Supplementary File 2: Facilitators and barriers to the implementation of a CRC-QI intervention in primary care

CFIR Construct	Facilitators	Barriers	Adaptations and/or Implementation Strategies
		Outer Setting	
Patient needs and resources: extent to which patient needs are accurately known and prioritized by organization	Engage patient with education as a tool to help them prioritise/ understand the importance of screening	• *Time and purpose of appointment*: Patients may not respond to opportunistic screening discussion. Bowel cancer screening not usually a 'presenting problem' (unless prompted by reminder/ awareness campaign). • Patients find it difficult to assimilate all the NBCSP kit information, which is more of an instruction kit with limited explanation that would make screening a priority for the patient. • Confronting nature of the test: Having to do test at home, and long follow-up after a +FOBT, creates anxiety. Little support and opportunity to ask questions	• Routinely incorporate bowel cancer screening conversations into new patient registrations, preventive health checks, health assessments, care planning, and in lead up to eligible age group (45-49 year) • Provide patient handouts/ pamphlets and/or relevant website links for later reference as further reassurance about doing the test at home and the importance of screening
Cosmopolitanism: degree to which organization is networked with other external organizations	Local pathology (and other registries) can assist practices with identifying and cross-checking those patients who have had bowel cancer screening	Sometimes difficult to engage with the public hospital as the information on the discharge summary may not be sufficiently clear to direct the general practice enquiry	• Develop/enhance links with local pathology, other registries (if applicable) and local gastroenterologists for screening/referral support • PHNs can help support link between general practice and hospital
External policy and incentives: external mandates, regulations, and incentives	• National registries and technological solutions that integrate with local clinical systems to avoid duplication, double handing and data errors (e.g. immunisation register) • Clinical audits provide a range of incentives for registrars, senior training, practice accreditation and (potentially) Practice Incentive Payments (PIP) • Practice accreditation requires appropriate policies for recall and reminder systems	• The NBCSP operates in parallel to other bowel cancer screening efforts, diminishing GP motivation to screen • Patients may participate in the NBCSP and present to different practices and be screened elsewhere, which can't be easily checked leading to duplication • NBCSP provides little direct information/education to general practice with some confusion about the staged implementation • Practices are reliant on software companies to allow capability, but the vendor priorities and timeframes may not align with the GP community.	• Clarify future intentions of NBCSP/advocate for: – linking National Cancer Screening Register (NCSR)[1] to clinical software – including all screening results into NCSR – primary care adjunct to NBCSP • NBCSP, who may exert greater influence, to lobby clinical software companies for changes in practice software • A network of group practices to advocate for change to NBCSP/clinical software companies, as may be more effective than individual practices where changes may be prioritised according to a perceived level of demand/request. • NBCSP to improve communication directly with general practice, such as monitoring of bowel cancer screening participation • Align national priorities[2], such as bowel cancer screening, with other primary care initiatives, such as the Practice Incentives Program (PIP) Quality Improvement (QI) Incentive [3]

[1] National Cancer Screening Register. https://www.ncsr.gov.au/

[2] Australia's Long Term Health Plan. https://www.health.gov.au/resources/publications/australias-long-term-national-health-plan

[3] PIP QI Incentive guidance. https://www1.health.gov.au/internet/main/publishing.nsf/Content/PIP-QI_Incentive_guidance

CFIR Construct	Facilitators	Barriers	Adaptations and/or Implementation Strategies
Inner Setting			
Structural characteristics: organisational social architecture, age, maturity, and size	Newer practices may be more competent at digital components as haven't had to move from a manual/paper-based system	Implementation capability may be dependent on practice characteristics: size, governance, how long it's been established, and IT capability (as a team)	• Identify the practice ability to implement the intervention through a 'readiness to change' and structural requirement checklist • Arrange software training and/or system updates prior to implementation
Networks and communications: nature and quality of social networks and communication within an organization	• Use clinical systems to communicate across the practice about the patient status: e.g. system flags for high priority patients • A team approach allows standard practice protocols to be developed • Practice meetings are useful forums to share data and motivation to make change	Time pressures for doctors to attend/be available at team meetings. Attitude of some GPs, who see patients as their business opportunity, and are not interested in meetings, working as part of a team or in developing shared goals or in implementing consistent processes	• Include prompts on new patient checklists to enable sharing of information across practice network • Combine data sharing and progress updates with other activities (e.g. lunch, weekend retreats) • Use team meetings to communicate changes in policy/protocol • Site coordinator to develop communication strategy relevant to their practice for updates to all staff
Culture: norms and values of organisation	• Different GPs/nurses in the practice have a range of personal interests/ expertise and act as 'go-to' people for advice and support on specific issues • An effective team approach supports information-sharing and data monitoring	• 'Local champion' needs to be a GP, however there may be reluctance to self-nominate because of the perceived additional work • Practice may not be aware of individual interests of different staff members	• All staff members to be asked about their interests to understand the practice mix, develop the team and points of support • Identify local champion (GP) based on their personal interest (not 'voted-in') and someone who the other team members could refer to (because of their interest/expertise)
Implementation climate (specific to this colorectal cancer screening-QI intervention)			
1. Tension for change: degree to which stakeholders perceive current situation as needing change	• Understanding the extent of the problem with respect to the numbers of eligible patients who have not been screened • Awareness of the current bowel cancer screening rates and the need to improve to realise the benefits of screening	• Practice demographic profile may dictate if can implement: – If large numbers, may be difficult for the practice to accommodate – if small numbers may not be worthwhile to make system change • Difficult to get robust data to understand the problem extent • Increasing screening participation may lead to unintended consequence of longer colonoscopy wait time	• Identify number of patients initially: if too many for practice to manage, target a subgroup, such as the never screened • Seek Primary Health Network (PHN)[4] assistance to identify the number of non-adherent eligible patients • Incorporate data visualisation/ interactive maps to enable practices to understand local bowel cancer screening rates
2. Compatibility: degree of fit between intervention and current workflow and systems	• Practices already engage in screening procedures for other preventive health areas (e.g. cervical cancer) which is facilitated by the clinical software in use • Automatic reminders can remind GPs to initiate conversations within eligible patients and patient recalls are enabled digitally	• Currently, the functionality of clinical software systems for bowel cancer screening is limited, requiring manual administrative effort from GPs (most often with no consistency) • Lack of GP involvement in NBCSP design leads to risk of duplication, multiple programs and points of data entry (combined with variation in ability to use the system)	• Refer to systems/policies and process in place for other preventive areas (e.g. cervical screening) to determine areas where compatible for bowel cancer screening, and can be easily modified • Configure reminders/recalls to include bowel cancer screening • Enhance clinical audit software so that it reports about bowel cancer screening in the same way as it does for screening for other cancers • Seek assistance from local PHN in use of clinical audit software, if needed
3. Relative priority: shared perception of importance of implementation	• Awareness of the current low participation rates may motivate some practices to make change • Special interest areas ('specialities') often relate back to the patient demographic that the practice is managing.	• Competing practice priorities, differing personal interests and lack of financial or point- based incentives potentially take priority over this intervention • Variation and lack of consistency between and within practice to initiate screening conversations	• Identify areas to target that are relevant to the practice demographic, priority and/or process • Coordinate administration and nursing staff to support practitioners in implementing intervention across the practice • Implement bowel cancer screening discussion as part of other routine practice, e.g. within annual health checks (preventative)

[4] Primary Health Networks (PHN). https://www1.health.gov.au/internet/main/publishing.nsf/Content/PHN-Background

CFIR Construct	Facilitators	Barriers	Adaptations and/or Implementation Strategies
Implementation climate (specific to this colorectal cancer screening-QI intervention) (cont)			
4. Organizational incentives and rewards: extrinsic incentives or internal incentives for implementation	• Practices tend to be team-oriented, and administrative buy-in is important to any change or organisational action • Clinical audits tend to be completed when a payment or other incentive is attached (e.g. registrar/ senior training, practice accreditation and Practice Incentive Payment (PIP))	• While practices reported setting targets for other health areas, these are attached to incentives, much of the time financial in nature (e.g. PIP payments) • Smaller internal audits with no incentive are more difficult to complete	• Implement practice level incentives (e.g. lunch) with performance monitoring and demonstrated progress on intervention participation • Tie clinical audits with other existing individual, practice and system-level incentive mechanisms, where applicable • Advocate the NBCSP for incentive/PIP payment to improve non-adherent screening participation
5. Goals and feedback: degree to which goals are clearly communicated and feedback about achieving these goals is provided	• Goal setting aligned to areas of practice interest and/or areas of audit (e.g. annual health checks) but may not be specific to a target group (e.g. 50-59-year old) • Clearly define target (in terms of % improvement on current level), so can monitor progress • Need to know baseline screening rate and where gaps exist	• Setting targets in areas being audited is not usual practice • Goals may be set (e.g. more annual health checks done) but targets may not be defined (e.g. 20% increase) • Difficulties in data extraction will impact on ability to effectively monitor progress • Setting goals will depend on the numbers of patients and impact on workload.	• Set realistic targets that are relevant to the practice (not population-level) and patient groups (e.g. % patients who've been screened in last 2 years) and define % improvement to allow the comparison • Link targets to audit/feedback and feasibility of data extraction/reflection • Use clinical audit software to establish practice participation rate, and other indicators from clinical software to provide context
6. Learning climate: climate in which individuals feel safe to try new methods, sufficient time for evaluation	• Shared involvement in policy/protocol development • Evaluation of marketing strategies (e.g. prompting skin checks) indirectly allows monitoring of new interventions	• Insufficient resources/skill base/time to effectively monitor impact • Identifying practitioners who are non-compliant with policy may act as a barrier to implementation	• Apply an approach to progress monitoring that is consistent with current practice (e.g. deidentified data/ reward individuals etc) • Use intervention as a marketing approach to improve local awareness of practice with support from administrative staff (e.g. practice manager) to monitor implementation progress
Readiness for implementation			
1. Leadership engagement: commitment of leaders and managers to implementation	• Support for the intervention from clinical directors and practice managers is important • Need someone in the practice who has ownership and where responsibility lies to progress: provides a point of reference if not working well • Delegation of clinical level responsibilities to different nursing staff works well for some programs	• Clinical partners have high level responsibility of some areas (e.g. medical registrars/ nursing staff) and may not have the capacity to progress • At a clinical level, prevention not done so well and comes down to individual interest with more done at admin/nursing staff	• Engage the support of the practice manager (through increasing practice awareness) and/or clinical directors (through low screening rates) to gauge practice interest in the intervention • Delegate practice coordinator role as a defined new responsibility/job role (preferably to someone who is interested and has the time/capacity) • Use nursing staff for preliminary screening discussion with new patients
2. Available resources: level of resources dedicated for implementation	• Existing clinical software systems for prioritisation, recall, data extraction (targeting) • For practices with agreements with PHNs, acceptable for PHNs to extract clinical data • Registrars may be able to do clinical audits, and present their findings to the practice, to give a focus to an area that needs improvement • Involvement of nurses in patient reminder/recall processes	• Lack confidence that have the IT mechanisms and/or capability (from data entry, prompts and extraction) available to implement • Clinical software limitations limit the capacity of practices to identify eligible patients for bowel cancer screening and set goals and targets. • Technical constraints with data entry prevent robust searching and sorting data using Pen CAT, for subsequent goal setting/auditing. • Data extraction only to be done by people who are competent and can trust (i.e. no pharmaceutical companies)	• Request patient lists from other providers to help identify who has been screened: pathology, PHN, local clinical registries • For practices with agreements with PHNs, seek support from PHNs to assist in data extraction and training needs. PHNs can also provide monitoring reports that practice can use • If applicable, seek the support of registrars to do clinical audits and present data for review • Nurses can identify patients using clinical audit software • Nurses role is to i) invite patients to the program and ii) flag to GP that eligible

3. Access to knowledge and information: knowledge about intervention and implementation	• Training in clinical audit software requirements/functionality would be beneficial • Conferences and online training provide mix of clinical education/training needs • Education to support practice change needs to be simple • Online learning (with attached CPD points) to accompany change in clinical guidelines/ NBCSP would be beneficial	• Currently, the use of clinical audit software is reportedly low with some uncertainty of the functionality. • Very little knowledge about current, population-level bowel cancer screening rates (State or national level) • Interrogating data is difficult. Need assistance/support • Some confusion of screening guidelines and roll-out of NBCSP	• Seek PHN support for training in use of clinical audit software/data extraction; incorporate guidelines into online clinical referral systems and/ or provide education/training • Educate clinical staff in clinical team meetings about current guidelines and consistent practice approach: registrar could present an overview to make sure everyone is up to date. • Lobby NBCSP to provide alternative formats/ communication of AIHW monitoring reports and other important program updates
Individuals			
Knowledge and beliefs about the intervention: attitudes toward and value placed on the intervention	• Provides a structure to what already should be being done-a standardised and systematic approach. • The evidence-base on which the framework was based gave credibility to the intervention.	Recognising and overcoming the perceived implementation barriers is vital: barriers will vary across different practices	• Develop a systematic approach to implementation with clear pre-planning and planning phases to help identify those practices who are most likely able to implement the intervention within current levels of resourcing • Seek endorsement from RACGP/NBCSP based on the robust evidence-base that informs the intervention.
Process			
Planning: degree to which implementation is planned in advance	• Understand the number of targeted, eligible patients for planning purposes • Clarify data rules/entry and extraction through updated strategy, training and protocols • Relevant policies/protocols to be updated to incorporate bowel cancer screening • Clinical software updates to include bowel cancer screening • Several steps in implementation process: include a planning phase e.g. upskilling nurses in use of clinical audit software tools; improve templates in care planning • Follow-up depends on level of urgency/risk as determined by doctor. Level of follow-up is linked to the severity of the risk [is the risk diminished because of the NBCSP role in follow-up]	• NBCSP FOBT results not always easily accessible in medical record • General lack of familiarity with clinical systems to enable appropriate retrieval of data • Variation in practitioner knowledge about how to process results • Uncertainty as to where to record the relevant information (NBCSP result) to enable appropriate extraction • Possibility of user errors in data entry • Data entry done by different people: reception, demographic; nursing/GP, medical information with different training needs • Approach to patients needs careful consideration and reflective of normal practice	• Early in planning phase, identify both site coordinator to oversee implementation and GP champion to drive practice change • Develop standard targeted pre-engagement letters/communication process • Data cleaning (correct input) and standardise data entry for data extraction • Add bowel screening as part of a 'new patient screen/assessment' to check if patient has participated • Prior to implementation, talk to gastroenterologists/hospitals to seek clarity around waiting times for colonoscopies, to manage patient and practitioner expectations and advice of the intention and potential impact on colonoscopy referral (and the numbers it may represent) • Adapt existing protocols for monthly recall systems/lists generated for follow-up/recall for bowel cancer screening
Engaging opinion leaders: individuals from the organization with responsibility for implementation	Practitioners with a personal interest in bowel cancer (GP (as champion) and nurse/administrator (site coordinator)	Despite policies, variations in ways doctors record information is different: can be difficult to change behaviours (e.g. needing systems that minimise the involvement of doctors[5])	• Identify practitioners with personal interest in bowel cancer to facilitate (through leadership) the implementation • Develop approach that minimises involvement of doctors in the implementation process per se

[5] Arroyave AM, Penaranda EK, Lewis CL. Organizational change: a way to increase colon, breast and cervical cancer screening in primary care practices. J Community Health. 2011; 36(2):281-8. 10.1007/s10900-010-9309-7

Intervention Characteristics			
Intervention source: perception about whether intervention is externally or internally developed	Intervention was positively received, many believing that it would be efficacious in relation to improving bowel cancer incidence and mortality		
Adaptability: degree to which an intervention can be adapted to meet local needs	• Practices were already implementing parts of the framework. • The intervention may also alert practices to other preventive care improvements (e.g. breast cancer screening)	Depends on practice size, the way it is being governed and how long it has been established. Need to be advanced in IT	• Intervention would help to identify what a practice could do within their own resource constraints. • Practices identified a range of current organisational approaches that can be readily modified to incorporate bowel cancer screening (for targeted patients)
Trialability: ability to test intervention on a small scale in organization	Group practices/ business networks represent an opportunity to share what is being done across the practice network		Potential to trial intervention in one practice, and roll-out to others in a practice group
Relative advantage: perception of advantage of program compared with alternatives	Would afford practices with enhanced ability to use the framework across other portfolios and preventive health areas		