SWAT 169: Electronic versus paper based Patient Reported oUtcomes CollEction (SPRUICE)

Objective of this SWAT
To compare collection of patient reported outcomes using electronic or paper formats in large randomised trials.

Study area: Data Quality, Follow-up
Sample type: Participants
Estimated funding level needed: Low

Background
In healthcare and clinical trials, questionnaires can be used to collect information directly from patients on the impact that treatment and health conditions on their quality of life (QoL). These data are known as patient reported outcomes (PRO) and are defined as “any report of the status of a patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else”.(1) A wide range of validated questionnaires are used to collect PRO, covering general health items as well as more disease specific factors.

In oncology trials, the patient perspective and survivorship effects are crucial factors to consider in evaluation of new treatments.(2) QoL information is thus a key factor to consider in their adoption and implementation. Collection of PROs is a time consuming and laborious process requiring significant input from patients, hospital staff and clinical trials units often over an extended period of time. Streamlining this process with the use of technology in the form of electronic PRO (ePRO) questionnaires has the potential to increase patient convenience, improve patient experience, reduce administrative burden, save costs, increase patient compliance and avoid secondary data errors including those due to data transcription, leading to more accurate and complete data.(3, 4)

Although ePRO questionnaires have been widely studied in the general clinical setting, it is yet to be proven that they are as effective as paper PRO questionnaires at collecting data in clinical trials where there are additional research ethics, governance and regulatory requirements. Our study will pilot implementation of ePRO collection and generate evidence regarding equivalence to paper-based collection. This research will investigate whether ePRO questionnaires can be used in multicentre oncology clinical trials and reduce the burden of clinical trial follow up on patients, allowing patients to participate in QoL follow up with minimal inconvenience at a time when they are under the stress of being unwell. If this is the case, the impact could allow for more comprehensive QoL study recruitment and responses, helping ensure the patient experience is captured as accurately as possible over the appropriate duration of time.

This SWAT will be run as a partially randomised patient preference study in oncology trials conducted by the Institute of Cancer Research Clinical Trials and Statistics Unit (ICR-CTSU). Participants providing written informed consent will first be asked if they agree to being randomised between electronic or paper questionnaires. If they agree, they will be randomised 1:1 based on minimisation factors of age, sex and host trial to receive either electronic or paper questionnaires. Patients who are unwilling to be randomised will be offered participation in the patient preference cohort and registered to complete questionnaires in their preferred format. Follow up questionnaires will be administered at time points determined by the host trial.

Interventions and comparators
Intervention 1: Electronic follow-up questionnaires.
Intervention 2: Paper follow-up questionnaires.

Index Type: Questionnaire Format

Method for allocating to intervention or comparator
Randomisation or patient preference

Outcome measures

Primary: Compliance with questionnaire completion, defined as the percentage of patients returning a questionnaire out of those expected (i.e. not withdrawn or died) at the first QoL assessment time point after completion of the host trial's study intervention.
Secondary: - Domain scores and item responses at key QoL host trial time points. Compliance with questionnaire completion at all further time points of QoL collection in the host trial.
- Compliance with questionnaire completion at all further time points of QoL collection in the host trial.
- Completeness of data (% of questions completed in the questionnaire) in the host trial's primary QoL questionnaire.
- Patient satisfaction with electronic and paper questionnaires.
- Change in response scores from baseline.
- Time taken (minutes) to prepare a paper questionnaire for distribution compared to electronic dispatch.
- Percentage of patients sent reminders to complete questionnaires for paper and electronic questionnaires.

Analysis plans
This is a partially randomised patient preference study, allowing participants to choose a preferred modality for questionnaire completion if they are unwilling or unable to be randomised between electronic or paper questionnaires. The randomised and patient preference groups will be analysed separately.

Sample size estimates are based on numbers required for the randomised part of the study. Based on compliance reports from existing ICR-CTSU trials, return rates for paper questionnaires are expected to be in the region of 90% at the first post-intervention time point. 244 patients would therefore be required to be randomised (1:1) to exclude <80% compliance rates with ePRO (i.e. 10% non-inferiority margin), with 80% power and 1-sided alpha=0.05.

In the analysis, confounders including patient baseline characteristics (e.g. age, sex) will be taken into account for the comparisons between electronic and paper questionnaires in the non-randomised patients. Regression analyses will adjust for potential confounders such as patient demographics and clinical characteristics for the comparison of outcomes between the patient preference groups. Additionally, descriptive analyses will summarise demographic and clinical characteristics of patients opting for randomisation versus expressing a preference.
The primary outcome of compliance at the first post intervention time point within the host trial will be calculated as percentage of returned questionnaires out of those expected (i.e. not withdrawn or died) for the electronic and paper questionnaire groups, and the difference calculated along with a 2-sided 90% confidence interval. Non-inferiority for electronic questionnaires will be concluded if the lower confidence limit for the difference in compliance for electronic versus paper questionnaires is greater than 10%.
For the secondary outcomes of questionnaire compliance at further time-points and data completeness, descriptive analyses will compare percentages between groups at each time-point. Questionnaire domain scores will be calculated as per guidance for each specific measure (e.g. the global health/overall QoL score from the EORTC QLQ-C30), and compared between electronic questionnaires and paper questionnaires at each time-point using descriptive statistics appropriate for the distributions (e.g. means or medians for numeric scales and percentages for categorical outcomes). Change in domain scores from baseline will be calculated for each follow-up time point and compared descriptively between the electronic and paper questionnaire groups.

Possible problems in implementing this SWAT
If most patients opt to enroll in the patient preference cohort, the analysis of the randomized cohort will lack statistical power. The number of patients opting for a preference rather than allocation via randomisation will be monitored monthly and assessed after 50 patients have been recruited. If >50% of these patients decline randomised allocation, consideration will be given to ceasing randomisation and adopting an alternative recruitment and analysis strategy. The overall feasibility of recruitment for the SWAT will be monitored and re-evaluated if a third of the required patients have not been recruited within 6 months of the study commencing.

References

1) FDA, HHS. Guidance for Industry Use in Medical Product Development to Support Labeling Claims Guidance for Industry. Clinical/Medical Federal Register. 2009.
2) Eremenco S, Coons SJ, Paty J, et al. PRO data collection in clinical trials using mixed modes: Report of the ISPOR PRO mixed modes good research practices task force. Value Heal 2014;17(5):501–16.
3) Coons SJ, Gwaltney CJ, Hays RD, et al. Recommendations on evidence needed to support measurement equivalence between electronic and paper-based patient-reported outcome (PRO) measures: ISPOR ePRO good research practices task force report. Value Heal 2009;12(4):419–29.
4) Aiyegbusi OL. Key methodological considerations for usability testing of electronic patient-reported outcome (ePRO) systems. Quality of Life Research 2020;29(2):325–33.

Publications or presentations of this SWAT design

Examples of the implementation of this SWAT

People to show as the source of this idea: Lara Philipps, Rebecca Lewis, Morgaine Stiles, Jo Haviland, Deborah Gardiner, Alexa Gillman, Emma Hall (The Institute of Cancer Research Clinical Trials and Statistics Unit)
Contact email address: lara.philipps@icr.ac.uk
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Revisions made by:
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