

Repeating Instruments and Events

REDCap has the ability to repeat a data collection instrument or an entire event of instruments an unlimited number of times without having to specify the amount needed. This is sometimes called one-to-many data collection, in which a project can have one or more repeating parts.

Link to Video Tutorial:

https://redcap.vanderbilt.edu/consortium/videoplayer.php?video=repeating_forms_events01.mp4&title=Designating%20Instruments%20for%20Events%20in%20Longitudinal%20Projects&referer=redcapstage.ctsi.ufl.edu

Concept

REDCap now has a feature to allow repeating instruments and events. This is very helpful if you have to collect multiple instances of the same data. This means that it is no longer necessary to create a specified number of instances of an instrument (or event) if you need to collect multiple instances. For example: if you are doing a study on a new experimental drug and need to track patient progress for 20 weeks, you might have an instrument that includes all the questions necessary for each week's visit. Now, instead of creating 20 instances of this "visit" instrument (say visit1, visit2, etc.), you can simply make the visit instrument a repeating instrument.

Another benefit is you are no longer limited by the planned number of repetitions. Continuing with the example above, say you had some patients that needed to be studied for an additional 12 weeks (32 weeks total). Instead of manually creating 12 more visit instruments, you can go to the previous visit instrument and select Save & Add New Instance. This way, you can easily add unplanned repetitions. You are no longer limited by your maximum number of instances.

Additionally, you can have a different number of instances of an instrument for different records. Using the above example, some patients may have data for 20 visits, and others may have data for 32 visits. You could even have some patients that missed a few visits, so they end up with 19, 18, or 30 visits. That is fine. Each record can have a unique number of repetitions.


Now let's take a look at the implementation of repeating instruments and events.


Preparing Repeating Instruments and Events

To use repeating instruments or events on your project, you must first enable it on the project setup page. It is the first option under the “Enable optional modules and customizations” section.


[Project Home](#) | [Project Setup](#) | [Other Functionality](#) | [Project Revision History](#) | [Edit project](#)

Project status: Development Completed steps **0** of **7**

 **Main project settings**

Use surveys in this project? [?](#)  [VIDEO: How to create and manage a survey](#)

Use longitudinal data collection with defined events? [?](#)


 **Design your data collection instruments & enable your surveys**

Add or edit fields on your data collection instruments (survey and forms). This may be done by either using the Online Designer (online method) or by uploading a Data Dictionary (offline method). You may then enable your instruments to be used as surveys in the Online Designer. Quick links: [Download PDF of all instruments](#) OR [Download the current Data Dictionary](#)

Go to or

You may also browse for pre-built data collection instruments in the

Have you checked the [Check For Identifiers](#) page to ensure all identifier fields have been tagged?

 **Enable optional modules and customizations**

Repeatable instruments [?](#)

Auto-numbering for records [?](#)

Scheduling module (longitudinal only) [?](#)

Randomization module [?](#)

Designate an email field to use for invitations to survey participants [?](#)

When you click enable, you will get a popup window asking which instruments (and events, if the project is longitudinal) should be made repeatable.

If your project is classic (NON longitudinal), your popup will look something like this:

Repeatable instruments

An excellent way to collect repeating data in REDCap is to use repeatable instruments and/or repeatable events. This is sometimes called one-to-many data collection. Some examples may include but are not limited to the following: data from multiple visits or observations, concomitant medications, adverse events, or repetitive surveys (daily, weekly, etc.).

Below you can specify a data collection instrument to be infinitely repeatable, which means that an instrument can be repeated over and over again (a different number of times for each record) even without enabling REDCap's longitudinal module. Once an instrument is set to repeat, you will see options on the Record Home Page to add another instance of the instrument for the currently selected record. All instances of a repeating instrument will then be displayed as a table near the bottom of the Record Home Page, thus allowing viewing of the instances and easy navigation within them.

Repeat this instrument?	Instrument name	Custom label for repeating instruments (optional)
<input type="checkbox"/>	General Info	<input type="text"/>
<input type="checkbox"/>	First Survey	<input type="text"/>
<input type="checkbox"/>	Second Survey	<input type="text"/>
<input type="checkbox"/>	Third Survey	<input type="text"/>

If your project is longitudinal your popup will look more like this:

Repeatable instruments and events

An excellent way to collect repeating data in REDCap is to use repeatable instruments and/or repeatable events. This is sometimes called one-to-many data collection. Some examples may include but are not limited to the following: data from multiple visits or observations, concomitant medications, adverse events, or repetitive surveys (daily, weekly, etc.).

Below you can specify a data collection instrument or a whole event of instruments to be infinitely repeatable, in which each repeating instrument or event can be repeated a different number of times for each record. You may set any event in the project to be repeatable *or* alternatively set selected instruments to be repeatable within an event. **The 'Repeat Entire Event' option means that all the event's instruments will repeat together and stay connected, whereas the 'Repeat Instruments' option implies that the instruments will repeat separately and independently from each other on that event.** Once an instrument or event is set to repeat, you will see options on the Record Home Page to add another instance of the instrument/event for the currently selected record.

Event Name	Repeat entire event or selected instruments?	Instrument name (select instruments to repeat)	Custom label for repeating instruments (optional)
Preliminary		<input type="checkbox"/> Preliminary Survey <input type="checkbox"/> Mood	<input type="text"/>
✓ Daily	Repeat Instruments (repeat i ↓)	<input checked="" type="checkbox"/> Mood <input type="checkbox"/> Diet <input type="checkbox"/> Caffeine Intake <input type="checkbox"/> Exercise	<input type="text"/>

For a classic (NON longitudinal) study:

If you have an instrument you would like to repeat, simply mark its checkbox in the “Repeat This Instrument?” column.

For a longitudinal study:

You will see each event listed along with its designated instruments. If you would like to repeat every instrument in the event, you can select “Repeat Entire Event (repeat all instruments together)” from the dropdown menu “Repeat entire event or selected instruments?”.

Repeating an event would allow a participant to repeat all instruments in the event. However, the participant could not pick and choose what instruments should be repeated, it would instead repeat them all at once, as if they were a package. In case the participant needs to choose to repeat only specific instruments on an event, the event should not be marked for repeat, only the instruments that could be repeated. For example: in the screenshot above, the Daily event has instruments Mood, Diet, Caffeine Intake, and Exercise. Let’s say that the daily dietary info stays the same. In this case, you want the participants to be able to repeat the Mood, Caffeine Intake and Exercise instruments, but the Diet instrument should only be entered on the first Daily occurrence. To accomplish this, you select “Repeat Instruments (repeat independently of each other)” from the dropdown for the Daily event (in the “Repeat entire event or selected instruments?” column). Then, you check the Mood, Caffeine Intake, and Exercise instruments (under the “Instrument name” column). Now the participants can create new instances of the Mood, Caffeine Intake, and Exercise instruments as needed. Furthermore, the participants now have the flexibility to create a new instrument instance without creating a new instance of any other instrument. If the participant had done more exercising one day (say an extra bike ride), then they can add another Exercise instance without creating additional instances of the other instruments.

Event Name	Repeat entire event or selected instruments?	Instrument name (select instruments to repeat)	Custom label for repeating instruments (optional) Example: [visit_date], [weight] kg
Preliminary	-- not repeating --	<input type="checkbox"/> Preliminary Survey <input type="checkbox"/> Mood <input type="checkbox"/> Diet <input type="checkbox"/> Caffeine Intake <input type="checkbox"/> Exercise	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
✓ Daily	Repeat Instruments (repeat i ↓)	<input checked="" type="checkbox"/> Mood <input type="checkbox"/> Diet <input checked="" type="checkbox"/> Caffeine Intake <input checked="" type="checkbox"/> Exercise	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

Save Cancel

To recap, choose “Repeat Entire Event” if all instruments should be repeated together or choose “Repeat Instruments” if some instruments should have more instances than others.

Creating and Editing Repeat Instances –

1) By Event

To record a new instance of an event, navigate to Add/Edit Records and select the appropriate record. From there, you can select “+Add new” for any event that is a repeating event.

Data Collection Instrument	+ Add new	
	Preliminary (#1)	Daily
Preliminary Survey (survey)	<input checked="" type="radio"/>	
Mood (survey)	<input type="radio"/>	<input type="radio"/>
Diet (survey)	<input type="radio"/>	<input type="radio"/>
Caffeine Intake (survey)	<input type="radio"/>	<input type="radio"/>
Exercise (survey)	<input type="radio"/>	<input type="radio"/>
Delete all data on event:	<input checked="" type="checkbox"/>	

Notice, the event does not need to be completely filled out for you to add a new instance, but you cannot add a new instance if there is already an empty instance (no add new button on the 4th instance below).

Data Collection Instrument	Preliminary (#1)	(#2)	(#3)	<input checked="" type="checkbox"/> (#4)	Daily
Preliminary Survey (survey)	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
Mood (survey)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diet (survey)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Caffeine Intake (survey)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise (survey)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delete all data on event:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

You can delete an instance by clicking the x at the bottom of the column (on the bottom row, “Delete all data on event”).

You can alter each entry for a record just by clicking on the instrument and instance you want. For example: in the image above, you can complete the incomplete 3rd instance of the Preliminary Survey by clicking on the red bubble. This takes you to a standard record entry page, but you will see an “(Instance #3)” next to the event name.

🔗 Editing existing Record ID 8

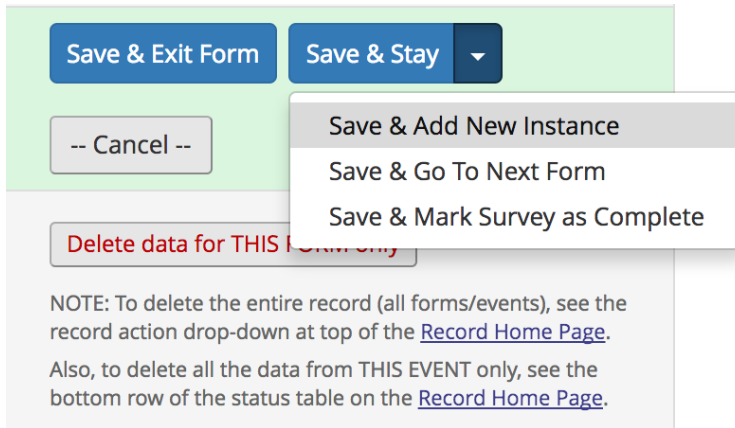
Event Name: **Preliminary** (Instance #3)

Record ID

8
To rename the record, see the record action drop-down at top of the [Record Home Page](#).

2) By Instrument

When editing a repeating instrument, you have an additional save option “Save & Add New Instance”.

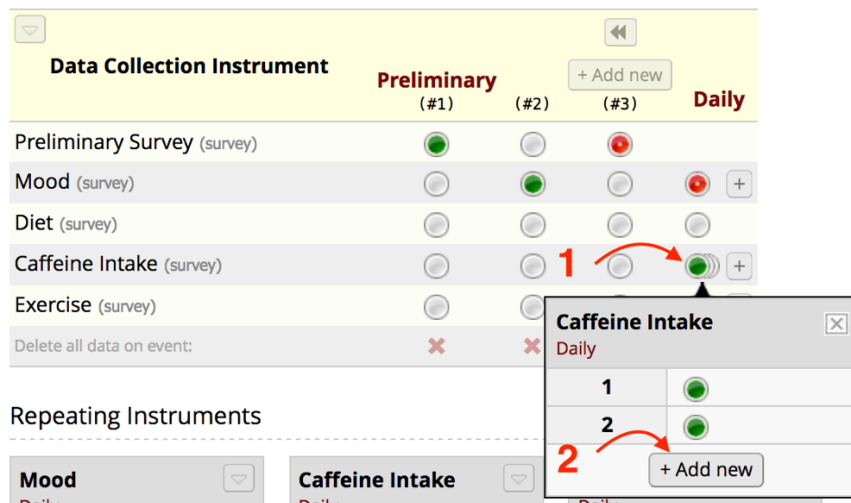


Or you can add a new instance to an instrument from the record home page as long as the instrument is not empty (has not had any data saved). Do this with the plus button on the side of the instrument.



Or you can add an instance by

- 1) clicking a stack of multiple instances
- 2) and selecting the “+Add new” button at the bottom of the popup.



Once you create a few repeat instrument instances, you will see the entries below the primary record/instrument table. You can add a new instrument instance from these lists of repeating instruments too.

Record Home Page

The grid below displays the form-by-form progress of data entered for the currently selected record. You may click on the colored status icons to access that form/event. If you wish, you may modify the events below by navigating to the [Define My Events](#) page.

Choose action for record ▾

Legend for status icons:

- Incomplete
- Unverified
- Complete
- Many statuses (mixed)
- Incomplete (no data saved) ?
- Partial Survey Response
- Completed Survey Response
- ● ● Many statuses (all same)

Record ID 8

Data Collection Instrument	Preliminary (#1)	(#2)	+ Add new (#3)	Daily
Preliminary Survey (survey)	●	●	●	
Mood (survey)	●	●	●	● +
Diet (survey)	●	●	●	●
Caffeine Intake (survey)	●	●	●	● +
Exercise (survey)	●	●	●	● +
Delete all data on event:	✗	✗	✗	✗

Repeating Instruments

Mood
Daily

1	●
+ Add new	

Caffeine Intake
Daily

1	●
2	●
+ Add new	

Exercise
Daily

1	●
2	●
+ Add new	

If you have surveys enabled, you can also allow participants to create new instances of an instrument in the Survey Settings.

Survey Termination Options:

(Optional) Auto-continue to next survey: Automatically start the next survey instrument after finishing this survey ⓘ

— OTHERWISE —

Redirect to a URL
(Redirect to a webpage when survey is completed)

Provide a full URL, e.g. <http://www.example.com/mypage.html>

✍ [How to use Piping here](#)

— OR —

(Optional) Allow respondents to repeat the survey: Ask them to take the survey again upon completion, if they wish. ⓘ

Set custom text for the button:

Location of the button on survey:

Once you enable the “Allow respondents to repeat the survey” option, you will see a looping arrow icon next to the survey from the Online Designer page. Below, we have allowed respondents to repeat the survey on our repeating instrument, “Exercise”. This is the only instrument we enable the option for, so it is the only one with a looping arrow icon.

[Project Home](#) | [Project Setup](#) | [Online Designer](#) | [Data Dictionary](#)

[Create snapshot of instruments](#) | [VIDEO: How to use this page](#)
 Last snapshot: never ?

The Online Designer will allow you to make project modifications to fields and data collection instruments very easily using only your web browser. NOTE: While in development status, all field changes will take effect immediately in real time.

Data Collection Instruments

Survey options:

[Survey Queue](#) | [Survey Login](#)

[Survey Notifications](#) ✓

Add new instrument:

[Create](#) a new instrument from scratch

[Import](#) a new instrument from the official [REDCap Shared Library](#)

[Upload](#) instrument ZIP file from another project/user or [external libraries](#)

Instrument name	Fields	View PDF	Enabled a survey	Instrument actions	Survey-related options
Preliminary Survey	8			Choose action ▾	Survey settings + Automated Invitations
Mood	1			Choose action ▾	Survey settings + Automated Invitations
Diet	1			Choose action ▾	Survey settings + Automated Invitations
Caffeine Intake	1			Choose action ▾	Survey settings + Automated Invitations
Exercise	1			Choose action ▾	Survey settings + Automated Invitations

As in the repeating events section, you can delete entire events with the x at the bottom of the column, but you can only delete individual instances of instruments from their data entry page.

Save & Exit Form

Save & Stay ▾

-- Cancel --

Delete data for THIS FORM only

NOTE: To delete the entire record (all forms/events), see the record action drop-down at top of the [Record Home Page](#).

Also, to delete all the data from THIS EVENT only, see the bottom row of the status table on the [Record Home Page](#).

You can alter each entry for a record just by clicking on the instrument and instance you want. For example: in the image above, you can complete the incomplete 3rd instance of the Preliminary Survey by clicking on the red bubble. This takes you to a standard record entry page, but you will see an “(Instance #3)” next to the event name.

Editing existing Record ID 8

Event Name: **Preliminary** (Instance #3)









Record ID 8

To rename the record, see the record action drop-down at top of the [Record Home Page](#).






































































Viewing Repeating Instruments and Events

You can still navigate to Add / Edit Records to see the individual records (same view as the examples used in the Create and Edit Repeat Instruments section). However, there are a few new icons to indicate when multiple instances are created. If there are multiple instances for an instrument there are now overlapping bubbles. There is a legend on the top right of the Record Status Dashboard which explains the new status nicely.

Legend for status icons:

 Incomplete	 Incomplete (no data saved) ?
 Unverified	 Partial Survey Response
 Complete	 Completed Survey Response
 Many statuses (mixed)	 Many statuses (all same)

Notice if you click on the overlapping bubbles, a popup will appear displaying all of the saved instances of the instrument as well as an “+Add new” button to create a new instance. In the example below, instances 1 and 3 had been filled in and saved for the “Preliminary Survey”.

Record ID	Preliminary					Daily										
	Preliminary Survey	Mood	Diet	Caffeine Intake	Exercise	Mood	Diet	Caffeine Intake	Exercise							
1																
2																
3																
4	<div> <p>Preliminary Survey ✕</p> <p>Preliminary</p> <table border="1"> <tr> <td>1</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td colspan="2"><input type="button" value="+ Add new"/></td> </tr> </table> </div>										1		3		<input type="button" value="+ Add new"/>	
1																
3																
<input type="button" value="+ Add new"/>																
5																
6																
7																
8																

There are also a few differences between repeating events, and individual repeating instruments. In the image above, the Preliminary event was marked for repetition (Repeat Entire Event), while the Daily event has repeating instruments (Repeat Instruments). The Record Status Dashboard allows you to create new instances of individual instruments with the “+” button, but only if the instruments are both marked as individually repeating *and* they have one saved instance. You can see above that record 3 has no saved instances, so the option to add a new individual instance is not available.

Exporting and Importing Repeating Data and Project Data Dictionaries

You may want to export and import data from your project that has repeating events or instruments (or both). These options are largely unchanged, but there are a few caveats to be aware of.

For data exports, you must disable the “Export survey identifier and survey timestamp field(s)?” option (if your project includes surveys) if you plan to import your data later (you can manually make the changes, but this would be tedious and vulnerable to accidental changes). The survey identifier field keeps track of survey respondents, and the timestamp field tracks the time of submission. These two fields are not stored in the same location as your collected data (it is outside of the data dictionary structure). If you try to import a raw data csv or CDISC ODM (XML) that has survey identifier and survey timestamp fields, you will get an error since these fields are not within your data dictionary (and therefore cannot be imported). However, if you are not worried about importing your exported data (if it isn’t supposed to be a backup), the survey identifier and timestamp fields may be useful information to include.

If you want to use your project as a template, one option is to export (and later import) the data dictionary. However, similar to longitudinal capabilities, an imported data dictionary cannot enable repeating events and instruments. If you import a data dictionary from a project with repeating events or instruments, you will have to manually enable the “Repeating instruments” option on the Project Survey page. Another option for using a project with repeating instruments as a template is to copy the project. When you copy the project (from the project setup page) you have the option to include or exclude existing records, and your new copied version of the project will already have the Repeating Instruments option enabled.