Standard Operating Procedure

5.5.1 Electronic Data Handling

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Introduction/Background

The correct management of research data and files is crucial to the integrity of the final results. Correct management enables researchers to accurately substantiate publication results, and meet reporting and auditing requirements.

Objective

This SOP describes the procedure for electronic data management, data entry and error resolution. A comprehensive manual for electronic Case Report Form (eCRF) completion and data entry will be available for each site to refer to for specific routine site data management.

Scope

This SOP applies to all sites involved in clinical studies conducted by the IMPACCT Trials Coordination Centre (ITCC), including Palliative Care Clinical Studies Collaborative (PaCCSC) and Cancer Symptom Trials (CST). It also applies to all staff involved in clinical studies conducted by the ITCC irrespective of individual organisational employment, role, or position.

Ownership and Responsibility

Responsibility of the Principal Investigator

It is the responsibility of the Principal Investigator to ensure that all data and files are accurately managed. The task may be delegated to another suitably trained individual as documented on the Staff Signature and Delegation Log (*refer* SOP 4.2.4 Delegation of Duties) but the responsibility remains with the Principal Investigator.

Responsibility of the IMPACCT Trials Coordination Centre (ITCC)

- To develop the paper data collection worksheets and eCRFs in the web-based Research Management System for each study
- To monitor and maintain the accessibility, security, and functionality of the Research Management System
- To monitor data quality and accuracy by performing systematic data verification
- To coordinate data archiving and retention

Procedure

1. Source documents

Source documents include original documents, data, and records (hospital records, clinical file charts, laboratory notes, diaries, checklists, dispensing records, etc.). These documents allow for the reconstruction and evaluation of the study. Data held within source documents are the first record of clinical observations. Examples include (but are not limited to):

- original signed consent form;
- pathology reports to confirm blood results used as eligibility screening;
- clinical records charting patient clinical assessment used to monitor patient eligibility or progress;
- Dangerous Drug Accountability signature sheets to show correct checking and dispensing procedures;
- data collection worksheets where patient information (such as, vital signs, patient responses to specific questions, assessments made while with the patient, among others), are recorded during a patient visit (especially if this forms the only record of the information and is not a transcription recorded elsewhere);
- quality of life or other participant completed questionnaires and forms completed as part of the study measures, and where this recording is the original or only recording of the scores and responses at that time.

Source data may also include the data recorded within case report forms (CRFs) or contained on audiotapes if these data forms clinical data from which analysis is conducted and not contained within other source documents. For example, suppose clinical observations, survey responses or patient reported outcomes are recorded directly within the CRF and used as study data. In that case, this is then source data (*refer* SOP 4.9.2 Source Data and Documentation).

2. Research data management system (RDMS)

The ITCC uses REDCap as the primary research data management system for all studies. The REDCap Electronic Data Capture (EDC) platform complies with international and national regulatory requirements for EDC systems in the countries where it is used.

This web-based system was developed to support research work by providing access to tools that include:

TOOL	FUNCTIONALITY
electronic Case Report Forms (eCRFs)	– Online design of e-CRFs and questionnaires – Online data entry (create and edit) from multiple sites with a single coordinating site – Online data checking – Conditioning and masking of unnecessary items – Automatic email alerts (on inclusion, randomisation, adverse events, serious adverse events) – Web-based and email-based form completion – Scheduling (Utilise a built-in project calendar and scheduling module for organising trial events and appointments). – Data Queries - Document the process of resolving data issues using the Data Resolution Workflow module.
Data Management Tool	– Data quality – Data monitoring – Online pre-set reports and statistics – Documentation and management – Study progress tracking
Data Extraction Tool	– Basic reporting of results with features such as percentages, graphs, and tables – Export data to common data analysis packages - Export your data to Microsoft Excel, PDF, SAS, Stata, R, or SPSS for analysis. – Generate a PDF version of trial forms and surveys for printing to collect data offline.

3. Data collection

The points at which specific data are collected are specified within the study protocols (e.g., the table of study measures). All investigations, forms, questionnaires, and all other data are to be included.

3.1 Consent for Data Collection and Use

All participants will be informed of, and provide consent for, the collection and use of their data for the purposes of this study.

3.2 Data Collection

Data will be collected from the following sources:

- Direct communication with the participant
- Study assessments, including laboratory test results, imaging, biomedical monitoring, questionnaires, interviews, and data downloaded from apps
- Participant medical records
- Communications with participant's clinical care team

Data will be collected primarily by the Investigator or designated study staff. All study personnel involved in data collection will be trained in Good Clinical Practice (GCP), the study protocol, and collection requirements.

Collection of data will be limited to that necessary for the specified purposes of the study, or for additional purposes that the participant has explicitly consented to.

3.3 Data Collection Flow

The Investigator or delegate will be responsible for the accuracy of the participant data entered in the REDCap EDC system. Data from source documents relevant to the protocol, should be reported under the responsibility of the Investigator as soon as possible on the provided EDC system. All entries must be completed in English.

The REDCap EDC system, provided with audit trail enabled, will allow identified and authorised users to remotely store data in electronic forms so that all data transactions between sites and central database are automatically and chronologically recorded.

The Principal Investigator should ensure the accuracy, completeness, legibility, and timeliness of the data reported to the Sponsor in the eCRFs from the REDCap EDC system and in all required reports.

Study data reported in the REDCap EDC system will be checked for consistency at UTS. Any discrepancies found will be notified to the Investigator responsible for resolving the data discrepancies, reporting data changes, and maintaining accurate and consistent data in source documents and REDCap EDC system.

As specified per study protocol, eCRFs may be considered source documentation, where the eCRF is the first recording of study data, such as during study visits where there are no other traditional source documents. To assist sites in ensuring that source documentation and data

reported in the eCRFs are complete and consistent, ITCC develops and provides study-specific data collection worksheets for use. The worksheets are designed to capture the required data and to enable smooth data entry in the eCRFs through similar question and response structures to minimise data entry errors. These worksheets may be considered source documentation, where the worksheet is the first recording of study data. All data entered in the eCRF must be verifiable with source data from the participant's data collection worksheets, medical records, and other relevant documents as applicable. Any discrepancies between the eCRF and the source data (including study worksheets) should be explained and documented.

The REDCap EDC system for each study is provided by UTS, supported by Australian Access Federation (AAF) Virtual Home, including eCRFs and data management services. REDCap is a secure web platform for building and managing online databases and surveys. Computer workstations do not require any specific client-side software installation. REDCap's streamlined process for rapidly creating and designing projects offers a vast array of tools that can be tailored to virtually any data collection strategy. REDCap provides automated export procedures for seamless data downloads to Excel and common statistical packages (SPSS, SAS, Stata, R), as well as a built-in project calendar, a scheduling module, ad hoc reporting tools, and advanced features, such as branching logic, file uploading, and calculated fields.

4. Electronic recording

Study data will be recorded in several files for both the administration of the study and collection of subject data.

- At each site, a Patient Master Index (Template 12) will contain the confidential subject contact information and will be the only link between individual subjects and the ID number. Each site will generate a site-specific Patient Master Index (PMI) for subjects recruited at that site. For sites with a local licence to REDCap, an electronic PMI has been developed by ITCC for import into local systems and is available on request.
- The ITCC will maintain a data entry and checking register, the date of return to the study site for correction, the date of return or correction, and the date of resolution. This log will enable paper or electronic data to be tracked for query resolution, completeness, and invoice generation. Within REDCap, this record is automatically generated.
- The data files will be held and administered in the ITCC and will contain the subject data as downloaded from the EDC system (REDCap). These data will then be transferred to the data set for analysis on request and on completion of study enrolment.

5. Data entry

- Data from each site will be entered into eCRFs contained within the web-based interface (REDCap) specifically developed for each study. REDCap is password protected to reduce the risk of unauthorised access.
- Each user is then granted access to specific studies/projects within REDCap.
- The REDCap eCRFs for each study are developed and tested for functionality prior to

site initiation.

- Subsequent changes and updates to the REDCap eCRFs and database are implemented in response to an identified issue, to correct an error or discrepancy, following a protocol amendment or upon request from the Coordinating Principal Investigator. These processes are detailed in the internal ITCC Electronic Case Report Form Work Instructions.
- Identifiable data are converted to a de-identified form at the study site, at which point it is entered into electronic case report forms using REDCap. De-identified data will be carried without reference to health information by using a participant code. The Site Investigator retains a log linking participant code with personal identifiers. This log will not be made available to the Sponsor (UTS). Specific care is to be taken when recording clinical information, such as notes within Serious Adverse Events.
- The ITCC will regularly download and store the REDCap study data (eCRFs) as an excel file saved on a local UTS network drive. Access to the network drive is only granted to internal ITCC staff and must be approved by the PaCCSC/CST National Manager or ITCC National Project Officer. The data can then be transferred to the study statistician using SOP 5.5.2 Data Transfer for conversion into other file types for analysis.

6. Data verification

- The ITCC will systematically conduct a manual check of the data recorded on the data collection worksheets against the eCRF data recorded in the Electronic Data Capture System (REDCap) to verify the completeness and accuracy of data entry.
- On completion of data entry for each form, the study site submits the data and is required to change the data ‘status’ from ‘Incomplete’ to ‘Complete’. Any further changes to the data initiate a log of changes in the form of an audit trail.
- Source Data Verification is a process to verify that the data collected in the eCRFs is correct and has been transcribed accurately from the source document. A central monitor at ITCC is provided with a REDCap account with monitoring authorisation which allows the monitor to verify and record in the eCRF whether a datum corresponds or not to the source document checked during the source data verification. The monitor is allowed to open manual queries on specific fields in REDCap eCRFs. Changes or queries raised by the ITCC will change the data status to ‘Unverified’. (*refer* SOP 5.18 Monitoring)
- A copy of the original data collection worksheet is uploaded to REDCap to the ITCC to enable verification of data entry and for filing.
- The extent of the data checking will be decided by the study investigator group and in accordance with the study Monitoring Plan (Template 35) and Data Management Plan (Template 10).

7. Data archiving

Electronic archiving (*refer* SOP 8.4.1 Archiving) can take place once:

- Study recruitment is complete;
- All data have been entered;
- All data have been checked and errors resolved, site data is recorded as closed using an ITCC Data Closure Checklist for each site (Template 50) ;
- The database has been locked to any further changes;
- The eCRF data have been downloaded as the final data set and sent to the study statistician;
- The main results publication has been accepted for publication in a peer-reviewed journal; or
- The decision has otherwise been made by the Coordinating Principal Investigator to archive the data.

At this point, the REDCap database administrator is informed of data closure using the form of notification according to the RDMS (Template 13).

There may be circumstances where the study statistician requests a correction to the data, such as a correction to dates, incorrect data, or other clarifications. Under these circumstances, the data will need to be unlocked in order for those requested corrections to be made. Unlocking of the database is to be recorded using a Database Unlock Form (Template 49). The form is to be completed and filed in the data management files in the TMF. Once the changes have been made, the database is to be locked again using the Data Closure Form (*refer to* Template 13).

The database owner will confirm destruction to the REDCap Administrator to enable the removal of the study data from the online research data management platform. The data will then be permanently deleted from the research data management system per their Standard Operating Procedures.

7.1 Data retention

The retention of closed or locked data will be in accordance with the study protocol, ethics approval, and the NHMRC *Australian Code for the Responsible Conduct of Research*.

The de-identified database will remain on REDCap and archived on UTS eResearch servers for up to 15 years from the date of the last publication of the research in line with the state records act of NSW. Electronic records are reformatted, overwritten or shredded, and then disposed of through normal channels. Destruction of digital data will be carried out by the UTS Information Technology Division according to International Organisation for Standardisation (ISO) best practice at that time.

The database will be electronically archived or deleted after the study team confirms that data can be deleted and a secure archive backup has been generated (*refer* SOP 8.4.2 Record Destruction). The process will be minuted for auditing purposes.

Related SOPs

4.9.2 Source Data and Documentation

5.23.1 Data Collection Worksheet Completion

5.5.2 Electronic Data Transfer

5.18 Monitoring

8.0 Essential Documents

8.4.1 Archiving

8.4.2 Record Destruction

Related documents

Template 10: Data Management Plan

Template 12: Patient Master Index

Template 13: Data Closure Form

Template 35: Study Monitoring Plan

Template 41: REDCap Training Record

Template 49: Database Unlock Form

Template 50: ITCC Data Closure Checklist

References

Australian Code for the Responsible Conduct of Research 2018 (accessed 07/02/2020) https://www.nhmrc.gov.au/about-us/publications/australian-code-responsible-conduct-research-2018

International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH). Integrated Addendum to ICH E6(R1): Guideline for Good Clinical Practice E6(R2). November 2016 (accessed 23/10/2017)

https://www.ich.org/fileadmin/Public_Web_Site/ICH_Products/Guidelines/Efficacy/E6/E6_R2__Step_4.pdf

King DW, Lashley R. A quantifiable alternative to double data entry. Controlled Clinical Trials 2000; 21(2):94-102.

National Statement on Ethical Conduct in Human Research (2007)- Updated 2018- (accessed 07/02/2020)

https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018

PaCCSC Work Instructions

PaCCSC Electronic Case Report Form Work Instructions

Praxis Australia

History			
Version	Date	Author	Reason
1.1	18/07/2007	B Fazekas	New procedure
1.2	18/08/2007	B Fazekas	Changes ratified by MAB
1.3	16/10/2007	B Fazekas	Update after David Currow review
1.4	8/06/2010	B Fazekas	Periodic review
1.5	7/01/2011	B Fazekas	Changes ratified by MAB
2.0	1/02/2011	B Fazekas	New version with all updates
2.1	9/12/2015	B Fazekas	Periodic review
2.2	28/02/2018	B Fazekas, S Kochovska	Periodic review Publication of the ICH GCP E6 (R2)
2.3	16/03/2020	C Strauss	Periodic review Publication of Australian Code for the Responsible Conduct of Research 2018 Publication of the National Statement on Ethical Conduct in Human Research (2007) - updated 2018
2.4	07/12/2021	J Hao	Periodic review

Approval		
Version	Approval Name	Approval Signature
2.4	M Agar