

NHG Research Database Platform

Translating Research into Highest **Quality** Patient Care

www.research.nhg.com.sg



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REDCap Introductory Roadshow

(2019 v4)

Agenda

- 1. Challenges in the Research environment**
- 2. Introducing REDCap**
- 3. Using REDCap**
 - a) Usage Models**
 - b) Application Process**
 - c) Oversight Mechanism**
- 4. Why REDCap?**

Conducting Research

We wished Research was like this...



But conducting research is tough work...



Topic Selection

Literature Review

Ethics Review

Population & Sampling

Participant Screening

Follow Up Visits

Data Analysis

Ethics Renewal

Study Design

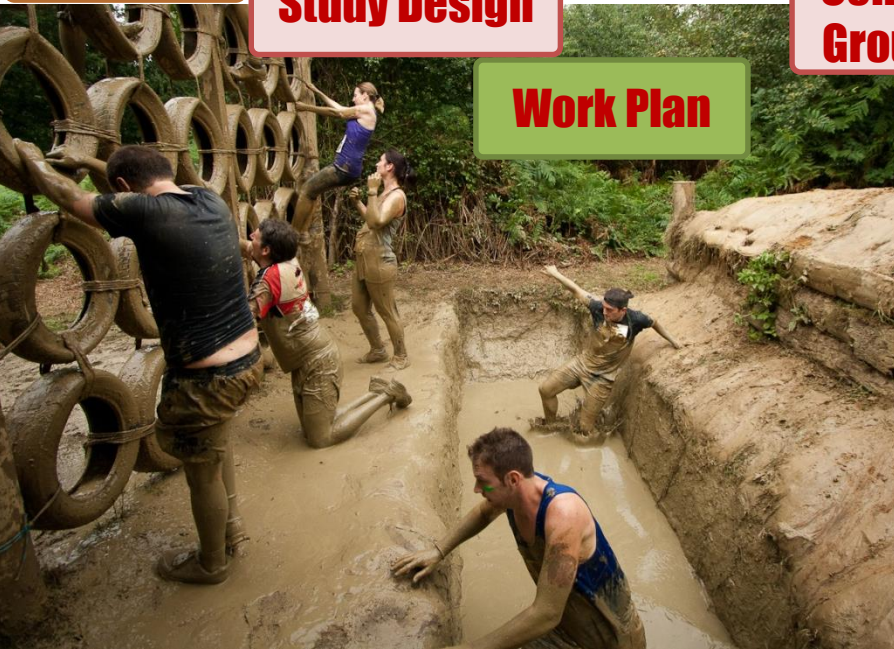
Control Groups

Adverse Events

Data Collection

Publication

Work Plan



Data Collection Challenges

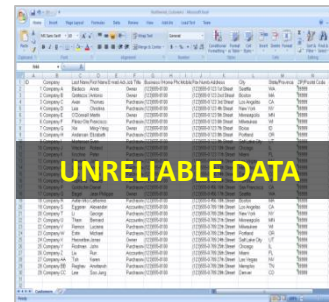
The Data collection process is largely a **manual “Pen & Paper” process** of capturing research data onto Case Report Forms (CRFs) for many researchers. Completed CRFs are then sent for **data-entry** into an **electronic format**, of which the dominant choice is **MS Excel**.



Paper Forms



Data Entry



Excel



Analysis

- Recording Errors
- Out of Range values
- Incomplete entries
- Illegible writing
- Lost Forms
- Resource intensive

- Typo Errors
- No Data Validation
- Inconsistent Data
- Incomplete Entries
- No Logic Checks
- No Audit Trails
- No Edit History

- Requires Data cleanup & validation
- Complex process to collate several data sources
- Lost / Missing Files
- Corrupted Files
- Weak Data Security
- No Access Control

- Long time period between Data Collection to Analysis and results
- Lacks real-time monitoring
- Analysis may be unreliable due to poor data quality

Data Storage Challenges

A significant portion of researchers store their **Research data (Excel files)** on **Shared Network Drives**; on their **PCs/Laptops, Thumb-drives** and **external Hard-drives**. These methods of data storage have very **weak levels of Security** and are extremely **vulnerable** to data loss and theft.

Data Loss

due to lack of regular Backups, Hardware Failure, Malicious Virus, Sabotage, Staff Turnover

Research Data



Poor Data Quality

due to lack of data errors, inconsistent definitions, missing data, unauthorized changes, lack of validation

Breach of Privacy & Confidentiality

due to data theft, leaks, lost laptops/thumb-drives

Data Theft

due to weak security, lack of Access Controls and Audit Trails,

Data Quality & Analysis Challenges

- Researchers have to wait for data to be **collated from the numerous sources**, and then to be validated and corrected for errors. This is both **resource and time intensive**.
- Researchers have **no capability** to assess **real-time research data reports/metrics** or **data visualization tools**.
- Researchers **cannot monitor the Study progress** or **evaluate the data collected** to test new research hypothesis and to fine-tune the study.

Delayed Analysis

due to manual collation, data cleanup, error correction and verification.

Poor Data Quality

due to data errors, inconsistent definitions, missing data, unauthorized changes, lack of validation

Unable to Monitor

due to lack of access to timely data and accurate reports



Introducing NHG's REDCap System

NHG Research Database Platform

Translating Research into Highest *Quality* Patient Care

www.research.nhg.com.sg



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REDCap
Research Electronic Data Capture



What is REDCap?

- REDCap is a **web-based** software application for **electronic collection** and management of research and clinical study data.
- Originally designed at Vanderbilt University, it is now used at more than **2000 institutions worldwide** (including **SHS, NUHS**, *Harvard Medical Sch* and *Johns Hopkins Hosp*)
- REDCap's user-friendly and stream-lined process for rapidly developing databases, **does not require in-depth** database design or IT knowledge to use.

Map of REDCap Consortium Partners



Main REDCap Features

Supported Research Types



REDCap is great for research data collection:

- **Traditional** (ie: one Participant, one visit)
- **Longitudinal** (ie: one Participant, multiple visits)
- **Participant-entered Surveys** (Participant Reported Outcomes) or **anonymous Surveys**

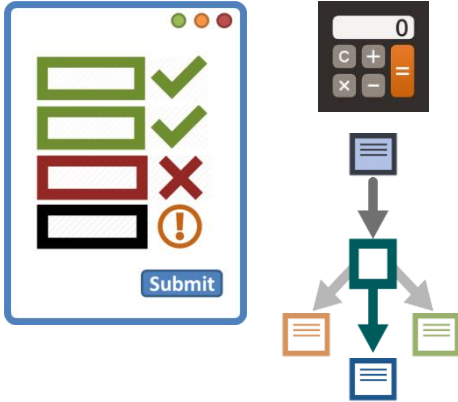
Easy to Use



- Easy-to-use Form Designer tool (**WYSIWYG**)
- **No Coding. No Programming.** Easy to learn.
- **No software to install.** Runs off your Browser
- Designed to be a Self-Service tool without need for IT intervention

Main REDCap Features

Data Validation



- The Form Designer has **real-time** data validation tools such as:
 - **Validation** checks (*data formats such as number, date, time*)
 - **Out-of-Range** values (*numbers, dates*)
 - **Calculated** fields (*BMI*)
 - Question **Branching/Skip** Logic (*Pregnancy*)
- Eliminate data errors and improve data quality

Standardized Form Library & Project Templates



- Provides a library of **curated Data Collection** forms that can be downloaded and used by researchers (e.g. APACHE II, CES-D, HAM-D, PSQI, PSS-10, SF-36)
- Provides **Project Templates** which can be quickly customized as needed.

Main REDCap Features

Data Quality Tools



- Data Quality Tools allows Users to apply Rules to the Data Fields in order to verify the integrity of data collected.
- Quickly assess missing values, outliers or any other potential data issues before data export for analysis.
- Provides common pre-defined “rules” and/or create customized rules to check the data

Project Calendar



- Utilize a built-in project calendar and scheduling module for organizing your events and appointments.

Main REDCap Features

Tablet Devices



- REDCap Mobile App for iOS and Android - Enables use of Tablet-devices for off-site data collection
- Most useful when data collection will be performed where there is no NHG network connection
- Ability to sync data when network is established
- Allows for deletion of data on device after syncing

Security



- Has extensive User Logs and Audit Trails for tracking data manipulation and user activity
- Each Project has Log that tracks every single change made.
- Fine-grained controls for User Rights Mangt.
- Server & Network security, Backups by IHIS

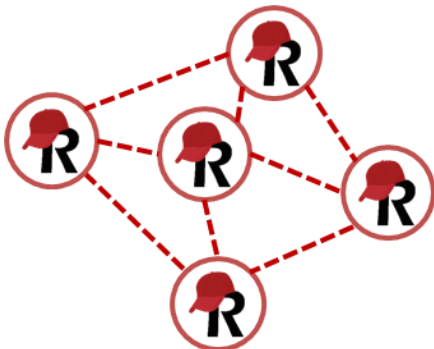
Main REDCap Features

Reporting & Data Export Tools



- Export data to a variety of popular formats (SPSS, SAS, Stata, R or CSV)
- Data exports are customizable, including all or some of the data forms and fields.
- Exports can include identified or only de-identified data depending on user and group rights.
- User controls can grant or restrict access to export data for analysis.

Share & Collaborate



- REDCap Projects can be easily duplicated or copied.
- REDCap “Copy Project” button lets you copy all the events, forms, variables, and settings into a new project (with or without data).
- Useful for multi-site collaboration or setting up a new Study Site which also uses REDCap.



Is REDCap suitable for all types of research activities?

- REDCap is not intended to be a silver-bullet to solve all your research data problems.
- REDCap has its **limitations** as an electronic data capture platform.
- You will have to assess and compare your Study needs against REDCap's capabilities to see if it is suitable for you.
- REDCap is **NOT SUITABLE** for studies with extremely complex logic (e.g., crossover arms; complex form design requirements)

Usage Models for REDCap Projects



**SELF – MANAGED
PROJECTS**

VS



**FULL – ASSISTANCE
PROJECTS**

Self-Managed Projects Vs Full-Assistance Projects



Self Managed Projects		Full Assistance Projects
<ul style="list-style-type: none"> No Cost to Project Owner* <p><i>* This <u>does not</u> refer to the Maintenance Cost of REDCap Platform which is already apportioned among NHG Institutions.</i></p>	<p>Cost to Researcher</p>	<ul style="list-style-type: none"> Cost determined by Project's complexity and requirements (at \$70/Man-hr). Approval required from Inst. Rep / DOR Project Cost payable by Project Owner's Institution.
<ul style="list-style-type: none"> Full Access to REDCap capabilities. 	<p>REDCap Access</p>	<ul style="list-style-type: none"> Full Access to REDCap capabilities.
<ul style="list-style-type: none"> Project Owner / Study Team responsible for creating and managing REDCap Project themselves. 	<p>Project Design</p>	<ul style="list-style-type: none"> REDCap Project will be designed and created by RDO Project-Analyst based on requirements.
<ul style="list-style-type: none"> Self-Taught via Videos, Guides and Training Sessions. General Help available for troubleshooting any system problems. 	<p>Learning</p>	<ul style="list-style-type: none"> Study Team expected to know REDCap basics via Self-Learning etc. Additional Project-specific Training provided to facilitate hand-over to Project Owner/Study Team.
<ul style="list-style-type: none"> Ethics Approval required before start. Quarterly Reports to Institution Representatives / Director of Research. 	<p>Oversight</p>	<ul style="list-style-type: none"> Ethics Approval required before start. Quarterly Reports to Institution Representatives / Director of Research.

Using **REDCap** – How much does it cost?



REDCap Usage Cost for NHG Researcher



SELF – MANAGED PROJECTS

- There is **NO COST** to the Project Owner for Self-Managed Projects.
- For Self-Managed Projects, Project Owners are responsible for their own REDCap Project's design, form creation and managing user access to their Project.
- Assistance is limited to general technical issues and trouble-shooting.

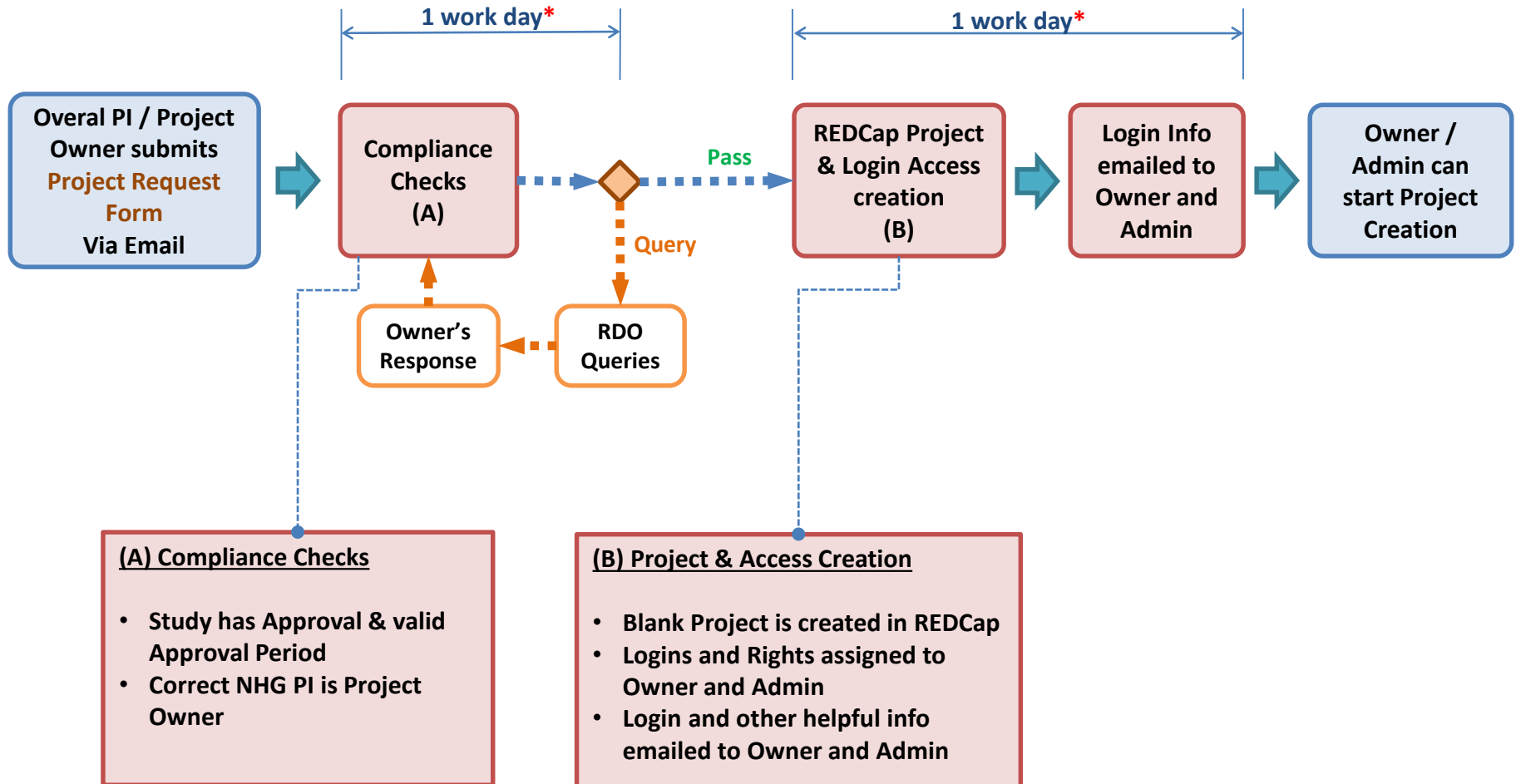
FULL-ASSISTANCE PROJECTS

- The **charges payable** for Full-Assistance Projects will depend on the **complexity** and **requirements** of the Project.
- These Projects are charged on a “Cost per Man-Hour” basis. (**\$70 per Man-Hour**)
- A Project-Analyst will assess the complexity and requirements of the Project before presenting a **Project Proposal** which will include the **estimated Project cost**.
- The **Institution Representative** and **Project Owner** must accept and sign the Proposal before the Project is initiated.
- Project cost is payable by the **Project Owner's Institution**, and it is **additional** to the shared REDCap Platform Maintenance Cost.

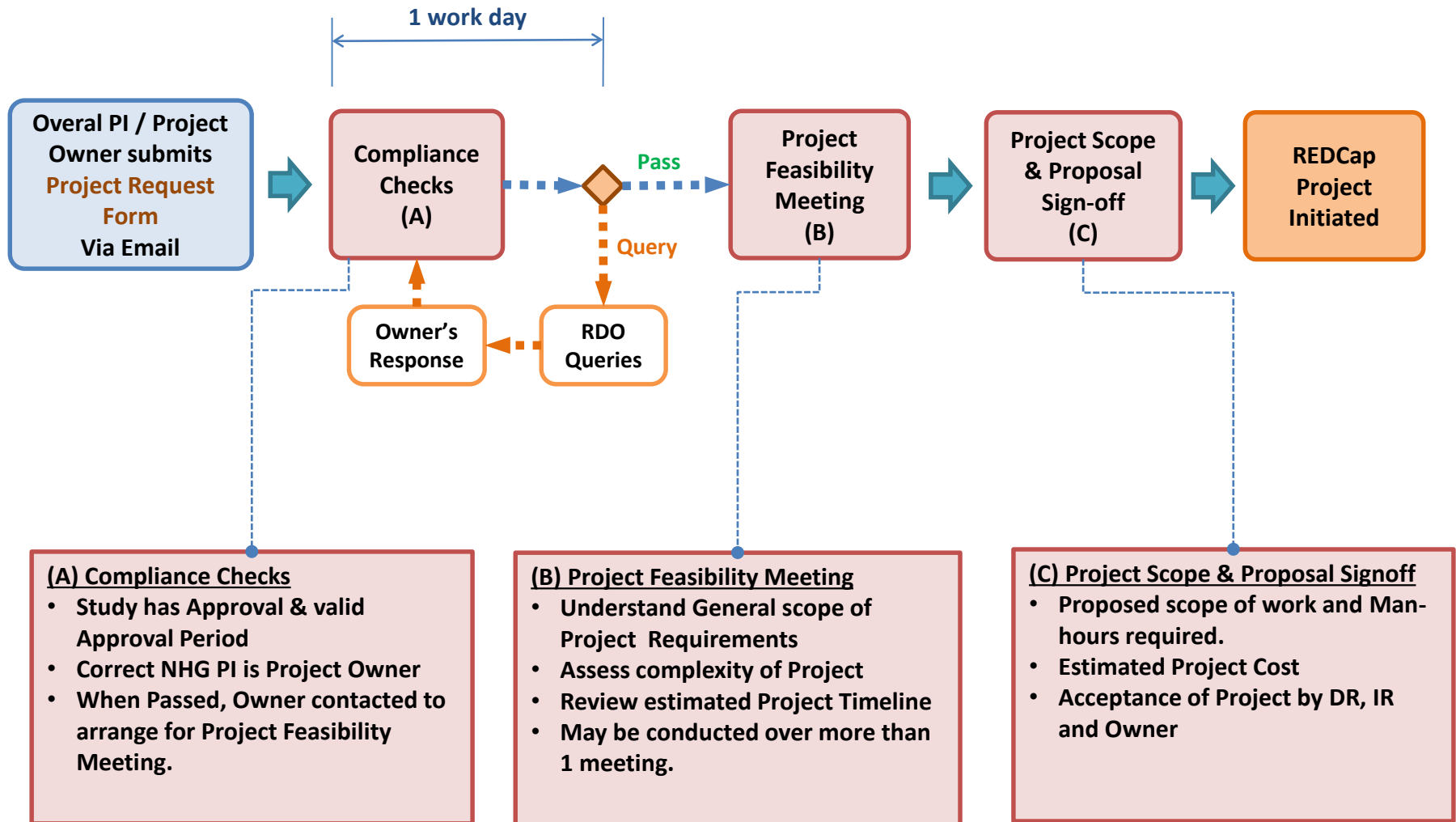
How to request for a **REDCap** Project?



REDCap Application Process (SELF-MANAGED Projects)



REDCap Application Process (FULL-ASSISTANCE Projects)



New REDCap Project Requests



- Overall Study PI, aka the REDCap “**Project Owner**”, is required to submit a 1-page Project Request Form.
- **No further endorsements required from DR and IR** (*for Self-Managed Projects*)
- Key Information for Compliance Checks
 - Overall Principal Investigator (Project Owner) info
 - Study Administrator (Project Administrator) info
 - Research Study Title
 - DSRB Reference Number or other IRB Approval letter for verification of ethics approval
 - Project Owner Declaration and Sign-off
- Two levels of REDCap Project Support available
 - **Self-Managed Projects**
 - **Full-Assistance Projects**

REDCap Project Request Form

- The information provided here must be consistent with that provided in the latest DSRB Ethics Approval Letter.
- Please scan the Form as a **PDF Document** and email it to **redcap@nhg.com.sg** for processing.

Part 1 Details of the Project Owner (Overall Principal Investigator)

IMPORTANT: The Overall Principal Investigator shall also be the **REDCap Project Owner**. The Project Owner must also be a current employee of National Healthcare Group and her Institutions for the duration of the Project.

Full Name :		ADID Username:	
Inst & Dept :		Work Email :	

Part 2 Details of Project Administrator (Optional)

IMPORTANT: The Project Administrator, with the Project Owner, shall have access to all project-level REDCap Privileges including Project and User setup. The Project Administrator should hold a senior role in the Study and be familiar with using REDCap.

Full Name :		ADID Username:	
Inst & Dept :		Work Email :	

Part 3 Proposed Research Activity for REDCap

IMPORTANT: The NHG REDCap system is intended for use in research activities as defined and regulated by the NHG-Domain Specific Review Boards (DSRB). The system is **NOT** intended as a primary system for supporting Clinical operations and providing Clinical services.

*DSRB Reference No. or NHG Standing Database/ Tissue Bank Reference No. :			
Study Title / Standing Database Name :			
Type of REDCap Project Support: Mark 'X' where applicable.	<input type="checkbox"/> Self-Managed Project**	<input type="checkbox"/> Full-Assistance Project***	

* **Ethics Approval:** If the ethics approval is **NOT** from the DSRB, please attach a copy of the ethics approval letter to this Form.

** **Self-Managed Projects:** No cost to the Project Owner. Owners are responsible for their REDCap Project's Design, Form creation and managing user access to their Project. Assistance is limited to general technical issues and trouble-shooting.

*** **Full-Assistance Projects:** Project Owners incur a direct cost for Project's Database design and Form creation services. Visit www.research.nhg.com.sg for more details.

* Please [visit the REDCap webpage \(www.research.nhg.com.sg\)](http://www.research.nhg.com.sg) → Resources → NHG Research Database Platform) to download the latest Request Form.

Conditions for the use of NHG REDCap system



IMPORTANT:

The REDCap System as hosted by NHG is:

- Intended for use in **research activities** as defined and regulated by the NHG-Domain Specific Review Boards (DSRB). If the Project involves Animal subjects, then the Project Owner must provide the applicable Institutional Animal Care and Use Committee (IACUC) approvals for the Project.
- **NOT** intended to be used as a primary system for supporting Clinical operations or Patient services.
- **NOT** intended to be used as a primary system for supporting any mission-critical operations or services.
- **NOT TO BE USED** as the basis for providing a contract or other services to any entity.

NHG REDCap Usage Agreement (Extract only)



IMPORTANT:

- !** The NHG REDCap System Usage Agreement ('Agreement') must be read, and accepted by all users of the NHG REDCap System ('REDCap Users').
 - By using the NHG REDCap system, the REDCap Users agree to abide by the provisions of the NHG REDCap System Usage Agreement.
- !** REDCap Users understand that violating the provisions of this Agreement may constitute grounds for disciplinary actions as determined by applicable research regulations and NHG's Policies and Procedures.
 - NHG may make changes to the NHG REDCap System Usage Agreement from time to time.
 - When these changes are made, NHG will make the new version of the Agreement available at the NHG research website (www.research.nhg.com.sg). Such updates will also be broadcast to all REDCap Users via email and publicized through other appropriate channels.
- !** REDCap Users understand and agree that if they continue to use the NHG REDCap system AFTER the date on which Agreement has changed, NHG treat their use of the System as acceptance of the updated Agreement.

* Please [visit the REDCap webpage \(www.research.nhg.com.sg → Resources → NHG Research Database Platform\)](http://www.research.nhg.com.sg) to download the complete Usage Agreement.

REDCap Project Oversight Processes

- Quarterly Reports will be sent based on Project Owners' respective Institution Representative / Director of Research.
- Reports will include information such as :
 - Project Owner
 - Related DSRB Reference number
 - Project Start Date
 - Current Project Status (Live, Closed)
- These reports will include both Self-Managed and Full-Assistance Projects.
- User access to REDCap Projects is linked to the DSRB Ethics Approval period.
- REDCap Accounts / access will lapse if DSRB Approval lapses.



Why should I use **REDCap** ?



Why should I use REDCap?

Improve Data Quality

- Don't waste time and resources on cleaning up data.
- No more data loss, corruption.

Do actual Research work

- Save time, effort and resources to do the real work of answering your research questions!

Get your Answers in a shorter time

- Good Quality Data → less cleaning, frustration → Answer your research questions sooner

More Secure

- Secure your research data via Project Logs, Audit trails, Fine-grain User-Rights control, Data backups, Server & Network security.

Share & Collaborate

- REDCap is widely used both in Singapore and abroad.
- Export / Import REDCap Project Files to quickly setup a Study Site to collaborate.

Transferable Skills

- Your REDCap knowledge will be a value-add to your research skillset.

Save the Earth. Save your resources

- It's not just about saving the Earth.
- Save your time and research resources for more productive, value-add activities.

So how do I get started on **REDCap** ?



Getting ready for REDCap



Learn

- *Watch the REDCap Training videos*
- *Read from Online Resources (Just Google “REDCap”)*
- *Apply for access to the Staging Server to try*
- *Sign up for our Training Sessions / REDCap Clinics (coming soon!)*



Re-think

- *What do you REALLY need to know to answer your Question(s)?*
- *Re-think your entire Data Collection Process (Electronic Forms).*
- *How can you streamline your Data Collection process with REDCap?*



Apply

- *Submit your REDCap Project Request ([See here for Forms](#))*
- *Start creating your Data Collection Instruments*
- *Start using!*



- Do visit the [NHG REDCap website](#) for more information.
- www.research.nhg.com.sg
NHG Research → {Resources} → **{NHG Research Database Platform}**
- You can also contact us via email at redcap@nhg.com.sg if you have any queries for us.