Cento Analytics

product manual

CEDARON

Cento Analytics Product Manual

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1   Introduction

Cento Analytics is Cedaron Medical, Inc.'s next generation Analytics platform.

Cento Analytics puts the power of business intelligence and reporting into the hands of clinicians and data analysts alike. Cento is an out-of-the-box analytics solution designed specifically for healthcare applications. It interfaces with your existing Cardiac Care software to collect data, and comes with a full catalogue of pre-written ACC and STS standard flash reports. There's no setup process - you can begin running reports immediately.

Individual users can design, create, share, and publish their own reports, as well as modify preexisting flash reports. All reports can be downloaded as a CSV, an Excel file, or even PDF without needing to learn and write SQL queries.

Dashboards are fully customizable, so individual users can quickly view real-time reports that are important to them. Users can also schedule reports to be sent by email, enabling them to take full advantage of the tool without ever even logging on.

For power users, Cento offers the unbounded complexity and full functionality you'd expect from analytics software, but with the advantage of having been designed with the healthcare application in mind. Cento also plays nicely with third party data collection tools, and can run reports using EHR or CVIS data or combine that data with registry data. Finally, Cento allows power users to easily and quickly share reports in a consumable format with anyone they want.

Cento represents the best we have to offer in usability, power, and versatility. It's healthcare data science at your fingertips.

2   System Requirements

2.1   Server Requirements

Component	System Requirements
Server Hardware	CPU: 2 single or 1 dual core processor at 2.5ghz or better Memory: 4 GB RAM (Minimum, 16GB+ recommended) Remote access to the servers by Cedaron must be made available for installation and support. Cedaron supplies SecureLink at no charge for this purpose. Additional information available when implementation begins or on request.
Supported Operating Systems	.NET 4.5.2 or later Windows Server 2016 Windows Server 2012 R2 Windows Server 2008 R2 Windows Server 2008 with Service Pack 2 or later **NOTE:** 32-bit environments are unsupported
Database	Microsoft SQL Server 2008 with Service Pack 4 or newer version
IIS and SSL/TLS Configuration	IIS 7.0 or later with ASP.NET Installed A valid SSL/TLS Web Hosting Certificate TLS 1.2 enabled (TLS 1.0+ on Windows Server 2008) **NOTE:** Windows Server 2008 R2 requires additional configuration to enable TLS 1.1/1.2
Other	Database growth estimated at less than 1GB per 5000 patient procedures

2.2   Client Requirements

Component	System Requirements
Browser Support	One of the following Web Browsers: - Internet Explorer 9 or later - Firefox - Chrome - Safari
Other	Microsoft Office Excel or other OpenXML compatible spreadsheet application recommended

3 Logging in to Cento Analytics

There are two methods of logging in to Cento Analytics. The primary way is through one-click authentication from within an existing medical system, such as CardiacCare or APTA Connect.

3.1 One-Click Authentication

One-click Authentication allows authorized users of an integrated system to log in seamlessly with the same identity the authorized user has in the integrated application.

The application integrated with Cento Analytics should provide a button or link for this functionality. Consult the product manual of the Integrated Application for details about to access Cento Analytics via One-Click Authentication.

3.2 Username / Password Authentication

In addition to One-Click Authentication, Cento Analytics has a login page. Users enter their username password for their integrated application into Cento Analytics. Credentials supplied this way must validate against the Integrated System and pass checks for both legitimacy and privilege level. Cento Analytics does not have separate users or credentials; if an account cannot log in to Cento Analytics, confirm the account is permitted to access analytics in the integrated application. Permissions in Cento Analytics pass through from the Integrate Application.
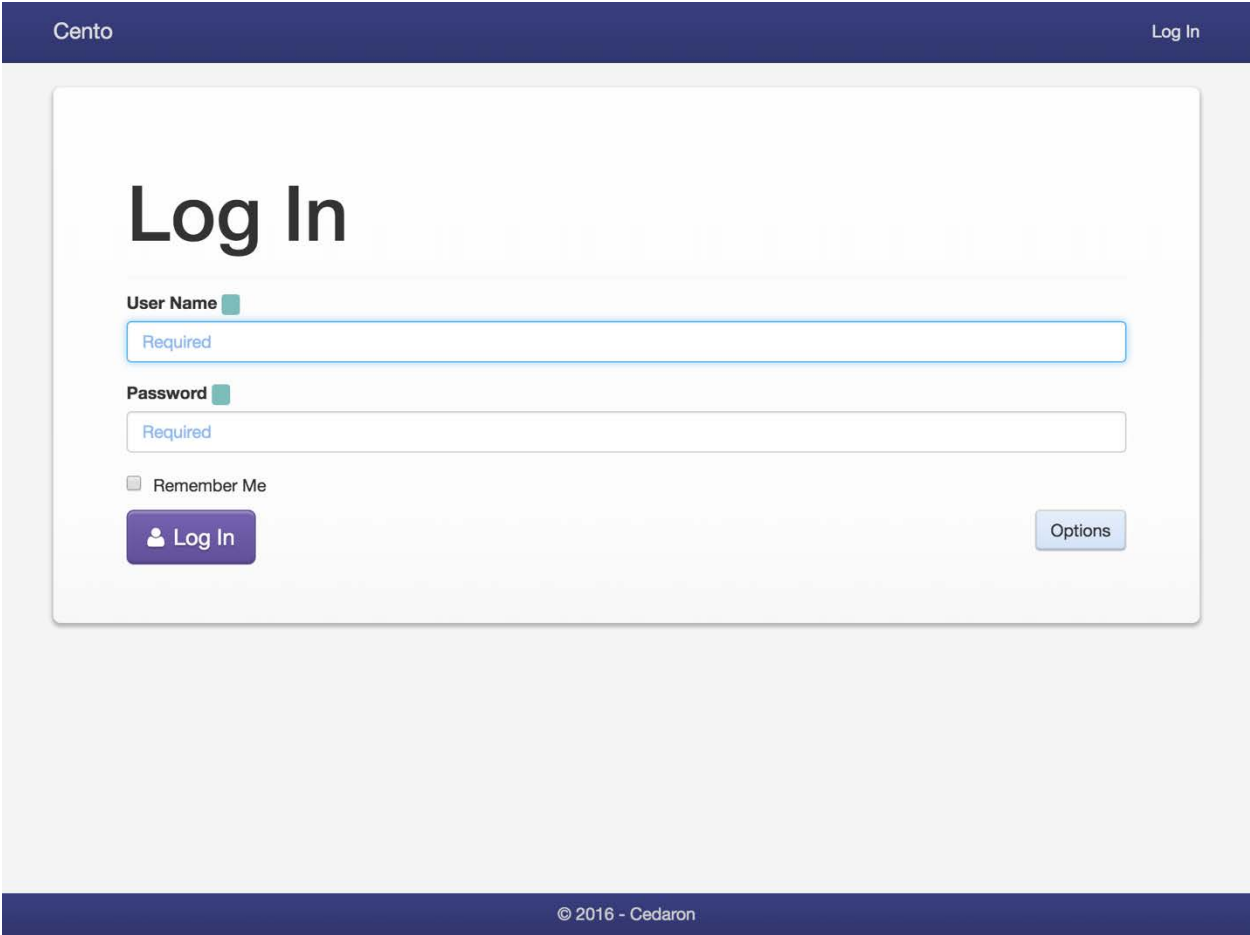

Figure 1 – The Login Screen

3.2.1   Authority Name

In some configurations of Cento Analytics, there is an additional textbox required for Username / Password authentication. This textbox is called the "Authority Name" and represents the context in which a user logs in. Many systems do not require the Authority textbox.

The permissible values of the Authority textbox vary from system to system, but typically corresponds to some known context from the integrated application, such as Facility Code or Database Name. Suggested values for the Authority textbox are displayed as a datalist control and configured in the Administration section of Cento Analytics. If a user has previously logged in to Cento Analytics, their browser usually autofills the Authority the user authenticated with most recently.

Consult the documentation of the integrated system for more information about Authority Name values.

3.2.1.1   *Using the Authority Name Textbox*

To access the Authority field, click on the "Options" button on the login page. In the textbox, enter the appropriate Authority or, if applicable, choose one from the provided options list.

3.2.2   Remember Me

Cento Analytics allows users to save their authentication/authorization state using a "Remember Me" checkbox. "Remember Me" cuts down on the time required to access the application by skipping the login screen.

3.2.2.1   *Using the Remember Me feature*

To save the identity of a log-in, press the "Remember Me" checkbox before logging in. Identities remembered in this way are retained by the web browser for up to 1 year.

3.3   Logging Out of Cento Analytics

Logging Out of Cento Analytics ends the current session of Cento Analytics in the user's web browser. Logging Out also makes the browser forget users who selected the "Remember Me" option when logging in.

3.3.1.1   *Using the Log Out feature*

To log out of Cento Analytics, click on the "Log Out" link at the upper right of every Cento Analytics page. This is only available while logged in.

4   Home Page

The Home Page is the default landing page of Cento Analytics. The Home Page provides links to every feature of the Analytics platform and displays the current user's dashboard reports.

4.1.1.1   Using the Home Page

To access the Home Page, click on the "Cento" link at the upper left of every screen in Cento Analytics.
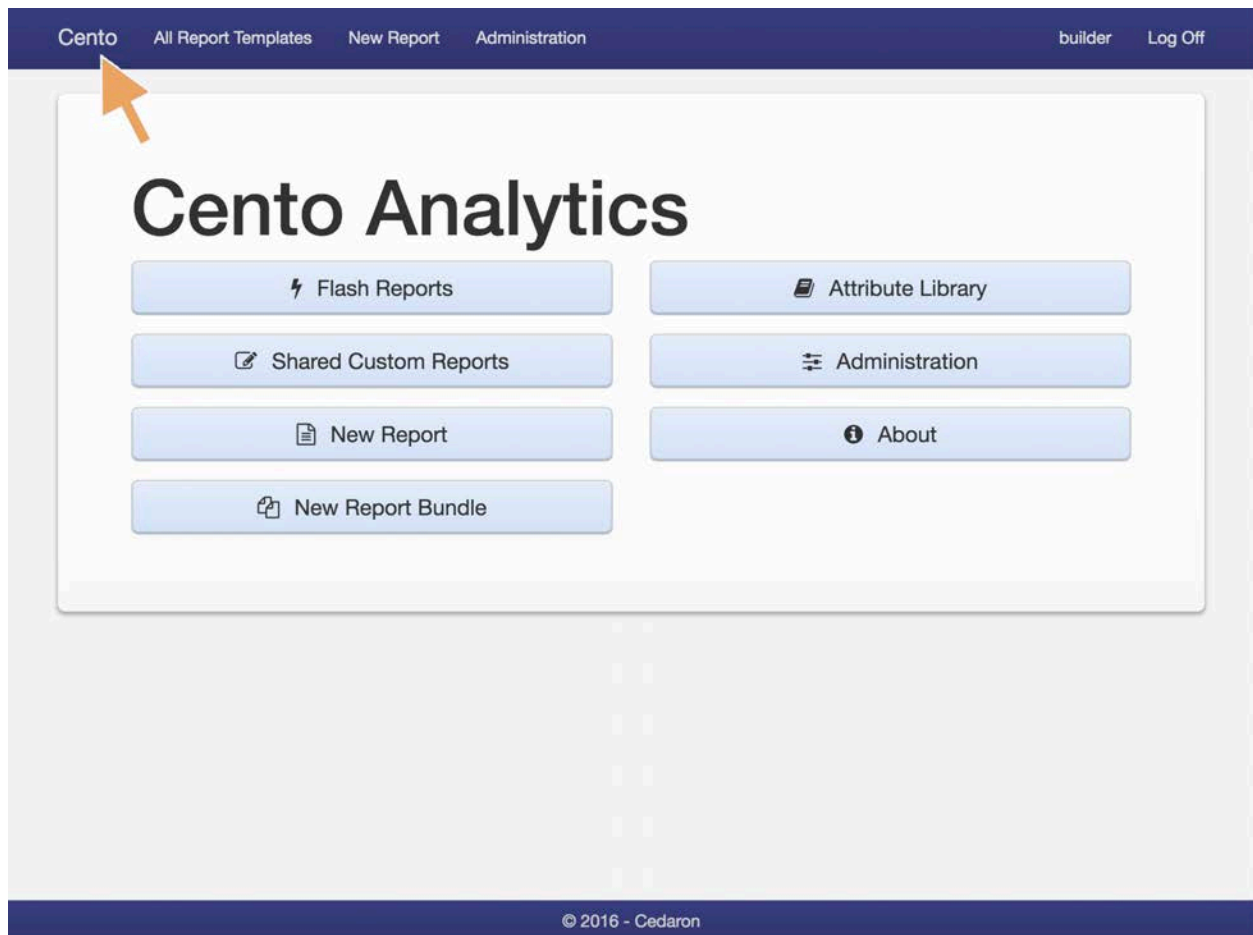
Figure 2 – Accessing the home page by clicking "Cento" in the upper left

See Also:
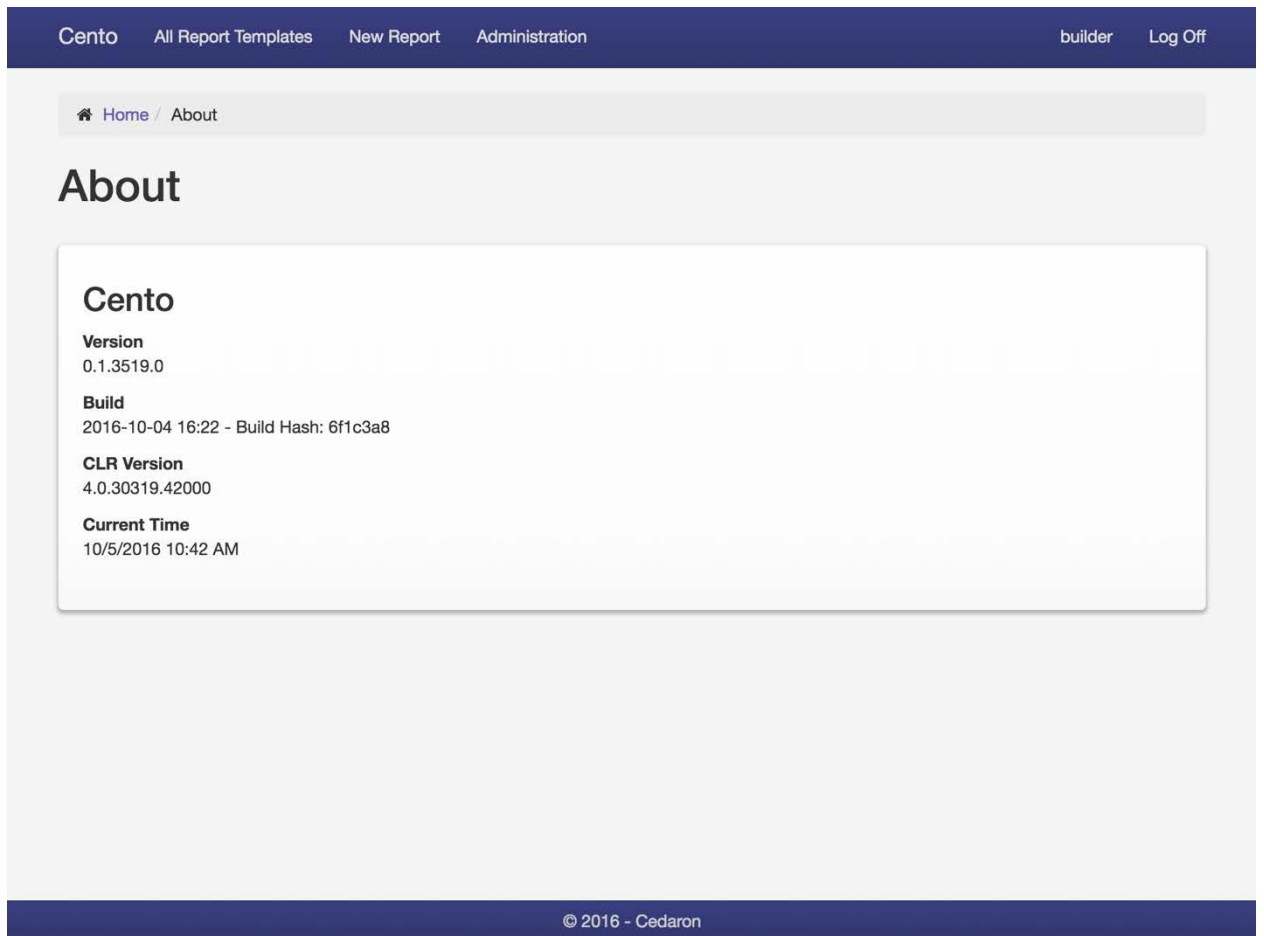
- Dashboards
- Administration
- Flash Reports
- Creating a New Report
- Attribute Library
- Report Bundles
- About Page

5   About Page

The About Page provides informational text about Cento Analytics. The data listed here includes:

- Version Number
- Build Number
- Microsoft CLR Version Number
- Current Time on the Web Server

The information on this page is useful for determining the version of Cento Analytics currently installed. Including this information in emails to Cedaron Support and when reporting bugs is encouraged.

5.1.1.1
Figure 3 – The About Page

5.1.1.2   Using the About Page

To access the About Page, click on the link from the Home Page.

5.1.1.3   See Also:

- [Home Page](#)

6 Navigation in Cento Analytics

Cento Analytics has a consistent look and feel, with common navigation features throughout the application.

6.1 Top-bar Navigation

Cento Analytics features a navigation bar at the top of the screen containing links to most used pages of Cento Analytics.

| Cento | All Report Templates | New Report | Documentation Writer | Log Off |

Figure 4 - Top Bar Navigation. The user currently logged in has the First Name "Documentation" and the Last Name "Writer."

For all users, the links navigate to the following locations.

Link	Destination
Cento	The Home page of Cento Analytics
All Report Templates	The My Reports page
New Report	The New Report page
Username / First Name and Last Name	The User Settings page
Log Off	Logs the user off. If the user logs in again, they arrive at the Home page

6.1.1.1 See Also:

- Home Page
- Logging Out of Cento Analytics
- Private Reports
- Creating a New Report

6.2 Breadcrumb Navigation

On most pages in Cento Analytics, there is a breadcrumb displaying the logical hierarchy of the current page as it relates to the overall website. The breadcrumb bar features a link to each parent page of the current page. Breadcrumbs enable users to quickly return to a different depth in the website based on the context of their current page.

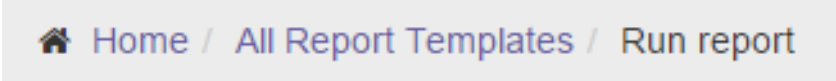
Home / All Report Templates / Run report

Figure 5 - The breadcrumb bar after running an ad-hoc report

In Figure 5, the breadcrumb displays links to the Home page and the All Report Templates page after the user runs an ad-hoc report. In other contexts, the breadcrumb bar shows a different path corresponding to the user's activity.

7 Reporting

Cento Analytics is a sophisticated Reporting Tool. Reporting is the primary purpose of Cento Analytics.

7.1 Flash Reports

A Flash Report is a report developed by Cedaron and shipped as part of Cento Analytics. Flash Reports are reports that mimic reports prepared by the various medical professional societies or those requested by Cedaron customers that have general applicability to a wide range of medical practices. Flash Report templates are read-only and cannot be edited by end users. Users may copy a Flash Report and develop their version of the Flash Report

7.1.1 Flash Report Copyrights

Some Flash Reports are required to carry additional copyright terms beyond the license of Cento Analytics. Most of these licenses require the prominent display of the copyright terms on the Flash Report and its results. Additionally, some Flash Report Copyrights prohibit users from viewing the source of the Flash Report. These reports cannot be copied and are only available in the form dictated by the registry providing the report definition.

7.2 Private Reports

Private Reports are report templates a specific user develops. The report templates are private to that user and cannot be viewed by any other user. Having private reports allows users to probe sensitive subjects without fear of stigma or "being caught" by the peers or subordinates whose data they are investigating.

Private Reports also allows users to track the statistics and figures most relevant to him or her without cluttering the system for other users.

Shared Private Reports are also listed in the Private Reports tab if the currently logged in user is the owner of the report

7.3 Shared Reports

Shared Reports are report templates a specific user developed, then later shared to the entire system. Shared Reports allow users to collaborate in report development, copy and tweak for their purposes, and run reports other users developed to answer specific questions affecting the department or organization.

A Shared Report is editable by all users with access to the report. In effect, a Shared Report is a Private Report for an entire organization

7.3.1 Sharing a Report

To share a report template, navigate to the Report Details page for the report you want to share. Under the Report Type heading, change the value of the "Sharing State" dropdown from "Private Report" to "Shared Report."
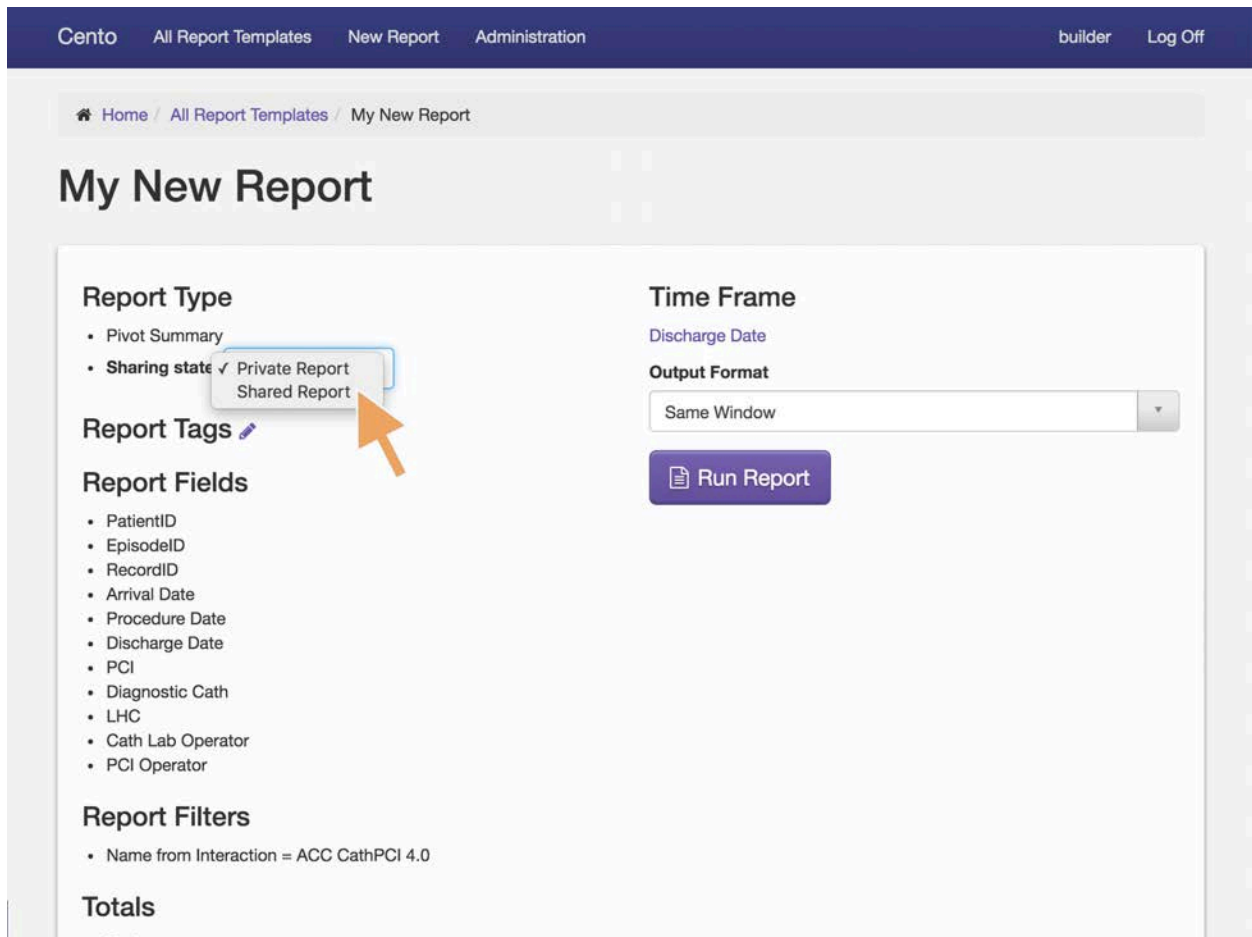
Figure 6 – Changing the Sharing State on a report from Private to Shared

7.3.2   Stop Sharing a Report

To stop sharing a report template, navigate to the Report Details of the report you want to stop sharing. Under the Report Type heading, change the value of the "Sharing State" dropdown from "Shared Report" to "Private Report."

7.4   Finding a Report

All Report Templates live in the same section of Cento Analytics, the "All Reports Page." The All Reports Page divides Reports into three tabs depending on the ownership and editing privileges the currently authenticated user holds for each report.

The tabs are as follows:

Tab Name	Reports Listed
My Reports	Lists any reports owned by the currently authenticated user
Shared Custom Reports	Lists any reports shared to the current facility
Flash Reports	Lists the current inventory of Flash Reports available within Cento Analytics

Each tab features a table of report templates. The table offers several filter and navigation features to aid users in finding Reports.
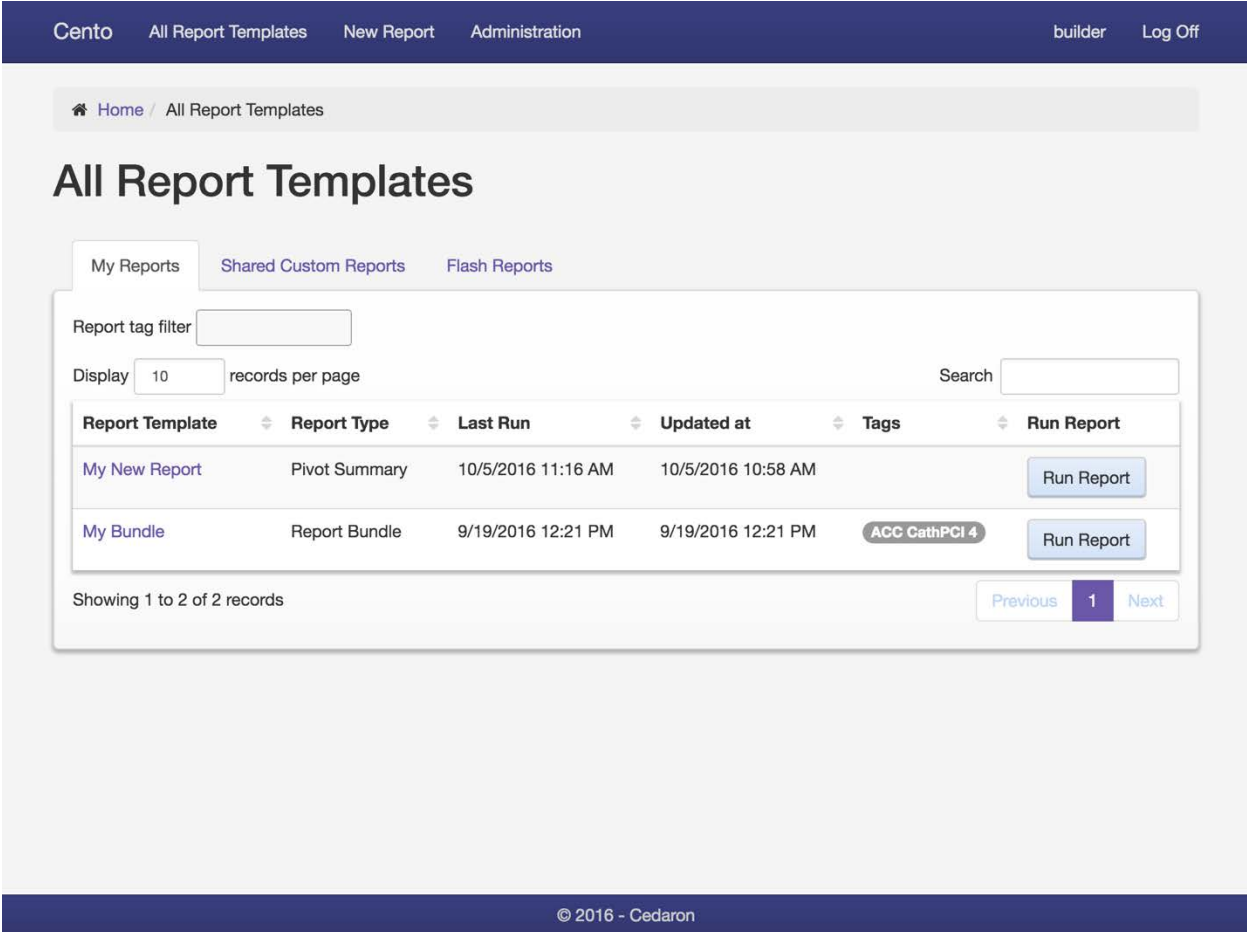
Figure 7 – All Report Templates screen.

7.4.1   Finding a Report by tag

To find reports associated with a specific Report Tag, select the appropriate tag from the "Report tag filter" dropdown.

Figure 8 – Selecting a Tag filter

7.4.2   Searching for a Report by Name

To search for a report by name, type the search term in the search box. If multiple search terms are required, separate each term by a space. The order of the search terms does not matter. All matches are partial word matches (e.g., "edar" matches Cedaron).
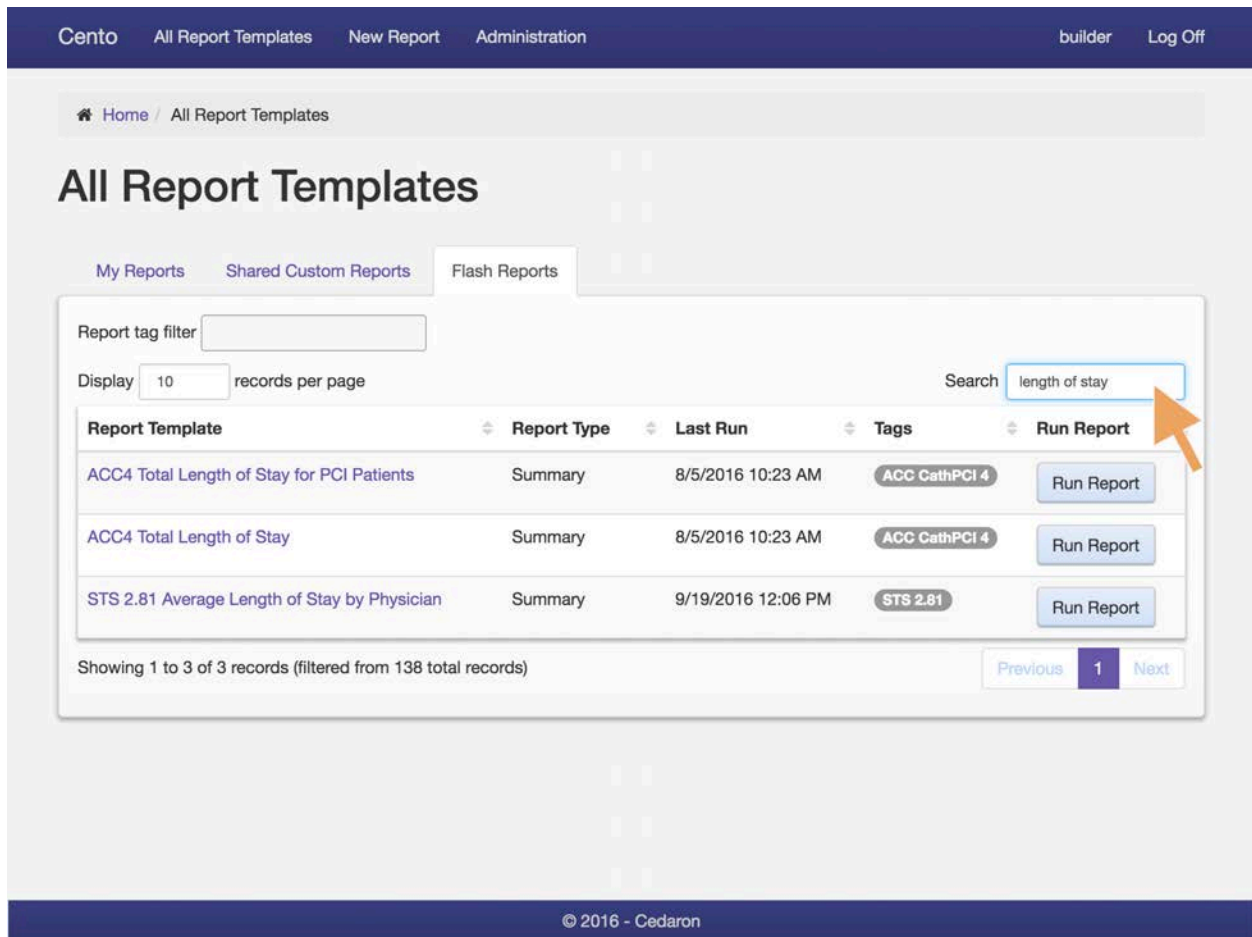
Figure 9 – Typing in "length of stay" to bring up all reports with "length of stay" in the name

7.5   Creating a New Report

To create a new report template, click the "New Report" link in the header of Cento Analytics or the "New Report" link on the Cento Analytics homepage.

The New Report wizard breaks the process of writing a new report down into a series of simple steps, depending the on the Report Type.

7.5.1   Report Components

A Report Template, depending on type, has the following components:

Component	Purpose
Fields	Report Fields are the data points included in a report. Fields may be registry questions, custom questions for a facility, or calculated values based on a CentoScript formula
Filters	Report Filters are data points considered by the report to determine if the results include a particular record. Report Filters compare data points in some way to produce a Yes/No value; a yes values includes the record; a no value excludes the record.
Timeframe	Timeframes are a special kind of Report Filter. Timeframes are a Date or DateTime value marked as the Report Timeframe. Timeframes have

	special UI that automates special forms of time specific parameterization and formula construction.
Groups	Report Groups are the Report Fields by which the Report groups data. Groups are hierarchical in Cento Analytics allowing multiple levels of aggregation in the same report.
Totals	Report Totals are summaries calculated from values provided by Report Fields. Every level of the Grouping hierarchy of a report calculates the totals.
Graphs	Graphs produce charts based upon numeric outputs of a Report. Available graph types include Bar, Line, and Pie Charts
Benchmark Lines	Benchmark Lines add a horizontal line to a bar graph indicating some benchmark value. The definition of a benchmark line is a name and value pair. The Name is the label for the benchmark line and the value is the point at which to draw the benchmark line on the Y-axis of the graph. Benchmark lines require the use of a graph.
Cross-reference summaries	Cross-reference summaries are a particular form of summary for cross-reference reports. A Cross-reference summary chooses the fields to cross-reference and the field to summarize in the report.
Classification Columns	Classification Columns define the columns in a Classification Report. A Column consists of a name and a type. The columns are arbitrary in a Classification Report.
Classifications	A Classification is the name of a row in a Classification Report. The names and number of rows are arbitrary in a Classification Report.
Classification Totals	Classification Totals are the specific formulas to run for any given cell in a Classification Report. Classification Totals are summaries of the entire data set and produce a single value.
Parameters	Report Parameters are pieces of data available in the report which the user specifies at runtime. Parameters allow for advanced reports that change their filters or formulas without changing the report definition.
Cross-version opt-out	The Cross-Version opt-out option allows reports to turn off automatic cross-version analysis. This feature ensures the values in a report are the values for the specific attributes included in the report, not their synonyms.
Processing Steps	Processing Steps provide a mechanism to process the results of a report by running another report on top of it. Processing Steps are an advanced feature that permits the creation of reports answering "having" questions about summary reports.

The following sections describe each type of report.

7.5.2   Simple Report

A Simple Report is a projection of the data selected in Cento Analytics. Each included Report Field corresponds to a column in the Report Output. This is the most basic report type; Simple Reports are basic data dumps from Cento Analytics.

7.5.2.1   Report Components Included
- Fields

- Filters
- Timeframe
- Graphs
- Benchmark lines
- Parameters
- Processing Steps

7.5.3   Summary Report

Summary Reports run aggregation functions on top of your projected data. The output columns of a Summary Report correspond one-to-one with the included Report Totals. Each field included in the report is displayed in the drill-down of the report. Summary reports are the most common type of report and permit the hierarchical organization of data through the Report Groups feature.

7.5.3.1   Report Components Included
- Fields
- Filters
- Timeframe
- Grouping
- Totals
- Graphs
- Benchmark Lines
- Parameters
- Processing Steps

7.5.4   Pivot Summary Report

Pivot Summary Reports are the same as Summary Reports except the output is pivoted. Whereas totals generate columns in a Summary Report, totals generate rows in a Pivot Summary. Each Group in the report output corresponds to a column. Typically, report writers favor a Pivot Summary Report when there are fewer groups than totals in the report (the longer of the two should be the control for the number of rows in the report output).

7.5.4.1   Report Components Included
- Fields
- Filters
- Timeframe
- Grouping
- Totals
- Graphs
- Benchmark Lines
- Parameters
- Processing Steps

7.5.5   Trend Report

Trend Reports run aggregations within a series of time-windows. This permits data-analysts to visualize how data is changing over a time axis.

Time-windows can be sized daily, weekly, quarterly or yearly. Timeframe functionality in Trend Reports behave identically to all other report types.

7.5.5.1 Report Components Included

- Fields
- Filters
- Timeframe
- Totals
- Graphs
- Benchmark Lines
- Parameters
- Processing Steps

7.5.6 Cross-Reference Report

Cross-Reference reports calculate one aggregate total for each intersection of two attributes in Cento Analytics. For instance, a Cross-Reference report of Smoker Status and Gender would include one column for each distinct answer of Smoker Status and one row for each distinct answer of Gender. In each cell of the report (for instance, "Current Smoker" and "Male"), Cento calculates one aggregate total, such as the number of diabetics among that patient cohort.

7.5.6.1 Report Components Included

- Fields
- Filters
- Timeframe
- Groups
- Cross-reference summaries
- Parameters
- Processing Steps

7.5.7 Classification Report

Classification Reports are the most complex type of report in Cento Analytics. A Classification Report gives the report writer full control over each row and column of the report. Each cell of a Classification report contains a custom aggregate formula that defines the value for that intersection of Row and Column.

Classification Reports require the most labor on the part of the Report Writer, but allow a report to cover many different topics on one output screen. It is also possible to achieve custom formatting scenarios involving Classification Reports, such as empty columns or rows for use as spacers.

7.5.7.1 Report Components Included

- Fields
- Filters
- Timeframe
- Classification Columns
- Classifications
- Classification Totals

7.5.8 Saving a New Report

Reports open in the "Report Template Editor" exist only in the user's web browser. If the user closes the browser tab with Cento Analytics open, all report template content the user create is lost. The only time changes made in the Report Template Editor persist is when the user proactively saves the Report Template.

7.5.8.1 *Saving a Report Template*

In order to Save a New Report, click on the "Finish" tab. On this screen, fill the "Report Template Name" textbox with the desired name for the Report. Clicking the "Save Template" button saves the report to the database.

7.5.9 Running Ad-hoc

An "Ad-hoc" report refers to an unsaved Report Template used to generate results. Ad-hoc reports are useful in the rapid prototyping of a more sophisticated report or in the quick dump of some data. Ad-hoc reports are ephemeral and exist only in the user's web browser. As long as the user has their web browser open, the user may re-run the ad-hoc report, modify the ad-hoc report, or save it.

Cento Analytics does not store the source of an ad-hoc report when the ad-hoc report is run. The source is used only to generate the results. The only aspect of an ad-hoc report which the system stores are the results. Stored Ad-hoc results last for no more than 20 minutes or the duration of the caching interval.

7.5.9.1 *Running an Ad-hoc Report*

In order to run an Ad-hoc Report, click on the "Finish" tab of the Report Template Editor. On the Finish tab, select the desired output format. Clicking the "Run Report" button runs the template as an ad-hoc report.

7.6 Navigating the Attribute Tree

The Attribute Tree provides report creators access to the library of Attributes provided by the Integrated System. Only the portions of the tree the user expands are loaded into their web browser in order to provide a fast experience on all devices. The Tree is organized into four primary tiers of data:

Data Level	Description
Entity	The Entity level of the Attribute tree is the topmost level. This level segregates the attributes by the Entity type of the Attributes.
Field / Category	The Field / Category level is the second level of the Attribute Tree. Entity Fields are built-in fields entities have in Cento Analytics. Alongside these fields are Attribute Categories. Attribute Categories are the topmost level of organization for Attributes. What an Attribute Category refers to in an Integrated System depends on the integrated system.
Group	Attribute Groups are the third level of the Attribute Tree. Attribute Groups belong to only one Attribute Category and represent a grouping of attributes within an Attribute Category. What an Attribute group refers to in an Integrated System depends on the integrated system.
Sub-group	Attribute Subgroups are indented groups of attributes in the Attribute tree. Attribute sub-groups help provide additional context for attributes in the attribute tree. Unlike higher levels of Attribute organization, sub-groups are not collapsible.

In addition to the four primary tiers, Integrated Systems may also include Repeated Attributes. Repeated Attributes are data that records the same set of answers multiple times, but once for each entity. Repeated Attributes represent a fifth tier of data organization that is allowed to be infinite.

7.6.1 Attribute Tree Filtering

In addition to normal tree navigation, Cento provides a Filter tool. The Filter provides a partial match search on Attribute Name and a drop-down to filter on Attribute data-types. This filter allows report writers to search specifically for certain types of questions, such as numbers, in order to activate certain portions of the Report Template editor.

7.6.1.1 Filtering the Attribute Tree

To apply an Attribute Filter, click the "Report Fields" button in the Report Template Editor. Above the Attribute Tree, click the "Filter" button. This button opens a modal. The modal contains two inputs – a dropdown for Attribute Type and a textbox for a partial text search on Attribute Name.

To Filter on just "Attribute Type", select a value in the dropdown and press "Apply".

To Filter on just the partial name match, specify a search term in the "Attribute name contains" textbox and press "Apply".

To Filter on "Attribute Type" and "Attribute name contains", populate both inputs and press "Apply"
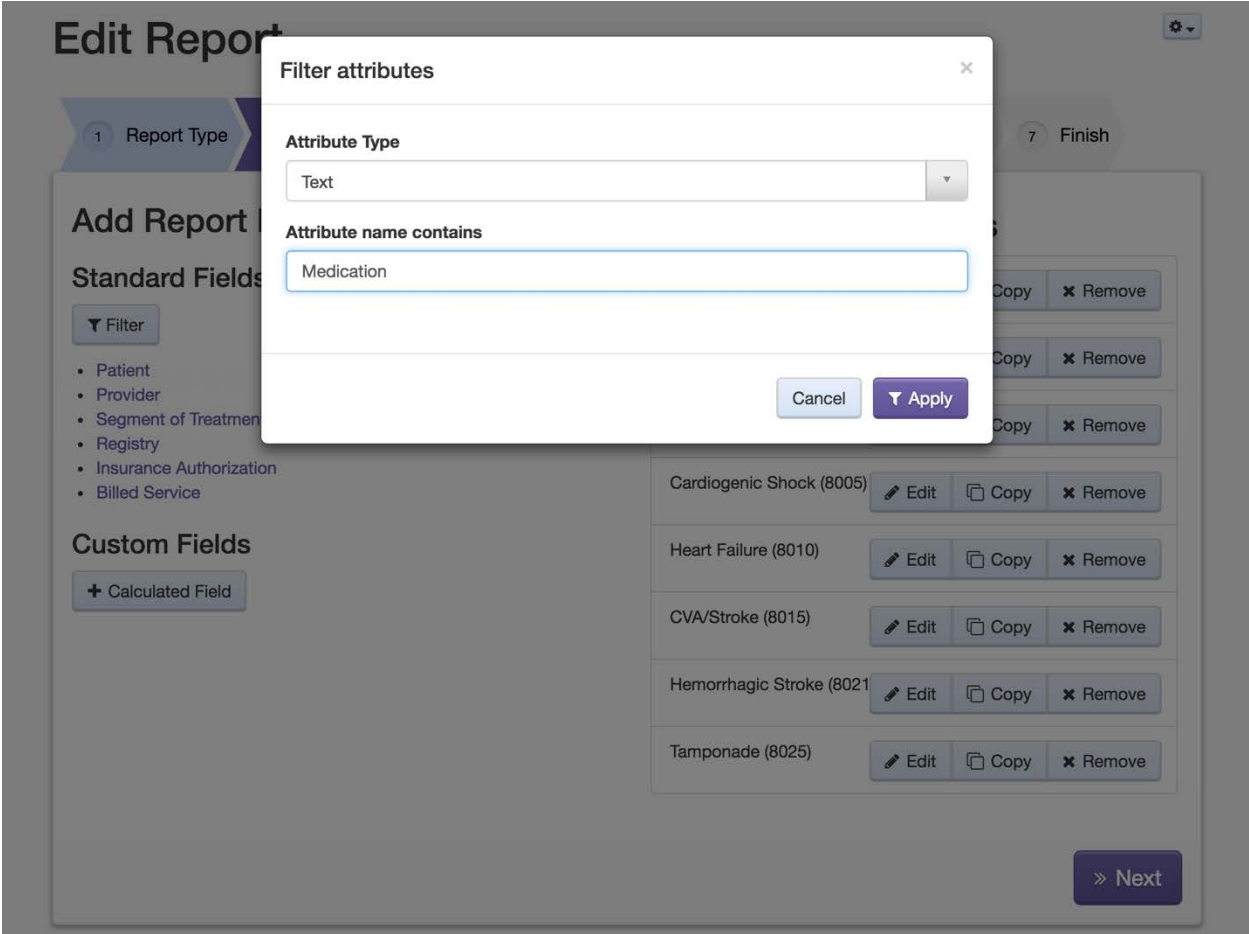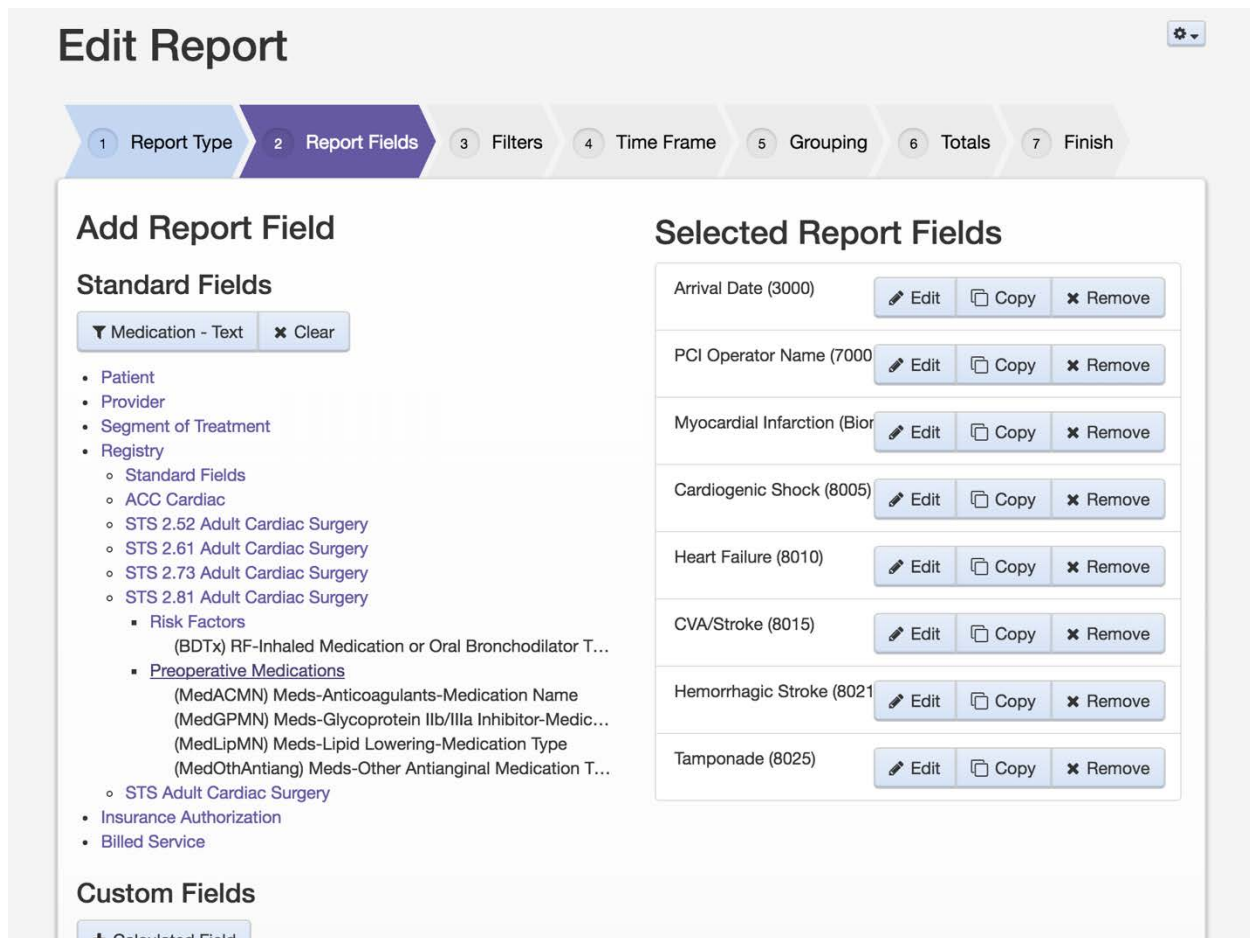
Figure 11 – Report fields after a filter for fields containing "Medication" has been applied

7.6.1.2   Clearing an Attribute Tree Filter

When an Attribute Tree Filter is applied, the text of the "Filter" button changes to the search term and/or the Attribute Type specified as the filter.

To clear the applied filter, press the adjacent "Clear" button.

7.6.1.3   Changing an Attribute Tree Filter

When an Attribute Tree Filter is applied, the text of the "Filter" button changes to the search term and/or the Attribute Type specified as the filter.

To change the applied filter, press the "Filter" button. Since the text of this button changes with the search term used, you will need to press the button containing your search term.

7.7   Adding Fields to a Report

Report writers add attributes to a New Report on the "Report Fields" tab of the Report Template Editor. The attribute tree offers two mechanisms for adding fields to the report: "Drag and Drop" and the "Add" button.

The Add button is only available on systems that use a keyboard and mouse. Drag and Drop is available on all supported systems.

7.7.1.1 Add an Attribute Via Drag and Drop

To add an attribute via the "Drag and Drop" method, expand the attribute tree to the attribute you wish to add to the report fields. If you tap and hold or click and hold, the attribute will become a purple bubble tracking your finger.

Figure 12 – Drag and drop method of adding "Diagnostic Cath Operator Name" attribute to a report

Valid drop targets are indicated by a dashed outline. To complete a drag and drop, move your finger/cursor over the drop zone and release the drag operation.

7.7.1.2 Add an Attribute Via the Add Button

To add an attribute via the "Add" button, expand the Attribute Tree to the desired attribute. On a non-touchscreen device, hover over the Attribute with the mouse pointer. The "Add" button for that attribute should appear. Clicking the "Add" button adds the Attribute to the report.

7.7.1.3 Removing an Attribute from a Report

To remove and attribute, hover the Attribute in the list of Report Fields. Press the "Delete" button that appears. A confirmation modal will open, confirming that you want to delete the Report Field. Press "Delete" to delete the Report Field.

On a touch screen, the delete button is always visible.

7.8 Adding Filters to a Report

Report writers add filters to a New Report using the "Filters" tab of the Report Template Editor. The Report Filters tab offers two mechanisms for adding filters to the report: "Drag and Drop" and the "Add" button.

Like Report Fields, the Add button is available only on systems that use a keyboard and mouse. Drag and Drop is available on all supported platforms.

The Report Filters tree is deeper than the standard attribute tree. The Filters tree includes a level below the Attribute level. Expanding the Attribute level of the Filters tree reveals shortcuts for adding common filters based on the Attribute's data type, such as "Is Blank" and "Is Not Blank". Where applicable, this tree level displays equality shortcuts for the most common values of the Attribute.

7.8.1.1 Add a Report Filter via Drag and Drop

To add a Report Filter via the "Drag and Drop" method, expand the Attribute tree to the attribute you wish to add to the Report Filters. If you tap and hold or click and hold, the attribute will become a purple bubble tracking your finger.
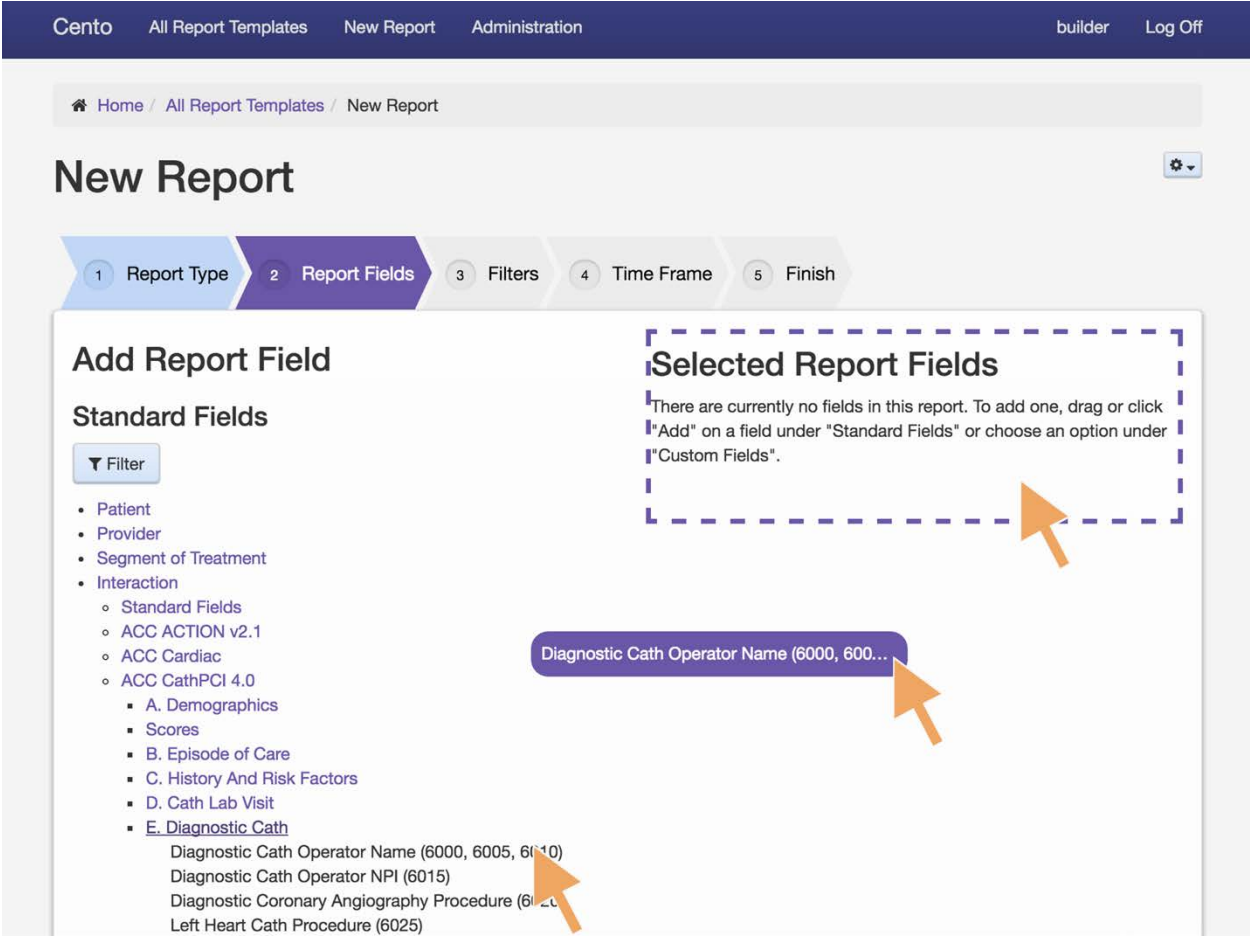
Valid drop targets are indicated by a dashed outline. To complete a drag and drop, move your finger/cursor over the drop zone and release the drag operation.
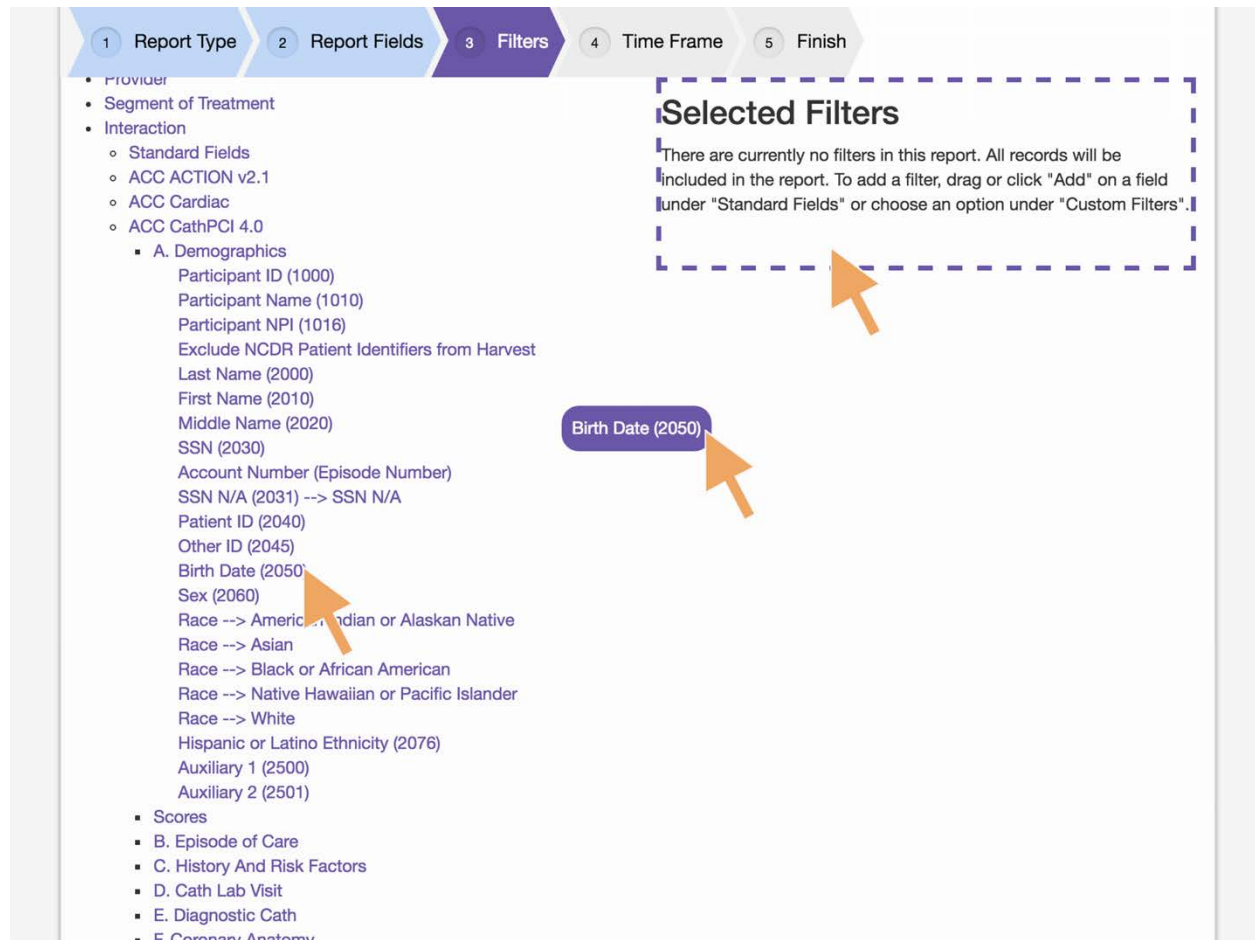
Dropping the Attribute opens the Report Filter modal. This modal allows you to select the kind of comparison you would like for the report filter.

Once your decisions is final, press the "Add" button to add the filter to the report.
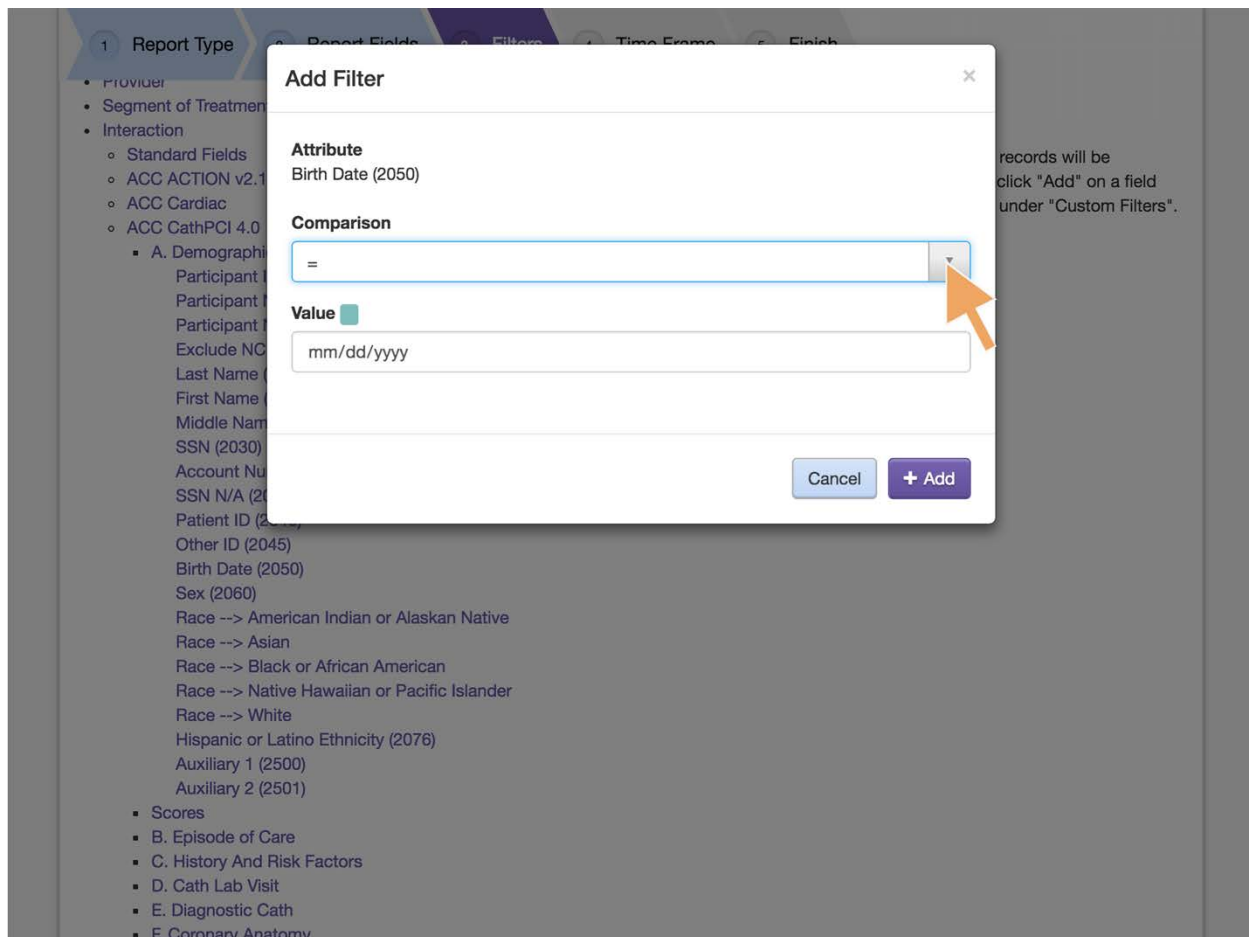
Figure 14 – The Report Filter Modal for Birth Date

7.8.1.2   Add a Report Filter via the Add Button

To add a filter via the "Add" button, expand the Attribute Tree to the desired attribute. On a non-touchscreen device, hover over the Attribute with the mouse pointer. The "Add" button for that attribute should appear. Clicking the "Add" button opens the Report Filter modal. This modal allows you to select the kind of comparison you would like for the report filter.

Once your decision is final, press the "Add" button to add the filter to the report.

7.8.1.3   Add a Report Filter Shortcut

To add a Report Filter Shortcut, expand the attribute tree to the attribute you want to create a filter based on. Click this attribute to expand the sub-options for that attribute. Use the "Add" button or "Drag and Drop" mechanism to add the filter shortcut to the Report Template.

7.9 Adding a Timeframe to a New Report

Report Timeframes are a special kind of parameterized filter. In order to add a Report Timeframe, the Report must contain at least one date or date and time type report field.

Cento Analytics has two concepts of Report Timeframes: Fixed Timeframes and Relative Timeframes

Timeframe Type	Description
Fixed	A fixed timeframe is a timeframe that has a specific start and end date. These timeframes are static as part of the Report Template and do not change depending on the date of the report's execution.
Relative	A relative timeframe is based on the current date. Relative timeframes consist of an offset from today, what unit the offset is in, and how many steps of that unit to include in the timeframe. A relative timeframe specifies a formula used to calculate the timeframe filter, based on today. The exact dates used in the timeframe depend on the date of report execution.

7.9.1.1 Selecting a Timeframe Field

To add a Timeframe field to a report, click on the "Time Frame" tab in the Report Template Editor. If the report does not contain an eligible report field, the tab displays a button labeled "Report Fields". Clicking this button selects the Report Fields tab and applies an Attribute Tree filter to the correct Attribute types for a Report Timeframe.
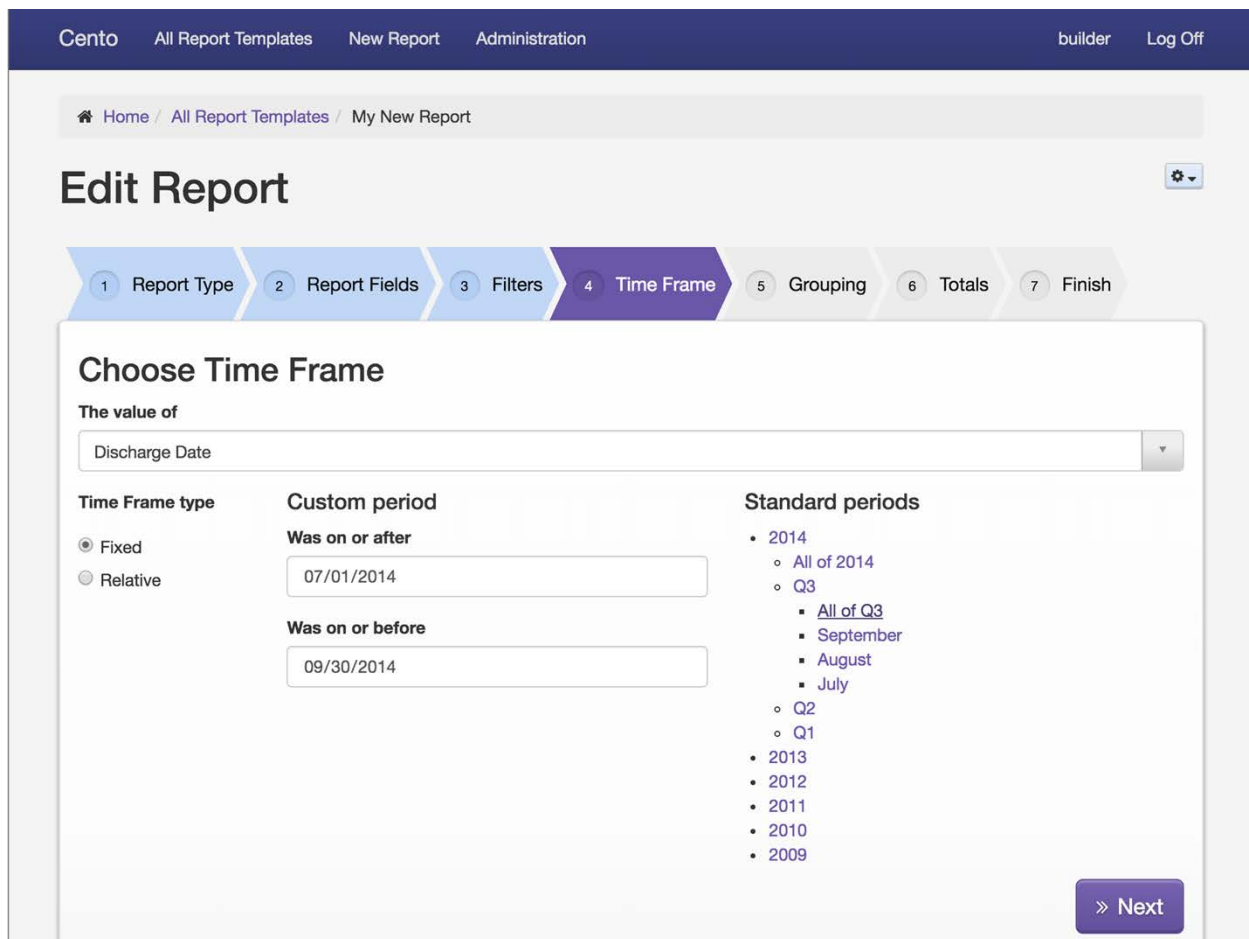
Figure 15 – Adding a Fixed Time Frame to a report

If an appropriate Report Field exists, the Timeframe tab displays a dropdown for selecting a Timeframe field. Selecting a value other than "none" in the Timeframe dropdown includes that Report Field as the Report's timeframe field.

To choose values for the Report Timeframe, select the Timeframe Type, "Fixed" or "Relative".

For Fixed Timeframes:

Either enter the desired fixed timeframe or use the "Standard Periods" tree to select a date-range. The dates displayed in the "Standard Periods" tree are based on data in Cento Analytics, when applicable

For Relative Timeframes:

Relative Timeframes have more options then Fixed Timeframes. The following table explains the options under Relative Timeframes:

Option	Effect
Starting	The "Starting" textbox indicates the number of Units before today to begin the relative timeframe
For	The "For" textbox indicates how many units of time to include in the timeframe

Units	The "Units" dropdowns allow the report writer to specify what units of time to use in the relative timeframe calculation. The choices are "Days", "Weeks",
Use whole units	The "Use whole units" checkbox moves the relative timeframe backwards to include the nearest whole unit of the beginning of the timeframe
To date	If "Use whole units" is selected, the "To Date" checkbox advances the relative timeframe to include the current date.

7.10 Adding Classification Columns to a Report

Classification Columns define the Columns in a Classification Report. Classification Columns consist of a Name and a Type. The Name of the Classification Column defines the label to use in the Report Results and the Type controls the type of Classification Total permitted in that column

7.10.1.1 Add a Classification Column to a Classification Report

To add a Classification Column to a Classification Report, click on the "Columns" tab in the Report Template Editor.

The "Classification Column Name" input specifies the name of the Classification Column.

The "Classification Column Type" input specifies the type of the Classification Column.

After specifying both Name and Type, pressing the "Add Classification Column" adds the column to the report.
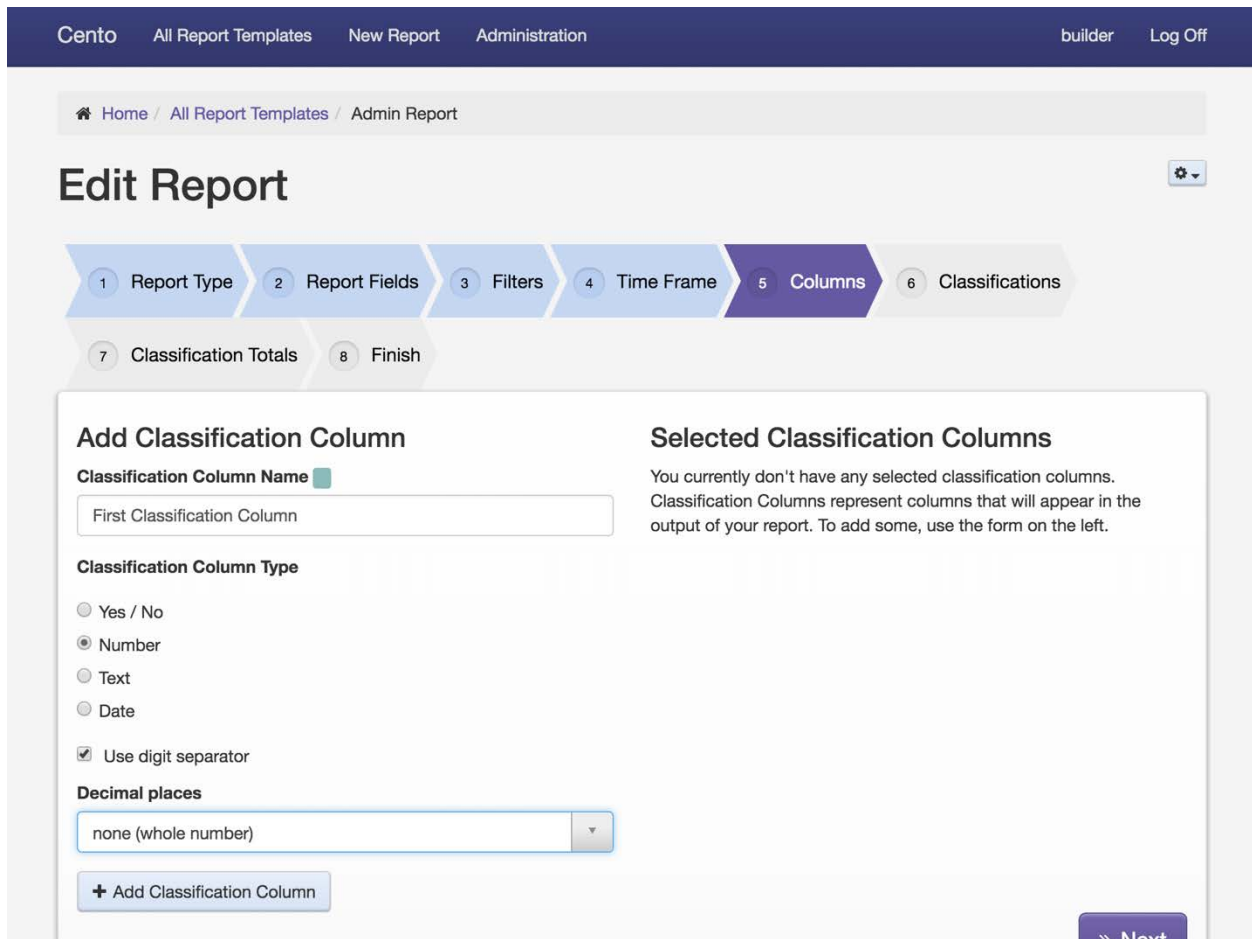
Figure 16 – Adding a Classification Column called "First Classification Column" to a report

7.11 Adding Classifications to a Report

Classifications are titles for the rows of a Classification Report. Classifications consist of a single property – the label to use for that row in Report Results.

7.11.1.1 Adding a Classification

To add a Classification, select the "Classifications" tab.

Provide a Classification Name and press the "Add Classification" button.
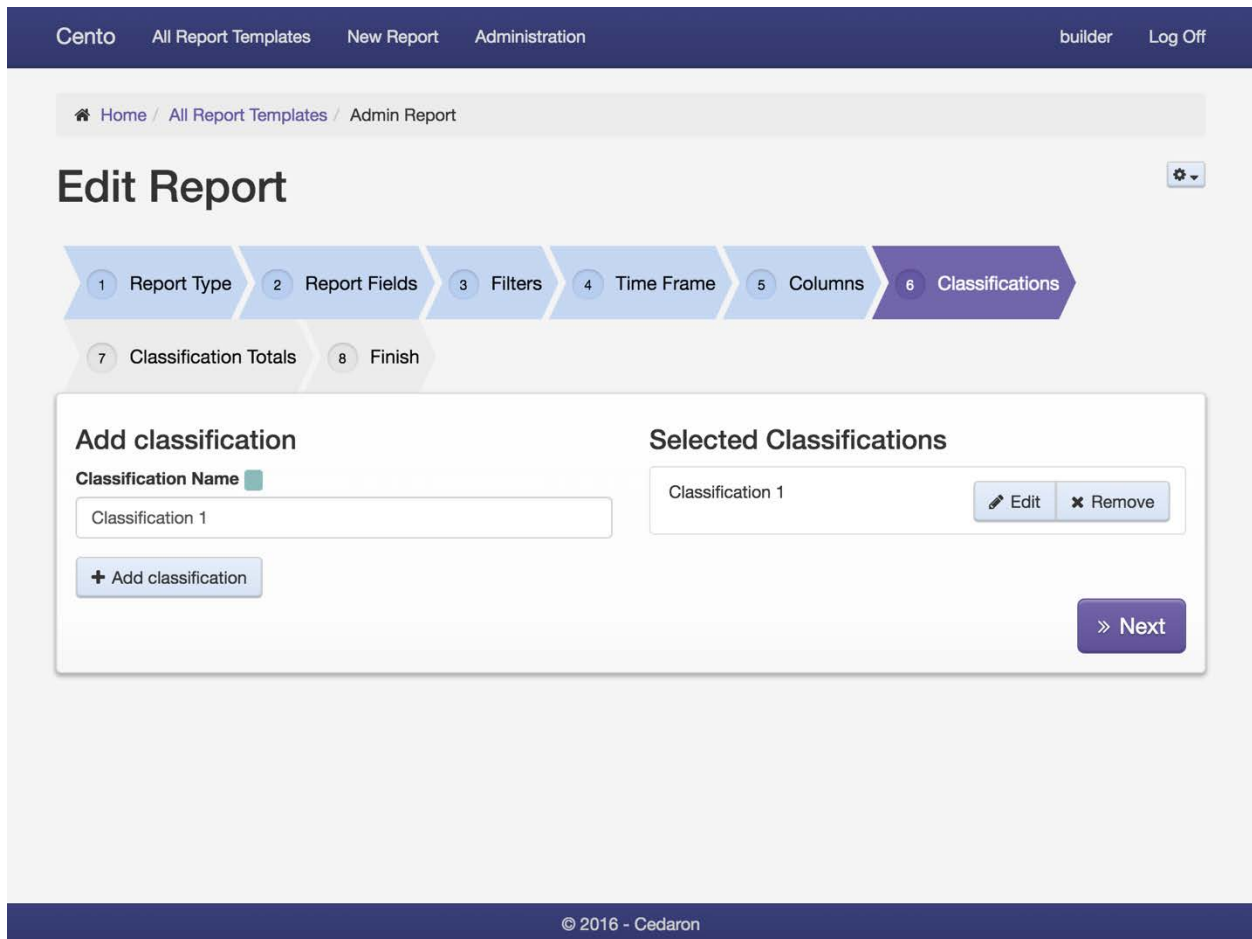
Figure 17 – Adding a Classification to a report

7.12 Adding Classification Totals to a Report

Classification Totals are aggregate expressions specified in the cells formed by the intersection of Classifications and Classification Columns. Classification Totals always operate on all results that match the filter applied to the report. All Classification Totals in a particular column must match the data type of the Classification Column.

7.12.1.1 Add a Classification Total

To add a Classification Total, click the "Classification Totals" tab. Choose the cell you wish to add a Classification Total to and press the "Add Calculated Total" button.

In the modal that opens, provide the aggregation formula for that cell.

7.12.1.2 Editing a Classification Total

To edit a Classification Total, click the "Classification Totals" tab. Choose the cell you wish to modify and press the "Edit" button.

In the modal that opens, change the aggregation formula for that cell.

7.13 Adding Parameters to a Report

If you wish to use Parameters in a report, you must first go to the "Report Type" tab and make sure the "Report has execution parameters" checkbox is checked. Once this is checked, you will see a "Report Parameters" tab.
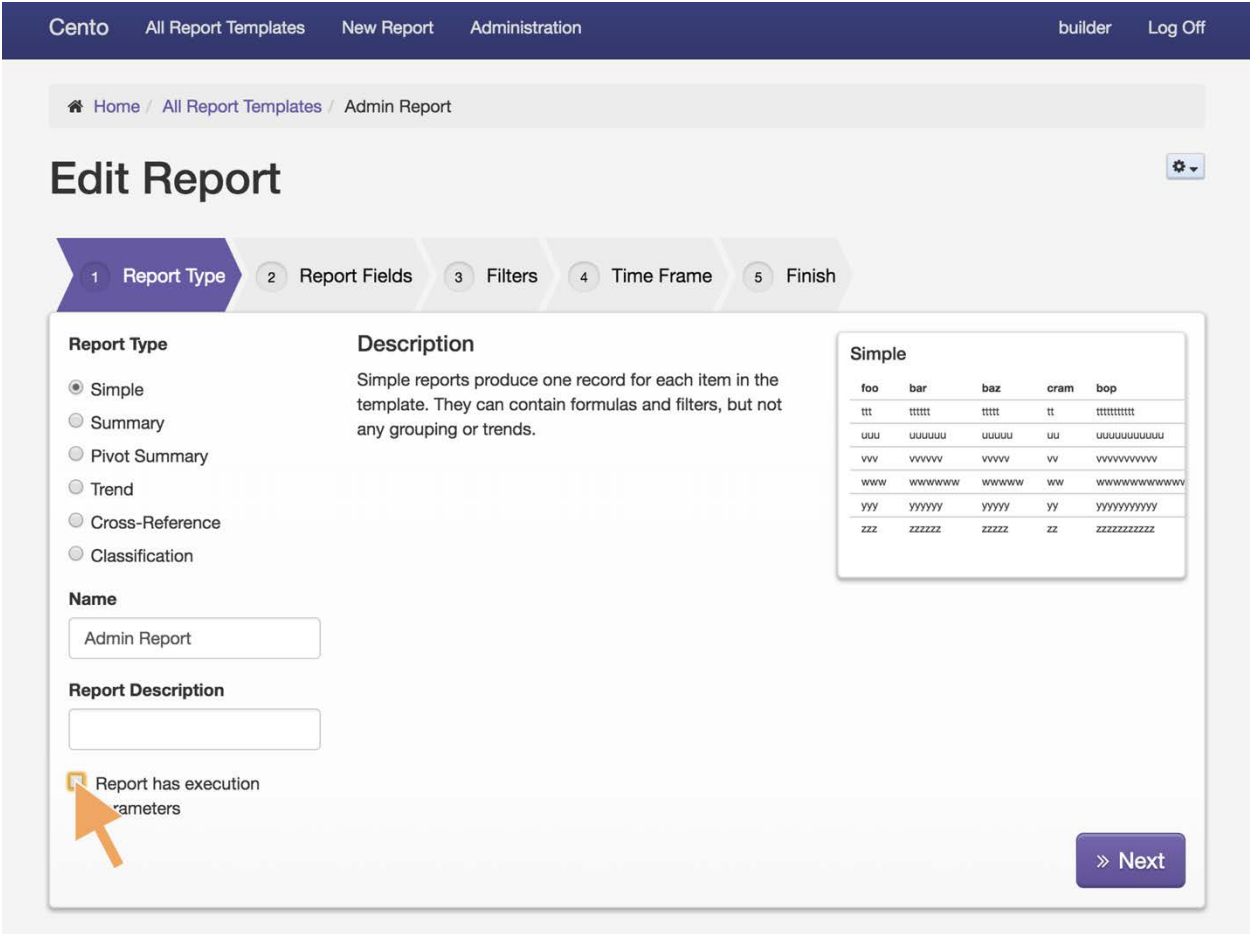
Figure 18 – Adding execution parameters to a report

On the "Report Parameters" tab, click the "Add" button. Provide a name and a type for the parameter. You also have the option of specifying the default value for the parameter and whether or not that parameter is required to have a value before anyone can run the report. Once satisfied, click the "Add parameter" button.
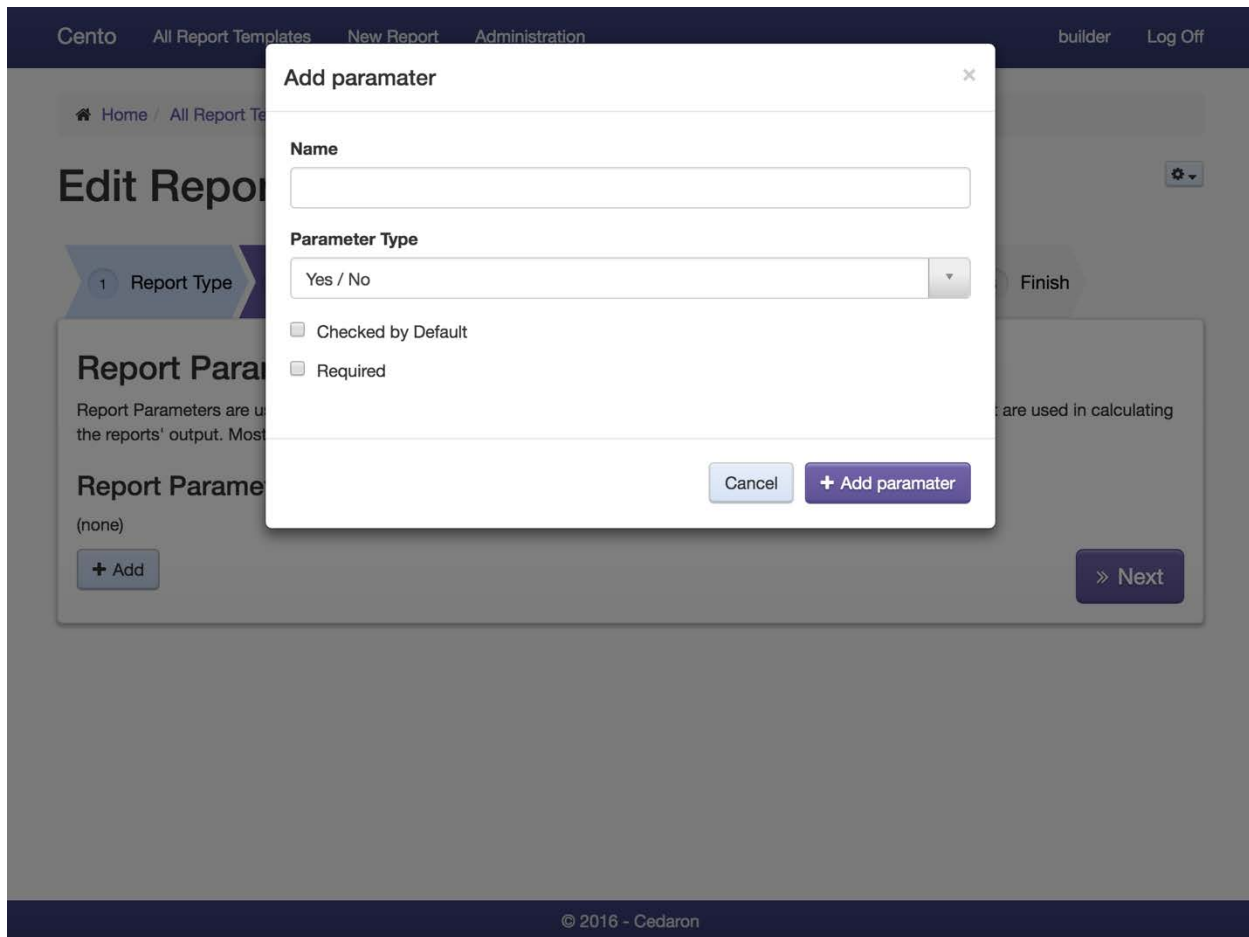
Figure 19 – Add parameters modal

You should now see the parameter you just added in the provided list. This parameter will now be able to be added to "Report Parameters", "Filters" and "Totals". It will also prompt the user for a value when attempting to run the report.

7.13.1 Opting Out of Cross-Version

If you do not wish for a specific report to use the Cross-Version functionality, open that report. Once there, click on the gear button on the top-right of the screen for more options and select "Cross Version". Check the "Use specific versions of attributes" checkbox and save the report.

7.14 Adding Groups to a Report

Report writers add groups to a report using the "Grouping" tab of the Report Template Editor. The Grouping tab offers two mechanisms for adding filters to the report: "Drag and Drop" and the "Add" button.

Like Report Fields, the Add button is available only on systems that use a keyboard and mouse. Drag and Drop is available on all supported platforms.

7.14.1.1 Add a Group via Drag and Drop

To add Grouping via the "Drag and Drop" method, choose the attribute you want to group. If you tap and hold or click and hold, the attribute will become a purple bubble tracking your finger.

Valid drop targets are indicated by a dashed outline. To complete a drag and drop, move your finger/cursor over the drop zone and release the drag operation.

Dropping the Attribute will group the data.
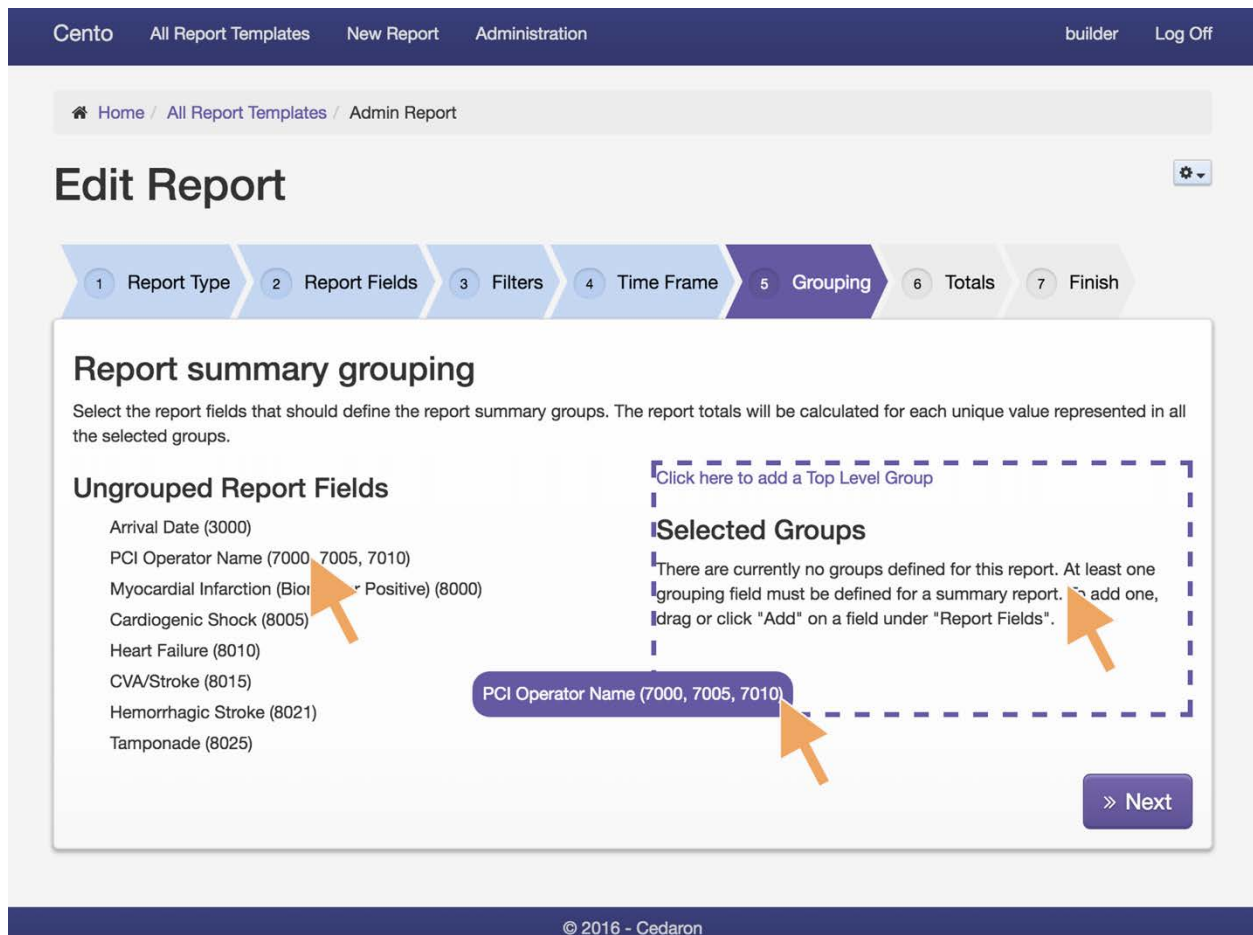
Figure 20 – Adding a group for PCI Operator Name to the report using drag and drop

7.14.1.2 Add a Group via the Add Button

To add a group via the "Add" button, expand the Attribute Tree to the desired attribute. On a non-touchscreen device, hover over the Attribute with the mouse pointer. The "Add" button for that attribute should appear. Clicking the "Add" button will create the group.
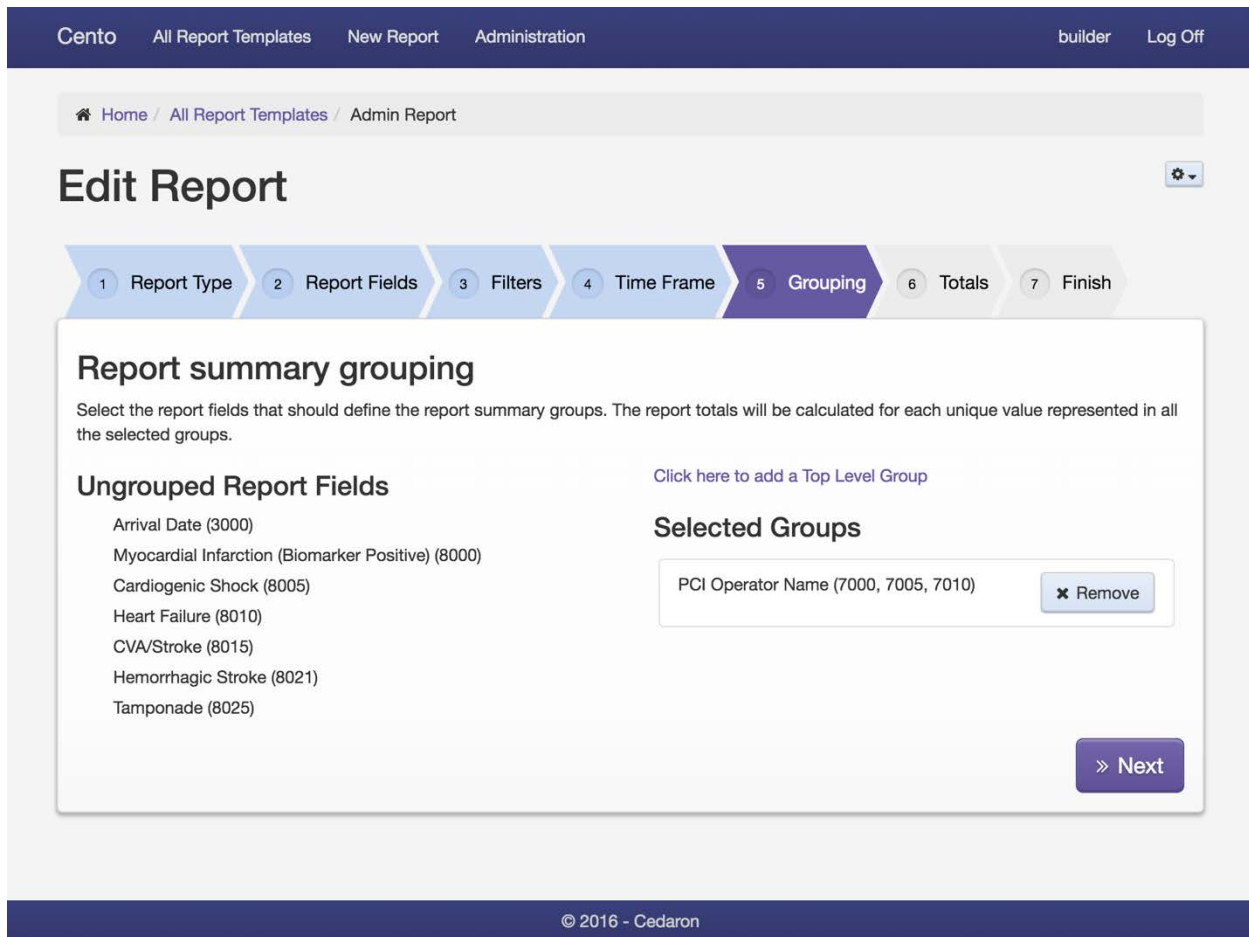
Figure 21 – A report with summary grouping for PCI Operator Name

7.14.2 Adding Totals to a Report

Report writers add Totals to a report using the "Totals" tab of the Report Template Editor. The Totals tab offers two mechanisms for adding filters to the report: "Drag and Drop" and the "Add" button.

Like Report Fields, the Add button is available only on systems that use a keyboard and mouse. Drag and Drop is available on all supported platforms.

7.14.2.1 Add a Total via Drag and Drop

To add Total via the "Drag and Drop" method, choose the attribute you want to Total. If you tap and hold or click and hold, the attribute will become a purple bubble tracking your finger.

Valid drop targets are indicated by a dashed outline. To complete a drag and drop, move your finger/cursor over the drop zone and release the drag operation.

Dropping the Attribute will bring up the Add Total Modal.
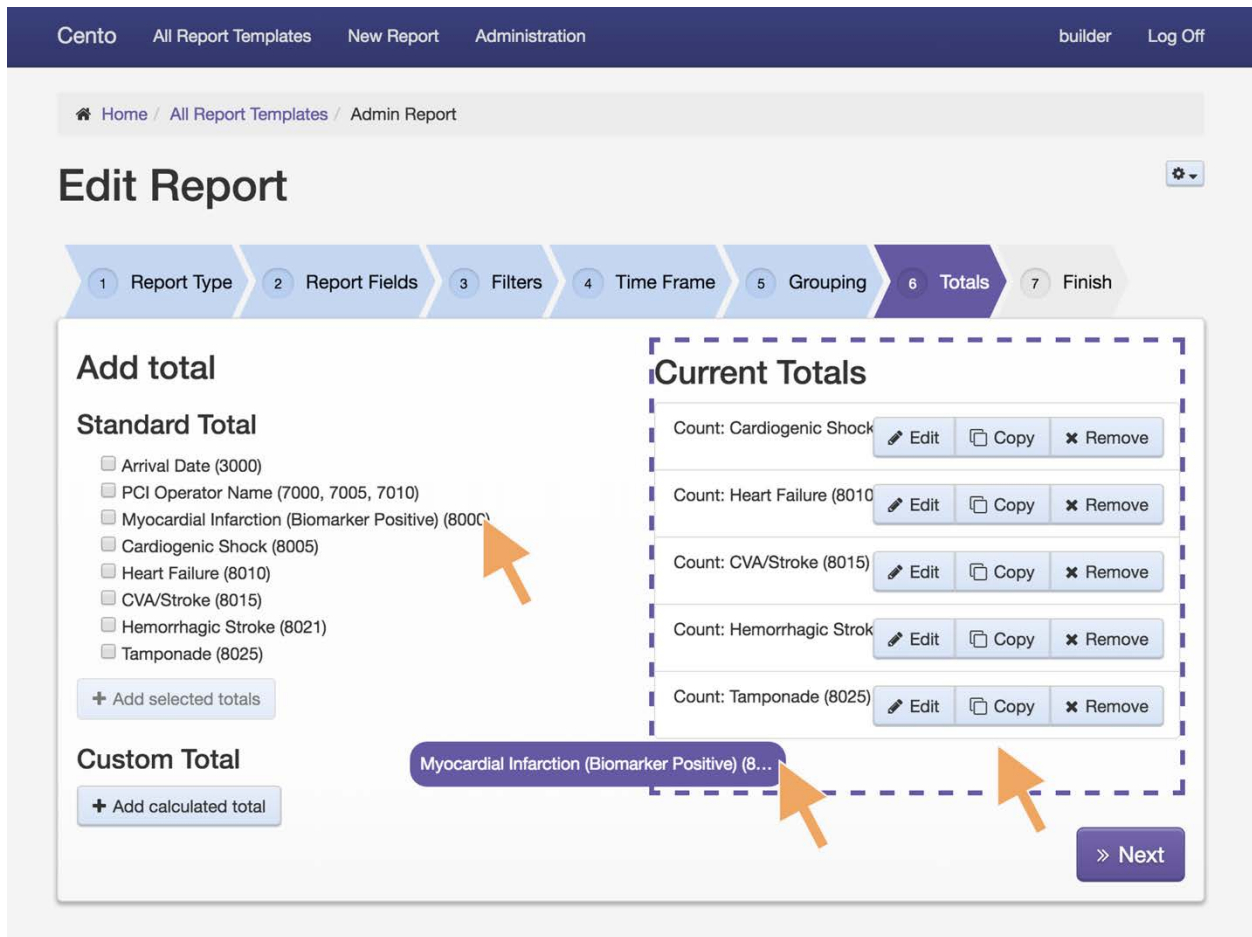
Figure 22 – Adding a Total for Myocardial Infarctions to a report

7.14.2.2   Add a Total via the Add Button

To add a Total via the "Add" button, on a non-touchscreen device, hover over the Attribute with the mouse pointer. The "Add" button for that attribute should appear. Clicking the "Add" button will bring up the Add Total Modal.

7.14.2.3   Add Total Modal

Adding a total to the report will bring up the Add Total Modal. Select a Summary Type (e.g., "Count" or "Mean") and click Add total to add the total to the report.
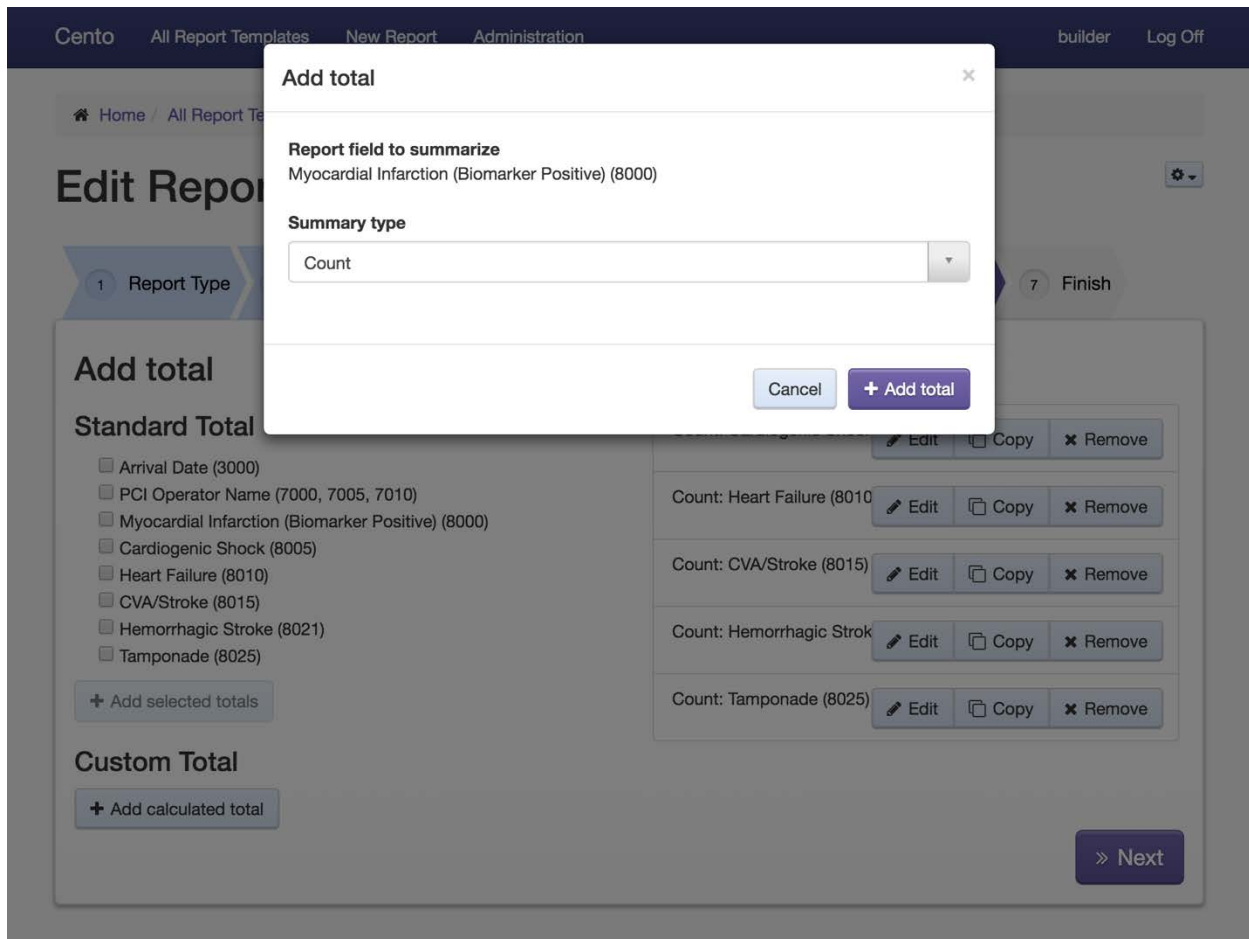
Figure 23 – The Add total modal

7.15 Adding a Graph to a Report

Report writers create graphs of reports using the "Finish" tab of the Report Template Editor. Graphs are only available for "Summary", "Pivot Summary", or "Trend" reports.

To add a graph, choose the graph type. For each graph type, there may be additional options for how the graph is displayed, including "Graph Bars," "Bar Labels," "Pie Slice Labels," "Relative Slice Labels," "X Coordinate" and/or "Y Coordinate."

Figure 24 – Adding a bar graph to a report from the Finish tab

7.15.1 Adding Benchmark Lines to a bar graph

To add Benchmark Lines to bar graphs, make sure that the Graph Type is either Bar, Stacked Bar, or Multiple Graph Bar. Click the "Add" button under the "Benchmark Lines" label.
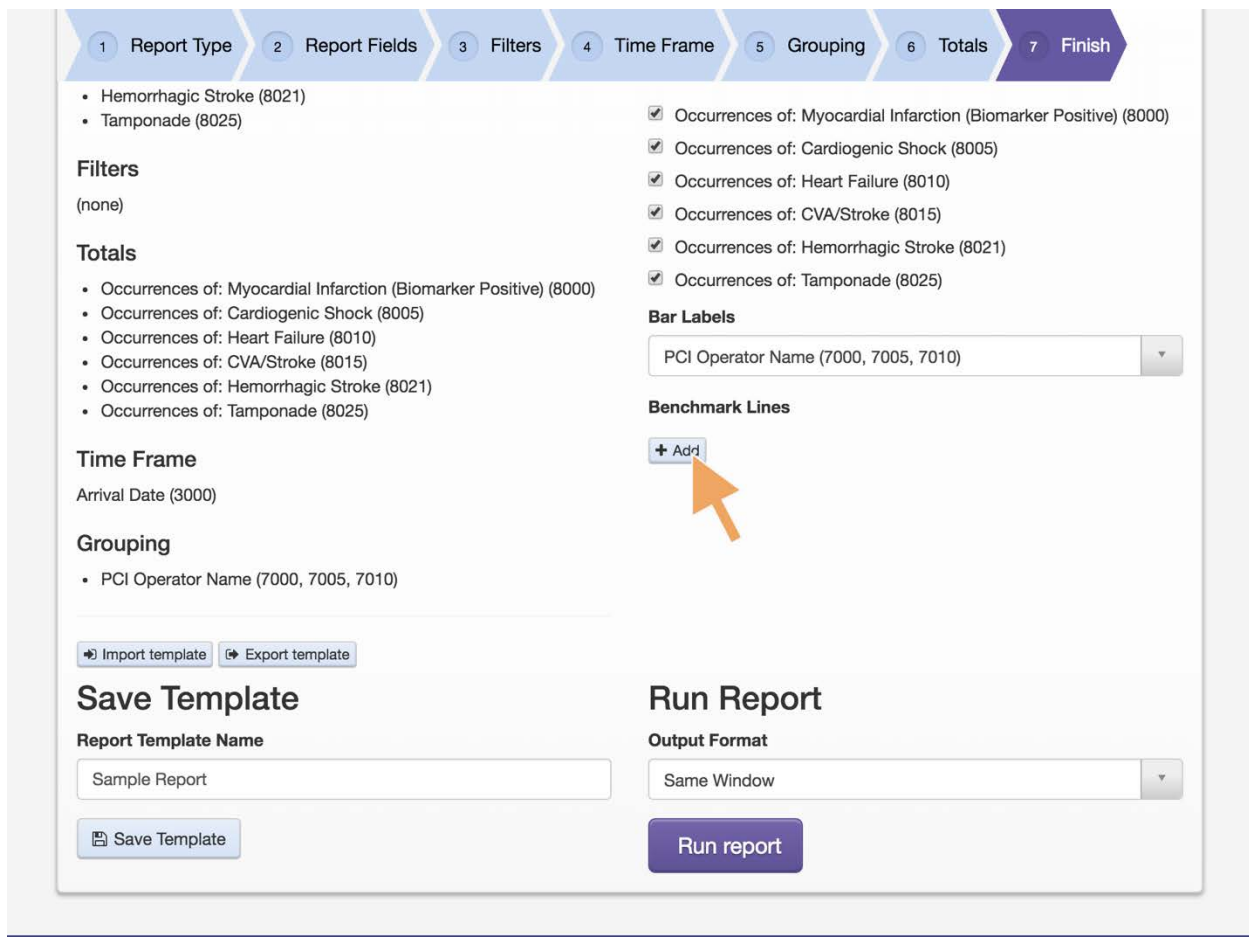
Figure 25 – Click Add under Benchmark Lines to add a benchmark line to the report

Clicking the Add button will bring up options for the Benchmark Line, including a name and a value. To add the line, click the Save Changes button.

To add multiple Benchmark Lines, repeat the process by saving changes and clicking add, then applying a name and value, and saving again.
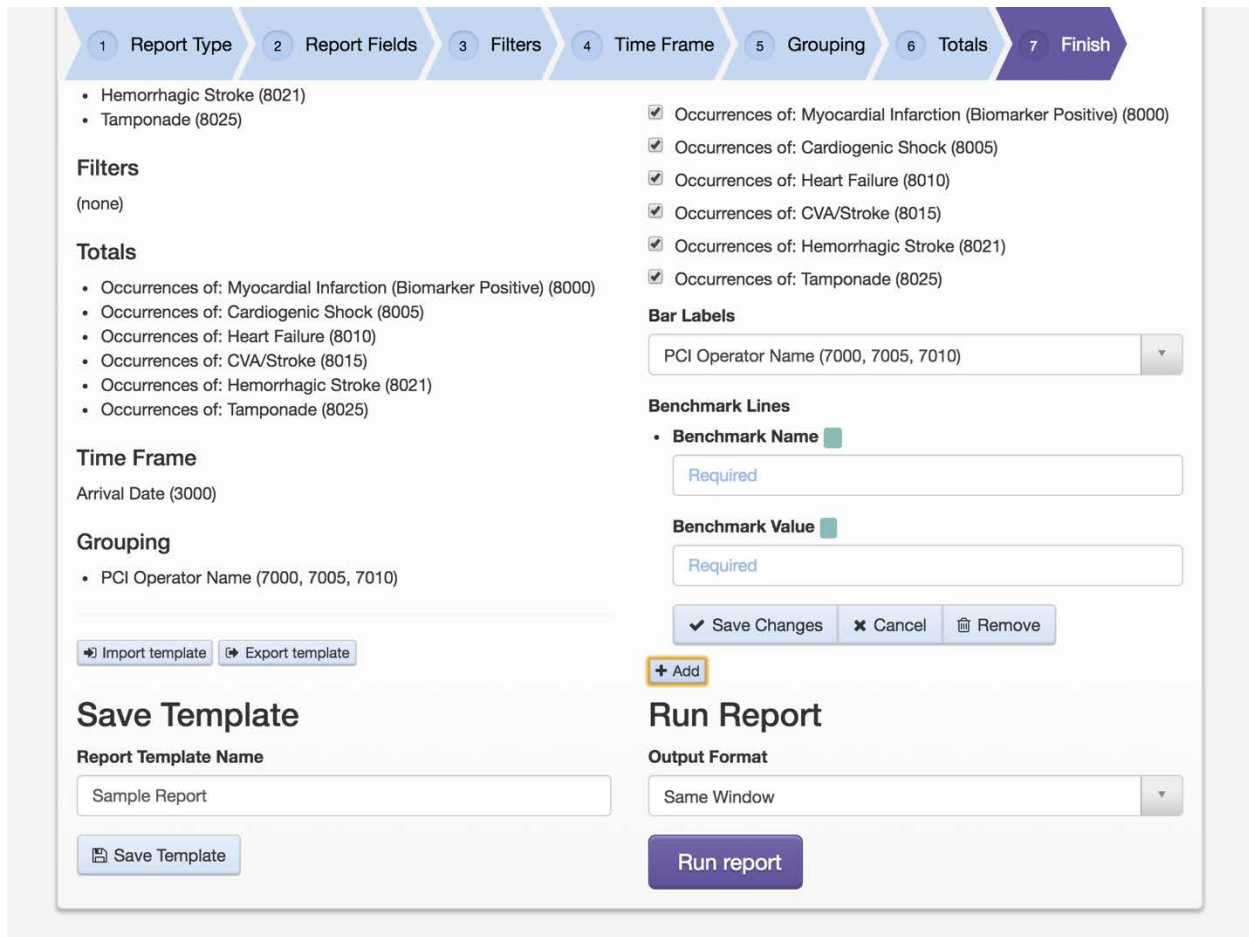
Figure 26 – Additional Options available for adding Benchmark Lines

7.16 Exporting a Report

Report writers can export a report in order to archive it or transfer it to another system from the "Finish" tab of the Report Template Editor.
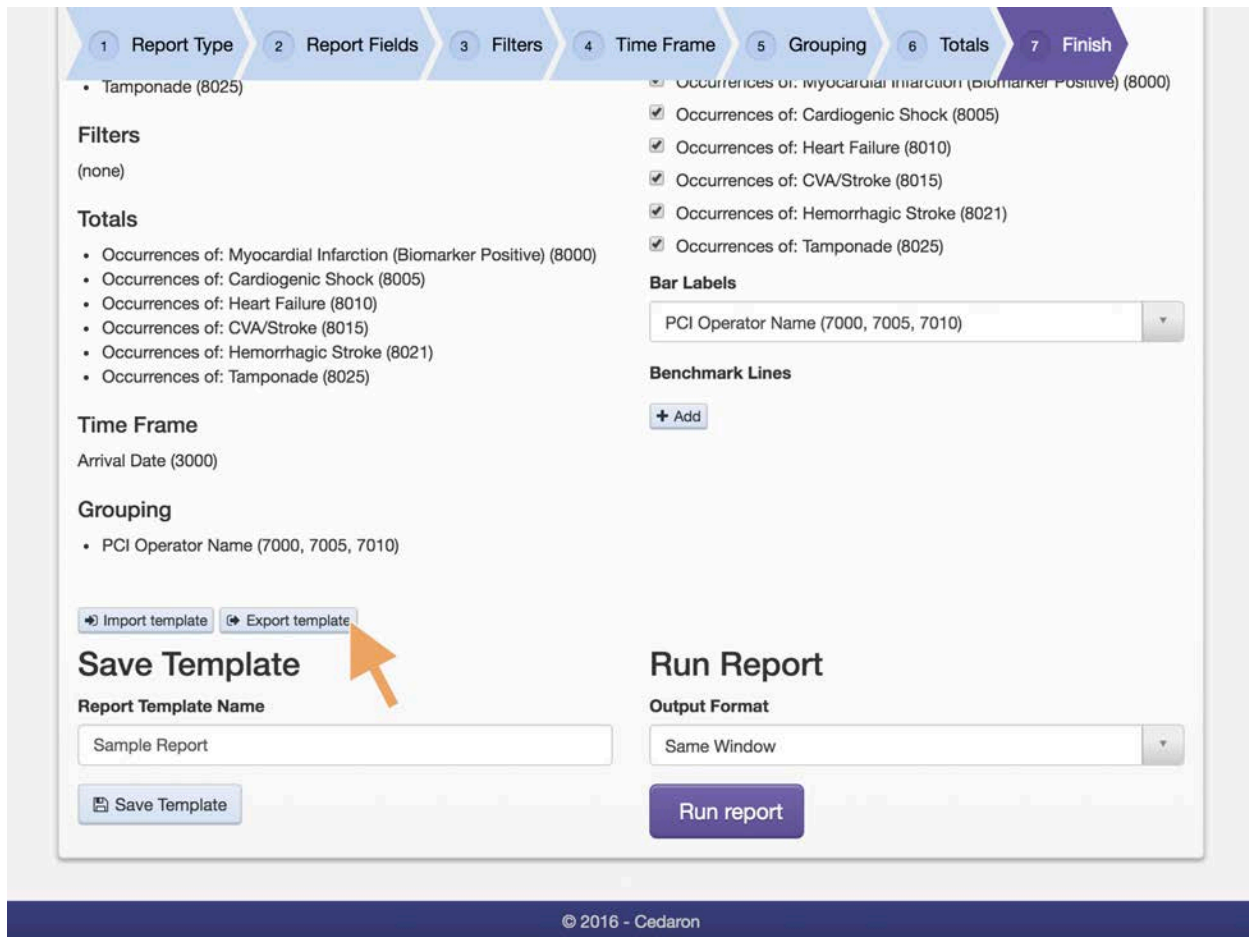
Figure 27 – Clicking the Export template button on the Finish tab to bring up the modal

Clicking "Export template" will bring up a modal with the export text. Copy this text and paste it into a document in order to save it.
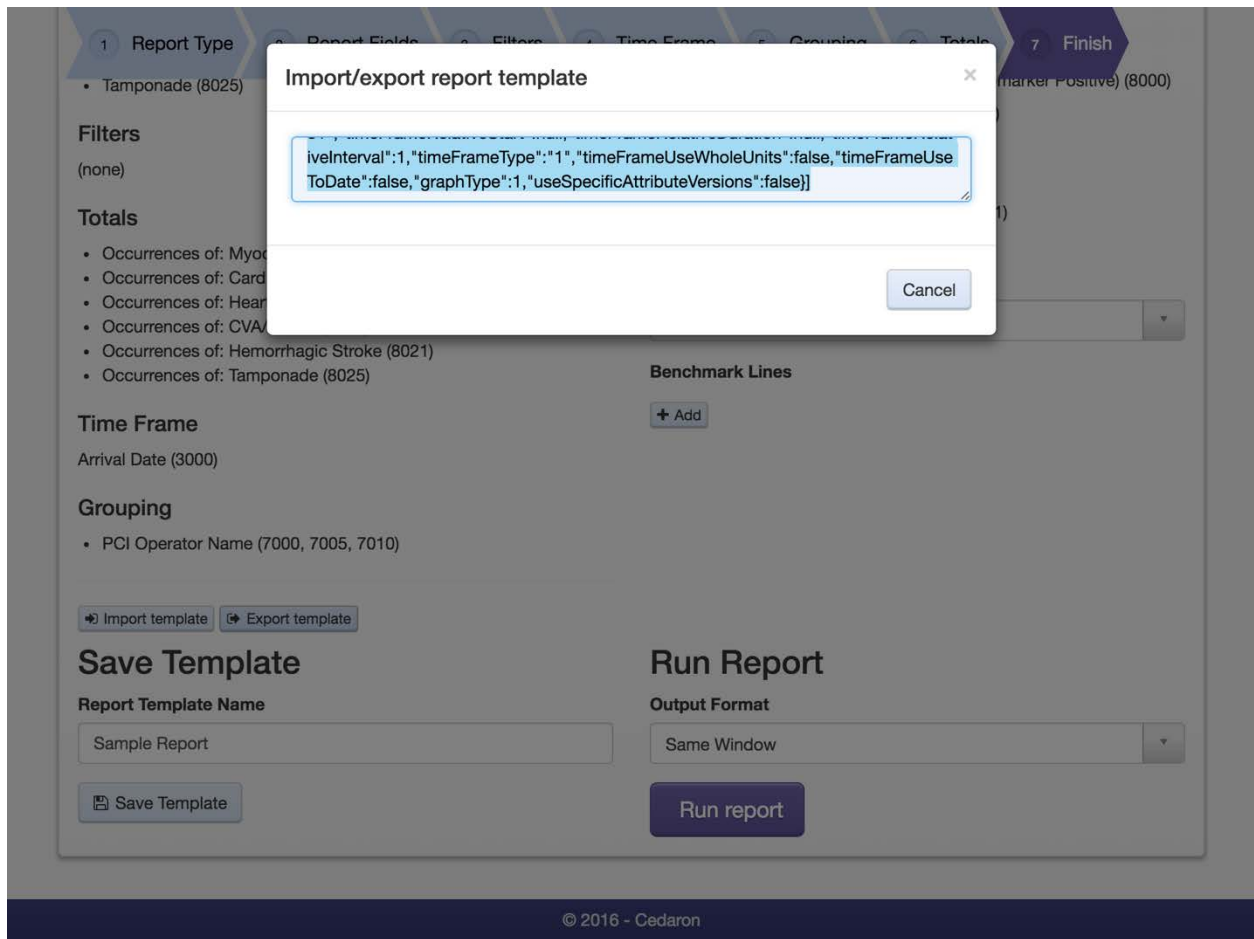
Figure 28 – The Import/export report template modal with selected text. Copy and paste from here to save the report.

7.17 Importing a Report

Report writers can import a report by clicking the "Import Template" button from the "Finish" tab of the Report Template Editor.
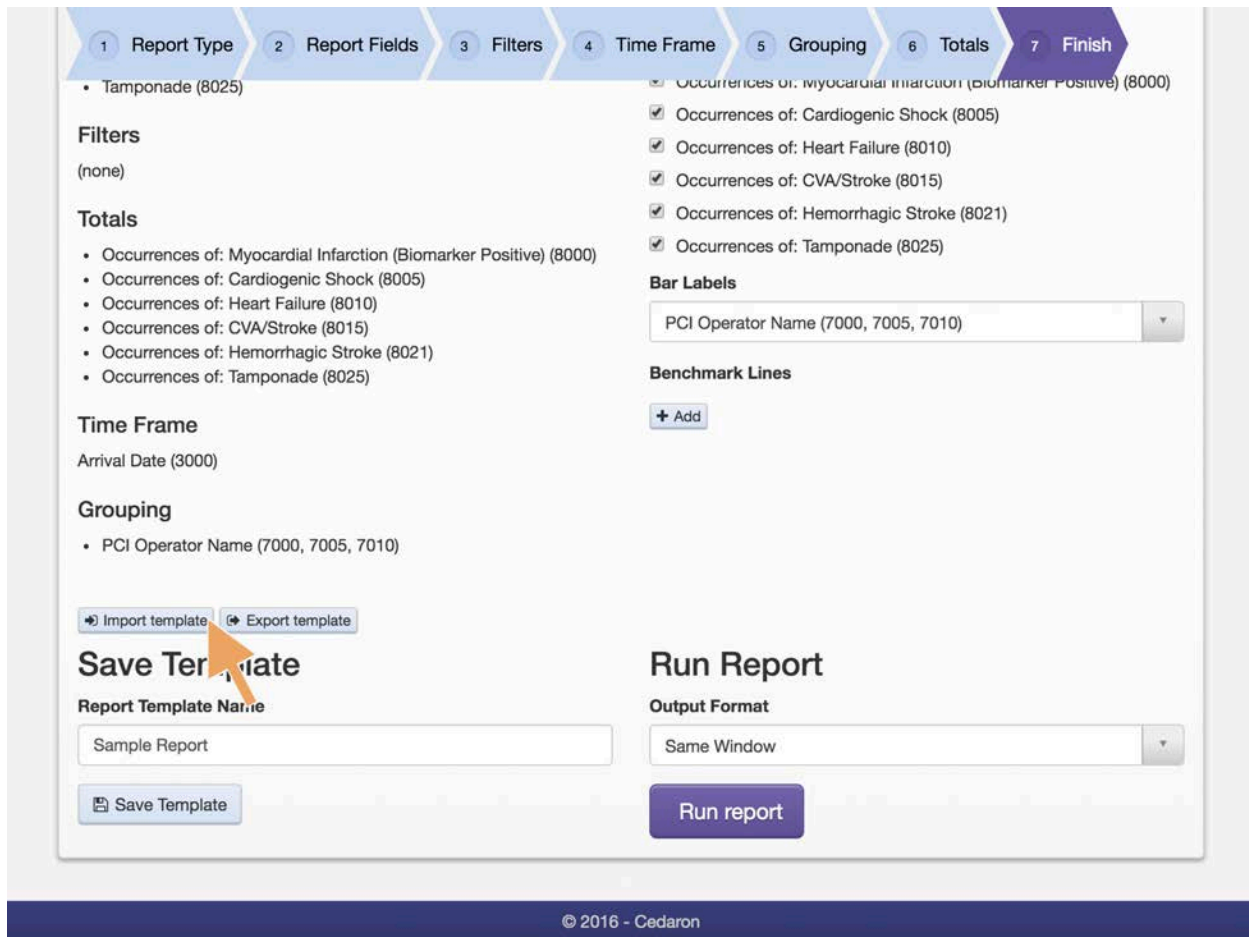
Figure 29 – Clicking the Import template button on the Finish tab to bring up the modal

Clicking "Import template" will bring up a modal. Copy the text from your document and paste it into the modal. See Exporting a Report above for instructions on how to get this export text.
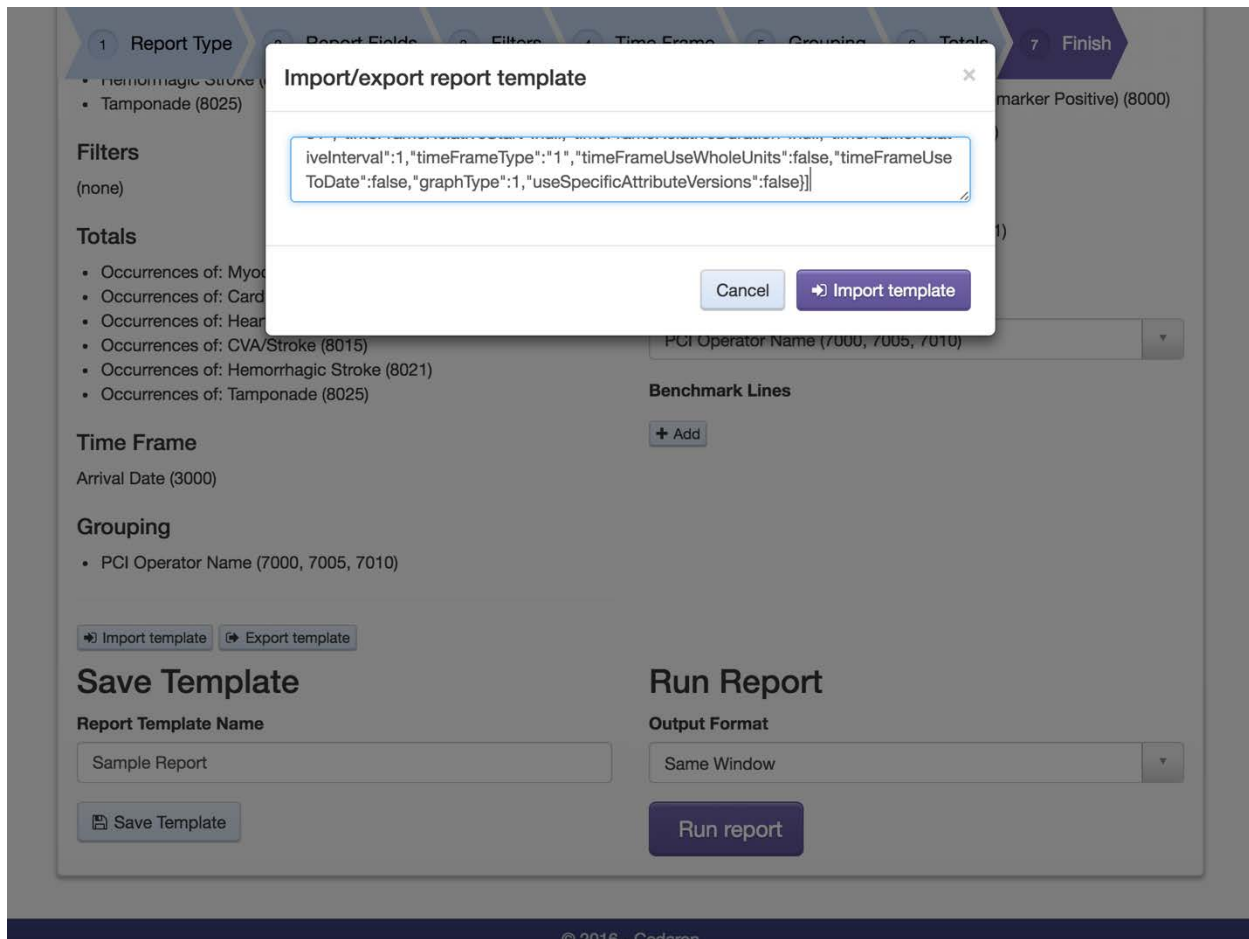
Figure 30 – Paste your text into the Import/export report template modal

Once you have pasted your text into the modal, click "Import template" to complete the import.

7.18 Downloading Report Results

Instead of displaying Report Results in the user's browser, Cento Analytics also offers the ability to download report results. Downloading results is useful for preserving the specific output of a report or moving the data to some other application or location for further analysis.

Reports are available for download in the following formats:

Attachment Type	Description
CSV	Comma separated values. This format is compatible with most spreadsheet applications.
PDF	PDF output is suitable for printing.
PDF (landscape)	PDF (landscape) output is the same as PDF output, except all pages are 11x8.5 instead of 8.5x11.
XLSX	OpenXML spreadsheet. This format is compatible with OpenOffice, LibreOffice, and Microsoft Excel.

7.18.1.1

7.18.1.2 Downloading Ad-hoc Report Results

There are two ways of downloading Ad-hoc report Results. Report writers can download report results from the Template Editor or from the Report Results Page.

7.18.1.2.1 Downloading Ad-hoc Results from the Report Template Editor

To download the output of the current report open in the Report Template Editor, choose the "Finish" tab. In the Report Output dropdown, select a value other than "Same Window". Pressing "Run Report" will download the current results of the template open in the editor.
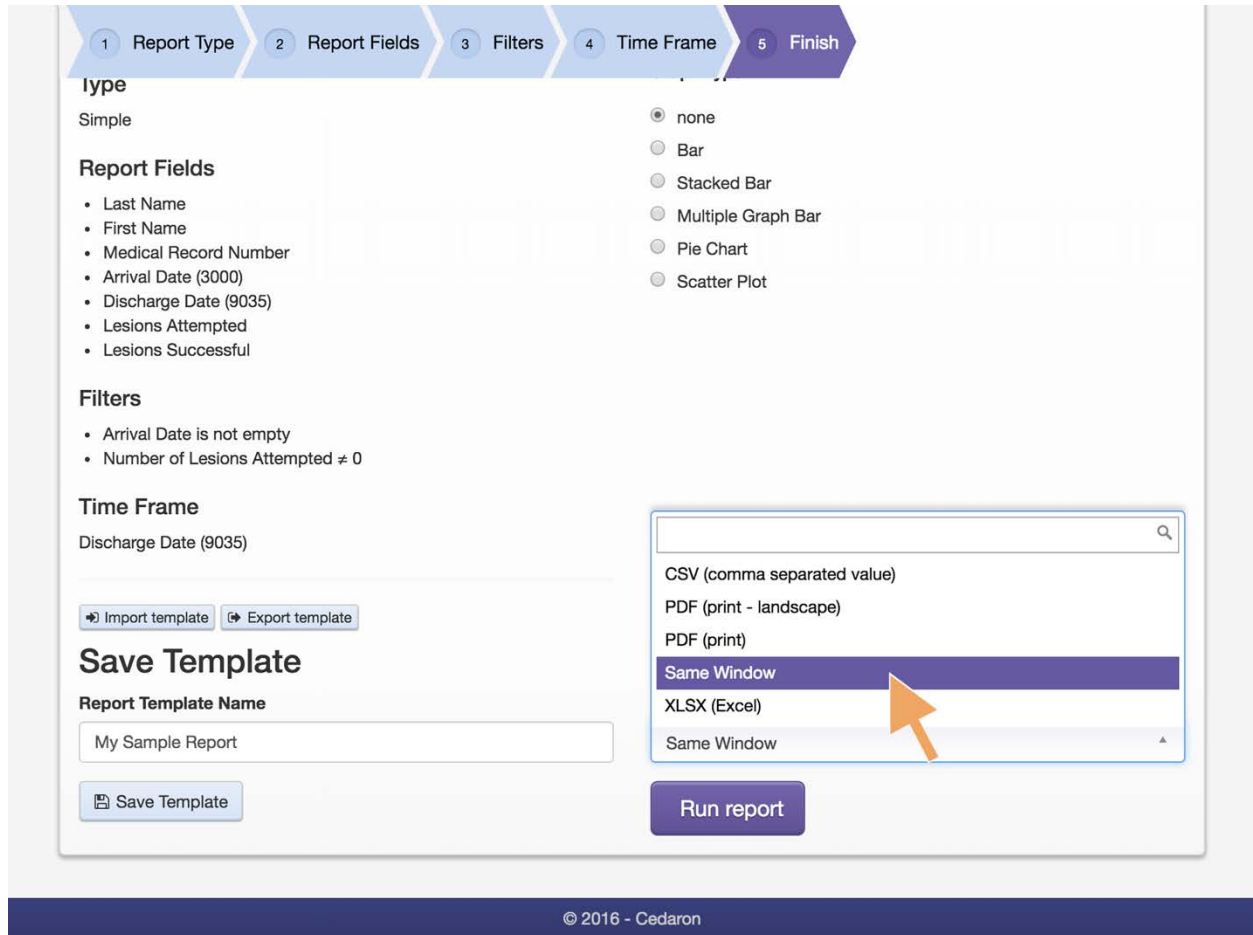
Figure 31 – Downloading a report from the Report Template Editor

7.18.1.2.2 Downloading Ad-hoc Results from the Report Results Page

When the ad-hoc report results are visible in your web browser, click the "Download" button. Selecting the desired download format from the dropdown downloads the report in that format.

Figure 32 – Click download in the upper right corner to download the Ad Hoc report as a CSV, PDF, PDF (landscape), or XLSX file

7.19 Emailing Report Results

Emailing of Report Results is available only when all email settings are specified in the Administrative section of Cento Analytics. Emailing Report Results allows users of Cento Analytics to share report results with personnel who do not have credentials to the Integrated System. Report Results can be emailed in any of the following formats:

Attachment Type	Description
CSV	Comma separated values. This format is compatible with most spreadsheet applications.
PDF	PDF output is suitable for printing.
PDF (landscape)	PDF (landscape) output is the same as PDF output, except all pages are 11x8.5 instead of 8.5x11.
XLSX	OpenXML spreadsheet. This format is compatible with OpenOffice, LibreOffice, and Microsoft Excel.

7.19.1 Email Report Results

Report writers can email reports after the report has been run. If the email has been configured, an email button will appear next to the download button in the upper right corner.

Figure 33 – Click Email in the upper right corner to Email the report as a CSV, PDF, PDF (landscape), or XLSX file

Clicking the Email button will allow the user the choose what format to send the Report in (PDF, CSV, etc.). Choosing the appropriate format will bring up the Email These Results modal. The Report Writer will need to add at least one email address, but can enter several. Multiple email addresses should be separated by a comma. The writer can add a message to the email as well. Clicking Send Email will email the report results asynchronously
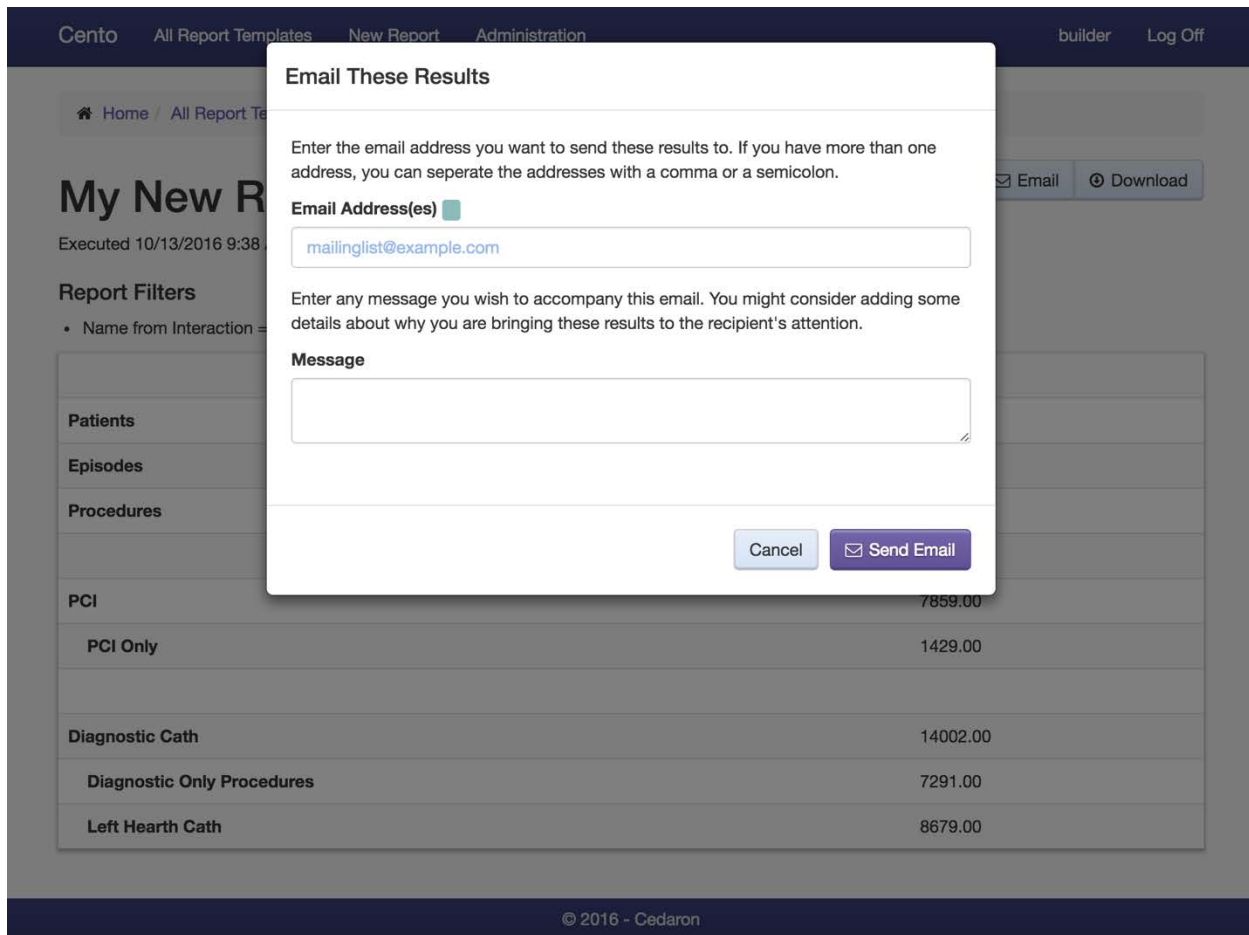
Figure 34 – The Email These Results Modal allows users to choose email addresses as well as an additional message to include alongside the report

7.20 Report Bundles

Report Bundles allow users to group reports that run together as one unit. Report Bundles display the results of a multitude of reports together on the same screen. Cento Analytics lists Report Bundles Alongside Reports on the All Report Templates screen.

7.20.1 Creating a Report Bundle

Report Writers can create a Report Bundle by clicking "New Report Bundle" on the Home page.
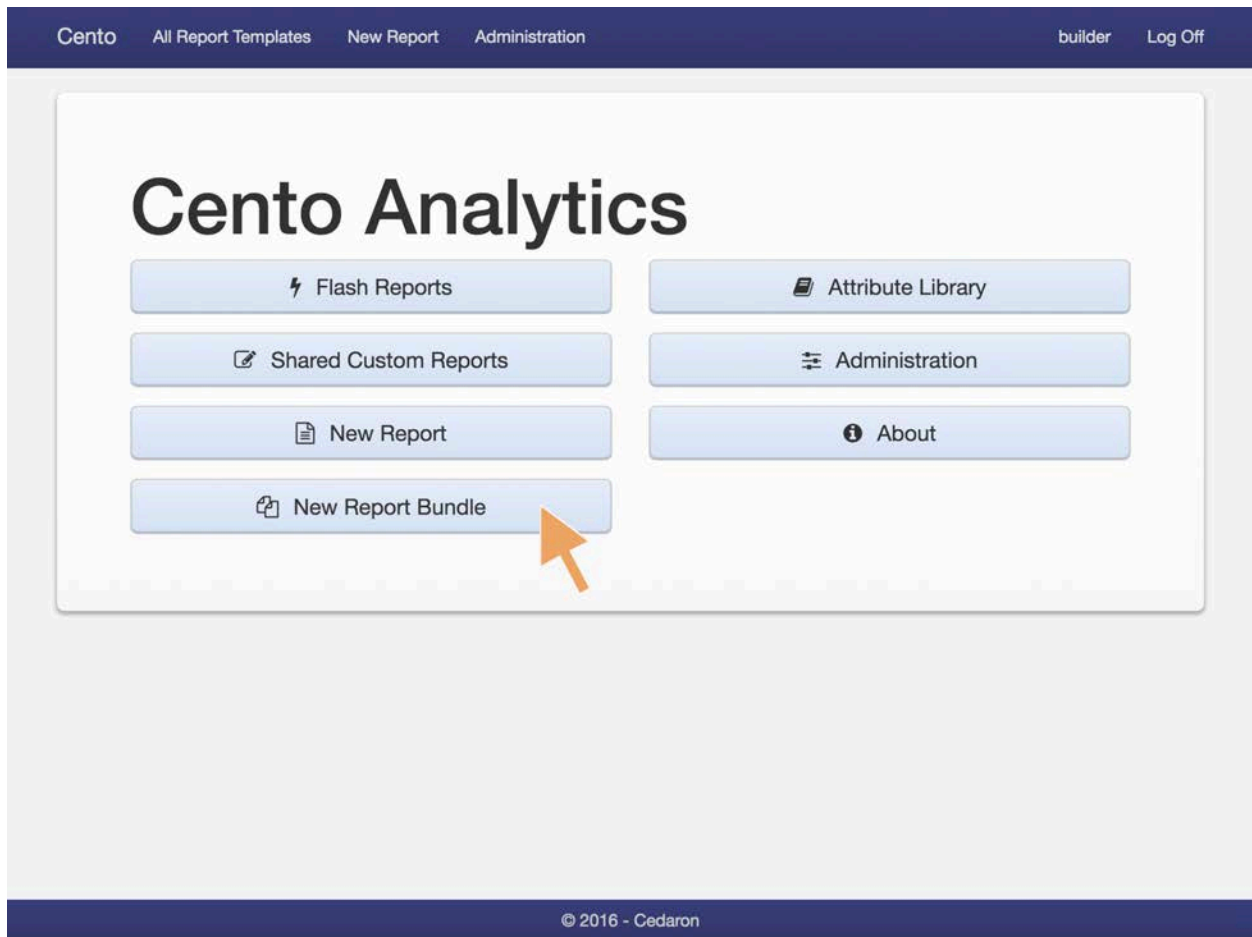
Figure 35 – To Create a new Report Bundle, choose "New Report Bundle" on the Home screen.

Clicking New Report Bundle will bring the user to the New Report Bundle Interface. The Report Writer will need to give a name (required) and description (optional) for the bundle.

Figure 36 – Enter a name (required) and a description (optional) for the new Report Bundle.

Once a Name for the Report Bundle has been entered, the user should click "Create Report Bundle" to continue to adding reports to the bundle. There are two ways to add reports to a bundle.

7.20.1.1 Add a Report to the Bundle via Drag and Drop
To add Report via the "Drag and Drop" method, choose the Report you want to add. If you tap and hold or click and hold, the attribute will become a purple bubble tracking your finger.

Valid drop targets are indicated by a dashed outline. To complete a drag and drop, move your finger/cursor over the drop zone and release the drag operation.

Dropping the Report will add it to the bundle.
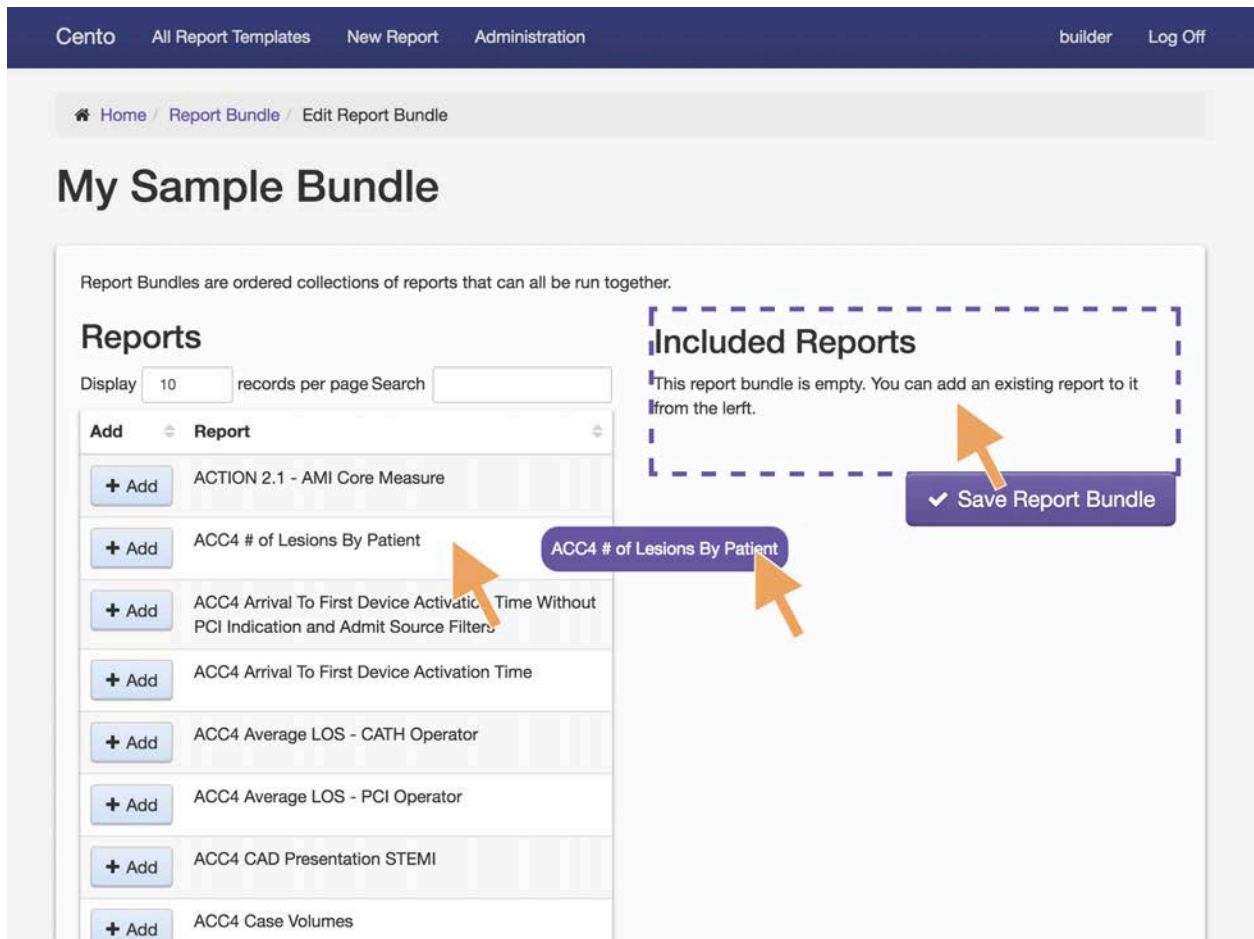
Figure 37 – Add the report "ACC4 # of Lesions by Patient" to the bundle by dragging and dropping it into the "Included Reports" area.

After adding and removing all necessary reports, the Report Writer will need to save the report bundle by clicking "Save Report Bundle."

7.20.1.2 Add a Report to the Bundle via the Add Button

To add a Report to the Bundle via the "Add" button, click the "Add" button to the left of the report. Clicking "Add" will add the report to the bundle.

After adding and removing all necessary reports, the Report Writer will need to save the report bundle by clicking "Save Report Bundle."

7.20.2 Removing Reports from a Report Bundle

Report Writers can remove a report from a bundle from the Edit Report Bundle screen. To remove a Report from the Bundle, click the "Remove" button to the right of the report. Clicking "Remove" will remove the report from the bundle.

Figure 38 – Remove the "ACC4 Coronary Perforation" report from the bundle by clicking "Remove."

After adding and removing all necessary reports, the Report Writer will need to save the report bundle by clicking "Save Report Bundle."

7.20.3 Running a Report Bundle

Report Writers can run Report Bundles from several different locations.

After editing and saving the Report Bundle, users can select "Run Report Bundle" from the Bundle Report Description Screen. Users can also access this screen by selecting the report bundle from the All Report Templates list of reports. Finally, users can run the Report Bundle directly by selecting "Run Report" for the bundle on the All Report Templates list of reports.

7.20.4 Deleting a Report Bundle

Report Writers can delete a Report Bundles from All Report Templates list of reports. Users will need to select the report by clicking on the name of the report. On the Report Bundle details screen, click the "Remove Report Bundle" button in the bottom right, then confirm deletion by clicking the "Remove Report Bundle" button on the modal that appears.
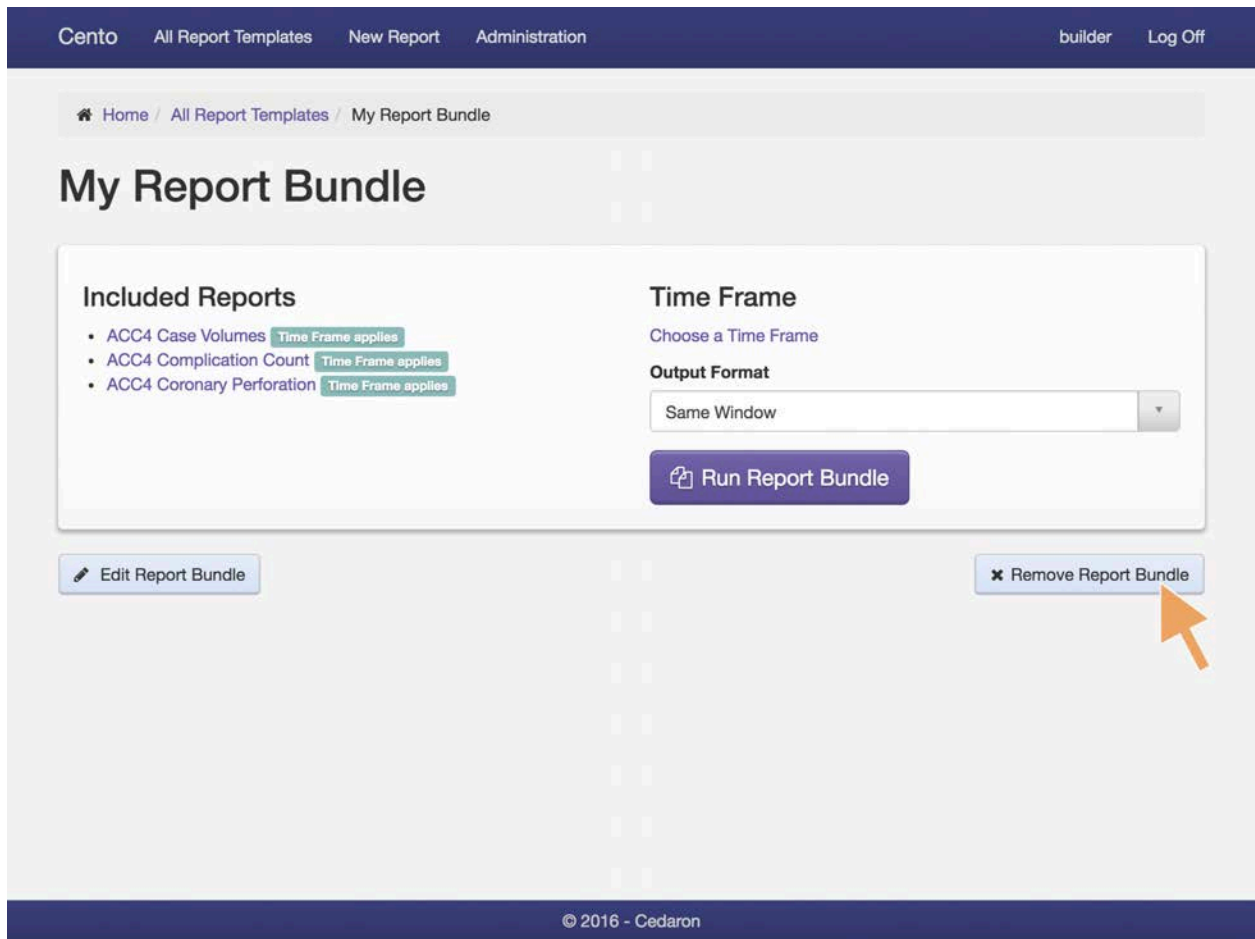
Figure 39 – Remove the Report Bundle by clicking "Remove Report Bundle" from the Report Bundle details screen.

8 Calculated Values

In some cases, the values stored in your medical system are not exactly what you want to include in your report. Sometimes you want to perform a calculation based on those values. CentoScript formulas allow you create calculated values which can be used as report fields, filters, totals, and more.

This section describes use cases for CentoScript formulas when editing saved reports, or creating ad-hoc reports.

8.1 Formula Editor

The formula editor can be used in several contexts. The formula editor is used to create calculated values that are automatically computed when the report is executed. It contains a set of menus that explain most of the legal computations that can be done. Experienced power users may prefer directly entering their formulas with the keyboard to navigating the menus and buttons.

The available actions can vary depending on context, but there are few basics that always apply.

The "Check Formula" button checks the syntax and types of your formula. The formula `(1+2))` would produce an error message, since it has unmatched parentheses. `(1+2)` would validate successfully. `length(7)` would produce an error, since length only operates on text, but `length("foo")` would validate successfully.

The "Format Formula" button removes extra spaces and applies a consistent set of formatting rules to the formula.

The "Insert" section contains instructions that can be inserted into the formula. These include report medical data, report parameters, and named shortcuts.

The "Functions" section contains a large list of functions that can be used in the current formula.

A full reference for CentoScript language features is available in the "CentoScript Language Reference" section of this document.

8.2 Named Shortcuts

Within a report, it's the same calculated values are often reused many times. To make this easier, you can store that calculation as a "named shortcut". It will then be accessible from all calculated formulas in the report by that name, without having to recreate it each time.

8.3 Adding Calculated Fields

The simplest way to use a formula is to add a calculated field to a report. This allows you to use synthesized values as report fields. For instance, patients have first name and last name fields, but there is no full name. It would be possible to include first name and last name as two different report fields. Using a calculated report field, those two report fields can be combined into a single full name field.

As an example, this is how users can add a "Patient Full Name" calculated field to a report:

From the "Report Fields" tab, click the "Calculated Field" button below "Custom Fields".
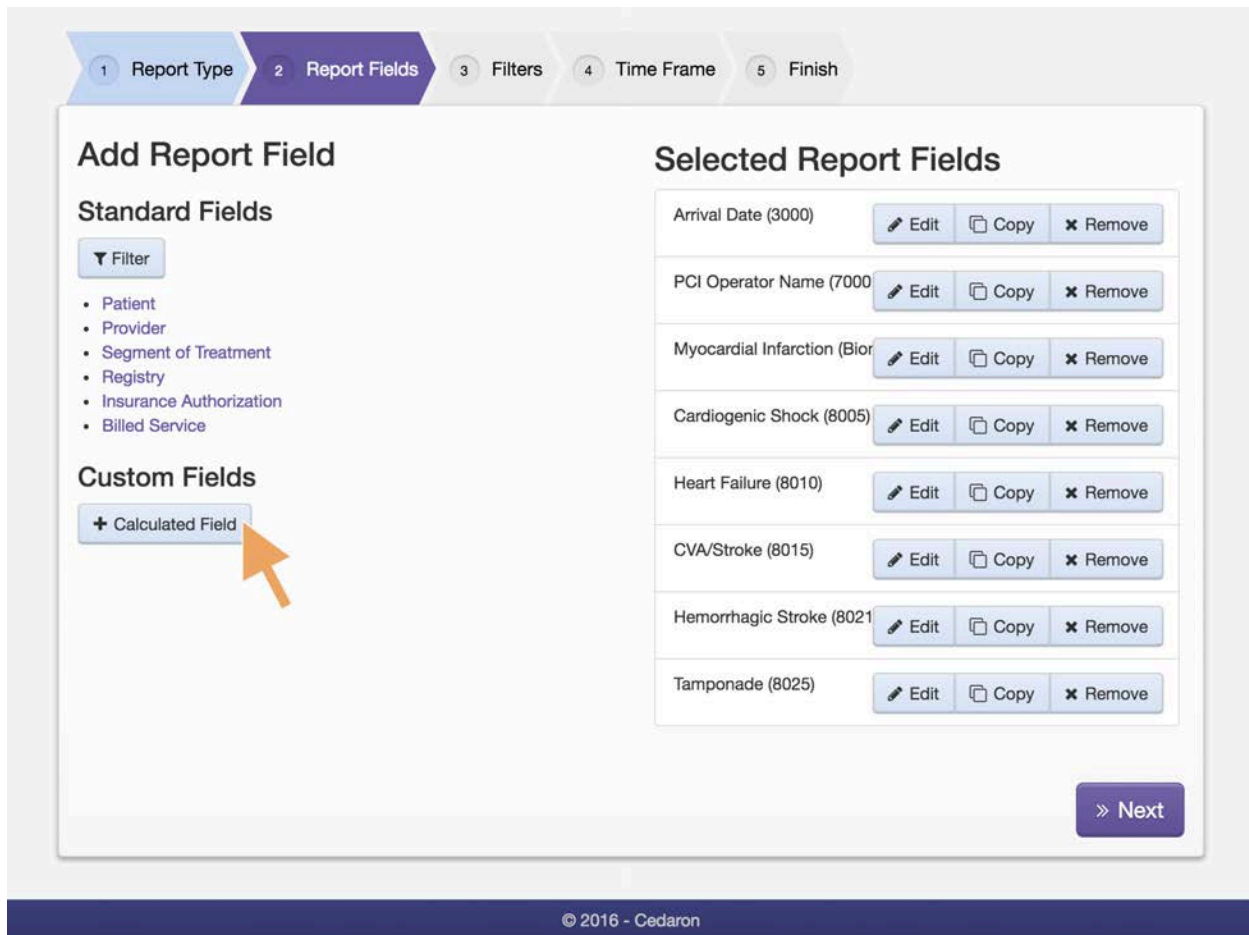
Figure 40 – Access the Calculated Field modal by clicking the button on the Report Fields tab.

In the Calculated Field Modal, the user can choose a title for the new calculated field. In this example, the user will use the function on the bottom to select "Text", and then chooses "Combine." This will bring up a description of the text combine formula. To choose this formula, the user should click "Insert".
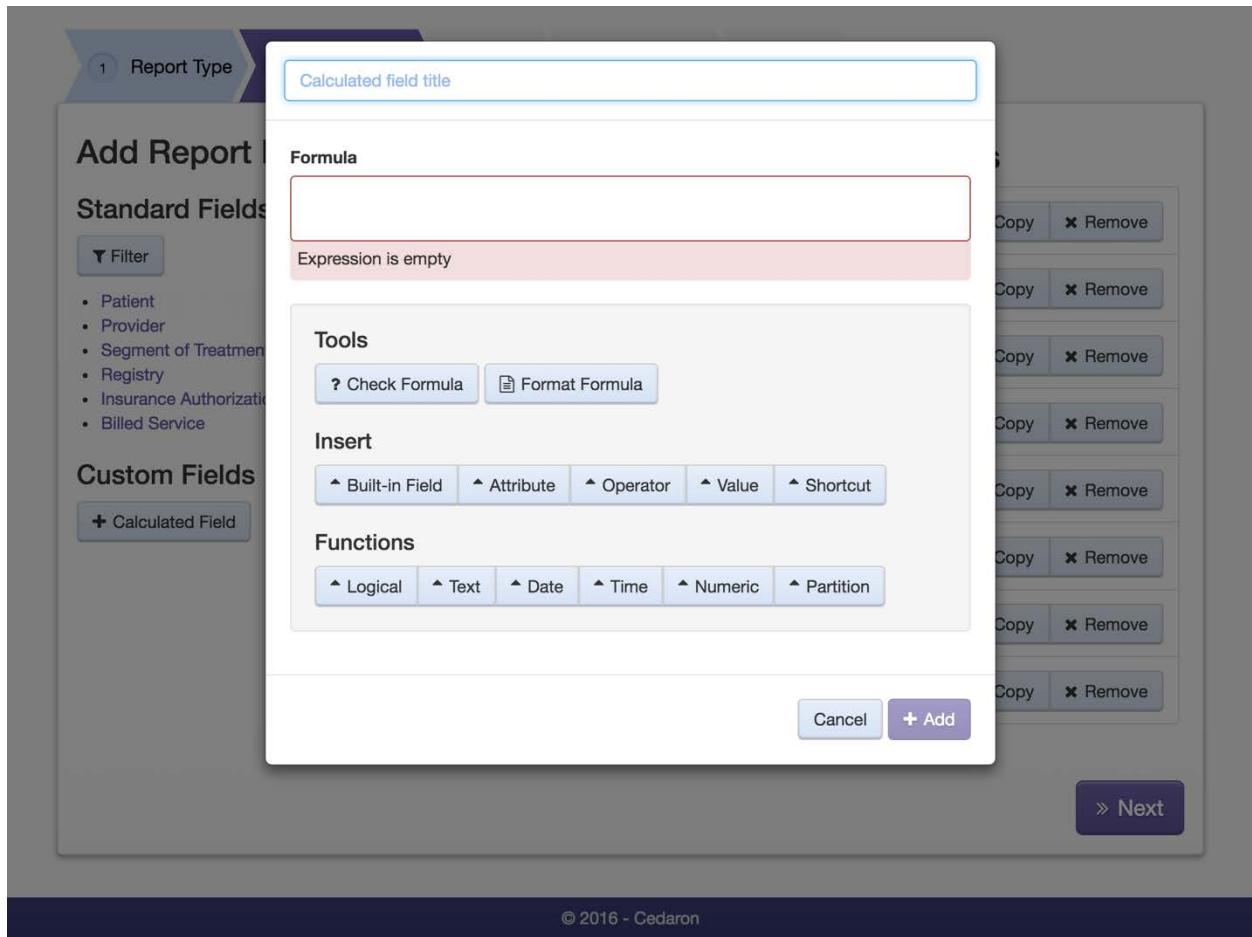
Figure 41 –The Calculated field modal.
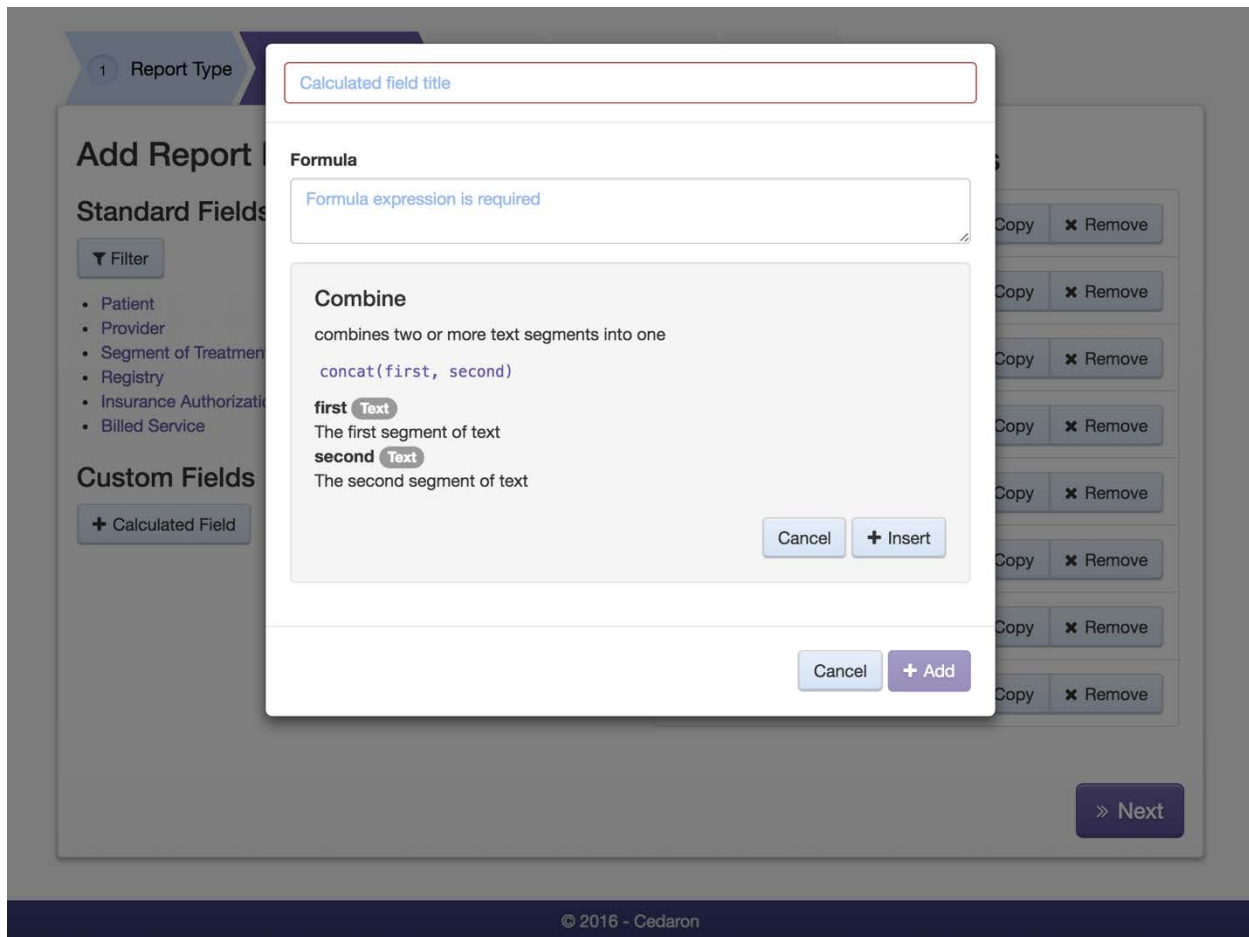
Figure 42 – The Calculated Field modal with the description of the formula for Combine Text.

Next, the user should enter the formula into the field according to the instructions on screen. In this case, the formula should look like this:

```
concat([patient-firstName], " ", [patient-lastName])
```

Finally, clicking "Add" will add this as a field to the report.

Note that if you are adding a report field to a Processing Step, you'll only be able to include data that was produced as output of the previous step. The full catalog of patient and interaction data will not be available.

See also:

- CentoScript Language Reference

8.4   Adding Calculated Filters

You can also create filters using calculated values. Some kinds of filters are difficult or impossible to create without the flexibility of CentoScript calculated values. For instance, using a calculated filter, users can include only patients born in January. There is no easy way to do this without a calculated

filter. As an example, here is how you would create a calculated filter that includes only patients born in January:

From the "Filters" tab, click the "Calculated Field" button below "Custom Fields".
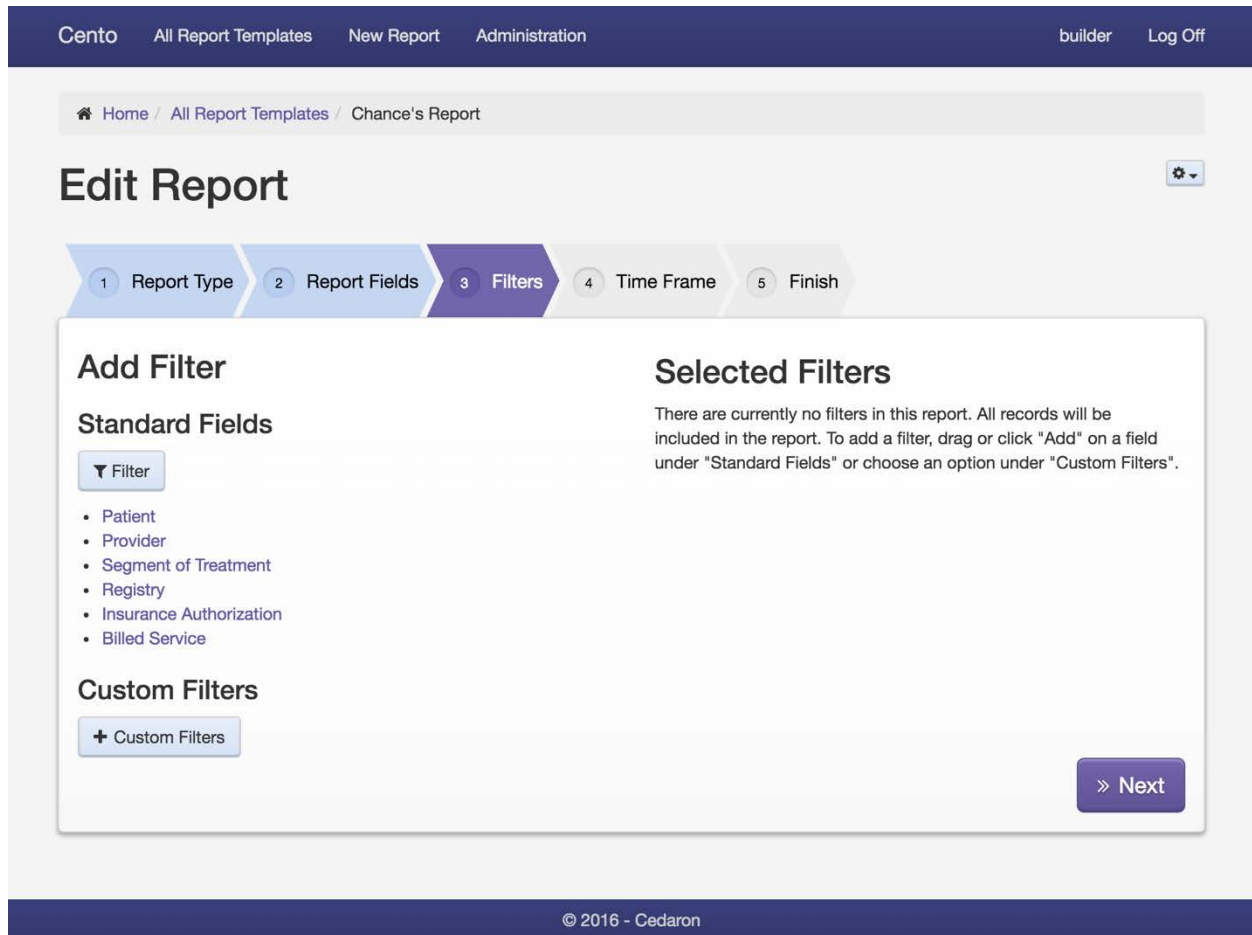
Figure 43 – The Custom Filters Modal can be accessed by clicking "Custom Filters" below the Custom Filters heading.

In the Calculated Field Modal, the user can choose a title for the new calculated field. In this example, the user will use the function on the bottom to select "Date", and then chooses "Month." This will bring up a description of the text combine formula. To choose this formula, the user should click "Insert".

Next, the user should enter the formula into the field according to the instructions on screen. In this case, the formula should look like this:

```
month([patient-dateOfBirth]) = 1
```

Finally, clicking "Add" will add this as a field to the report.

See also:

- [CentoScript Language Reference](#)

Note that if a user adds a report filter to a Processing Step, that filter will only be able to include data that was produced as output of the previous step. The full catalog of patient and interaction data will not be available.

8.5   Adding Calculated Totals

In summary reports, it's possible to use CentoScript formulas to create more flexible report totals. During the summary phase of report execution, the Report Fields are the only values available. Using a calculated total, it is possible to create a total that calculates the most common month of birth of the patients included in the report. As an example, here's how you'd add a calculated total to calculate the most common birth month of patients.

From the "Totals" tab, click the "Add Calculated Total" button below "Custom Total".
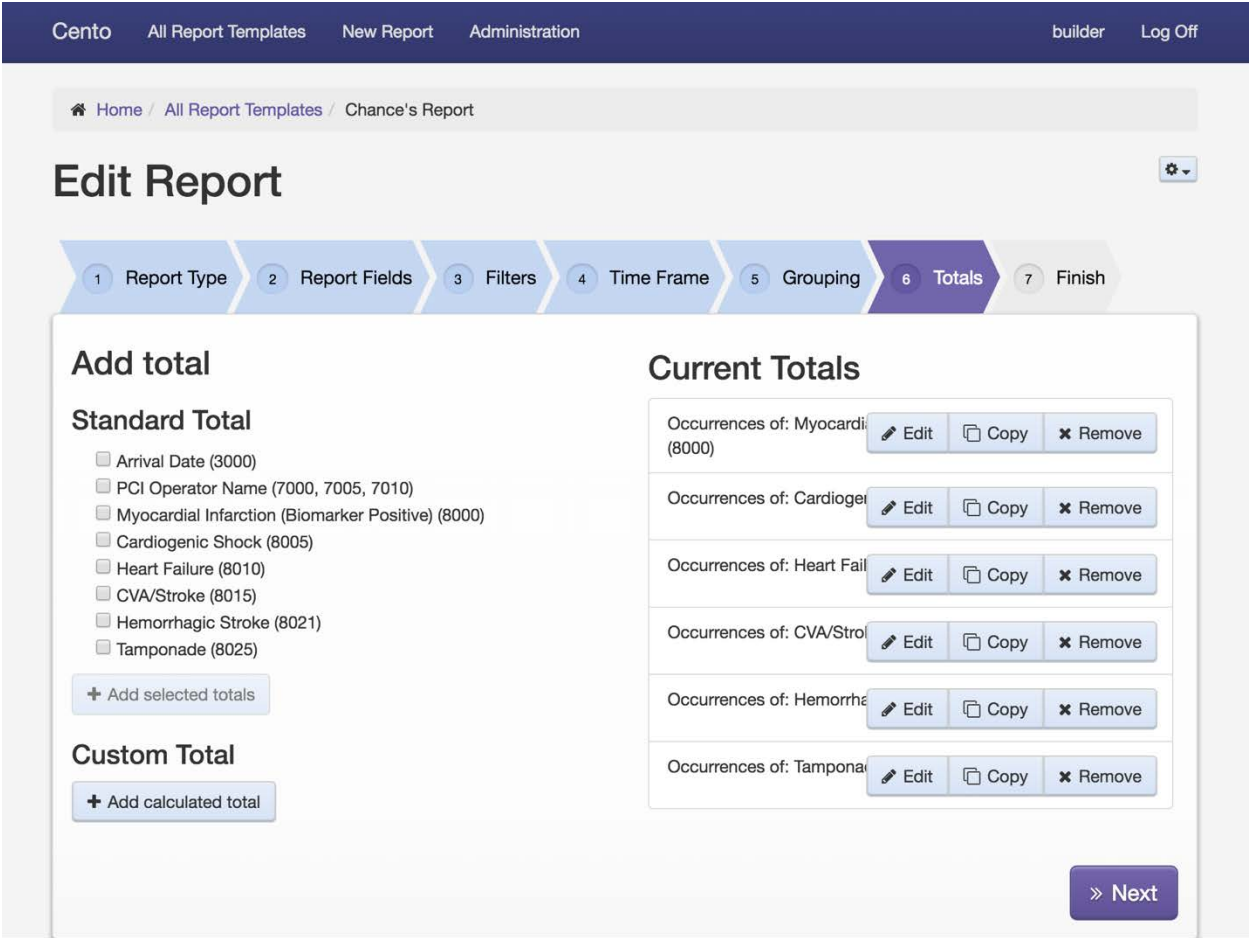
Figure 44 – The Calculated Totals button appears on the bottom left, under the Custom Total heading.

In the Calculated Total Modal, the user can choose a title for the new calculated field. In this example, the user will use the function on the bottom to select "Summary", and then chooses "Mode." This will bring up a description of the Summary Mode formula. To choose this formula, the user should click "Insert".

Next, the user should enter the formula into the field according to the instructions on screen. In this case, the formula should look like this:

```
mode(month({Date of Birth from Patient}))
```

Finally, clicking "Add" will add this as a field to the report.

See also:

- CentoScript Language Reference

Report totals can only include data that was included as a report field. To add a report total on data that is not in a report field, add that data as a report field.

8.6   Adding Classification Totals

When working on classification type reports, the only values that will appear in the report are calculated totals. These totals are similar to the calculated totals available in summary reports. The biggest difference is that classification totals do not contain any groups. Therefore all the records in the report output are grouped into one single summary group. For a classification report that has columns and classifications defined, it is possible to add calculated totals. On the "Classification Totals" tab, click the report output cell you want to edit. If it doesn't have a total assigned yet, you can click the "Add calculated total button" button to create a new total. If there is already a total assigned, you can use the buttons to edit or remove it.

8.7   Editing Existing Fields, Filters, and Totals

All report fields, filters, and totals can be edited as calculated formulas. That includes standard report fields that were not originally created as calculated fields. In order to do this, click the edit button inside the report field, filter, or total definition. A modal dialog will appear with report field options. Click the "Edit Formula" button to change CentoScript formula that defines the report field.

If you've made some changes, and want to check the syntax of your formula, but are not ready to save it yet, you can click the "Check Formula" button. The user will receive immediate feedback about whether the formula is valid or not.

8.8   Using Parameters

To use the value of a report parameter in a formula, you can insert a parameter reference. Use the "Insert Value" button to reveal the "Parameter" menu. Click the parameter you want to include in your formula. For example, a formula, that includes patient interactions that occurred after the "threshold" parameter, you could use a filter that looks like this.

```
[interaction-arriveDate] > {param:threshold}
```

9 CentoScript Language Reference

9.1 Comments

Comments don't affect the behavior of a formula. They exist only for the benefit of other human readers of the formula. They start with /* and end with */.

```
[height] * 2.54 /* we need height in centimeters, not inches */
```

9.2 Attribute References

Attribute references are used in report fields and filters, and can't be used in processing steps. An attribute reference retrieves some particular piece of medical data, like blood pressure. The format of an attribute reference is

```
[vendor:entity.attributeId]
```

Vendor specifies a type of integrated system like "Cardiac" for Cedaron Cardiac Care or "Connect" for Cedaron APTA Connect.

Entity specifies which object the data is from. This can be patient, provider, segmentOfTreatment, interaction, billedService, and insuranceAuthorization.

AttributeId is the id of the specific data point specified by the originating software system.

9.2.1 Built-In Fields

Built-in field references are similar to attribute references. A small number of data points, like patient name and date of birth or standard across all originating system vendors. Built-in field references look like this.

```
[entity-fieldName]
```

Entity specifies which object the data is from. This can be patient, provider, segmentOfTreatment, interaction, billedService, and insuranceAuthorization.

FieldName specifies which field to retrieve from the entity.

9.3 Values

9.3.1 Literal Values

There are a few types of literal values you can use in CentoScript.

```
"abc"       /* text literal */
"abc\"def"  /* text literal with embedded quote */
123.456     /* number literal */
true        /* yes/no literal */
false       /* yes/no literal */
```

Literal values can be used in any formula context.

9.3.2 Parameter References

Parameter references get the value provided for the report parameter when the report is executed. In this example, the parameter is named "facility".

```
{param:facility}
```
Parameter references can be used only when the named parameter has been defined in the report.

9.4   Named Shortcuts

A named shortcut is a reusable formula that can be embedded in other formulas. The scope of named shortcuts is per report. To use the same named shortcut in different reports, the named shortcut must be manually copied from one report to the other. In this example, the shortcut is named "patient age".

```
[patient age]
```

9.5   Operators

All operators follow standard order of operations. If you want to change the order operators are applied, you can enclose part of the formula in parentheses. That will force it to be evaluated first.

```
1 + 2 * 3          /* evaluates to 7 */
(1 + 2) * 3        /* evaluates to 9 */
```

9.5.1   Arithmetic Operators

There are six standard arithmetic operators, including negation and exponentiation. These operators can only be applied to numbers.

```
2 + 3              /* evaluates to 5 */
2 - 3              /* evaluates to -1 */
2 * 3              /* evaluates to 6 */
2 / 3              /* evaluates to 0.66666666666… */
2 ^ 3              /* evaluates to 8 */
-(2 + 3)           /* evaluates to -5 */
```

9.5.2   Comparison Operators

There are six comparison operators. They are used to compare two values. The two values must have the same type, or must both be dates or datetimes.

Operator name	CentoScript	Allowed types
Equals	=	any
Not Equals	<>	any
Less Than	<	number, date, datetime, time
Greater Than	>	number, date, datetime, time
Less Than Or Equals	<=	number, date, datetime, time
Greater Than Or Equals	>=	number, date, datetime, time

9.5.3   Logical Operators

There are three logical operators. They can be used only on yes/no values.

```
a and b     /* true if and only if a and b are both true */
a or b      /* true if one or both of a and b is true */
not a       /* true if and only if a is false */
```

9.6   Standard Functions

All functions are invoked by name, and followed by a parenthesized list of function arguments. They all look something like this.

```
function(argument1, argument2, argument3)
```

9.6.1   Numeric Functions

9.6.1.1   Round

round() rounds a number to the nearest integer or other specified decimal place.

```
round(value, places)
```

value (Number) is the number to round.
places (Number) is the number of places after the decimal point to keep.

9.6.1.2   Ceiling

ceiling() gets the smallest integer that's greater than or equal to the specified value.

```
ceiling(value)
```

value (Number) is the number to convert.

9.6.1.3   Floor

floor() gets the largest integer that's less than or equal to the specified value.

```
floor(value)
```

value (Number) is the number to convert.

9.6.1.4   As Text

Convert numbers to text values

```
astext(value)
```

value (Number) is the number to convert.

9.6.2   Text Functions

9.6.2.1   Length

Get the number of characters in some text.

```
length(value)
```

value (Text) is the text to check.

9.6.2.2   Substring

Get an excerpt from a piece of text.

```
substring(value, start, length)
```

value (Text) is the original text.

start (Number) is the zero-based position to start the excerpt from.

length (Number) is the length of the excerpt to extract.

9.6.2.3   Replace

Replace all occurrences of one word or phrase with another.

```
replace(value, search, replacement)
```

value (Text) is the original text.

search (Text) is the text to look for.

replacement (Text) is the text to replace with.

9.6.2.4   Contains

Test whether one piece of text contains another. It will return true if it does, and false otherwise.

```
contains(value, search)
```

value (Text) is the text to search inside of.

search (Text) is the text to search for.

9.6.2.5   Combine

Combine two or more text segments into one.

```
concat(first, second, ...)
```

first (Text) is the first segment of text.

second (Text) is the second segment of text.

Combine isn't limited to two parameters. It can accept any number of arguments.

9.6.2.6   As Number

Convert text to number values, allowing you to perform calculations and comparisons on them.

```
asnumber(value)
```

value (Text) is the text to convert.

9.6.3 Logical Functions

9.6.3.1 If

Do one thing if a condition is true, do another otherwise.

```
if(condition, truepart, falsepart)
```

condition (Yes / No) is the yes/no condition to test.

truepart (Any) is the result if the condition is true.

falsepart (Any) is the result if the condition is not true.

truepart and falsepart must have the same type.

9.6.3.2 When

When the condition is true, do the truepart. Otherwise, do nothing. This is similar to if(), except that if the condition is false, the result is blank.

```
when(condition, truepart)
```

condition (Yes / No) is the yes/no condition to test.

truepart (Any) is the result if the condition is Yes.

9.6.3.3 Not

Turn yes to no, and no to yes

```
not(value)
```

value (Yes / No) is the value to negate.

9.6.3.4 Is Blank

Return yes if the value is empty or has no value. Text with zero characters is considered blank. Nulls are considered blank as well.

```
isblank(value)
```

value (Any) is the value to test.

9.6.3.5 Is one of

Test whether a value is among a set of provided values. This returns true if the value of the first argument is found among the rest of the arguments.

```
isoneof(searchValue, test1, test2, ...)
```

searchValue (Any) is the value being searched for.

test1 (Any) is the first value to test.

test2 (Any) is the second value to test.

Any number of test values can be used. All the arguments must be the same type.

9.6.3.6   Coalesce
Returns the first parameter that has a value.

```
Coalesce(first, second, …)
```

first (Any) is the first value to use.

second (Any) is the second value to use. Must be the same type as first.

9.6.4   Date and Time Functions

9.6.4.1   Today
Get today's date as of whenever this function is executed.

```
today()
```

9.6.4.2   Now
Get the current date and time when this function is executed.

```
now()
```

9.6.4.3   Date
Get a date based on year, month, and day.

```
date(year, month, day)
```

year (Number) is the year component of the date.

month (Number) is the month component of the date.

day (Number) is the day component of the date.

9.6.4.4   Date and Time
Get a date and time based on year, month, day, hour, and minute.

```
datetime(year, month, day, hour, minutes)
```

year (Number) is the year component of the date.

month (Number) is the month component of the date.

day (Number) is the day component of the date.

hour (Number) is the hour part of the time of day starting from midnight (e.g. 2:30pm would be 14).

minutes (Number) is the minutes part of the time of day (e.g. 2:30pm would be 30).

9.6.4.5   Combine Date and Time

Combine a date and a time into a single date and time field.

```
combinedatetime(date, time)
```

date (Date) is the date to combine.

time (Time) is the time to combine.

9.6.4.6   Date Part

Get just the date part of a combined date and time.

```
datepart(datetime)
```

datetime (Date and time) is the datetime to extract the date component from.

9.6.4.7   Add Days

Add the specified number of days to this date.

```
adddays(datedays)
```

date (Date) is the date to add days to.

days (Number) is the number of days to add.

9.6.4.8   Add Months

Add the specified number of months to this date.

```
addmonths(date, months)
```

date (Date) is the date to add months to.

months (Number) is the number of months to add

9.6.4.9   Add Years

Add the specified number of months to this date.

```
addyears(date, years)
```

date (Date) is the date to add years to.

months (Number) is the number of years to add

9.6.4.10 Year

Get the year component of a date.

```
year(date)
```

date (Date) is the date to extract the year component from.

9.6.4.11 Month
Get the month component of a date.

```
month(date)
```

date (Date) is the date to extract the month component from.

9.6.4.12 Day of Month
Get the day of month component of a date.

```
dayofmonth(date)
```

date (Date) is the date to extract the day of month component from.

9.6.4.13 Day Of Week
Get the day of the week. Sunday yields 0. Saturday yields 6.

```
dayofweek(date)
```

date (Date) is the date to extract the day of the week component from.

9.6.4.14 Years Between
Calculate the number of calendar years between two dates, the same way a person's age is calculated

```
yearsbetween(from, to)
```

from (Date) is the start of the time interval.

to (Date) is the end of the time interval.

9.6.4.15 Days Between
Calculate the number of calendar days between two dates. Comparing two consecutive days yields 1.

```
daysbetween(from, to)
```

from (Date) is the start of the time interval.

to (Date) is the end of the time interval.

9.6.4.16 Days Between (decimal)
Calculate the number of days between two dates returning the fraction of total days between the two datetimes.

```
decimaldaysbetween(from, to)
```

from (DateTime) is the start of the time interval.

to (DateTime) is the end of the interval.

9.6.4.17   Time
Get a time based on hour and minutes.

```
time(hour, minutes)
```

hour (Number) is the hour part of the time of day starting from midnight. For example, 2:30pm would be 14.

minutes (Number) is the minutes part of the time of day. For example, 2:30pm would be 30.

9.6.4.18   Time Part
Get just the time part of a combined date and time.

```
timepart(datetime)
```

datetime (Date and time) is the date and time to extract the time component from.

9.6.4.19   Hour
Get the hours component of a time of day in 24 hour format (midnight yields 0, noon yields 12)

```
hour(time)
```

time (Time) is the time to extract the hours component from.

9.6.4.20   Minutes
Get the minutes component of a time

```
minutes(time)
```

time (Time) is the date to extract the minutes component from.

9.6.4.21   Seconds
Get the seconds component of a time.

```
seconds(time)
```

time (Time) is the date to extract the seconds component from.

9.6.5   Partition Functions
Partition functions can be used in report fields, but not filters or totals. Partition functions consider records grouped from the originating system by a particular value.

9.6.5.1   Partitioned Count

Count the number of non-empty values that exist in records sharing the same partition value.

```
partition_count(partition, value)
```

partition (Any) is the value by which to group the partitions.

value (Any) is the value used to count. For all the records sharing the same partition, the result will be the total number of values that are not blank.

9.6.5.2   Partitioned Minimum

Find the minimum of a value in records sharing the same partition value.

```
partition_min(partition, value)
```

partition (Any) is the value by which to group the partitions.

value (Any) is the value to minimize.

9.6.5.3   Partitioned Maximum

Find the maximum of a value in records sharing the same partition value.

```
partition_max(partition, value)
```

partition (Any) is the value by which to group the partitions.

value (Any) is the value to maximize.

9.6.5.4   Partitioned Average

Find the average of a value in records sharing the same partition value.

```
partition_average(partition, value)
```

partition (Any) is the value by which to group the partitions.

value (Number) is the value to average.

9.6.5.5   Partitioned Exists

Test whether there is any record sharing the same value that satisfies the test. The result will be true if there is, and false otherwise.

```
partition_exists(partition, predicate)
```

partition (Any) is the value by which to group the partitions.

predicate (Yes / No) is the test to apply to each record. The result will be true if any record in the partition has predicate value of true.

9.6.5.6   Rank

Calculate the rank of a record within the group of records that share the same partition value.

```
partition_rank(partition, orderby)
```

partition (Any) is the value by which to group the partitions.

orderby (Any) isthe value by which to order the ranking.

9.7   Repeated Attribute Functions

Most attributes record a single data point about an entity like patient or provider. Repeated attributes are different. Repeated attributes store one or more records of data in one attribute value. This section covers the CentoScript functions that operate on these repeated attributes.

9.7.1   First

Get the first specified value from a repeated attribute.

```
repeated_first(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Any) is the value within the repeated attribute to get the first instance of.

9.7.2   Last

Get the last specified value from a repeated attribute.

```
repeated_last(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Any) is the value within the repeated attribute to get the last instance of.

9.7.3   Nth value

Get the specified value from within a repeated attribute at a specified index location.

```
repeated_nth(index, repeated, value)
```

index (number) is the position of the record you want to retrieve. The first record has an index of 0.

repeated (Repeated) is the repeated attribute.

value (Any) is the value to retrieve.

9.7.4   Count

Get the number of records in a repeated attribute.

```
repeated_first(repeated)
```

repeated (Repeated) is the repeated attribute to count the records from.

9.7.5 Distinct Count

Get the number of unique values in a particular value attribute inside a repeated attribute.

```
repeated_distinct(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Any) is the value to count the distinct values of. Blank values do not contribute to the count.

9.7.6 Average

Get the arithmetic mean of a numeric value within a repeated attribute.

```
repeated_average(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Number) is the value to calculate the average of.

9.7.7 Sum

Get the sum of a numeric value within a repeated attribute.

```
repeated_sum(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Number) is the value to calculate the sum of.

9.7.8 Minimum

Get the minimum of a particular value within a repeated attribute.

```
repeated_min(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Number) is the value to calculate the minimum of.

9.7.9 Maximum

Get the maximum of a particular value within a repeated attribute.

```
repeated_max(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Number) is the value to calculate the maximum of.

9.7.10 Occurrences

Count the occurrences of a search value in a particular value within a repeated attribute.

```
repeated_occurrences(search, repeated, value)
```

search (Any) is the value to search for.

repeated (Repeated) is the repeated attribute.

value (Any) is the value within the repeated to search. It must have the same type as **search**.

9.7.11 Contains Count

Count the number of instances of a text value within a repeated attribute that contain the search text as a substring. This is different from repeated_occurrences because it only works on text values, and it doesn't require an exact match. If the search value exists anywhere as a substring of the repeated attribute value, it will count as a match.

```
repeated_containscount(search, repeated, value)
```

search (Text) is the value to search for as a substring.

repeated (Repeated) is the repeated attribute.

value (Text) is the value within the repeated to search. It must have the same type as **search**.

9.7.12 Repeated Access

Get the specified value from within a repeated attribute split into rows in the report. This function works differently from any other function. Using this function has the ability to change the number of rows in the output of the report. When multiple records within a repeated attribute are encountered, multiple records will be emitted in the report output. If there are zero records in a repeated attribute, there will be a single row emitted. The value of the repeated access function will be blank in that case.

```
repeated_access(repeated, value)
```

repeated (Repeated) is the repeated attribute.

value (Any) is the value within the repeated to retrieve.

9.8   Summary Functions

Summary functions are functions that can only be applied in the totals of a summary or classification report. They take multiple records and produce a single total value.

9.8.1   Count

Count the number of non-blank values.

```
count(value)
```

value (Any) is the value to count.

9.8.2   Count Distinct
Count the number of unique different non-blank values.

```
distinct(value)
```

value (Any) is the value to summarize.

9.8.3   Minimum
Get the lowest value.

```
min(value)
```

value (Any) is the value to summarize.

9.8.4   Maximum
Get the highest value.

```
max(value)
```

value (Any) is the value to summarize.

9.8.5   Correlated minimum
Find the value in one column associated with the lowest value in another column.

```
minby(outputVal, comparedBy)
```

outputVal (Any) is the associated value to be returned.

comparedBy (Any) is the value used to seek the minimum.

9.8.6   Correlated maximum
Find the value in one column associated with the highest value in another column.

```
maxby(outputVal, comparedBy)
```

outputVal (Any) is the associated value to be returned.

comparedBy (Any) is the value used to seek the maximum.

9.8.7   Sum
Add all numbers together.

```
sum(value)
```

value (Number) is the value to summarize.

9.8.8   Mean
Perform an arithmetic average.

```
mean(value)
```

value (Any) is the value to summarize.

9.8.9   Median
Find the median value.

```
median(value)
```

value (Any) is the value to summarize.

9.8.10 Mode
Find the most commonly occurring value.

```
mode(value)
```

value (Any) is the value to summarize.

9.8.11 Percentile
Find the value at some arbitrary percentile in a population.

```
percentile(value, percentile)
```

value (Any) is the value to summarize.

percentile (Number) is the percentile value to search for in the range 0 to 100.

9.8.12 Occurrences of
Count the number of occurrences of a particular value.

```
occurrences(value, search)
```

value (Any) is the value to summarize.

search (Any) is the value to search for.

9.8.13 Count containing text
Count the number of times a particular value appears anywhere in the text.

```
containingtextcount(value, search)
```

value (Text) is the value to search inside of.

search (Text) is the value to search for.

9.8.14 Starts with text

Count the number of times a particular value is the starting text.

```
startswithtextcount(value, search)
```

value (Text) is the value to summarize.

search (Text) is the value to search for.

9.8.15 Exists

Determine whether a given value exists in a population. This function returns true if it does and false otherwise.

```
exists(value, search)
```

value (Any) is the value to summarize.

search (Any) is the value to search for. It must have the same type as **value**.

9.8.16 Standard deviation

Calculate sample-based standard deviation.

```
stdev(value)
```

value (Number) is the value to summarize.

9.9 Other Functions

9.9.1 Variable

Get the value of an analytics variable. Analytics variables are values that occasionally change. Variables can be used in multiple reports. Making changes to variables can be done in one place, and doesn't require updates to each report.

```
getvariable(name, effectiveDate)
```

name (Text) is the name of the variable to retrieve.

effectiveDate (Date) is the as-of date on which to get the effective value. If you want always want to use the current time, today() can be used as this argument.

10 Dashboards

Cento Analytics Dashboards allow users run reports on their personal homepage. Dashboards allow users stay abreast of developing trends in their data, gauge overall facility benchmarks, and get the latest figures immediately after logging in.

10.1 Viewing Your Dashboard

Dashboards automatically run on users' home pages. Viewing a dashboard is the same as viewing the home page. See Home Page for more information.

10.1.1 Viewing the Details of a Dashboard Report

The title of each Report in a Dashboard is a link to the detailed results for that dashboard. The Report Results page features a larger graph, result downloads, raw data, and drill-down, if applicable. This view is the same as running the report in a non-dashboard context.

10.2 Assigning Reports to Your Dashboard

For more information on adding reports to a dashboard, see Dashboard Reports.

11 Attribute Library

Data in Cento Analytics comes from the Integrated System. This data is wholly defined by the Integrated System and has the format and structure it does in the Integrated System. The Attribute Library allows users to browse the data-points Cento Analytics currently knows about and view some statistics of the data such as answer frequency, the most common answers, and where to find that data point in the Attribute Tree.

11.1 Attribute Library Layout

The default view of the Attribute Library consists of a tree of Attribute Categories and a Search. Attribute Categories are the top level of Attribute organization that Cento Analytics offers. What this level of organization corresponds to in the Integrated System is up to the Integrated System to decide. The structure should look familiar to users of the Integrated System.

11.1.1 Navigating the Attribute Library

Attributes in the Attribute Library are laid out in a hierarchy. The first level of Attribute organization is the Attribute Category. Attribute Categories consist of a list of Attribute Groups. Within Attribute Groups, the Attributes are broken out by Entity Type. Note: there may be more than one location for the same attribute within the Attribute hierarchy depending on the layout of attributes in the Integrated System.

The default landing page of Cento Analytics lists all known Attribute Categories. Each Attribute Category is a link to the Attribute Category details page. The sorting of Attribute Categories on this page depends on the sort values supplied by the Integrated System. The search on this page searches all attributes known to Cento Analytics. Clicking on any of the Attribute Category links opens the Attribute Category details page.

The Attribute Category details page closely resembles the landing page of the Attribute Library. This page lists the groups contained within the Attribute Category. The Attribute Category details page includes a search box that searches within this specific Attribute Category. This search is useful for finding an attribute known to be part of a certain Attribute Category, but when the Attribute Group the attribute belongs to is unknown. Clicking on any of the Attribute Group links opens the Attribute Group details page.

The Attribute Group details page displays all the Attribute members of the Attribute Group broken out by Entity level. Depending on your Integrated System, some Entity levels do not contain any Attributes. Each Attribute listed is a link to the Attribute Details page.

The Attribute Details page displays the known information about the Attribute. For an explanation of this screen, see Attribute Details.

11.1.2 Searching for Attributes

Both the Attribute Category details page and the Attribute Group details page have search boxes for discovering attributes.

Attribute search performs a substring search and matches on all or part of the name of an Attribute. The results of the Attribute search are group by the Entity-level of the matching attributes, where each

attribute is a link to the Attribute Details page for that Attribute. Each matching attribute is listed no more than once in search results. Searching again from the search results page performs a new search.

11.2 Attribute Details

The Attribute Details page lists all details known to Cento Analytics and provides some statistics on the attribute in the database.

11.2.1 Attribute Properties

The top of the Attribute Details page displays the properties of the Attribute. These properties are metadata provided by the Integrated System and vary from system to system.

The standard properties listed for every attribute are as follows.

Property Name	Description
Entity	The Entity-Level of the Attribute
Attribute	The name of the Attribute. The Attribute Tree lists the Attributes by this property
Description	A textual description of the Attribute, if provided by the Integrated System
Type	The CentoScript expression type of the attribute

Additionally, if the Attribute is a child of a Repeated Attribute, the Attribute Properties include a property called "Repeated Status."

Property Name	Description
Repeated Status	Indicates whether or not the Attribute is usable outside of Repeated Attributes

11.2.2 Attribute Locations

Depending on the Integrated System, Attributes in Cento Analytics are found in one or more places in the Attribute Tree when accessed by Attribute Category and Attribute Group. For each unique combination of Attribute Category and Attribute Group, the Attribute Details page lists one path. The Attribute Tree uses the same hierarchy to present attributes, so the Attribute Library can help users find attributes to use in their reporting. Most systems provide a single location for each attribute.

Figure 45 - An Example of an Attribute Location

11.2.3 Attribute Statistics

Attributes are only useful in reporting if Cento Analytics has data for them. The Attribute Statistics section allows users to check if this particular Attribute has much data. The Attribute Statistics bar indicates what percentage of records that answered a related field also responded to this particular field. For rarely collected data, this value could be 0%. For data collected for every patient, the value is 99-100%.

The following figure depicts an Attribute answered for virtually all entities.

Attribute Statistics

Percentage Answered	99%

Figure 46 - An Attribute answered for nearly every Interaction

11.2.3.1 Percentage Answered Accuracy

Cento Analytics calculates Attribute Statistics based on Related Values. This determination depends on the original location of the Attribute within an Attribute Group. The "Percentage Answered" scored derives from the number of entities with any answer in that Attribute Group. If the Integrated System provides multiple paths to an Attribute, only the first one received is used for this calculation. Furthermore, if the Integrated System provides a mechanism to move Attributes, Cento Analytics continues to calculate Related Values based on the original location of the Attribute. Continuing to calculate the score this way may cause some drift in the accuracy of the "Percentage Answered" score.

Another caveat concerning Related Values relates to the internal storage details of Cento Analytics. Each Attribute Group has a maximum size before Cento Analytics begins using an extended addressing scheme internally. The Related Values score only takes into account the entities with answers in each extended address region. This behavior is another contributor to accuracy drift in the "Percentage Answered" score. Typically, this drift is minimal, but certain arrangements of the Integrated System can exacerbate it, lowering the quality of the Percentage Answered score.

11.2.4 Values Answered

The Attribute Library displays the number of occurrences of each unique answer for a given Attribute.

The formula for "Values Answered" is as follows:

The calculation of these percentages is given by the number of occurrences of an answer divided by the number of answers for a given Attribute.

Integrated Systems may optionally provide a list of "known values" that represent the possible values for a question known by the Integrated System. These values augment the listed "Values Answered" by providing lines for each possible answer. If no entity has an answer with the value of a particular "Known Value," then the Attribute Library displays 0% for that value.

Note: Answers occurring less than 1% also display 0%

11.2.5 Parent Attributes

If an Attribute is an Attribute inside a Repeated Attribute, the Parent Attributes section lists the Repeated Attribute parents of this Attribute. Attributes that are not valid outside a Repeated Attribute are difficult to find in the Attribute tree. This section provides information on accessing the Attribute in the Attribute Tree. If the Attribute is the not the child of a Repeated Attribute, this section is omitted.

11.2.6 Child Attributes

If an Attribute is a Repeated Attribute, this section lists all the Attributes inside this Repeated Attribute. If the section is omitted, the Attribute is not a Repeated Attribute.

12 User Settings

The User Settings section of Cento Analytics allow users to view details about their authentication state and manage their preferences. The User Settings section is split into two sub-sections: User and User Settings.

12.1.1.1 Accessing the User Settings page

From any screen in Cento Analytics, click on the user's name displayed in the upper navigation bar adjacent to the Log Off link.

12.2 User

The User section provides access to details of a User's account and authentication state. This data is read-only and provided as information data only.

12.2.1 Account Details

The Account Details page displays technically relevant information about a User's current authorization state. The page lists information about the identity of the user and any Cento Claims granted by the Integrated System during Authentication.

The following table defines the known Cento Claims.

Claim Name	Purpose
User Name	The current username of the authenticated account
Name	The name of the authenticated individual
Email	The email address of the authenticated individual
Database Identifier	Database Identifiers represent the different databases the current user has access to, as currently authenticated
Authority Name	The Authentication Authority Name that allowed the user to authenticate
Authority URL	The URL of the Authentication Authority that allowed the user to authenticate
Role	Each listing of the role claim corresponds to a role the authenticated user holds
Group ID	Each listing of the Group ID claim corresponds to the ID of a group the user belongs to
Group Name	Each listing of the Group Name claim corresponds to the Name of a group the user belongs to

Note: Other claims may appear in the Cento Claims listing depending on the environment Cento Analytics and the Integrated System are hosted in.

12.3 User Settings

The User Settings section provides links to control preferences and settings on a per-user level. These settings are private and apply to a user account based on username and authentication authority. This means that users who routinely authenticate with different Authentication Authorities may have different preferences saved for each authority.

12.3.1 Dashboard Reports

Each user of Cento Analytics can assign reports to a private dashboard that runs when the user logs in. Users configure their dashboards using the Dashboard Configuration screen accessed through the User Settings screen.

12.3.1.1 Dashboard Reports screen

The Dashboard Reports screen has two columns: the list of reports a user has access to and the reports currently added to the user's dashboard. You may add reports to your dashboard by clicking on their "Add" button, or remove them by hovering over them on the right side with the mouse and clicking their "Remove" button. You may then specify Timeframe settings for each report you added.

13 Administration

The Administration screen features links to the various administrative tasks available in Cento Analytics along with icons to indicate what functionality the section controls. The majority of Administration tasks in Cento Analytics relate to the configuration of the whole website.

The Administration section of Cento Analytics is only accessible to users whom the Integrated System authorized as Cento Analytics Administrators. Adding users to the Administrator role is done in the integrated system.

13.1 Flash Report Administration

The Flash Report Administration section allows an Administrator to configure the following properties of flash reports in Cento Analytics:

- Flash Report Services URL
- Manage Flash Reports

13.1.1 Flash Report Services URL

The Flash Report Services URL is the URL from which Cento Analytics downloads new Flash Reports. This URL rarely changes. The default value of this URL is https://support.cedaronmedical.com/FRService.

Cedaron Medical notifies customers when this URL changes.

13.1.2 Manage Flash Reports

The "Manage Flash Reports" section allow Administrators to update the flash reports available in Cento Analytics. Depending on whether or not the server hosting Cento Analytics has Internet Access, Administrators see one of two screens.

13.1.2.1 Updating Flash Reports when Server has Internet Access

When the server hosting Cento Analytics can verify the URL configured under Flash Report Services URL, it shows the streamlined version of the Flash Report Update screen. On this screen, the Administrator decides which report tags for which new flash reports should be download/updated. For Stock Reports, the tags generally correspond to known items in the integrated system.

When an Administrator clicks the "Download Flash Reports" button, the Cento Analytics connects to the Flash Report Services URL and downloads the latest flash report package. The software then installs the new flash reports. This process can take several minutes.
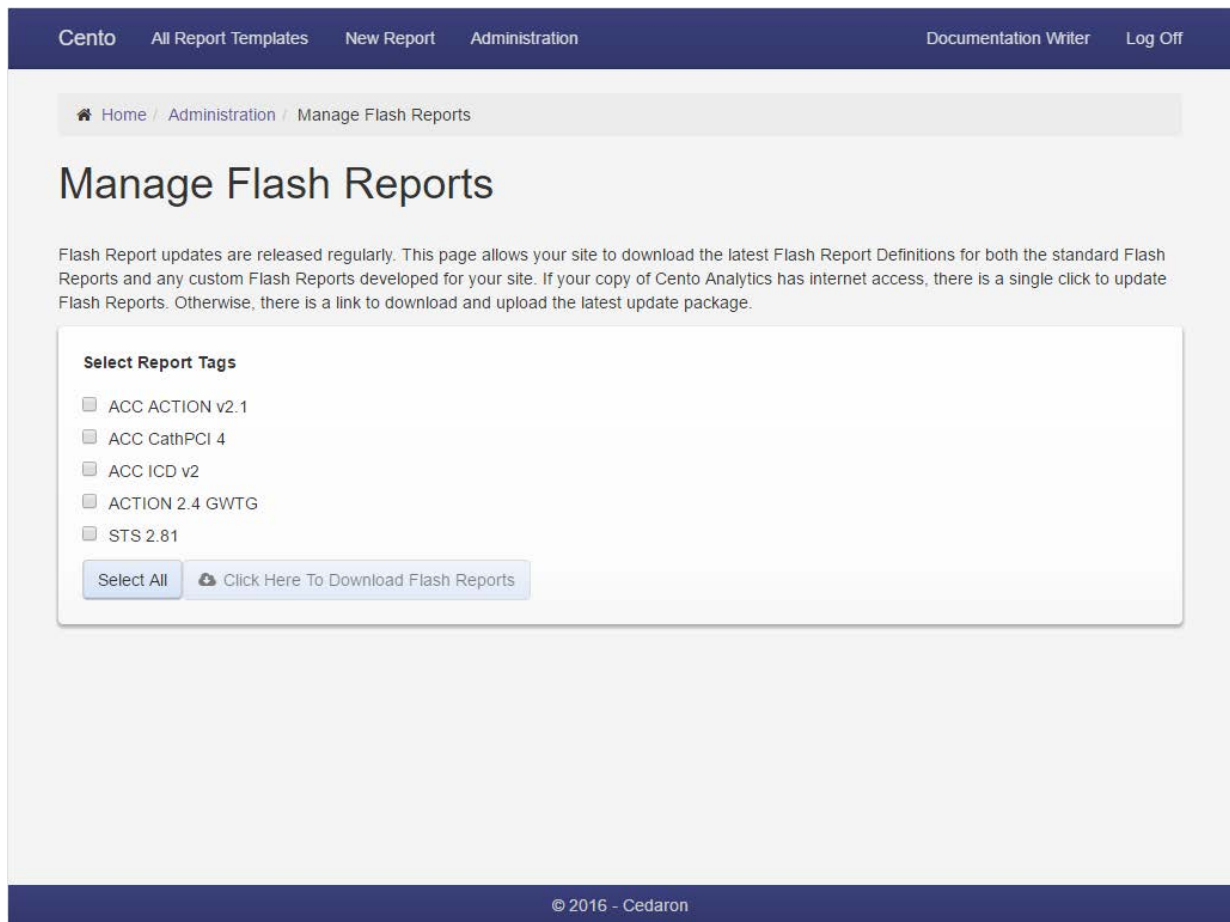
Figure 47 – Updating Flash Reports when the Web Server has Internet access

13.1.2.2 Updating Flash Reports when Web Server does not have Internet Access

When the server does not have Internet Access, a flash report download wizard is displayed. In this configuration, an Administrator is responsible for downloading the update package using their workstation's Internet connection, then uploading it to the Cento Analytics website.

While this interface is typically displayed only when the Cento Analytics web server does not have internet access, it may also be displayed when the corporate firewall prevents the web server from accessing the flash report download site or after a misconfiguration of the flash Report Update URL. In the latter case, the download step of the wizard fails.

The wizard has three panes.

1. Choose Tags

This tab lists the available Report Tags the Administrator can update or install. This list comprises the tags currently in the system, and the tags supplied by the last flash report update package installed.

2. Download Package

This tab presents a single button. Clicking this button attempts to download the chosen flash report update package from the flash report update service.

3. Install Package

This tab presents a simple form consisting solely of a file upload. On this page, the Administrator uploads the flash report update package downloaded in the previous step.

Figure 48 - Updating Flash Reports when the Web Server does not have Internet access

Figure 49 - Step 1 of Flash Report Package Download

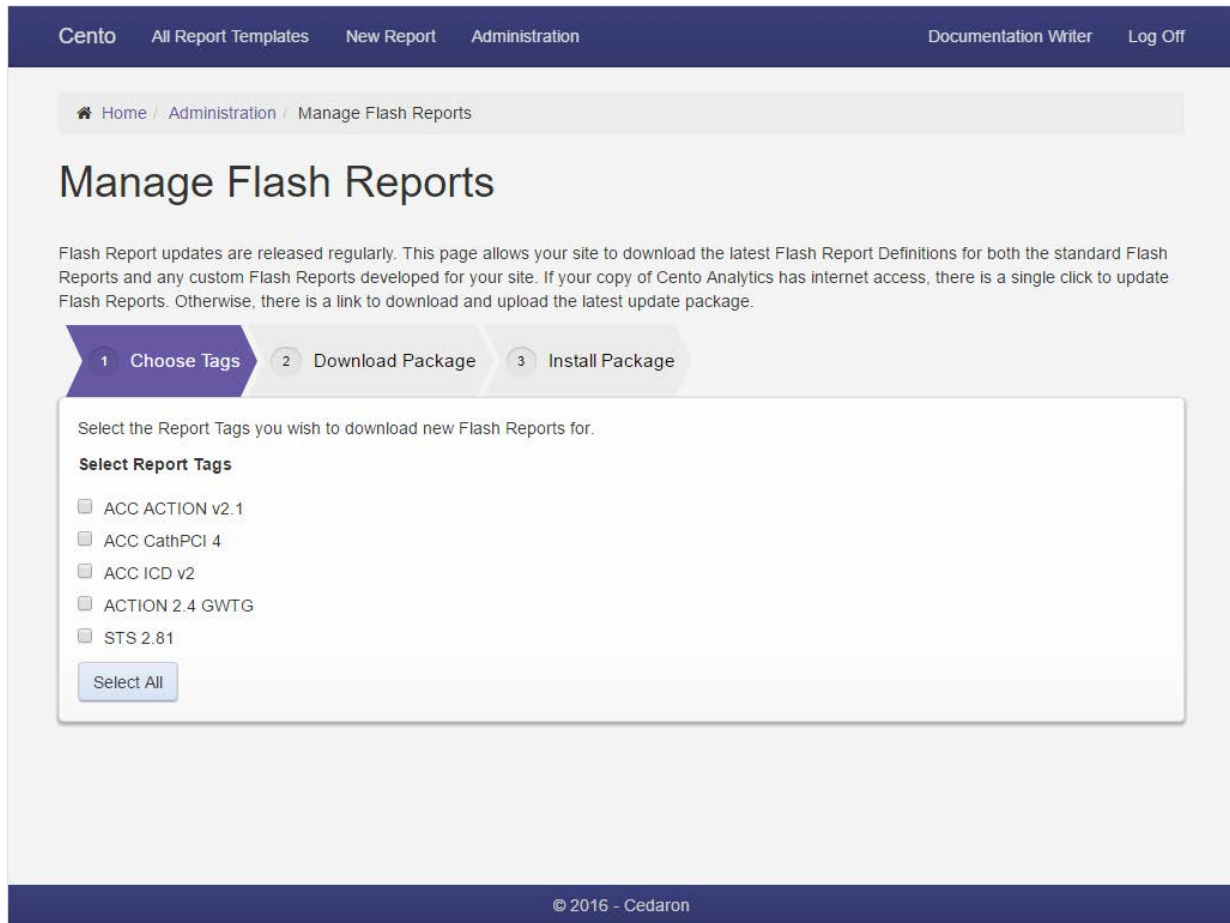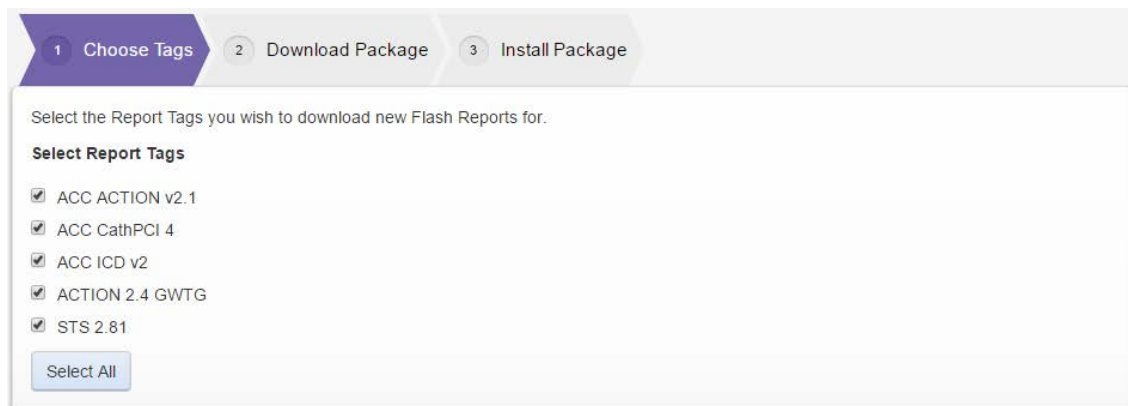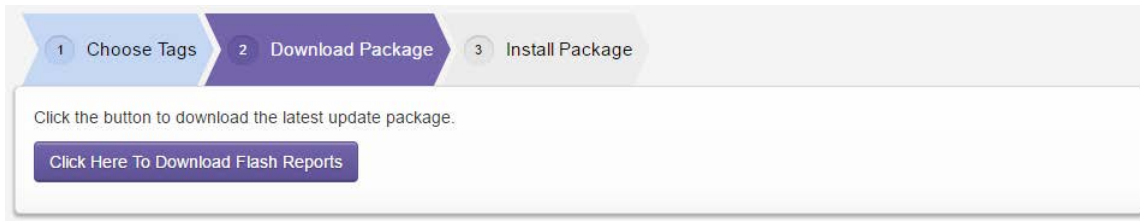*Figure 50 - Step 2 of Flash Report Package Download*
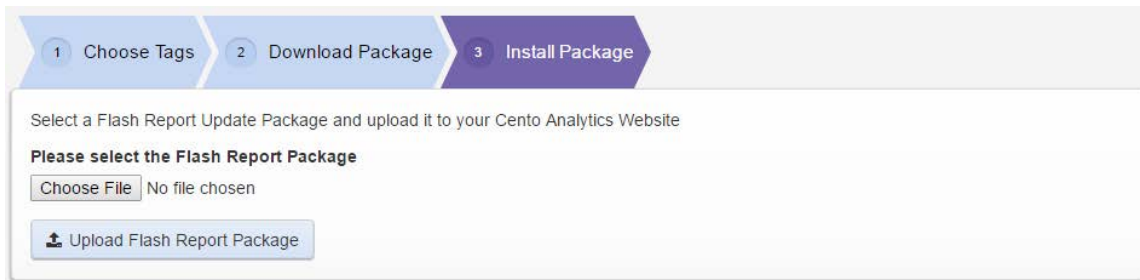
Figure 51 - Step 3 of Flash Report Package Download

13.2 Localization Administration

Cento Analytics is a fully localizable application. All text in the application is provided via resource files, allowing administrators to change the language of the application without redeploying. Contact Cedaron for the availability details of your preferred language.

13.2.1 Set Default Localization

The Default Localization is the localization resource used application-wide by Cento Analytics. At the time of writing, the only localization shipped with Cento Analytics is *English (United States)*. This screen lists any additional language resource files available on the Cento Analytics Web Server.

The "Set Default" button sets the currently selected localization as the system-wide localization.

The "Flush Localization Cache" button forces the web server to reload the localization resource from disk. This function is useful if localization files are updated in-place.

13.2.2 Customize Localization

Cento Analytics permits the site-wide customization of any localized phrase in the application. This section of the Administration area allows Administrators to customize phrases.

The default view of the "Customize Localization" screen is a table of the phrases in use in Cento Analytics. The columns of this table have the following meanings.

Manage	A link to modify the localization phrase
Phrase Id	The key that identifies this particular phrase. This key is identical in every localization resource Cento Analytics uses.
Phrase Text	The current text displayed by that Phrase Id within the application. The actual content of the phrase may differ from the text of the phrase based on templating

The provided search box searches both Phrase Id and Phrase Text.

13.2.2.1 Editing a Phrase

To edit a particular phrase, click on the "Manage" link in phrase table. The next screen shows the details of the phrase, including the Phrase Id, the current "expanded template value" and the actual text of the phrase. The "Expanded Template Value" is the text of the phrase after localization templates are expanded (see Phrase Templates). The "Phrase Template Text" shows the current source of the localization phrase, including any unexpanded templates.

To edit the phrase, modify the value of the "Phrase Template Text" textbox and press the "Save Phrase" button.

To revert any changes to the phrase, press the "Revert Customization" button. This button clears any existing customization of the phrase and reloads the original value of the phrase from the localization resource currently in effect.

13.2.2.2 Phrase Templates

There are two kinds of Phrase Templates in Cento Analytics - Localization Templates and Format Templates. Localization templates operate within the Cento Analytics Localization Engine while Format Templates typically include user or integrated system provided data.

13.2.2.2.1 Localization Templates

A localization template enables the insertion of one phrase into another. The following table describes the syntax for Localization Templates.

Example	Meaning
Is the {patient} well?	This phrase includes the value of the phrase with phrase id "patient" in your phrase. Assuming the phrase "patient" has the value "Patient", the resulting phrase is "Is the Patient well?"
{patient:lower}	This phrase includes the value of the phrase with phrase id "patient" and converts it to lowercase, using the rules for the current localization
{patient:upper}	This phrase includes the value of the phrase with phrase id "patient" and converts it to uppercase, using the rules for the current localization
{patient:upperfirst}	This phrase includes the value of the phrase with phrase id "patient" and capitalizes the first letter of each word in the phrase

13.2.2.2.2 Format Templates

A format template enables the insertion of user-specified or integrated system specified data in localized phrases. These phrases will include text such as {0} or {1}. Despite the similarity to the format of Localization Template phrase insertions, these do not correspond to phrases named "0" or "1". Instead, this refers to a value inserted when used in the application. When modifying these phrases, take special care not to include a number higher than the ones already present.

The meaning of the substituted values is not clear from the localization screen, and may not be determinable unless the locations where Cento Analytics uses the phrase are known.

13.2.3 Customize Entity Defaults

This screen allows administrators to configure the default presentation of the Attribute Tree in the Report Template Designer. If an Integrated System does not use a particular entity-level, customizing the Entity defaults allows administrators to disable the unused entity-levels.

The following states of the "Entity Default" are as follows.

State Name	Behavior
Collapse	Leaves the tree-node collapsed in the Attribute Tree. This is the default behavior.
Expand	Expands the tree node in the Attribute Tree by default.
Hide	Omits the tree-node in the Attribute Tree by default. This setting prevents access via the "Add" button or the drag-and-drop feature within the Report Template Designer. This setting allows Administrators to hide unused levels of the Entity Tree.

To change the "Entity Defaults" settings, choose the appropriate behavior for each Entity level, then press the "Save Changes" button.

13.3 Email Administration

Cento Analytics features the capability to directly email report results from the Web Application, without first downloading the results to the user's workstation. This feature is off by default. Enabling the feature requires specifying all the settings in the Manage Email section.

To disable emails in Cento Analytics, clear any of the settings in the Manage Email section.

13.3.1 Manage Email

This page consists of a single form with the required information to configure emails in Cento Analytics. Below is a description of the required fields.

Field	Description
From Email Address	The email address used as the "from" address in emails sent from Cento Analytics. This email address is recommended to be the same as the Email Account Username, but may be different such as a "do not reply" email address
SMTP Server	The address of the email server Cento Analytics sends email from
Use SSL	If checked, Cento Analytics uses an encrypted connection to connect to the SMTP Server. Cedaron recommends enabling SSL
SMTP Port Number	The port number for connections to the email server. The SMTP Port Number is typically 25, 587, or 465.
Email Account Username	The username of the email account Cento Analytics uses
Email Account Password	The password of the email account Cento Analytics uses. Cento Analytics stores this value securely

After all the fields in this section are saved, the option to email Report Results becomes available from the Report Results screen.

13.3.2 Manage Mailing Lists

Mailing Lists allow Administrators to configure pre-defined lists of email addresses that receive emails as a unit.

The Mailing Lists page shows the current mailing lists in the system, summarizing the name of each mailing list and how many email addresses the list represents.

13.3.2.1 Create a new Mailing List

To create a new Mailing List, click on the "New Mailing List" button.

The screen transitions to the mailing list editor. The mailing list editor contains a form with the fields required to define a Mailing List. The meaning of each input follows.

Field	Description
Name	The name of the mailing list. Users choose a mailing list by name.
Description	The description of the mailing list. Users may refine their choice of a mailing list by reading the description of the mailing list.
To:	A list of email addresses to send the email "To"
Cc:	A list of email addresses to send the email "Cc"
Bcc:	A list of email addresses to send the email "Bcc"

The "To:" "Cc:" and "Bcc:" fields accept email addresses separated by a comma, semicolon or new lines.

Once the mailing list has the appropriate data, press the "Save Mailing List" button.

13.3.2.2 View the Details of an existing Mailing List
To view the details of an existing Mailing List, click on the "Details" link in the same row as the mailing list.

13.3.2.3 Delete an Existing Mailing List
To delete an existing Mailing List, click on the "Details" link in the same row as the Mailing List. From the Details view, click on the "Delete Mailing List" button.

13.3.2.4 Edit an Existing Mailing List
To edit and existing Mailing List, click on the "Details" link in the same row as the Mailing List. From the Details view, click on the "Edit Mailing List" button.

The screen transitions to the Mailing List Editor. For a complete description of this screen, see Create a new Mailing List.

13.3.3 Edit Email Template
The email template is the template used when sending report results via email. The template has several substitution options, as listed.

Substitution	Meaning
<<user>>	The username of the user sending the email
<<report name>>	The name of the report template referred to in the email
<<user note>>	The message the sender added to the report results
<<report details>>	The specific filters, timeframe, and parameter values used to generate the report results

None of the substitution texts are required.

Email templates are plain-text and cannot contain rich text features such as italics, bold, images or hyperlinks. Using plain-text for email template simplifies the structure of emails sent from Cento Analytics and helps ensure consistent viewing experiences on a broad range of email clients.

13.3.3.1 Changing the Email Template
To change the email template, supply the text to use in Email Template text area.

After making changes, press the "Save Changes" button to save the email template. Changes to the email template are effective immediately.

13.4 Analytics Variables Administration

Analytics Variables are named values accessible from within Report Templates. Variables consist of a name, and a list of values effective during specific time ranges. This feature acts as a constant lookup-table and allows report writers the ability to write a report once, without hard-coding the constants needed for formulas or calculations. To protect the correctness of Analytics Variables in Cento Analytics, only Administrators can add, modify or delete Analytics Variables

13.4.1 Managing Analytics Variables

In the Analytics Variables screen, a table lists all existing Analytics Variables. The name of an Analytics Variable is its primary identifier. The value of an Analytics Variable depends on the date parameter provided in the Analytics Variable lookup function. The table lists the existing Analytics Variables, their value as of today, and the expiration date of that value (if applicable).

13.4.1.1 *Create a new Analytics Variable*

To create a new Analytics Variable, click on the "Create a new Analytics Variable" button. This button opens the Analytics Variable editor.

The Analytics Variable editor has two main panes: the specific details of the Analytics Variable and a table of its values.

The fields of an Analytics Variable are as follows.

Field	Description
Variable Name	The name of the Analytics Variable. The name is the primary identifier for Analytics Variables
Variable Description	A textual description of what the variable is for
Variable Type	The type of value the Analytics Variable

13.4.1.1.1

13.4.1.1.2 Adding values to an Analytics Variable

To add a new value to an Analytics Variable, click on the "Add Value" in the values table.

In the new row, add the value of the Analytics Variable. To indicate a Variable has always had this value, leave the Effective Date empty. To create a value that never expires, leave the expiration date blank. Otherwise, provide the appropriate Effective Date and Expiration Date.

The type of an Analytics Variable is permanent while it has at least one value. To change the type of an Analytics Variable, delete all values for the variable.

13.4.1.2 *View the details of an existing Analytics Variable*

To view the details of an existing Analytics Variable, click on the "Details" link in the same row as the Analytics Variable of interest.

13.4.1.3 *Delete an existing Analytics Variable*

To delete an existing Analytics Variable, click on the "Details" link in the same row as the Analytics Variable of interest.

On the details screen, click the "Delete Analytics Variable" button.

13.4.1.4 Edit an existing Analytics Variable

To edit an existing Analytics Variable, click on the "Details" link in the same row as the Analytics Variable of interest.

On the details screen, click the "Edit" button, opening the Analytics Variable editor. For the full details of the Analytics Variable editor, see Create a new Analytics Variable.

13.5 Authentication Administration

Cento Analytics delegates both Authentication and Authorization to the trusted Integrated System. The Integrated System must provide either a token authentication service ("One-Click") or a standard authentication service ("Username and Password") or both.

Administrators may also provide a list of suggested Authentication Authorities.

13.5.1 Authentication Services

To configure the Authentication Services URLs, change the value of the textbox for the relevant service.

The "Credential Authentication Service URL" is the URL "Username and Password" log-ins authenticate against

The "Token Authentication Service URL" is the URL "One-Click" log-in authentication uses to verify authentication tokens.

If your Integrated System uses more than one Authentication Authority, adding the possible values to the Authentication Authority textbox adds those values to the Authority textbox on the login page. If there is only one possible authority, entering it in this text area automatically populates that authority on the login page. Newlines delimit authority names.

13.6 Cache Administration

Cento Analytics utilizes several application-level caches to optimize response speed and performance. Like all caches, there is a chance the cache becomes too large or contains significant amounts of stale data. In the event an Administrator suspects this, the Cache Administration page allows the administrator to view the contents of the cache and clear it.

13.6.1 Manage Cache

The Manage Cache screen displays the contents of the Cento Analytics application-level cache. The first line of each entry is the "cache-key," the value that uniquely identifies the item in the cache. The second line describes the .NET Runtime type of the item in the cache.

13.6.1.1 Clearing the Cache

To clear the cache, press the "Clear Cache" button.

Clearing the cache forces all reports to rerun against the database, invalidates any report results currently open and may slow navigation responses until the cache reloads shared resources.

13.7 Modifying Application Settings in Web.config

In addition to the Administration UI in Cento Analytics, several settings feature keys in the web.config file. These settings require administrative access to the Web Server hosting Cento Analytics, and are configurable by personnel that may or may not have access to the Cento Analytics application.

There are two settings, Cache Expiration and the Connection String, that are configurable only through the Web.config file.

Note: Settings configured via the Administration pages of Cento Analytics supersede settings in the Web.config file.

13.7.1 Web.config configurable settings

Application specific settings in the Web.config belong in the <appsettings> tag in the Web.config XML. The following is an example of the settings tag.

```
<appSettings>
    <add key="LoggingLevel" value="WARN" />
</appSettings>
```

Settings follow the pattern of "add", "key", "value".

The following table lists the settings configurable through the Web.config. Supported values listed where applicable.

Setting	Key	Value(s)
Cache Expiration Minutes	CacheExpirationMinutes	Any number greater than zero. The value is the number of minutes to retain items in the cache.
Token Authentication URL	TokenAuthenticationUrl	Any valid URL hosting a Token Authentication ("One-Click") service
Credential Authentication URL	CredentialAuthenticationUrl	Any valid URL hosting a Credential Authentication ("Username and Password") service
Flash Report Update URL	FlashReportUpdateService	The URL of Cedaron's Flash Report Update Service
Email Template	EmailTemplate	Text specifying the template to use when sending Report Results via email from Cento Analytics
Use SSL for Email	WebMail.EnableSSL	"True" or "False"
From Address for Email	WebMail.From	Any valid email address
SMTP Server Name	WebMail.SmtpServer	Any valid URL referring to an SMTP server
SMTP Port Number	WebMail.SmtpPort	Any valid number between 1 and 65535

SMTP Username	WebMail.UserName	The username Cento Analytics sends emails using
SMTP Password	WebMail.Password	The password of the email account Cento Analytics uses. Note: providing the password in the Web.config file necessitates storing the password in plain-text