Data Management in Castor EDC

The following manual contains suggestions and ideas for managing your data. The manual uses activities outlined in the GCDMP as a guide and is divided based on those activities. This manual may reference information provided in our other role specific manuals for Data Entry, Monitoring, and Study Admin.

Study Set-up

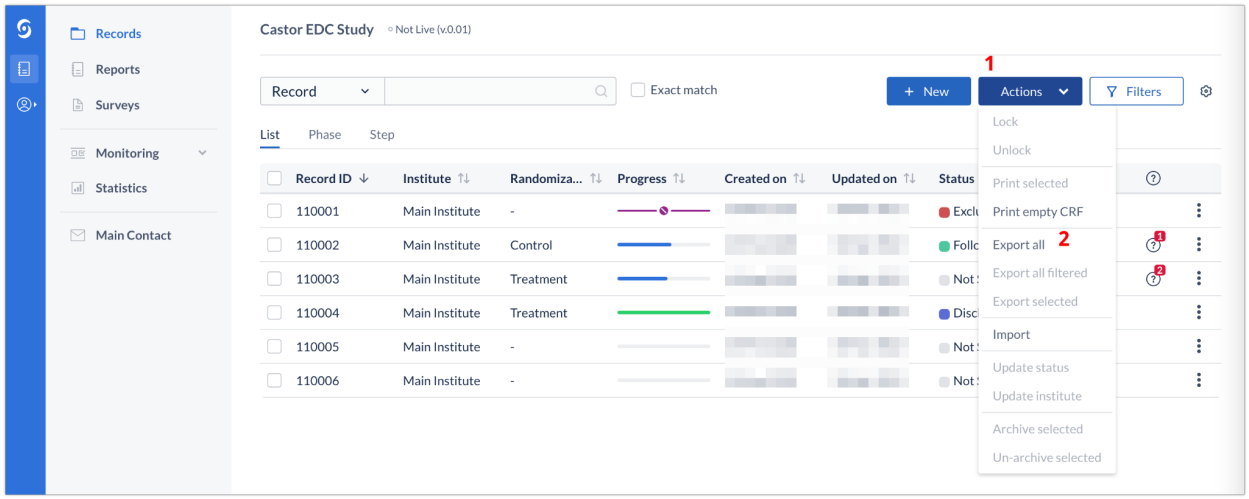
CRF Review

To review the entire CRF, there are two options: export the data dictionary or print the CRF to PDF.

Data Dictionary

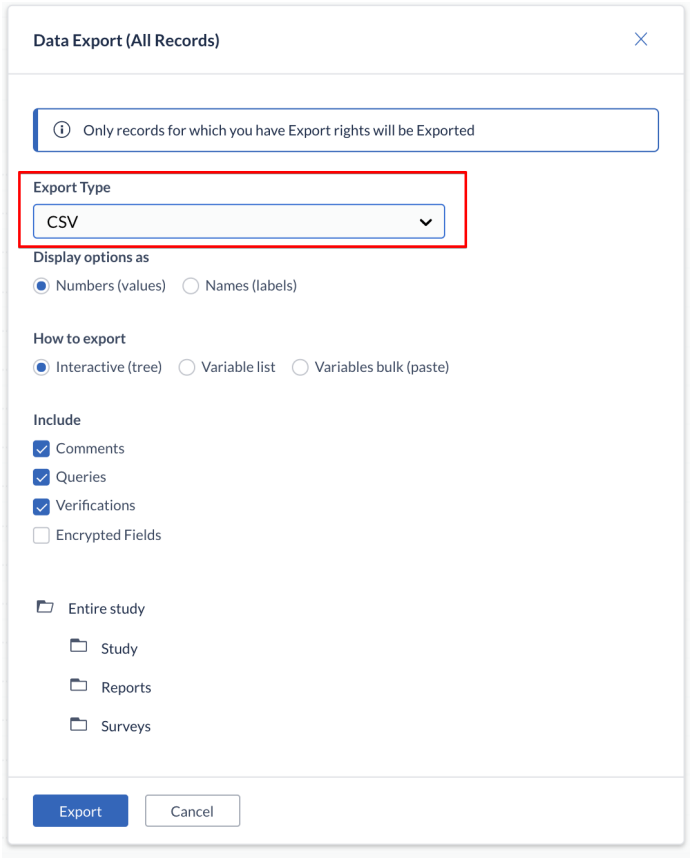
A data dictionary is included with each data export. The data dictionary includes all of the variables within the study, including option groups, and field dependencies.

In the Records Overview, click on the ‘Actions’ button and choose the option to ‘Export all’ to export all records. If you would like to export only a selection of records, click on the checkbox next to each record or use the ‘Filters’ button to filter the records based on certain criteria. Afterwards, the options ‘Export all filtered’ or ‘Export selected’ will be activated in the ‘Actions’ menu.

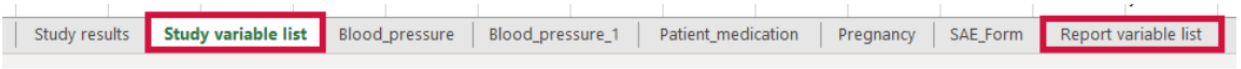


In the ‘Data Export’ window:

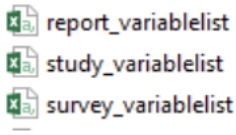
1. Select either Excel or CSV.



- An Excel export will produce one workbook with multiple worksheets.



- A CSV export will produce a ZIP file with individual worksheets.

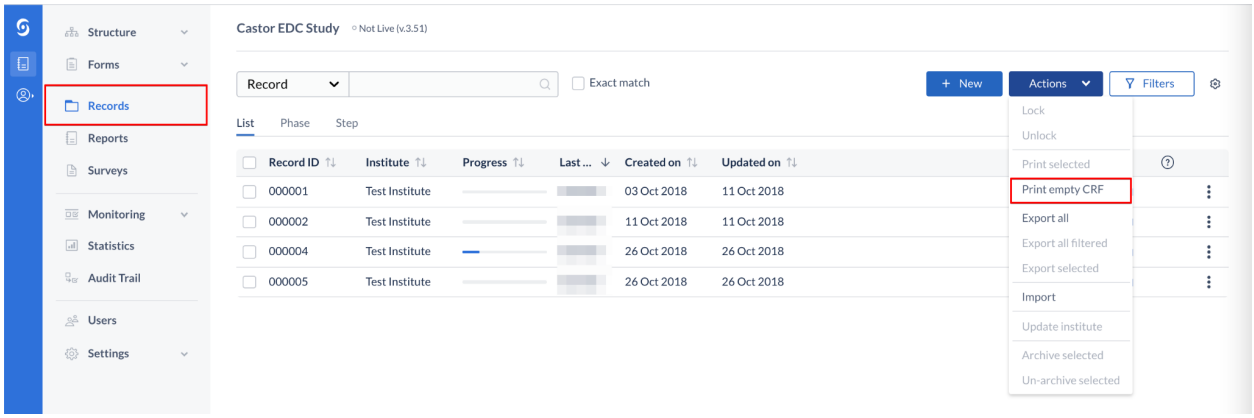


2. Select ‘Entire Study’.
3. Click ‘Export’.

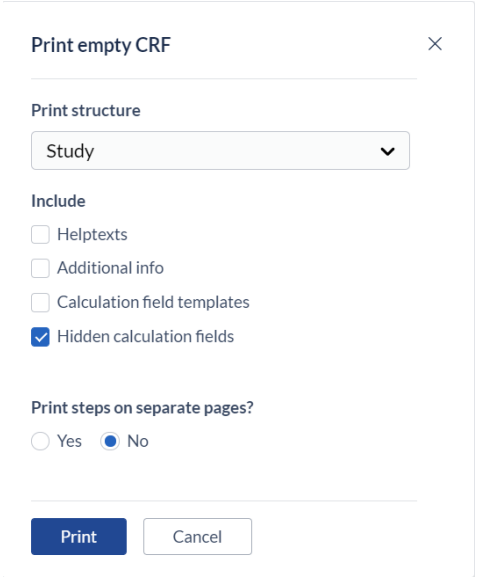
Study variables, report variables, and survey variables will be exported as separate variable lists.

Blank CRFs

1. Navigate to the 'Records' tab. In the upper right corner, click on the 'Actions' button, then click on 'Print empty CRF':



2. Here you will select the options for your PDF.



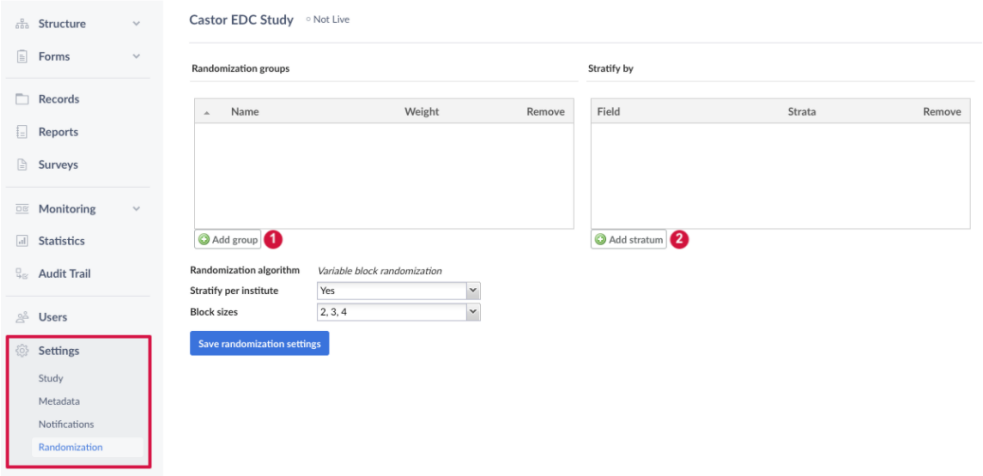
    1. Select the structure (Study, Reports, Surveys) you would like to print.
    2. Choose the options you would like to include in the PDF.
    3. Click ‘Print’.

A new page will open, which contains a preview of the printable study form. You can save this page as a PDF by selecting the option 'Save as PDF' from the available options.

Randomization Review

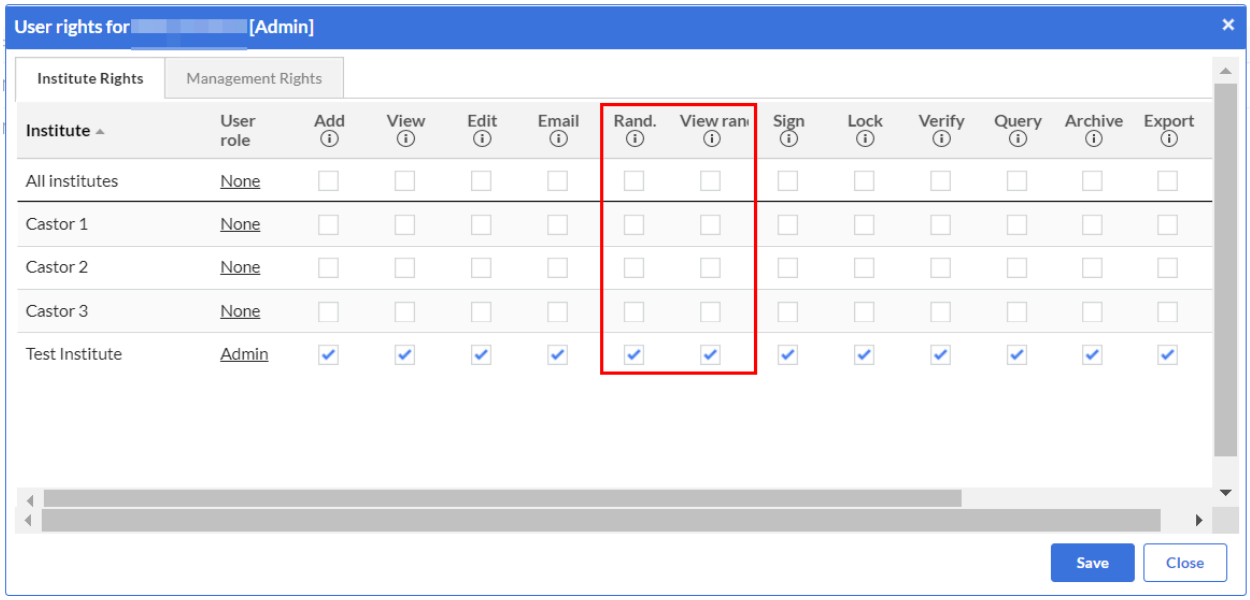
Castor uses a variable block randomization method. Randomization settings can be viewed in the Settings tab.You are able to define up to 9 randomization groups and weights (1), block sizes, and fields within the CRF for stratification (2). Customized randomization settings are available for an additional fee. Please contact your account executive for more information.

The option ‘Stratify per institute’ is set to ‘Yes’ by default.



Randomization User Rights

There are two separate user rights related to randomization in Castor. A user can have none, one, or both rights. The randomization right allows a user to randomize a record. View randomization allows a user to view the randomization allocation for a record. Both rights together will allow a user to both randomize and view the randomization allocation for a record.



Please note that users that do not have view randomization rights will be unable to export randomization data when performing data exports.

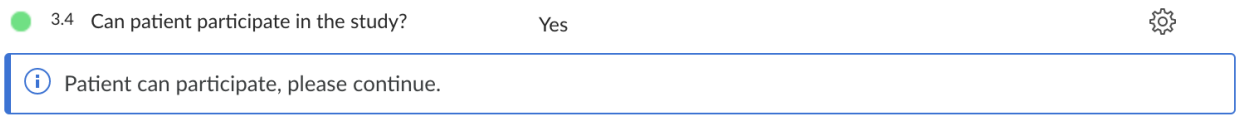
Data Validations/Edit Checks

Data validations, or real-time edit checks, are able to be programmed at the field level. A simple or single field validation can be created on the field properties tab. You are able to use these data validations to warn data entry users about a possible error or provide further instructions.

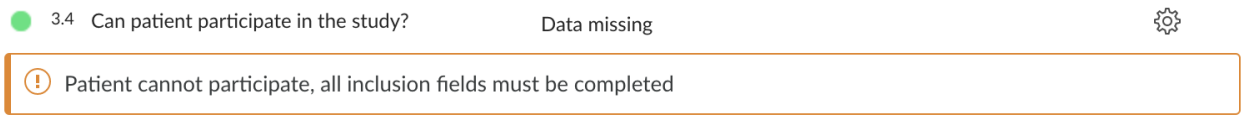
Data Validation: Single Field

There are 4 validation types:

- Message: A simple indication message, outlined in blue, that the user needs to take a certain action.

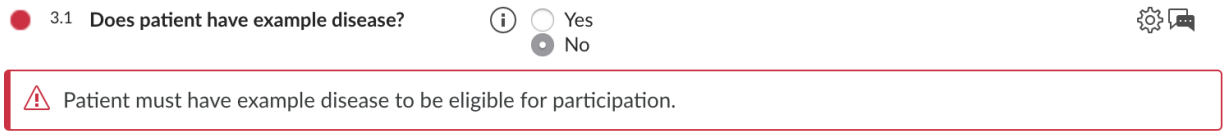


- Warning: An orange coloured message bar appears to warn the user that something is incorrect.



- Error: A red outlined message can be used to indicate data has been entered that is not accepted or wrong. When the error message type is displayed, the data for that field is not saved. This means that a subsequent field cannot be

dependent on a value that would trigger the 'Error' message.

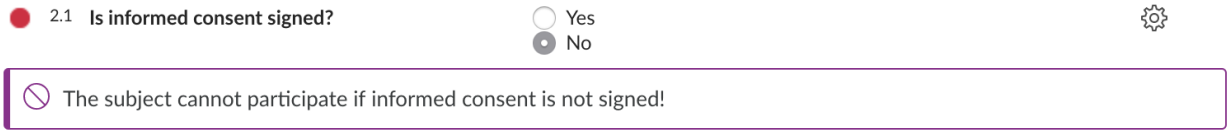


Exclusion: A message in purple that excludes the subject from the study; when this message is visible the user, it is possible to navigate to different steps in a form:

- if an exclusion occurs on the study form, data entry is blocked on the entire study form and on any report instances. The Exclusion message will be displayed on every form in the study data view with the name of the step where the exclusion has been triggered. The report data view will be greyed out:

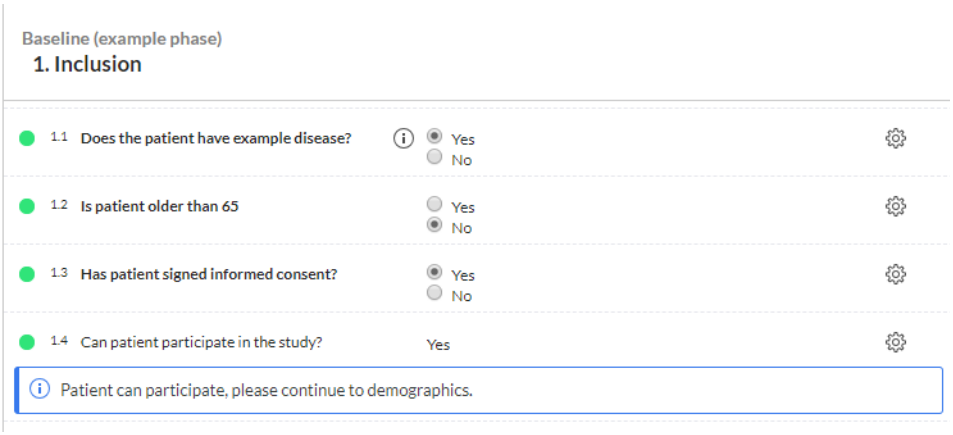
- If an exclusion occurs on a report instance form, data entry is blocked on that report instance form, but not blocked on any other report instances or study data.

  You can use this for validating inclusion and exclusion criteria. Please be aware, that it's not possible to leave fields with exclusion criteria empty (user missing), nor possible to enter values which are outside the boundaries you have set.



Data Validation: Multi-Field

If you would like to validate multiple fields, for example, eligibility criteria, it is necessary to first create a calculation field that considers the variables in the study. For an example calculation, please see the article in our helpdesk. You can then create a data validation in the field properties on the calculation field.



eLearning

Castor Academy (academy.castoredc.com) is our eLearning platform. The Academy contains a structured series of videos with step-by-step instructions for each selected Castor feature. Courses are role specific for data entry personnel, monitors, and study builders.

For premium accounts, we offer courses with certifications that require the completion of quizzes after each section is completed. Users are required to pass each quiz with an 80% to proceed to the next section. If a user fails to pass a quiz, they will need to wait 2 weeks in order to retake the quiz.The courses without a certification are also available at no charge to all Castor users.

User accounts on Castor Academy are not linked to user accounts in Castor EDC. Therefore, we at Castor do not enforce the completion of Castor Academy for access to live studies.

To take advantage of the certified courses, please contact your dedicated Customer Success Manager or Support at support@castoredc.com.

User Acceptance Testing (UAT)

Castor does not offer UAT for studies not created by our Professional Services team. However, we have provided guidance documentation in our online manual. This documentation can be reviewed here.

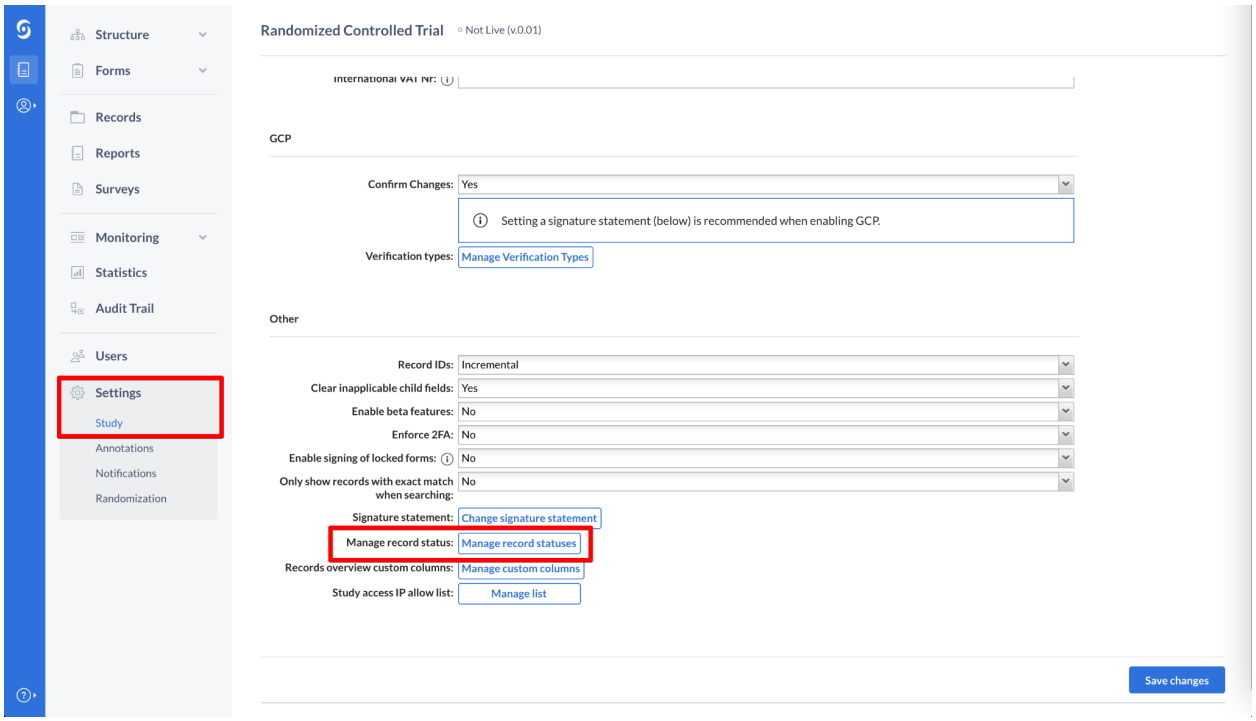
For studies that are created by our Professional Services team, Castor offers two levels of UAT. Basic UAT includes the creation of two test records and ensuring that all edit checks and dependencies work correctly. Basic UAT does not include documentation.

Extensive UAT includes the creation of a data dictionary before study building commences, and an automated UAT process that confirms the existence of fields and tests functionality of each field. Documentation is provided. Extensive UAT should be requested before study building begins and cannot be added later.

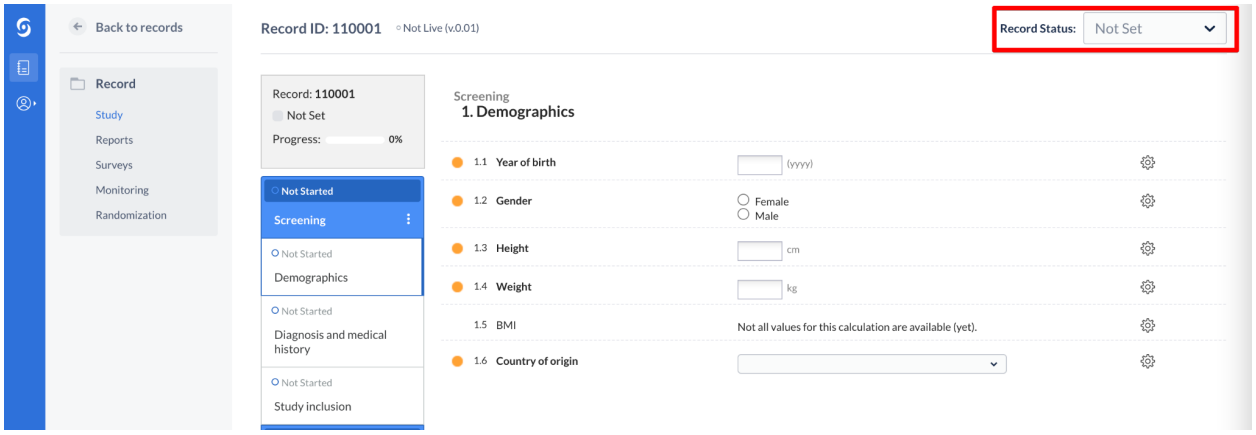
Tracking

Enrollment Status

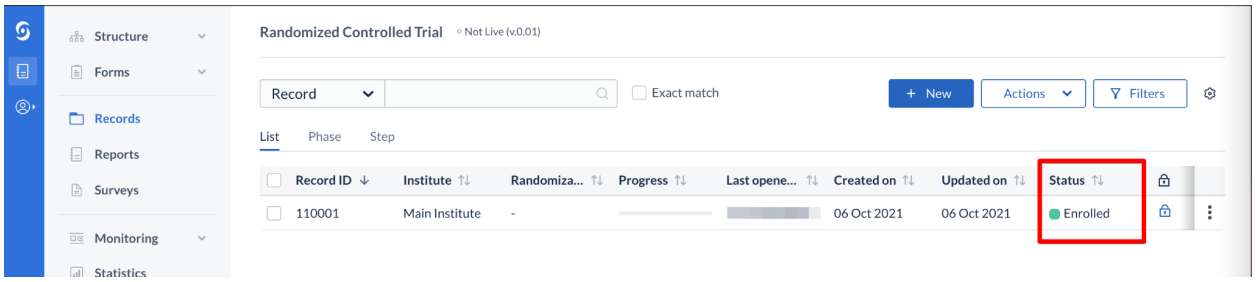
It is possible to track enrollment status using the Record Status feature in Castor EDC.Study admins with ‘Manage Settings’ rights can create, update and delete record statuses from the Study settings.



Once a status is defined in the Settings tab, data entry users will be able to select the status in the Records view.

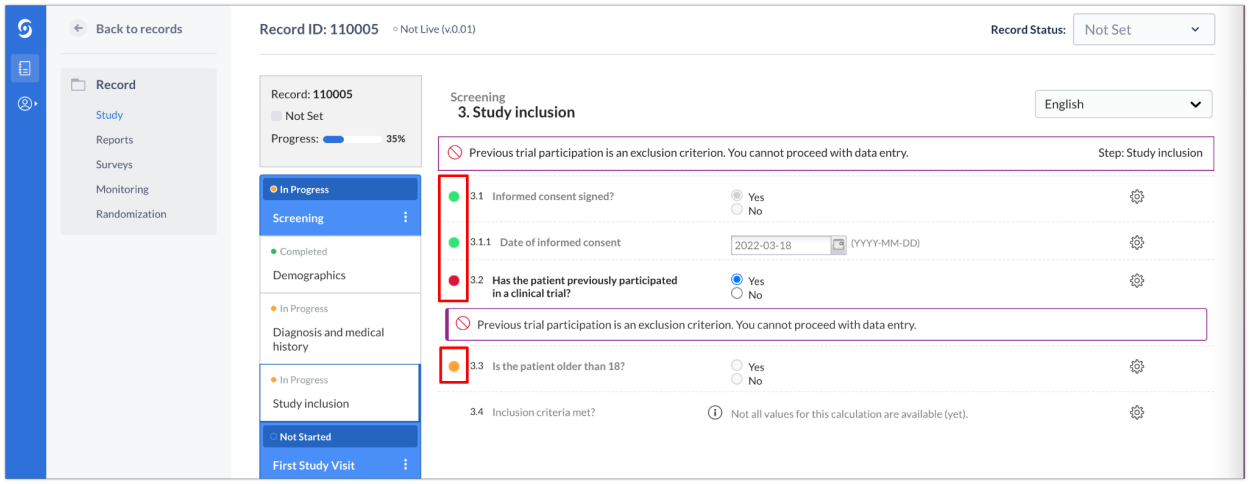


The record status is also visible in the Records overview in the Status column.



Progress of completion

Completion for each area of the CRF is generally coded using colored status icons.



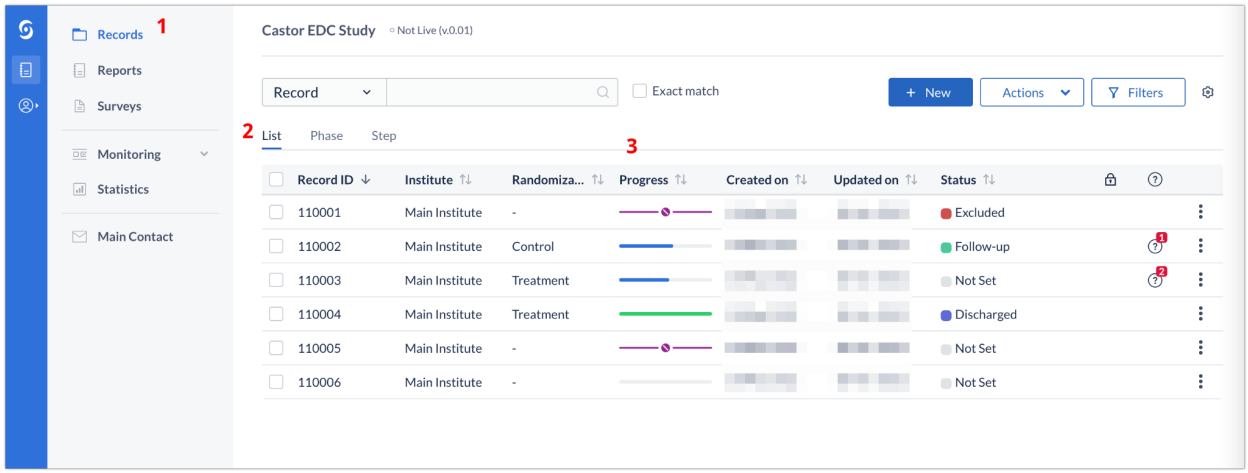
The status icons indicate the status for a field, they have the following meanings:

- **Green**: The value is valid and the field is saved.
- **Orange**: The field is required and no value has been entered yet.
- **Red**: The value is invalid and the field has not been saved.
- **No icon**: The field is not required and no value has been saved.

These field level status icons in data entry view are the lowest status level for progress indication in phases, steps, reports, and surveys. Progress for phases, steps, reports, and surveys are calculated based on the fields that are marked required in the fields' settings. Fields that are not required are not included in the completion progress.

Records

Record progress can be viewed on the Record Overview screen (3).

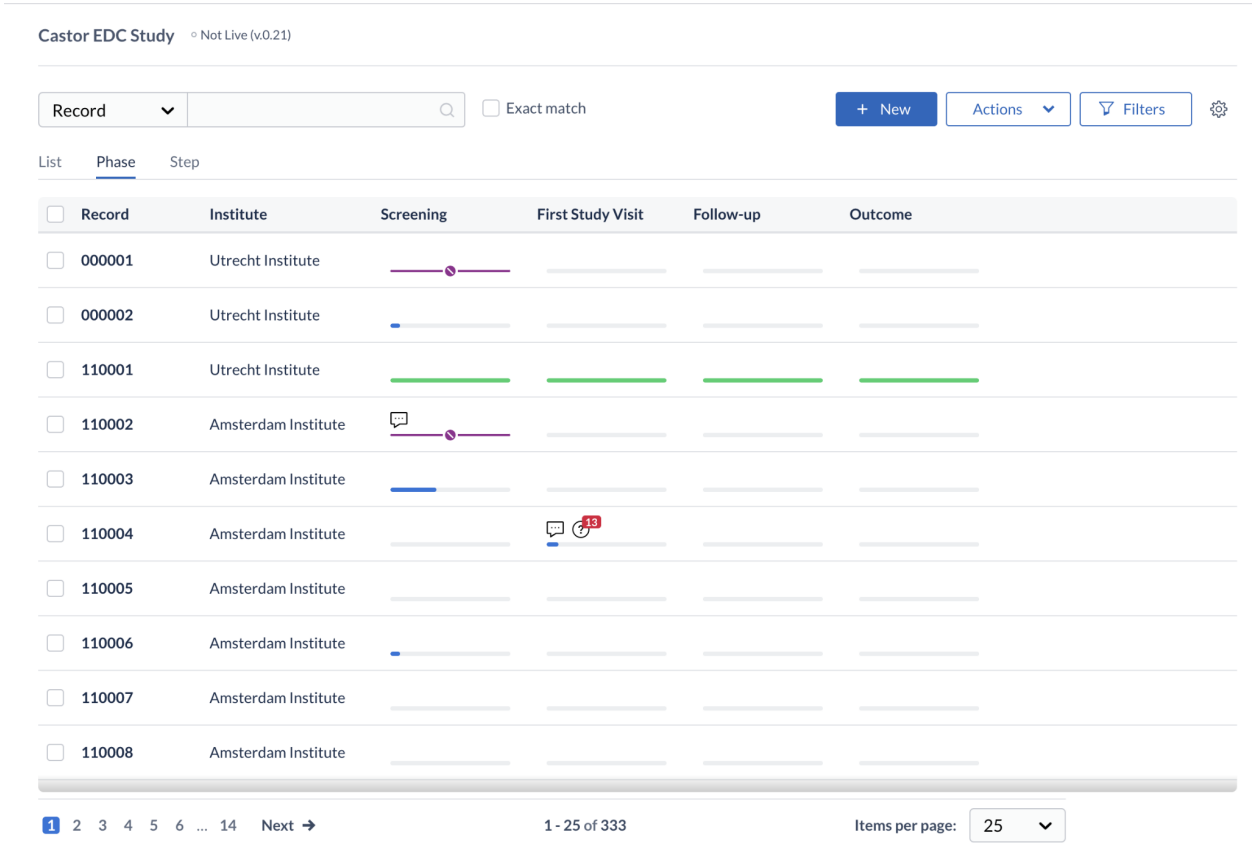


List view (2) provides an overall view of required fields in the study form. A record will show as incomplete until required fields in all phases and steps are complete.

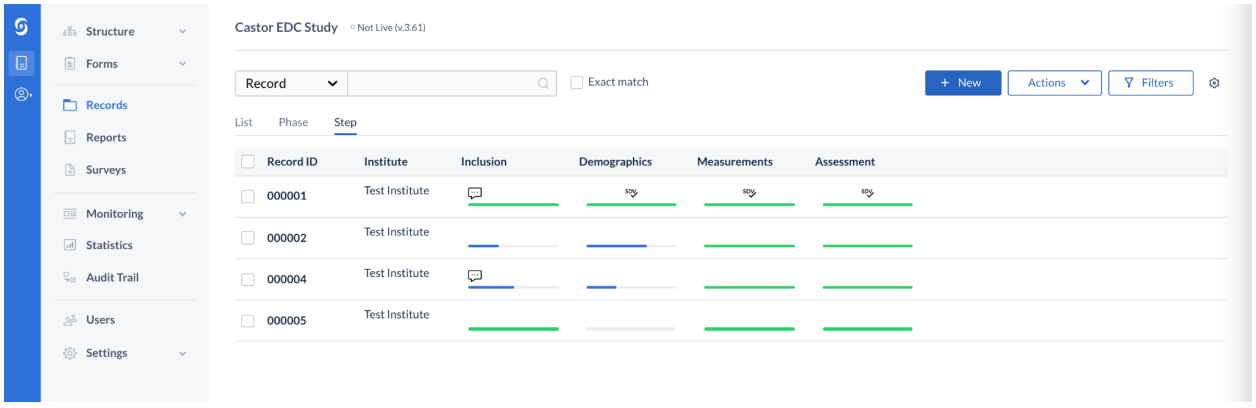
- **Green**: All field values are complete and valid.
- **Gray**: No values have been saved or data entry has not begun.
- **Blue**: Data Entry has started but is not complete.
- **Purple with an icon**: Patient is excluded from the study.

Please note that if a record contains an unclosed query, progress will remain incomplete even if all data has been entered.

Phase View provides an overview of the progress for each phase.



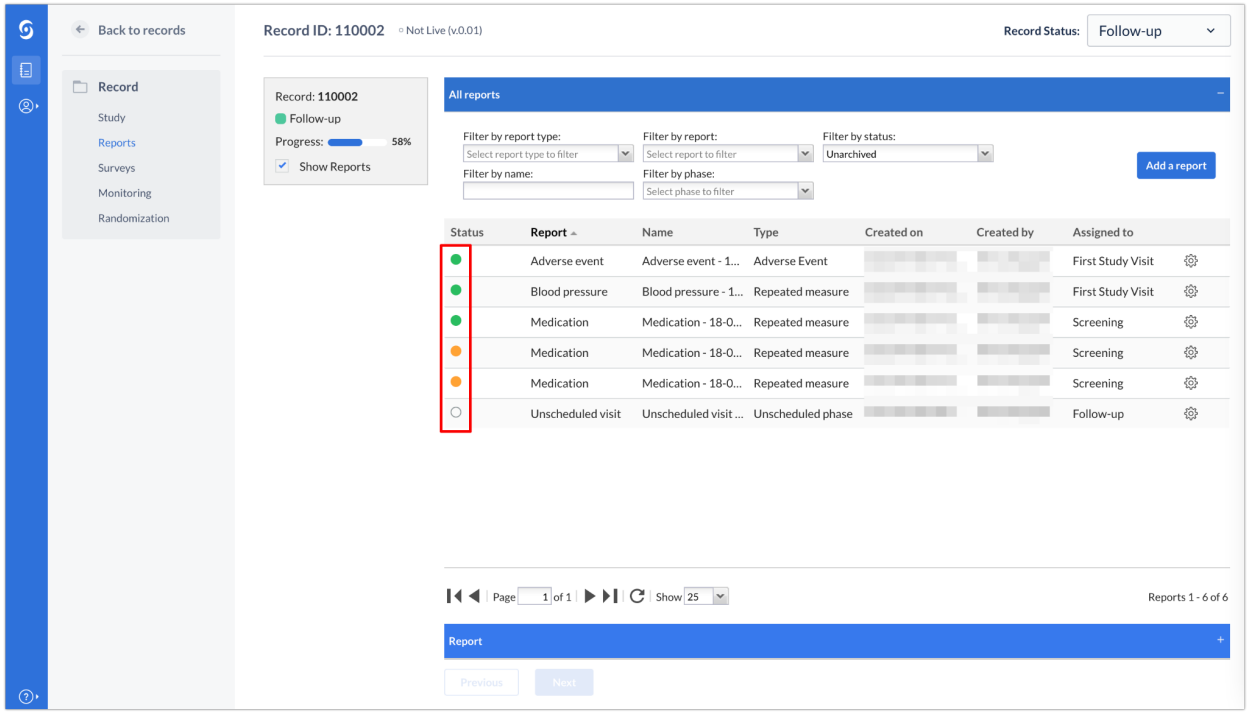
Step View provides an overview of the progress for each step.



Reports

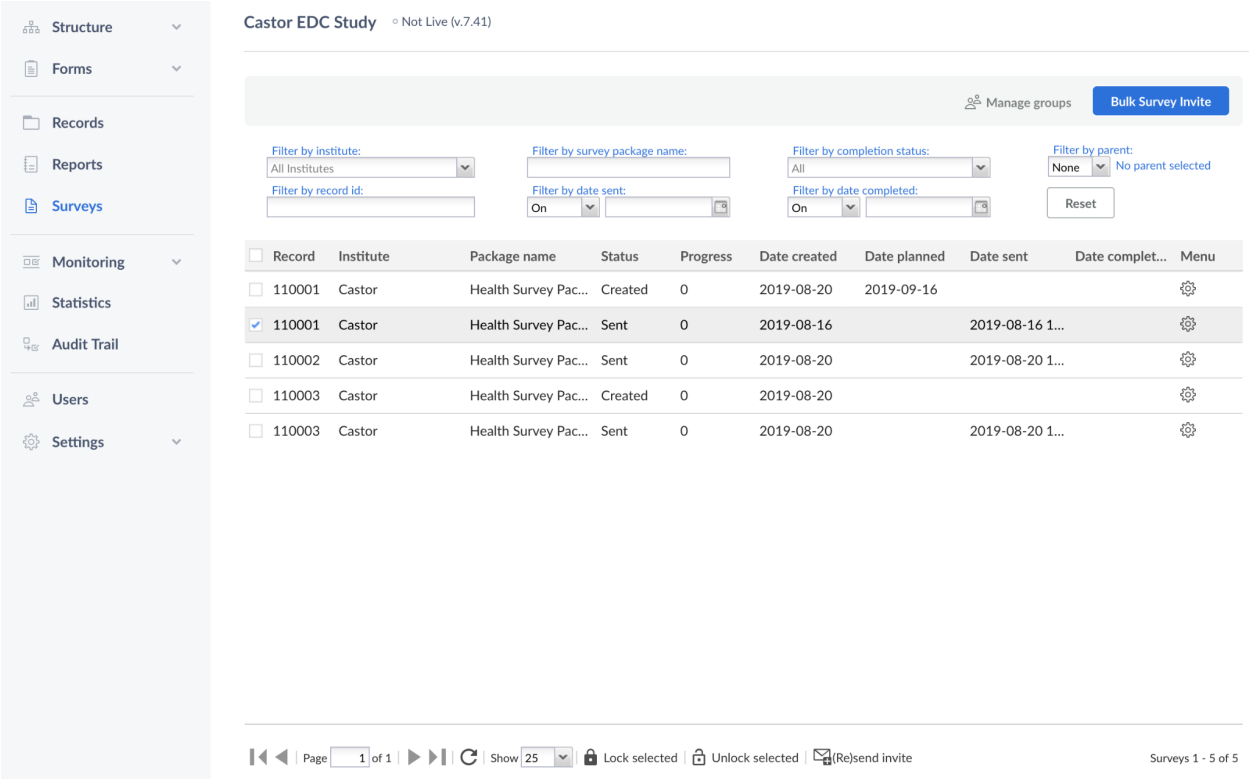
Since each report can have none to many instances for each record, progress for reports does not influence the progress of the record. Like study data, progress is only influenced by those

fields that are required. The color coded status icons indicate the completion status of each report instance.



Surveys

Survey progress is displayed as a percentage of required fields that have been completed. You further have the option to automatically lock surveys when a respondent submits a survey and create notifications each time a survey is completed. If a respondent does not complete a survey in one sitting, responses are saved and the respondent can continue answering where they left off.



Data Review

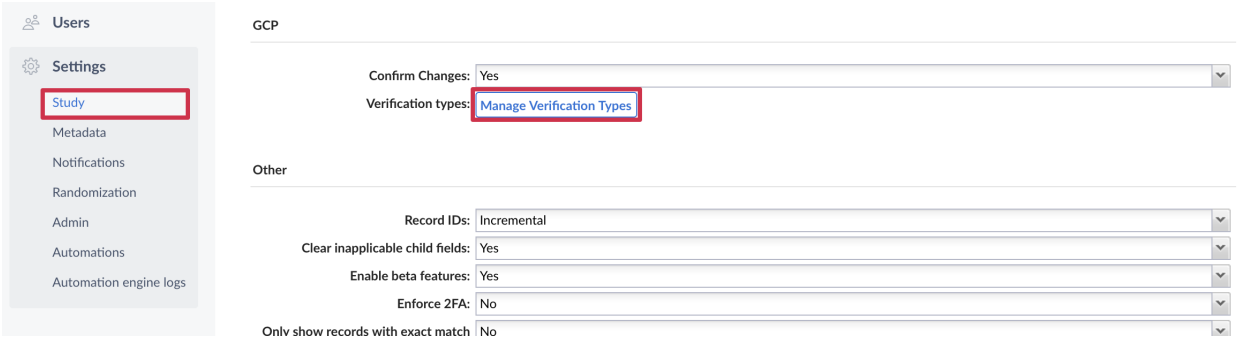
Verification

In Castor you have the option to verify collected data in your study. The most common example is source data verification (SDV), but you can also define your own verification type depending on the quality control that you want to use for your study data.

The SDV option is included by default if Monitoring is enabled. To use this feature you have to first ensure that the correct study settings are applied and that the correct user rights are assigned to users in the study.

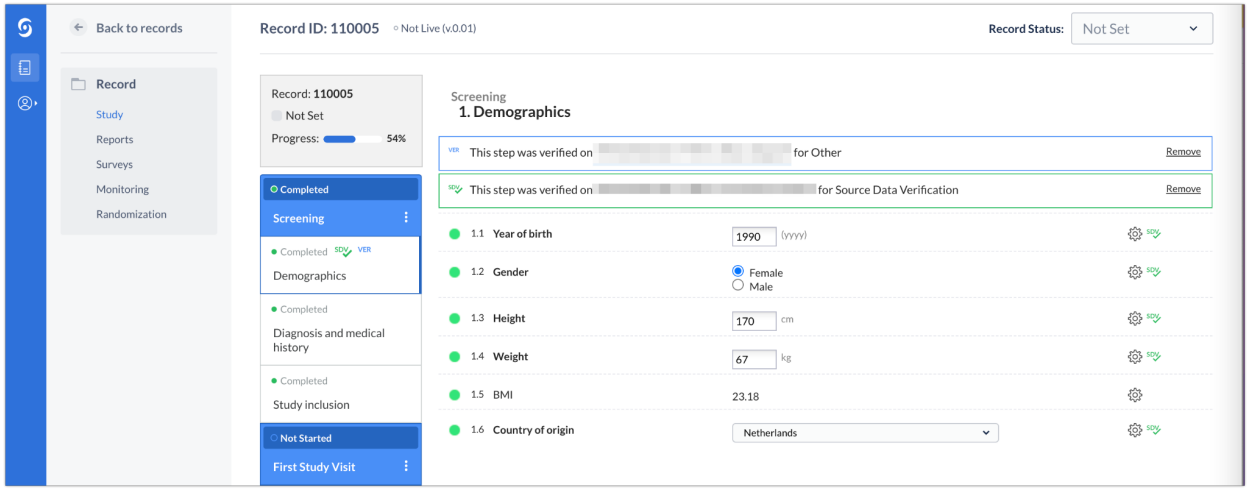
Data verification is linked to Monitoring, so to be able to use it, first enable Monitoring in your study settings. Note: Monitoring cannot be enabled for retrospective studies.

Under 'Manage verification types', located in the 'GCP' section of the study settings, you can add or edit the verification types in your study:



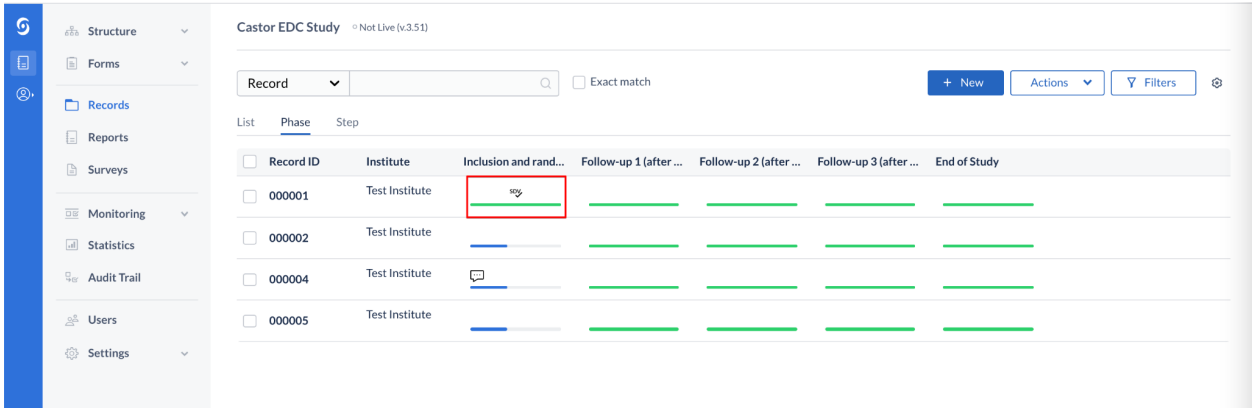
You have the option to SDV all steps in a phase, a step (including all fields or required fields) as well as individual fields. For other custom verification types, you cannot verify individual fields.

At the top of each verified page, a banner is displayed with the verification details. This banner is only visible if SDV has been performed on an entire step.



1. A custom verification banner
2. An SDV banner
3. The step verification icons

Phases and steps that have been SDV'd can be seen on the Records overview page when in Phase or Step view. Remember that an entire phase or step would need to have SDV performed in order for the SDV icon to appear.



Data Processing

Medical Coding

Castor EDC allows for medical coding of adverse events and concomitant medications. We have implemented an out-of-the-box integration with a Medical Coding platform: MedCodr.

MedCodr is a web based solution for coding medical terms and products to standard dictionaries including MedDRA and WHODrug or custom dictionaries.

It is possible to attach metadata from the MedDRA and WHODrug to Adverse Event (AE) dictionaries. This means that, upon adding terms in a text field in an AE, Medical History, or Concomitant Medication Report, it is possible to use MedCodr (an external service) to browse and attach the correct translation from the MedDRA and WHODrug to these reports.

Once one of the above mentioned reports are created and a term is added to a text field, codes are pushed back to Castor EDC in dedicated coding reports that can be exported separately.

Castor also provides Coding-as-a-Service for when your team does not have the time or capabilities to perform this task.

Medical Coding is a premium feature. If you are interested in adding this service, please contact your account executive or support@castoredc.com.

Loading Electronic Data

There are two methods available to add electronic data to the EDC: CSV import or Application Programming Interface (API).

CSV Import

You are able to import data into the EDC via CSV. You can import data for one record at a time or for multiple records. For importing via CSV, variable names must exist in the database and there is a limit of 25,000 data points per single import. This limit is much lower for importing encrypted data.

It is possible to import study data and report data only. Study and report data must be imported seperately. It is not possible to to import the following:

- Survey data
- Queries
- Comments
- Signatures
- Data verifications

Note that in certain circumstances data in the CSV file must be formatted properly for a successful import. Details about these formats can be found in our online manual.
Please review Import Study Data and Import Report Data for more information about importing.

Application Programming Interface (API)

Castor EDC allows for linking the EDC database to other applications via API. The API supports authentication and authorization of API calls through the industry standard OAuth2. To start, you will need to create API credentials in the Account Settings.

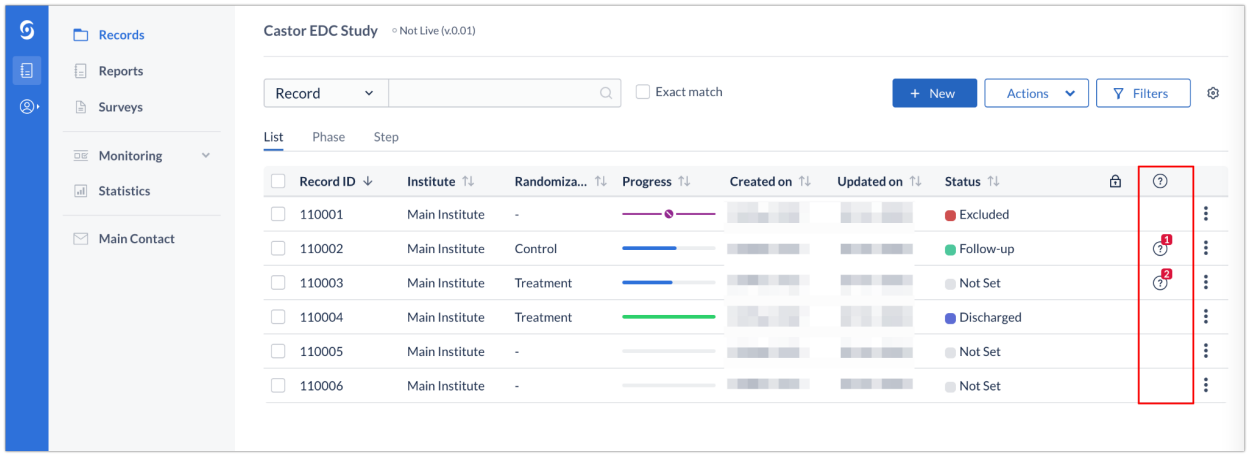
It is possible to retrieve (GET) and send (POST) using API endpoints.
These endpoints can be found in our online manual based on the server you are using for your study:

- EU: https://data.castoredc.com/api
- US: https://us.castoredc.com/api
- UK: https://uk.castoredc.com/api
- AUS: https://au.castoredc.com/api

If questions arise during your setup, please contact support@castoredc.com.

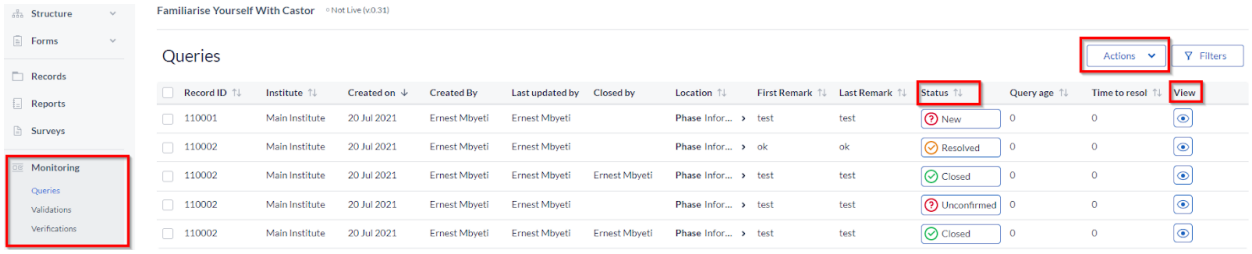
Data Queries

Data queries can be viewed on the Record Overview for each record. The counter displays only queries that have not been closed.



The query icon can also be seen when in phase and step view.

The status and comments for each query can be reviewed on the Monitoring tab, Queries subtab.



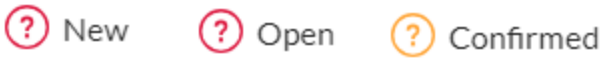
When an existing query is opened, the status is set as New. A normal user can either set the status to:

- **Open**: The user has acknowledged/opened the query, and added a remark. The status changes from New to Open.
- **Unconfirmed**: The user does not agree with the monitor.
- **Confirmed**: The user agrees with the monitor and will try to resolve the issue.
- **Resolved**: The user has changed the value and indicates the issue is resolved, for example the user has reacted to a query and left a comment. In this case the query is not closed which is why the step status is shown as amber, and not green - the query is still open.
- [Only with 'Query' right (monitor)] **Closed**: The monitor indicates the issue is resolved and marks the query as closed. The query icon will turn into a green check mark and the progress button of the entire step will be green indicating

that the step has been completed - all data entered and there are no open queries.

The icon that is displayed next to the field with the query or in the Monitoring tab displays the status of the query:

1. Open/Unconfirmed/Confirmed.



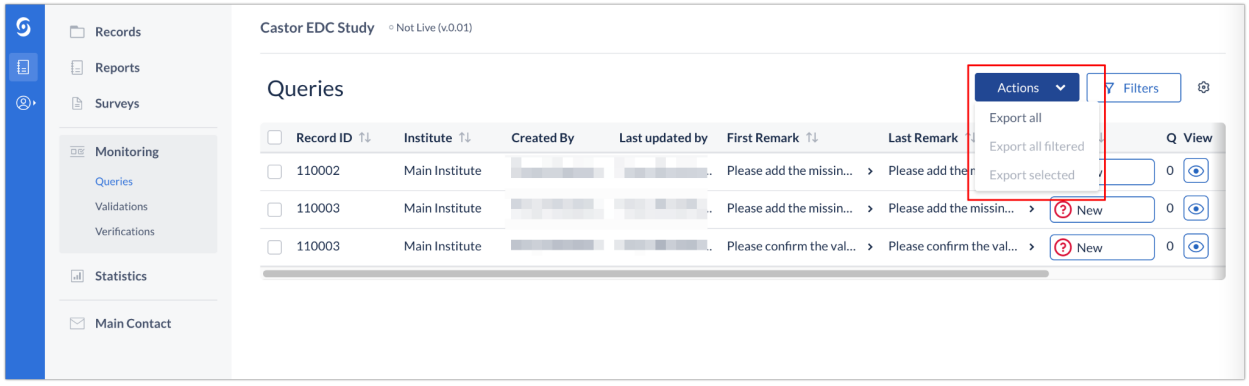
2. Resolved.

3. Closed.

Exporting Queries

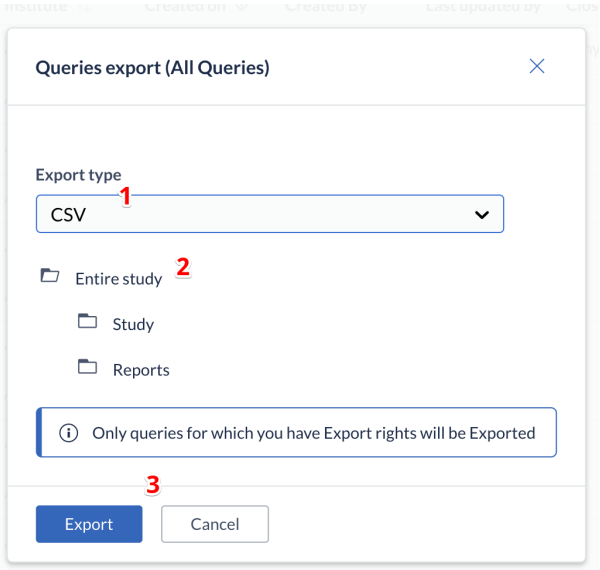
Users with Export rights can export the queries overview in bulk, either by exporting all available queries or only the ones that the user has selected or filtered. To export the queries from the Monitoring tab, Queries sub-tab, follow the steps below:

- Click on the Actions button and choose to Export either all queries, export all filtered or all selected:



- In Queries export dialog window, you can specify:
    - Export type: choose to export into CSV or Excel (1)

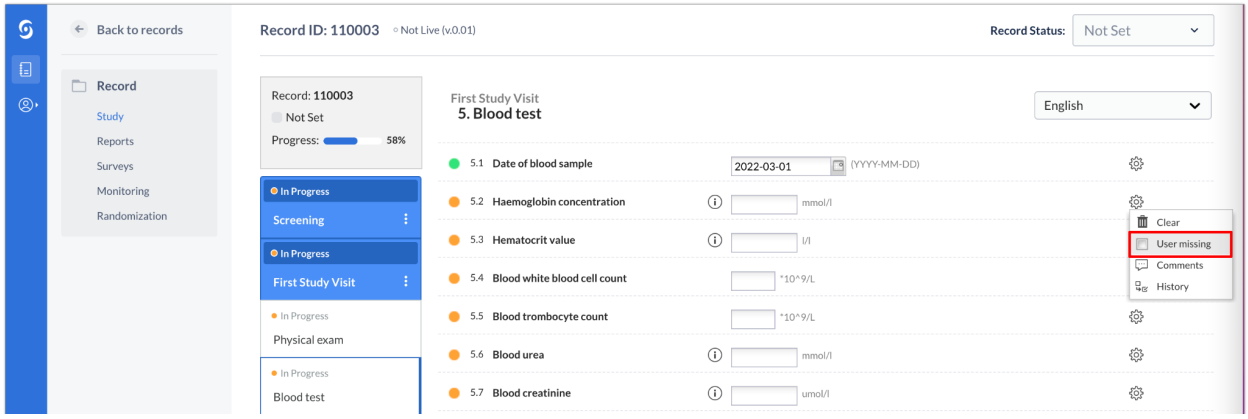
- Export tree: choose if you would like to export queries for entire study, specific study phases or steps in your study or for reports, a specific report or a report step (2)
- Export: click on Export button to generate export of the queries (3)



Missing pages

User missing

If a data point cannot be answered due to missing data or other known reason, you can address this in the study forms by defining the data as 'user missing'. This option can be accessed by clicking on the cogwheel next to the field and selecting 'User missing':



A dialog window will open, in which you are prompted to select the most applicable reason for the missing data point and to add a comment. The selected reason will assign the associated value to the field and this value that will also be exported as data values. It is not possible to change the predefined values for missing data. The available values are:

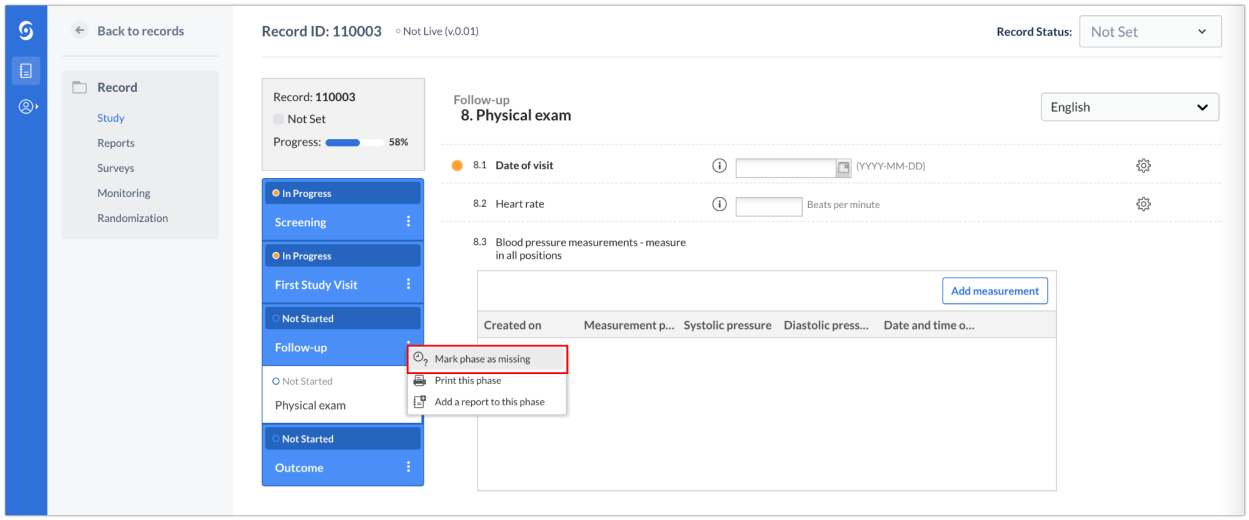
- Measurement failed (-95)
- Not Applicable (-96)
- Not asked (-97)
- Asked but unknown (-98)
- Not done (-99)

The field marked as missing will be faded/greyed in the form, but the status icon will update to show that the field has been completed. A comment will be added to the field, containing the reason entered.

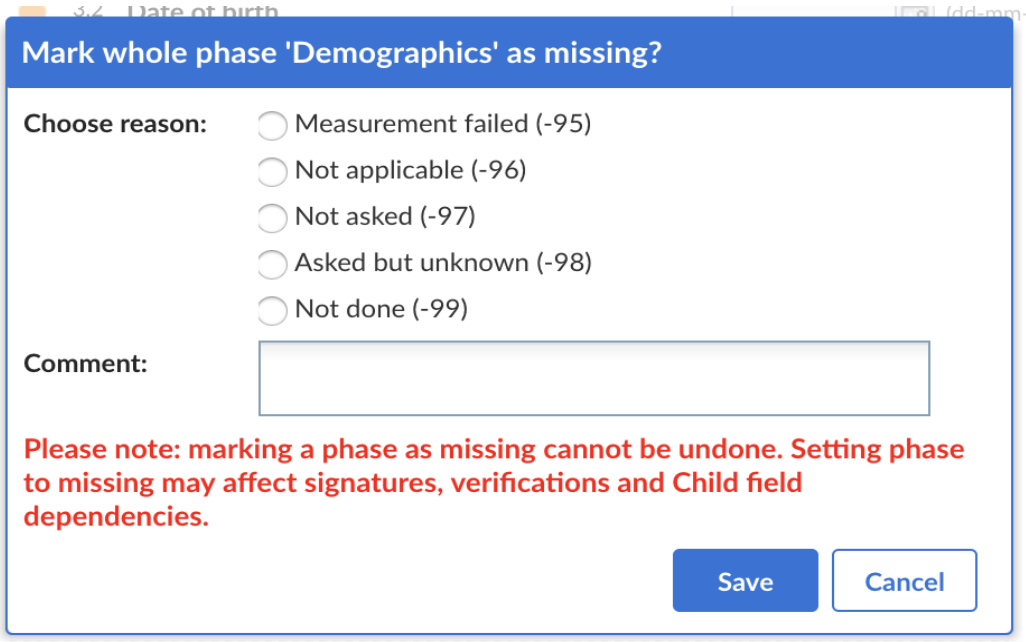
If needed, it is possible to remove the 'user missing' entry by clicking on the cogwheel menu and selecting the checkbox 'User missing' again. This will remove the 'User missing' status and allow entry of data into the field. The comment will be kept and each of these actions will be logged in the audit trail.

Mark full steps/phases as missing

Full steps and phases can also be marked as missing by selecting Mark phase / step as missing in the data entry navigator using the cogwheel right next to the phase/step:



After 'Mark step/phase as missing' is clicked, a new dialog window will open in which you can provide a reason for the missing information and include a comment:

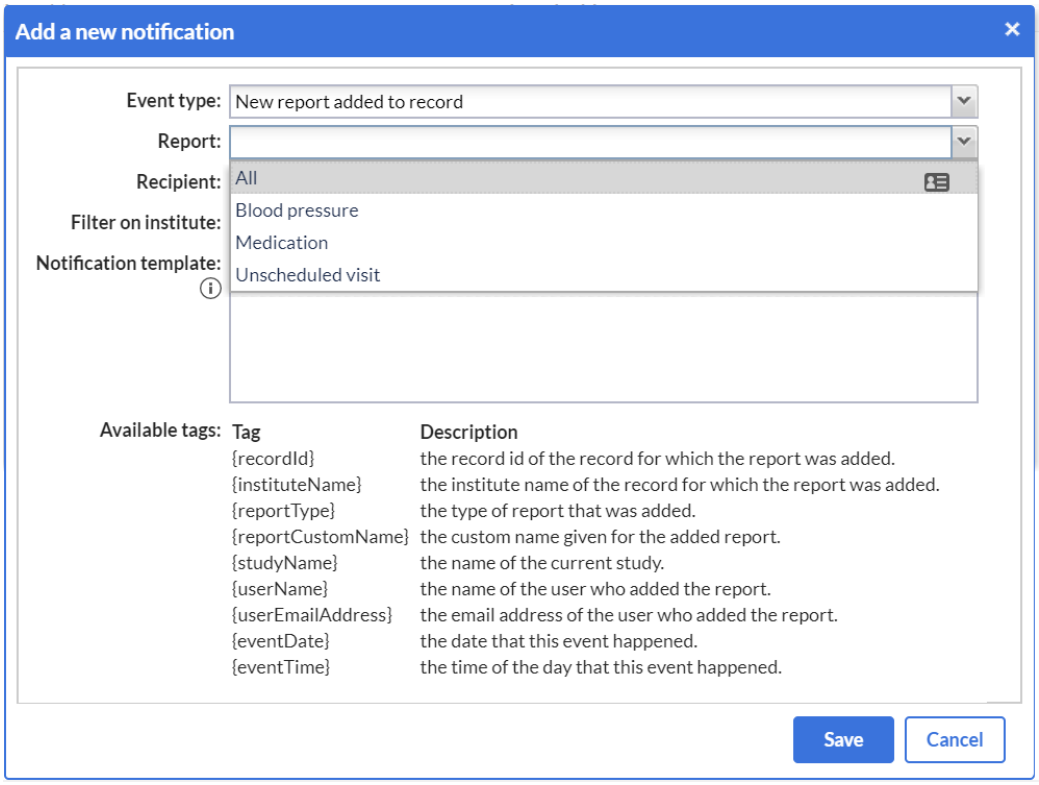


Notifications

Notifications for specific study events can be created in the study settings. Notifications are not possible for individual fields or completion statuses. Available study events include:

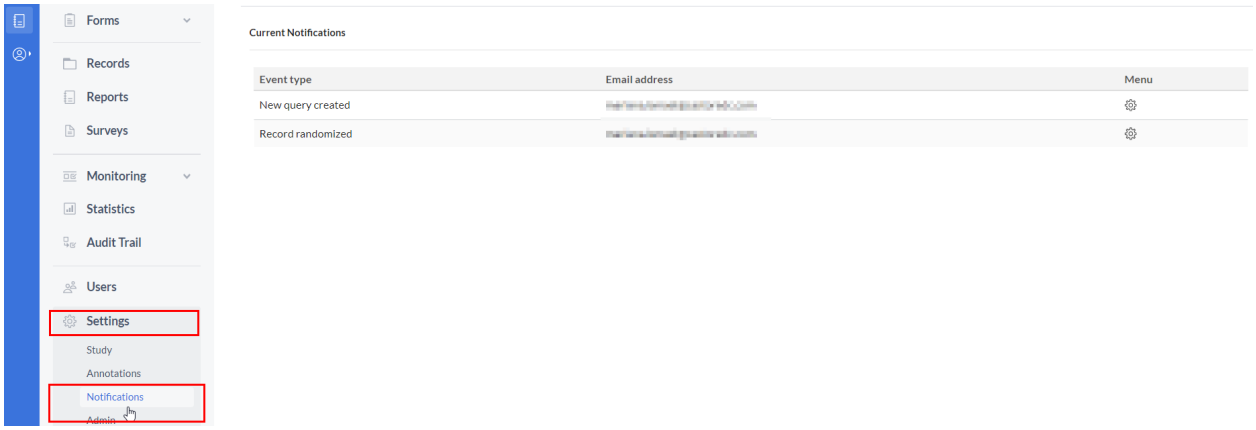
- Form signature dropped due to edit
- Form signed: Report
- For signed: Report Step

- Form signed: Study Phase
- Form signed: Study Step
- Form verification dropped due to edit (and field form verification dropped due to edit)
- New query created
- New record created
- Query updated
- Record randomized
- Report completed
- Survey package completed
- New report added to record: when selecting new report added to a record, choose from the drop-down menu which is the specific report that you are interested in receiving the notification



1. Recipient: Choose a recipient of the notification email in the drop-down (which shows all users added to the study).
2. Filter on institute: Choose one or multiple institutes for which you want to receive the notifications (i.e. only your own hospital). Leave this field empty if you want to receive notifications for all institutes.
3. Notification template: This is the email text that will be sent when the event occurs. You can modify this as you like. The listed available tags will be replaced by their real values when the notification is sent.

4. Press the ‘Save’ button to save the notification or the cancel button to return to the notifications overview. This is also where you can find all current the notifications created for your study:



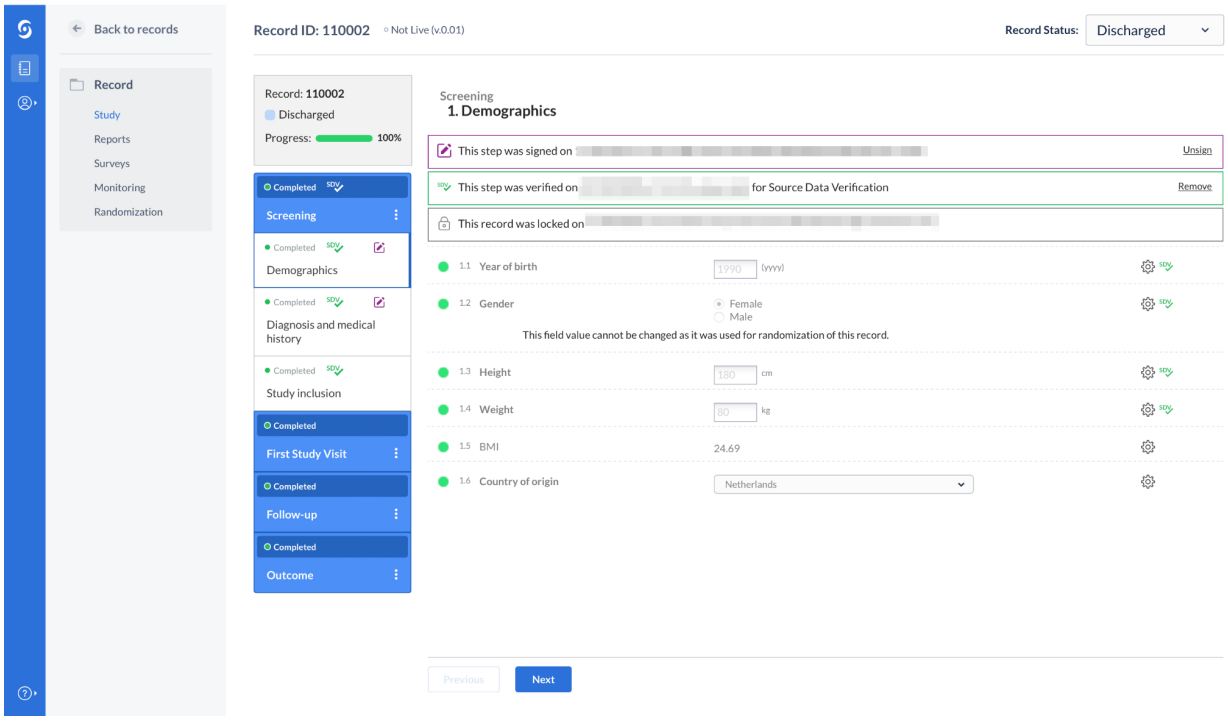
Signing and Locking

In order to sign or lock a phase, step, or report, it is necessary to have sign and lock user rights. One or both of these rights can be assigned to a user as they are separate rights.

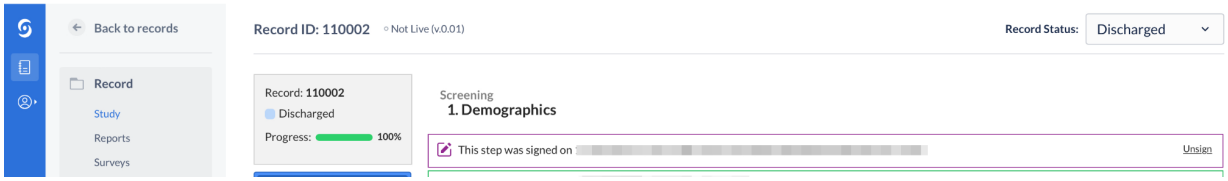
Sign or unsign a phase or step

You can sign individual phases and steps. Open the record for which you want to sign steps/phases. On the left side you will find the phase and step navigator. In our example, we will sign and lock the step "Inclusion".

1. When in a record, click on a step or phase. Click on the three dots that appear to the right.
2. Click on "Sign this phase" for phases or "Sign this step" for steps.
3. Enter your password to confirm your identity. You can choose to also lock the phase/step in the same instance, to prevent further data entry. Click "Sign" to confirm and to sign the phase or step. In order to lock during signing, it is necessary to to have the lock user right. For users without the lock user right, an error message will appear if they attempt to lock.

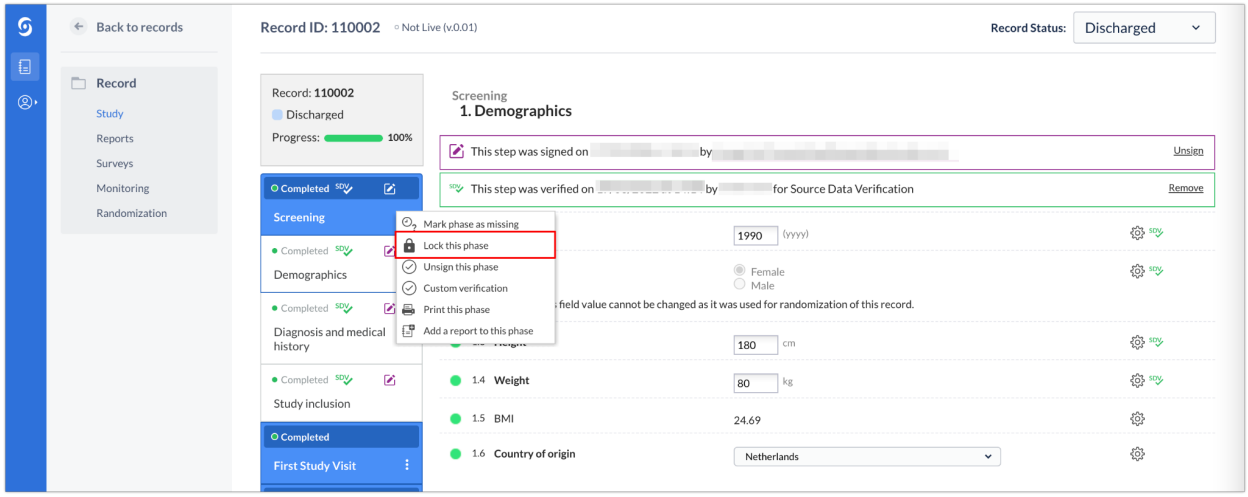


A warning will be displayed at the top of the data entry screen, warning the user that the current step has been signed and/or locked. It is also possible to unsign a step/phase.



Lock or unlock a phase or step

If you have lock rights, you can also choose to separately lock or unlock a phase or step by choosing the "Unlock this phase" or "Unlock this step" option.

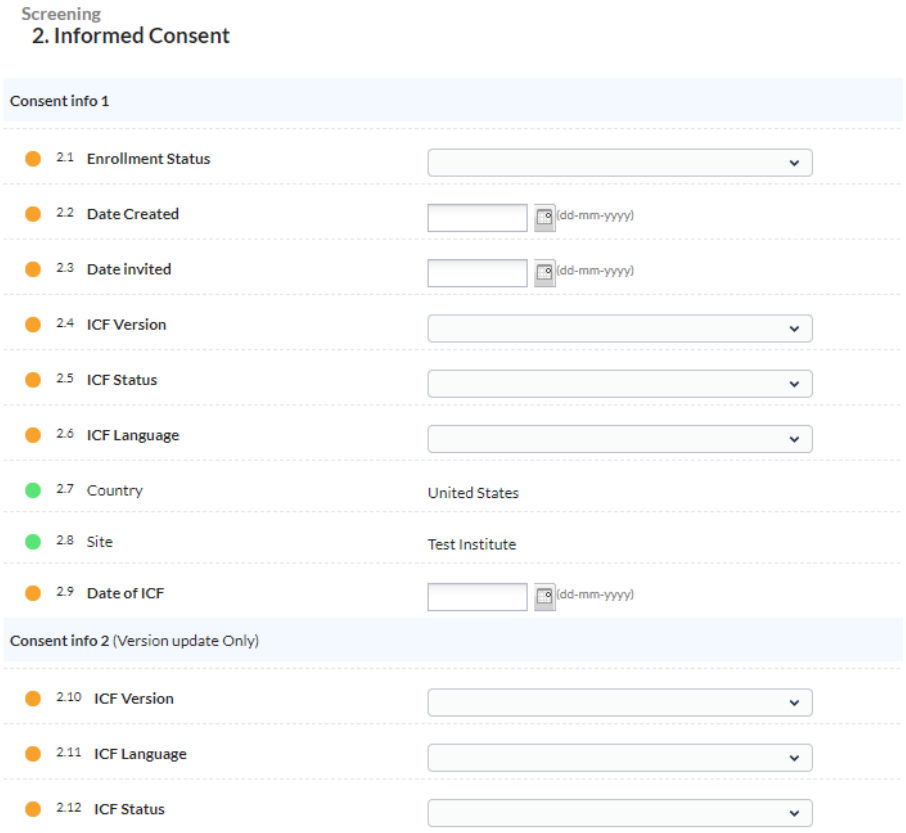


Study Conduct

The remainder of this manual is dedicated to providing suggestions to maximize the EDC for managing your data.

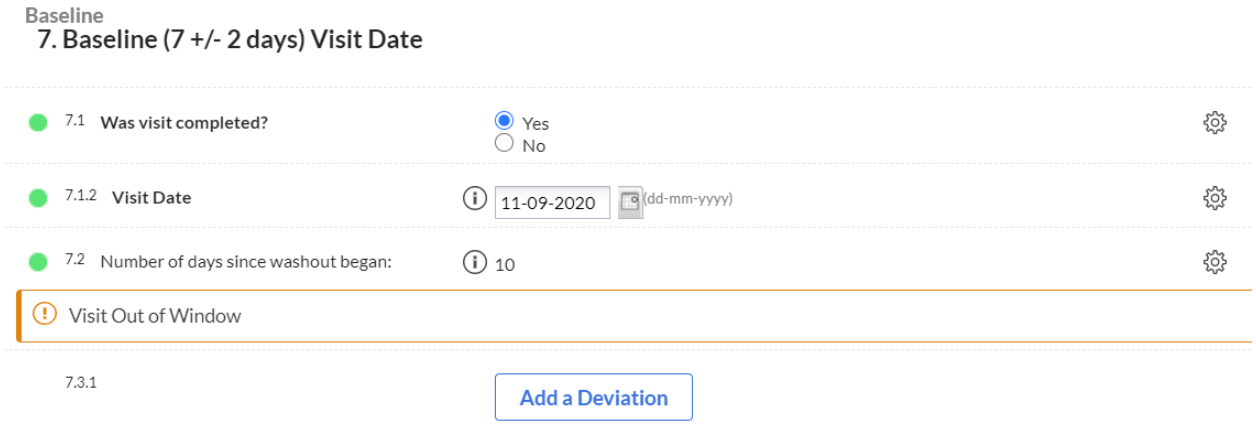
Protocol Amendments

You can keep track of protocol amendments within the EDC by creating fields that document the protocol or informed consent versions. Doing this allows this information to be documented for each record.

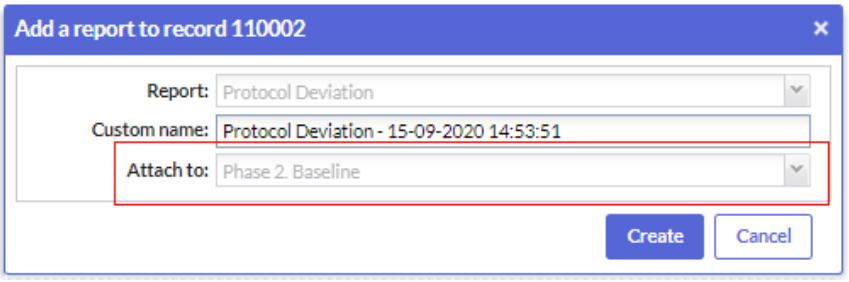


Deviations

Reports are useful for keeping track of protocol deviations.
It is recommended that the add a report button is utilized and dependencies are created where a deviation may occur.



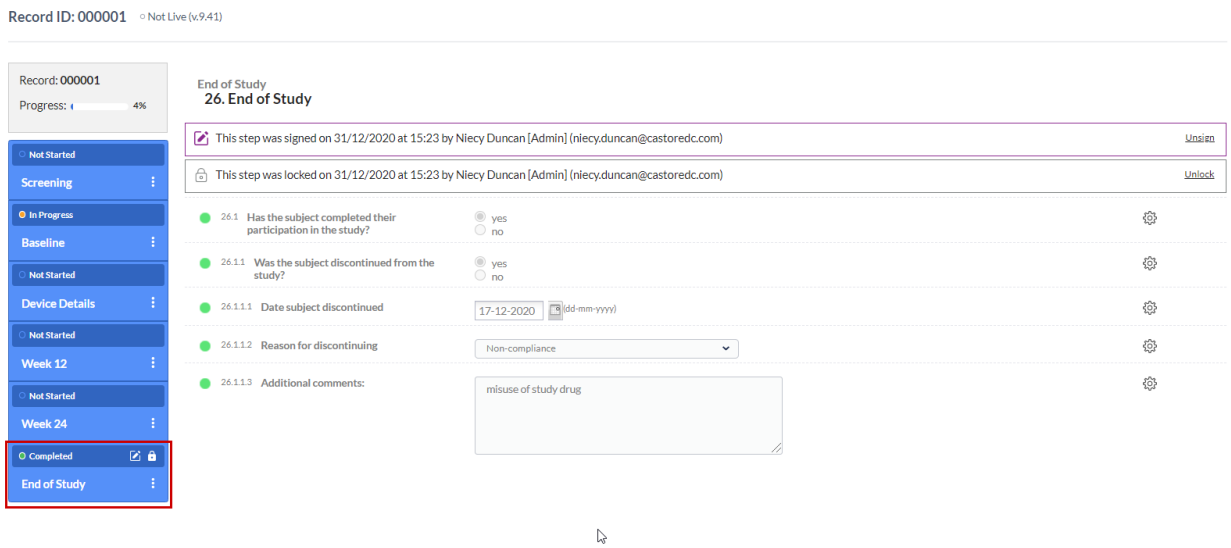
Using the add a report button, the Protocol Deviation report will always be linked to the phase in which the report was created.



You are further able to create notifications on the Report Event type and choosing the Deviation Report.

Signing the Record

In a previous section, we showed you how to sign phases and steps. It is not possible to sign a record. However, you can opt to have your investigators sign off on an End of Study phase shown previously.



Closeout Activities

Once a study is complete, we recommend performing the following actions:
1) Lock all records
2) Export a copy of the study data
3) Set the study to 'not live' in the 'Settings' tab
4) Remove all users and study admins can reduce their own rights. It is recommended that study admins leave themselves as the only user, and remove all user rights except 'View', 'Export', 'Manage Records', ‘Manage Settings’.
5) Archive the study. Once the study is 'closed', you can archive the study in the 'My studies' overview, which will remove it from the overview for all users and prevent users from accessing it in future.

The data is stored for at least 25 years (depending on local laws).
Our policy is to always match relevant, local regulations. In this case, the new Clinical Trial Regulation will require the Clinical Trial Master File to be stored for 25 years. Castor will ensure that we support storage of data (including the original audit trail) for that time period unless our customers explicitly do not require us to (as they might archive it elsewhere).

Further information
View the Castor EDC video workshop at https://workshop.castoredc.com/.

For more information regarding data management, check Castor EDC’s knowledge base: https://helpdesk.castoredc.com. Additional ready-to-print instructions based on user roles are also available. If you have any questions or concerns, please contact us at support@castoredc.com