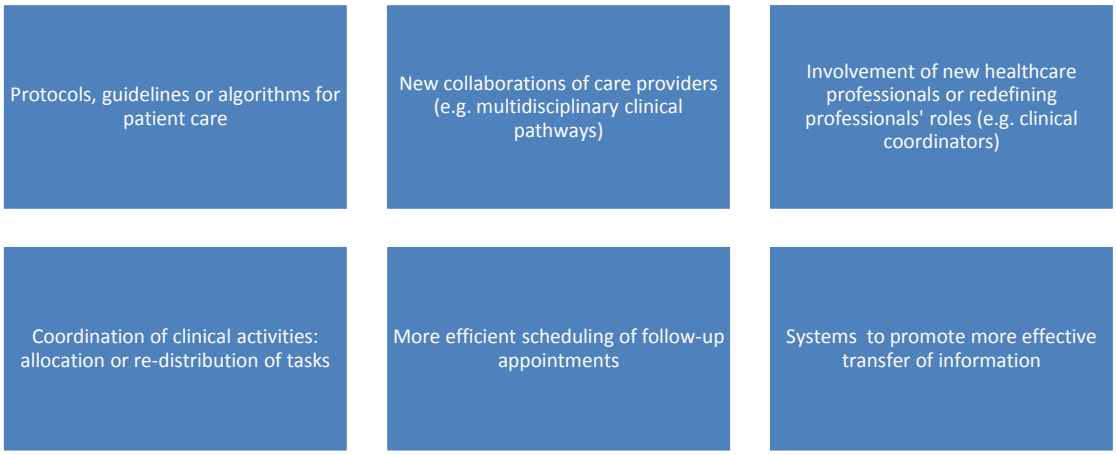
Although there is a lack of consensus with regards to the definition and underlying concepts of integrated care[483], it is generally implemented in response to the fragmentation of healthcare services, and with the aim of improving continuity or coordination of patient care[484,485]. Integrated care models can be delivered at three

distinct levels: organisational (integration of healthcare delivery systems), population (integrated care for people with the same condition or diseases) and individual (integrated care for individual service users and their carers)[486]. In the context of this thesis, it is appropriate to consider integrated care models that are delivered at the level of populations with specific diseases, since this concept is most relevant to the development of a complex intervention for patients with TIA. Integrated care interventions at this level may also be termed 'disease management' (interventions for populations with a specific condition) or 'case management' (interventions for populations with multiple conditions)[487]. The remainder of this chapter will therefore use the term 'integrated care programmes' to refer to population-level interventions, including 'disease management' and 'case management'.

Integrated care programmes are generally underpinned by organisational changes that promote a systematic approach to patient care[485]. Accordingly, in line with the categorisation of organisational interventions developed by Wensing[354], integrated care services have been defined in this thesis as 'organisational interventions, to include disease or case management programmes, where patient care follows protocols for screening, education and treatment/monitoring' (see Chapter 5, section 5.3.1). Numerous forms of organisational change may be applied in integrated care and these are shown in Figure 8-2[485,488,489]. In addition to organisational change, integrated care programmes frequently contain additional components that are directed towards healthcare providers (education, reminders, financial incentives and feedback) or patients (education, reminders and financial incentives)[489]. However, a discussion of the effectiveness of individual components of integrated care

programmes is beyond the scope of this thesis: these have been evaluated in systematic reviews by Ouwens et al[485] and Weingarten et al[489]. Recommendations for further research to establish the optimal components of an integrated care intervention for patients with TIA are outlined in section 8.6.2.

Figure 8-2: Organisational components of integrated care interventions[485,488,489]



8.4.1. Understanding and optimising an integrated care intervention

The key findings from this thesis (see section 8.2), and insights gained from relevant literature (see section 8.3), suggest that a consideration of subject positioning in the context of integrated care programmes could facilitate a greater understanding of intervention effects. Furthermore, it is possible that this understanding could be used as a means of moderating the effects of such programmes (although this would need to be tested empirically).

Consideration of the discursive subject positions adopted by individuals with TIA could be helpful to intervention design in two ways. Firstly, discursive insights could be used

to explain the effects of an intervention more fully. As discussed in section 8.2, integrated care interventions may only be effective for individuals who position themselves as 'patients' following a TIA (i.e. integrated care may be limited in its application to a subset of TIA patients). Thus, the identification of 'resistant' subject positions through the qualitative study may facilitate a greater understanding of intervention effectiveness and/or acceptability.

Secondly, discursive insights could be directly linked to an intervention[185]. Since this thesis does not provide a perspective on this issue, it is necessary to refer to relevant literature in order to generate some suggestions as to how this could be achieved in practice. Therefore, the remainder of this section will consider broader literature in order to make suggestions for intervention development that are consistent with the integration of key findings from this thesis (section 8.2).

(I) Applications of discourse analysis in healthcare interventions

This thesis is not the first study to suggest that healthcare interventions could be informed by the findings from discourse analysis[228,454,457,490,491]. In particular, researchers have argued that discourse analysis is of direct relevance to facilitating interactions between patients and healthcare professionals[228,490,491]. From a discourse perspective, medical consultations can be "conceived as relational and structural…this could help to perceive consultations from a new angle"[492]. For example, Robertson et al recommended that an understanding of discursive features in the context of doctor-patient interactions "suggests that better ways of identifying, and reflecting upon, how participants' talk contributes to the complex process of the consultation

would be useful in communication skills training for health professionals"[228 (p91)].

Findings from discourse analyses have also been used to design practical interventions for use in healthcare settings. For example, Roberts et al designed a training video for doctors in order to help them to manage interactions with patients from different language and cultural backgrounds[493]. The authors of this study state that the video contained examples of research data "which provides trigger material for understanding misunderstandings and gives examples of how these can be prevented and repaired"[493 (p471)]. McKenzie and Monk have also described how trainee therapists learned to identify the discursive positions that were adopted by themselves and their patients[185,494]. However, no studies could be located that have rigorously evaluated interventions informed by discourse analysis in order to establish their effectiveness. Nevertheless, in order to apply the insights obtained from the qualitative study described in this thesis, it is necessary to consider how discourse analysis findings could be utilised in the particular context of integrated care.

(II) Facilitating subject repositioning in the context of integrated care interventions

While there are no formal theoretical models that directly link discourse theory to behaviour change, Willig suggests that interventions could be informed by the 'positioning theory' that was initially developed by Davies and Harré in 1990[182,185]. Davies and Harré assert that "with positioning, the focus is on the way in which the discursive practices constitute the speakers and hearers in certain ways and yet at the same time is a resource through which speakers and hearers can negotiate new

positions"[182]. Thus, it can be deduced that discursive strategies could be used during consultations in an integrated care intervention in order to "facilitate empowerment through repositioning of the subject…to open up spaces for resistance to limited positionings and their associated practices"[457 (p152)]. More specifically, the findings from this thesis suggest that it may be beneficial for some individuals with TIA to move from 'resistant' subject positions and adopt arguably more empowering 'patient' subject positions. For example, the qualitative study demonstrated that the use of an 'expert patient' repertoire appeared to be empowering for some participants since it enabled them to gain control over the management of stroke prevention (see Chapter 7, section 7.7.1).

Subject repositioning could be facilitated in several ways within an integrated care intervention. For example, healthcare professionals could be trained to recognise particular subject positions adopted by individuals during consultations (e.g. disclaiming 'patient' subject positions to justify non-adherence to medication) and to use these as cues to open up new discursive possibilities[185]. Alternatively, peer support could be employed as a means of facilitating subject repositioning. It has been suggested that patients could learn from others who manage the same condition effectively, since this may help them to access more empowering subject positions[454,480]. Thus, contact with other service users may enable individuals to 'navigate' between different subject positions. Nonetheless, further research is required to determine whether peer support interventions would be feasible among individuals with TIA, and to establish whether these could provide access to more empowering subject positions in practice.

However, there is currently no evidence to demonstrate that interventions aiming to facilitate subject repositioning are feasible or effective. It may be that some individuals who adopt a 'resistant' position following a TIA cannot be recruited to 'patient' positions. Furthermore, the application of discourse interventions in order to promote subject repositioning does present some ethical dilemmas[185,480]. The question has been raised of whether or not it is appropriate to improve health in a way that aims to change another person's subjectivity[185]. It should also be recognised that not all patients wish to be involved in shared decision making and self-management[224]. Therefore, it would be necessary to ensure that any intervention used in this context achieves a balance between enabling individuals to adopt more empowering subject positions (for example, by making an 'expert patient' repertoire more accessible to TIA patients) and recognising/supporting individuals' autonomous choices not to do so[434]. An alternative means of using knowledge of subject positioning to optimise integrated care interventions is described in the following section.

(III) Designing integrated care interventions around different subject positions and interpretive repertoires

While numerous qualitative studies have considered the experiences and preferences of stroke patients in order to inform healthcare interventions[495], few comparable studies have been conducted among TIA patients[183,184]. This thesis therefore contributes to an under researched area by exploring these issues in people who have experienced a TIA. More specifically, this thesis has considered the possible impact of patient perspectives on integrated care interventions. A number of other studies have

looked at ways of incorporating patients' preferences into integrated care interventions[496-498]. For example, focus groups have been used to elicit patients' preferences on lifestyle and pharmacological measures, and shared decision making, in the context of integrative care[498]. However, studies exploring patient preferences tend to view these as stable cognitive representations. This thesis provides an alternative perspective on the issue of preferences, by suggesting that it is necessary to understand and consider how these are affected by socially constructed subject positions and interpretive repertoires.

Knowledge of subject positions could be used to optimise integrated care by recognising that a universal intervention approach is unlikely to be effective for all individuals. Instead, it may be necessary to provide a range of service delivery models to enable patients to choose between those that best meet their needs or preferences. Integrated care has previously been defined in the following way: "patient care that is coordinated across professionals, facilities, and support systems; continuous over time and between visits; tailored to the patients' needs and preferences; and based on shared responsibility between patient and caregivers for optimizing health"[499 (p113)]. Thus, as a consequence of promoting shared responsibility between patients and healthcare professionals, it can be argued that integrated care interventions tend to reinforce the use of 'expert patient' repertoire. It is the promotion of a single, universal patient repertoire that is problematised by the findings of this thesis. It is unlikely that all individuals can be persuaded to adopt a 'patient' subject position or to draw upon an 'expert patient' repertoire. Consideration of the key findings from this thesis suggests that, in the context of

integrated care interventions, it is important not to overlook those who deliberately decide to position themselves by drawing upon 'passive' patient repertoires (e.g. the 'sick role' repertoire), a finding that is also supported by other literature[209,448]. The consequences of this for intervention design are discussed in sections 8.5.1 and 8.5.2.

8.5. In summary: outlining an intervention to optimise secondary stroke prevention following a TIA

In summary, a number of initial principles for the design of a complex intervention can now be outlined. The active intervention should take the form of an integrated care programme to target multiple stroke risk factors in patients who have experienced a TIA. A consideration of findings from this thesis (see section 8.2), in addition to the wider literature relating to successful components of integrated care programmes (see section 8.4), indicate that this intervention could potentially include the following elements:

- Employment of a clinical coordinator to assess patients' needs and coordinate care
- Delivery of comprehensive patient education on the topic of secondary stroke prevention
- Scheduling of regular follow-up appointments
- Development of protocols to facilitate implementation of RCP guidelines

In addition, the following moderating factors have been identified that could potentially improve the effectiveness of an integrated care programme. However, further empirical evidence is required to establish the effectiveness of these

components (see section 8.6.2):

- Provision of financial incentives for local general practices: e.g. linking financial incentives to the attainment of RCP targets
- Discourse training for clinicians: this could include the development of training packages on the performative actions of language during medical consultations (e.g. guidelines or video training) to enable clinicians to map subject positions and tailor care accordingly
- Establishment of peer support for patients with TIA

8.5.1. Adapting an integrated care programme

The qualitative study provided insights into the relationship between participants' use of discourse and the secondary prevention practices that this may facilitate or inhibit (see Chapter 7). The integrated findings from this thesis indicate that these insights should be incorporated into the development of a complex intervention. Therefore, this section will consider how the design of an integrated care intervention could be adapted to account for the influences of broader socio-cultural discourses on secondary stroke prevention following a TIA.

In summary, it is recommended that at least two variations of the intervention should be developed in accordance with the insights obtained from the qualitative study. More specifically, the integrated care intervention should be tailored to meet the needs of individuals who draw upon two contrasting interpretive repertoires ('expert patient' and 'sick role' repertoires) when positioning themselves as 'patients' following a TIA. Additionally, consideration should be given to the moderating effects

of ‘resistant’ subject positions on intervention effectiveness.

To achieve these aims, certain elements of an integrated care programme, such as patient education sessions and consultations, could be systematically varied in terms of their frequency, length and content. Additionally, healthcare professionals responsible for intervention delivery could adapt their communication styles in response to the different discourses that patients draw upon. Informed by the findings of the qualitative study, healthcare professionals could be encouraged to consider whether patients’ talk is indicative of particular subject positions or interpretive repertoires. By becoming attentive to the discourses employed by patients, healthcare professionals may be able to respond in ways that facilitate secondary prevention by opening up opportunities for patients to access more empowering subject positions[457] (i.e. positions of agency and expertise) in relation to secondary stroke prevention. Alternatively, healthcare professionals could consider adapting their communication styles to meet the needs of individuals with preferences for drawing upon more ‘passive’ patient repertoires (e.g. the ‘sick role’ repertoire). Thus, an understanding of the performative actions of language could enable healthcare professionals to establish patients’ preferred roles in the management of secondary stroke prevention and to tailor care accordingly.

Individuals should be provided with the opportunity to choose between the two variations of the intervention in a way that best meets their needs and preferences. Additionally, it may be beneficial for a clinical coordinator (for example, an experienced nurse or patient educator), with knowledge of the discursive constructs identified through the qualitative study, to facilitate this process by advising and

guiding individuals towards the most appropriate variant of the intervention, as required. It may be appropriate to provide patients with opportunities to talk about their treatment preferences so that allocation to the most appropriate variation of an integrated care programme can be made on an individual basis. As discussed in section 8.2, integrated care may not be appropriate for individuals who adopt a 'resistant' position. However, a clinical coordinator may be able to identify the specifics of what is being resisted in order to provide opportunities for patients to access potentially more empowering subject positions. In this way, individuals could be enabled to take up alternative positions of agency in relation to stroke prevention. For example, a focus on enabling healthy lifestyle behaviour could represent a "less pathologising" [185 (p136)] alternative to medication adherence among some individuals who resist 'patient' positions.

8.5.2. Adapting delivery of patient education

The findings from this thesis indicate that it would be beneficial to incorporate comprehensive patient education into an integrated care program for patients with TIA (see section 8.2). Models of structured patient education could provide a framework to guide the development of a patient education programme. In the context of chronic disease, several structured education interventions have produced improvements in patient outcomes when evaluated in RCTs (e.g. DESMOND programme[210]; X-pert patient programme[213]; Expert Patients Programme[205,500]). For example, DESMOND is a programme of structured patient education that is implemented across the UK in the context of diabetes care[210,211]. The patient education modules are delivered by educators (healthcare professionals who attend

training programmes). A randomised controlled trial has demonstrated that a single DESMOND education session, when compared with usual care, produced significant improvements in body weight (mean difference, −1.01 kg; 95% CI −1.91 to −0.12), self-reported smoking cessation (OR 3.56; 95% CI 1.11 to 11.45) and cardiovascular risk scores ($p < 0.002$) after 12 months[210]. Although these benefits were not maintained in a follow-up study conducted after three years, the trialists hypothesise that modification of programme delivery (in terms of intervention frequency and contact time) may be required to sustain the programme benefits[211].

Structured education programmes implemented in the context of chronic disease are generally based on discourses of patient empowerment and self-care that function to convey a greater responsibility to patients for the management of their health (see Chapter 2, section 2.3.2). The provision of these programmes rests on the assumption that lay people will want to engage with health-related information and adhere to recommended self-management strategies. Based on the findings from this thesis, it can be argued that educational approaches based upon the DESMOND philosophy are likely to be effective for a subset of individuals with TIA who can be recruited to draw upon an 'expert patient' repertoire. Thus, it is recommended that one variation of an integrated care intervention should adapt and incorporate an existing patient education programme that is based on the principles of patient empowerment (e.g. the DESMOND programme[210,211]).

As discussed above, structured education programmes for chronic disease tend to locate responsibility for health management with the individual, due to an emphasis on discourses of patient empowerment and self-care. However, the findings from this

thesis indicate that TIA patients are unlikely to be universally receptive to this approach; instead, it may be beneficial to provide an alternative means of delivering secondary prevention education that does not impose the use of an 'expert patient' repertoire. In consideration of individuals with a preference for drawing upon a 'sick role' repertoire following a TIA, one strategy might be for healthcare professionals to deliver patient education during consultations. For example, this could involve the provision of concise and tailored recommendations based on an assessment of patients' modifiable risk factors. Therefore, a second variation of an integrated care programme could involve the delivery of patient education during extended consultations.

In conclusion, this section has outlined some principles for the development of an integrated care intervention. However, further modelling and pilot work are needed to develop these suggestions before proceeding to a RCT (see section 8.6.2). In the context of future development work, consideration of the discourses employed in the context of secondary stroke prevention and TIA may help to unpack the 'black box' of an intervention and account of some of the between-participant variation in effectiveness or acceptability.

8.6. Recommendations for future research

8.6.1. Future research on the topic of secondary stroke prevention

This thesis has addressed several under researched areas in relation to the topic of secondary stroke prevention following TIA. The three component studies have provided insights into (1) the quality of secondary prevention measures in a local population of TIA patients; (2) the effectiveness of different models of stroke service

interventions for the secondary prevention of stroke; (3) the barriers and facilitators to stroke prevention that are relevant to the perspective of TIA patients. However, there remain some limitations in the coverage of this mixed methods thesis. Future research could contribute to the broader literature on barriers and facilitators to secondary stroke prevention in order to develop a more comprehensive theory and evidence base to inform complex intervention development. For example, the findings from the three component studies in this thesis may be inadequate to understand contextual barriers and facilitators to secondary stroke prevention. The conceptual model developed in section 8.2 would therefore benefit from several areas of future research:

- Further qualitative research is required to explore the perspectives of general practitioners and practice nurses in relation to the topic of secondary stroke prevention. For example, RCP targets may not be achieved because of clinical constraints, gaps in professional knowledge, or a lack of financial incentives.
- The sample for qualitative study described in Chapters 6 and 7 consisted of mainly White British individuals, and an ability to speak English was a requirement of participation in the study. There is scope to explore the perspectives of other ethnic groups and individuals who are unable to speak English. Further qualitative research would enable intervention development to be responsive to more diverse cultural and linguistic needs.
- Several patient-related factors were not explored through research in this thesis (e.g. age, ethnicity and socioeconomic status) and may need to be integrated into a conceptual model of barriers/facilitators to stroke prevention following a TIA.

Further research is required to explore this.

- Qualitative research involving observations of clinical consultations (e.g. an ethnographic study) is required to explore other factors that could potentially influence secondary stroke prevention, such as interactional barriers or facilitators. Additionally, consideration of the discourses drawn upon during clinical consultations, using a discursive psychology approach, would enable comparison with the discursive features identified in Chapter 7.

8.6.2. Future research to inform intervention development: modelling and pilot work

The findings from this thesis have identified broad principles for the design of a complex intervention. The intervention should take the form of an integrated care intervention for patients with TIA. Further, the intervention should be optimised by considering the likely impact of subject positioning. According to the MRC framework for complex interventions, modelling and pilot work are required to inform areas of uncertainty with regards to intervention development. Future research can be recommended to correspond with four main areas of uncertainty arising from the work presented in this thesis:

- Research to determine the optimal components of an integrated care intervention (see section 8.4). This may involve several areas of investigation: qualitative research to explore the perspectives of a range of stakeholders (e.g. patients and their carers, healthcare professionals, academic researchers); a review of literature relating to the effectiveness of specific components of integrated care programmes; identification of theoretical frameworks to guide the selection of

specific components and provide a rationale for expected intervention effects. Additionally, tools such as the MOST framework offer a pragmatic method of optimising intervention components through the use of randomised experiments[62,501].

- Research to evaluate the feasibility and effectiveness of integrated care interventions for patients who have experienced a TIA. The findings from this thesis suggest that that integrated care/patient education may not be effective for a subset of individuals with TIA who resist positioning themselves as 'patients'. It is not possible from this mixed methods study to quantify the subset of individuals for whom this approach might be acceptable or problematic. Thus, it is likely that this discrepancy can only be identified and addressed with further modelling/pilot work to explore whether these facilitators are acceptable to a wide spectrum of patients. Furthermore, it may be possible to pilot a variety of interventions models (in terms of design and intensity) in order to identify acceptable delivery models for this group of patients.
- Research to evaluate the feasibility and effectiveness of discourse training programmes for healthcare professionals. This could include the development of training packages on the performative actions of language during consultations (e.g. guidelines or video training). Although such programmes have been reported in the literature[491], no research studies could be identified that have rigorously evaluated training programmes of this type. The findings from this thesis suggest that, if successful, discourse training programmes may help to optimise integrated care interventions.
- Research to adapt the content of an existing structured patient education

programme, based on the principles of patient empowerment, for use in patients who have experienced a TIA. As discussed in section 8.5.2, a structured education programme is expected to be beneficial for individuals who can be recruited to draw upon an 'expert patient' repertoire.

Theoretical considerations

Once the components of the intervention are selected, further development work (modelling) is required to determine the likely processes/mechanisms by which intervention components impact upon outcome measures. According to the MRC framework, interventions are more likely to be successful if they are developed using a coherent theoretical basis[62]. A Chronic Care Model (CCM) model developed by Wagner is often cited as conceptual framework to guide the development of integrated care programmes for patients with chronic disease[502]. This model identifies six elements that contribute to effective patient care: community resources and policies; healthcare organisation; self-management support; delivery system design; decision support; and clinical information systems[502]. It is proposed that improvements in any of these interrelated elements will lead to more "activated patients" who "interact with prepared, proactive practice teams"[502 (p1775)]. Empirical evidence supports the conclusion that interventions based on the CCM lead to improvements in health outcomes[503]. However, although components of integrated care programmes are expected to address elements of Wagner's model, this does not provide a comprehensive explanatory theory to describe how changes in organisational delivery or patient education are expected to lead to improvements in health outcomes. Many have called for a theoretical framework to specifically guide

integrated care interventions[483,504,505]. In response to this, Lemmens has gone on to define a theoretical framework for integrated care programmes that include patient-related interventions, professional-directed interventions and organisational interventions[505]. A further conceptual approach has been developed by Norris et al[506]. The theoretical frameworks developed by Lemmens et al[505] and Norris et al[506] may therefore inform future modelling work following from the findings of this thesis.

8.6.3. Future research to develop the MRC framework

This thesis has illustrated the application of mixed methods research in the context of the MRC framework for developing and evaluating complex interventions[62]. The MRC framework provides no guidance on the design, implementation and integration of mixed methods research. However, these issues require careful consideration if the benefits of mixed methods research in this context are to be realised. In particular, the challenges highlighted within this thesis suggest that it would be beneficial to conduct future research to inform specific methodological developments in the MRC framework:

- Research into the development of standardised methods for incorporating patient or stakeholder perspectives into complex intervention development
- Research into the development of methods to deal with inconsistent or divergent research findings, based on the philosophy of pragmatism[285]

Additionally, the following material could be usefully incorporated into future updates of the MRC framework to enhance its application in the context of mixed methods research:

- Guidance on the development of mixed methods research designs, based on the philosophy of pragmatism [285]
- Exemplars to illustrate the design, execution and integration of mixed methods research in the context of complex intervention development
- A discussion of methods for establishing rigor in relation to the design, execution and integration of mixed methods research
- An overview of available techniques for integration of data sources in mixed methods research; provision or recommendation of a tool to guide integration of evidence and theory.
- Guidance to standardise the reporting of complex intervention development in research publications

8.7. Strengths and limitations of the overall programme of work

The three component studies of this thesis were located within the most appropriate paradigm for each particular research question (see Chapter 3, section 3.4). Therefore, the strengths and limitations of each component study were evaluated according to underlying paradigm criteria for rigour/trustworthiness, and this has been discussed in the relevant earlier chapters. It has been observed that some mixed method studies assign a disproportionately large weighting to the contribution of quantitative studies (i.e. positivism is regarded as the dominant paradigm)[308]. However, this runs the risk of qualitative research being devalued. This thesis therefore sought to give equal weighting to quantitative and qualitative components. The integration of mixed methods research in this thesis related the conclusions of each study together in a balanced way that included a consideration of divergent

findings. It can be argued that these approaches strengthen the conclusions produced by the overall programme of work[280,287,324]. This thesis has also identified numerous barriers to the integration of mixed methods research in the context of complex intervention development. These observations highlight the lack of practical guidance provided by the MRC framework with regards to the integration of theory and evidence during the development phase. This has some implications for the future development of the MRC framework in terms of a need to incorporate clearer guidance on this issue.

8.8. Chapter conclusion

The 2012 RCP National Clinical Guideline for Stroke recommends that patients with a history of TIA should be given information about stroke risk factors, secondary prevention medications and lifestyle measures in order to reduce their risk of secondary stroke[11]. This guideline also recommends that patients should receive regular medication review and risk factor monitoring in primary care ("at a minimum on a yearly basis")[11 (p62)]. In the context of other chronic diseases such as diabetes, well-established service delivery models for optimising secondary prevention and cardiovascular risk reduction have been developed and implemented across the UK[210,213]. However, organised models of service delivery for the management of secondary stroke prevention are not generally available for TIA patients.

This chapter has revisited the conclusions from the research studies contained within this thesis and related them back to the principal objective of developing a complex intervention for optimising stroke prevention in patients who have experienced a TIA.

The application of mixed methods research in this context enabled different research approaches to be implemented independently, in order to generate a broad perspective on the barriers and facilitators to secondary stroke prevention. An integration of key research findings enabled inferences for intervention development to be consistent with the overall programme of work.

The findings from this thesis indicate that an integrated care intervention should be implemented to improve secondary stroke prevention following a TIA. Additionally, the findings have highlighted the moderating effects of patient discourses on the uptake of secondary prevention recommendations. This led to the recognition that a universal approach to integrated care is unlikely to be the most effective delivery strategy. Consequently, this chapter has used insights from the qualitative study to generate some preliminary recommendations for the adaption of an integrated care intervention. Additionally, this chapter has outlined a number of specific suggestions for future modelling and pilot work to select and refine intervention components.

The application of mixed methods research in this thesis has also informed some recommendations for the future development of the MRC framework for complex interventions[62]. MRC guidance for the development of complex interventions progresses directly from the consideration of relevant evidence and theory (identifying the evidence base; identifying/developing appropriate theory) to the optimisation of an intervention (modelling processes and outcomes)[62]. The process of integrating empirical evidence and theory, and mapping this to intervention design, is not addressed by the MRC framework. Mixed methods research has to potential to optimise the development of complex interventions by enabling multifaceted

research problems to be addressed. However, effective integration and mapping processes are required if the benefits of mixed methods research in this context are to be realised. To facilitate this process, this thesis has outlined a number of suggestions for the future development of the MRC framework.

Appendices

List of appendices

Appendix A: Documentation relating to the TIA audit study

- Data collection form
- Letter to primary care practices
- Results letter

Appendix B: Documentation relating to the systematic review

- Assessment of eligibility and data collection form
- Characteristics of Included Studies
- Characteristics of Ongoing Studies
- Characteristics of Studies Awaiting Classification
- Characteristics of Excluded Studies
- Data and analyses
- RevMan graphs (forest plots)
- Medline search strategy

Appendix C: Documentation relating to the qualitative study

- Patient invitation letter
- Patient information sheet
- GP letter
- Patient consent form
- Interview topic guide

Appendix D: Publications relating to the work detailed in this thesis

- List of published manuscripts

Data Collection Form

Date of completion			/			/		

Patient D.O.B.			/			/				Male ☐	Female ☐

	Not documented in last 2 years	Date of most recent check or advice in last 2 years	Results
Blood pressure **documented**	☐	/ /	Systolic / Diastolic
Exercise advice **documented**	☐	/ /	
Dietary advice **documented**	☐	/ /	
BMI **documented**	☐	/ /	BMI value .
Waist:hip measurement ratio **documented**	☐	/ /	Waist-hip measurement ratio .
Smoking status **documented**	☐	/ /	Current Smoker ☐ — If smoker, cessation advice given? Yes ☐ No ☐
			Non-smoker ☐
Current medications prescribed: Please **attach a print-out of repeat prescriptions**	☐ **Print-out attached to this form (stapled)** please remove patient's name, address & NHS number		
Documented that patient buys aspirin over-the-counter	Yes ☐	No ☐	

ID number

University of Leicester

School of Medicine

University Hospitals of Leicester NHS
NHS Trust

Date

Address

Return address

Dear Healthcare Professional,

We are conducting an audit of patient risk factor control and medical management following Transient Ischaemic Attack (TIA). Further details about the audit have been enclosed in a separate information sheet.

We would be grateful if you could find time to fill in the attached data collection form, for **one TIA patient (named below),** which should take approximately **5 minutes** to complete. The completed form should be detached from this letter and returned to us in the freepost envelope provided, along with a **print out of the patient's repeat prescriptions.** To maintain confidentiality, please remove the patient's name, address and NHS number from the repeat prescription form or block out these details using a marker pen.

If you have any questions about the audit please contact Kate Lager (tel) or Professor Andrew Wilson (email).

We would be most grateful for your support.

Yours Sincerely,

(Names of research team members)

Please complete data collection forms for the following patient:

Name of patient		D.O.B.	

University of Leicester
School of Medicine

University Hospitals of Leicester NHS
NHS Trust

Date
Practice address

Return address

Dear Healthcare Professional,

In 2010/2011 we carried out an **audit of patient risk factor control and medical management following Transient Ischaemic Attack (TIA)**. The audit was approved by Leicester City PCT and Leicestershire County and Rutland PCT. A sample of TIA patients were identified from the Leicestershire TIA clinic and follow-up data were requested from general practices. We are very grateful to the general practices that provided data for this audit. The purpose of this letter is to provide a summary of the audit results along with an update on nationally accepted guidelines. We intend to conduct further research into improving patient outcomes following TIA.

Summary of audit results

The full report can be accessed at: http://pmj.bmj.com/content/early/2012/03/19/postgradmedj-2011-130484.full
An associated editorial can be accessed at: http://pmj.bmj.com/content/88/1040/303.extract

Objective **Pharmacological and lifestyle interventions are recommended for the reduction of stroke risk in people who have had a transient ischaemic attack (TIA). This study aimed to investigate the quality of secondary stroke prevention in primary care following diagnosis of TIA in a specialist clinic.**

Methods **Quality standards were identified from the Royal College of Physicians (RCP) national clinical guideline for stroke and the general practice Quality and Outcomes Framework (QOF) indicators. Patients who were diagnosed with TIA between February and October 2009 were identified from a TIA clinic database. Achievement of quality standards was assessed 12–24 months following clinic attendance.**

Results **General practices were sent structured data collection forms for 233 patients, and the response rate was 80% (n=186). Complete data were available for 163 eligible patients (70%). Overall, 94% were prescribed antithrombotic medication. QOF standards were achieved by 82% for blood pressure (≤150/90 mm Hg) and 61% for total cholesterol (≤5.0 mmol/l). RCP standards were achieved by 35% for blood pressure (≤130/80 mm Hg) and 28% for total cholesterol (<4.0 mmol/l). RCP standards for the provision of dietary and exercise advice were achieved by 29% and 34% of patients, respectively.**

Conclusion **Only a minority of TIA patients achieved RCP standards whereas QOF standards were generally well achieved. Substantial benefits in terms of stroke prevention stand to be gained if risk factors are managed in line with more stringent RCP standards.**

The third edition of the National clinical guideline for stroke (2008) outlines the current 'gold standard' recommendations for the secondary prevention of stroke. Primary care concise guidelines for stroke (2008) are available on the Royal College of Physicians website (http://bookshop.rcplondon.ac.uk/contents/eb8259b6-ba93-43c5-baa9-395ff5a46107.pdf). The guidelines state that the optimal blood pressure target for TIA patients is ≤ 130/80 mm Hg. Cholesterol targets are total cholesterol < 4.0 mmol/L *and* LDL cholesterol < 2.0 mmol/L. If you have any questions about the audit please contact Dr Amit Mistri or Kate Lager (email). We are most grateful for your support.

Yours Sincerely,

(Names of research team members)

Assessment of Eligibility

Study ID (RevMan)		Report ID(s)	

Eligibility Criteria	Yes	No	Comments
Randomised controlled trial[a]			If no, then exclude
Restricted participants to TIA or stroke patients, or reported outcomes separately for TIA or stroke patient subgroups			If no, then exclude
Evaluated a stroke service intervention[b]			If no, then exclude
Stated or clearly implied that the intention of an intervention was to improve modifiable risk factor control[c]			If no, then exclude
Follow-up duration => 3months			If no, then exclude
Assessed one or more of the defined outcome measures[d]			If no, then exclude
Contained any of the following interventions: ○ Physical rehabilitation programs ○ New pharmacological therapies, surgical procedures ○ Exercise training programs ○ Educational programs intended to improve knowledge of stroke in general			*If yes, then exclude*

If study to be **excluded**, record the main reason why (to be entered into the 'Characteristics of Excluded Studies' table) **Do not proceed to data extraction**

Notes

a: Include published or unpublished RCTs. Parallel group trials, cluster-randomised trials and cross-over trials are all included.

b: Stroke service interventions are defined as alternative models of care that are implemented in order to improve patient outcomes following stroke or TIA. We will include **educational** and **behavioural** interventions for stroke service providers or patients. This review will also include the following categories of **organisational** interventions[354]:

- Revision of professional roles, e.g. involvement of non-physician staff in prevention clinics;
- Collaboration between multidisciplinary teams, e.g. interventions promoting effective liaison between primary and secondary care teams;
- Integrated care services, e.g. disease and case management programs;
- Knowledge management systems, e.g. computerised decision support on medication prescribing, shared medical records;
- Quality management, e.g. guideline and protocol development;
- Financial incentives, e.g. Quality and Outcomes Framework[71]

c: In the context of this review, 'modifiable risk factors' for stroke include:

- Clinical conditions (hypertension, hyperlipidaemia, atrial fibrillation, diabetes and obesity);
- Lifestyle factors (smoking, physical inactivity, unhealthy diet and excess alcohol consumption);
- Patient non-adherence to secondary prevention medications.

d: **Primary outcomes**

- Quantitative changes (or target achievement) in blood pressure, lipid profile (total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL), triglycerides), glycaemic control in diabetes mellitus (Hb1Ac), body mass index (BMI) or validated cardiovascular risk score.
- Any indicator of patient adherence to secondary prevention medications, e.g. self-reported medication adherence or medication persistence, medication possession, individual patient data on prescriptions, pharmacy claims, electronic monitoring, drug tracers in blood or urine.

Secondary outcomes

- Secondary cardiovascular events: stroke, myocardial infarction or vascular death.

Protocol: http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD009103/pdf_fs.html

Data Extraction Form

General Information

Study ID (RevMan)		Report ID(s)	
Date of extraction		Reviewers initials	

Title of report	
First author	
Published/ unpublished	
Journal/source	
Type of report (e.g. full paper/abstract)	
Publication date	
Country of origin	
Publication language	
Funding source	
Author contact details	
Citation	

Copy and paste this table if data from other reports (including conference abstracts) have been collated in data extraction form

Study Methods

Type of RCT	Parallel ☐	Cluster ☐	Other: state ☐
Total number of arms	1 ☐	2 ☐	Other: state ☐
Total number of relevant arms	1 ☐	2 ☐	Other: state ☐
Unit of randomisation *(e.g. individual patient, healthcare professional, general practice)*			
<u>Questionnaires</u> If questionnaire used: describe evidence of validity e.g. • validation in current study; • statement about previous validation [provide reference]			
<u>Scales</u> If scales used: describe upper and lower limits, and whether high or low score is good			
Method of analysis *(e.g. intention-to-treat; per protocol)*			
Statistical methods used to deal with missing data			

Relevant subgroup analyses reported (within-trial subgroups)	☐ None ☐ Patient age (under 65 years, 65 years and over) ☐ Condition (ischaemic stroke, haemorrhagic stroke or TIA) ☐ Stroke severity (e.g. according to NIHSS) or disability (e.g. according to Barthel score or modified Rankin score)

Participants

Method of sampling *(e.g. random or convenience)*			
Location (e.g. UK)			
Place of recruitment *(e.g. general practice, acute care hospital, emergency department)*:			
Number of randomised patients	Intervention group:	Control group:	Total:
Total number lost to attrition (%):	Intervention group:	Control group:	Total:
Total number excluded from analysis (%):	Intervention group:	Control group:	Total

% completing final follow-up	Intervention group:	Control group:	Total:
Reasons for attrition/ exclusion:			
Inclusion criteria			
Exclusion criteria			
Method used to diagnose stroke/TIA			
% with ischaemic stroke/ haemorrhagic stroke/ TIA			
Age: *mean (SD)*			
Gender: *% male*			
Ethnicity			
Socioeconomic or sociodemographic status			
Stroke severity *(e.g. according to NIHSS)* or disability *(e.g. according to Barthel score or modified Rankin score)*			
Co-morbidities			
Similarity between groups at baseline			

Intervention(s)

For each intervention and comparison group of interest:

Intervention protocol	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): LOCATION: MODE OF DELIVERY: PERSONNEL RESPONSIBLE FOR DELIVERY: TIMING POST-STROKE:	
Control protocol: *(describe the characteristics of usual care where this information is available)*		
Aim of the intervention	Secondary prevention is the main aim of the intervention ☐ Details:	Secondary prevention is a minor aim of the intervention ☐ Details:
Risk factor management strategy *(e.g. blood pressure lowering)*		

Outcomes

Box 1: Outcomes relevant to the review

Primary outcomes:

- Quantitative changes (or target achievement) in blood pressure, lipid profile (total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL), triglycerides), glycaemic control in diabetes mellitus (Hb1Ac), body mass index (BMI) or validated cardiovascular risk score.
- Any indicator of patient adherence to secondary prevention medications, e.g. self-reported medication adherence or medication persistence, medication possession, individual patient data on prescriptions, pharmacy claims, electronic monitoring, drug tracers in blood or urine.

Secondary outcomes:

- Secondary cardiovascular events (stroke, myocardial infarction or vascular death)

Results for CONTINUOUS outcomes relevant to the review (see Box 1):

Outcomes	Results: Intervention group						Results: Control group						Difference between groups						Reported estimate of effect with confidence interval; P value	Notes/ Additional data/ Missing data$	Method of measuring
	Mean*	SD*	SE	LCL	UCL	Total‡	Mean	SD	SE	LCL	UCL	Total‡	Mean*	SD*	SE	LCL	UCL	Total‡			
Systolic blood pressure (mmHg) Baseline																					
Time point:																					
Change (time point):																					
Diastolic blood pressure (mmHg) Baseline																					
Time point:																					
Change (time point):																					
Total cholesterol (mmol/L) Baseline																					
Time point:																					
Change (time point):																					
LDL (mmol/L) Baseline																					
Time point:																					
Change (time point):																					
HDL (mmol/L) Baseline																					
Time point:																					

Change (time point):																					
Triglycerides (mmol/L) Baseline																					
Time point:																					
Change (time point):																					
Hb1Ac (mmol/mol) Baseline																					
Time point:																					
Change (time point):																					
BMI (kg/m^2) Baseline																					
Time point:																					
Change (time point):																					
Cardiovascular risk score: 10 year CHD risk Baseline																					
Time point:																					
Change (time point):																					
Adherence: use of recommended medications (e.g. aspirin, stains, thiazide diuretics, beta-blockers, ACEIs/ARBs) Baseline																					
Time point:																					
Change (time point):																					

Results for DICHOTOMOUS outcomes relevant to the review (see Box 1):

Outcomes (including outcome definition if relevant)	Intervention group			Control group			Reported estimate of effect with confidence interval; P value	Notes/ Additional data/ Missing data$	Method of measuring
	Events^	Total‡	%	Events^	Total‡	%			
Participants meeting blood pressure target **State target:_____mm Hg** Baseline									
Time point:									
Change (time point):									
Participants meeting total cholesterol target **State target:_____mmol/L** Baseline									
Time point:									
Change (time point):									
Participants meeting LDL target **State target:_____mmol/L** Baseline									
Time point:									
Change (time point):									
Participants meeting HDL target **State target:_____mmol/L** Baseline									
Time point:									
Change (time point):									
Participants meeting triglyceride target **State target:_____mmol/L** Baseline									
Time point:									
Change (time point):									
Participants meeting Hb1Ac target (mmol/mol) **State target:___(mmol/mol)** Baseline									
Time point:									
Change (time point):									
Participants meeting BMI target (kg)									

State target: (kg/m^2) Baseline									
Time point:									
Change (time point):									
Participants meeting Cardiovascular risk score target **State target:** Baseline									
Time point:									
Change (time point):									
Number of participants with combined cardiovascular risk factor control: **State targets:** Baseline									
Time point:									
Change (time point):									
Participants meeting adherence target **State target:** Baseline									
Time point:									
Change (time point):									
Number of participants with at least one secondary cardiovascular event Baseline									
Time point:									
Change (time point):									
Number of participants with at least one secondary stroke Baseline									
Time point:									
Change (time point):									
Number of participants with at least one secondary TIA Baseline									
Time point:									
Change (time point):									
Number of participants with at least one myocardial infarction									

Baseline									
Time point:									
Change (time point):									
Number of participants with vascular death Baseline									
Time point:									
Change (time point):									

Results for COUNT data relevant to the review (see Box 1):

Outcomes (including outcome definition if relevant)	**Intervention group**		**Control group**		Reported estimate of effect with confidence interval; P value	Notes/ Additional data/ Missing data$	Method of measuring
	Events	Total person-years of follow-up	Events	Total person-years of follow-up			
Number secondary cardiovascular events Time point:							
Number secondary strokes Time point:							
Number secondary TIAs Time point:							
Number myocardial infarctions Time point:							
Number vascular deaths Time point:							

Key:

* Report median (IQR) if mean (SD) not available

^ number of participants with the outcome

‡ total number of participants assessed

$ for cluster randomised controlled trials extract:

- the number of clusters the number of clusters (or groups) randomized to each intervention group; or the average (mean) size of each cluster
- Outcome data ignoring the cluster design for the total number of individuals (for example, number or proportion of individuals with events, or means and standard deviations)
- Estimate of the intracluster (or intraclass) correlation coefficient (ICC)

Methodological quality

Sequence generation (describe)		
DESCRIBE THE METHOD USED TO GENERATE ALLOCATION SEQUENCE:	**Risk of bias**	
	Low risk (random)	
	Unclear risk	
	High risk (e.g. alternate)	

Allocation sequence concealment (describe)		
	Risk of bias	
	Low risk	
	Unclear risk	
	High risk	

Method of blinding for OUTCOME ASSESSMENT (describe) Assessments should be made for each main outcome (or class of outcomes e.g. all subjective outcomes and all objective outcomes).		
	Risk of bias	
	Low risk	
	Unclear risk	
	High risk	

Incomplete outcome data (describe) Assessments should be made for each main outcome or each class of outcomes (e.g. all subjective outcomes and all objective outcomes).		
	Risk of bias	
	Low risk	
	Unclear risk	
	High risk	

Evidence of selective outcome reporting (describe)		
	Risk of bias	
	Low risk	
	Unclear risk	
	High risk	

Any other factors (describe)		
	Risk of bias	
	Low risk	
	Unclear risk	
	High risk	

Miscellaneous

Key conclusions of the study authors:
Miscellaneous comments from the study authors:
Miscellaneous comments by the review authors:
References to other relevant studies:
Correspondence required:

Characteristics of Included Studies

Adie 2010[400]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital stroke clinic and hospital neurovascular clinic NUMBERS RANDOMISED (TOTAL; I & C): total:56, I:29, C:27 % COMPLETING FINAL FOLLOW-UP: 100% INCLUSION CRITERIA: < 1 month since minor stroke or TIA; > 18 years; clinic SBP ≥140mmHg; living at home at time of follow-up EXCLUSION CRITERIA: known dementia, "significant disability or co-morbidity which would impair ability to consent or cause undue distress" TYPE OF STROKE: minor stroke (57%); TIA (43%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): 72.5(8.9) GENDER (% MALE): 50% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): motivational telephone follow-up intervention based on social cognitive theory. Participants received a 20 minute telephone call at 7 days, 1, 2 and 4 months to review risk factors, medication and goal setting; participants provided with tailored educational material; participants with high blood pressure encouraged to visit their GP LOCATION: community MODE OF DELIVERY: telephone follow-up PERSONNEL RESPONSIBLE FOR DELIVERY: one researcher TIMING POST-STROKE: < 1 month CONTROL: usual care (patients received instructions for follow-up with their general practitioner; no follow-up visits arranged in secondary care)
Outcomes	6 months Systolic BP (clinic and ambulatory); diastolic BP (clinic and ambulatory); total cholesterol; BP≤130/80 mm Hg; total cholesterol ≤4 mmol/L
General Information	COUNTRY OF ORIGIN: UK PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: LOW COMMENTS: definition of minor stroke not stated

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Envelope method: "participants were randomised …at the end of their first study visit (baseline; month 0) by sequential opaque envelopes stratified by stroke or TIA"
Allocation	Low risk	Envelope method

concealment (selection bias)		
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	All outcomes No missing outcome data
Selective reporting (reporting bias)	Low risk	Protocol available and outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Allen 2002[361]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital acute stroke department NUMBERS RANDOMISED (TOTAL; I & C): total:96, I:47, C:46 % COMPLETING FINAL FOLLOW-UP: 76% INCLUSION CRITERIA: Ischaemic stroke or TIA; discharged to home or short-term rehab facility (for < 1 month); no other illnesses that would dominate post-discharge care; Rankin scale score ≤3; EXCLUSION CRITERIA: Rankin score of 4 or 5; discharged to long-term care facility TYPE OF STROKE: ischaemic stroke (I:70%, C:71%); TIA (I:30%, C:29%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SE): I:69(1.7), C:72(1.5) GENDER (% FEMALE): I:57, C:54 ETHNICITY (% AFRICAN-AMERICAN): I:30%, C:20% SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): advanced practice nurse (APN) telephoned patients 3-7 days post-discharge to assess needs and deliver education; APN conducted home assessment within 1 month post-discharge; individualised patient care plans developed by interdisciplinary team using evidence-based recommendations; APN implemented treatment plan and conducted follow-up assessments;

	primary care physicians provided with care plans/evidence-based recommendations LOCATION: community MODE OF DELIVERY: home visits PERSONNEL RESPONSIBLE FOR DELIVERY: advanced practice nurse and interdisciplinary team TIMING POST-STROKE: discharge home CONTROL: usual care provided by primary care physician; PRE-DISCHARGE CARE (I & C):interdisciplinary care and stroke education
Outcomes	3 months BP: mean mm Hg BP > 140/90; proportion of participants rehospitalised for stroke
General Information	COUNTRY OF ORIGIN: US PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Patients were assigned to the intervention or to usual postdischarge care by drawing consecutive concealed tickets that were randomised within permuted blocks of 10"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Rehospitalisation for stroke Recording of events was blinded to group assignment Blood pressure "Some of the outcome measures were obtained by nurses who were not blinded to patient status" Review authors judge that objective outcomes included in this review are not likely to be affected by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Unclear risk	MISSING DATA NOT REPORTED BY GROUP ATTRITON:

		1 became cognitively impaired; 2 moved out of state; 3 moved to nursing home; 5 died; 12 refused follow up visit JUDGEMENT: not enough information to permit judgement (missing data not reported by group)
Selective reporting (reporting bias)	Unclear risk	Insufficient information (protocol not obtained)
Other bias	Low risk	The study appears to be free of other sources of bias

Allen 2009[401]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital acute stroke department NUMBERS RANDOMISED (TOTAL; I & C): total:380, I:190, C:190 % COMPLETING FINAL FOLLOW-UP: 84%-100% depending on outcome measure INCLUSION CRITERIA: ischaemic stroke; National Institutes of Health Stroke Scale (NIHSS) ≥1; discharged to home or short-term rehabilitation/nursing facility (for <8 weeks); no other illnesses that would dominate post-discharge care; English-speaking; no planned carotid endarterectomy TYPE OF STROKE: ischaemic (100%) DEMOGRAPHIC CHARACTERISTICS
	MEAN AGE (SE): I:68(1), C:69(1) GENDER (% MALE): I:48%, C:52% ETHNICITY (% AFRICAN AMERICAN): I:17%, C:15% SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS (% MARRIED): I:47%, C:46%
Interventions	INTERVENTION DETAILS: patients received home assessment at one week from advanced practice nurse (APN); individualised patient care plans developed by interdisciplinary team using evidence-based recommendations; ongoing care management provided by APN for 6 months (telephone contact every week for first month and monthly thereafter; home visits as needed; physical therapist visits arranged as needed; liaison with social services; patients provided with personalised health record and pill organisers for risk factor management); primary care physicians provided with care plans/evidence-based recommendations LOCATION: community MODE OF DELIVERY: home visits and telephone contact PERSONNEL RESPONSIBLE FOR DELIVERY: advanced practice nurse and interdisciplinary team TIMING POST-STROKE: discharge home CONTROL: usual care provided by primary care physician; received postal stroke-related educational materials every 2 months USUAL CARE BEFORE DISCHARGE (I & C): organised stroke department care with enhanced discharge planning. Involved physical and psychological evaluation using standardized assessment tools; initiation of

	appropriate medication; development of individualised discharge plan; discharge summary sent to primary care physician
Outcomes	6 months Systolic BP>140 mm Hg; diastolic BP>90 mmHg; total cholesterol > 180 mg/dL; Hb1Ac > 6.5%; proportion of participants on anticoagulant; proportion of participants using method for medication compliance
General Information	COUNTRY OF ORIGIN: US PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: stated intention to treat RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The randomisation sequence was by permuted blocks of fixed size (10) generated by study biostatisticians"
Allocation concealment (selection bias)	Low risk	"Group assignment was made by a research assistant using the sealed envelope method"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Outcome measurements were performed at a home visit (when possible) by a research nurse blinded to group assignment at 6 months post-discharge…some measurements were confirmed by review of hospital and PCP records"
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	---	---
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Unclear risk	MISSING DATA REPORTED BY GROUP BUT REASONS NOT FULLY DESCRIBED ATTRITON (DEPENDENT ON OUTCOME): I: range 0/90 to 25/190 (reasons unclear) C: range 0/190 to 36/190 (reasons unclear) JUDGEMENT: not enough information to permit judgement (reasons for missing data not

		provided)
Selective reporting (reporting bias)	Low risk	Examination of study reports suggests that all outcomes were reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Boter 2004[402]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: 2 university hospitals; 10 general hospitals NUMBERS RANDOMISED (TOTAL; I & C): total:536, I:263, C:273 % COMPLETING FINAL FOLLOW-UP: 91% INCLUSION CRITERIA: TIA, ischaemic stroke, primary intracerebral haemorrhage, or subarachnoid haemorrhage; Dutch-speaking; ≥ 18 years; first admission for stroke or TIA; hospitalisation within 72 hours after onset of symptoms; life expectancy > 1 year; Rankin grade 0 to 3; discharged home TYPE OF STROKE: TIA (I:9%, C:8%); ischaemic stroke (I:53%, C:55%); haemorrhagic stroke (I:10%, C:9%); subarachnoid haemorrhage (I:19%, C:19%) DEMOGRAPHIC CHARACTERISTICS MEDIAN AGE (IQR): I:66 (52 to 76), C:63 (51 to 74) GENDER (% FEMALE): I:51%, C:52% ETHNICITY (% AFRICAN AMERICAN): I:17%, C:15% SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS:
	Education level I: primary school or less - 24%, secondary school - 60%, higher education or university – 15, unknown - 1% C: primary school or less - 27%, secondary school - 58%, higher education or university - 15%, unknown <1% Living alone I:30%, C:26%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): patients and their carers received 3 telephone calls from a stroke nurse at 1-4, 4-8 and 18-24 weeks; patients received one home visit from a stroke nurse at 10-14 weeks; checklists used to address stroke risk factors, stroke consequences and unmet needs in terms of stroke services; nurses supported patients and carers according to their individual needs LOCATION: community MODE OF DELIVERY: home visits and telephone follow-up PERSONNEL RESPONSIBLE FOR DELIVERY: stroke nurses trained for two days on "secondary prevention of stroke, rehabilitation, therapies, prognosis and knowledge of local care facilities" TIMING POST-STROKE: post-discharge CONTROL: standard care
Outcomes	6 months Proportion of participants using secondary prevention drugs (anticoagulants or antiplatelets)
General Information	COUNTRY OF ORIGIN: Netherlands PUBLICATION LANGUAGE: English

Notes	ANALYSIS METHOD: stated intention to treat RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Allocation was done by means of a central telephone service"
Allocation concealment (selection bias)	Low risk	"Allocation was done by means of a central telephone service"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Outcome assessors blinded to group allocation"
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	---	---
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)		MISSING DATA REPORTED BY GROUP ATTRITON: I: 32/263 (7 died; 25 declined follow-up) C:18/273 (5 died; 13 declined follow-up) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Study protocol available and all outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Boysen 2009 [403]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: stroke units NUMBERS RANDOMISED (TOTAL; I & C): total:314, I:157, C:157 % COMPLETING FINAL FOLLOW-UP: 88% INCLUSION CRITERIA: ischaemic stroke; aged >40 years; able to walk EXCLUSION CRITERIA: contraindications to exercise;

	modified Rankin scale of 4 or 5 pre-stroke; cognitive impairment; discharge to nursing home; severe neurological deficit TYPE OF STROKE: ischaemic (100%) DEMOGRAPHIC CHARACTERISTICS MEDIAN AGE (IQR): I:69.7(60.0-77.7), C:69.4(59.6-75.8) GENDER (% FEMALE): I:43%, C:44% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: years of education (%) I: ≤8 – 45%, 9-12– 34%, ≥13 – 21% C: ≤8 – 47%, 9-12 – 40%, ≥13 – 13%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): repeated verbal instructions about physical activity over 2 years; first meeting (30-60 minutes) to develop individualised plan for physical activity; follow-up visits (20-30 minutes) every 3 months for the first year and every 6 months thereafter to provide repeated instructions and readjust physical activity plan; between-visit reminder telephone calls LOCATION: community MODE OF DELIVERY: home visits and telephone calls PERSONNEL RESPONSIBLE FOR DELIVERY: physiotherapist in 8 centres, neurologist in 1 centre TIMING POST-STROKE: beginning < 90 days post-stroke CONTROL: received information about physical activity; received follow-up visits at same frequency as intervention group but without instructions about physical activity
Outcomes	24 months
	Number of secondary strokes; number of myocardial infarctions; number of vascular deaths
General Information	COUNTRY OF ORIGIN: Denmark, China, Poland and Estonia PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: stated intention to treat; per protocol RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Central randomisation: ""generation of allocation sequences was computer based"
Allocation concealment (selection bias)	Low risk	"Allocation concealment was achieved through centralised randomisation by telephone or email."
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent	Low risk	"All events were adjudicated by an independent adjudication committee, which was blinded to the intervention group of the patient"

cardiovascular events)		
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 24/157 (11 died; 3 withdrawn due to severe neurological deficits caused by recurrent stroke; 10 lost to follow-up) C: 14/157 (9 died; 2 withdrawn due to severe neurological deficits caused by recurrent stroke; 2 lost to follow-up) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Study protocol available and all outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Brotons 2006[359]

Methods	UNIT OF RANDOMISATION: general practice
Participants	PLACE OF RECRUITMENT: 42 primary care centres in 8 regions of Spain NUMBERS RANDOMISED (TOTAL; I & C): total:1224 (414 stroke/TIA), I:624 (203 stroke/TIA), C:600 (211 stroke/TIA) % COMPLETING FINAL FOLLOW-UP: 70% INCLUSION CRITERIA: cardiovascular disease (ischaemic heart disease, stroke /TIA and peripheral arterial disease); ≤ 80 years EXCLUSION CRITERIA: cardioembolic stroke or subarachnoid haemorrhage as a result of valvulopathy; serious disease or terminal illness; bedbound TYPE OF STROKE (%): not stated DEMOGRAPHIC CHARACTERISTICS OF STROKE/ TIA PATIENTS MEAN AGE (SE): I:68(11), C:69(11) GENDER (% MALE): I:64%, C:64% ETHNICITY: not stated SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Employment status Employed - 11%, unemployed - 2%, sick leave/ invalidity - 10%, retired 61%, Other - 16% Education level Illiterate - 4%, uneducated, literate - 36%, primary education - 39%, secondary education - 13%, higher education - 6%, university 3%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH,

	FREQUENCY): comprehensive secondary prevention program including tailored patient education and promotion of medication adherence; participants attended appointment every 4 months for 2.75 years; participants advised to contact doctor for medication adjustments and to discuss queries; health professionals delivering the intervention followed protocols for patient care and attended training sessions on secondary prevention of cardiovascular disease LOCATION: primary care MODE OF DELIVERY: education and monitoring PERSONNEL RESPONSIBLE FOR DELIVERY: nurses with specific training in the secondary prevention of cardiovascular disease TIMING POST-STROKE: < 1 year CONTROL: usual care
Outcomes	3 years Systolic BP; diastolic BP; total cholesterol; LDL; HDL; triglycerides; BMI; BP<140/90 in non-diabetics or BP <130/80 in diabetics/ patients with chronic renal failure; cardiovascular readmissions; cardiovascular fatal events
General Information	COUNTRY OF ORIGIN: Spain PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: intention to treat RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random numbers generated using a validated computer program
Allocation concealment (selection bias)	Low risk	Central allocation service, stratified by region ("the randomisation sequence was not revealed until the intervention was assigned")
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP

		ATTRITON: I: 11 died; 51 lost to follow-up (reasons provided); 6 unknown C: 13 died; 69 lost to follow-up (reasons provided); 41 unknown* *study authors explain that it was difficult to recover reasons for losses in control group because they were visited only at baseline and at end of follow-up JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Study protocol available and outcomes are reported in pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Chanruengvanich 2006[404]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital (centre specialising in Neurology) NUMBERS RANDOMISED (TOTAL; I & C): total:72, I:36, C:36 % COMPLETING FINAL FOLLOW-UP: 86% INCLUSION CRITERIA:> 6 weeks since TIA or minor stroke; energy expenditure < 1000 Kcal/week; age >45 years; no cognitive impairment; able to exercise; BP ≤ 180/100 mm Hg; fasting blood sugar ≤ 150 mg% EXCLUSION CRITERIA: complications e.g. heart attack or chest pain TYPE OF STROKE (%): not reported DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:62.8(7.4), C:63.1(7.1) GENDER (% FEMALE):I:68%, C:68% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Marital status Single – 11%, couple – 63%, separated – 26%, Educational level Elementary –53%, high school – 21%, vocational/college – 15%, bachelor degree – 10%, master degree – 1.6% Income (Baht) <5000 – 63%, 5,001- 10,000 – 16%, 10,0001-15,000- 8%, 15,001-20,000- 8%, >20,000- 5%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): 12 week self-regulated exercise program; 1st week - educational meeting (topics included disease management, diet, exercise and stress management); 2nd week - instruction in self-regulation techniques and recommended exercises (using group demonstration and video); 3rd week - home visit from researcher to identify problems; 2nd to 12th weeks – moderate exercise for a

	minimum of 15 minutes 2-3 times per day (recorded in exercise diary) with energy expenditure target 1000 kcal per week; researcher made weekly telephone calls to monitor exercise/ adjust exercise goals LOCATION: community MODE OF DELIVERY: education and monitoring PERSONNEL RESPONSIBLE FOR DELIVERY: researcher/ investigator TIMING POST-STROKE: >6 weeks CONTROL: usual care
Outcomes	12 weeks Systolic BP; diastolic BP; total cholesterol; HDL
General Information	COUNTRY OF ORIGIN: Thailand PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated (per protocol) RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias)	---	---
All outcomes		
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Nurses conducting outcome assessments were blinded to group allocation
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 5/36 (1 withdrew; 4 illness prohibited exercise) C: 3/36 (3 withdrew) EXCLUDED FROM ANALYSIS: I: 0 C: 2/36 (2 excluded to balance the groups) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to

		outcomes
Selective reporting (reporting bias)	Low risk	Study protocol available and all outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Chiu 2008[405]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: tertiary referral hospital (outpatients) NUMBERS RANDOMISED (TOTAL; I & C): total:160, I:80, C:80 % COMPLETING FINAL FOLLOW-UP: not reported INCLUSION CRITERIA: ischaemic stroke; national health insurance (coverage: 95%); attending outpatient clinics for >12 months EXCLUSION CRITERIA: currently enrolled in other trials; terminal illness TYPE OF STROKE: ischaemic stroke (100%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:65.7(10.0), C:64.8(10.6) GENDER (% FEMALE) I:50%, C:50% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Education (%) I: illiterate - 45%, educated – 55% C: illiterate – 46%, educated - 54%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): monthly 1 hour pharmacist-led educational program conducted over 6 months; topics included drug effects, treatment goals, lifestyle modification, compliance and adverse effects; no scheduled monitoring of modifiable risk factors LOCATION: hospital MODE OF DELIVERY: outpatient visit PERSONNEL RESPONSIBLE FOR DELIVERY: pharmacist TIMING POST-STROKE: > 12 months CONTROL: usual care (attendance at outpatient clinics)
Outcomes	6 months Systolic BP; diastolic BP; total cholesterol; LDL; triglycerides; BP<140/90 mm Hg; LDL < 100 mg/dL or TC < 160 mg/dL; HbA1C < 7% or fasting blood glucose <126 mg/dL or random postprandial blood glucose < 200 mg/dL
General Information	COUNTRY OF ORIGIN: Taiwan PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Simple random sampling"

Allocation concealment (selection bias)	Unclear risk	Not stated
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Unclear risk	MISSING DATA NOT REPORTED
Selective reporting (reporting bias)	Unclear risk	Insufficient information (protocol not obtained)
Other bias	Low risk	The study appears to be free of other sources of bias

Eames 2010[375]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: two acute stroke units in metropolitan hospitals NUMBERS RANDOMISED (TOTAL; I & C): total:77, I:37, C:40 % COMPLETING FINAL FOLLOW-UP: 86% INCLUSION CRITERIA: ischaemic stroke, haemorrhagic stroke or TIA; admitted to hospital for stroke or TIA; living in a residential care facility prior to admission and it was not a planned discharge destination; adequate spoken English, cognition, communication and corrected vision and hearing to complete the outcome measures EXCLUSION CRITERIA: poor medical prognosis (i.e. medically unstable patients and/or those undergoing palliative treatment) TYPE OF STROKE: ischaemic (I:73%, C:84%); haemorrhagic (I:25%, C:14%), TIA (I:3%, C:0%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:57.0(16.6), C:64.1 (14.3) GENDER (% MALE) I:55%, C:51% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): tailored written stroke information (stroke booklet) and verbal reinforcement of this information by a health professional (verbal reinforcement was offered face-to-face up to three times prior to discharge and

	over the telephone up to three times following discharge). Participants could tailor the content of the information booklet and the verbal sessions. LOCATION: acute stroke unit (prior to discharge) and community/ inpatient rehabilitation ward (post-discharge) MODE OF DELIVERY: primary care appointment PERSONNEL RESPONSIBLE FOR DELIVERY: occupational therapist TIMING POST-STROKE: approximately one week prior to acute stroke unit discharge CONTROL: usual care (stroke unit care included usual medical, nursing, and allied health management)
Outcomes	3 months Adherence to secondary prevention medications
General Information	COUNTRY OF ORIGIN: Australia PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: unknown RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Concealed, random allocation was achieved via sequentially numbered envelopes containing computer-generated random numbers prepared by a person not involved in the study"
Allocation concealment (selection bias)	Low risk	Sealed envelope method
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	---	---
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	Low risk	"Baselines outcome measures were obtained prior to randomisation and therefore by a blinded assessor. Administration of outcome measures at the follow-up interview was undertaken by a blinded assessor. Once completed, the assessor opened a sealed section of the form to determine group allocation and asked intervention group participants additional questions regarding the intervention." (unpublished information

		provided by trialists)
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 5/40 (4 unable to be contacted; 1 cognition impairment too severe for interview follow-up C:6/37 (2 withdrew; 3 unable to be contacted; 1 admitted to residential care JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Protocol is available and outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Ellis 2005[406,414]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital TIA clinic or geriatric medical day hospital NUMBERS RANDOMISED (TOTAL; I & C): total: 205, I:100, C:105
	% COMPLETING FINAL FOLLOW-UP: 94% INCLUSION CRITERIA: < 3 months since stroke, TIA or amaurosis fugax; ambulant patients; one of more cardiovascular risk factor (high BP, history of current smoking, high cholesterol, diabetes) EXCLUSION CRITERIA: cognitive impairment (AMT <5 on screening) TYPE OF STROKE: TIA (I:29%, C:26%); stroke (I:61%, C:65%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (95%CI): I:64.3(62.4-66.1), C:65.8(64.0-67.5) GENDER (% MALE): I:54%, C:50% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): monthly reviews (approximately 3) with a stroke nurse specialist; participants received tailored verbal and written information addressing medication compliance, lifestyle modification, interaction with medical services, risk factor status and risk factor targets; participants advised to visit their GP if risk factors poorly controlled. LOCATION: hospital outpatient setting MODE OF DELIVERY: outpatient appointment PERSONNEL RESPONSIBLE FOR DELIVERY: stroke nurse specialist TIMING POST-STROKE: first review at 3 months CONTROL: usual care (one review in hospital outpatient setting where patients received standard outpatient

	advise on risk factors and secondary prevention; discharged to general practice care)
Outcomes	5 months (per protocol) Systolic BP; diastolic BP; total cholesterol; Hb1Ac; combined risk factor control 3.6 years (additional follow-up) Systolic BP; diastolic BP; total cholesterol; Hb1Ac; persistence with therapy; self-reported adherence; recurrent cardiovascular events; percentage of patients meeting target for combined risk factor control
General Information	COUNTRY OF ORIGIN: UK PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: stated intention to treat RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Patients were randomly allocated to treatment or control groups using a computer-generated random sequence"
Allocation concealment (selection bias)	Low risk	"concealed in sequentially numbered opaque sealed envelopes"
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Outcome assessors were blinded to group allocation
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	Unclear risk	Recurrent vascular events Assessment of recurrent vascular events was by patient self report: "Clinical events were self-reported and there was no attempt to confirm evidence of reported events or submissions"
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITION I: 6 lost to follow-up (reasons unclear) C: 7 lost to follow-up (reasons unclear) EXCLUDED FROM ANALYSIS I: 3 patients entered twice by error: duplicate results excluded from the analysis C: 1 patient found to be ineligible: results included in the analysis (intention to treat) JUDGMENT: Reasons for missing

		data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Unclear risk	Insufficient information (protocol not obtained)
Other bias	Low risk	The study appears to be free of other sources of bias

Evans 2010[367]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: primary care medical clinic NUMBERS RANDOMISED (TOTAL; I & C): total:176 (8 stroke/TIA), I:88 (4 stroke/TIA), C:88 (4 stroke/TIA) % COMPLETING FINAL FOLLOW-UP: 89% INCLUSION CRITERIA: Framingham risk score ≥ 15% or coronary artery disease risk equivalent (coronary artery disease, peripheral artery disease, cerebrovascular disease, diabetes mellitus) EXCLUSION CRITERIA: severe psychiatric conditions or dementia; symptomatic heart failure; terminal illness TYPE OF STROKE (%): not stated DEMOGRAPHIC CHARACTERISTICS OF STROKE/ TIA PATIENTS MEAN AGE (SD): 62.5 (10.5) GENDER (% MALE): 87.5% ETHNICITY: not reported
	SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): pharmacist-delivered secondary prevention program involving cardiovascular risk stratification, monitoring of cardiovascular risk factors and drug adherence support; participants were contacted approximately every 8 weeks for minimum of 6 months (telephone call, appointment, mailed letters); mean duration of follow-up was 380 days; participants and their primary care physicians were informed if risk factors were uncontrolled LOCATION: primary care medical clinic MODE OF DELIVERY: regular patient review PERSONNEL RESPONSIBLE FOR DELIVERY: pharmacist (intervention designed for non-specialist pharmacists in order to facilitate collaborative partnerships without the need for advanced training) TIMING POST-STROKE: unknown USUAL CARE (I & C): general counselling about cardiovascular disease (1 hour pharmacist appointment)
Outcomes	12 months Systolic BP; diastolic BP; total cholesterol; LDL; HDL; triglycerides; HbA1C; 10 year Framingham risk score
General Information	COUNTRY OF ORIGIN: Canada PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: stated intention to treat RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomisation lists were stratified by each physician and were created by using a table of random numbers in permuted blocks of four"
Allocation concealment (selection bias)	Low risk	"Randomisation codes were kept in individually sealed envelopes and opened by the study pharmacist at the end of the initial visit"
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 11/88 (9 laboratory data not available; 1 moved; 1 died) C: 9/88 (8 laboratory data not available; 1 withdrew due to unrelated illness) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Protocol available and outcomes reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Hornnes 2011[407]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital NUMBERS RANDOMISED (TOTAL; I & C): total:349, I:172, C:177 % COMPLETING FINAL FOLLOW-UP: 87% INCLUSION CRITERIA: ischaemic stroke, intracerebral

	haemorrhage or TIA EXCLUSION CRITERIA: discharged to a nursing home; cognitive deficits prohibiting informed consent; life expectancy < 2 years TYPE OF STROKE (%): ischaemic (I:71%, C:73%); intracerebral haemorrhage (I:3%, C:5%); TIA: (I:26%. C:22%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:70.2(13.7), C:68.5(12.2) GENDER (% FEMALE):I:48%, C:50% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Living alone (%) I:52%, C:52% Educational level (%) I: low – 31%, medium – 26%, high – 43% C: low – 32%, medium – 26%, high – 42%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): 4 home visits from a nurse at 1, 4, 7 and 10 months; each visit included blood pressure monitoring, tailored lifestyle counselling and promotion of medication compliance; hypertensive patients encouraged to visit their GP LOCATION: community MODE OF DELIVERY: home visits PERSONNEL RESPONSIBLE FOR DELIVERY: nurse TIMING POST-STROKE: randomised at time of discharge CONTROL: usual care (neurologist outpatient visit 3 months post-stroke)
Outcomes	12 months
	Systolic BP; diastolic BP; proportion of participants meeting BP targets; proportion of participants adhering antihypertensive therapy
General Information	COUNTRY OF ORIGIN: Denmark PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not reported RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"used a computer-generated, block randomisation procedure"
Allocation concealment (selection bias)	Unclear risk	"the allocation sequence was concealed…the study nurses who administered the intervention had access to a computer program…entering the patient's Central Person Registry number, BP value, and hospital yielded a printout of the patient's randomisation number and allocation"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessors were blinded to the allocation of the patients

Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	---	---
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 27/172(13 dropped out; 3 diagnosis revised; 10 died; 1 too ill) C: 19/177 (9 dropped out; 5 died; 2 too ill; 2 diagnosis revised; 1 other reason) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Outcomes reported in a pre-specified way (trial registry: http://www.clinicaltrials.gov/)
Other bias	Low risk	The study appears to be free of other sources of bias

Johnston 2010[360]

Methods	UNIT OF RANDOMISATION: hospital
Participants	PLACE OF RECRUITMENT: 12 hospitals NUMBERS RANDOMISED (TOTAL; I & C): total:3361, I:1464, C:1897 % COMPLETING FINAL FOLLOW-UP: 80% INCLUSION CRITERIA: ischaemic stroke; KPMCP members with pharmacy benefits; age ≥ 40 years; acute hospitalisation for stroke EXCLUSION CRITERIA: haemorrhagic stroke; discharged to hospice TYPE OF STROKE: ischaemic (100%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): 72.9(12.6) GENDER (% FEMALE): 53% ETHNICITY: non-Hispanic white 66%; African American 14%; Asian/Pacific Islander 11%; Hispanic 7%; other/unknown 1% SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: members of Kaiser Permanente Medical Care Plan with "under-representation of the very poor and wealthy"
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): hospitals received support from a central coordinator in the development and implementation

	of standardised stroke discharge orders (discharge orders based on American Heart Association recurrent stroke prevention guidelines and included 1) statin prescription for all patients irrespective of cholesterol levels; 2) antihypertensive prescriptions for hypertensive patients; 3) warfarin prescription for patients with atrial fibrillation); two physician "champions" (from neurology and hospital-based medicine) from each hospital tailored discharge order and supervised implementation ; two educational presentations delivered to healthcare providers (timing: development of discharge orders and 3 months post-implementation) LOCATION: KPMCP hospitals MODE OF DELIVERY: health provider education and pre-printed stroke discharge orders PERSONNEL RESPONSIBLE FOR DELIVERY: central coordinator and two physicians supervised implementation TIMING POST-STROKE: discharge from hospital CONTROL: usual care without contact from study staff; some hospitals implemented their own discharge orders
Outcomes	6 months BP < 140/90 mm Hg; combined cardiovascular risk factor control; adherence to secondary prevention medications
General Information	COUNTRY OF ORIGIN: US PUBLICATION LANGUAGE: English

Notes	ANALYSIS METHOD: stated intention to treat RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Participating hospitals were paired based on characteristics that could have impacted the success of the intervention, including patient demographics, hospital size, number of enrolees, and presence of a motivated stroke expert. Then, using a random number generator, 1 hospital in each pair was randomised to receive the intervention, whereas the other was randomised to usual care."
Allocation concealment (selection bias)	Low risk	"Participating hospitals were paired based on characteristics that could have impacted the success of the intervention, including patient demographics, hospital size, number of enrolees, and presence of a motivated stroke expert. Then, using a random number generator, 1 hospital

		in each pair was randomised to receive the intervention, whereas the other was randomised to usual care."
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Blood pressure "blood pressures were obtained for routine clinical purposes by personnel unaware of the study goals" Filled prescription data: statins and warfarin "statin and warfarin data were gathered from linked pharmacy records"
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 1149/1464 (237 died; 78 lost to follow-up)
		C: 1533/1897 (277 died; 87 lost to follow-up) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Unclear risk	Protocol available and primary outcomes are reported in the pre-specified way; some secondary outcomes not reported
Other bias	Low risk	The study appears to be free of other sources of bias

Joubert 2009[408]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital NUMBERS RANDOMISED (TOTAL; I & C): total:233, I:123, C:110 % COMPLETING FINAL FOLLOW-UP: 80% INCLUSION CRITERIA: ischaemic stroke, parenchymal haemorrhage or TIA; aged ≥ 20 years EXCLUSION CRITERIA: not managed by GP; discharged to nursing home; serious co-morbidities; non-English speaking; serious cognitive impairment; significantly aphasic TYPE OF STROKE (%): ischaemic (I:73%, C:80%);

	haemorrhagic (I:10%, C:7%); TIA (I:17%, C:13%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:63.4(13.7), C:68.2(12.7) GENDER (% MALE): I:58%, C:52% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): "shared care" program; risk factor targets derived from National guidelines and consensus statements; medication initiated in hospital; lifestyle education provided by nurse coordinator; GP appointments pre-arranged for 2 weeks, 3 months, 6 months, 9 months and 12 months post-discharge; recommendations and evidence-based guidelines sent to GP; nurse coordinator telephoned participants before and after every GP visit to screen for depression; risk factor data collected at each GP visit and faxed to nurse coordinator; nurse coordinator facilitated transfer of information and recommendations between stroke specialists and general practitioners; general practitioners able telephone stroke specialist for advice LOCATION: community MODE OF DELIVERY: telephone follow-up; information management PERSONNEL RESPONSIBLE FOR DELIVERY: stroke specialists, a nurse coordinator and patients' general practitioners TIMING POST-STROKE: intervention initiated before hospital discharge CONTROL: standard care from GP
Outcomes	12 months systolic BP; diastolic BP, total cholesterol, BMI, systolic BP <140 mmHg; total cholesterol <5.18 mmol/L; proportion of AF patients taking warfarin
General Information	COUNTRY OF ORIGIN: Australia PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Computer-generated process" "At a later stage, the coordinator checked the patient's GP, and if this GP was also responsible for a different patient already in the trial, the current patient was assigned to the same group as the previous patient"
Allocation concealment (selection bias)	Low risk	"The allocation to group was undertaken after consent, so the coordinator was unaware of treatment allocation prior to consent"

Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	Unclear risk	Compliance with medication No blinding reported JUDGEMENT: the review authors judge that non-blinding may have affected outcome assessment
Incomplete outcome data (attrition bias)	Unclear risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 32/123 (7 unwilling to participate; 2 withdrew due to other medical problems, 2 changed GP; 11 withdrew for unknown reasons; 3 did not have stroke; 3 not contactable; 2 died; 1 moved to nursing home; 1 GP refused) C: 15/110 (2 unwilling to participate; 1 left country; 3 withdrew for unknown reasons; 2 did not have stroke; 1 not contactable; 6 died) JUDGEMENT: imbalances in missing data between the groups however the review authors judge that this is unlikely to be related to study outcomes
Selective reporting (reporting bias)	Unclear risk	Insufficient information (protocol not obtained)
Other bias	Low risk	The study appears to be free of other sources of bias

Lowe 2007[409]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital stroke unit NUMBERS RANDOMISED (TOTAL; I & C): total:100, 50, C:50 % COMPLETING FINAL FOLLOW-UP: 84% INCLUSION CRITERIA: stroke; discharged home; able to complete questionnaire or had carer who could complete questionnaire EXCLUSION CRITERIA: severe cognitive impairment or communication difficulties; discharged to institutional care

	TYPE OF STROKE (%): ischaemic (I:96% C:94%) DEMOGRAPHIC CHARACTERISTICS MEDIAN AGE (IQR): I:68(62-74), C:73(65-80) GENDER (% MALE): I:58%, C:62% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): information book (CareFile) containing general information about stroke and tailored information about stroke risk factors; researcher explained contents of book to participants/carers during 15-20 minute discussion; participants advised to take the CareFile to GP and stroke review clinic appointments. LOCATION: hospital MODE OF DELIVERY: educational materials PERSONNEL RESPONSIBLE FOR DELIVERY: researcher (stroke research registrar) TIMING POST-STROKE: before discharge CONTROL: usual care(“usual stroke information leaflets (Stroke Association leaflets) provided by the stroke unit and follow-up in a stroke review clinic")
Outcomes	3 months; 6 months systolic BP; diastolic BP
General Information	COUNTRY OF ORIGIN: UK PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: UNCLEAR

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sealed envelope method
Allocation concealment (selection bias)	Low risk	“When a diagnosis of stroke was confirmed, eligible patients were randomised by the researcher into the control or intervention group (using sealed opaque envelopes containing blocks of 10 names, in a one-to-one ratio).”
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes	---	---

(e.g. medication adherence)		
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 6/50 (2 could not be contacted; 4 died) C: 10/50 (4 could not be contacted; 6 died) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Unclear risk	Insufficient information (protocol not obtained)
Other bias	Low risk	The study appears to be free of other sources of bias

Maasland 2007[410]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: TIA service (“provides a rapid diagnostic work-up of patients with TIA or minor stroke in a single day”) NUMBERS RANDOMISED (TOTAL; I & C): total:65, I:33, C:32 % COMPLETING FINAL FOLLOW-UP: 88%
	INCLUSION CRITERIA: < 3months since TIA or minor ischaemic stroke; ≥ 18 years; fluent in spoken and written Dutch; modified Rankin score < 4 EXCLUSION CRITERIA: involved in cardiovascular health education; aphasia, dementia (diagnosis based on DSM-Iv criteria); visual impairment that would affect health education TYPE OF STROKE: TIA (I:57% C:52%); minor stroke (I:43% C:46%) DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:65(12), C:63(13) GENDER (% MALE): I:57%, C:63% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Educational level (%): I: Primary school - 27%, Secondary school - 37%, College - 20%, University - 17% C: Primary school - 15%, Secondary school - 41%, College - 26%, University - 19%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): 20-25 minute computerised education program about TIA and stroke, antiplatelet and anticoagulant medication and modifiable risk factor control; information tailored according to the impact of each risk factor on secondary prevention (calculated using algorithm) and each patient’s current risk factor status, treatment status, educational level and age; participants received a printed summary of the information. LOCATION: TIA service

	MODE OF DELIVERY: computer education PERSONNEL RESPONSIBLE FOR DELIVERY: NA TIMING POST-STROKE: acute TIA or minor stroke CONTROL: usual care (health education by a neurologist as part of the TIA service)
Outcomes	12 weeks systolic BP; diastolic BP; total cholesterol; LDL, triglycerides; BMI; compliance with anticoagulants; compliance with lipid-lowering medication; compliance with antihypertensive medication
General Information	COUNTRY OF ORIGIN: Netherlands PUBLICATION LANGUAGE: not stated
Notes	ANALYSIS METHOD: available case analysis RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Treatment allocation was random, and based on computer-generated random numbers"
Allocation concealment (selection bias)	Low risk	"The randomisation was blocked in lots of 10; block size was unknown to the investigators at the time of the trial"
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	Unclear risk	Compliance with medication No blinding reported JUDGEMENT: the review authors judge that non-blinding may have affected outcome assessment
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITION I: 2/33 lost to follow-up C: 5/32 lost to follow-up EXCLUDED FROM ANALYSIS I: 1/33 professional health worker (ineligible) C: 0/32 JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes

Selective reporting (reporting bias)	Low risk	Protocol available and primary outcomes are reported in the pre-specified way
Other bias	Low risk	The study appears to be free of other sources of bias

Markle-Reid 2011[411]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: community care access centre NUMBERS RANDOMISED (TOTAL; I & C): total:101, I:52, C:49 % COMPLETING FINAL FOLLOW-UP: 81% INCLUSION CRITERIA: < 18 months since stroke or TIA; living in community; newly referred (<2 weeks) to home care services; competent to give informed consent or substitute decision maker available; competent in English or with an interpreter available TYPE OF STROKE (%): not reported DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:75.8(12.4), C:70.6(14.5) GENDER (% MALE): I:49%, C:62% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: Married (%): I:40%, C:51% Living with others (%): I:54%, C:64%
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): usual home care services plus organised home visits from an interprofessional team (care coordinator, nurse, physiotherapist, occupational therapist, speech language pathologist, dietician, social worker, physiotherapist, personal support worker) over a 12 month period; rehabilitation followed evidence-based rehabilitation protocols addressing community reintegration and stroke prevention; use of standardised screening tools e.g. stroke risk assessment tool; members of interdisciplinary team met at monthly case conferences and attended training sessions delivered by the study investigators; LOCATION: community MODE OF DELIVERY: home visits; health care provider meetings PERSONNEL RESPONSIBLE FOR DELIVERY: interprofessional team TIMING POST-STROKE: < 18 months CONTROL: usual home care services (follow-up by a care-coordinator who provided in-home assessments and coordinated home support services)
Outcomes	12 months Number of secondary strokes
General Information	COUNTRY OF ORIGIN: Canada PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomly generated numbers constructed by a biostatistician who was not involved in the recruitment process"
Allocation concealment (selection bias)	Low risk	"Consecutively numbered, sealed, opaque envelopes"
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Outcome assessors blind to group assignment
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON:
		I: 9/52 (I: 4 died; 4 refused; 1 unable to contact) C: 10/49 (C: 3 died; 7 refused) JUDGMENT: Reasons for missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Unclear risk	No protocol available
Other bias	Low risk	The study appears to be free of other sources of bias

Wang 2005[412]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: hospital NUMBERS RANDOMISED (TOTAL; I & C): total:198, I:146, C:52 % COMPLETING FINAL FOLLOW-UP: unknown INCLUSION CRITERIA: stroke in internal carotid artery; first stroke EXCLUSION CRITERIA: none stated TYPE OF STROKE (%): not stated DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:63.24±7.35, C:60.94±9.87 GENDER (% MALE): I:54%, C:50% ETHNICITY: not reported

	SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION DETAILS (COMPONENTS, LENGTH, FREQUENCY): follow-up by a neurologist within one week post-discharge and then every at 1, 2 or 3 months; patients and caregivers educated about nursing care, home rehabilitation, neuropsychology and modifiable risk factors LOCATION: community MODE OF DELIVERY: visits, lectures, leaflets, multimedia teaching PERSONNEL RESPONSIBLE FOR DELIVERY: neurologists TIMING POST-STROKE: < 1 week post-discharge CONTROL: USUAL CARE
Outcomes	3 years Time to first stroke relapse; stroke relapse rate; proportion of participants meeting targets for blood pressure, blood fats, blood sugar and BMI
General Information	COUNTRY OF ORIGIN: China PUBLICATION LANGUAGE: Mandarin
Notes	ANALYSIS METHOD: not stated RISK OF BIAS: HIGH

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Not stated Unexplained imbalances in numbers allocated to
		intervention and control groups
Allocation concealment (selection bias)	Unclear risk	Not stated
Blinding of outcome assessment (detection bias) All outcomes	---	---
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	No blinding reported, but the review authors judge that the outcomes are not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Unclear risk	Not stated
Selective reporting (reporting bias)	Unclear risk	No protocol available
Other bias	Low risk	The study appears to be free from other sources of bias

Welin 2010[413]

Methods	UNIT OF RANDOMISATION: patient
Participants	PLACE OF RECRUITMENT: Rural hospital NUMBERS RANDOMISED: total:163, I:81, C:82 % COMPLETING FINAL FOLLOW-UP: 71% INCLUSION CRITERIA: ischaemic or haemorrhagic stroke; first stroke; <85 years; living at home before the stroke EXCLUSION CRITERIA: previous stroke; severe dementia; severe stroke (Rankin score >5); severe cardiovascular disease; life expectancy <1 year TYPE OF STROKE (%): haemorrhagic I:9%, C:16% DEMOGRAPHIC CHARACTERISTICS MEAN AGE (SD): I:71.2 (9.9), C:69.6 (11.7) GENDER (% FEMALE): I:41%, C:37% ETHNICITY: not reported SOCIOECONOMIC OR SOCIODEMOGRAPHIC STATUS: not reported
Interventions	INTERVENTION: follow-up appointments with a stroke nurse at 1.5, 6 and 12 months post-discharge (included assessment of handicap and depression, measurement of blood pressure, provision of health information and referral to physiotherapist or occupational therapist if necessary); appointments with a stroke physician at 3 and 9 months (included a review of medication and medical problems with referral to other specialists if necessary) LOCATION: hospital stroke clinic MODE OF DELIVERY: outpatient appointment
	PERSONNEL RESPONSIBLE FOR DELIVERY: stroke nurse and stroke physician TIMING POST-STROKE: 1.5 - 12 months post-discharge CONTROL: usual care involved follow-up with general practitioner; general practitioners were sent discharge summaries; “the quality of follow-up care by general practitioners varies in Sweden from non follow-up at all to regular visits every third or fourth month” USUAL CARE BEFORE DISCHARGE (I AND C): initiation of secondary prevention medications and referral to continuous physiotherapy or occupation therapy, if necessary.
Outcomes	Systolic blood pressure (12 months); diastolic blood pressure (12 months); recurrent stroke (3.5 years)
General Information	COUNTRY OF ORIGIN: Sweden PUBLICATION LANGUAGE: English
Notes	ANALYSIS METHOD: NOT STATED RISK OF BIAS: LOW

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Shuffling sealed envelopes
Allocation concealment (selection bias)	Low risk	Shuffling sealed envelopes
Blinding of outcome assessment (detection	---	---

bias) All outcomes		
Blinding of outcome assessment (detection bias) Objective outcomes (e.g. physiological risk factors, recurrent cardiovascular events)	Low risk	Blood pressure No blinding reported JUDGMENT: review authors judge that the outcomes are not likely to be affected by lack of blinding Recurrent stroke Outcome assessors were blinded ("outcome data were presented and all information about which group the patient belonged to was concealed")
Blinding of outcome assessment (detection bias) Self-reported outcomes (e.g. medication adherence)	---	---
Incomplete outcome data (attrition bias)	Low risk	MISSING DATA REPORTED BY GROUP ATTRITON: I: 18/81 (5 died, 13 did not attend follow-up visit) C: 30/82 (9 died, 21 did not attend follow-up visit) JUDGMENT: Reasons for
		missing data reported and review authors judge that they are unlikely to be related to outcomes
Selective reporting (reporting bias)	Low risk	Study protocol available and outcomes are reported in the pre-specified way

Characteristics of Ongoing Studies

Chan 2009[372]

Study name	Promoting Adherence to a Regimen of risk factor modification by Trained Non-medical personnel Evaluated against Regular practice Study PARTNERS
Methods	RCT
Participants	TIA or non-disabling stroke; hypertension
Interventions	Support from a trained volunteer for risk factor reduction
Outcomes	Diastolic BP; medication adherence; BMI; cardiovascular risk score; LDL; total cholesterol/HDL ratio; HbA1c
Starting date	Start: April 2009 Estimated completion: October 2013
Contact information	Richard Chan University Hospital London Canada
Notes	ISRCTN07607027 Status: ongoing/recruiting

Dromerick 2008[374]

Study name	Preventing Recurrence of Thromboembolic Events Through Coordinated Treatment in the District of Columbia (PROTECT DC)
Methods	RCT
Participants	Ischaemic stroke or TIA
Interventions	Lay persons ('stroke navigators') trained to help participants reduce their risk of secondary stroke
Outcomes	12 months LDL; systolic BP; HbA1C; pill count (antiplatelet medication)
Starting date	Start: April 2008 Estimated completion: December 2012
Contact information	Chelsea Kidwell, M.D. Medical Director, Georgetown University Stroke Center, Washington United States
Notes	NCT00703274 Status: ongoing but not recruiting participants

Friedberg 2010[376]

Study name	Reducing Risk of Recurrence (RRR)
Methods	Parallel RCT
Participants	Stroke or TIA
Interventions	Telephone intervention to reduce behavioural risk factors for secondary stroke
Outcomes	6 months BP; total cholesterol/HDL ratio; antihypertensive/lipid-lowering medication adherence

Starting date	Start: January 2010 Estimated completion: January 2014
Contact information	Erica Kaplan, BA New York Harbor HCS New York United states
Notes	NCT01122394 Status: recruiting participants (correspondence June 2012)

Gulliford 2010[377]

Study name	Secondary prevention after first stroke
Methods	Multicentre clustered RCT
Participants	Stroke
Interventions	Electronic prompts to promote GP adherence to guidelines during primary care consultations
Outcomes	12 months Systolic BP; diastolic BP; cholesterol; prescription adherence; recurrent vascular events
Starting date	Start: April 2010 Estimated completion: October 2011
Contact information	Professor Martin Gulliford King's College London
Notes	ISRCTN35701810 Status: participants currently being recruited (correspondence: June 2012)

Horowitz 2009[378]

Study name	Prevent return of stroke study
Methods	Parallel RCT
Participants	Stroke or TIA
Interventions	Peer-led education program to reduce risk factors for recurrent stroke
Outcomes	6 months BP; LDL; use of anti-thrombotic medication; medication adherence
Starting date	Start: June 2009 Estimated completion: April 2013
Contact information	Rennie Negron, MPH Mount Sinai School of Medicine New York United States
Notes	NCT01027273 Status: ongoing but not recruiting participants

Lees 2010[379]

Study name	ECG monitoring to detect atrial fibrillation after stroke
Methods	RCT
Participants	Ischaemic stroke or TIA
Interventions	Continuous ECG monitoring to detect atrial fibrillation after acute stroke or TIA
Outcomes	Recurrent stroke

Starting date	Start: May 2010 Estimated completion: December 2016
Contact information	Professor Kennedy R Lees Acute Stroke Unit & Cerebrovascular Clinic Western Infirmary Glasgow
Notes	ISRCTN97412358 Status: ongoing

Liddy 2007[380]

Study name	Improved Delivery of Cardiovascular Care Through Outreach Facilitation (IDOCC)
Methods	RCT
Participants	Coronary artery disease; cerebrovascular disease; peripheral vascular disease; diabetes mellitus; chronic kidney disease; high risk of CVD (presence of at least 3 established cardiovascular risk factors)
Interventions	Outreach facilitator implementing chronic care model in primary care practices
Outcomes	5 years recommended targets reached
Starting date	Start: April 2007 Estimated completion: April 2012
Contact information	Clare E Liddy, MD, MSc
Notes	NCT00574808 Status: ongoing but no longer recruiting (correspondence June 2012)

McAlister 2009[381]

Study name	Preventing recurrent vascular events in patients with stroke or transient ischaemic attack (PREVENTION)
Methods	Parallel RCT
Participants	Ischaemic stroke or TIA
Interventions	Pharmacist case management to improve risk factor control
Outcomes	6 months Optimal BP and lipid control; systolic BP; LDL cholesterol
Starting date	Start: January 2009 Estimated completion: July 2014
Contact information	Finley A McAlister, MD, MSc University of Alberta Hospital Canada
Notes	NCT00931788 Status: recruiting participants (correspondence: June 2012)

Schmid 2010[382]

Study name	Adapting tools to implement stroke risk management to veterans (TOOLS)
Methods	RCT
Participants	Ischaemic stroke; TIA
Interventions	Stroke prevention tools e.g. written materials; videos; training guides for doctors; home blood pressure

	machines; blood sugar monitors; messaging devices for contact between patient and healthcare provider
Outcomes	Risk factor screening
Starting date	Start: January 2009 Estimated completion: September 2012
Contact information	Teresa M. Damush, PhD Roudebush VA Medical Center Indianapolis United States
Notes	NCT00355147 Status: ongoing but not recruiting participants (correspondence June 2012)

Thrift 2008[383]

Study name	Shared team approach between nurses and doctors for improved risk factor management for stroke patients
Methods	Parallel RCT
Participants	Ischaemic/haemorrhagic stroke or TIA
Interventions	Coordinated team approach for risk factor management in primary care setting
Outcomes	12 months; 24 months Framingham cardiovascular disease risk score; use of secondary prevention medications; BP
Starting date	Start: April 2008 Estimated completion: unknown
Contact information	Professor Amanda Thrift
	Stroke and Ageing Research Centre (STARC) Monash University Australia
Notes	ACTRN12608000166370 Status: recruiting participants (correspondence June 2012)

Vickrey 2010[384]

Study name	Intervention to Enable Stroke Survivors in Los Angeles County Hospitals to "Stay Within the Guidelines" SUSTAIN
Methods	Parallel RCT
Participants	Included: ischaemic stroke or TIA Excluded: haemorrhagic stroke
Interventions	Chronic care program aimed at improving secondary stroke prevention (intervention includes "group clinics, self-management support, report cards, decision support through care guides and protocols, and coordination of ongoing care")
Outcomes	3 months; 12 months BP; lipid levels; 8 months medication adherence
Starting date	Start: January 2010 Estimated completion: January 2012
Contact information	Barbara Vickrey, MD, MPH University of California, Los Angeles

	United States
Notes	NCT00861081 Status: recruiting participants (correspondence: June 2012)

Yamada 2009[385]

Study name	Lifestyle intervention for prevention of stroke recurrence in mild stroke - A Randomized Controlled Trial
Methods	Parallel RCT
Participants	Ischaemic stroke
Interventions	Lifestyle intervention (behavioural)
Outcomes	Recurrent cardiovascular events; BP; LDL; HDL; HbA1C
Starting date	Start: April 2009 Estimated completion: March 2016
Contact information	Yuji Kono Nagoya University Graduate School of Medicine Nagoya Japan
Notes	UMIN000001865 Status: recruiting participants (correspondence: June 2012)

Yip 2005[386]

Study name	North Taiwan Stroke Center for Prevention and Treatment
Methods	Parallel RCT
Participants	Stroke
Interventions	Nursing program: education/rehabilitation
Outcomes	Not available
Starting date	Start: January 2005 Estimated completion: December 2005
Contact information	Ping-Keung Yip Department of Neurology National Taiwan University Hospital
Notes	NCT00172484 Status: recruiting participants

Characteristics of Studies Awaiting Classification

Behrens 2008[387]

Methods	Parallel RCT
Participants	Ischemic stroke or intra-cerebral bleeding
Interventions	Case management involving web portal, telephone hotline, individual counselling sessions and home visits
Outcomes	12 months recurrent stroke /TIA
Notes	NCT00687869 Status: completed (29/03/12); ongoing data analysis No study reports currently available (correspondence June 2012)

Chassin 2002[388]

Methods	RCT
Participants	stroke; TIA
Interventions	Chronic disease self-management course
Outcomes	Adherence to secondary prevention measures
Notes	NCT00211731 Status: completed (June 2009) No study reports currently available (correspondence: June 2012)

Cheng 2010[389]

Methods	RCT
Participants	Stroke; TIA
Interventions	Outpatient stroke prevention program involving group clinics, patient self-management and telephone care coordination
Outcomes	3 months; 7 months BP; lipids; medication adherence
Notes	NCT01071408 Status: completed (31/05/12) No study reports currently available (correspondence June 2012)

Cui 2008[390]

Methods	Parallel RCT
Participants	Ischaemic stroke or TIA
Interventions	Interactive education program
Outcomes	12 months Recurrent cardiovascular events
Notes	NCT00664846 Status: completed (31/12/10) No study reports currently available (correspondence June 2012)

Joshi 2012[391]

Methods	Cluster RCT
Participants	Cardiovascular disease
Interventions	Health promotion for cardiovascular disease prevention; education programs to promote medication compliance
Outcomes	Use of secondary prevention medications; blood pressure; cholesterol; blood glucose; BMI
Notes	NCT00263393 Status: completed

Kerry 2008[392]

Methods	Parallel RCT
Participants	Stroke or TIA
Interventions	Use of home blood pressure monitor and follow-up from study nurse
Outcomes	12 months Systolic BP; diastolic BP;
Notes	NCT00514800 Status: completed (December 2010) No study reports currently available (correspondence June 2012)

Lowrie 2010[393]

Methods	Cluster RCT
Participants	Participants at high risk of vascular event
Interventions	"Primary care based pharmacist-led intervention for General Practitioners (GPs) and nurses" with the aim of improving statin prescribing
Outcomes	Cholesterol control
Notes	Status: completed (18/01/2006) No study reports currently available (correspondence: June 2012)

Nguyen 2011[394]

Methods	Parallel RCT
Participants	Stroke patients
Interventions	Pharmacist telephone intervention to deliver secondary stroke prevention education and promote medication adherence
Outcomes	Medication adherence, blood pressure, cholesterol, HbA1C
Notes	Status: completed (attempts to contact trialists were unsuccessful)

O'Carroll 2010[395]

Methods	RCT
Participants	Stroke or TIA
Interventions	Appointments with research nurse to promote adherence to secondary prevention medications
Outcomes	3 months

	Medication adherence; systolic BP; diastolic BP
Notes	ISRCTN38274953 Status: completed (25/06/12) No study reports currently available (correspondence: June 2012)

Peterson 2010[396]

Methods	Parallel RCT
Participants	Ischaemic stroke, TIA or intracranial haemorrhage
Interventions	Stroke education involving telephone call from a "medication coach"
Outcomes	3 months Medication persistence
Notes	NCT01115660 Status: completed (June 2011) No study reports currently available (correspondence June 2012)

Rochette 2008[397]

Methods	RCT
Participants	Mild stroke
Interventions	Telephone support addressing secondary prevention and adaption; use of written information and "StrokEngine" website
Outcomes	12 months Use of health services and reasons (e.g. recurrent

	stroke)
Notes	ISRCTN95662526 Status: completed (June 2012) No study reports currently available (correspondence June 2012)

Slark 2010[398]

Methods	RCT
Participants	Ischaemic stroke
Interventions	Risk awareness intervention involving calculation of personalised risk scores for secondary stroke, verbal information and written support
Outcomes	3 months Recurrent stroke; stroke risk; blood pressure
Notes	ISRCTN67999605 Status: completed (September 2011) No study reports currently available (correspondence June 2012)

Wolfe 2010[399]

Methods	RCT
Participants	Stroke
Interventions	Individualised evidence-based secondary prevention plans provided to patients/caregivers (“keeping well plans”) and general practitioners (“secondary prevention plans”) on a maximum of 3 occasions (10 weeks, 5 months and 8 months post-stroke);

	structured approach to risk factor monitoring
Outcomes	12 to 18 months Modifiable risk factors for stroke: blood pressure, total cholesterol, HbA1C, BMI
Notes	ISRCTN10730637 Status: completed (2007) and study reports available Outcome data relevant to the review not currently available (Correspondence June 2012)

Characteristics of Excluded Studies

Banet 1997[507]

Reason for exclusion	No relevant outcomes

Bokemark 1996[508]

Reason for exclusion	No relevant outcomes

Bosworth 2011[509]

Reason for exclusion	Not a stroke service intervention

Gillham 2010[510]

Reason for exclusion	No relevant outcomes

Goessens 2006[511]

Reason for exclusion	Outcomes not reported separately for stroke/TIA patients

Green 2007[512]

Reason for exclusion	No relevant outcomes

Harrington 2007[513]

Reason for exclusion	Not intended to improve modifiable risk factor control

Johnston 2000[514]

Reason for exclusion	Not a stroke service intervention

Ma 2009[515]

Reason for exclusion	Outcomes not reported separately for stroke/TIA patients

Middleton 2004[516]

Reason for exclusion	No relevant outcomes

Nir 2006[517]

Reason for exclusion	No relevant outcomes

Ornstein 2004[518]

Reason for exclusion	Not a stroke service intervention

Palanco 2007[519]

Reason for exclusion	Outcomes not reported separately for stroke/TIA patients

Rimmer 2000[520]

Reason for exclusion	Contained exercise training program

Ross 2007[521]

Reason for exclusion	Not intended to improve modifiable risk factor control

Strandberg 2006[522]

Reason for exclusion	Outcomes not reported separately for stroke/TIA patients

Data and analyses

Educational/ behavioural interventions for patients vs usual care

Outcome	Studies	Participants	Statistical Method	Effect Estimate
1.1 Mean systolic blood pressure	4	329	Mean Difference (IV, Fixed, 95% CI)	-7.45 [-10.73, -4.16]
1.2 Mean diastolic blood pressure	4	329	Mean Difference (IV, Fixed, 95% CI)	-1.94 [-4.06, 0.18]
1.3 Blood pressure target achievement	2	210	Odds Ratio (M-H, Fixed, 95% CI)	1.02 [0.59, 1.78]
1.4 Mean total cholesterol	4	277	Mean Difference (IV, Fixed, 95% CI)	-0.16 [-0.41, 0.09]
1.5 Total cholesterol target achievement	1	56	Odds Ratio (M-H, Fixed, 95% CI)	0.56 [0.19, 1.68]
1.6 Mean low density lipoprotein	2	139	Mean Difference (IV, Fixed, 95% CI)	-0.27 [-0.58, 0.04]
1.7 Mean triglycerides	2	148	Mean Difference (IV, Fixed, 95% CI)	-0.08 [-0.45, 0.29]
1.8 HbA1C target achievement	1	67	Odds Ratio (M-H, Fixed, 95% CI)	0.65 [0.25, 1.75]
1.9 Mean BMI	1	57	Mean Difference (IV, Fixed, 95% CI)	-0.24 [-0.80, 0.32]

Organisational interventions vs usual care

Outcome	Studies	Participants	Statistical Method	Effect Estimate
2.1 Mean systolic blood pressure	7	1178	Mean Difference (IV, Fixed, 95% CI)	-3.15 [-5.22, -1.09]
2.2 Mean diastolic blood pressure	6	1084	Mean Difference (IV, Fixed, 95% CI)	-1.60 [-2.92, -0.28]
2.3 Blood pressure target achievement	6	1351	Odds Ratio (M-H, Fixed, 95% CI)	1.20 [0.95, 1.50]
2.4 Mean total cholesterol	4	630	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.42, 0.24]
2.5 Total cholesterol target achievement	3	695	Odds Ratio (M-H, Fixed, 95% CI)	1.80 [1.31, 2.48]
2.6 Mean low density lipoprotein	2	245	Mean Difference (IV, Fixed, 95% CI)	-0.08 [-0.28, 0.12]
2.7 Mean high density lipoprotein	2	247	Mean Difference (IV, Fixed, 95% CI)	0.07 [-0.04, 0.17]
2.8 Mean triglycerides	2	246	Mean Difference (IV, Fixed, 95% CI)	-0.05 [-0.25, 0.14]

Outcome	Studies	Participants	Statistical Method	Effect Estimate
2.9 Mean HbA1C	2	198	Mean Difference (IV, Fixed, 95% CI)	0.53 [-0.31, 1.37]
2.10 HbA1C target achievement	2	517	Odds Ratio (M-H, Fixed, 95% CI)	2.86 [1.92, 4.27]
2.11 Mean BMI	2	423	Mean Difference (IV, Fixed, 95% CI)	-0.99 [-1.92, -0.06]
2.12 BMI target achievement	1	198	Odds Ratio (M-H, Fixed, 95% CI)	1.93 [0.97, 3.81]
2.13 Proportion of participants with secondary stroke or TIA	3	454	Odds Ratio (M-H, Fixed, 95% CI)	0.48 [0.29, 0.78]
2.14 Number of secondary strokes	3		Odds Ratio (IV, Fixed, 95% CI)	1.19 [0.70, 2.03]
2.15 Number of secondary strokes	1		Odds Ratio (IV, Fixed, 95% CI)	0.72 [0.12, 4.32]
2.16 Number of secondary TIAs	1		Odds Ratio (IV, Fixed, 95% CI)	2.49 [1.18, 5.22]
2.17 Proportion of participants with secondary cardiovascular events	1	380	Odds Ratio (M-H, Fixed, 95% CI)	1.54 [0.87, 2.75]
2.18 Number of secondary cardiovascular events	2		Odds Ratio (IV, Fixed, 95% CI)	1.46 [0.84, 2.56]
2.19 Number of myocardial infarctions	3		Odds Ratio (IV, Fixed, 95% CI)	0.47 [0.15, 1.48]
2.20 Proportion of participants with vascular death	1	380	Odds Ratio (M-H, Fixed, 95% CI)	1.58 [0.44, 5.70]
2.21 Number of vascular deaths	1		Odds Ratio (IV, Fixed, 95% CI)	0.75 [0.17, 3.35]

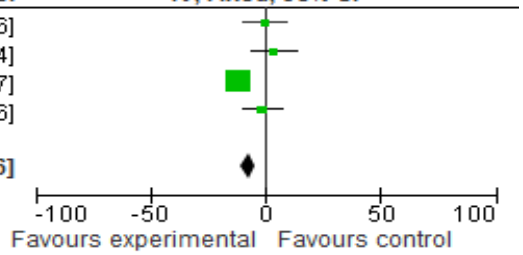
RevMan graphs (forest plots)

1 - Educational/ behavioural interventions for patients vs usual care

1.1 Mean systolic blood pressure

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Adie 2010	142	19.3	29	142.4	17.2	27	11.8%	-0.40 [-9.96, 9.16]
Chanruengvanich 2006	141.2	16.8	31	137.9	22.7	31	10.9%	3.30 [-6.64, 13.24]
Chiu 2008	131.9	11.4	78	143.8	14.5	76	63.5%	-11.90 [-16.03, -7.77]
Maasland 2007	-8.4	17.4	30	-6.9	16.7	27	13.8%	-1.50 [-10.36, 7.36]
Total (95% CI)			**168**			**161**	**100.0%**	**-7.45 [-10.73, -4.16]**

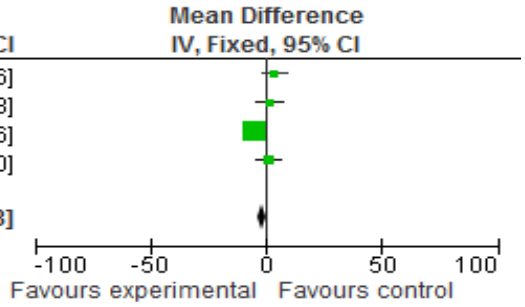
Heterogeneity: Chi² = 12.78, df = 3 (P = 0.005); I² = 77%
Test for overall effect: Z = 4.44 (P < 0.00001)



1.2 Mean diastolic blood pressure

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Adie 2010	75.7	10.1	29	72.1	12.1	27	13.1%	3.60 [-2.26, 9.46]
Chanruengvanich 2006	77.1	11.3	31	75.8	11.5	31	13.9%	1.30 [-4.38, 6.98]
Chiu 2008	76	7.8	78	80.9	10	76	55.8%	-4.90 [-7.74, -2.06]
Maasland 2007	-5.4	9.73	30	-6.2	9.89	27	17.2%	0.80 [-4.30, 5.90]
Total (95% CI)			**168**			**161**	**100.0%**	**-1.94 [-4.06, 0.18]**

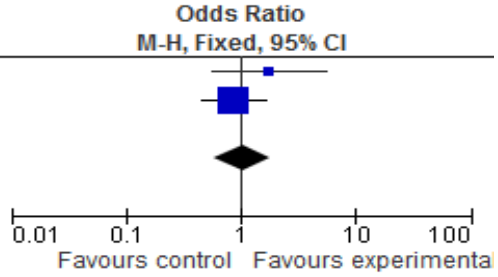
Heterogeneity: Chi² = 9.97, df = 3 (P = 0.02); I² = 70%
Test for overall effect: Z = 1.80 (P = 0.07)



1.3 Blood pressure target achievement

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Adie 2010	11	29	7	27	18.3%	1.75 [0.56, 5.47]
Chiu 2008	31	78	33	76	81.7%	0.86 [0.45, 1.63]
Total (95% CI)		**107**		**103**	**100.0%**	**1.02 [0.59, 1.78]**
Total events	42		40			

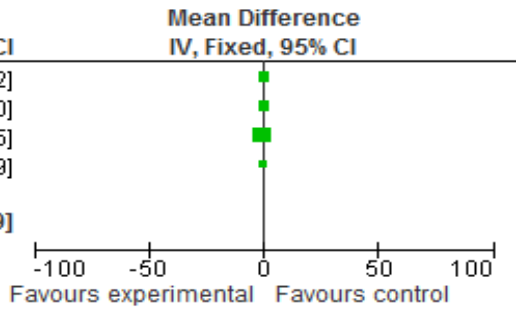
Heterogeneity: Chi² = 1.13, df = 1 (P = 0.29); I² = 11%
Test for overall effect: Z = 0.07 (P = 0.94)



1.4 Mean total cholesterol

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Adie 2010	4.4	1.1	29	4.1	0.9	27	23.1%	0.30 [-0.22, 0.82]
Chanruengvanich 2006	5.36	1.17	31	5.18	0.88	31	23.9%	0.18 [-0.34, 0.70]
Chiu 2008	4.63	0.87	53	5.28	1.16	49	39.6%	-0.65 [-1.05, -0.25]
Maasland 2007	5.5	1.1	30	5.6	1.5	27	13.4%	-0.10 [-0.79, 0.59]
Total (95% CI)			**143**			**134**	**100.0%**	**-0.16 [-0.41, 0.09]**

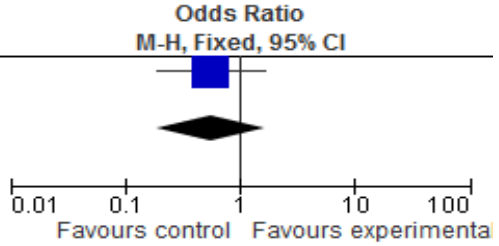
Heterogeneity: Chi² = 10.40, df = 3 (P = 0.02); I² = 71%
Test for overall effect: Z = 1.23 (P = 0.22)



1.5 Total cholesterol target achievement

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Adie 2010	9	29	12	27	100.0%	0.56 [0.19, 1.68]
Total (95% CI)		**29**		**27**	**100.0%**	**0.56 [0.19, 1.68]**
Total events	9		12			

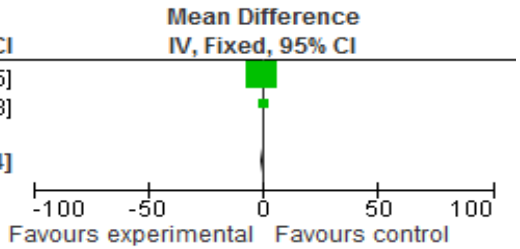
Heterogeneity: Not applicable
Test for overall effect: Z = 1.03 (P = 0.30)



1.6 Mean low density lipoprotein

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Chiu 2008	2.81	0.768	45	3.2	0.812	37	81.4%	-0.39 [-0.73, -0.05]
Maasland 2007	-1.17	1.68	30	-1.43	1.06	27	18.6%	0.26 [-0.46, 0.98]
Total (95% CI)			**75**			**64**	**100.0%**	**-0.27 [-0.58, 0.04]**

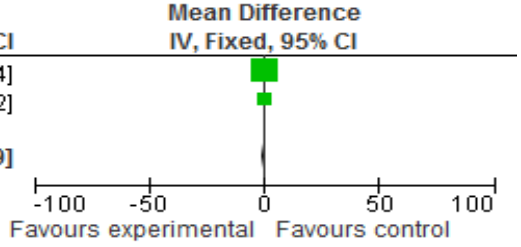
Heterogeneity: Chi² = 2.54, df = 1 (P = 0.11); I² = 61%
Test for overall effect: Z = 1.70 (P = 0.09)



1.7 Mean triglycerides

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Chiu 2008	1.66	0.779	47	1.77	1.33	44	67.2%	-0.11 [-0.56, 0.34]
Maasland 2007	-0.65	1.64	30	-0.62	0.723	27	32.8%	-0.03 [-0.68, 0.62]
Total (95% CI)			**77**			**71**	**100.0%**	**-0.08 [-0.45, 0.29]**

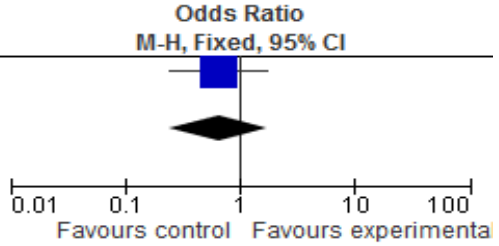
Heterogeneity: Chi² = 0.04, df = 1 (P = 0.84); I² = 0%
Test for overall effect: Z = 0.44 (P = 0.66)



1.8 HbA1C target achievement

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Chiu 2008	12	34	15	33	100.0%	0.65 [0.25, 1.75]
Total (95% CI)		**34**		**33**	**100.0%**	**0.65 [0.25, 1.75]**
Total events	12		15			

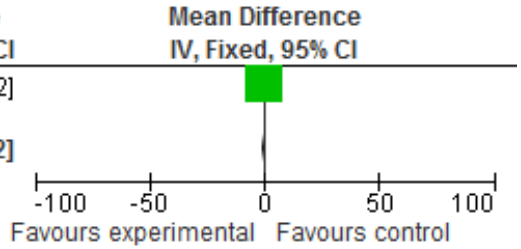
Heterogeneity: Not applicable
Test for overall effect: Z = 0.85 (P = 0.40)



1.9 Mean BMI

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Maasland 2007	0.01	1.19	30	0.25	0.978	27	100.0%	-0.24 [-0.80, 0.32]
Total (95% CI)			**30**			**27**	**100.0%**	**-0.24 [-0.80, 0.32]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.83 (P = 0.40)

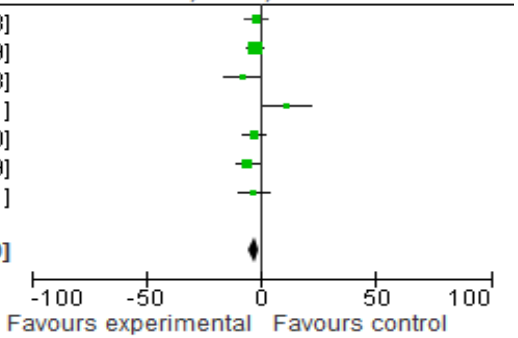


2 - Organisational interventions vs usual care

2.1 Mean systolic blood pressure

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Allen 2002	4.1	12.6	47	6.2	13.1	46	15.6%	-2.10 [-7.33, 3.13]
Brotons 2006	133.9	15.9	130	136.6	15.1	114	28.2%	-2.70 [-6.59, 1.19]
Ellis 2005	-9.3	28.4	94	-1	26.8	98	7.0%	-8.30 [-16.12, -0.48]
Evans 2010	137.3	8.5	4	126.3	6.2	4	4.0%	11.00 [0.69, 21.31]
Hornnes 2011	139.4	21.3	145	142.4	22.2	158	17.8%	-3.00 [-7.90, 1.90]
Joubert 2009	128.5	13.7	91	134.5	19.4	95	18.4%	-6.00 [-10.81, -1.19]
Welin 2010	140.9	19	78	144.1	24	74	9.0%	-3.20 [-10.11, 3.71]
Total (95% CI)			**589**			**589**	**100.0%**	**-3.15 [-5.22, -1.09]**

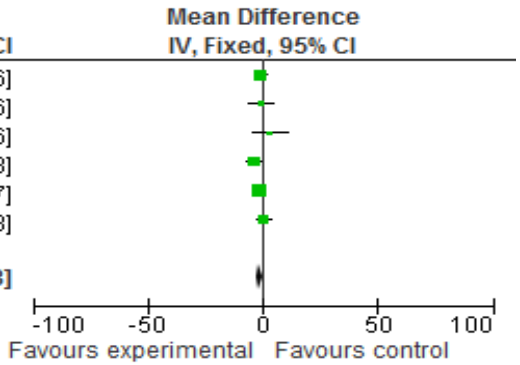
Heterogeneity: Chi² = 10.46, df = 6 (P = 0.11); I² = 43%
Test for overall effect: Z = 2.99 (P = 0.003)



2.2 Mean diastolic blood pressure

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	75.9	10.1	130	77.1	10.2	113	26.5%	-1.20 [-3.76, 1.36]
Ellis 2005	-2.1	17.8	94	-1.2	22.7	98	5.2%	-0.90 [-6.66, 4.86]
Evans 2010	78.2	2.5	4	75.3	7.3	4	3.0%	2.90 [-4.66, 10.46]
Hornnes 2011	82	13.1	145	86	12.3	158	21.1%	-4.00 [-6.87, -1.13]
Joubert 2009	77.3	8.3	91	79.1	8.9	95	28.4%	-1.80 [-4.27, 0.67]
Welin 2010	80.5	8.4	78	80.3	12.1	74	15.7%	0.20 [-3.13, 3.53]
Total (95% CI)			**542**			**542**	**100.0%**	**-1.60 [-2.92, -0.28]**

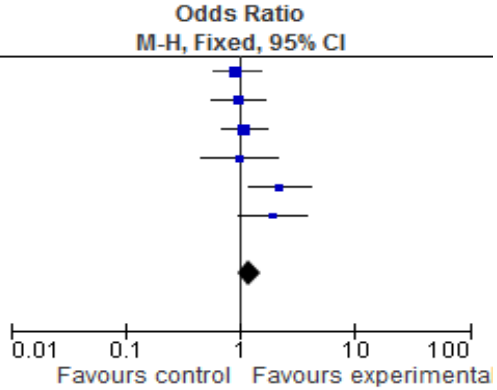
Heterogeneity: Chi² = 5.35, df = 5 (P = 0.37); I² = 7%
Test for overall effect: Z = 2.38 (P = 0.02)



2.3 Blood pressure target achievment

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Allen 2009	113	165	108	154	26.3%	0.93 [0.57, 1.49]
Brotons 2006	39	130	35	114	19.5%	0.97 [0.56, 1.67]
Hornnes 2011	57	145	59	158	25.6%	1.09 [0.68, 1.73]
Johnston 2010	30	49	37	60	9.6%	0.98 [0.45, 2.13]
Joubert 2009	66	88	52	90	9.6%	2.19 [1.16, 4.15]
Wang 2005	64	146	15	52	9.3%	1.93 [0.97, 3.81]
Total (95% CI)		**723**		**628**	**100.0%**	**1.20 [0.95, 1.50]**
Total events	369		306			

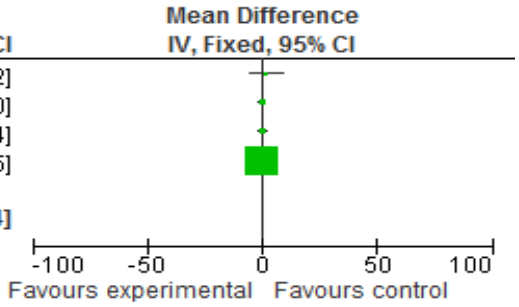
Heterogeneity: Chi² = 7.43, df = 5 (P = 0.19); I² = 33%
Test for overall effect: Z = 1.52 (P = 0.13)



2.4 Mean total cholesterol

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	188.7	0.92	130	187	37.7	114	0.2%	1.70 [-5.22, 8.62]
Ellis 2005	-0.96	4.72	94	-0.87	4.42	98	6.4%	-0.09 [-1.38, 1.20]
Evans 2010	4.84	1.25	4	4.77	1.01	4	4.4%	0.07 [-1.50, 1.64]
Joubert 2009	5.1	1	91	5.2	1.4	95	89.0%	-0.10 [-0.45, 0.25]
Total (95% CI)			**319**			**311**	**100.0%**	**-0.09 [-0.42, 0.24]**

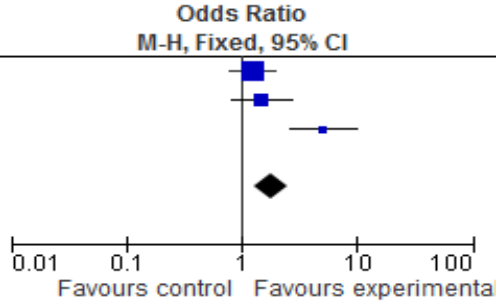
Heterogeneity: Chi² = 0.30, df = 3 (P = 0.96); I² = 0%
Test for overall effect: Z = 0.52 (P = 0.60)



2.5 Total cholesterol target achievement

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Allen 2009	58	165	47	154	56.3%	1.23 [0.77, 1.97]
Joubert 2009	57	88	50	90	31.1%	1.47 [0.80, 2.69]
Wang 2005	109	146	19	52	12.7%	5.12 [2.60, 10.06]
Total (95% CI)		**399**		**296**	**100.0%**	**1.80 [1.31, 2.48]**
Total events	224		116			

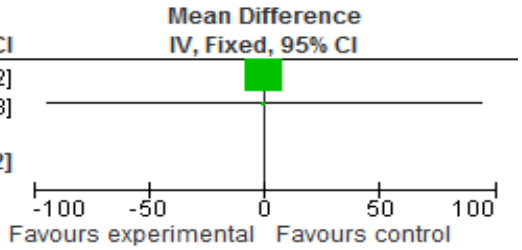
Heterogeneity: Chi² = 12.08, df = 2 (P = 0.002); I² = 83%
Test for overall effect: Z = 3.60 (P = 0.0003)



2.6 Mean low density lipoprotein

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	2.88	0.765	130	2.96	0.791	107	100.0%	-0.08 [-0.28, 0.12]
Evans 2010	2.85	1.05	4	2.95	96	4	0.0%	-0.10 [-94.18, 93.98]
Total (95% CI)			**134**			**111**	**100.0%**	**-0.08 [-0.28, 0.12]**

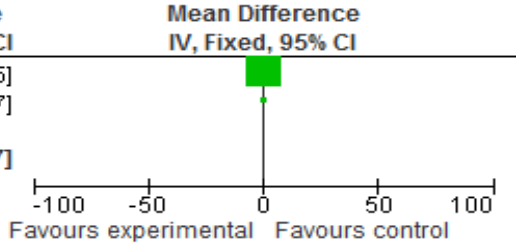
Heterogeneity: Chi² = 0.00, df = 1 (P = 1.00); I² = 0%
Test for overall effect: Z = 0.79 (P = 0.43)



2.7 Mean high density lipoprotein

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	1.41	0.445	130	1.36	0.383	109	94.4%	0.05 [-0.05, 0.15]
Evans 2010	1.33	0.36	4	0.99	0.25	4	5.6%	0.34 [-0.09, 0.77]
Total (95% CI)			**134**			**113**	**100.0%**	**0.07 [-0.04, 0.17]**

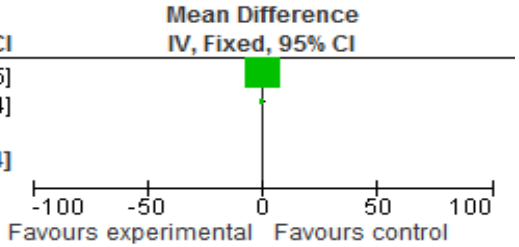
Heterogeneity: Chi² = 1.65, df = 1 (P = 0.20); I² = 39%
Test for overall effect: Z = 1.28 (P = 0.20)



2.8 Mean triglycerides

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	1.33	0.69	130	1.38	0.84	108	95.7%	-0.05 [-0.25, 0.15]
Evans 2010	1.66	0.5	4	1.75	0.81	4	4.3%	-0.09 [-1.02, 0.84]
Total (95% CI)			**134**			**112**	**100.0%**	**-0.05 [-0.25, 0.14]**

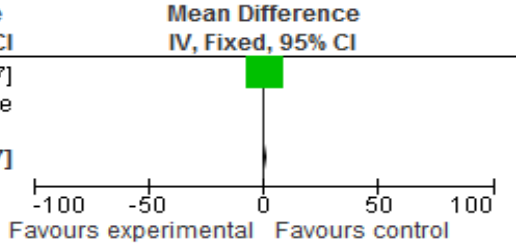
Heterogeneity: Chi² = 0.01, df = 1 (P = 0.93); I² = 0%
Test for overall effect: Z = 0.52 (P = 0.60)



2.9 Mean HbA1C

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Ellis 2005	-0.25	1.61	94	-0.78	3.91	98	100.0%	0.53 [-0.31, 1.37]
Evans 2010	7.2	0	2	6.35	0.07	4		Not estimable
Total (95% CI)			**96**			**102**	**100.0%**	**0.53 [-0.31, 1.37]**

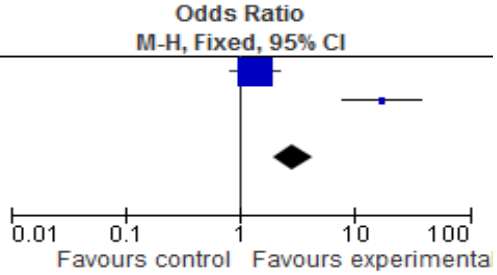
Heterogeneity: Not applicable
Test for overall effect: Z = 1.24 (P = 0.22)



2.10 HbA1C target achievment

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Allen 2009	47	165	35	154	90.4%	1.35 [0.82, 2.25]
Wang 2005	129	146	16	52	9.6%	17.07 [7.86, 37.11]
Total (95% CI)		**311**		**206**	**100.0%**	**2.86 [1.92, 4.27]**
Total events	176		51			

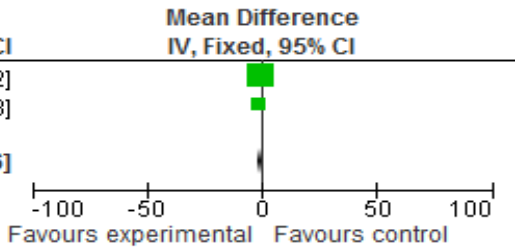
Heterogeneity: Chi² = 28.73, df = 1 (P < 0.00001); I² = 97%
Test for overall effect: Z = 5.17 (P < 0.00001)



2.11 Mean BMI

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Fixed, 95% CI
Brotons 2006	28.2	4.25	129	29.1	4.47	108	69.4%	-0.90 [-2.02, 0.22]
Joubert 2009	27.5	5.4	91	28.7	6.3	95	30.6%	-1.20 [-2.88, 0.48]
Total (95% CI)			**220**			**203**	**100.0%**	**-0.99 [-1.92, -0.06]**

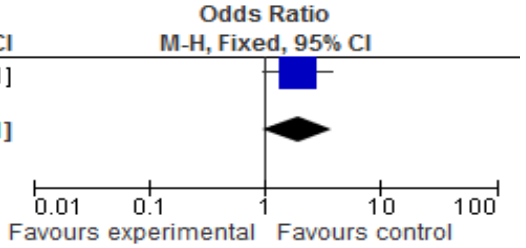
Heterogeneity: Chi² = 0.08, df = 1 (P = 0.77); I² = 0%
Test for overall effect: Z = 2.09 (P = 0.04)



2.12 BMI target achievement

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Wang 2005	64	146	15	52	100.0%	1.93 [0.97, 3.81]
Total (95% CI)		**146**		**52**	**100.0%**	**1.93 [0.97, 3.81]**
Total events	64		15			

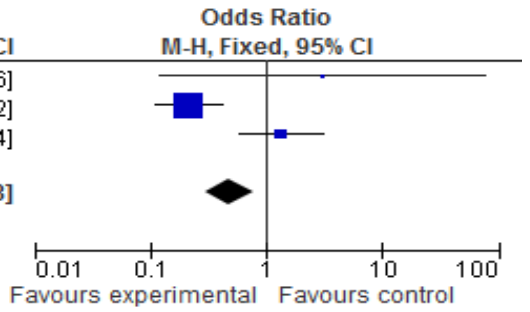
Heterogeneity: Not applicable
Test for overall effect: Z = 1.88 (P = 0.06)



2.13 Proportion of participants with secondary stroke or TIA

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Allen 2002	1	47	0	46	1.1%	3.00 [0.12, 75.56]
Wang 2005	42	146	34	52	77.8%	0.21 [0.11, 0.42]
Welin 2010	15	81	12	82	21.2%	1.33 [0.58, 3.04]
Total (95% CI)		**274**		**180**	**100.0%**	**0.48 [0.29, 0.78]**
Total events	58		46			

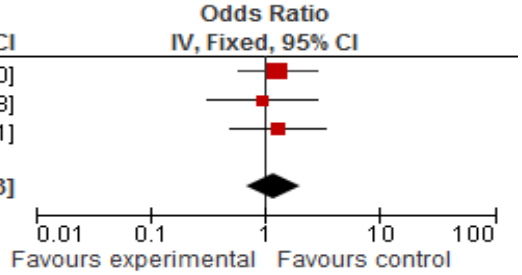
Heterogeneity: Chi² = 12.51, df = 2 (P = 0.002); I² = 84%
Test for overall effect: Z = 2.95 (P = 0.003)



2.14 Number of secondary strokes

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Boysen 2009	0.241	0.403	45.6%	1.27 [0.58, 2.80]
Hornnes 2011	-0.0683	0.556	24.0%	0.93 [0.31, 2.78]
Markle-Reid 2011	0.259	0.493	30.5%	1.30 [0.49, 3.41]
Total (95% CI)			**100.0%**	**1.19 [0.70, 2.03]**

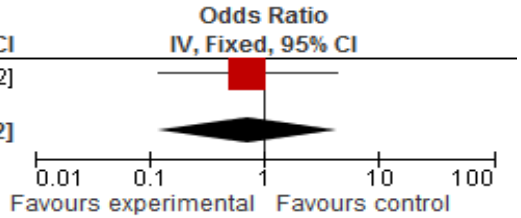
Heterogeneity: Chi² = 0.25, df = 2 (P = 0.88); I² = 0%
Test for overall effect: Z = 0.63 (P = 0.53)



2.15 Number of secondary strokes

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Ellis 2005	-0.327	0.913	100.0%	0.72 [0.12, 4.32]
Total (95% CI)			**100.0%**	**0.72 [0.12, 4.32]**

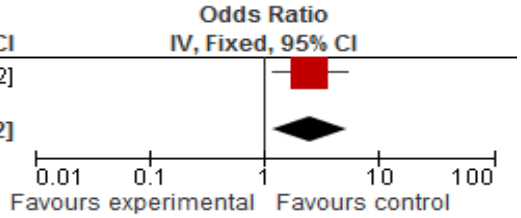
Heterogeneity: Not applicable
Test for overall effect: Z = 0.36 (P = 0.72)



2.16 Number of secondary TIAs

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Ellis 2005	0.911	0.37879	100.0%	2.49 [1.18, 5.22]
Total (95% CI)			**100.0%**	**2.49 [1.18, 5.22]**

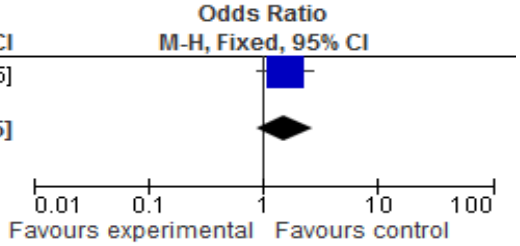
Heterogeneity: Not applicable
Test for overall effect: Z = 2.41 (P = 0.02)



2.17 Proportion of participants with secondary cardiovascular events

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Brotons 2006	32	186	23	194	100.0%	1.54 [0.87, 2.75]
Total (95% CI)		**186**		**194**	**100.0%**	**1.54 [0.87, 2.75]**
Total events	32		23			

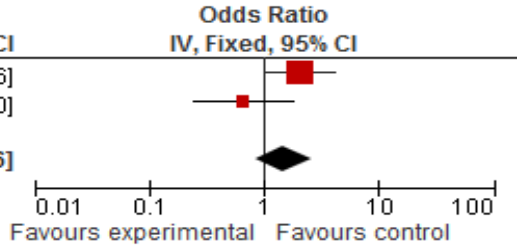
Heterogeneity: Not applicable
Test for overall effect: Z = 1.47 (P = 0.14)



2.18 Number of secondary cardiovascular events

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Ellis 2005	0.732	0.3419	69.5%	2.08 [1.06, 4.06]
Hornnes 2011	-0.425	0.5164	30.5%	0.65 [0.24, 1.80]
Total (95% CI)			**100.0%**	**1.46 [0.84, 2.56]**

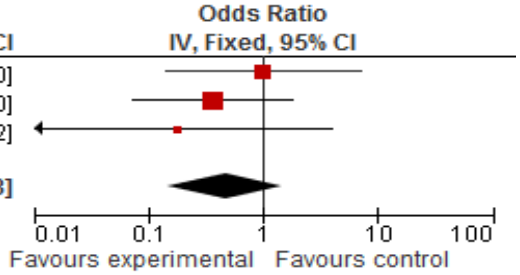
Heterogeneity: Chi² = 3.49, df = 1 (P = 0.06); I² = 71%
Test for overall effect: Z = 1.33 (P = 0.18)



2.19 Number of myocardial infarctions

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Boysen 2009	0	1	34.5%	1.00 [0.14, 7.10]
Ellis 2005	-1.01	0.8165	51.7%	0.36 [0.07, 1.80]
Hornnes 2011	-1.706	1.58	13.8%	0.18 [0.01, 4.02]
Total (95% CI)			**100.0%**	**0.47 [0.15, 1.48]**

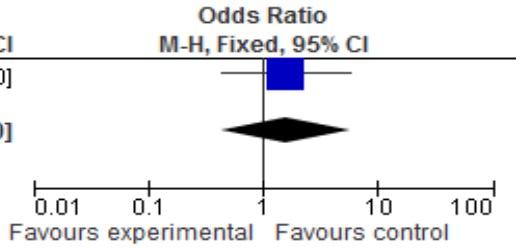
Heterogeneity: Chi² = 1.03, df = 2 (P = 0.60); I² = 0%
Test for overall effect: Z = 1.29 (P = 0.20)



2.20 Proportion of participants with vascular death

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Brotons 2006	6	186	4	194	100.0%	1.58 [0.44, 5.70]
Total (95% CI)		**186**		**194**	**100.0%**	**1.58 [0.44, 5.70]**
Total events	6		4			

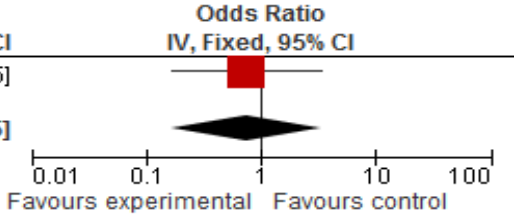
Heterogeneity: Not applicable
Test for overall effect: Z = 0.70 (P = 0.48)



2.21 Number of vascular deaths

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Boysen 2009	-0.288	0.7638	100.0%	0.75 [0.17, 3.35]
Total (95% CI)			**100.0%**	**0.75 [0.17, 3.35]**

Heterogeneity: Not applicable
Test for overall effect: Z = 0.38 (P = 0.71)



MEDLINE search strategy

1. exp Cerebrovascular Disorders/
2. ((cva$ or stroke$ or poststroke$ or post-stroke$ or post stroke$ or transient isch?emic attack$ or TIA$ or ministroke$ or mini-stroke$ or mini stroke$) adj6 (people or patient$ or inpatient$ or outpatient$ or adult$ or survivor$ or victim$ or individual$ or client$ or population$ or community or subject$)).tw.
3. (cerebrovascular$ or cerebral vascular).tw.
4. (cerebral or cerebellar or brain$ or vertebrobasilar).tw.
5. (infarct$ or isch?emi$ or thrombo$ or apoplexy or emboli$).tw.
6. 4 and 5
7. (cerebral or intracerebral or intracranial or brain$ or cerebellar or subarachnoid).tw.
8. (accident$ or h?emorrhag$).tw.
9. 7 and 8
10. 1 or 2 or 3 or 6 or 9
11. Child/
12. exp Infant/
13. exp pediatrics/
14. (child$ or neonat$ or p?ediatric$ or infant$).tw.
15. 11 or 12 or 13 or 14
16. 10 not 15
17. Patient Care Management/
18. Comprehensive Health Care/
19. Nursing Process/
20. exp Nursing Assessment/
21. Patient Care Planning/
22. Case Management/
23. delivery of health care/
24. "Delivery of Health Care, Integrated"/
25. exp Managed Care Programs/
26. Disease Management/
27. exp Patient Care Team/
28. exp Primary Health Care/
29. Reminder Systems/
30. Guideline Adherence/
31. Home Care Services/
32. Home Nursing/
33. exp Nursing Services/
34. exp Professional Role/
35. Community Health Services/
36. Medical Records/ or Medical Records Systems, Computerized/
37. Patient Education as Topic/
38. exp Patient Compliance/
39. Life Style/
40. Health Promotion/
41. Health Services Administration/
42. Education, Medical, Continuing/
43. Marketing of Health Services/
44. Patient Participation/
45. Quality of Health Care/
46. Quality Assurance, Health Care/
47. Exercise/ or Physical Fitness/
48. Smoking Cessation/
49. Diet/ or Diet, Fat-Restricted/ or Diet, Carbohydrate-Restricted/ or Diet, Reducing/ or Caloric Restriction/
50. Alcohol, Drinking/pc
51. Health Education/
52. Community Health Planning/
53. Communication/ or Communication Barriers/ or Information

Dissemination/ or Interdisciplinary Communication/
54. Nurse Clinicians/
55. Nurse Practitioners/
56. Risk Reduction Behavior/
57. Pamphlets/
58. Health Behavior/
59. Health Knowledge, Attitudes, Practice/
60. Secondary Prevention/
61. Preventive Health Services/
62. (manag$ adj3 care).tw.
63. (management adj3 program$).tw.
64. (case adj3 manag$).tw.
65. (patient adj3 management).tw.
66. (home adj3 intervention$).tw.
67. (home adj visit$).tw.
68. (discharg$ adj3 program$).tw.
69. (practice adj guideline$).tw.
70. (discharg$ adj3 plan$).tw.
71. (comprehensive adj3 care).tw.
72. (treatment adj3 plan$).tw.
73. (nurse$ adj3 led).tw.
74. (disease adj management).tw.
75. multi-disciplin$.tw.
76. multidisciplin$.tw.
77. secondary prevention clinic$.tw.
78. reminder$.tw.
79. recall$.tw.
80. (nurse adj3 clinic$).tw.
81. (secondary prevention adj3 intervention$).tw.
82. (secondary prevention adj3 program$).tw.
83. "Appointments and Schedules"/
84. appointment$.tw.
85. (outreach adj nurs$).tw.
86. (outreach adj visit$).tw.
87. (lifestyle adj3 intervention$).tw.
88. (nurs$ adj intervention$).tw.
89. (education$ adj program$).tw.
90. (physical adj (activit$ or exercise$)).tw.
91. (exercise adj3 (train$ or intervention$ or program$ or activit$ or regim$)).tw.
92. aerobic.tw.
93. fitness.tw.
94. (risk factor$ adj5 (modif$ or reduc$ or manage$ or monitor$ or self-manage$)).tw.
95. 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94
96. randomized controlled trial.pt.
97. controlled clinical trial.pt.
98. randomized.ab.
99. randomised.ab.
100. placebo.ab.
101. clinical trials as topic.sh.
102. randomly.ab.
103. trial.ti.
104. 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103
105. 16 and 95 and 106
106. exp animals/ not humans.sh.
107. 105 not 106

University Hospitals of Leicester NHS
NHS Trust

Return address

Date
Patient Address

Interview study: stroke prevention after transient ischaemic attack (TIA)

Dear (first name),

I am writing to invite you to take part in a study that is being carried out by the University of Leicester. Researchers at the University are carrying out an interview-based study about people's experiences with treatment following a **transient ischaemic attack (TIA)**, also called a **"mini-stroke".**

A researcher from the University of Leicester will be interviewing people who volunteer to take part.

There is no compulsion to participate and it is up to you to decide whether or not to take part in this study. The enclosed **Patient Information Sheet** (Version 2, dated 03/05/2011) explains the study in more detail. We would be grateful if you would consider participation. If you decide to take part please complete the enclosed **reply slip** to pass on your details to the University of Leicester. A pre-paid envelope has been enclosed with this letter.

Please be assured that if you decide not to take part in this study your care will not be affected in any way.

Yours sincerely,

(Name of Stroke Consultant)

University of Leicester

Patient Information Sheet v2 03/05/2011
Stroke prevention after transient ischaemic attack (TIA)

Patient Information Sheet

We would like to interview you to hear about your experiences following a transient ischaemic attack (TIA). This could help us to improve health care services for TIA patients in the future.

You are being invited to take part in an interview study. Before you decide whether or not to take part, we would like you to understand why the research is being done and what it will involve. Please read this information sheet carefully before deciding whether you would like to be interviewed. You might find it helpful to discuss this information with other people. Please feel free to contact us if you would like any further information.

What is the purpose of this study?

A transient ischaemic attack (TIA) is similar to a stroke, but the symptoms do not last as long. A TIA is often called a "mini-stroke". People who have a TIA are at increased risk of stroke in the future. However, medications and lifestyle changes can be used to reduce the risk of stroke.

In this interview study, we would like to find out about your understanding of a TIA. We would also like to hear about your experiences with treatment and health care services since having a TIA. This information will help us to understand how health care services for TIA patients could be improved and tailored to the needs of patients.

Why am I being invited to take part?

You are being invited to take part because you have had a TIA in the last 2 years.

Do I have to take part?

No, it's up to you to decide. If you decide not to take part, your health care will not be affected in any way. Even if you agree to take part, you are entitled to change your mind at any time, without giving a reason.

(Image removed due to copyright requirements)

What will happen if I volunteer to take part in this interview study?

If you agree to be interviewed, a researcher (PhD student) from the University of Leicester will contact you to arrange a convenient time for an interview. Interviews are usually held in people's homes (but another place for the interview can be arranged if this is more convenient for you). The researcher will visit your house at an arranged time to carry out the interview. The researcher will go through this patient information sheet with you and answer any questions. If you agree to take part in the interview after this, you will be asked to sign a consent form. You can change your mind about taking part at any time.

The interview will be as short or long as you like, but it will probably last for about 45 minutes. The interview be audio (voice) recorded.

Interviews will be carried out by a researcher (PhD student) from the University of Leicester

At the end of the interview we will give you some information. We will tell you how you can find out about the results of the study. We will also tell you about a feedback session where there will be an opportunity for you to comment on the results of the study. However, this is optional. You do not need to do anything else after the interview.

What are the possible benefits and risks of taking part?

- The findings from this study could be used to improve health services for TIA patients in the future, but there is no immediate benefit from taking part in the study.
- We do not anticipate any major risks from taking part in the interview. You do not *have* to answer any of the questions and you will be able to stop the interview at any time.

You can change your mind about taking part in the interview at any time

What if there is a problem?

Taking part in this research involves being interviewed, so it is unlikely that you will be harmed. If you have a concern about any aspect of this study please contact the study researcher or the project supervisor. If you remain unhappy or wish to complain formally, the normal National Health Service complaints mechanisms would be available to you.

Will the interview be confidential?

The interview will be confidential

The interview will be confidential and your doctor will not know what you have said during the interview. Your name will not be mentioned in the any of the results. With your permission the interview will be audio (voice) recorded. The audio recording will be treated in the strictest confidence and will be stored without your name on it. You will be able to request a copy of your audio recording if you wish.

At the end of the study the audio recording will be destroyed. Your contact details will be deleted from our records as soon as they are no longer required for contacting you.

Will my general practitioner (GP) be told whether I take part?

If you decide to take part in the study you will be given the option to choose whether or not we tell your GP that you are taking part. If you decide to give permission for your GP to be told, we will send them a letter to explain about the study and inform them that you are taking part. The interview is completely confidential. Your GP will not be told anything that you have said during the interview.

Your medical care will not be affected in any way by your decision about whether or not to take part.

What will happen to the results of the study?

The results of the study will be published in a medical journal or presented at research meetings. Small parts of what you say may be quoted anonymously when the results of the research are reported.

Who is organising and funding this research?

This research is organised and funded by the University of Leicester.

Who has reviewed this study?

To protect your interests, all research involving patients is looked at by an independent group of people, called a Research Ethics Committee. This study has been reviewed and given a favourable opinion by Nottingham Research Ethics Committee 1.

University of Leicester

What do I do if I am interested in taking part?

If you are interested in taking part in the study, please complete the enclosed reply slip and return it to the researcher at the University of Leicester. Alternatively, you can telephone the researcher on 0116 252 5494 to say that you are interested in taking part. You will then be contacted to arrange an interview. If we have more volunteers than are needed, we will contact you to let you know.

Who can I contact for further information about the study?

(Names and contact details of Study Researcher, Project Supervisor and Principal Investigator)

University Hospitals of Leicester NHS
NHS Trust

Return address

Date
GP address

Interview study: stroke prevention after transient ischaemic attack (TIA)

Patient name:	
DOB:	

Dear (Name of GP)

I am writing to inform you that your patient has agreed to participate in a qualitative study that is being carried out by the University of Leicester. Researchers at the University are carrying out interviews with TIA patients. The purpose of this study is to explore the barriers and facilitators to the secondary prevention of stroke following TIA.

All patients seen in the UHL TIA clinic have their information recorded in the TIA clinic database. This database was used to identify and recruit eligible patients for this study.

The study is not intended to create work for general practices. However, if any queries about secondary prevention arise as a result of qualitative interviews, patients will be advised to contact their GP.

Thank you for your support.

Yours sincerely,

Dr Amit Mistri

(Name of Stroke Consultant)

University Hospitals of Leicester NHS
NHS Trust

University of Leicester

Department of Health Sciences
University of Leicester
22-28 Princess Road West
Leicester · LE1 6TP

Patient Identification Number for this trial:

CONSENT FORM

Title of study: stroke prevention after transient ischaemic attack (TIA)
Name of Researcher: Kate Lager

Please initial boxes

1. I can confirm that I have read and understood the Patient Information Sheet (Version 2, dated 03/05/2011) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. [1]

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. [2]

3. I understand that the interview will be audio-recorded but that all information will be strictly confidential. [3]

4. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the research team, the research sponsor or the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records. [4]

5. I agree that any information collected as part of the study can be stored and analysed by the research team at the University of Leicester, and that small parts of what I say may be quoted anonymously when the results of the research are reported. [5]

6. I agree to my general practitioner (GP) being informed of my participation in the study. (This is optional) [6]

7. I agree to take part in the above study. [7]

Name of participant (print)	Date	Signature

Name of researcher taking consent (print)	Date	Signature

When completed, 1 for patient; 1 for researcher site file

Interview Topic Guide

OBJECTIVES

1) Develop an understanding of the experience of being a TIA patient
2) Explore the experience of secondary prevention among TIA patients

Beliefs about TIA and perceptions of stroke risk

- Can you tell me about what happened when you had a TIA?
- How did you feel when you were first told that you had a TIA? What were your main concerns?
- Have you discussed the risk of having a stroke with doctors/nurses? When you were told that having a TIA increases the risk of stroke, how did you feel about that?

Perceptions of secondary prevention and current practices

- Do you take any medications as a result of having a TIA? What are you aiming for with this treatment? How often do you take the medications?
- Have you made any lifestyle changes as a result of having a TIA? (e.g. changes in diet, exercise, alcohol consumption, smoking status)
- What influenced you to make these changes? (e.g. doctors, nurses, family, information leaflets etc.)
- How helpful do you think these medications and lifestyle changes are? (in preventing health problems)
- Has your medication or lifestyle changed over time since you had the TIA? - Why?

Barriers and facilitators to secondary prevention

- How do you feel about taking medications as a result of the TIA? Have you had any problems with the medications?
- How easy or difficult has it been to make lifestyle changes? What has been helpful or unhelpful? (e.g. family, work, social situations)
- How did you find the support that was given to you by doctors/ nurses?

Views on support requirements (opinions about medical care and services)

- How did you find the care that you received at the TIA clinic? What did you think of the advice you were given?
- Have you spoken to your GP or practice nurse about the TIA? What did you think of the advice you were given?
- Would you have liked any more support/ information? How was the timing of the support/ information that you received?

Suggestions for service improvements

- Can you think of any changes that could be made to health services for TIA patients? (e.g. lay-person support, more regular BP checks, educational programme)
- If you could offer any advice to nurses and doctors looking after TIA patients, what would this be?

List of published manuscripts

Lager K, Mistri AK. Current status of blood pressure management after stroke. Expert Review of Cardiovascular Therapy. 2010;8(11):1587-98.

Available from: http://www.expert-reviews.com/doi/pdf/10.1586/erc.10.155

Lager KE, Wilson A, Khunti K, Mistri AK. Quality of secondary prevention measures in TIA patients: a retrospective cohort study. Postgraduate Medical Journal. 2012;88(1040):305-11.

Available from: http://pmj.bmj.com/content/88/1040/305.full.pdf+html

Lager KE, Wilson AD, Mistri AK, Khunti K. Stroke services for risk reduction in the secondary prevention of stroke (Protocol). In: Cochrane Database of Systematic Reviews 2011 [Internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 Jun 14]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009103/full Record No.: CD009103.

References

(1) Stroke Association. Stroke statistics. London: Stroke Association; 2013.

(2) Rothwell P, Coull A, Silver L, Fairhead J, Giles M, Lovelock C, et al. Population-based study of event-rate, incidence, case fatality, and mortality for all acute vascular events in all arterial territories (Oxford Vascular Study). The Lancet. 2005;366(9499):1773-83.

(3) Townsend N, Wickramasinghe K, Bhatnagar P, et al. Coronary Heart Disease Statistics. 2012 edition. London: British Heart Foundation; 2012. p. 21.

(4) Saka Ö, McGuire A, Wolfe C. Cost of stroke in the United Kingdom. Age and Ageing. 2009;38(1):27-32.

(5) Dhamoon MS, Moon YP, Paik MC, Boden-Albala B, Rundek T, Sacco RL, et al. Quality of life declines after first ischemic stroke. Neurology. 2010;75(4):328-34.

(6) Dhamoon MS, Moon YP, Paik MC, Boden-Albala B, Rundek T, Sacco RL, et al. Long-term functional recovery after first ischemic stroke. Stroke. 2009;40(8):2805-11.

(7) Gubitz G, Sandercock P. Prevention of ischaemic stroke. BMJ. 2000;321(7274):1455-9.

(8) Hankey GJ. Ischaemic stroke--prevention is better than cure. J R Coll Physicians Edinb. 2010;40(1):56-63.

(9) Department of Health. National stroke strategy. London: Department of Health; 2007.

(10) Department of Health. Progress in improving stroke care. London: National Audit Office; 2010.

(11) Intercollegiate Stroke Working Party. National clinical guideline for stroke: fouth edition. London: Royal College of Physicians; 2012.

(12) World Health Organization. Cerebrovascular disorders: a clinical and research classification. Geneva: World Health Organization; 1978.

(13) Albers GW, Caplan LR, Easton JD, Fayad PB, Mohr JP, Saver JL, et al. Transient ischemic attack--proposal for a new definition. N Engl J Med. 2002;347(21):1713-16.

(14) Easton JD, Saver JL, Albers GW, Alberts MJ, Chaturvedi S, Feldmann E, et al. Definition and Evaluation of Transient Ischemic Attack: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Stroke Council; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular Nursing; and the Interdisciplinary Council on Peripheral Vascular Disease: The American Academy

of Neurology affirms the value of this statement as an educational tool for neurologists. Stroke. 2009;40(6):2276-93.

(15) Sudlow CLM, Warlow CP. Comparable Studies of the Incidence of Stroke and its Pathological Types : Results From an International Collaboration. Stroke. 1997;28(3):491-9.

(16) Adams HP,Jr, Bendixen BH, Kappelle LJ, Biller J, Love BB, Gordon DL, et al. Classification of subtype of acute ischemic stroke. Definitions for use in a multicenter clinical trial. TOAST. Trial of Org 10172 in Acute Stroke Treatment. Stroke. 1993;24(1):35-41.

(17) George SJ, Lyon C. Pathogenesis of atherosclerosis. In: George SJ, Johnson J, editors. Atherosclerosis: molecular and cellular mechanisms. Weinheim: Wiley-VCH Verlag GmbH & Co. KGaA; 2010. p. 3-20.

(18) Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Stroke. 2004;35(7):1782-3.

(19) Sacco RL, Benjamin EJ, Broderick JP, Dyken M, Easton JD, Feinberg WM, et al. Risk factors. Stroke. 1997;28(7):1507-17.

(20) O'Donnell MJ, Xavier D, Liu L, Zhang H, Siu LC, Purnima RM, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. Lancet. 2010;376(9735):112-23.

(21) World Health Organisation. 2008-2013 Action plan for the global strategy for the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2008.

(22) Strong K, Mathers C, Leeder S, Beaglehole R. Preventing chronic diseases: how many lives can we save? The Lancet. 2005;366(9496):1578-82.

(23) Feigin VL, Lawes CM, Bennett DA, Barker-Collo SL, Parag V. Worldwide stroke incidence and early case fatality reported in 56 population-based studies: a systematic review. The Lancet Neurology. 2009;8(4):355-69.

(24) Reddy KS. cardiovascular disease in non-western countries. N Engl J Med. 2004;350(24):2438-40.

(25) Carandang R, Seshadri S, Beiser A, Kelly-Hayes M, Kase CS, Kannel WB, et al. Trends in incidence, lifetime risk, severity, and 30-day mortality of stroke over the past 50 years. JAMA. 2006;296(24):2939-46.

(26) Rothwell P, Coull A, Giles M, Howard S, Silver L, Bull L, et al. Change in stroke incidence, mortality, case-fatality, severity, and risk factors in Oxfordshire, UK from 1981 to 2004 (Oxford Vascular Study). The Lancet. 2004;363(9425):1925-33.

(27) Townsend N, Wickramasinghe K, Bhatnagar P, et al. Coronary heart disease statistics. 2012 edition. London: British Heart Foundation; 2012. p. 57.

(28) Johnston SC, Fayad PB, Gorelick PB, Hanley DF, Shwayder P, van Husen D, et al. Prevalence and knowledge of transient ischemic attack among US adults. Neurology. 2003;60(9):1429-34.

(29) Sorensen AG, Ay H. Transient ischemic attack: definition, diagnosis, and risk stratification. Neuroimaging Clin N Am. 2011;21(2):303-13.

(30) Hackam DG, Kapral MK, Wang JT, Fang J, Hachinski V. Most stroke patients do not get a warning: a population-based cohort study. Neurology. 2009;73(13):1074-6.

(31) Moncayo J, de Freitas GR, Bogousslavsky J, Altieri M, van Melle G. Do transient ischemic attacks have a neuroprotective effect? Neurology. 2000;54(11):2089-94.

(32) Lovett JK, Dennis MS, Sandercock PA, Bamford J, Warlow CP, Rothwell PM. Very early risk of stroke after a first transient ischemic attack. Stroke. 2003;34(8):e138-40.

(33) Dennis M, Bamford J, Sandercock P, Warlow C. Prognosis of transient ischemic attacks in the Oxfordshire Community Stroke Project. Stroke. 1990;21(6):848-53.

(34) Rothwell PM, Giles MF, Chandratheva A, Marquardt L, Geraghty O, Redgrave JN, et al. Effect of urgent treatment of transient ischaemic attack and minor stroke on early recurrent stroke (EXPRESS study): a prospective population-based sequential comparison. Lancet. 2007;370(9596):1432-42.

(35) Merwick A, Kelly PJ. Transient ischaemic attack clinics and management of transient ischaemic attacks. Curr Opin Neurol. 2011;24(1):50-8.

(36) Rothwell PM, Warlow CP. Timing of TIAs preceding stroke: time window for prevention is very short. Neurology. 2005;64(5):817-20.

(37) Chandratheva A, Mehta Z, Geraghty OC, Marquardt L, Rothwell PM, Oxford Vascular Study. Population-based study of risk and predictors of stroke in the first few hours after a TIA. Neurology. 2009;72(22):1941-7.

(38) Giles MF, Rothwell PM. Risk of stroke early after transient ischaemic attack: a systematic review and meta-analysis. Lancet Neurology. 2007;6(12):1063-72.

(39) Wu CM, McLaughlin K, Lorenzetti DL, Hill MD, Manns BJ, Ghali WA. Early risk of stroke after transient ischemic attack: a systematic review and meta-analysis. Arch Intern Med. 2007;167(22):2417-22.

(40) Touze E, Varenne O, Chatellier G, Peyrard S, Rothwell PM, Mas J. Risk of Myocardial Infarction and Vascular Death After Transient Ischemic Attack and Ischemic Stroke: A Systematic Review and Meta-Analysis. Stroke. 2005;36(12):2748-55.

(41) van Wijk I, Kappelle LJ, van Gijn J, Koudstaal PJ, Franke CL, Vermeulen M, et al. Long-term survival and vascular event risk after transient ischaemic attack or minor ischaemic stroke: a cohort study. Lancet. 2005;365(9477):2098-104.

(42) Lindsay MP, Gubitz G, Bayley M, Hill MD, Davies-Schinkel C, Singh S, et al.
Canadian best practice recommendations for stroke care (update 2010). Ottawa: Canadian Stroke Network; 2010.

(43) Straus SE, Majumdar SR, McAlister FA. New evidence for stroke prevention: scientific review. JAMA. 2002;288(11):1388-95.

(44) McAlister FA. Commentary: Relative treatment effects are consistent across the spectrum of underlying risks … usually. International Journal of Epidemiology. 2002;31(1):76-7.

(45) Ebrahim S, Smith GD, Bennett R. Health promotion activity should be retargeted at secondary prevention. BMJ. 2000;320(7228):185-6.

(46) Ebrahim S, Smith GD. Systematic review of randomised controlled trials of multiple risk factor interventions for preventing coronary heart disease. BMJ. 1997;314(7095):1666-74.

(47) Khunti K, Walker N, Sattar N, Davies M. Unanswered questions over NHS health checks. BMJ. 2010;342.

(48) Artac M, Dalton ARH, Majeed A, Car J, Huckvale K, Millett C. Uptake of the NHS Health Check programme in an urban setting. Family Practice. 2013 [Epub ahead of print].

(49) NHS Employers, General Practitioners Committee and NHS England. 2013/14 general medical services (GMS) contract quality and outcomes framework (QOF) [Internet]. London: NHS Employers; 2013 [cited 2013 Jun 14]. Available from: http://www.nhsemployers.org/Aboutus/Publications/Documents/qof-2013-14.pdf.

(50) Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. In: Cochrane Database of Systematic Reviews 2007 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000197.pub2/full Record No.: CD000197.

(51) Wardlaw JM, Murray V, Berge E, Del Zoppo GJ. Thrombolysis for acute ischaemic stroke. In: Cochrane Database of Systematic Reviews 2009 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000213.pub2/full Record No.: CD000213.

(52) Goldstein LB. How much can be gained by more systematic prevention of stroke? International Journal of Stroke. 2008;3(4):266-71.

(53) Hackam DG, Spence JD. Combining multiple approaches for the secondary prevention of vascular events after stroke: a quantitative modeling study. Stroke. 2007;38(6):1881-5.

(54) Mouradian MS, Majumdar SR, Senthilselvan A, Khan K, Shuaib A. How well are hypertension, hyperlipidemia, diabetes, and smoking managed after a stroke or transient ischemic attack?. Stroke. 2002;33(6):1656-9.

(55) Johnson P, Rosewell M, James MA. How good is the management of vascular risk after stroke, transient ischaemic attack or carotid endarterectomy?. Cerebrovasc Dis. 2007;23(2-3):156-61.

(56) Ramsay SE, Whincup PH, Wannamethee SG, Papacosta O, Lennon L, Thomas MC, et al. Missed opportunities for secondary prevention of cerebrovascular disease in elderly British men from 1999 to 2005: a population-based study. J Public Health (Oxf). 2007;29(3):251-7.

(57) Rudd AG, Lowe D, Hoffman A, Irwin P, Pearson M. Secondary prevention for stroke in the United Kingdom: results from the National Sentinel Audit of Stroke. Age Ageing. 2004;33(3):280-6.

(58) Bushnell CD, Olson DM, Zhao X, Pan W, Zimmer LO, Goldstein LB, et al. Secondary preventive medication persistence and adherence 1 year after stroke. Neurology. 2011;77(12):1182-90.

(59) Kronish IM, Edmondson D, Goldfinger JZ, Fei K, Horowitz CR. Posttraumatic Stress Disorder and Adherence to Medications in Survivors of Strokes and Transient Ischemic Attacks. Stroke. 2012;43(8):2192-7.

(60) Barber N, Parsons J, Clifford S, Darracott R, Horne R. Patients' problems with new medication for chronic conditions. Quality and Safety in Health Care. 2004;13(3):172-5.

(61) Buckley BS, Byrne MC, Smith SM. Service organisation for the secondary prevention of ischaemic heart disease in primary care. In: Cochrane Database of Systematic Reviews 2010 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006772.pub2/full Record No.: CD006772.

(62) Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: new guidance. London: Medical Research Council; 2008.

(63) Grunwald IQ, Fassbender K and Wakhloo AK. How to set up an acute stroke service. Heidelberg: Springer-Verlag; 2012. Chapter 2, Guidelines and regulations; p. 25-32.

(64) Williams PH, de Lusignan S. Does a higher 'quality points' score mean better care in stroke? An audit of general practice medical records. Inform Prim Care. 2006;14(1):29-40.

(65) Roland M. Linking Physicians' Pay to the Quality of Care - A Major Experiment in the United Kingdom. N Engl J Med. 2004;351(14):1448-54.

(66) Intercollegiate Stroke Working Party. <*br /*>National clinical guideline for stroke. London: Royal College of Physicians; 2000.

(67) Intercollegiate Stroke Working Party. National clinical guideline for stroke: second edition. London: Royal College of Physicians; 2004.

(68) Intercollegiate Stroke Working Party. National clinical guideline for stroke: third edition. London: Royal College of Physicians; 2008.

(69) NHS Confederation and the General Practioners Committee (GPC) of the British Medical Association (BMA). The New General Medical Services Contract. London: NHS Confederation; 2003.

(70) Roland M. Chapter 2: where did the Quality and Outcomes Framework come from? In: Gillam S, Siriwardena AN, editors. The Quality and Outcomes Framework: transforming general practice. Oxon: Radcliffe Publishing; 2011. p. 8-15.

(71) NHS Confederation and the General Practitioners Committee (GPC) of the British Medical Association (BMA). Quality and Outcomes Framework guidance for GMS contract 2011/12 [Internet]. London: NHS Employers; 2011 [cited 2013 Mar 04]. Available from: http://www.nhsemployers.org/Aboutus/Publications/Documents/QOF_guidance_GMS_contract_2011_12.pdf.

(72) National Institute for Health and Clinical Excellence.
Developing the clinical and health improvement indicators for the Quality and Outcomes Framework (QOF). London: NICE; 2009.

(73) Sacco RL, Adams R, Albers G, Alberts MJ, Benavente O, Furie K, et al. Guidelines for prevention of stroke in patients with ischemic stroke or transient ischemic attack: a statement for healthcare professionals from the American Heart Association/American Stroke Association Council on Stroke: co-sponsored by the Council on Cardiovascular Radiology and Intervention: the American Academy of Neurology affirms the value of this guideline. Circulation. 2006;113(10):409-49.

(74) Warrior L, Prabhakaran S. Challenges in the diagnosis and management of transient ischemic attack. Expert Review of Cardiovascular Therapy. 2009;7(4):333-6.

(75) Furie KL, Kasner SE, Adams RJ, Albers GW, Bush RL, Fagan SC, et al. Guidelines for the prevention of stroke in patients with stroke or transient ischaemic attack: a

guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2011;42(1):227-76.

(76) Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL,Jr, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 Report. JAMA. 2003;289(19):2560-71.

(77) European Stroke Organisation (ESO) Executive Committee. ESO Writing Committee. Guidelines for management of ischaemic stroke and transient ischaemic attack 2008. Cerebrovascular Diseases. 2008;25(5):457-507.

(78) Canadian Hypertension Education Program (CHEP).
2011 CHEP recommendations for the management of hypertension. Markham: Hypertension Canada; 2011.

(79) National Stroke Foundation. Clinical guidelines for stroke management 2010. Melbourne: National Stroke Foundation; 2010.

(80) Scottish Intercollegiate Guidelines Network. Management of patients with stroke or TIA: assessment, investigation, immediate management and secondary prevention: a national clinical guideline. Edinburgh: Scottish Intercollegiate Guidelines Network; 2008.

(81) Wang YJ, Zhang SM, Zhang L, Wang CX, Dong Q, Gao S, et al. Chinese guidelines for the secondary prevention of ischemic stroke and transient ischemic attack 2010. CNS Neurosci Ther. 2012;18(2):93-101.

(82) Collins R, Peto R, MacMahon S, Hebert P, Fiebach NH, Eberlein KA, et al. Blood pressure, stroke, and coronary heart disease. Part 2, Short-term reductions in blood pressure: overview of randomised drug trials in their epidemiological context. Lancet. 1990;335(8693):827-38.

(83) Lawes CMM, Bennett DA, Feigin VL, Rodgers A. Blood Pressure and Stroke: An Overview of Published Reviews. Stroke. 2004;35(3):776-85.

(84) PROGRESS Collaborative Group. Effects of a perindopril-based blood pressure lowering regimen on cardiac outcomes among patients with cerebrovascular disease. Eur Heart J. 2003;24(5):475-84.

(85) Arima H, Chalmers J, Woodward M, Anderson C, Rodgers A, Davis S, et al. Lower target blood pressures are safe and effective for the prevention of recurrent stroke: the PROGRESS trial. J Hypertens. 2006;24(6):1201-8.

(86) Mant J, McManus RJ, Hare R. Applicability to primary care of national clinical guidelines on blood pressure lowering for people with stroke: cross sectional study. BMJ. 2006;332(7542):635-7.

(87) Rashid P, Leonardi-Bee J, Bath P. Blood pressure reduction and secondary prevention of stroke and other vascular events: a systematic review. Stroke. 2003;34(11):2741-8.

(88) Irie K, Yamaguchi T, Minematsu K, Omae T. The J-curve phenomenon in stroke recurrence. Stroke. 1993;24(12):1844-9.

(89) Jansen PA, Schulte BP, Meyboom RH, Gribnau FW. Antihypertensive treatment as a possible cause of stroke in the elderly. Age Ageing. 1986;15(3):129-38.

(90) Fletcher K, Mant J, McManus R, Campbell S, Betts J, Taylor C, et al. Protocol for Past BP: a randomised controlled trial of different blood pressure targets for people with a history of stroke of transient ischaemic attack (TIA) in primary care. BMC Cardiovasc Disord. 2010;10:37.

(91) Law MR, Morris JK, Wald NJ. Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies. BMJ. 2009;338:b1665.

(92) Williams B, Poulter NR, Brown MJ, Davis M, McInnes GT, Potter JF, et al. Guidelines for management of hypertension: report of the fourth working party of the British Hypertension Society, 2004-BHS IV. J Hum Hypertens. 2004;18(3):139-85.

(93) Lavoie JL, Sigmund CD. Minireview: Overview of the Renin-Angiotensin System—An Endocrine and Paracrine System. Endocrinology. 2003;144(6):2179-83.

(94) Gibbs CR, Beevers DG, Lip GYH. The management of hypertensive disease in Black patients. QJM. 1999;92(4):187-92.

(95) Grundy SM, Cleeman JI, Merz CNB, Brewer HB, Clark LT, Hunninghake DB, et al. Implications of Recent Clinical Trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Circulation. 2004;110(2):227-39.

(96) Imamura T, Doi Y, Arima H, Yonemoto K, Hata J, Kubo M, et al. LDL cholesterol and the development of stroke subtypes and coronary heart disease in a general Japanese population: the Hisayama study. Stroke. 2009;40(2):382-8.

(97) Lewington S, Clarke R, Qizilbash N, Peto R, Collins R, Prospective Studies Collaboration. Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. Lancet. 2002;360(9349):1903-13.

(98) Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol lowering with simvastatin in 20,536 high-risk individuals: a randomised placebo-controlled trial. Lancet. 2002;360(9326):7-22.

(99) Heart Protection Study Collaborative Group. Effects of cholesterol-lowering with simvastatin on stroke and other major vascular events in 20 536 people with cerebrovascular disease or other high-risk conditions. The Lancet 2004;363(9411):757-67.

(100) Amarenco P. Bogousslavsky J. Callahan A 3rd. Goldstein LB. Hennerici M. Rudolph AE. Sillesen H. Simunovic L. Szarek M. Welch KM. Zivin JA. Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) Investigators. High-dose atorvastatin after stroke or transient ischemic attack. N Engl J Med. 2006;355(6):549-59.

(101) Amarenco P, Goldstein LB, Szarek M, Sillesen H, Rudolph AE, Callahan A,III, et al. Effects of Intense Low-Density Lipoprotein Cholesterol Reduction in Patients With Stroke or Transient Ischemic Attack: The Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) Trial. Stroke. 2007;38(12):3198-204.

(102) Manktelow BN, Potter JF. Interventions in the management of serum lipids for preventing stroke recurrence. In: Cochrane Database of Systematic Reviews 2009 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002091.pub2/full Record No.: CD002091.

(103) Corvol JC, Bouzamondo A, Sirol M, Hulot JS, Sanchez P, Lechat P. Differential effects of lipid-lowering therapies on stroke prevention: a meta-analysis of randomized trials. Arch Intern Med. 2003;163(6):669-76.

(104) Sett AK, Robinson TG, Mistri AK. Current status of statin therapy for stroke prevention. Expert Rev Cardiovasc Ther. 2011;9(10):1305-14.

(105) Antithrombotic Trialists' C. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ. 2002;324(7329):71-86.

(106) Simmons BB, Yeo A, Fung K, American Heart Association, American Stroke Association. Current guidelines on antiplatelet agents for secondary prevention of noncardiogenic stroke: an evidence-based review. Postgrad Med. 2010;122(2):49-53.

(107) de Schryver EL, Algra A, Kappelle LJ, van Gijn J, Koudstaal PJ. Vitamin K antagonists versus antiplatelet therapy after transient ischaemic attack or minor ischaemic stroke of presumed arterial origin. In: Cochrane Database of Systematic Reviews 2012 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001342.pub3/full Record No.: CD001342.

(108) Antithrombotic Trialists' (ATT) Collaboration, Baigent C, Blackwell L, Collins R, Emberson J, Godwin J, et al. Aspirin in the primary and secondary prevention of

vascular disease: collaborative meta-analysis of individual participant data from randomised trials. Lancet. 2009;373(9678):1849-60.

(109) Sudlow CL, Mason G, Maurice JB, Wedderburn CJ, Hankey GJ. Thienopyridine derivatives versus aspirin for preventing stroke and other serious vascular events in high risk patients. In: Cochrane Database of Systematic Reviews 2009 [internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001246.pub2/full Record No.: CD001246.

(110) De Schryver E, Algra A, van Gijn J. Dipyridamole for preventing stroke and other vascular events in patients with vascular disease. In: Cochrane Database of Systematic Reviews 2008 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001820.pub3/full Record No.: CD001820.

(111) Diener HC, Cunha L, Forbes C, Sivenius J, Smets P, Lowenthal A. European Stroke Prevention Study. 2. Dipyridamole and acetylsalicylic acid in the secondary prevention of stroke. J Neurol Sci. 1996;143(1-2):1-13.

(112) Diener HC, Bogousslavsky J, Brass LM, Cimminiello C, Csiba L. Aspirin and clopidogrel compared with clopidogrel alone after recent ischaemic stroke or transient ischaemic attack in high-risk patients (MATCH): randomised, double-blind, placebo-controlled trial. Lancet. 2004;364(9431):331-7.

(113) Bhatt DL, Flather MD, Hacke W, Berger PB, Black HR, Boden WE, et al. Patients With Prior Myocardial Infarction, Stroke, or Symptomatic Peripheral Arterial Disease in the CHARISMA Trial. J Am Coll Cardiol. 2007;49(19):1982-8.

(114) ESPRIT Study Group, Halkes PH, van Gijn J, Kappelle LJ, Koudstaal PJ, Algra A. Aspirin plus dipyridamole versus aspirin alone after cerebral ischaemia of arterial origin (ESPRIT): randomised controlled trial. Lancet. 2006;367(9523):1665-73.

(115) Sacco RL, Diener HC, Yusuf S, Cotton D, Ounpuu S, Lawton WA, et al. Aspirin and extended-release dipyridamole versus clopidogrel for recurrent stroke. N Engl J Med. 2008;359(12):1238-51.

(116) Kurth T, Gaziano JM, Rexrode KM, Kase CS, Cook NR, Manson JE, et al. Prospective study of body mass index and risk of stroke in apparently healthy women. Circulation. 2005;111(15):1992-8.

(117) Kurth T, Gaziano JM, Berger K, Kase CS, Rexrode KM, Cook NR, et al. Body mass index and the risk of stroke in men. Arch Intern Med. 2002;162(22):2557-62.

(118) Suk SH, Sacco RL, Boden-Albala B, Cheun JF, Pittman JG, Elkind MS, et al. Abdominal obesity and risk of ischemic stroke: the Northern Manhattan Stroke Study. Stroke. 2003;34(7):1586-92.

(119) Hu G, Tuomilehto J, Silventoinen K, Sarti C, Mannisto S, Jousilahti P. Body mass index, waist circumference, and waist-hip ratio on the risk of total and type-specific stroke. Arch Intern Med. 2007;167(13):1420-7.

(120) Neter JE, Stam BE, Kok FJ, Grobbee DE, Geleijnse JM. Influence of weight reduction on blood pressure: a meta-analysis of randomized controlled trials. Hypertension. 2003;42(5):878-84.

(121) Anderson JW, Konz EC. Obesity and disease management: effects of weight loss on comorbid conditions. Obes Res. 2001;9 (Suppl. 4):326S.

(122) Shinton R, Beevers G. Meta-analysis of relation between cigarette smoking and stroke. BMJ. 1989;298(6676):789-94.

(123) Hankey GJ. Smoking and risk of stroke. J Cardiovasc Risk. 1999;6(4):207-11.

(124) Kool MJ, Hoeks AP, Struijker Boudier HA, Reneman RS, Van Bortel LM. Short- and long-term effects of smoking on arterial wall properties in habitual smokers. J Am Coll Cardiol. 1993;22(7):1881-6.

(125) Mast H, Thompson JL, Lin IF, Hofmeister C, Hartmann A, Marx P, et al. Cigarette smoking as a determinant of high-grade carotid artery stenosis in Hispanic, black, and white patients with stroke or transient ischemic attack. Stroke. 1998;29(5):908-12.

(126) Kawachi I, Colditz GA, Stampfer MJ, Willett WC, Manson JE, Rosner B, et al. Smoking cessation and decreased risk of stroke in women. JAMA. 1993;269(2):232-6.

(127) Wolf PA, D'Agostino RB, Kannel WB, Bonita R, Belanger AJ. Cigarette smoking as a risk factor for stroke. The Framingham Study. JAMA. 1988;259(7):1025-9.

(128) Edjoc RK, Reid RD, Sharma M. The effectiveness of smoking cessation interventions in smokers with cerebrovascular disease: a systematic review. BMJ Open. 2012;2(6).

(129) Stead LF, Perera R, Bullen C, Mant D, Hartmann-Boyce J, Lancaster T. Nicotine replacement therapy for smoking cessation. In: Cochrane Database of Systematic Reviews 2012 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000146.pub4/full Record No.: CD000146.

(130) Lancaster T, Stead LF. Individual behavioural counselling for smoking cessation. In: Cochrane Database of Systematic Reviews 2008 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001292.pub2/full Record No.: CD001292.

(131) Rice VH, Stead LF. Nursing interventions for smoking cessation. In: Cochrane Database of Systematic Reviews 2009 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001188.pub3/full Record No.: CD001188.

(132) Lee CD, Folsom AR, Blair SN. Physical Activity and Stroke Risk: A Meta-Analysis. Stroke. 2003;34(10):2475-81.

(133) Reimers CD, Knapp G, Reimers AK. Exercise as stroke prophylaxis. Dtsch Arztebl Int. 2009;106(44):715-21.

(134) Wilmot EG, Edwardson CL, Achana FA, Davies MJ, Gorely T, Gray LJ, et al. Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. Diabetologia. 2012;55(11):2895-905.

(135) Gallanagh S, Quinn TJ, Alexander J, Walters MR. Physical activity in the prevention and treatment of stroke. ISRN Neurology. 2011;2011 (Article ID: 953818).

(136) Rimmer JH, Braunschweig C, Silverman K, Riley B, Creviston T, Nicola T. Effects of a short-term health promotion intervention for a predominantly African-American group of stroke survivors. Am J Prev Med. 2000;18(4):332-8.

(137) Rees K, Dyakova M, Ward K, Thorogood M, Brunner EJ. Dietary advice for reducing cardiovascular risk. In: Cochrane Database of Systematic Reviews 2013 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Jun 14]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002128.pub4/full Record No.: CD002128.

(138) He FJ, Nowson CA, MacGregor GA. Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. Lancet. 2006;367(9507):320-6.

(139) Liu S, Manson JE, Stampfer MJ, Rexrode KM, Hu FB, Rimm EB, et al. Whole grain consumption and risk of ischemic stroke in women: A prospective study. JAMA. 2000;284(12):1534-40.

(140) He K, Song Y, Daviglus ML, Liu K, Van Horn L, Dyer AR, et al. Fish consumption and incidence of stroke: a meta-analysis of cohort studies. Stroke. 2004;35(7):1538-42.

(141) Chowdhury R, Stevens S, Gorman D, Pan A, Warnakula S, Chowdhury S, et al. Association between fish consumption, long chain omega 3 fatty acids, and risk of cerebrovascular disease: systematic review and meta-analysis. BMJ. 2012;345:e6698.

(142) He FJ, Li J, MacGregor GA. Effect of longer-term modest salt reduction on blood pressure. In: Cochrane Database of Systematic Reviews 2013 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Jun 14]. Available from:

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004937.pub2/full Record No.: CD004937.

(143) Berger K, Ajani UA, Kase CS, Gaziano JM, Buring JE, Glynn RJ, et al. Light-to-Moderate Alcohol Consumption and the Risk of Stroke among U.S. Male Physicians. N Engl J Med. 1999;341(21):1557-64.

(144) Sacco RL, Elkind M, Boden-Albala B, Lin I-, Kargman DE, Hauser WA, et al. The protective effect of moderate alcohol consumption on ischemic stroke. J Am Med Assoc. 1999;281(1):53-60.

(145) Gill JS, Shipley MJ, Tsementzis SA, Hornby RS, Gill SK, Hitchcock ER, et al. Alcohol consumption—A risk factor for hemorrhagic and non-hemorrhagic stroke. Am J Med. 1991;90(4):489-97.

(146) Zakhari S. Alcohol and the cardiovascular system: molecular mechanisms for beneficial and harmful action. Alcohol Health Res World. 1997;21(1):21-9.

(147) Djousse L, Levy D, Benjamin EJ, Blease SJ, Russ A, Larson MG, et al. Long-term alcohol consumption and the risk of atrial fibrillation in the Framingham Study. Am J Cardiol. 2004;93(6):710-3.

(148) Hillbom M. Alcohol consumption and stroke: benefits and risks. Alcohol Clin Exp Res. 1998;22(Suppl 7):352S-8S.

(149) Reynolds K, Lewis LB, Nolen JDL, Kinney GL, Sathya B, He J. Alcohol Consumption and Risk of Stroke: A Meta-analysis. J Am Med Assoc. 2003;289(5):579-88.

(150) Kurth T, Moore SC, Gaziano JM, Kase CS, Stampfer MJ, Berger K, et al. Healthy lifestyle and the risk of stroke in women. Arch Intern Med. 2006;166(13):1403-9.

(151) Haynes B, Haines A. Barriers and bridges to evidence based clinical practice. BMJ. 1998;317(7153):273-6.

(152) Hulscher MEJL, Wensing M, van Der Weijden TG, R.P. Interventions to implement prevention in primary care. In: Cochrane Database of Systematic Reviews 2005 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000362/full Record No.: CD000362.

(153) Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. In: Cochrane Database of Systematic Reviews 2010 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD005470.pub2/full Record No.: CD005470.

(154) Jin J, Sklar GE, Min Sen Oh V, Chuen Li S. Factors affecting therapeutic compliance: A review from the patient's perspective. Ther Clin Risk Manag. 2008;4(1):269-86.

(155) Martin LR, Williams SL, Haskard KB, Dimatteo MR. The challenge of patient adherence. Ther Clin Risk Manag. 2005;1(3):189-99.

(156) De Schryver EL, van Gijn J, Kappelle LJ, Koudstaal PJ, Algra A, Dutch TIA trial and SPIRIT study,groups. Non-adherence to aspirin or oral anticoagulants in secondary prevention after ischaemic stroke. J Neurol. 2005;252(11):1316-21.

(157) Sappok T, Faulstich A, Stuckert E, Kruck H, Marx P, Koennecke HC. Compliance with secondary prevention of ischemic stroke: a prospective evaluation. Stroke. 2001;32(8):1884-9.

(158) Liu Q, Wang M, Guo J, Li J, Li C, Qian M. Effect of socioeconomic status on secondary prevention of stroke. Int J Qual Health Care. 2011;23(4):405-12.

(159) Dundas R, Morgan M, Redfern J, Lemic-Stojcevic N, Wolfe C. Ethnic differences in behavioural risk factors for stroke: implications for health promotion. Ethn Health. 2001;6(2):95-103.

(160) Gholap N, Davies M, Patel K, Sattar N, Khunti K. Type 2 diabetes and cardiovascular disease in South Asians. Primary Care Diabetes. 2011;5(1):45-56.

(161) Fischbacher CM, Hunt S, Alexander L. How physically active are South Asians in the United Kingdom? A literature review. Journal of Public Health. 2004;26(3):250-8.

(162) Mold F, McKevitt C, Wolfe C. A review and commentary of the social factors which influence stroke care: issues of inequality in qualitative literature. Health & Social Care in the Community. 2003;11(5):405-14.

(163) O'Neill D, Horgan F, Hickey A, McGee H. Long term outcome of stroke: Stroke is a chronic disease with acute events. BMJ. 2008;336(7642):461.

(164) Brunton SA. Improving medication adherence in chronic disease management. J Fam Pract. 2011;60(Suppl 4):S1.

(165) Moshkovska T, Stone M, Baker R, Mayberry J. Qualitative investigation of patient adherence to 5-aminosalicylic acid therapy in patients with ulcerative colitis. Inflamm Bowel Dis. 2008;14(6):763-8.

(166) Viswanathan H, Lambert BL. An inquiry into medication meanings, illness, medication use, and the transformative potential of chronic illness among African Americans with hypertension. Research in Social and Administrative Pharmacy. 2005;1(1):21-39.

(167) Durack-Bown I, Giral P, d'Ivernois J, Bazin C, Chadarevian R, Benkritly A, et al. Patients' and physicians' perceptions and experience of hypercholesterolaemia: a qualitative study. Br J Gen Pract. 2003;53(496):851.

(168) Armitage CJ, Conner M. Social cognition models and health behaviour: A structured review. Psychol Health. 2000;15(2):173-89.

(169) Maasland L, Koudstaal PJ, Habbema JD, Dippel DW. Knowledge and understanding of disease process, risk factors and treatment modalities in patients with a recent TIA or minor ischemic stroke. Cerebrovasc Dis. 2007;23(5-6):435-40.

(170) Croquelois A, Bogousslavsky J. Risk awareness and knowledge of patients with stroke: results of a questionnaire survey 3 months after stroke. Journal of Neurology, Neurosurgery & Psychiatry. 2006;77(6):726-8.

(171) Smith J, Forster A, Young J, Cochrane Group for information provision after,stroke. Cochrane review: information provision for stroke patients and their caregivers. Clin Rehabil. 2009;23(3):195-206.

(172) Allison R, Evans PH, Kilbride C, Campbell JL. Secondary prevention of stroke: using the experiences of patients and carers to inform the development of an educational resource. Fam Pract. 2008;25(5):355-61.

(173) Sullivan K, Waugh D. Toward the development of the Cerebrovascular Attitudes and Beliefs Scale (CABS): a measure of stroke-related health beliefs. Top Stroke Rehabil. 2007;14(3):41-51.

(174) Lawrence M, Kerr S, Watson H, Paton G, Ellis G. An Exploration of Lifestyle Beliefs and Lifestyle Behaviour Following Stroke: Findings from a Focus Group Study of Patients and Family Members. BMC Family Practice. 2010;11(1).

(175) Gillham S, Endacott R. Impact of enhanced secondary prevention on health behaviour in patients following minor stroke and transient ischaemic attack: a randomized controlled trial. Clinical Rehabilitation. 2010;24(9):822-30.

(176) Potter J. Representing reality: discourse, rhetoric and social construction. London: Sage Publications; 1996.

(177) Edwards D, Potter J. Discursive Psychology. London: Sage Publications; 1992.

(178) Potter J, Wetherell M. Discourse and social psychology. London: Sage Publications; 1987.

(179) Phillips L, Jorgensen MW. Discourse analysis as theory and method. London: Sage Publications; 2002.

(180) Potter J. Attitudes, social representations and discursive psychology. In: Wetherell M, editor. Identities, groups and social issues. London: Sage Publications; 1996. p. 119-174.

(181) Burr V. An introduction to social construction. London: Routledge; 1995.

(182) Davies, B., & Harré, R. Positioning: The discursive production of selves. Journal for the Theory of Social Behaviour. 1990;20(1):43-63.

(183) Gibson J, Watkins C. People's experiences of the impact of transient ischaemic attack and its consequences: qualitative study. J Adv Nurs. 2012;68(8):1707-15.

(184) Kamara S, Singh S. What are the patient-held illness beliefs after a transient ischaemic attack, and do they determine secondary prevention activities: an exploratory study in a North London General Practice. Primary Health Care Research & Development. 2012;13(02):165.

(185) Willig C, editor. Applied discourse analysis: social and psychological interventions. Buckingham: Open University Press; 1999.

(186) Redfern J, McKevitt C, Wolfe C. Risk management after stroke: The limits of a patient-centred approach. Health Risk & Society. 2006;8(2):123-41.

(187) Giddens A. Modernity and self-identity: self and society. Stanford: Stanford University Press; 1991.

(188) Beck U. Risk society: towards a new modernity. London: Sage Publications; 1992.

(189) Martin CM, Peterson C. The social construction of chronicity ? a key to understanding chronic care transformations. J Eval Clin Pract. 2009;15(3):578-85.

(190) Anderson RM. Patient Empowerment and the Traditional Medical Model: A case of irreconcilable differences? Diabetes Care. 1995;18(3):412-5.

(191) Anderson RM, Funnell MM. Patient empowerment: reflections on the challenge of fostering the adoption of a new paradigm. Patient Educ Couns. 2005;57(2):153-7.

(192) Rogers A. Advancing the Expert Patient? Primary Health Care Research & Development. 2009;10(03):167.

(193) Freidson E. Professional dominance: the social structure of medical care. New York: Atherton Press; 1970.

(194) Roter D. An exploration of health education's responsibility for a partnership model of client-provider relations. Patient Educ Couns. 1987;9(1):25-31.

(195) Levesque A, Li HZ, Pahal JS. Factors related to patients' adherence to medication and lifestyle change recommendations: data from Canada. International Journal of Psychological Medicine. 2012;4(2):42-55.

(196) Delamater AM. Improving Patient Adherence. Clinical Diabetes. 2006;24(2):71-7.

(197) Vermeire EIJJ, Wens J, Van Royen P, Biot Y, Hearnshaw H, Lindenmeyer A. Interventions for improving adherence to treatment recommendations in people with type 2 diabetes mellitus. In: Cochrane Database of Systematic Reviews 2009 [Internet]. Hoboken: John Wiley & Sons, Ltd. 1999- [cited 2012 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003638.pub2/full Record No.: CD003638.

(198) Parsons T. The social system. London: Routledge & Kegan Paul Ltd; 1951.

(199) Anderson JM. Empowering patients: issues and strategies. Soc Sci Med. 1996;43(5):697-705.

(200) Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. JAMA. 2002;288(19):2469-75.

(201) Coulter A. Paternalism or partnership? Patients have grown up-and there's no going back. BMJ. 1999;319(7212):719-20.

(202) Lehane E, McCarthy G. Medication non-adherence--exploring the conceptual mire. Int J Nurs Pract. 2009;15(1):25-31.

(203) Vermeire E, Hearnshaw H, Van Royen P, Denekens J. Patient adherence to treatment: three decades of research. A comprehensive review. J Clin Pharm Ther. 2001;26(5):331-42.

(204) Department of Health. The expert patient: a new approach to chonic disease management in the 21st century. London: Stationery Office; 2001.

(205) Rogers A, Bower P, Gardner C, Gately C, Kennedy A, Lee V, et al. The National evaluation of the pilot phase of the expert patients programme: final report. Manchester: National Primary Care Research and Development Centre; 2007.

(206) Wilson PM, Kendall S, Brooks F. The Expert Patients Programme: a paradox of patient empowerment and medical dominance. Health & Social Care in the Community. 2007;15(5):426-38.

(207) Department of Health. Self Care – A Real Choice. Self Care Support – A Practical Option. London: Department of Health; 2005.

(208) Edwards A, Elwyn G. Shared decision-making in health care: achieving evidence-based patient choice. In: Edwards A, Elwyn G, editors. Shared decision-making in

health care: achieving evidence-based patient choice. 2nd ed. Oxford: Oxford University Press; 2009.

(209) Morden A, Jinks C, Ong BN. Rethinking 'risk' and self-management for chronic illness. Soc Theory Health. 2012;10(1):78-99.

(210) Davies MJ, Heller S, Skinner TC, Campbell MJ, Carey ME, Cradock S, et al. Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cluster randomised controlled trial. BMJ. 2008;336(7642):491-5.

(211) Khunti K, Gray LJ, Skinner T, Carey ME, Realf K, Dallosso H, et al. Effectiveness of a diabetes education and self management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three year follow-up of a cluster randomised controlled trial in primary care. BMJ. 2012;344:e2333.

(212) Skinner TC, Carey ME, Cradock S, Daly H, Davies MJ, Doherty Y, et al. Diabetes education and self-management for ongoing and newly diagnosed (DESMOND): Process modelling of pilot study. Patient Educ Couns. 2006;64(1–3):369-77.

(213) Deakin TA, Cade JE, Williams R, Greenwood DC. Structured patient education: the Diabetes X-PERT Programme makes a difference. Diabetic Med. 2006;23(9):944-54.

(214) DAFNE Study Group. Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial. BMJ. 2002;325(7367):746.

(215) Petersen A, Lupton D. The new public health: discourses, knowledges and strategies. London: Sage Publications; 1996.

(216) Crawford R. Healthism and the medicalization of everyday life. Int J Health Serv. 1980;10(3):365-88.

(217) Bunton R, Burrows R. Consumption and health and the 'epidemiological' clinic of late modern medicine. In: Bunton R, Nettleton S, Burrows R, editors. The sociology of health promotion. London: Routledge; 1995.

(218) Fitzpatrick M. The tyranny of health: doctors and the reguation of lifestyle. London: Routledge; 2001.

(219) Lupton D. Medicine as a culture: illness, disease and the body. 3rd ed. London: Sage Publications; 2012.

(220) Nettleton S. The sociology of health and illness. 2nd ed. Cambridge: Polity Press; 2006. Chapter 9, Sociological analyses of contemporary developments in UK health policy: a new paradigm for health care? p. 233-261.

(221) Anderson RM, Funnell MM. Compliance and adherence are dysfunctional concepts in diabetes care. Diabetes Educ. 2000;26(4):597-604.

(222) Armstrong N, Murphy E. Conceptualizing resistance. Health. 2012;16(3):314-26.

(223) Ogedegbe G, Mancuso CA, Allegrante JP. Expectations of blood pressure management in hypertensive African-American patients: a qualitative study. J Natl Med Assoc. 2004;96(4):442-9.

(224) Levinson W, Kao A, Kuby A, Thisted RA. Not all patients want to participate in decision making. A national study of public preferences. J Gen Intern Med. 2005;20(6):531-5.

(225) Nunes V, Neilson J, O'Flynn N, Calvert N, Kuntze S, Smithson H, Benson J, Blair J, Bowser A, Clyne W, Crome P, Haddad P, Hemingway S, Horne R, Johnson S, Kelly S, Packham B, Patel M, Steel J. Clinical Guidelines and Evidence Review for Medicines Adherence: involving patients in decisions about prescribed medicines and supporting adherence. 2009.

(226) Gravel K, Legare F, Graham I. Barriers and facilitators to implementing shared decision-making in clinical practice: a systematic review of health professionals' perceptions. Implementation Science. 2006;1(1):16.

(227) Gagliardi A, Brouwers M. Integrating guideline development and implementation: analysis of guideline development manual instructions for generating implementation advice. Implementation Science. 2012;7(1):67.

(228) Robertson M, Moir J, Skelton J, Dowell J, Cowan S. When the business of sharing treatment decisions is not the same as shared decision making: A discourse analysis of decision sharing in general practice. Health:. 2011;15(1):78-95.

(229) Broom A. Medical specialists' accounts of the impact of the Internet on the doctor/patient relationship. Health. 2005;9(3):319-38.

(230) Wilson PM, Kendall S, Brooks F. Nurses' responses to expert patients: The rhetoric and reality of self-management in long-term conditions: A grounded theory study. Int J Nurs Stud. 2006;43(7):803-18.

(231) Salmon P, Hall GM. Patient empowerment and control: a psychological discourse in the service of medicine. Soc Sci Med. 2003;57(10):1969-80.

(232) Raftery JP, Yao GL, Murchie P, Campbell NC, Ritchie LD. Cost effectiveness of nurse led secondary prevention clinics for coronary heart disease in primary care: follow up of a randomised controlled trial. BMJ. 2005;330(7493):707.

(233) Campbell NC, Ritchie LD, Thain J, Deans HG, Rawles JM, Squair JL. Secondary prevention in coronary heart disease: a randomised trial of nurse led clinics in primary care. Heart. 1998;80(5):447-52.

(234) Phillips LS, Branch WT, Cook CB, Doyle JP, El-Kebbi IM, Gallina DL, et al. Clinical inertia. Ann Intern Med. 2001;135(9):825-34.

(235) Kaplan RC, Tirschwell DL, Longstreth WT,Jr, Manolio TA, Heckbert SR, LeValley AJ, et al. Blood pressure level and outcomes in adults aged 65 and older with prior ischemic stroke. J Am Geriatr Soc. 2006;54(9):1309-16.

(236) Leung ES, Hamilton-Bruce MA, Price C, Koblar SA. Transient Ischaemic Attack (TIA) Knowledge in General Practice: a cross-sectional study of Western Adelaide general practitioners. BMC Res Notes. 2012;5:278.

(237) Cook S, Drum ML, Kirchoff AC, Jin L, Levie J, Harrison JF, et al. Providers' assessment of barriers to effective management of hypertension and hyperlipidemia in community health centres. Journal of Health Care for the Poor and Underserved. 2006;17:70-85.

(238) Intercollegiate Stroke Working Party. National Sentinel Stroke Audit: Organisational Audit 2010. London: Royal College of Physicians; 2010.

(239) Sprigg N, Machili C, Otter ME, Wilson A, Robinson TG. A systematic review of delays in seeking medical attention after transient ischaemic attack. Journal of Neurology, Neurosurgery & Psychiatry. 2009;80(8):871-5.

(240) Lasserson DS, Chandratheva A, Giles MF, Mant D, Rothwell PM. Influence of general practice opening hours on delay in seeking medical attention after transient ischaemic attack (TIA) and minor stroke: prospective population based study. BMJ. 2008;337:a1569.

(241) Giles MF, Flossman E, Rothwell PM. Patient behavior immediately after transient ischemic attack according to clinical characteristics, perception of the event, and predicted risk of stroke. Stroke. 2006;37(5):1254-60.

(242) Robinson TG, Reid A, Haunton VJ, Wilson A, Naylor AR. The face arm speech test: does it encourage rapid recognition of important stroke warning symptoms? Emerg Med J. 2013;30(6):467-71.

(243) de Koning JS, Klazinga N, Koudstaal PJ, Prins AD, Borsboom GJ, Mackenbach JP. Quality of stroke prevention in general practice: relationship with practice organization. International Journal for Quality in Health Care. 2005;17(1):59-65.

(244) Whitford DL, Hickey A, Horgan F, O'Sullivan B, McGee H, O'Neill D. Is primary care a neglected piece of the jigsaw in ensuring optimal stroke care? Results of a national study. BMC Family Practice. 2009;10:27.

(245) Short D, Frischer M, Bashford J, Ashcroft D. Why are eligible patients not prescribed aspirin in primary care? A qualitative study indicating measures for improvement. BMC Family Practice. 2003;4:9.

(246) Ovbiagele B, Drogan O, Koroshetz WJ, Fayad P, Saver JL. Outpatient practice patterns after stroke hospitalization among neurologists. Stroke. 2008;39(6):1850-4.

(247) Stone MA, Charpentier G, Doggen K, Kuss O, Lindblad U, Kellner C, et al. Quality of Care of People With Type 2 Diabetes in Eight European Countries: Findings from the Guideline Adherence to Enhance Care (GUIDANCE) study. Diabetes Care. 2013 [Epub ahead of print].

(248) Stone MA, Wilkinson JC, Charpentier G, Clochard N, Grassi G, Lindblad U, et al. Evaluation and comparison of guidelines for the management of people with type 2 diabetes from eight European countries. Diabetes Res Clin Pract. 2010;87(2):252-60.

(249) Medical Research Council. A Framework for Development and Evaluation of RCTs of Complex Interventions to Improve Health. London: Medical Research Council; 2000.

(250) Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ. 2008;337:a1655.

(251) Petticrew M. Systematic reviews from astronomy to zoology: myths and misconceptions. BMJ. 2001;322(7278):98-101.

(252) Campbell M, Fitzpatrick R, Haines A, Kinmonth AL, Sandercock P, Spiegelhalter D, et al. Framework for design and evaluation of complex interventions to improve health. BMJ. 2000;321(7262):694-6.

(253) Hardeman W, Sutton S, Griffin S, Johnston M, White A, Wareham NJ, et al. A causal modelling approach to the development of theory-based behaviour change programmes for trial evaluation. Health Educ Res. 2005;20(6):676-87.

(254) Rowlands G, Sims J, Kerry S. A lesson learnt: the importance of modelling in randomized controlled trials for complex interventions in primary care. Fam Pract. 2005;22(1):132-9.

(255) Denzin NK, Lincoln YS. Introduction: the discipline and practice of qualitative research. In: Denzin NK, Lincoln YS, editors. Handbook of qualitative research. 2nd ed. London: Sage Publications; 2000. p. 1-28.

(256) Lincoln YS, Guba EG. Paradigmatic controversies, contradictions and emerging confluences. In: Denzin NK, Lincoln YS, editors. Handbood of qualitative research. 2nd ed. London: Sage Publications; 2000. p. 163-188.

(257) Guba EG. The paradigm dialog. In: Guba EG, editor. The alternative paradigm dialog. Newbury Park: Sage Publications; 1990. p. 17-30.

(258) Berger PL, Luckmann T. The social construction of reality: a treatise in the sociology of knowledge. New York: Doubleday; 1966.

(259) Willig C. Introducing qualitative research in psychology. Berkshire: Open University Press; 2008.

(260) Creswell JW. Research design: qualitative and quantitative approaches. London: Sage publications; 1994.

(261) Morse Jm, Barrett M, Mayan M, Olson K, Spiers J. Verification strategies for establishing reliability and validity in qualitative research. International Journal of Qualitative Methods. 2002;1(2):1-19.

(262) Davies D, Dodd J. Qualitative Research and the Question of Rigor. Qualitative Health Research. 2002;12(2):279-89.

(263) Koch T, Harrington A. Reconceptualizing rigour: the case for reflexivity. J Adv Nurs. 1998;28(4):882-90.

(264) Golafshani N. Understanding reliability and validity in qualitative research. The Qualitative Report. 2003;2003:597-607.

(265) Lincoln YS, Guba EG. Naturalistic inquiry. Thousand Oaks: Sage Publications; 1985.

(266) Schou L, Høstrup H, Lyngsø EE, Larsen S, Poulsen I. Validation of a new assessment tool for qualitative research articles. J Adv Nurs. 2012;68(9):2086-94.

(267) Nicholas Mays, Catherine Pope. Qualitative Research: Rigour and qualitative research. BMJ. 1995;311(6997):109-12.

(268) Mays N, Pope C. Qualitative research in health care. Assessing quality in qualitative research. BMJ. 2000;320(7226):50-2.

(269) Spencer L, Ritchie J, Lewis J, Dillon L. Quality in qualitative evaluation: a framework for assessing research evidence. London: Government Chief Social Researcher's Office; 2003.

(270) Rolfe G. Validity, trustworthiness and rigour: quality and the idea of qualitative research. J Adv Nurs. 2006;53(3):304-10.

(271) Lewis-beck MS, Bryman A, Liao TF. The SAGE encyclopedia of social science research methods. Volume 2. London: Sage Publications; 2004.

(272) Kuhn TS. The structure of scientific revolutions. 1st ed. Chicago: University of Chicago Press; 1962.

(273) Tashakkori A, Teddlie C. Mixed methodology: combining qualitative and quantitative approaches. London: Sage Publications; 1998.

(274) Brewer J, Hunter A. Multimethod research: a synthesis of styles. Thousand Oaks: Sage Publications; 1989.

(275) Brewer J, Hunter A. Multimethod research: a synthesis of styles. Thousand Oaks: Sage Publications; 1989. p. 16-7.

(276) Reichardt CS, Rallis SF. Qualitative and quantitative inquiries are not incompatible: a call for a new perspective. In: Reichardt CS, Rallis SF, editors. The qualitative - quantitative debate: new perspectives. San Francisco: Jossey-Bass; 1995. p. 85-92.

(277) Greene JC, Caracelli VJ, Graham WF. Toward a Conceptual Framework for Mixed-Method Evaluation Designs. Educational Evaluation and Policy Analysis. 1989;11(3):255-74.

(278) Bryman A. Integrating quantitative and qualitative research: how is it done? Qualitative Research. 2006;6(1):97-113.

(279) Armitage A, Keeble-Allen D. Mutual research designs: redefining mixed methods research design. In: Remenyi D, editor. Proceedings of the 6th European Conference on Research Methodology for Business and Management Studies. Reading: Academic Conferences Limited; 2007. p. 29-36.

(280) Jick TD. Mixing Qualitative and Quantitative Methods: Triangulation in Action. Adm Sci Q. 1979;24(4, Qualitative Methodology):602-11.

(281) Denzin NK. Sociological methods. New York: McGraw-Hill; 1978.

(282) Morgan DL. Practical strategies for combining qualitative and quantitative methods: applications to health research. Qual Health Res. 1998;8(3):362-76.

(283) Bryman A. Quantity and Quality in Social Research. Routledge: London; 1988.

(284) Khunti K. Use of multiple methods to determine factors affecting quality of care of patients with diabetes. Family Practice. 1999;16(5):489-94.

(285) Johnson RB, Onwuegbuzie AJ, Turner LA. Toward a Definition of Mixed Methods Research. Journal of Mixed Methods Research. 2007;1(2):112-33.

(286) Bryman A. Breaking down the quantitative/qualitative divide. In: Anonymous Social research methods. 3rd ed. Oxford: Oxford University Press; 2008.

(287) Greene JC, Caracelli VJ. Defining and describing the paradigm issue in mixed-method evaluation. New Directions for Evaluation. 1997;1997(74):5-17.

(288) Nowotny H. Re-thinking science: knowledge and the public in an age of uncertainty. Malden: Blackwell; 2002.

(289) O'Cathain A, Murphy E, Nicholl J. Why, and how, mixed methods research is undertaken in health services research in England: a mixed methods study. BMC Health Services Research. 2007;7:85.

(290) Oertle M, Bal R. Understanding non-adherence in chronic heart failure: a mixed-method case study. Qual Saf Health Care. 2010;19(6):e37.

(291) Dixon N and Pearce M. Guide to ensuring data quality in clinical audits [Internet]. London: Healthcare Quality Improvement Partnership; 2011 [cited 2013 Mar 04]. Available from: http://hqip.org.uk/assets/LQIT-uploads/Guidance-0212/HQIP-CA-PD-028-Guide-to-Ensuring-Data-Quality-in-Clinical-Audits-220212.pdf.

(292) Banks NJ. Designing medical record abstraction forms. Int J Qual Health Care. 1998;10(2):163-7.

(293) MacDonald SE, Newburn-Cook CV, Schopflocher D, Richter S. Addressing nonresponse bias in postal surveys. Public Health Nurs. 2009;26(1):95-105.

(294) Nakash R, Hutton J, Jorstad-Stein E, Gates S, Lamb S. Maximising response to postal questionnaires - A systematic review of randomised trials in health research. BMC Medical Research Methodology. 2006;6(1):5.

(295) Liberati A, Altman DG, Tetzlaff J, Mulrow C, GÃ¸tzsche PC, Ioannidis JPA, et al. The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. PLoS Med. 2009;6(7):e1000100.

(296) Moher D, Cook DJ, Eastwood S, Olkin I, Rennie D, Stroup DF. Improving the Quality of Reports of Meta-Analyses of Randomised Controlled Trials: The QUOROM Statement. Onkologie. 2000;23(6):597-602.

(297) Torgerson C. Systematic reviews. Cornwall: MPG books Ltd; 2003.

(298) J. P. T. Higgins and S. Green, editors. Cochrane Handbook for Systematic Reviews of Interventions: version 5.1.0 [Internet]. Hoboken: The Cochrane Collaboration; 2011 [updated 2011 Mar; cited 2013 Mar 04]. Available from: www.cochrane-handbook.org.

(299) Bryman A. Social research methods. 4th ed. New York: Oxford University Press Inc.; 2008. Chapter 9, Structured interviewing; p. 208-30.

(300) Gee JP. An introduction to discourse analysis theory and method. 3rd ed. Oxon: Routledge; 2011.

(301) Wood LA, Kroger RO. Doing discourse analysis. London: Sage Publications; 2000.

(302) Tracy K. Action-implicative discourse analysis. Journal of Language and Social Psychology. 1995;14:195-215.

(303) Bryman A. Barriers to Integrating Quantitative and Qualitative Research. Journal of Mixed Methods Research. 2007;1(1):8-22.

(304) Yin RK. Mixed methods research: Are the methods genuinely integrated or merely parallel? Research in the Schools. 2006;13(1):41-47.

(305) Conn VS, Cooper PS, Ruppar TM, Russell CL. Searching for the Intervention in Intervention Research Reports. Journal of Nursing Scholarship. 2008;40(1):52-9.

(306) Slonim-Nevo V, Nevo I. Conflicting Findings in Mixed Methods Research. Journal of Mixed Methods Research. 2009;3(2):109-28.

(307) Redfern J, McKevitt C, Wolfe CD. Development of complex interventions in stroke care: a systematic review. Stroke. 2006;37(9):2410-9.

(308) O'Cathain A, Murphy E, Nicholl J. The quality of mixed methods studies in health services research. Journal of Health Services Research & Policy. 2008;13(2):92-8.

(309) Woolley CM. Meeting the Mixed Methods Challenge of Integration in a Sociological Study of Structure and Agency. Journal of Mixed Methods Research. 2009;3(1):7-25.

(310) Higginson I, Vivat B, Silber E, Saleem T, Burman R, Hart S, et al. Study protocol: delayed intervention randomised controlled trial within the Medical Research Council (MRC) Framework to assess the effectiveness of a new palliative care service. BMC Palliative Care. 2006;5(1):7.

(311) Hermann K, Boelter R, Engeser P, Szecsenyi J, Campbell S, Peters-Klimm F. PalliPA: How can general practices support caregivers of patients at their end of life in a home-care setting? A study protocol. BMC Research Notes. 2012;5(1):233.

(312) Teddlie C, Tashakkori A. Overview of contemporary issues in mixed methods research. In: Tashakkori A, Teddlie C, editors. SAGE handbook of mixed methods in social and behavioral research. 2nd ed. Thousand Oaks: Sage Publications; 2010. p. 1-44.

(313) Lovell K, Bower P, Richards D, Barkham M, Sibbald B, Roberts C, et al. Developing guided self-help for depression using the Medical Research Council complex interventions framework: a description of the modelling phase and results of an exploratory randomised controlled trial. BMC Psychiatry. 2008;8(1):91.

(314) Redfern J, Rudd AD, Wolfe CD, McKevitt C. Stop Stroke: development of an innovative intervention to improve risk factor management after stroke. Patient Education & Counseling. 2008;72(2):201-9.

(315) Bazeley P. Integrative Analysis Strategies for Mixed Data Sources. American Behavioral Scientist. 2012;56(6):814-28.

(316) Faes MC, Reelick MF, Esselink RA, Rikkert MGO. Developing and Evaluating Complex Healthcare Interventions in Geriatrics: The Use of the Medical Research Council Framework Exemplified on a Complex Fall Prevention Intervention. J Am Geriatr Soc. 2010;58(11):2212-21.

(317) Kirkevold M, Bronken BA, Martinsen R, Kvigne K. Promoting psychosocial well-being following a stroke: Developing a theoretically and empirically sound complex intervention. Int J Nurs Stud. 2012;49(4):386-97.

(318) Kennedy A, Chew-Graham C, Blakeman T, Bowen A, Gardner C, Protheroe J, et al. Delivering the WISE (Whole Systems Informing Self-Management Engagement) training package in primary care: learning from formative evaluation. Implementation Science. 2010;5(1):7.

(319) Gunn J, Palmer V, Dowrick C, Herrman H, Griffiths F, Kokanovic R, et al. Embedding effective depression care: using theory for primary care organisational and systems change. Implementation Science. 2010;5(1):62.

(320) Kennedy J, Hill MD, Ryckborst KJ, Eliasziw M, Demchuk AM, Buchan AM, et al. Fast assessment of stroke and transient ischaemic attack to prevent early recurrence (FASTER): a randomised controlled pilot trial. Lancet Neurol. 2007;6(11):961-9.

(321) The Glaucoma screening Platform,Study group. Developing the clinical components of a complex intervention for a glaucoma screening trial: a mixed methods study. BMC Medical Research Methodology. 2011;11(1):54.

(322) Moran-Ellis J, Alexander VD, Cronin A, Dickinson M, Fielding J, Sleney J, et al. Triangulation and integration: processes, claims and implications. Qualitative Research. 2006;6(1):45-59.

(323) Teddlie C, Tashakkori A. Foundations of mixed methods research. London: Sage Publications; 2009.

(324) Tashakkori A, Teddlie C. Quality of inferences in mixed methods research: calling for an integrative framework. In: Bergman M, editor. Advances in mixed methods research. Sage Publications ed. Thousand Oaks; 2008. p. 101-119.

(325) Lager KE, Wilson A, Khunti K, Mistri AK. Quality of secondary prevention measures in TIA patients: a retrospective cohort study. Postgraduate Medical Journal. 2012;88(1040):305-11.

(326) Rudd AG. Improving care for patients after transient ischaemic attack (TIA). Postgrad Med J. 2012;88(1040):303-4.

(327) Selvarajah JR, Smith CJ, Hulme S, Georgiou RF, Vail A, Tyrrell PJ, et al. Prognosis in patients with transient ischaemic attack (TIA) and minor stroke attending TIA services in the North West of England: The NORTHSTAR Study. Journal of Neurology, Neurosurgery & Psychiatry. 2008;79(1):38-43.

(328) Office for National Statistics. ONS Ethnic Group population estimates mid-2009 [internet]. Leicester: Leicestershire Statistics and Research Online; [updated 2011 Jul 6; cited 2013 Mar 04]. Available from: www.lsr-online.org/reports/ethnic_group_population_estimates_2001_2009_ons_experimental.

(329) Report : Ethnic Group Population Estimates 2001-2009 (ONS Experimental) [Internet]. Leicester: Leicestershire Statistics and Research Online; [updated 2011 Jul 6; cited 2013 Mar 04]. Available from: http://www.lsr-online.org/reports/ethnic_group_population_estimates_2001_2009_ons_experimental.

(330) Gunarathne A, Patel JV, Gammon B, Gill PS, Hughes EA, Lip GYH. Ischemic Stroke in South Asians. Stroke. 2009;40(6):e415-23.

(331) Jackson D, Moshinsky J, Begg AJ. Addressing shortfalls in TIA care in the UK: an economic perspective. J Med Econ. 2009;12(4):331-8.

(332) Stroke Improvement Programme. Going up a gear: practical steps to improve stroke care. Leicester: NHS Improvement - Stroke Improvement Programme; 2010.

(333) Institute of Medicine. Guidelines for Clinical Practice: From Development to Use. Washington DC: National Academy Press; 1992.

(334) PROGRESS Collaborative G. Randomised trial of a perindopril-based blood-pressure-lowering regimen among 6,105 individuals with previous stroke or transient ischaemic attack.[Erratum appears in Lancet 2001 Nov 3;358(9292):1556]. Lancet. 2001;358(9287):1033-41.

(335) Schrader J, Luders S, Kulschewski A, Hammersen F, Plate K, Berger J, et al. Morbidity and Mortality After Stroke, Eprosartan Compared with Nitrendipine for Secondary Prevention: principal results of a prospective randomized controlled study (MOSES). Stroke. 2005;36(6):1218-26.

(336) Thiru K, Hassey A, Sullivan F. Systematic review of scope and quality of electronic patient record data in primary care. BMJ. 2003;326(7398):1070.

(337) Strazzullo P, D'Elia L, Cairella G, Garbagnati F, Cappuccio FP, Scalfi L. Excess body weight and incidence of stroke: meta-analysis of prospective studies with 2 million participants. Stroke. 2010;41(5):e418-26.

(338) Department of Health. Puttting Prevention First - NHS Health Check: Vascular Risk Assessment and Management Best Practice Guidance. London: Department of Health; 2009.

(339) Beech PF, Greenhalgh JF, Thornton MF, Tyrrell P. A survey of the practice of stroke doctors in developing transient ischaemic attack services in the UK. Journal of evaluation in clinical practice JID - 9609066 2007;13(3):395-9.

(340) National Audit Office DoH. Reducing Brain Damage: Faster access to better stroke care. London: The Stationery Office; 2005.

(341) The National Audit of Stroke Care Research Team. National Audit of Stroke Care Community Audit: National Survey of General Practitioners 2006. Dublin: Irish Heart Foundation; 2007.

(342) Pierce M, Agarwal G, Ridout D. A survey of diabetes care in general practice in England and Wales. Br J Gen Pract. 2000;50(456):542-5.

(343) Gandhi TK, Weingart SN, Borus J, Seger AC, Peterson J, Burdick E, et al. Adverse Drug Events in Ambulatory Care. N Engl J Med. 2003;348(16):1556-64.

(344) Lager KE, Wilson AD, Mistri AK, Khunti K. Stroke services for risk reduction in the secondary prevention of stroke (Protocol). In: Cochrane Database of Systematic Reviews 2011 [Internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 Jun 14]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009103/full Record No.: CD009103.

(345) Rowley E, Morriss R, Currie G, Schneider J. Research into practice: Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Nottinghamshire, Derbyshire, Lincolnshire (NDL). Implementation Science. 2012;7(1):40.

(346) Scottish Intercollegiate Guidelines Network. SIGN 50: a guideline developer's handbook. Edinburgh: Scottish Intercollegiate Guidelines Network; 2011.

(347) Francke A, Smit M, de Veer A, Mistiaen P. Factors influencing the implementation of clinical guidelines for health care professionals: A systematic meta-review. BMC Medical Informatics and Decision Making. 2008;8(1):38.

(348) Holloway RG, Benesch C, Rush SR. Stroke prevention: narrowing the evidence-practice gap. Neurology. 2000;54(10):1899-906.

(349) Redfern J, McKevitt C, Rudd AG, Wolfe CD. Health care follow-up after stroke: opportunities for secondary prevention. Fam Pract. 2002;19(4):378-82.

(350) Ovbiagele B, Saver JL, Fredieu A, Suzuki S, Selco S, Rajajee V, et al. In-Hospital Initiation of Secondary Stroke Prevention Therapies Yields High Rates of Adherence at Follow-up. Stroke. 2004;35(12):2879-83.

(351) Starfield B, Shi L. Policy relevant determinants of health: an international perspective. Health policy (Amsterdam, Netherlands) JID - 8409431 2002;60(3):201-18.

(352) World Health Organization. The World Health Report 2008: Primary Health Care Now More Than Ever. Geneva: World Health Organization; 2008.

(353) World Health Organization. Adherence to Long Term Therapies. Geneva: World Health Organization; 2003.

(354) Wensing M, Wollersheim H, Grol R. Organizational interventions to implement improvements in patient care: a structured review of reviews. Implementation Science. 2006;1(2).

(355) MacKay-Lyons M, Thornton M, Ruggles T, Manley S. Non-pharmacological interventions for preventing secondary vascular events after stroke or transient ischaemic attack. In: Cochrane Database of Systematic Reviews 2012 [internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008656.pub2/full Record No.: CD008656.

(356) Saunders DH, Greig CA, Mead GE, Young A. Physical fitness training for stroke patients. In: Cochrane Database of Systematic Reviews 2011 [Internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 Mar 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003316.pub4/full Record No.: CD003316.

(357) Higgins JPT, Altman DG, Sterne JAC. Chapter 8: Assessing risk of bias in included studies. In: Higgins JPT, Green S, editors. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [Internet]. Hoboken: The Cochrane Collaboration; 2011[updated 2011 Mar; cited 2013 Mar 04] Available from: www.cochrane-handbook.org.

(358) Review Manager (RevMan) [Computer program]. Version 5.0. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration; 2008.

(359) Brotons C, Arino D, BorrÃ¡s I, Buitrago F, GonzÃ¡lez ML, Orozco KP, et al. Evaluation of the efficacy of a comprehensive programme of secondary prevention of cardiovascular disease in primary care: the PREseAP Study. Atencion Primaria. 2006;37(5):295-8.

(360) Johnston SC, Sidney S, Hills NK, Grosvenor D, Klingman JG, Bernstein A, et al. Standardised discharge orders after stroke: results of the quality improvement in stroke prevention (QUISP) cluster randomised trial. Ann Neurol. 2010;67:579-89.

(361) Allen KR, Hazelett S, Jarjoura D, Wickstrom GC, Hue K, Weinhardt J, et al. Effectiveness of a postdischarge care management model for stroke and transient ischaemic attack: a randomised trial. Journal of Stroke and Cerebrovascular Disease. 2002;11(2):88-98.

(362) Higgins JPT, Thompson SG. Quantifying heterogeneity in a meta-analysis. Stat Med 2002;21(11):1539-58.

(363) Higgins JPT, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. BMJ. 2003;327:557-60.

(364) Goldstein LB, Bertels C, Davis JN. Interrater reliability of the NIH stroke scale. Arch Neurol. 1989;46(6):660-2.

(365) Quinn TJ, Langhorne P, Stott DJ. Barthel Index for Stroke Trials: Development, Properties, and Application. Stroke. 2011;42(4):1146-51.

(366) van Swieten JC, Koudstaal PJ, Visser MC, Schouten HJ, van Gijn J. Interobserver agreement for the assessment of handicap in stroke patients. Stroke. 1988;19(5):604-7.

(367) Evans CD, Eurich DT, Taylor JG, Blackburn DF. The collaborative cardiovascular risk reduction in primary care (CCARP) study. Pharmacotherapy. 2010;30(8):766-75.

(368) Goessens BMB, Visseren FLJ, Sol BGM, de Man-van Ginkel JM, van dG. A randomised, controlled trial for risk factor reduction in patients with symptomatic vascular disease: the multidisciplinary Vascular Prevention by Nurses Study (VENUS). European Journal of Cardiovascular Prevention and Rehabilitation. 2006;13:996-1003.

(369) Ma J, Berra K, Haskell WL, Klieman L, Hyde S, Smith MW, et al. Case Management to Reduce Cardiovascular Risk in a County Healthcare System. Arch Intern Med. 2009;169(21):1988-95.

(370) Palanco MAM, de Pablo CC, Sanz IP, Luis SC, Portillo AP, Fernandez C. Cardiovascular morbimortality reduction after an acute cardiovascular event through multifactorial and intensive cardiovascular risk factors management (MIRVAS project). Med Clin. 2007;129(7):241-6.

(371) Strandberg TE, Pitkala KH, Berglind S, Nieminen MS, Tilvis RS. Multifactorial intervention to prevent recurrent cardiovascular events in patients 75 years or older: The Drugs and Evidence-Based Medicine in the Elderly (DEBATE) study: A randomised, controlled trial. Am Heart J. 2006;152:585-92.

(372) Chan R. Promoting adherence to a regimen of risk factor modification by trained non-medical personnel evaluated against regular practice study PARTNERS. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN07607027 Identifier: ISRCTN07607027.

(373) Damush TM. Adapting Tools to Implement Stroke Risk Management to Veterans (TOOLS). ClinicalTrials.Gov.

(374) Dromerick A, Kidwell CS. Preventing Recurrence of Thromboembolic Events Through Coordinated Treatment in the District of Columbia. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00703274 Identifier: NCT00703274.

(375) Eames S, Hoffmann T, Worrall L, Wong A, Read S. Evaluation of an innovative post-discharge education and support package for patients with stroke and their carers. International Journal of Stroke. 2010;5(Suppl 2):190.

(376) Friedberg JP. Reducing Risk of Recurrence (RRR). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/ct2/show/NCT01122394 Identifier: NCT01122394.

(377) Gulliford M. Secondary prevention after first stroke. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN35701810 Identifier: ISRCTN35701810.

(378) Horowitz CR. Prevent return of stroke study. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/ct2/show/NCT01027273 Identifier: NCT01027273.

(379) Lees KR. ECG monitoring to detect atrial fibrillation after stroke. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN97412358 Identifier: ISRCTN97412358.

(380) Liddy CE, Hogg W. Improved Delivery of Cardiovascular Care Through Outreach Facilitation (IDOCC). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://www.clinicaltrials.gov/ct2/show/NCT00574808 Identifier: NCT00574808.

(381) McAlister FA, Fradette M. Preventing recurrent vascular events in patients with stroke or transient ischaemic attack (PREVENTION). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00931788 Identifier: NCT00931788.

(382) Schmid AA, Andersen J, Kent T, Williams LS, Damush TM. Using intervention mapping to develop and adapt a secondary stroke prevention program in Veterans Health Administration medical centers. Implement Sci. 2010;5:97.

(383) Thrift A. Shared team approach between nurses and doctors for improved risk factor management for stroke patients. In: Australian New Zealand Clinical Trials Registry (ANZCTR) [Internet]. Sydney: National Health and Medical Research Council. 2005- [cited 2011 Jun 30]. Available from: https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=82711 Identifier: ACTRN12608000166370.

(384) Vickrey B. Intervention to Enable Stroke Survivors in Los Angeles County Hospitals to "Stay Within the Guidelines" SUSTAIN. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/ct2/show/NCT00861081 Identifier: NCT00861081.

(385) Yamada S, Kono Y. Lifestyle intervention for prevention of stroke recurrence in mild stroke - A Randomised Controlled Trial. In: UMIN Clinical Trials Registry (UMIN-CTR) [Internet]. Tokyo: UMIN Center. [cited 2011 Jun 30]. Available from: https://upload.umin.ac.jp/cgi-open-bin/ctr/ctr.cgi?function=brows&action=brows&type=summary&recptno=R000002244&language=E Identifier: UMIN000001865.

(386) Yip PK. North Taiwan Stroke Center for Prevention and Treatment. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00172484 Identifier: NCT00172484.

(387) Behrens J. Participative rehabilitation in stroke patients (paReSiS). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00687869 Identifier: NCT00687869.

(388) Chassin M. Preventing Recurrent Stroke in Minority Populations. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/ct2/show/NCT00211731 Identifier: NCT00211731.

(389) Cheng EM. Trial of a secondary stroke prevention program. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT01071408 Identifier: NCT01071408.

(390) Cui L. Standard Medical Management in Secondary Prevention of Ischaemic Stroke in China (SMART). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00664846 Identifier: NCT00664846.

(391) Neal BC. Rural Andhra Pradesh Cardiovascular Prevention Study (RAPCAPS). In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT00263393 Identifier: NCT00263393.

(392) Kerry S, Markus H, Khong T, Doshi R, Conroy R, Oakeshott P. Community based trial of home blood pressure monitoring with nurse-led telephone support in patients with stroke or transient ischaemic attack recently discharged from hospital. Trials. 2008;9(15).

(393) Lowrie R, Morrison J, McConachie A. A cluster randomised controlled trial of pharmacist led statin outreach support (SOS) in primary care: design and baseline characteristics. Contemporary Clinical Trials. 2010;31:303-11.

(394) Nguyen, Poon, Tokuda, Sayers, Wallis, Dergalust. Pharmacist telephone interventions improve adherence to stroke preventive medications and reduce stroke

risk factors: a randomised controlled trial. Stroke Conference: 2011 International Stroke Conference Los Angeles, CA United States.Stroke. 2011;43(3):e244.

(395) O'Carroll R. Improving Adherence To Medication In Stroke Survivors: A Single Centre Randomised Controlled Pilot study. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN38274953 Identifier: ISRCTN38274953.

(396) Peterson ED. Stroke Education Intervention Trial - Pilot AVAIL II. In: ClinicalTrials.gov [Internet]. Bethesda: National Library of Medicine. 2000- [cited 2011 Jun 30]. Available from: http://clinicaltrials.gov/show/NCT01115660 Identifier: NCT01115660.

(397) Rochette A. The YOU CALL - WE CALL trial: impact of a multimodal support intervention after a "mild" stroke. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN95662526 Identifier: ISRCTN95662526.

(398) Slark J. Individual Risk Awareness Intervention in Stroke. In: ISRCTN Register [Internet]. London: Current Controlled Trials Ltd. [cited 2011 Jun 30]. Available from: http://www.controlled-trials.com/ISRCTN67999605 Identifier: ISRCTN67999605.

(399) Wolfe CD, Redfern J, Rudd AG, Grieve AP, Heuschmann PU, McKevitt C. Cluster randomized controlled trial of a patient and general practitioner intervention to improve the management of multiple risk factors after stroke: stop stroke. Stroke. 2010;41:2470-6.

(400) Adie K, James MA. Does telephone follow-up improve blood pressure after minor stroke or TIA? Age Ageing. 2010;39:598-603.

(401) Allen K, Hazelett S, Jarjoura D, Hua K, Wright K, Weinhardt J, et al. A randomised trial testing the superiority of a postdischarge care management model for stroke survivors. Journal of Stroke and Cerebrovascular Disease. 2009;18(6):443-52.

(402) Boter H, for the HESTIA Study. Multicenter randomised controlled trial of an outreach nursing support program for recently discharged stroke patients. Stroke. 2004;35:2867-72.

(403) Boysen G, Krarup L, Zeng X, Oskedra A, KÃµrv J, Andersen G, et al. ExStroke pilot trial of the effect of repeated instructions to improve physical activity after ischaemic stroke: a multinational randomised controlled trial. Br Med J. 2009;339:b2810-.

(404) Chanruengvanich W, Kasemkitwattana S, Charoenyooth C, Towanabut S, Pongurgsorn C. Self-regulated exercise program in transient ischemic attack and minor stroke patients. Thai Journal of Nursing Research. 2006;10(3):165-78.

(405) Chiu CC, Wu SS, Lee Py, Huang YC, Tan TY, Chang KC. Control of modifiable risk factors in ischemic stroke outpatients by pharmacist intervention: an equal allocation stratified randomized study. J Clin Pharm Ther. 2008;33:529-35.

(406) Ellis G, Rodger J, McAlpine C, Langhorne P. The impact of stroke nurse specialist input on risk factor modification: a randomised controlled trial. Age Ageing. 2005;34(4):389-92.

(407) Hornnes N, Larsen K, Boysen G. Blood pressure 1 year after stroke: the need to optimise secondary prevention. Journal of Stroke and Cerebrovascular Diseases. 2011;20(1):16-23.

(408) Joubert J, Reid C, Barton D, Cumming T, McLean A, Joubert L, et al. Integrated care improves risk-factor modification after stroke: initial results of the Integrated Care for the Reduction of Secondary Stroke model. Journal of Neurology, Neurosurgery and Psychiatry. 2009;80:279-84.

(409) Lowe DB, Sharma AK, Leathley MJ. The CareFile Project: a feasibility study to examine the effects of an individualised information booklet on patients after stroke. Age Ageing. 2007;36:83-9.

(410) Maasland E, Koudstaal PJ, Habbema JDF, Dippel DWJ. Effects of an individualized multimedia computer program for health education inpatients with a recent minor stroke or transient ischaemic attack - a randomized controlled trial. Acta Neurol Scand. 2007;115:41-8.

(411) Markle-Reid M, Orridge C, Weir R, Browne G, Gafni A, Lewis M, et al. Interprofessional stroke rehabilitation for stroke survivors using home care. The Canadian Journal of Neurological Sciences. 2011;38:317-34.

(412) Wang L. Neurologist participates in the community intervention for the functional prognosis of convalescent patients with stroke. Chinese Journal of Clinical Rehabilitation. 2005;9(17):4-5.

(413) Welin L, Bjälkefur K, Roland I. Open, randomized pilot study after first stroke: a 3.5 year follow-up. Stroke. 2010;41:1555-7.

(414) McManus J, Craig A, McAlpine C, Langhorne P, Ellis G,. Does behaviour modification affect post-stroke risk factor control? Three-year follow-up of a randomized controlled trial. Clin Rehabil. 2009;23:99-105.

(415) Deeks JD, Higgins JPT, on A,D.G. Chapter 9: Analysing data and undertaking meta-analyses. In: Higgins JPT, Green S, editors. Cochrane Handbook for Systematic Reviews of Complex Interventions Version 5.1.0 [Internet]. Hoboken: The Cochrane Collaboration; 2011 [updated 2011 Mar; cited 2012 Mar 04]. Available from: www.cochrane-handbook.org.

(416) PATS Collaborating Group. Post-stroke antihypertensive treatment study. A preliminary result. Chin Med J. 1995;108(9):710-7.

(417) Francis DP, Backer PRA, Doyle J, Hall JB, Waters E. Reviewing interventions delivered to whole communities: learnings and recommendations for application to policy, practice and evidence development. Journal of Public Health. 2011;33(2):322-5.

(418) Greaves C, Sheppard K, Abraham C, Hardeman W, Roden M, Evans P, et al. Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. BMC Public Health. 2011;11(1):119-31.

(419) O'Connor D, Green S, Higgins JPT. Chapter 5: Defining the review question and developing criteria for including studies. In: Higgins JPT, Green S, editors. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [Internet]. Hoboken: The Cochrane Collaboration; 2011 [updated 2011 Mar; cited 2013 Mar 04]. Available from: www.cochrane-handbook.org.

(420) Baker PR, Francis DP, Soares J, Weightman AL, Foster C. Community wide interventions for increasing physical activity. In: Cochrane Database of Systematic Reviews 2011 [Internet]. Hoboken: John Wiley & Sons Ltd. 1999- [cited 2013 MAr 04]. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008366.pub2/full Record No.: CD008366.

(421) Beswick AD, Rees K, Dieppe P, Ayis S, Gooberman-Hill R, Horwood J, et al. Complex interventions to improve physical function and maintain independent living in elderly people: a systematic review and meta-analysis. Lancet. 2008;371(9614):725-35.

(422) Shepperd S, Lewin S, Straus S, Clarke M, Eccles MP, Fitzpatrick R, et al. Can We Systematically Review Studies That Evaluate Complex Interventions? PLOS Medicine. 2009;6(8):e1000086.

(423) Wittgenstein L. Tractatus logico-philosophicus. New York: Kegan Paul; 1933.

(424) Wittgenstein L. Philosophical investigations. Oxford: Blackwell; 1953.

(425) Austin JL. How to do things with words. Cambridge: Harvard University Press; 1962.

(426) Foucault M. The archaeology of knowledge and the discourse on language. New York: Random House Inc.; 1972.

(427) Brian David Hodges, Ayelet Kuper, Scott Reeves. Discourse analysis. BMJ. 2008;337.

(428) Madill A, Doherty K. 'So you did what you wanted then': Discourse analysis, personal agency, and psychotherapy. Journal of Community & Applied Social Psychology. 1994;4(4):261-73.

(429) Murtagh MJ, Burges Watson DL, Jenkings KN, Lie MLS, Mackintosh JE, Ford GA, et al. Situationally-Sensitive Knowledge Translation and Relational Decision Making in Hyperacute Stroke: A Qualitative Study. PLoS ONE. 2012;7(6):e37066.

(430) Stephenson N. Perpetuating Autonomy. In: Radtke HL, Jorna RJ, Stam HJ, editors. Theoretical Psychology: Critical Contributions. Canada: Camptus Press Inc; 2003.

(431) Georgaca E, Avdi E. Discourse analysis. In: Harper D, Thompson AR, editors. Qualitative research methods in mental health and psychotherapy: a guide for students and practitioners. Chichester: John Wiley & Sons Ltd; 2012. p. 147-162.

(432) Kurri K, Wahlström J. Placement of responsibility and moral reasoning in couple therapy. J Fam Ther. 2005;27(4):352-69.

(433) Barclay L. Autonomy and the social self. In: Mackenzie C, Stoljar N, editors. Relational autonomy: feminist perspectives on autonomy, agency and the social self. New York: Oxford University Press; 2000. p. 52-71.

(434) Entwistle VA, Carter SM, Cribb A, McCaffery K. Supporting patient autonomy: the importance of clinician-patient relationships. J Gen Intern Med. 2010;25(7):741-5.

(435) Sacks H. Lectures on conversation. Oxford: Blackwell; 1992.

(436) Magnusson E, Marecek J. Gender and culture in psychology. New York: Cambridge University Press; 2012.

(437) Gilbert GN, Mulkay M. Opening Pandora's Box: a sociological analysis of scientists' discourse. Cambridge: Cambridge University Press; 1984.

(438) Glaser BG, Strauss AL. The discovery of grounded theory: strategies for qualitative research. Chicago: Aldine Publishing Company; 1967.

(439) Kvale S. Interviews: an introduction to qualitative research interviewing. 3rd ed. Thousand Oaks: Sage Publications; 1996.

(440) Benson P. Feeling crazy: self worth and the social character of responsibility. In: Mackenzie C, Stoljar N, editors. Relational autonomy: feminist perspectives on autonomy, agency and the social self. New York: Oxford University Press; 2000. p. 72-93.

(441) Miller LJ, Findlay DA. Through medical eyes: The medicalization of women's bodies and women's lives. In: Bolaria BS, Dickinson HD, editors. Health Illness, and Health Care in Canada. 2nd ed. Toronto: Harcourt Brace Canada; 1994.

(442) Parry O, Fowkes FGR, Thomson C. Accounts of Quitting among Older Ex-smokers with Smoking-related Disease. Journal of Health Psychology. 2001;6(5):481-93.

(443) Weaver NF, Murtagh MJ, Thomson RG. How do newly diagnosed hypertensives understand 'risk'? Narratives used in coping with risk. Fam Pract. 2006;23(6):637-43.

(444) Emigh RJ. The Power of Negative Thinking: The Use of Negative Case Methodology in the Development of Sociological Theory. Theory and Society. 1997;26(5):649-84.

(445) Rapley T. Interviews. In: Seale C, Gobo G, Gubrium JF, Silverman D, editors. Qualitative Research Practice. London: Sage Publications; 2007. p. 15-33.

(446) Lumme-Sandt K, Hervonen A, Jylhä M. Interpretative repertoires of medication among the oldest-old. Soc Sci Med. 2000;50(12):1843-50.

(447) Sharf BF, Street Jr. RL. The Patient as a Central Construct: Shifting the Emphasis. Health Commun. 1997;9(1):1-11.

(448) Lupton D. Consumerism, reflexivity and the medical encounter. Soc Sci Med. 1997;45(3):373-81.

(449) Tomes N. Patient empowerment and the dilemmas of late-modern medicalisation. Lancet. 2007;369(9562):698-700.

(450) Parens E. On good and bad forms of medicalization. Bioethics. 2013;27(1):28-35.

(451) Valentine K. A consideration of medicalisation: Choice, engagement and other responsibilities of parents of children with autism spectrum disorder. Soc Sci Med. 2010;71(5):950-7.

(452) Castle J, Mlynash M, Lee K, Caulfield AF, Wolford C, Kemp S, et al. Agreement Regarding Diagnosis of Transient Ischemic Attack Fairly Low Among Stroke-Trained Neurologists. Stroke. 2010;41(7):1367-70.

(453) Seymour-Smith S, Wetherell M, Phoenix A. ‘My Wife Ordered Me to Come!’: A Discursive Analysis of Doctors’ and Nurses’ Accounts of Men’s Use of General Practitioners. Journal of Health Psychology. 2002;7(3):253-67.

(454) Parry O, Peel E, Douglas M, Lawton J. Issues of cause and control in patient accounts of Type 2 diabetes. Health Education Research. February 2006;21(1):97-107.

(455) Henwood F, Wyatt S, Hart A, Smith J. 'Ignorance is bliss sometimes': constraints on the emergence of the 'informed patient' in the changing landscapes of health information. Sociol Health Illn. 2003;25(6):589-607.

(456) Donaldson C, Lloyd P, Lupton D. Primary Health Care Consumerism amongst Elderly Australians. Age and Ageing. 1991;20(4):280-6.

(457) Willig C. Conclusion: opportunities and limitations of 'applied discourse analysis'. In: Willig C, editor. Applied discourse analysis: social and psychological interventions. Buckingham, UK: Open University Press; 1999. p. 145-159.

(458) Wagner G, Miller LG. Is the influence of social desirability on patients' self-reported adherence overrated? J Acquir Immune Defic Syndr. 2004;35(2):203-4.

(459) Amrhein PC, Miller WR, Yahne CE, Palmer M, Fulcher L. Client commitment language during motivational interviewing predicts drug use outcomes. J Consult Clin Psychol. 2003;71(5):862-78.

(460) Say R, Murtagh M, Thomson R. Patients' preference for involvement in medical decision making: A narrative review. Patient Educ Couns. 2006;60(2):102-14.

(461) Hussain-Gambles M, Leese B, Atkin K, Brown J, Mason S, Tovey P. Involving South Asian patients in clinical trials. Health Technology Assessment. 2004;8(42).

(462) Galdas P, Cheater F, Marshall P. What is the role of masculinity in white and South Asian men's decisions to seek medical help for cardiac chest pain? Journal of Health Services Research & Policy. 2007;12(4):223-9.

(463) Palinkas LA, Aarons GA, Horwitz S, Chamberlain P, Hurlburt M, Landsverk J. Mixed method designs in implementation research. Adm Policy Ment Health. 2011;38(1):44-53.

(464) Bodenheimer T. Interventions to improve chronic illness care: evaluating their effectiveness. Dis Manag. 2003;6(2):63-71.

(465) Fahey T, Schroeder K, Ebrahim S. Educational and organisational interventions used to improve the management of hypertension in primary care: a systematic review. Br J Gen Pract. 2005;55(520):875-82.

(466) Parkes G, Greenhalgh T, Griffin M, Dent R. Effect on smoking quit rate of telling patients their lung age: the Step2quit randomised controlled trial. BMJ. 2008;336(7644):598-600.

(467) Sheridan SL, Viera AJ, Krantz MJ, Ice CL, Steinman LE, Peters KE, et al. The effect of giving global coronary risk information to adults: a systematic review. Arch Intern Med. 2010;170(3):230-9.

(468) Ornish D. Statins and the soul of medicine. Am J Cardiol. 2002;89(11):1286-90.

(469) Stamatakis E, Weiler R. Prevention of cardiovascular disease: why do we neglect the most potent intervention? Heart. 2010;96(4):261-2.

(470) Linden A, Roberts N. Disease management interventions: what's in the black box? Dis Manag. 2004;7(4):275-91.

(471) Tim Doran, Evangelos Kontopantelis, Jose M Valderas, Stephen Campbell, Martin Roland, Chris Salisbury, et al. Effect of financial incentives on incentivised and non-incentivised clinical activities: longitudinal analysis of data from the UK Quality and Outcomes Framework. BMJ. 2011;342.

(472) Steel N, Maisey S, Clark A, Fleetcroft R, Howe A. Quality of clinical primary care and targeted incentive payments: an observational study. Br J Gen Pract. 2007;57(539):449-54.

(473) Lorencatto F, West R, Stavri Z, Michie S. How Well Is Intervention Content Described in Published Reports of Smoking Cessation Interventions? Nicotine Tob Res. 2012.

(474) Michie S. Interventions to change health behaviours: evidence-based or evidence-inspired? Psychology and Health. 2004;19(1):29-49.

(475) Campbell NC, Murray E, Darbyshire J, Emery J, Farmer A, Griffiths F, et al. Designing and evaluating complex interventions to improve health care. BMJ. 2007;334(7591):455-9.

(476) Perera R, Heneghan C, Yudkin P. Graphical method for depicting randomised trials of complex interventions. BMJ. 2007;334(7585):127-9.

(477) Michie S, Johnston M, Francis J, Hardeman W, Eccles M. From Theory to Intervention: Mapping Theoretically Derived Behavioural Determinants to Behaviour Change Techniques. Appl Psychol. 2008;57(4):660-80.

(478) Wolfe CD, Redfern J, Rudd AG, Grieve AP, Heuschmann PU, McKevitt C. Cluster randomized controlled trial of a patient and general practitioner intervention to improve the management of multiple risk factors after stroke: stop stroke. Stroke. 2010;41:2470-6.

(479) Bartholomew LK, Parcel GS, Kok G, Gottlieb NH. Planning health promotion programs. 2nd ed. San Francisco: Jossey-Bass; 2006.

(480) Gillies V. An analysis of the discursive positions of women smokers. In: Willig C, editor. Applied discourse analysis: social and psychological interventions. Buckingham: Open University Press; 1999. p. 66-87.

(481) Damush TM, Plue L, Bakas T, Schmid A, Williams LS. Barriers and facilitators to exercise among stroke survivors. Rehabilitation Nursing. 2007;32(6):253-60.

(482) Mirel B, Ackerman MS, Kerber K, Klinkman M. Designing CIS to improve decisions in depression disease management: a discourse analysis of front line practice. AMIA Annu Symp Proc. 2006:564-8.

(483) Stein VK, Rieder A. Integrated care at the crossroads - defining the way forward. International Journal of Integrated Care. 2009;9:e10.

(484) Williams P, Sullivan H. Faces of integration. Int J Integr Care. 2009;9:e100.

(485) Ouwens M, Wollersheim H, Hermens R, Hulscher M, Grol R. Integrated care programmes for chronically ill patients: a review of systematic reviews. International Journal for Quality in Health Care. 2005;17(2):141-6.

(486) Ham C and Curry N. Integrated care: What is it? Does it work? What does it mean for the NHS?[Internet]. London: The King's Fund; 2011 [cited 2013 Mar 04]. Available from: http://www.kingsfund.org.uk/sites/files/kf/Integrated-care-summary-Sep11.pdf.

(487) Challis D, Hughes J, Berzines K, Reilly S, Abell J and Stewart K. Self-care and case management in long-term conditions: the effective management of critical interfaces [Internet]. Southampton: National Institute for Health Research Service Delivery and Organisation Programme; 2010 [cited 2013 Mar 04]. Available from: http://www.pssru.ac.uk/pdf/MCpdfs/SCCMfr.pdf.

(488) Grol RP, Bosch MC, Hulscher ME, Eccles MP, Wensing M. Planning and studying improvement in patient care: the use of theoretical perspectives. Milbank Q. 2007;85(1):93-138.

(489) Weingarten SR, Henning JM, Badamgarav E, Knight K, Hasselblad V, Gano A,Jr, et al. Interventions used in disease management programmes for patients with chronic illness-which ones work? Meta-analysis of published reports. BMJ. 2002;325(7370):925.

(490) E Shaw S, Bailey J. Discourse analysis: what is it and why is it relevant to family practice? Family Practice. 2009;26(5):413-9.

(491) Roberts C, Sarangi S. Theme-oriented discourse analysis of medical encounters. Med Educ. 2005;39(6):632-40.

(492) Werner A. A sociological perspective on the medical consultation. Tidsskr.Nor.Laegeforen. [Internet]. 2011 Oct [cited 2011 Mar 04];131:2032-4. Available from: http://tidsskriftet.no/article/2159795/en_GB.

(493) Roberts C, Moss B, Wass V, Sarangi S, Jones R. Misunderstandings: a qualitative study of primary care consultations in multilingual settings, and educational implications. Med Educ. 2005;39(5):465-75.

(494) McKenzie W, Monk M. Learning and teaching narrative ideas. In: Monk G, Winslade J, Crocket K, Epston D, editors. Narrative therapy in practice: the archaeology of hope. San Francisco: Jossey-Bass; 1997. p. 82-120.

(495) McKevitt C, Redfern J, Mold F, Wolfe C. Qualitative studies of stroke: a systematic review. Stroke. 2004;35(6):1499-505.

(496) Sidani S, Epstein D, Miranda J. Eliciting Patient Treatment Preferences: A Strategy to Integrate Evidence-Based and Patient-Centered Care. Worldviews on Evidence-Based Nursing. 2006;3(3):116-23.

(497) Mühlbacher A, Bethge S. Patient priorities in coordinated care: a literature review to identify patients' preferences. Int J Integr Care. 2009(9):e155.

(498) McCaffrey AM, Pugh GF, O'Connor BB. Understanding patient preference for integrative medical care: results from patient focus groups. J Gen Intern Med. 2007;22(11):1500-5.

(499) Singer SJ, Burgers J, Friedberg M, Rosenthal MB, Leape L, Schneider E. Defining and Measuring Integrated Patient Care: Promoting the Next Frontier in Health Care Delivery. Medical Care Research and Review. 2011;68(1):112-27.

(500) Rogers A, Kennedy A, Bower P, Gardner C, Gately C, Lee V, et al. The United Kingdom Expert Patients Programme: results and implications from a national evaluation. Med J Aust. 2008;189(Suppl 10):S21-4.

(501) Collins LM, Murphy SA, Nair VN, Strecher VJ. A strategy for optimizing and evaluating behavioral interventions. Ann Behav Med. 2005;30(1):65-73.

(502) Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. JAMA. 2002;288(14):1775-9.

(503) Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. JAMA. 2002;288(15):1909-14.

(504) Kodner DL. Integrated care: meaning, logic, applications, and implications - a discussion paper. Int J Integrated Care. 2002;2:e12.

(505) Lemmens KM, Nieboer AP, van Schayck CP, Asin JD, Huijsman R. A model to evaluate quality and effectiveness of disease management. Qual Saf Health Care. 2008;17(6):447-53.

(506) Norris SL, Nichols PJ, Caspersen CJ, Glasgow RE, Engelgau MM, Jack L, et al. The effectiveness of disease and case management for people with diabetes. A systematic review. Am J Prev Med. 2002;22(Suppl 4):15-38.

(507) Banet GA, Felchlia MA. The potential utility of a shared medical record in a "first-time" stroke population. Journal of Vascular Nursing. 1997;15(1):29-33.

(508) Bokemark L, Blomstrand C, Fagerberg B. Considerable differences in the management of stroke. A study of structured vs. conventional care. Lakartidningen. 1996;93(8):681-5.

(509) Powers BJ, Danus S, Grubber JM, Olsen MK, Oddone EZ, Bosworth HB. The effectiveness of personalised coronary heart disease and stroke risk communication. Am Heart J. 2011;161(4):673-80.

(510) Gillham S, Endacott R. Impact of enhanced secondary prevention on health behaviour in patients following minor stroke and transient ischaemic attack: a randomised controlled trial. Clin Rehabil. 2010;24(9):822-30.

(511) Goessens BMB, Visseren FLJ, Sol BGM, de Man-van Ginkel JM, van der Graaf Y. A randomised, controlled trial for risk factor reduction in patients with symptomatic vascular disease: the multidisciplinary Vascular Prevention by Nurses Study (VENUS). European Journal of Cardiovascular Prevention and Rehabilitation. 2006;13:996-1003.

(512) Green T, Haley E, Eliasziw M, Hoyte K. Education in stroke prevention: efficacy of an educational counselling intervention to increase knowledge in stroke survivors. Canadian Journal of Neuroscience Nursing. 2007;29(2):13-20.

(513) Harrington R, Taylor G, Duggan A, Reed M, Wood V. The evaluation of a community-based stroke scheme. Disabil Rehabil. 2007;29(20-21):1636-7.

(514) Johnston B. Outcomes of the kaiser permanente tele-home health research project. Arch Fam Med. 2000;9(1):40-5.

(515) Ma J, Berra K, Haskell WL, Klieman L, Hyde S, Smith MW, et al. Case Management to Reduce Cardiovascular Risk in a County Healthcare System. Arch Intern Med. 2009;169(21):1988-95.

(516) Middleton S, Donnelly N, Harris J, Ward J. Nursing intervention after carotid endarterectomy: a randomised trial of co-ordinated care post-discharge. Issues and Innovations in Nursing Practice. 2004;52(3):250-61.

(517) Nir Z, Weisel-Eichler A. Improving knowledge and skills for use of medication by patients after stroke: Evaluation of a nursing intervention. American Journal of Physical Medicine and Rehabilitation. 2006;85(7):582-92.

(518) Ornstein S, Jenkins RG, Nietert PJ, Feifer C, Roylance LF, Nemeth L, et al. A multimethod quality improvement intervention to improve preventive cardiovascular care: A cluster randomised trial. Ann Intern Med. 2004;141(7):523-32.

(519) Palanco MAM, de Pablo CC, Sanz IP, Luis SC, Portillo AP, Fernandez C. Cardiovascular morbimortality reduction after an acute cardiovascular event through multifactorial and intensive cardiovascular risk factors management (MIRVAS project). Med Clin. 2007;129(7):241-6.

(520) Rimmer JH, Braunschweig C, Silverman K, Riley B, Creviston T, Nicola T. Effects of a short-term health promotion intervention for a predominantly African-American group of stroke survivors. Am J Prev Med. 2000;18(4):332-8.

(521) Ross MA, Compton S, Medado P, Fitzgerald M, Kilanowski P, O'Neil BJ. An Emergency Department Diagnostic Protocol for Patients With Transient Ischaemic Attack: A Randomized Controlled Trial. Ann Emerg Med. 2007;50(2):109-19.

(522) Strandberg TE, Pitkala KH, Berglind S, Nieminen MS, Tilvis RS. Multifactorial intervention to prevent recurrent cardiovascular events in patients 75 years or older: The Drugs and Evidence-Based Medicine in the Elderly (DEBATE) study: A randomised, controlled trial. Am Heart J. 2006;152:585-92.