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This guide was created using the documents available for REDCap Administrators:

- REDCap Help & FAQ tab in software
- REDCap software
REDCap Intermediate Topics

Prerequisite for Intermediate Class In order to be prepared for this class:

1. You should have already completed the Basic User Training Class
2. Know how to navigate around REDCap
3. Be knowledgeable of REDCap terminology
4. Understand a longitudinal project

REDCap Glossary

Arms: group events into ‘arms’; there may be one or more arms/groups per project. Each arm can have as many events as needed. Used in Longitudinal projects.

Calendar: a project calendar to help organize the scheduling and keep track of any upcoming events. Data Access Groups: restricts viewing of data within a database (Ex: in a multi-site study).

Event: allows for the utilization of data collection forms multiple times for any given project record (used when collecting longitudinal data). An ‘event’ may be a temporal event in the course of a project, such as a participant visit or a task to be performed.

File Repository: a repository that stores and retrieves files and documents used for a project. Whenever a data export is performed, the resulting data and syntax files are also stored in the file repository of the project.

Longitudinal Model: this model is designed so that data collection instruments may be used multiple times for any given record/patient so that data for the same fields may be captured over and over again, longitudinally. This model allows users to define events that will be used for the data collection and associated data collection instruments with those events.

Record ID: a unique identifier for each record in your database. You can label this differently in your project, but the ID must remain the first field in the first data form.

Record Label: information/variables added to the unique ID of the study to help select the right record during data entry. For example, date of birth or last name can be added as record labels when selecting a subject for data entry. Record labels are displayed only and have no impact when exporting data.

Record Status Dashboard: a table that lists all existing records and their status for every data collection instrument. The table uses color-coded icons; Red—Incomplete; Yellow—Unverified; Green—Complete; Grey—Incomplete (no data saved); Orange Check—Partial Survey Response; Green Check—Completed Survey Response.

User Rights: the customized privileges that research team members have in terms of data form modification, data entry, and data access. The PI may create “Roles” for groups of team members to ensure consistency in specified user rights.

HIPAA Compliance and PHI

The HIPAA Security Rule defines the standards, which require covered entities to implement basic safeguards to protect electronic protected health information (EPHI), which is individually identifiable health information in the electronic form. Privacy depends upon security measures: no security, no privacy.

HIPAA also mandates that covered entities must maintain reasonable and appropriate administrative, physical, and technical safeguards to protect patients’ electronic protected health information. This information may be in any electronic format that is stored or transmitted from devices such as desktop or laptop computers, networked systems,
disks, CD-ROMs, hand-held device (PDAs), and other clinical-related devices.

Always think about the security of your data—only export when necessary. Take precaution when exporting data and only export data if you need to run reports or analysis outside of REDCap. Limit user privileges to allow export rights only to those who really need it. Note: REDCap is a web-based system. Once data is downloaded from REDCap to a device (ex: computer, laptop, mobile device), the user is responsible for that data. If the data being downloaded is protected health information (PHI), the user must be trained and knowledgeable as to which devices are secure and in compliance with ECU’s standards (ex: HIPAA) for securing PHI.

Use the REDCap Send-It feature to send data—Send-It is a secure data transfer application that allows you to upload a file (up to 32MB in size) and then allow multiple recipients to download the file in a secure manner. Each recipient will receive an email containing a unique download URL, along with a second follow-up email with the password (for greater security) for downloading the file. The file will be stored securely and then later removed from the server after the specified expiration date. Send-It is the perfect solution for anyone wanting to send files that are too large for email attachments or that contain sensitive data.

At ECU, we are committed to protecting our patients’ privacy and maintaining our organization’s security of information. We continue to comply with the HIPAA rule and maintain the confidentiality, security, and integrity of our patients’ health information. Note: If you have a question about HIPAA or wish to report a privacy concern, please call: 744-5200 or email: HEALTHCAREPRIVACY@ecu.edu.

PHI Identifiers

There are 18 pieces of information that are considered identifiers (also called protected health information, or PHI) for the purposes of HIPAA compliance. When you indicate a variable as an Identifier, you have the option to “de-identify” your data on data exports. In the Data Export Tool, the identifier variables appear in red and there are de-identification options you can select prior to exporting the data.

The 18 HIPAA Identifiers are:

1. Name
2. Fax number
3. Phone number
4. Email address
5. Account numbers
6. Social Security number (not allowed in REDCap)
7. Medical Record number
8. Health Plan number
9. Certificate/License number
10. URL
11. IP address
12. Vehicle identifiers
13. Device ID
14. Biometric ID
15. Full face/identifying photo
16. Other unique identifying number, characteristic, or code
17. Postal address (geographic subdivisions smaller than state)
18. Date precision beyond year

REDCap and Your PHI

It is imperative that REDCap users who store Protected Health Information (PHI) do so in a responsible way. REDCap is HIPAA-compliant in that it provides the means to limit who has access to the PHI you enter into your project, but there are some things you have to do yourself.

Identify the variables that contain your PHI to REDCap. When you add a new field in your project, make sure you select “Yes” in the “Identifier?” property. Do this for all your fields containing PHI. This way REDCap will know
what data to limit to those who only have the clearance to see de-identified data.

Set up your User Rights to control who has access to your PHI. The “User Rights” module is where you define who has access to what data. You can set a user's permissions to include either a full data set or a de-identified data set. Users can also be granted or denied access to specific instruments in your project. If your project contains PHI, it is imperative to limit who has access to that information in your project.

Be cognizant of your downloaded record sets. In REDCap it is easy to download a full set of data, including PHI, if you have the permissions. Because of that convenience, it would be easy to download a set to your desktop, view the data, and then leave it, forgetting it’s there, even past its usefulness. (This is just one example meant to serve as a possible scenario.) These “forgotten” record sets could get into the wrong hands if left, unprotected or forgotten. They are especially vulnerable on laptops, tablets, mobile phones and USB drives that are even more susceptible to loss or theft. Your mobile devices must be encrypted if you are using them to store PHI. Better yet, don’t store sensitive data on them at all.

Always be mindful of PHI, however you use it. Even if you never export identified data from REDCap, if you have it displayed on your computer monitor, or write it down on a piece of paper that ends up on your desk, you are potentially exposing that data to individuals without authorization to view it. Consider using a screening device on your computer monitor to shield your data from casual visitors and make sure you shred any pieces of paper you have used to quickly jot down a name and phone number, or any other PHI.

Import an Instrument from the REDCap Shared Library

The REDCap Shared Library is a global repository of data collection instruments that can be downloaded and used in your project. If you navigate to the Shared Library, you can view any of the instruments on the library web page or as a PDF. You will be able to import any instrument from the library into your project. To begin, click on the “Import” button, to import a new instrument from the official REDCap Shared Library.

The REDCap Shared Library will open. There will be a list of instruments or you can search for a specific instrument in the library.
Curated instruments highlighted with a star have been approved for inclusion by the REDCap Library Oversight Committee (REDLOC) after review for research relevance, accuracy in function and coding, and copyright issues. Other instruments and forms are shared by individuals or groups from consortium institutions on "as-is" basis. You may search for any available data collection instruments by entering a keyword into the "Keyword search:" box.
Read the description, acknowledgement, and last updated. You can then click on the “View as web page” link to make sure this is the correct instrument for your project.

The “Viewing Instrument as Web Page” box will open. This will show you the instrument. When you have finished viewing the instrument, click on the “Close” button at the bottom of the screen.

Now you can click on the “View as PDF” link to see the terms of use for the instrument.

The “Shared Content Agreement” box will open. This will show you the License Agreement for the instrument. Make sure you read the entire document. It contains information regarding what you can do and what you cannot do with the REDCap Shared Data Instrument Library (SDIL) and the instruments developed for the library. The library consists of standardized assessment instruments for various research studies. The instruments in the SDIL can only be used by members of the REDCap Consortium exclusively for research and non-commercial purposes. When you are finished reading, click on the “I agree” button at the bottom of the screen.
Now you can import the instrument into your REDCap project. Click on the “Import into my REDCap project” button. The “Shared Content Agreement” box will open again, click on “I agree” again. The “Importing instrument from the REDCap Shared Library” box will open. Here you click the “Add” button to import the instrument. You also have the option to cancel the import, if you change your mind.

When you click “Add”, the instrument will be imported into your project.

Click on “Return to Previous Page”, to see the new instrument on the data collection instruments list.
Data Entry Overview

This section contains information on creating and managing data records: creating, saving, searching, editing, and deleting records. Navigation to record and data entry pages varies slightly according to the project type and the collection format for the data entry forms (Ex: whether a project contains survey forms or is longitudinal). To enter or view individual data records, you can navigate to the “Data Collection” section on the left menu bar.

Note: In each case an “Edit instruments” button is displayed at the top right of the “Data Collection” menu while the project is in development.

Data Entry Navigation: Survey

Manage Survey Participants
Manage your survey respondents and track responses

Record Status Dashboard
View a single-page summary of the status of all surveys (and data entry forms, if applicable) for all records

Add / Edit Records
Select a record and view data, or create a new record either by a survey page or as regular data entry

Data Collection Instruments: <Form name here> Select a record and view a specific form

Data Entry Navigation: Data Entry Forms (Non-Longitudinal)

Record Status Dashboard
View a single-page summary of the status of all data entry forms for all records

Add / Edit Records
Select a record and view data or create a new record

Data Collection Instruments: <Form name here> Select a record and view a specific form

Data Entry Navigation: Data Entry Forms (Longitudinal)

Scheduling
Displayed only is “Scheduling” is enabled under “Enable optional modules and customizations”

Record Status Dashboard
View a single-page summary of the status of all data entry forms for all records

Add / Edit Records
Select a record and view data or create a new record
As in any database, your project records must be uniquely identifiable. REDCap projects must all define a “Record Identifier” field as the first field on the first form.

In any changes, you make to your project’s data collection forms it is essential that the record identifier field remain the first field of the first form, but provided there are no records in your project, you are free to change the field name from “Record ID”.

Creating a New Record
There are three ways that records can be created in your REDCap project:

1. Auto-numbered (includes projects where records are created by a survey
2. Manual entry
3. Import

Record Auto-Numbering: Data Entry Forms Project
With record auto-numbering switched on (Enable optional modules and customizations) records are created by clicking the “Add new record” button.

If your project has multiple arms, you must select the appropriate arm before creating the record. The first data entry form will open and show the new record identifier. This identifier is not yet saved – it will be reused if you do not save the form and may change if another user creates a new record while you have the data entry form open.

Record Auto-Numbering: Survey Project

All survey-only projects have auto-numbered records because there is no necessity for survey forms to include any identifier. Click on “Add new record” to create the new record on a data entry style form. The record creation is associated in the log with the user that created it.
Manual Entry of Record Identifier

With record auto-numbering switched off (Enable optional modules and customizations) records are created by entering the new record identifier into the text entry box. The first data entry form will open and show the new record identifier. The new record (and its identifier) is not saved until you save the data entry form. If your project has multiple arms, you must select the appropriate arm before creating the record.

Data Import

“Data Import” is considered an advanced feature and will be covered in the Advanced Training Class.

Creating a New Record: Arms

You must select the arm appropriate to your new record before creating the record. For longitudinal projects where multiple Arms are defined, each arm functions essentially as a distinct project. Record identifiers are unique only within an arm (Ex: You can have a record identified with Record_ID=5 in both Arm 1 and Arm 2.

It is not possible to ensure that a record identifier is unique within the project, although REDCap does provide a warning when creating a new record with a record identifier that matches one from another Arm:

**NOTICE:** Please note that Record ID "6" also exists on another arm.

Saving a Record

There are four “Save” buttons in REDCap (one that only applies to surveys) and each have a slightly different functionality.

**Note:** Save early and save often, there is no auto-save or undo feature in REDCap.

The “Save Record” button saves and returns you to the main data entry screen, where you can create a new record. The “Save and Continue” button saves your data and refreshes the page, so you can continue entering data. The “Save and go to Next Form” button will appear if you have more than one data entry form. The “Save and Mark Response as Complete” button saves your data and changes the response status from “Incomplete” to “Complete”.
Selecting Existing Record

Select

Records can be selected either directly from the drop-down lists labeled “Partial Responses or Incomplete Records”, “Unverified Responses or Unverified Records”, and “Complete Responses or Complete Records” or by typing the record identifier into the text entry box. The example below shows a survey (responses) and a data form (records) record.

Ice Cream Survey

You may view an existing record/response by selecting it from one of the drop-down lists below. The records are separated into each drop-down list according to their status for this particular data collection instrument. To create a new record/response, click the button below.

<table>
<thead>
<tr>
<th>Total records: 2</th>
<th>Total survey responses: 0</th>
<th>Last survey response: survey not taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Responses (2)</td>
<td>-- select response -- ▼</td>
<td></td>
</tr>
<tr>
<td>Unverified Responses (0)</td>
<td>-- select response -- ▼</td>
<td></td>
</tr>
<tr>
<td>Complete Responses (0)</td>
<td>-- select response -- ▼</td>
<td>Add new record</td>
</tr>
</tbody>
</table>

Search

The “Data Search” section of the record selection page enables you to search for records based on the value saved for the field you select. Only non-categorical fields appear in the list as they are most likely to contain useful identifiers.

With each keystroke of your typing, records with saved data matching your entry are shown in a list. Click an item in the list to select that record.

When the Record is Selected

What you see next is determined by the project type and how the record was selected:

1. Search: selecting a record using the “Data Search” feature takes you directly to the event/form for the data item you selected
2. “Add /Edit Records”, non-longitudinal projects: you will see the first of your data entry forms
3. “Add / Edit Records”, longitudinal projects: you will see the “Event Grid”.

**Rename a Record**

“Renaming” a record is amending the record identifier (Ex: Record_ID value). To rename a record:

1. Navigate to the first form (of the first event, if longitudinal)
2. You will see the record identifier field displayed twice: once as a display of the current value and once in a text entry box that permits you to edit the value.
3. Edit the value and save the form, to rename the record.

**Note:** You cannot change the record identifier to that of an existing record. To rename records a user must have the necessary permissions on the “User Rights” page. Access to this function should be restricted to a limited number of project users since it can cause problems with data integrity.

**Delete a Record** To delete a record:

1. Navigate to any data entry form for the record
2. Click the “Delete Record” button that appears at the bottom of the form
3. Confirm the deletion **Note:** Be very careful, there is no “Undo” button, records deleted are records lost. To delete records a user must have the necessary permissions on the “User Rights” page. Access to this function should be restricted to a limited number of project users.

**Survey Topics**

A survey is a version of a data form that is completed by a study participant without logging into the REDCap system. A survey can be used for anonymous or personalized data collection. An invitation can be sent by email to many participants and public forms can be assessable by a link published to a website.

**Survey Queue, Survey Login & Survey Notifications**

To get to these survey options you will need to click on the “My Projects” tab and then click on your project. This will open the “Project Setup” tab and you will click on the “Online Designer” button.

**Survey Queue**

The Survey Queue displays a list of all of your surveys to a participant on a single page. The queue comprises all surveys that are to be completed (like a 'to-do' list) as well as the surveys that the participant has already completed.
Surveys can be set to appear in the Survey Queue based upon 1) if the participant has completed a particular survey, and/or 2) if certain conditions are met (based upon data values). If any surveys have been activated in the Survey Queue, they will be displayed to the participant after completing a survey (displayed below the survey completion text on the page). The participant will only see in their queue the surveys they have already completed and the surveys that they are being requested to take next (based upon the criteria defined). The setup options allow you to set the conditions that determine when each survey will be displayed in the queue, and (optionally) you can provide custom text to display at the top of every participant’s survey queue, in which you may customize the styling of the text with HTML tags or even utilize Piping to inject data values. Additionally, the 'auto start' feature is optional and can be used to take the participant immediately to the first incomplete survey in the queue if 'auto start' is enabled for that survey, in which it allows for more rapid survey-taking if the participant is completing several surveys in one sitting. NOTE: The first instrument survey is not displayed because it does not have a survey that comes before it for which to set conditions.

To activate your survey queue, navigate to “Online Designer” and click the “Survey Queue” icon located above your data collection instruments.

A “Set up Survey Queue” box will appear. If you would like, you may add your own custom text to display at the top of the survey queue.

Click the “Activate” icon for each survey you would like to set up. Under the “Display survey in the Survey Queue when...” column, use the drop down to indicate when the survey should be displayed. For an example, you might want your second survey to display after the first survey is completed.
If you would like to add additional logic as to when the next survey should be displayed, use the operator drop down and select AND/OR and then check the box next to "When the following logic becomes true" and add your logic in the formula box. In the example, I want my second survey to start after my first survey is completed AND the participant’s age is greater than 18. To do this, I added the variable for the participant’s age field in the square bracket, the greater than sign, and the number. \([\text{age}] > 18\)

The participant can click the Begin Survey to start the second survey. If you would like the second survey to automatically launch and do not want to force the participant to click the Begin Survey icon, you can do this by going back to the Survey Queue settings and click the box underneath the Auto Start column.

**Note:** It is important to test your survey queue prior to your project being moved into production! Take your survey a couple of times to ensure the survey queue logic is working correctly.

**Survey Login**

You can provide improved security to your surveys with a survey login page in which participants will be required to enter specified login credentials in order to begin a survey or if the “Save & Return Later” feature is enabled to a previously entered survey response. The Survey Login can be enabled for ALL surveys in a project or just selected surveys. For selected surveys, navigate to the Survey Settings page to enable. If Survey Login has been enabled and a record does not exist yet for the respondent (Ex: if they are beginning a Public Survey), then the survey page will display directly without the login page. However, once the record exists, the respondent will always be prompted to log in to the survey.

**Note:** If a survey has the "Save & Return Later" feature enabled, Return Codes will not be used to return to the
survey, but it will use the Survey Login's login credentials instead.

To enable the Survey Login feature, navigate to “Online Designer” and click the “Survey Login” icon that is located above your data collection instruments. That will open up the Survey Login settings box. Use the drop down and select “Enabled”. You may choose one, two, or three fields in your project to be used as the login credential fields for surveys in your project.

![Survey Login settings box](image)

**Login Field # 1:** Use the drop down and select a field from your project. If you would like to add another login field, click the Add another login field link.

**Minimum number of fields above that are required for login:** If you have more than one field that you are using as the login, indicate how many of the fields are required. For an example, you might have three fields but only two of them are required to be answered in order to log in.

**Apply the survey login to all surveys in this project:** Use the drop down and indicate if the survey login should be used for all surveys or if you would like to specify the surveys this will be used for. If you would like to specify which surveys this will be used for, you will need to navigate to survey settings.

**Custom error message:** Enter a custom error message that will be displayed if the user experiences difficulty logging in.

**Number of failed login attempts:** Enter the amount of login attempts you would like to grant to the participant. If you would like them to have unlimited attempts, enter 0.

**Amount of time respondent will be locked out:** Enter the amount of time (in minutes) you would like to have the participant locked out for. If you do not wish to lock them out, enter 0.
When the participant attempts to take the survey, they will receive this login in box:

If they do not enter the correct Login code, they will receive this message:

If they reach the maximum number of failed attempts you specified, they will receive this message:

**Survey Notifications**

Survey notifications can be used if you or other users wish to be notified via email *every time* a participant completes a survey. **Note:** The notification email message you receive from REDCap is hardcoded and cannot be changed.

To activate Survey Notifications, navigate to “Online Designer” and click the “Survey Notifications” icon that is located above your data collection instruments.
Select the users to be notified under each survey listed. Use the drop-down list underneath the “Recipient Email Address” column and select each user to be notified by selecting their email address. Once you have selected an email address, the “Notifications Enabled” icon will turn green. To remove a user as a recipient for the survey notifications, change their email drop-down option to “not selected”, after which they will no longer receive notification emails for that survey.

Example of survey notification email:

[Sample email content]

Automated Invitations
You can set up your survey invitations to be sent automatically by using Automated Invitations. Instead of adding your survey participants through the Participant List, the automated invitations can be scheduled to be sent automatically based upon specific conditions. To use this feature, you must first designate an email field to use for invitations to survey
To use this feature, navigate to “Project Setup” and click the “Enable” button next to “Designate an email field to use for invitations to survey participants”.

That will open up the Designate an email field to use for invitations to survey participants settings box.

From the drop down menu, choose “email_address ("Enter your email address:\")” and then click “Save”. Note: If you enable this feature, your survey responses will not be anonymous since the participant’s email address can be viewed on the data collection form.

Navigate to “Online Designer” and click on the “Automated Invitations” icon beside the appropriate data collection instrument.

That will open up the Define Conditions for Automated Survey Invitations settings box.
Step 1: Compose Message

From: Use the drop down and select an email address
To: This will automatically include all participants who meet your criteria. Subject: Enter an optional subject
Message: Enter an optional message.

Note: The survey link will be automatically included in the email message. You may use HTML formatting in the email message: <b> bold, <u> underline, <i> italics, <a href="..."> link, etc.

Step 2: Conditions – Specify the conditions for sending the invitations

You may select "When the following survey is completed" and then use the drop down and select a survey. If you would like to add additional logic as to when the next survey should be displayed, use the Boolean operator box and select AND/OR and then check the box next to "When the following logic becomes true" and then add your logic in the text box. For an example, you may want your second survey to start after your first survey is completed AND the
participant’s age is greater than 18. To do this, I would add my variable for the participant’s age field in square brackets and then the greater than sign and the number in quotations. [age] > 18.

If you would like REDCap to check the logic in real time prior to sending the message, click the box next to “Ensure logic is still true before sending invitation”. REDCap will re-evaluate the logic against the record’s data values whenever the record values are changed AFTER the invitation has been scheduled but BEFORE it has been sent to the respondent. If the logic is no longer true, the invitation will not be sent.

**Step 3: When to send invitations AFTER conditions are met**

You can choose between four different options for sending invitations. You can choose to: Send immediately, Send on the next X day at the X time, Send after lapse of time: X amount of days X hours X minutes or Send at the exact date/time.

**Optional: Enable Reminders**

Check the box if you would like the survey invitation to be sent as a reminder if the participant hasn’t answered in a specific amount of time. You may specify to send the reminder every day, every weekday, on a specific day, every x amount of day, hours and/or minutes or send the reminders at a specific date and time. You will also need to specify how many reminders should be sent. The limit is 5.

**Step 4: Activated?**

Once you are ready, click “Active” and then click “Save”. 
Stop Survey Action
The Stop Survey action will prompt the survey participant to end the survey when a specific answer is given. The stop survey action is available on Drop-down List, Radio Buttons, Multiple Answers, Yes/No and True/False field types.

Once you have created one of the field types listed above and you have your data collection instrument set up as a survey, you will see a stop sign icon.

To add the Stop Survey logic, click on the “Stop Sign” icon. The Stop Survey logic box will appear. Select the answer choice that should prompt the survey participant to end the survey and click “Save”.

In this example, I want the survey participant to be prompted when they click No.

Notice that once the Stop Survey logic is setup, text appears next to the answer choice that will end the survey.

When the participant takes the survey and they answer No, they will receive the following message. The message is hard coded and cannot be changed. The participant can either choose to “End the survey now” which would take them to the Survey Acknowledgment text or they can choose “Continue survey and undo last response”.

Participant List, Compose Survey Invitations & Survey Invitation Log

Participant List

The Participant List option allows you to send a customized email to anyone in your list and track who responds to your survey. When you add a participant, you can also add a Participant Identifier. Unless an Identifier is used, all survey responses collected are considered anonymous. To use this feature, navigate to “Manage Survey Participants” and then click on the “Participant List” tab.

If you would like to use a Participant Identifier, you must click “Enable” before you add your participants. If you enable this feature, the survey is no longer considered anonymous. REDCap will alert you and ask you to confirm that you do want to enable the participant identifier. Click on the “Yes, ENABLE Participant Identifiers” button to activate.

An alert will pop-up, click on “Close”.
To add a participant, click on the “Add Participants” icon.

Enter the email address of the recipient and if you are using a Participant Identifier, enter a comma and then enter the participant’s name. If you are not using a Participant Identifier, enter each email on a separate line.

Example with Participant Identifier

Example without Participant Identifier

If a participant’s email address needs to be changed after it has been added to the Participant List, you may simply click on the email address in the list to begin editing it. You may also remove a participant by clicking the remove link next to the participant’s name.

If the participant needs to take your survey more than once, you will need to add the participant the exact number of times they should take the survey. For an example, if you need every participant to take your survey twice, you will need to add them in the Participant List twice. Two invitations will then be sent to the participant, each with its own unique survey link.
Compose Survey Invitations

Once you have added all of your participants, you may compose a survey invitation by clicking on the “Compose Survey Invitations” button.

A pop-up box will appear and you will enter the following criteria:

**When should emails be sent:** Select “Immediately” or “At specified time.” If you choose a specified time, a calendar will appear to add the date and time. After choosing the date and time, click on the “Done” button.

**Enable Reminders:** Check the box if you would like the survey invitation to be sent as a reminder if the participant hasn’t answered in a specific amount of time. You may specify to send the reminder every day, every weekday, on a specific day, every x amount of day, hours and/or minutes or send the reminders at a specific date and time. You will also need to specify how many reminders should be sent. The limit is 5.
Compose Message:
From: Use the drop down and select an email address.
To: This will automatically be sent to the participants you have entered and selected.
Subject: Enter an optional subject
Message: Enter an optional message.
*Note: you may use piping and/or HTML in your survey invitations!*

**Participant List:** Select which participants you want to send the invitation to. You may use the drop down under “Actions” and select participants who meet specific criteria such as “Check Not Responded”.

When you are ready, click “Send Invitations”.
Example of a survey invitation email the recipient will receive:

From: mcdonaldd@ecu.edu
Sent: Wednesday, November 09, 2016 11:35 AM
To: Motteler, Christopher Scott <MOTTLERC@ECU.EDU>
Subject: Ice Cream Project

Thank you for your interest in this study.

You may open the survey in your web browser by clicking the link below:

Ice Cream

If the link above does not work, try copying the link below into your web browser:
https://redcap.ecu.edu/surveys/?e=vUTkJZ9iyD

This link is unique to you and should not be forwarded to others.

Once the survey is sent, the Participant List will show you if the participant has responded, if the invitation was scheduled, if the invitation was sent and the unique link to the survey invitation.

After receiving an email invitation and then completing the survey, the participant’s response status in the list below will be changed to Responded or Partial Response, otherwise their status will remain as No Response. Once a participant has responded, they will not be able to take the survey again unless you add them again as a participant.

Survey Invitation Log

The Survey Invitation log displays the survey invitations that have already been sent or have been scheduled to be sent to survey participants. To use this feature, navigate to “Manage Survey Participants” and then click on the “Survey Invitation Log” tab.

For each invitation, it displays the participant email, participant identifier (if exists), survey name and the date/time in...
which the invitation was or will be sent. You can also view the invitation email itself by clicking the icon in the “View Invite” column.

The Survey Invitation log allows you to filter by specific dates, invitation types (sent invitations, scheduled invitations and failed invitations), response statuses (Unresponded, Partial Responses and Completed Responses) and survey names/events. You have the option to display invitation reminders and to view past or future invitations.

You may export the log by clicking the “Download Log” button.

![Survey Invitation Log](image)

**Define Events and Designate Instruments**

**Longitudinal Data Collection**

**What is a Longitudinal project?**

A longitudinal project is similar to a traditional data collection project in that multiple data entry forms are defined. However, unlike the traditional model, forms in a longitudinal project can be completed repeatedly for a single record. The longitudinal model allows any data entry page to be repeated any given number of times across pre-defined time-points, which are specified by the user before data is collected. So rather than repeating a data entry form multiple times in the Data Dictionary, it can exist only once in the Data Dictionary but be repeated N number of times using the longitudinal model.

![Modify Project Settings](image)

![Data Collection](image)

When creating a Longitudinal project, click on the “Enable” button beside “Scheduling module (longitudinal only)” to activate the scheduling module under Data Collection.
Scheduling module (longitudinal only)
This module is only available when you have enabled longitudinal data collection in your project. The scheduling module can generate schedules for your project calendar that are auto-generated from project-defined events (Ex: visits, time-points). It enables you to generate an event schedule for each individual project record, typically a calendar of a participant’s study visits.

Define Events & Designate Instruments for My Events
When your project is configured as longitudinal you will have this additional section on the Project Setup tab:

Define My Events

The Define My Events module allows you to define the “events” and scheduling intervals for your project that allow the utilization of data collection forms multiple ties for any given project record, as well as for generating new schedules to display on the calendar. An “event” may be a temporal event in the course of your project such as a participant visit or a task to be performed. After events have been defined, you may use them and their Days Offset value to generate schedules. For data collection purposes, you will additionally need to designate the data entry forms that you wish to utilize for any or all events, thus allowing you to use a form for multiple events for the same database record. You may group your events into “arms” in which you may have one or more arms/groups for your project. Each arm can have as many events as you wish. You may use the table below to create new events and/or arms, or modify existing ones. (One arm and one event will be initially defined as the default for all projects).

To add new events provide an “Event Name” and “Days Offset” for that event and click the “Add new event” button. If your events are temporal (Ex: visits, tasks), you may use the Days Offset to provide a timeframe of all your events relative to the time of the first event defined. If you will be using the Scheduling module, the Days Offset will be used to generate a schedule based on a start date that you provide, and then that new schedule will be added to the Calendar.
The Offset Range may be used to help you stay within a range of days, if needed, when scheduling is being done by changing it to a value other than 0. If your events are not temporal but are ordered, you may still use the Days Offset simply as a means of ordering your events.

**Notes:**
- The edit button (✔️) facilitates editing a record
- Use the delete button (❌) to remove an event from the schedule
- To add an event, enter data into the text boxes, then click the “Add new event” button
- The number of events you can define is limited only by your patience for creating them and assigning forms
- **Days Offset** is the number of days from an arbitrary baseline on which an event will be created when using the Scheduling module. If not using the Scheduling module, Days Offset is just for information.
- **Days Offset** can be negative
- **Offset Range** is a number of days before (-) or after (+) the date set using Days Offset. There is no special significance to this range within REDCap, other than that a warning message is displayed if you move the scheduled event date to a date that is outside of the range. For example, an event is scheduled on June 10th +/- 5 days. If the event is rescheduled to a date before June 5th or after June 15th a warning message is displayed that prompts the user to confirm that they accept the new out of range date.
- Note the settings for “Unique event name”. These codes are used when importing and exporting longitudinal data.

**Designate Instruments for My Events**

To assign data collection forms to events, click the “Designate Instruments for My Events” button on the Project Setup page or on the “Define My Events” page. The event setup page will open.

<table>
<thead>
<tr>
<th>Data Collection Instrument</th>
<th>Event 1 (1)</th>
<th>Event 2 (2)</th>
<th>Event 3 (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice Cream (survey)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flavors (survey)</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This is where you may select the data collection instruments that you wish to utilize for each event that you defined. This allows you to enter data on any data collection form multiple times for any given project record. Any and all data collection instruments can thus be used for any event defined.

Click the “Begin Editing” button to change the relationships by designating which forms you wish to utilize for which events.
When you are finished making changes, click the “Save” button to finalize your changes.

Enable Optional Modules and Customizations

**Designate an Email Field to Use for Invitations to Survey Participants**

This is only applicable when you have enabled surveys in your project. Project users may capture a participant's email address by designating a field in their project to be the survey participant email field for capturing the email address to be used. The field can be designated in the "Enable optional modules and customizations" section of the Project Setup page.

You can capture email addresses for sending invitations to your survey participants by designating a field in your project. If a field is designated for that purpose, then any records in your project that have an email address captured for that particular field will have that email address show up as the participant’s email address in the Participant List (unless an email address has already been entered for that participant in the Participant List directly). Using the designated email address field can be especially valuable when your first data collection instrument is not enabled as a survey while one or more other instruments have been enabled as surveys. Since email addresses can only be entered into the Participant List directly for the first data collection instrument, the designated email field provides another opportunity to capture the email address of survey participants.

**NOTE:** If the participant’s email address has already been captured directly in the Participant List, then that email address will supersede the value of the email field here when survey invitations are sent to the participant.

**Additional Customizations**

On the “Enable optional modules and customizations” module, there are various additional customizations that are available by clicking the “Additional customizations” button.

Set a Custom Record Label

You may append other data and/or static text to any record name (Ex: Study ID) as the record is displayed on your data collection instruments, such as inside the drop-down lists when choosing a record and at the top of the page after being selected. Simply provide the text you wish to display and place any variable names inside square brackets [ ], after which the data collected for those variables for that record will replace the variable in the text.

**Note:** When multiple events are defined for a project (Ex: it is longitudinal), the data will only be pulled from the first Event of the currently selected Arm.
Define a Secondary Unique Field

The secondary unique field may be defined as any field on the data collection instruments. The value for the field you specify will be displayed next to your unique identifier when choosing an existing record/response. It will also appear at the top of the data entry page when viewing a record/response. Unlike the value of the primary unique identifier field, it will not be visible in the URL. The data values entered into the secondary unique field must also be unique. The system will not allow for duplicate entries and checks values entered in real time. If a duplicate value is entered, an error message will appear and the value must be changed to save/submit data entered on the data entry instrument.

Specify a field as your secondary unique field, whose value will be displayed next to the record name when selecting or viewing records/responses in order to more easily identify a record/response. When entering data for the secondary unique field on a form or survey, its value will be checked in real time to ensure it does not duplicate the value from another record. Only 'text' fields may be used.

Order the Records by Another Field

The default setup is that all records are ordered by their record name (Ex: Study ID) when displayed in the drop-down lists on your data collection instruments, but you may alternatively order the drop-down lists by the values of another field in the project (Ex: last name), if desired. If you wish to order the records by another field, select the field from the drop down list.

Note: This feature does not work for longitudinal projects.
Enable the Field Comment Log or Data Resolution Workflow (Data Queries)?

What is a Field Comment?
The field comments which are indicated by the balloon icon next to a field are enabled by default. Any user with data entry rights can create comments for any given field on a data entry form by clicking the balloon icon next to the field. All comments can be viewed, searched, and downloaded on the “Field Comment Log” page, which appears in the list of Applications.

What is the Data Resolution Workflow?
The Data Resolution Workflow, sometimes called a data query, is a process for managing and documenting resolution of data entry issues. A data query can be initiated on a data entry form by clicking the balloon icon next to a field, or in the “Data Quality” module when discrepancies are found. The Data Quality module will then display a new “Resolve Issues” tab, which will allow users to view all resolved and unresolved data queries and thus resolve any queries that are still open. Individual users must be granted appropriate User Rights to open, respond to, or close data queries.

Enable the Data History Widget for all Data Collection Instruments?
If enabled, an icon will appear next to every field on a data collection instrument. When the icon is clicked, the history of all data entered into that field for that record will be listed chronologically and will display all previous values, who changed the value at each instance, and the time it was changed.

Require a “Reason” When Making Changes to Existing Records?
Require users to enter a reason (200 character max) in a text box when making any data changes to an already existing record on a data collection instrument. The prompt is triggered when clicking the “Save” button on the page. Any “reasons” entered can then be viewed anytime afterward on the Logging page.
Applications

Calendar & Scheduling Calendar

The “Calendar” application can be used as a project calendar within your project to help organize your schedule and keep track of any upcoming events. It will allow you to add or modify calendar events and then view them either in a daily, weekly, or monthly format. To add a new note or calendar event to any day, click “+New” at the top of that day's box to begin entering the information.

Scheduling

The “Scheduling” module can generate schedules for your project calendar that are auto-generated from project-defined events (Ex: visits, time-points). This will serve as a reminder to you and your study participants to enter data into REDCap. Scheduling is only available for projects using longitudinal data collection.

The Schedule Generator will allow you to generate a new schedule based upon your Events and their Days Offset that have been defined on the “Define My Events” page. Once scheduled, you may then view it on the “Calendar”, after which, if desired, you can also perform data entry for that calendar event. You may create a new project record while performing scheduling or you may choose a currently existing one that has not yet been scheduled.

After clicking the “Generate Schedule” button, you will get the projected schedule below that is automatically generated based on your pre-defined Events. You can make changes if necessary. Click on the “Create Schedule” button to finalize your schedule.
After clicking the "Create Schedule" button, you will see the successfully scheduled dialog box, stating you successfully scheduled for the dates and times and it has been added to the Calendar.

Field Comment Log

This page displays the Field Comment Log for all records/events/fields in this project. You may use the controls listed to perform keyword searches in the comments as well as filter the comments by record, event, field, or data access group. Keep in mind that if you do not have user privileges to view some data collection instruments, then comments for any fields on those
instruments will not be displayed in the table. Also, if you belong to a data access group, then you will only see results for records that belong to your group. The entire Field Comment Log is downloadable as a file in Excel/CSV format.

Field Repository
The File Repository can be used for storing and retrieving project files and documents (Ex: protocols, instructions, announcements). You can upload files here to save for retrieval later, or you may download previously uploaded files in the file list. Whenever a data export is performed, the resulting data and syntax files are stored here.

To upload a new file to the repository, click on the “Choose File” button and specify the file on your computer. Then provide a name/label for the file and click the “Upload File” button.

Note:
- The four Actions are:
  - Download file
  - Edit label
  - Remove file
  - Send the file to anyone using Send-It
- All files will be visible to and all actions can be performed by any user that is given access to the “File Repository” module.

User Rights and DAGs

User Rights
Access to individual projects is coordinated by the project owner (Principal Investigator) using the “User Rights”
module. The project owner may delegate this task to other users by granting them permission to access the “User Rights” module.

Note: Do not ask the REDCap Administrator to grant a user access to your project.

Knowing how to add users and managing their access to your sensitive data is one of the most important parts of cultivating security in your REDCap project. If your project will contain PHI (Protected Health Information), you must limit the ability to access and download data only to those with a need to know. These individuals may be explicitly defined by your IRB protocol.

What all project managers need to know first and foremost is that ANY user who has "user rights" permissions in REDCap, has the rights to add other users as well as the rights to manage any user’s permissions—including their own. Anyone with user rights permissions may upgrade their own permissions at any time. That’s why it is best practice to have only one individual on your team with user rights permissions at the time your project is moved into production. It may be more convenient to have everyone on your team possessing user rights permissions, but it can also be unsafe and is not recommended.

To grant other users access to your project, click on “User Rights”. Enter the person’s last name in the “Add new user” text box. If the person is found, click on their name and then click on “Add with custom rights”. If the person is not found, this either means they do not have access to REDCap or they have not set up their user profile. If they are an ECU employee, you can add them to your project by entering their PirateID. You cannot add them by their email address.

Correct way: mcdonaldd Incorrect way: mcdonaldd@ecu.edu

Once you click “Add with custom rights” button, you will now choose what you want the user to have access to. Select the appropriate rights and then click “Add user”.

DAGs

Data Access Groups (DAGs) restrict viewing of data within a database. A typical use of Data Access Groups is a multi-site study where users at each site should only be able to view data from their site but not any other sites. Users at each site are assigned to a group and will only be able to see records created by users within their group.
To create a Data Access Group to your project, enter the name of the new group in the “Enter new group name” text box and then click on the “Add Group” button.

Once you have entered the name of your new group and click “Add Group”, you will get a dialog box stating you have created your new group.

To rename an existing Data Access Group, simply click the group name in the table and type the new name. You can also delete the group at any time by clicking on the X under “Delete Group?”

You can assign a user to a Data Access Group by selecting the username and group name and then clicking the “Assign” button.
Once assigned to a Data Access Group, the user will be able to see ONLY the project records created by themselves and others in that group. This includes being able to view records on data entry forms, in reports, and in exported data sets. Users can be unassigned from a group by selecting the user name and selecting “No Assignment” and clicking on the “Assign” button.

**Data Export**

The “Data Exports, Reports, and Stats” application allows you to export your data to Microsoft Excel, SAS, Stata, R, or SPSS for analysis. To export data a user must have the necessary permissions on the “User Rights” page. There are three report types to choose from when exporting data, “Report A” will export your entire data set and “Report B” will give you the option to export data from specific instruments or events. You can also create your own custom report using the “+Create New Report” button.

**Note:** REDCap is a web-based system. Once data is downloaded from REDCap to a device (Ex: computer, laptop, or mobile device), the user is responsible for that data. If the data being downloaded is protected health information (PHI), the user must be trained and knowledgeable as to which devices are secure and in compliance with ECU’s standards (Ex: HIPAA) for securing PHI.

Use Report A to export all data, just click on the “Export Data” button.

Use Report B to export selected instruments and/or events, just select one or more instruments/events from the list and click on the “Export Data” button.
Export Formats

Choose how you would like to download the data, either CSV Format or Statistical Software.

CSV Format raw data-variable names in the first row or labelled data-variable labels shown in the first row. Use the “Raw” option if you are wanting to take a backup of your data or if you want to use the data for producing charts or to prepare a file to import back into REDCap. Remember, CSV files are NOT Excel files.

Statistical Software for each stats package option (SPSS, SAS, R, and Stata) REDCap will give you a raw data file in CSV format and a syntax file that will read the data from the CSV file and apply the appropriate column formatting, variable labels, and value labels.

De-Identification

The de-identification options allow you to limit the amount of sensitive information that you are exporting out of the project.

- **Known identifiers:** conceal record identifiers and/or ensure all fields that are flagged as identifiers in the online designer or data dictionary are excluded from the export
- **Free-form text:** text entry fields with no validation (and particularly Notes-type fields) may well have identifying information entered into them. You can opt to exclude such fields from the export
- **Data and datetime fields:** can be excluded or date-shifted whereby all dates for each record are shifted by a random but consistent number of days (Ex: Record 1 dates all +23 days, Record 2 dates all +201 days etc.)

For users whose export permission are set to De-identified only, these options (with the exception of record identifier hashing) are always applied.

You can also create your own custom report with appropriate privileges in which you can filter the report to specific fields, records, or events using a vast array of filtering tools to make sure you can get the exact data you want. Once you have created a report, you may view it as a webpage, export it out of REDCap in a specified format (Excel, SAS, Stata, SPSS, R), or view the plots and descriptive statistics for that report.
There are also some other additional export options that are available for your project. They are as follows:

- Export entire project as REDCap XML file (containing metadata & data)
- ZIP file of uploaded files (all records)
- PDF of data collection instruments containing saved data (all records)

Instructions for each type of export are provided. You can click on the corresponding icon on the right of the instructions to download the file for each type.
Additional Data Export Information

Here is some additional information to remember when you export data from REDCap.

- Note the reminder to cite your use of REDCap in any published material. Please cite the publication below in study manuscripts using REDCap for data collection and management. We recommend the following boilerplate language:

  Study data was collected and managed using REDCap electronic data capture tools hosted at East Carolina University. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

- The data in the Excel CSV Raw and stats package DATA CSV files are identical-raw, unlabeled data in CSV format—but the stats package DATA CSV files do not contain header rows (field information is included in the syntax files).

- The Pathway Mapper files for SPSS and SAS are Windows batch files. When you have downloaded the associated syntax and data files, you can run (double-click) the pathway mapper. It will update the syntax file’s file handle/infile statement so that it includes the full file path to the location where the files are saved.

• Using the Pathway Mapper is optional (and not possible if you use Mac or Linux). You can perform the same task by manually setting the path in the syntax file, or by setting the current working directory to the appropriate location.

• Send file? Loads the export files into REDCap’s Send-It application, enabling you to send the files securely to anyone.

• All exports are saved to the database and can be downloaded again using the File Repository.

**Project Status**

There are five categories also known as project statuses of a project. A project can exist in one of the following five categories at any given time:

**Development**

All projects when first created start in Development. In Development, you can design, build, and test your REDCap projects. All design decisions can be made in real time and are implemented immediately to your project. All survey and data entry features/functions can and should be tested. In this phase, no real data is entered. If you are conducting a research study, your IRB number is not required until you move into Production mode.

**Production**

From Development, you will move your project to Production. At this point, you should have fully tested the workflow, data validation and branching logic. You should be certain that your data forms are finalized and fully functional. You should also have your IRB approval number, if applicable. If it was not added to your project initially, you may add it under “Modify project title, purpose, etc.” on the main project dashboard. When you are ready to deploy your project, you will request to have your project moved into Production mode by clicking the button on the Project Setup page. This will send a notification to the REDCap Administrator that you are ready to deploy your project. Once your project is approved for Production, you will receive an email alerting you of your project’s new status. By default, moving a project to Production erases all existing practice records, calendar events, and all other associated practice data. All survey and data entry features/functions will be the same as they are in development with the exception of certain Project Setup features. In this phase, real data is collected. Moving your project to Production prior to collecting real study data ensures you are maintaining data accuracy and integrity.

**Draft**

When you enter production mode and find that you need to modify an element of your data entry forms, you may enter Draft Mode and submit the changes. Changes to your project configuration and setup are possible, but should be minor and infrequent. Some project and form design updates will require contacting a REDCap Administrator and/or submitting data collection instrument changes in Draft Mode. Changes to data collection instruments in Draft Mode are not made to your project in real time. After making updates, you must submit the changes for review. Review and approval time are typically done in two business days. This post-production control process provides an additional check to ensure that data in your records are not modified, deleted, or overwritten unintentionally.

From Production, you can move the projects in the following status on the Project Setup > Other Functionality page:

**Inactive**

Inactive mode is only available once a project is already in Production mode; it is not available in Development mode. Under the “Other Functionality” tab of the project dashboard, you can move your project to inactive status. Ideally, you would move the project to inactive status when data collection is complete, but you would still like to export and analyze the records you have collected. This will disable most project functionality, including access to individual records, but the data will remain available for export and analysis. In this phase, the project is essentially complete. Your project will still be accessible from your My Projects List, but you will see a red “Inactive” icon next to it. Once inactive, the project can be
moved back to production status at any time by clicking the “Other Functionality” tab and click “Move to production status”. Since your project was already approved for Production, it does not need another approval; it will be immediately placed back in Production.
Archive

Once you are finished with a project, you may archive it. Unlike the Inactive mode, a project can be moved to Archive mode whether it is in Development or Production mode. You can also move a project into Archive mode directly from Inactive mode. Move the project to archive mode if data collection is complete and/or you no longer wish to view it on My Projects List. Similar to Inactive mode, this will disable most project functionality. The project can only be accessed again by clicking the Show Archived Projects link at the bottom of the My Projects page. Once archived, the project can be moved back to production mode at any time by clicking the “Other Functionality” tab and click “Move to production status”.

Note: Only users that have Project Design and Setup permissions can accomplish transitions of the project status. A project may not necessarily progress through these categories in sequence. Some such as “Practice” projects may never reach production; others may be archived directly once the Production phase is complete.

Test Your Project Thoroughly

It is extremely important to test your project before moving it into production! The purpose of testing your database is to ensure that it has the structure and integrity checks that you expect and that it meets your requirements. Entering practice data will often lead to more instrument changes.

Testing a database means doing much more than simply verifying that it contains the desired fields: you need to verify that each field has the appropriate properties (data type, allowed range, allowed values) and that cross-field data validations work as you expect. Make sure you create test records and enter some data to ensure that your data collection instruments look and work how you expect, especially branching logic and calculations. You can do this by clicking “Add/Edit Records” in the Data Collection section. If you have surveys, complete the surveys as if you were a participant by using the Public Survey Link.

Once you have some test records entered, review them by going to your “Record Status Dashboard”; create reports and export your data and view in Excel or one of the statistical analysis packages; review your Stats.

Note: It is recommended that you export your test data for review prior to moving your project into Production.

The best way to test your project is to use it as if you were entering real production data, and it is always helpful to have colleagues (especially team members) take a look at your project to get a fresh set of eyes looking at it.

Move Your Project to Production

When you are ready to begin entering real data, use the Project Setup tab to move the project to production status. Once in production, you will not be able to edit the project fields in real time. However, you can make edits in Draft Mode, which will then need to be approved by a REDCap administrator before taking effect.

You are strongly encouraged to test your project thoroughly before you move your project into Production. Once you have ensured your project is capturing all of the fields you need and has all of the design elements, click on the
Move project to production icon.

**Note:** Moving a project from development mode to production mode is done by the REDCap Administrator.

Production mode looks much like development mode, but production has extra precautions to protect saved data. All survey and data entry features/functions will be exactly the same as they are in development with the exception of certain Project Setup features. The Online Designer and Data Dictionary can still be used to modify instruments. You can only make edits in Draft Mode, which will then need to be approved by a REDCap administrator before taking effect.
Enter Draft mode to make and submit changes to the instruments.

Additional Training/Support Resources
If you have questions or need additional training, please email redcap@ecu.edu

Advanced Topics
The following features will be included in the REDCap Advanced User Training Class. Please login to Cornerstone to see the upcoming classes.

- How to Use Piping
- Create additional Arms
- Randomization Module
- Data Dictionary
- Data Import Tool
- Data Comparison Tool
- Double Data Entry
- Record Locking Customization
- E-signature and Locking Management
- Data Quality
- Data Entry Trigger
- API
- Dynamix Query (SQL)
- Calculated Fields
- Customizing Text
- Logging
- Reports