

Study protocol

Can an App Supporting Psoriasis Patients Improve Adherence to Topical Treatment? A single-blind randomized controlled trial

[Additional file 1: Filled SPIRIT 2013 checklist.](#)

SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Addressed on page number
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	p. 1, l. 2 - 4.
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	p. 3, l. 49 - 50.
	2b	All items from the World Health Organization Trial Registration Data Set	Additional file 1.
Protocol version	3	Date and version identifier	Protocol version 1.6.
Funding	4	Sources and types of financial, material, and other support	Additional file 1, p. 6, l. 119 – p. 7, l. 129, and p. 23, l. 488 – p. 24, l. 500.
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	p. 25, l. 52 – p. 25, l. 536.
	5b	Name and contact information for the trial sponsor	Additional file 6.

5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	For sponsor: p. 25, l. 526-533 and additional file 7. For funder (LEO [®] Pharma): p. 6, l. 116 and p. 7, l. 131-134, p. 10, l. 208-212, p. 20, l. 427 and l. 444-445, p. 23, l. 505-507 and l. 509-515 and additional file 7.
5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	Additional file 6

Introduction

Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	p. 4, l. 68 – p. 7, l. 139.
	6b	Explanation for choice of comparators	Ibid
Objectives	7	Specific objectives or hypotheses	p. 7, l. 137-139.
Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	p. 6, l. 110 – p. 7, l. 139.

Methods: Participants, interventions, and outcomes

Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	p. 6, l. 110 and p. 7, l. 139-140.
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	<p>Inclusion and exclusion criteria: p. 11, l. 224 – p. 13, l. 258.</p> <p>Individuals who will perform the interventions: p. 7, l. 139-140 and p. 19, l. 388 – p. 21, l. 434.</p>
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	p. 15, l. 301 – p. 15, l. 317, p. 6, l. 115 - 127.
	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	p. 13, l. 260 – p. 13, l. 283.
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	p. 16, l. 332 – p. 16, l. 337.
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	p. 13, l. 260-283.
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	<p>Outcome measurements: p. 8, l. 155– p. 9, l.181 and table 1.</p> <p>Harm outcomes: additional file 8.</p>

Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	Figure 1 and Table 1.
Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	p. 17, l. 344-353.
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	p. 7, l. 137-144 and additional file 2.

Methods: Assignment of interventions (for controlled trials)

Allocation:

Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	p. 14, l. 285 – p. 14, l. 299.
Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	Ibid.
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	Generate allocation Ibid Enrol p. 18, l. 282- p. 20, 416 Assign participants to interventions: Ibid.
Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	p. 14, l. 285-299.

17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	p. 13, l. 260 - p. 14, l. 283
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Methods: Data collection, management, and analysis

Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	Assessment and collection of baseline data: p. 20, l. 417 – 422.
			Assessment and collection of outcome data: p. 8, l. 153 – p. 9, l. 188.
			Storing of data: p. 10, l. 204 – p. 11, l. 214
			Process to promote data quality: p. 27, l. 561-564.
Data management	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	p. 13, l. 260 – p. 14, l. 283.
	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	p. 10, l. 190 – 210; p. 14, l. 287; p. 27, l. 561-564.
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	p. 18, l. 366 – 380.

20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	Ibid.
20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	Ibid.

Methods: Monitoring

Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	p. 27, l. 561 – 564.
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	p. 18, l. 379-380.
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	p. 13, l. 267 – p. 14, l. 283 and additional files 8.
Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	p. 27, l. 561-564

Ethics and dissemination

Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	p. 27, l. 555–559 .
Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	Ibid.
Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	p. 27, l. 555 – p. 27, l. 559.
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	NA.

Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	p. 20, l. 417 – p. 21, l. 447.
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	p. 26, l. 548-550.
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	p. 25, lo. 519-524.
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	p. 14, l. 280 – 283 and p. 27, l. 566 – 568.
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	Additional file 7.
	31b	Authorship eligibility guidelines and any intended use of professional writers	Ibid.
	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	NA.
Appendices			
Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	Additional file 4 and 5.
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	NA.

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons [“Attribution-NonCommercial-NoDerivs 3.0 Unported”](#) license.

Page and line numbers and name of additional files submitted with the first protocol version, August 2017. Abbreviation; NA: Not applicable.

World Health Organization Trial Registration Data Set

DATA CATEGORY	INFORMATION
Primary registry and trial identifying number	ClinicalTrials.gov, NCT 02858713
Date of registration in primary registry	August 3, 2016
Secondary identifying numbers	EudraCT number 2016-002143-42
Sources of monetary and material support	LEO® Pharma and anonymous fund
Primary sponsor	Professor Klaus Ejner Andersen, Department of Dermatology and Allergy Centre, Odense University Hospital, Denmark, e-mail: KHandersen@health.sdu.dk
Secondary sponsor	None
Contact for public queries	Investigator, MD Mathias Tiedemann Svendsen, e-mail: mathias.tiedemann.svendsen@rsyd.dk
Contact for scientific queries	Investigator, MD Mathias Tiedemann Svendsen, e-mail: mathias.tiedemann.svendsen@rsyd.dk
Public title	Adherence in Topical Treatment of Psoriasis
Scientific title	A Designed Patient-Centered Intervention to Improve Medical Adherence in Topical Treatment of Psoriasis: A single-blind randomized controlled trial
Countries of recruitment	Denmark
Health conditions and problems studied	Medical adherence in topical treatment of psoriasis
Intervention	Intervention: Calcipotriol/betamethasone dipropionate (Cal/BD) foam + electronic monitor (EM) +application for smartphones (app) Non-intervention: Cal/BD foam + EM
Key inclusion and exclusion criteria	Inclusion: <ul style="list-style-type: none"> - Legally competent patients of sound mind between 18-75 years of age - Mild-moderate plaque and guttate type psoriasis - The psoriasis must be visible to the investigator at the baseline visit) - Users of smartphones (the app can be used in most types of smartphone) - Access to a private e-mail.

	<p>Exclusion:</p> <ul style="list-style-type: none"> - Minors and patients over 75 years of age - Legally incompetent patients or patients not of sound mind - Patients for whom a psoriasis diagnosis cannot be objectified at the consultation - Patients with severe psoriasis, including erythrodermic and pustular psoriasis - Lack of possession of or ability to use a smartphone - Breastfeeding or pregnant patients or fertile women who do not use reliable contraception - Patients who are allergic to one of the ingredients in the Cal/BD foam preparation.
Study type	<p>Interventional Allocation: randomized Intervention model: parallel assignment Masking: Single blind (subject) Primary purpose: testing an adherence improving intervention Phase IV</p>
Date of first enrolment:	January 9, 2017
Target sample size	134
Recruitment status	All participants recruited
Primary outcomes	<p>Rates of adherence measured by:</p> <ul style="list-style-type: none"> - No treatment sessions (chip) - Weight of used medication (electronic weight) - Patient reported on a 4-point ordinal scale
Key secondary outcomes	<p>DLQI: Dermatology Quality of Life Index LS-PGA: Lattice System Physician's Global Assessment</p>