



# CardiacCare

## Custom Question Creation Guide

CEDARON

## CardiacCare Guide to Creating Custom Questions

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## Overview

CardiacCare allows users to customize data forms and collect data unique to that organization's reporting/tracking by allowing the organization to define custom data questions and custom data forms.

A custom form would be used when an organization has a need to collect its own set of data points, which may not be related to any of the specific registry data forms. For example, perhaps the organization has a procedure that needs data points tracked and metrics generated, but this is not a procedure currently part of the registries used by the organization. In this case, the organization would create its own data form full of custom questions to represent the data the organization wishes to collect, track, and analyze.

While custom questions can be used on a custom data form, they also can be used to extend a stock registry form. For example, an organization may wish to collect additional data points related to an Adult Cardiac procedure that is not part of the standard STS Adult Cardiac registry data form. In this case, the organization would create custom questions and then add those to the STS Adult Cardiac registry data form. These questions would then appear for the data abstractors within their organization. This is advantageous since the questions being seen as “part” of the standard data form make it much less likely that an abstractor will forget to collect and enter that information.

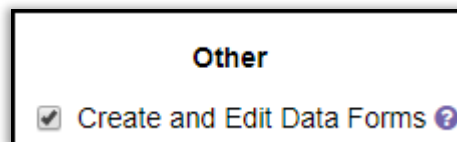
This guide will review a sample scenario and provide additional reference information at the end.

## Creating Custom Questions

Whether your organization will use a separate custom data form or integrate custom questions into a stock registry data form, the process is the same.

### Permissions

To work with custom questions, a user must have the “Create and Edit Data Forms” permission enabled in the Security Manager. This adds the “Form Builder” menu item under “Utilities”.



### Plan Custom Questions

The first step is to gather information from your constituents about the type of data you wish to collect and how that data will behave. In general, this will be categorized as one of the following types of questions:

- Yes/No question  
The data form will have three options for these questions: (unspecified), No, and Yes. The default value selected will be (unspecified).
- Numeric question  
These questions will provide a box for the abstractor to enter a numeric value. The maximum and minimum values allowed can be specified, as well as the number of decimal places and the unit of measurement. The default value will be blank.

- Date/time question  
These questions can be set to one of the following 3 modes, allowing entry of a date, a date and time, or a date OR date and time. The default value will be blank.
- Single Choice question  
These questions allow a set of choices to be specified. The abstractor will have to select one of the listed choices. The question will also have (unspecified) as a choice – this does not need to be entered. The default value selected will be (unspecified).
- Free Text question  
These questions allow free text to be entered by the data abstractor for the answer. The default value will be blank.

While CardiacCare offers additional question types, the above list will cover most of the custom questions created by organizations. For assistance with the more advanced question types, feel free to contact Cedaron.

You should carefully consider which type of question best represents the data you wish to collect and if there are any relationships between the questions you will be creating.

For example, perhaps an organization wants to collect the following information:

- a. When did the pre-op consultation occur?
- b. How long did the pre-op consultation last? 15 minutes, 30 minutes, 45 minutes, 1 hour, Over 1 hour
- c. Was an interpreter used?
- d. If yes, collect the interpreter's badge number
- e. Were all the patients' concerns addressed?
- f. If not, what were the outstanding concerns?
- g. Was the patient referred to additional resources for those concerns?

For the above questions, (a) could be a date or a selection such as "1-3 days prior to the procedure," "4-6 days prior to the procedure," "1 week prior to the procedure," etc. In this scenario, our organization would like to collect the date the pre-op consultation occurred, as our analysts can use that with the date of surgery to determine additional information, such as how far in advance the consultation was.

Question (b) will be a single-choice question.

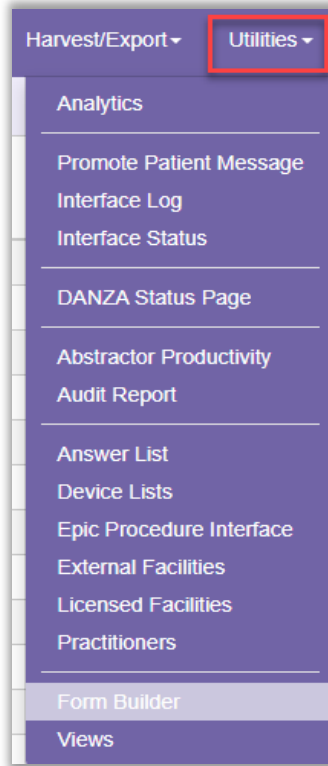
Question (c) will be a Yes/No question. Question (d) will be free text, but will only be visible and allow entry if Yes is selected to question (c).

Question (e) will also be a Yes/No question. Question (f) will be free text, but will only be visible and allow entry if No is selected to question (e). Question (g) will be a Yes/No question, and also only be visible if No is selected to question (e).

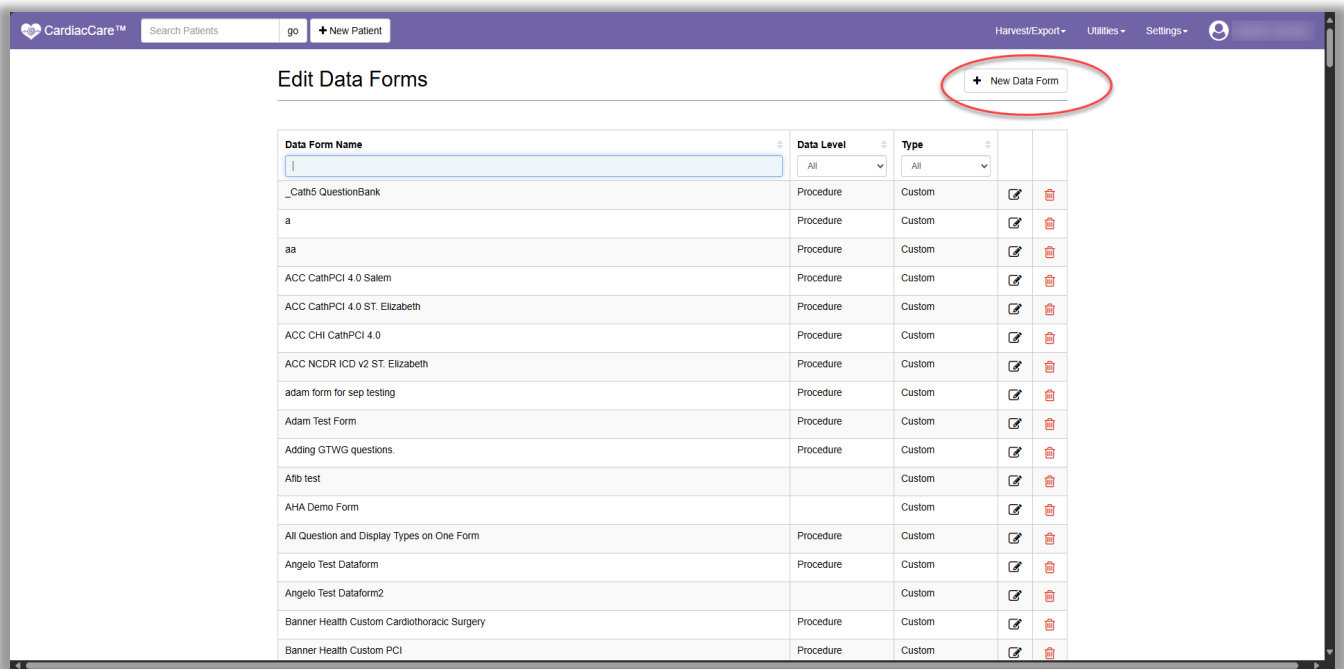
We want these questions to be collected at the end of the STS Adult Cardiac 2.9 data form.

## Create Data Form

Whether the custom questions will be integrated as one or more sections into a stock data form or used as a separate data form, they are created on a custom data form. To begin, go to the **Utilities** menu and select **Form Builder** from the sub-menu.



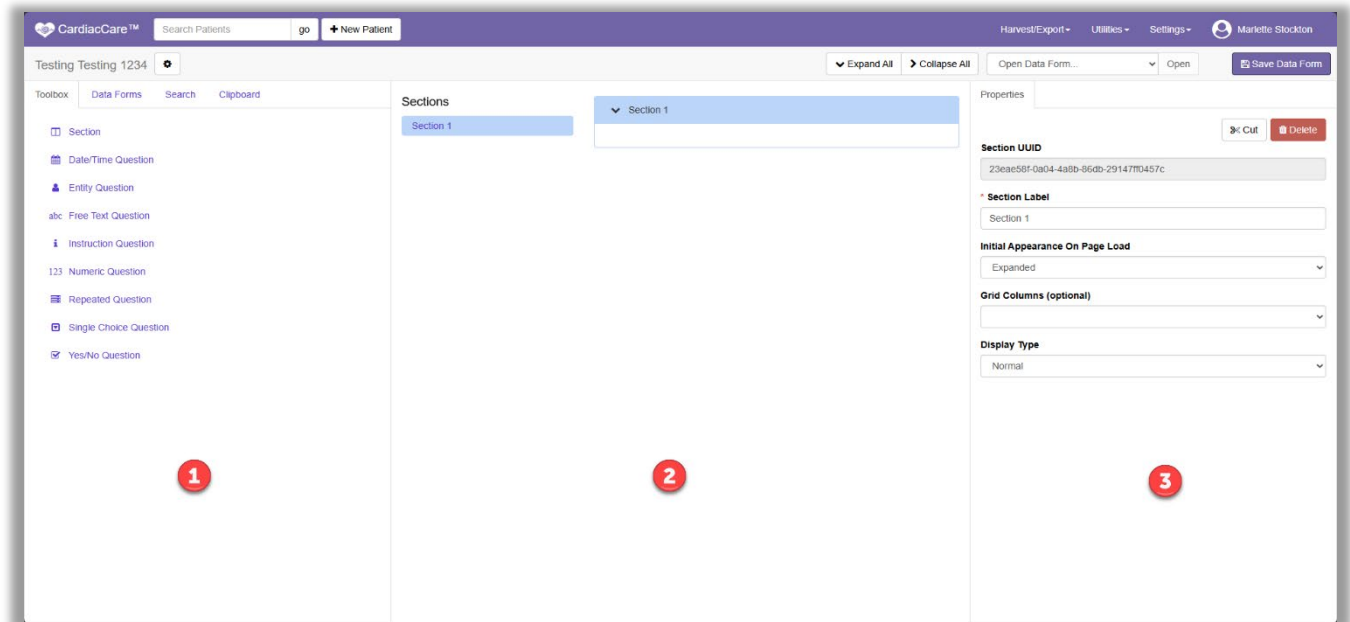
Select the **+ New Data Form** button.



Enter a name for the Data Form, select the Data Form Type, and press **Save**.

The screenshot shows a dialog box for creating a new data form. It features a text input field for the 'Data Form Name' and a radio button selection for the 'Data Form Type', with options for 'Clinical Form' and 'Patient Survey'. At the bottom right, there are 'Cancel' and 'Save' buttons.

You will be presented with a blank data form containing one section. The question tools are to the left (1); the form's current contents are in the center(2), and the right contains the properties for the current item(3).

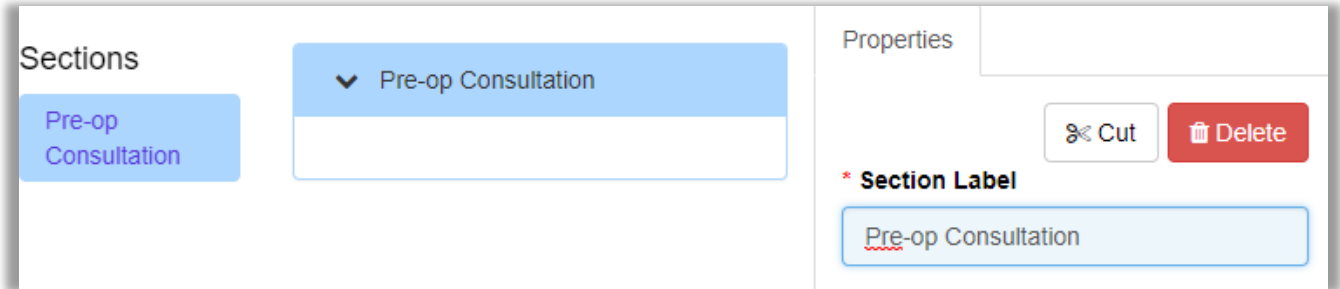


Start by giving a name to the section rather than accepting the default of “Section 1”. This will display the abstractors in the data form navigation on the left of the data form, allowing abstractors to jump to this section quickly. You can also select what the initial appearance of this section will look like on the data form. You can choose from Expanded, Collapsed, and Collapsed if there is no user-answered question. Selecting Grid Columns is optional, and you can also select the Display type as Normal or Multi Select.

The screenshot shows a configuration form for a section. At the top right, there are two buttons: "Cut" (with a scissors icon) and "Delete" (with a trash can icon). Below these are the following fields:

- Section UUID:** A text input field containing the value "23eae58f-0a04-4a8b-86db-29147ff0457c".
- \* Section Label:** A text input field containing the value "Section 1".
- Initial Appearance On Page Load:** A dropdown menu with "Expanded" selected.
- Grid Columns (optional):** A dropdown menu that is currently empty.
- Display Type:** A dropdown menu with "Normal" selected.

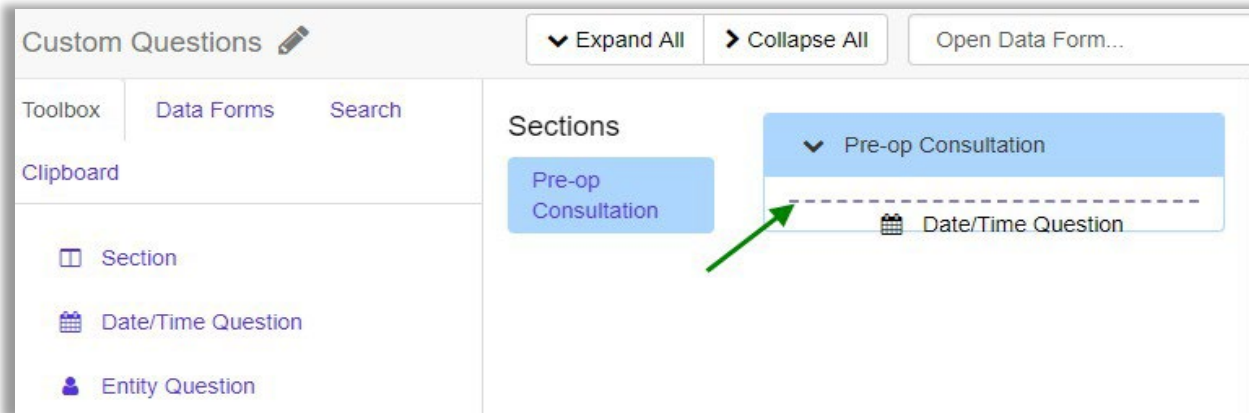
Section 1 is already selected, so to change the name, you simply have to access the Section Label in the Properties panel – (3) in the screenshot above – and change the entered name. For this example, we will call the section “Pre-op Consultation”. You can see in the screenshot below that the data form – in the center section – the name of the section changes to reflect the updated information:



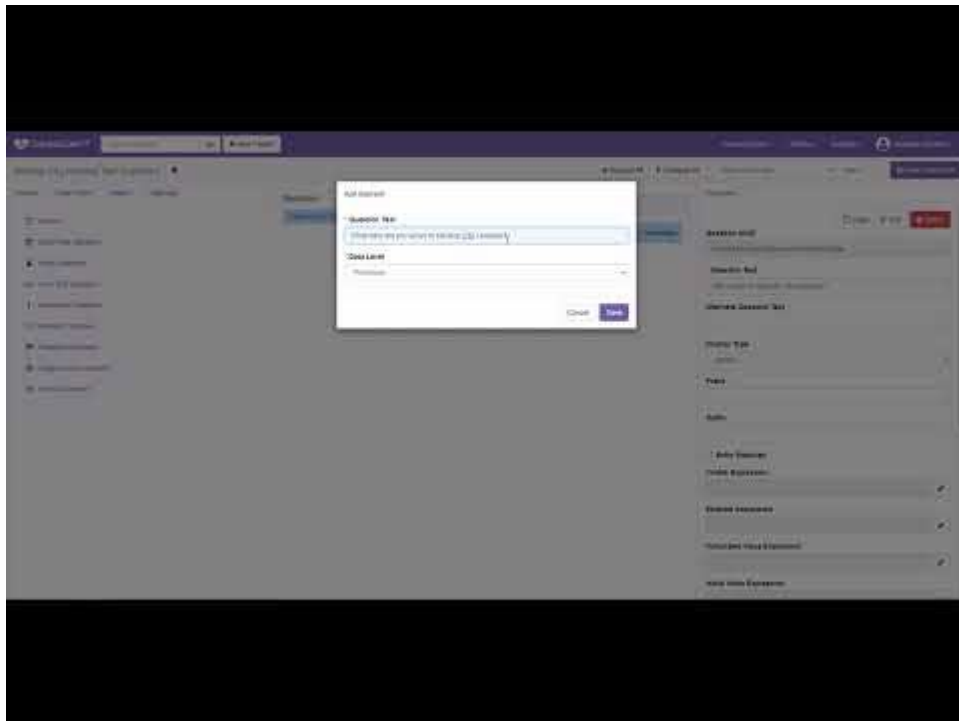


## Add Questions

Next, we will add questions to the data form. We will start by getting each question working in the desired display order. All questions will always be visible. Adding the parent/child relationships we identified will be completed later. To add a question, drag the question type from the left-hand panel to where it should appear on the data form. A label showing the type of question appears, and a purple dashed line shows where the question will be placed:



For more information, please see the snippet video below. (Select YouTube at the bottom right to see the full-screen video.)



When you let go of the mouse button, the add element dialog box will appear, promoting you to the text of the question. For this walk-through, we will be creating Procedure Level questions. Information about additional data levels is available in the reference section or by contacting Cedaron.

Add Element


\* **Question Text**

When did the pre-op consultation occur?

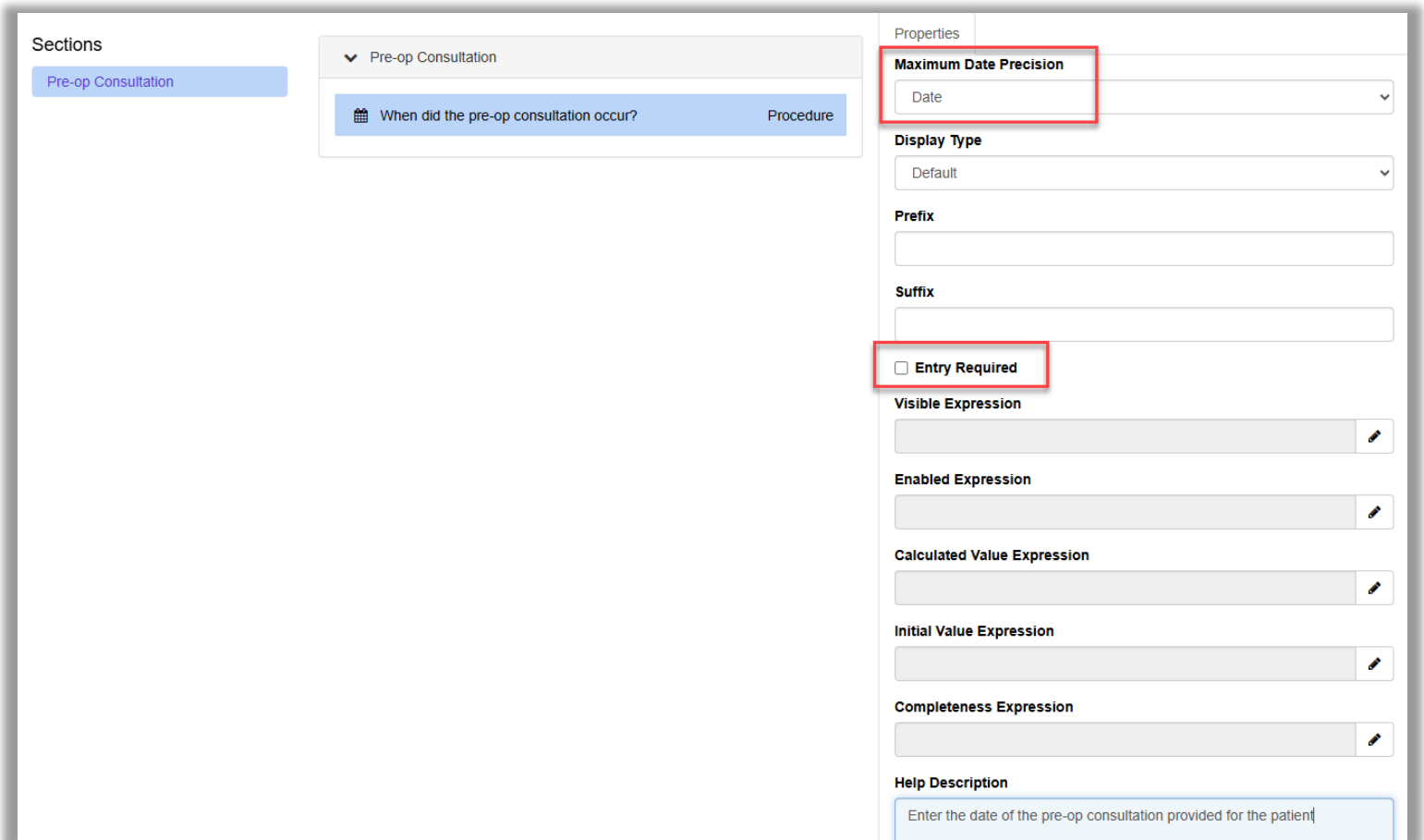
\* **Data Level**

Procedure

Cancel Save

After pressing **Save**, the question is added to the form. It is automatically selected so that you can adjust any additional properties as needed. We want the precision to be “date,” the default for this question. Can we enter some additional help text displayed when the purple  icon is clicked?

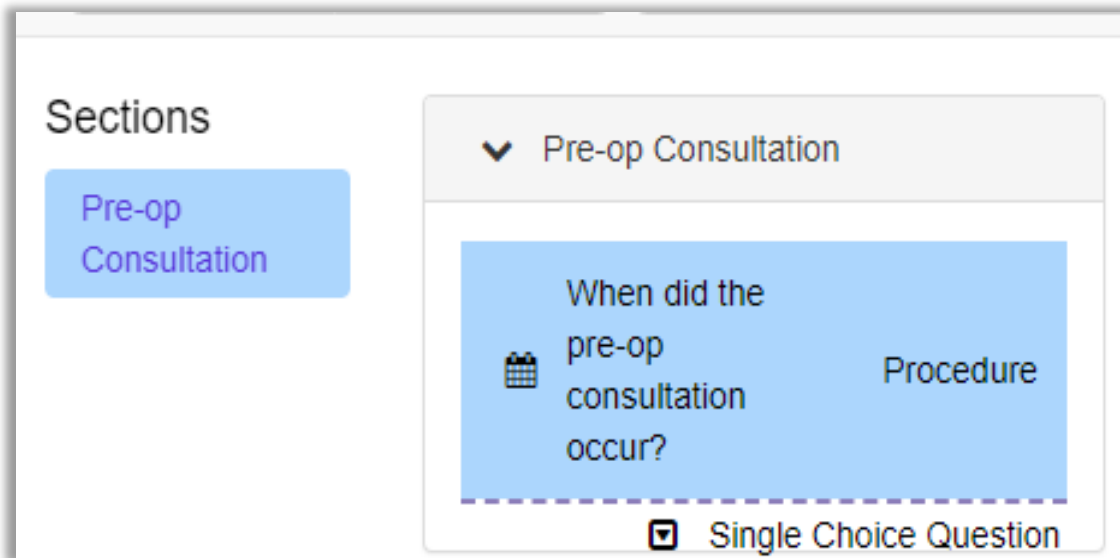
For every question, there is also the option of making an entry required by checking the **Entry Required** checkbox. See the additional reference material at the end of this guide for details.



The screenshot displays the CEDARON configuration interface. On the left, under 'Sections', 'Pre-op Consultation' is selected. The main area shows a question 'When did the pre-op consultation occur?' with a 'Procedure' icon. The right-hand 'Properties' panel is expanded, showing several settings:

- Maximum Date Precision:** A dropdown menu set to 'Date'.
- Display Type:** A dropdown menu set to 'Default'.
- Prefix:** An empty text input field.
- Suffix:** An empty text input field.
- Entry Required:** A checkbox that is currently unchecked.
- Visible Expression:** An empty text input field with an edit icon.
- Enabled Expression:** An empty text input field with an edit icon.
- Calculated Value Expression:** An empty text input field with an edit icon.
- Initial Value Expression:** An empty text input field with an edit icon.
- Completeness Expression:** An empty text input field with an edit icon.
- Help Description:** A text input field containing the text: 'Enter the date of the pre-op consultation provided for the patient'.

Next, we add the second question by dragging the Single Choice question from the left-hand panel to the appropriate location in the center panel, again looking for the purple dashed line to indicate where the question will be placed:



When the mouse button is released, we are prompted to enter the Question Text and Data Level. Press **Save** when done. The question has been added and auto selected so we can edit its properties.

### Sections

Pre-op Consultation

▼ Pre-op Consultation

When did the pre-op consultation occur?

Procedure

How long did the pre-op consultation last?

Procedure

### Properties

Copy
Cut
Delete

**\* Question Text**

How long did the pre-op consultation

**Alternate Question Text**

**Display Type**

Default ▼

**Choices**

Seq. #	Value	Text	
1	<input style="width: 60px;" type="text"/>	<input style="width: 60px;" type="text"/>	+

For this question, we need to add the choices that should appear in the drop-down list. This is done by adding value and text for each choice. The value is a numeric representation of this answer option (for example, a code, a numeric value related to the answer, or even sequential numbering). The text will be displayed to the data abstractor for selection on the form. After entering the value and the text, press the green + icon to add the entry as a choice. A blank set of inputs will automatically appear for subsequent choice entries. You can use the red X to delete an entry if it is no longer needed. It is strongly recommended not to re-use values for different text options if the options change in the future or if you have ever collected any data for that question. Recall that this will impact the meaning of all previously collected data.

**▼ Choices**

Seq. #	Value	Text	
1	15	15 minutes	✖ 📄
2	30	30 minutes	✖ 📄
3	60	1 hour	✖ 📄
4	45	45 minutes	✖ 📄
5	<input style="width: 50px;" type="text" value="360"/>	<input style="width: 250px;" type="text" value="Over 1 hour"/>	+

If a choice is entered in the wrong order, you can simply drag the option up or down in the list to re-order the options. A purple dashed line will indicate where the item is being moved to.

**▼ Choices**

Seq. #	Value	Text	
1	15	15 minutes	✕ 📄
2	30	30 minutes	✕ 📄
		45 minutes	
3	45	45 minutes	✕ 📄
4	60	1 hour	✕ 📄
5	<input type="text" value="360"/>	<input type="text" value="Over 1 hour"/>	+

Releasing the mouse button will move the item to the correct position.

**▼ Choices**

Seq. #	Value	Text	
1	15	15 minutes	✕ 📄
2	45	45 minutes	✕ 📄
3	30	30 minutes	✕ 📄
4	60	1 hour	✕ 📄
5	<input type="text" value="360"/>	<input type="text" value="Over 1 hour"/>	+

We can also add some help text for this question:

**Help Description**

Indicate how long the pre-op consultation lasted. Round the time to the nearest 15 minute increment.

For our next question, “Was an interpreter used?”, we will drag the Yes/No question from the left-hand panel to the center panel:

Sections

Pre-op Consultation

Pre-op Consultation

<input type="checkbox"/>	When did the pre-op consultation occur?	Procedure
<input checked="" type="checkbox"/>	How long did the pre-op consultation last?	Procedure

In this case, we accidentally placed the question in the wrong position:

Sections

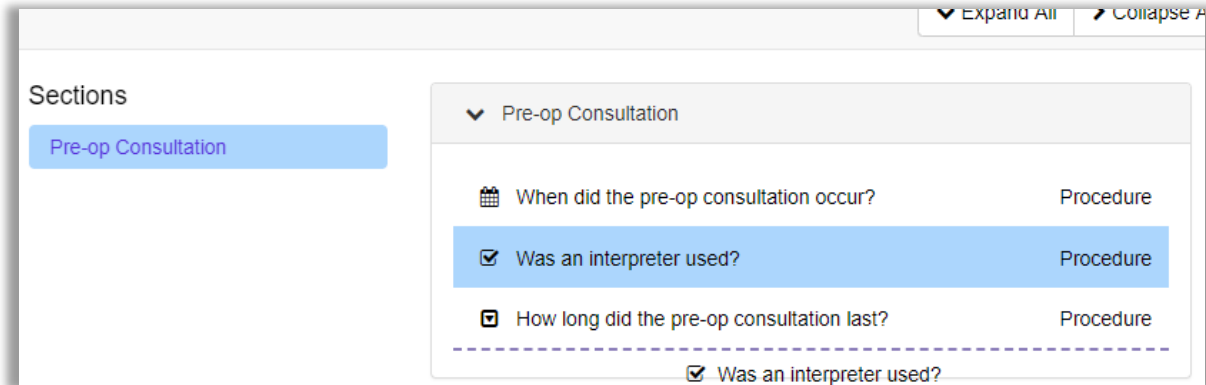
Pre-op Consultation

Pre-op Consultation

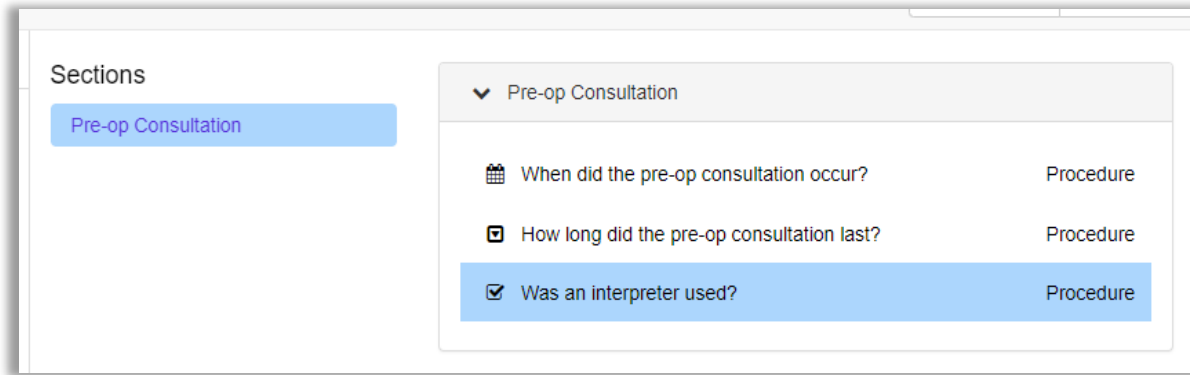
<input type="checkbox"/>	When did the pre-op consultation occur?	Procedure
<input checked="" type="checkbox"/>	Was an interpreter used?	Procedure
<input type="checkbox"/>	How long did the pre-op consultation last?	Procedure



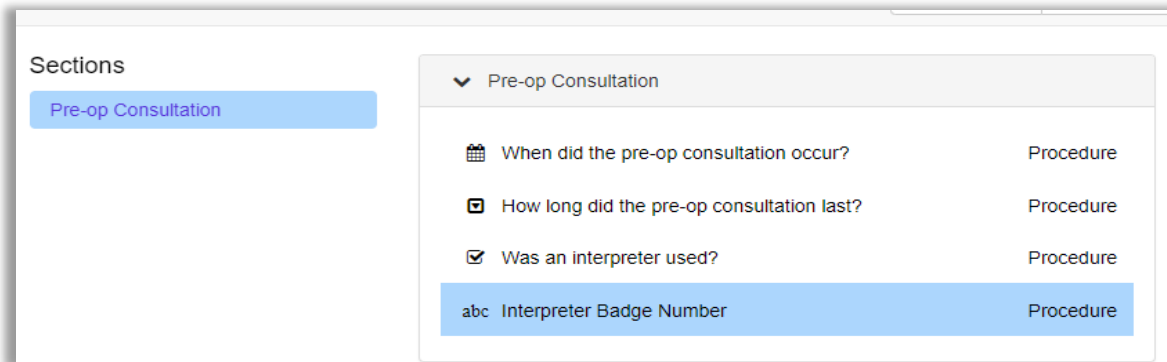
We can easily fix this by dragging the question to the correct location, which will re-order the questions within the section:



And the completed re-ordering:



For our next question, “If yes, collect the interpreter’s badge number,” we will just set it up as a free text question with the label “Interpreter’s Badge Number.” We do not need the “if yes...” wording, as we will eventually make it so that this question only displays if **Yes** was entered for the previous question. However, to start, we will just create the question, keeping in mind that we will add a parent/child relation later. Drag the Free Text Question from the left-hand panel to the appropriate location in the center panel, and create the question:

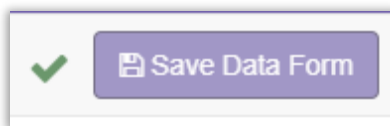


Use a similar method to add the remaining few questions, with question (e) being Yes/No, question (f) being free text, and question (g) being Yes/No. Once done, your form should look like this:

Question	Type
<input type="checkbox"/> When did the pre-op consultation occur?	Procedure
<input type="checkbox"/> How long did the pre-op consultation last?	Procedure
<input checked="" type="checkbox"/> Was an interpreter used?	Procedure
abc Interpreter Badge Number	Procedure
<input checked="" type="checkbox"/> Were all of the patient's concerns addressed?	Procedure
abc What were the outstanding concerns?	Procedure
<input checked="" type="checkbox"/> Was the patient referred to additional resources for those concerns?	Procedure

Press the Save Data Form button in the upper right to save the form in its current state:

The save button will gray out, and a green check will indicate the successful save of the data form:



### Add Parent/Child Relationships

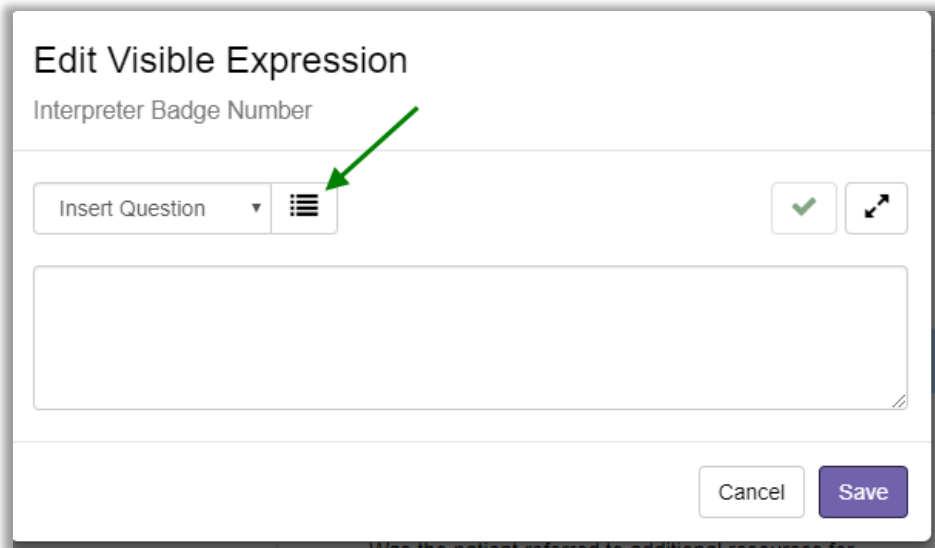
Next, we will add parent/child relationships to the questions which require them. This is how we can control which questions remain hidden and only display based on the answer to a different question. The question that controls visibility is referred to as the parent, and the question hidden or displayed is referred to as the child.

The first relationship we need to add is to hide the “Interpreter Badge Number” question by default. It will display if an abstractor enters “Yes” to the question “Was an interpreter used?”

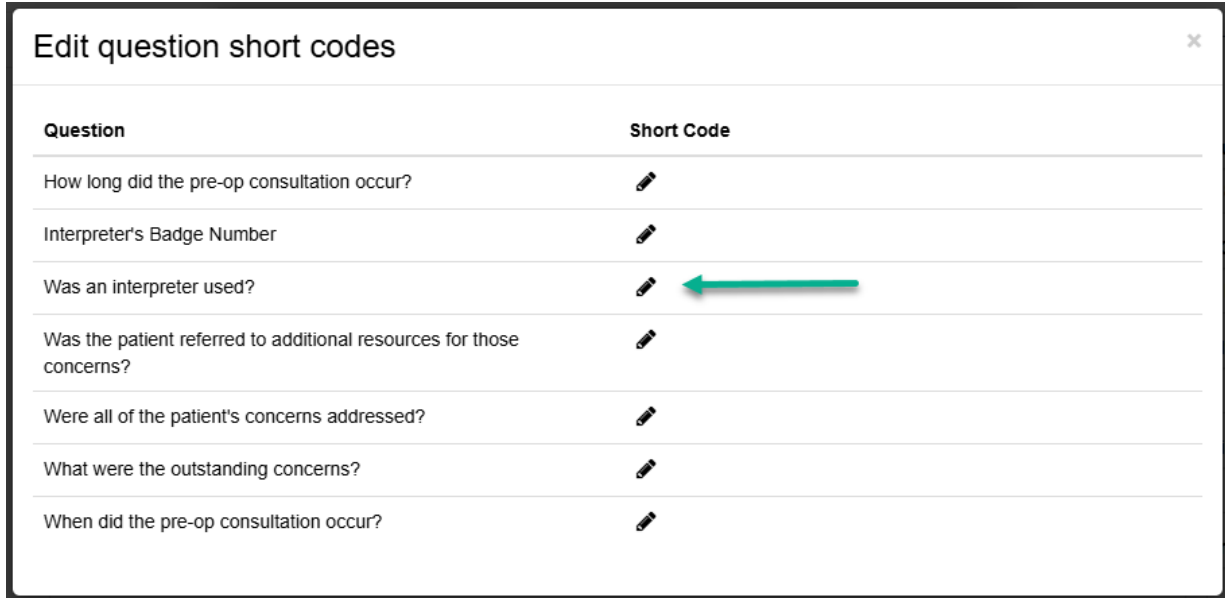
Click on the “Interpreter Badge Number” question to select it and have the properties display in the right-hand panel. Scroll down (if necessary) to find the edit (pencil) icon next to the “Visible Expression” property and click that button:

The screenshot shows the CEDARON interface with a list of questions on the left and a properties panel on the right. The question "Interpreter Badge Number" is selected and highlighted in blue. The properties panel on the right shows various fields for editing the question, including "Question Text", "Alternate Question Text", "Display Type", "Prefix", "Suffix", "Entry Required", "Visible Expression", "Enabled Expression", and "Calculated Value Expression". A green arrow points to the pencil icon next to the "Visible Expression" field.

A window will appear to allow editing of the visibility expression for this question. Our first step will be to create a short code (think nickname) for the parent question. To do so, click on the list icon next to the "Insert Question" drop-down menu:



A window allowing editing of shortcodes appears. Click the pencil icon next to the parent question.

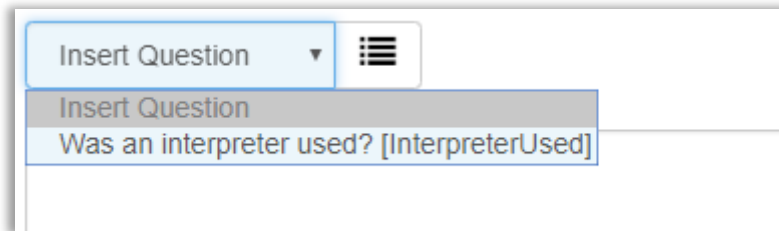


A text input appears. Enter a short code for this question. It is recommended that the shortcode does not contain any spaces. A frequent method for naming when spaces are not allowed is called Camel Case, which means capitalizing the first letter of each word. For this question, we can use “InterpreterUsed”. After entering the text for the shortcode, press the green check mark to save the shortcode:

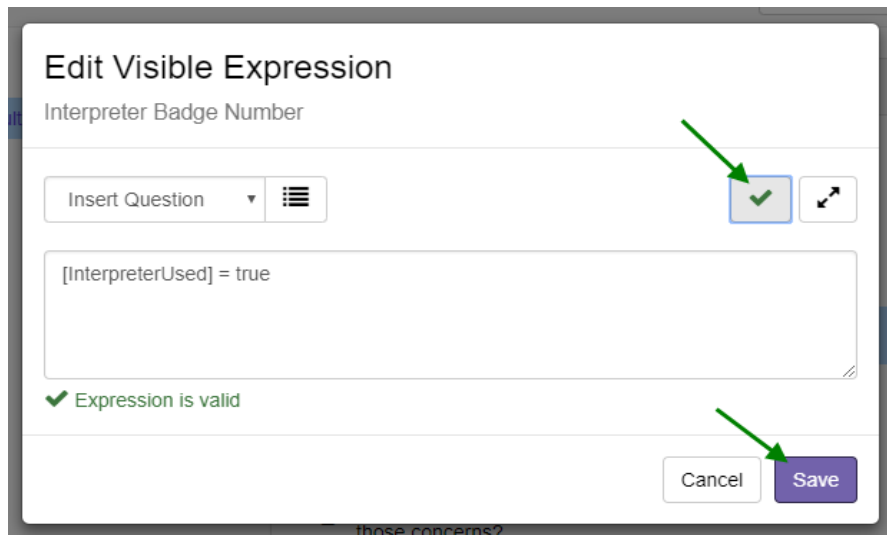


Click the X in the upper right to close the shortcode editor screen.

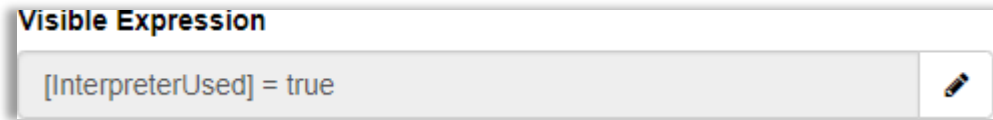
Back on the previous window, we can now click on the “Insert Question” drop-down and see that the parent question is now available to use in a relationship. The drop-down shows both the question and the shortcode we created:



This parent is a simple Yes/No Question. The system interprets Yes as true, No as false, and (unspecified) as blank. In this case, we want the child to be visible when the parent question is “Yes”; our expression can be whether the parent question is true (or as a shortcut simply be the shortcode of the parent question). We can press the check mark to test whether our expression is valid. The results display between the expression input and the save/cancel buttons. Once we are done, we can save the expression:



The visibility expression now appears in the properties for the “Interpreter Badge Number” question:

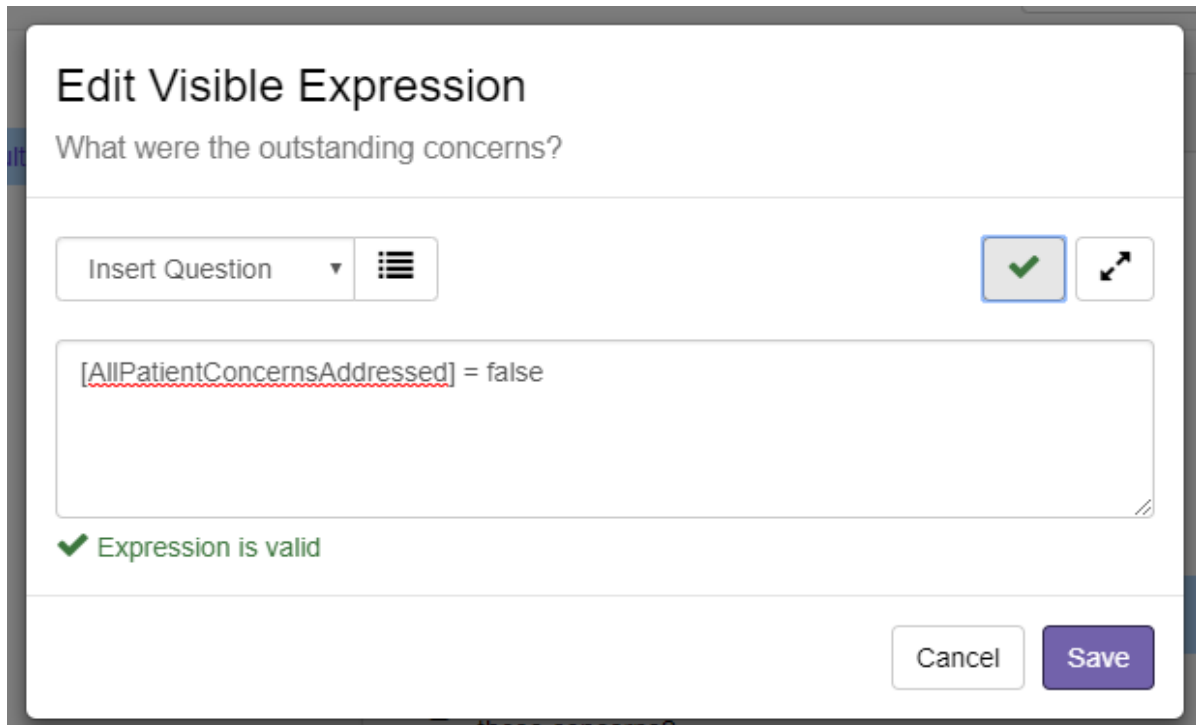


This question will now only appear when Yes is selected for the parent.

Our next relationship is very similar, except that we want the child question to appear when the parent question has an answer of No. Select the “What were the outstanding concerns?” question and click the edit icon on the visible expression property. Add a short code for the “Were all of the patient’s concerns addressed?” question:




Next, we add in the visibility expression, but this time, check for the value of No (is the answer to the parent question false):




**(Note:** Do not worry if the browser places a red squiggly line under the shortcode – this is not an error, just the web browser’s spell check. But since the “Insert Question” drop-down was used to select the short code, you can be sure it is correct)

After saving, the visibility expression now appears in the properties:

**Visible Expression**

[AllPatientConcernsAddressed] = False 

Repeat the process to add the same visibility expression to the final question. **Note:** This time, you will not need to create the short code since it used the same parent question, which we have already created a short code for.

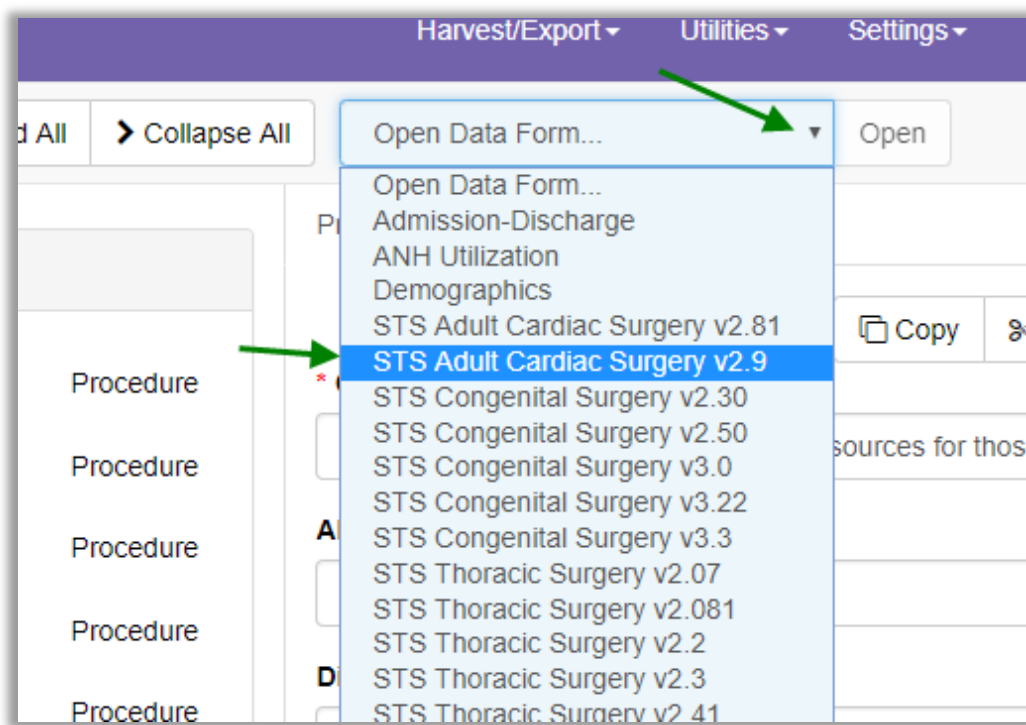
<input checked="" type="checkbox"/> Was the patient referred to additional resources for those concerns? Procedure	<b>Prefix</b> <input type="text"/>
	<b>Suffix</b> <input type="text"/>
	<input type="checkbox"/> <b>Entry Required</b>
	<b>Visible Expression</b> [AllPatientConcernsAddressed] = false 

Be sure to **save** the data form with the changes.

### Place Custom Question Section on Existing Data Form

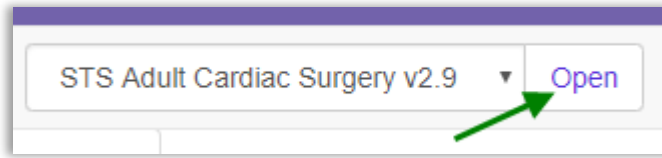
Our final step is to add these questions to the desired location at the end of the STS Adult Cardiac 2.9 data form.

To do this, we need to open the STS Adult Cardiac 2.9 data form. In the upper right, from the “Open Data Form” drop-down, find STS Adult Cardiac 2.9:

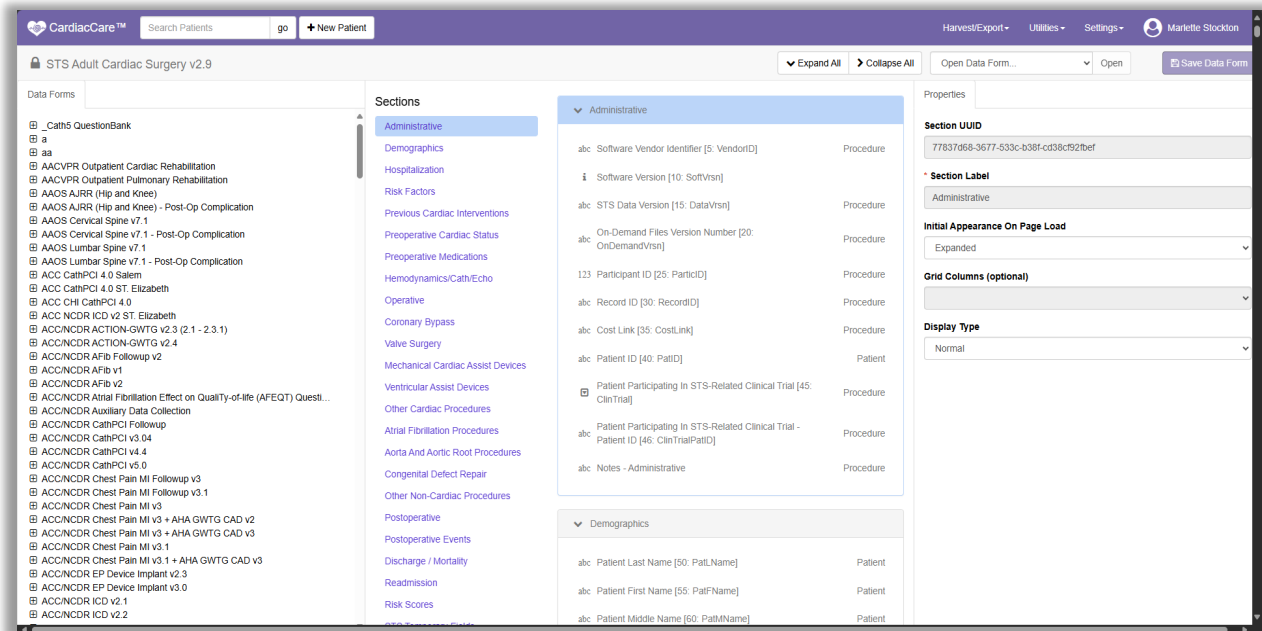




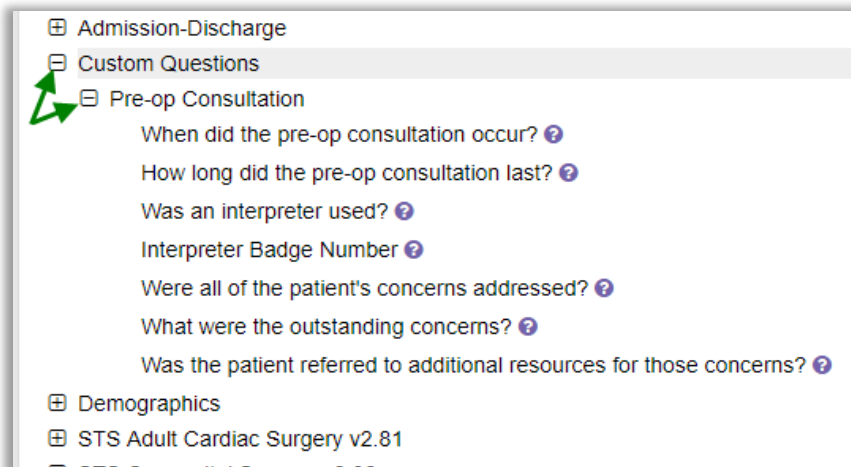
Once the form is selected, press the Open button:



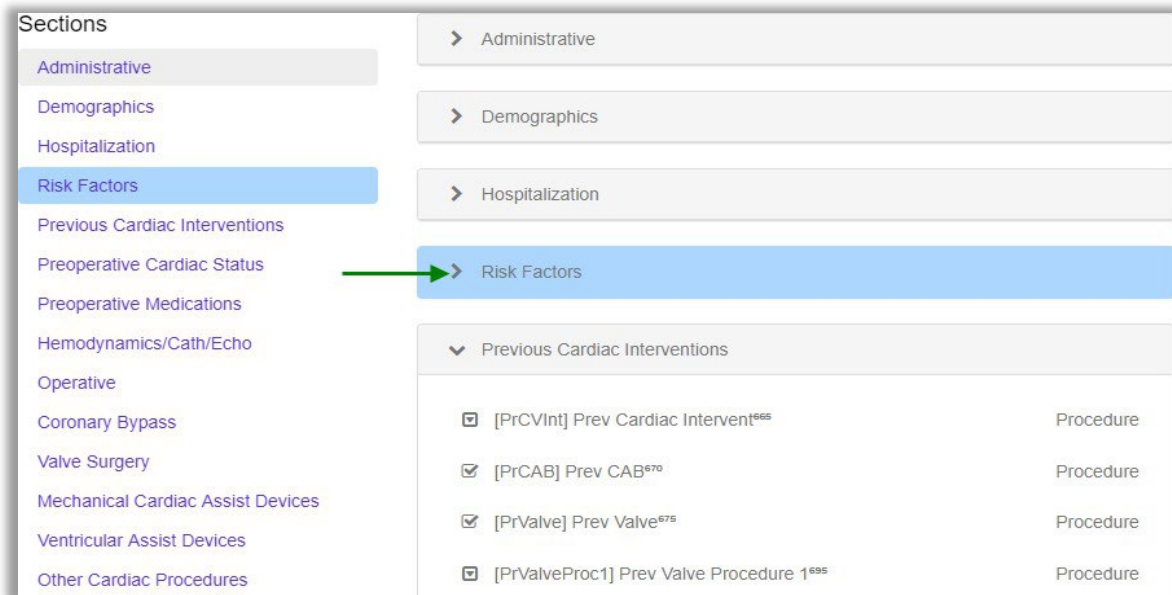
This screen will be very similar to the edit data form screen we were just working with. One difference is that the left-hand panel will have all the data forms in the system. The center panel will have the STS Adult Cardiac 2.9 data form sections and questions:



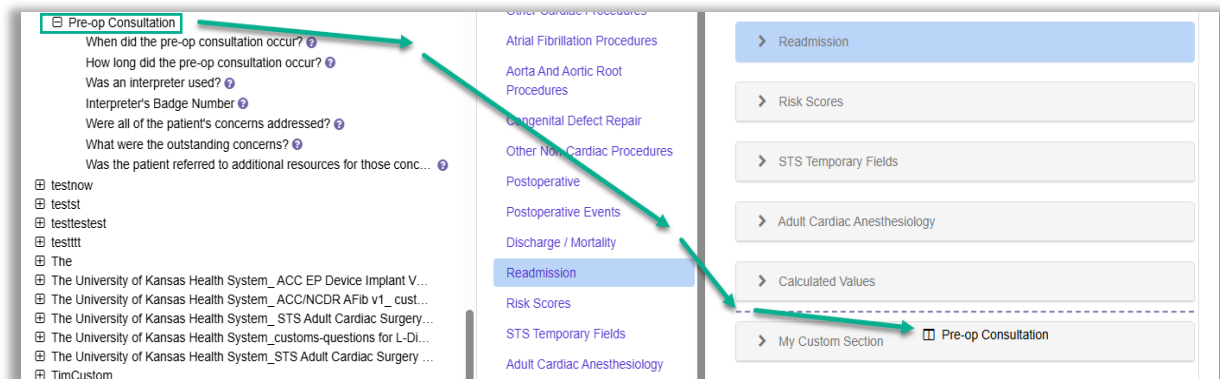
The questions we just created are in a section inside the “Custom Questions” data form. We need to press the plus icon to expand this data form to see the sections and/or questions we created:



We now have the option to insert a single question or a whole section from our custom questions into the STS Adult Cardiac 2.9 data form. For this example, we decided to use our entire section. When inserting a custom section, you will need to drag the item to the center panel to the actual location on the form, not the section list. To make this easier, it is recommended that the existing sections be collapsed first. To do this, you would click the down carrot icon next to each section name. The section will collapse and turn into a sideways carrot icon (which could be clicked again to re-expand the section). Here is a screenshot of that having been done for several sections:



We want to insert the “Pre-op Consultation” under Calculated Values for this example. We do this by dragging it to the center panel, again using the dashed purple line to see the location where the section will be added:



When the mouse is released, the section is added to the form:

The form can now be saved.

### Test Custom Questions

Now that we have placed our custom questions on the data form, we can test the questions. To do this, we navigate to any patient record, open an STS Adult Cardiac 2.9 data form, and we should see our section as part of the form:

The pink icon next to the questions indicates these are custom questions. We can select different answers to test out our visibility expressions:

If we need to make any changes, we can go back to the form builder. Otherwise, the process is now complete.

Pre-op Consultation

? ? When did the pre-op consultation occur? mm/dd/yyyy

? ? How long did the consultation last? (unspecified) ▾

? ? Was an interpreter used?  (unspecified)  No  Yes

? ? Interpreter badge number: \_\_\_\_\_

? ? Were all of the patient's concerns addressed?  (unspecified)  No  Yes

? ? What were the outstanding concerns? \_\_\_\_\_

? ? Was the patient referred to additional resources to address those concerns?  (unspecified)  No  Yes

## Additional Reference Material

Whether your organization will use a separate custom data form or integrate custom questions into a stock:

### Entry Required

When creating a custom question, there is the option to mark the “Entry Required” checkbox.

\* **Question Text**

When did the pre-op consultation occur?

**Alternate Question Text**

**Precision**

Date

**Prefix**

**Suffix**

**Entry Required** ←

**Visible Expression**

This will cause the question to have a red asterisk and a red bar to the side of the question, indicating that entering an answer is required for the question.

Pre-op Consultation

When did the pre-op consultation occur? \*

mm/dd/yyyy

## Common Numeric Question Properties

Numeric Questions have several additional properties which may be useful when creating custom questions. These include the minimum and maximum allowed values, the type of units the numeric value represents (i.e., kg, cm, in, mL, etc.), how many decimal points should be collected, and usual expressions.

A “Usual Expression” indicates to the data abstractor that the value entered for the answer to the question is not typical and should be checked. This will be displayed in orange (unlike min/max values displayed in red). A value outside the usual range can still be saved, while a value outside the min and max range cannot be saved. An example of this is commonly seen in patients’ height or weight. For example, in the STS Adult Cardiac 2.9 data form, the specifications state that the entered value must be between 10 kg and 250 kg but is most commonly between 30.0 kg and 181.8 kg. The data abstractor should be prevented from entering a value less than 10 or greater than 250. The abstractor should be allowed to enter a value between 10 kg and 30 kg, but if this is done, it should be warned. Similarly, for values between 181.8 kg and 250 kg. This is implemented using Usual Expressions for the weight field. Here are some screenshots to see how this can be done for any custom question.

For this example, let’s assume we want to create a numeric question that records a value in mL. The answer must be between 0 mL and 1000 mL but is most commonly between 100 mL and 500 mL. In this case, whole numbers should be collected.

First, the question is created:

▼ Other Custom Questions	
123 Specify amount administered:	Procedure

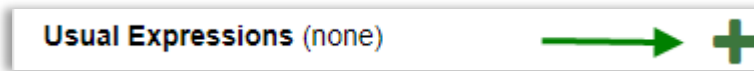
In the properties panel on the right-hand side, we enter the **minimum** and **maximum** allowed values:

<b>Min Value</b>
0
<b>Max Value</b>
1000

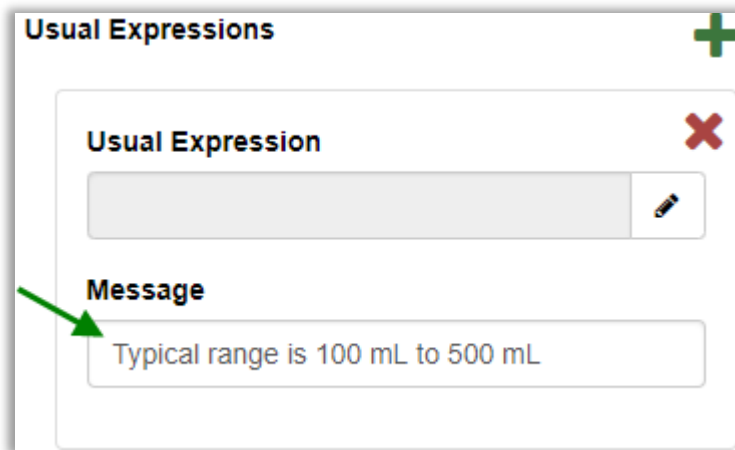
We specify the number of **Decimals** for the numeric value to be 0, and that we expect the answer to be supplied in mL:

<b>Decimals</b>
0
<b>Unit of Measurement</b>
mL

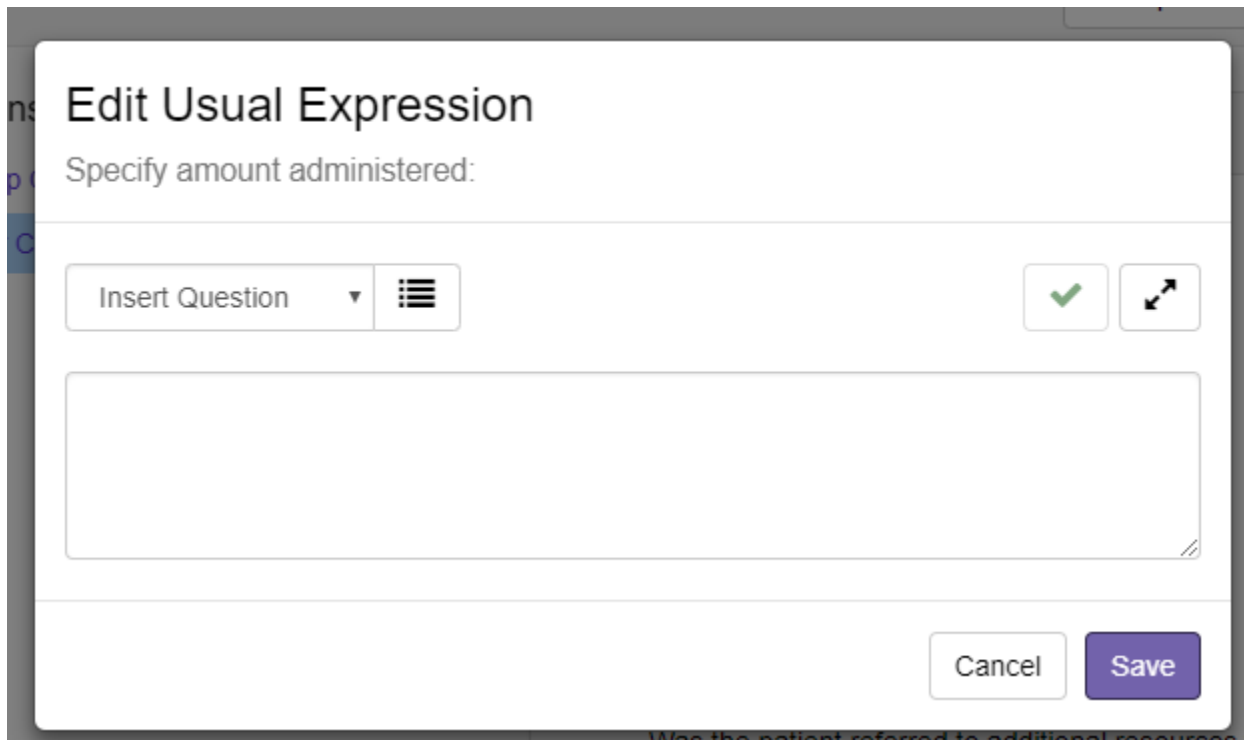
We next specify the **Usual Expression** for this question. Click the green + next to the Usual Expressions:



In the **Message** box, enter the message that will display to the abstractor when a value outside of the typical range is entered into the form:



Click the pencil (edit) icon next to the Usual Expression to create the logic for when the message should and should not appear:





As in creating parent/child relations, you may need to create a short code for the question. In this case, we will create a short code for this question itself (not for any parent):

Specify amount administered:

AmountAdministered 

Then specify the criteria for what are considered the usual values. This means the expression should show the times the message will NOT appear. For example, in this case, the expression should read:

Insert Question

`([AmountAdministered] >= 100 or [AmountAdministered] <= 500)`

✓ Expression is valid

Cancel Save

Press **Save** to return to the previous screen:

Usual Expressions

Usual Expression

`([AmountAdministered] >= 100 or [Amou`

Message

Typical range is 100 mL to 500 mL

Then save your data form. Now if you try to use the field, you will see the expected behavior:

Specify amount administered:

1250 mL

• Value must be between 0 and 1000

### More Complex Parent/Child Relationships

One type of parent/child relationship that may be useful, but which is more complex than the Yes/No parent example shown in the guide examples, is to have the parent question be a Single Choice Question. In this case you may want a child enabled when one of a set of values is selected from the parent. You may also want a different child enabled when alternate items are selected. For example, suppose that you have a question which you would like to behave as follows:

Diabetic Management:

- None
- Self-monitoring of blood glucose (SMBG)
- Dietary and exercise modifications
- Medication (Oral)
- Medication (Injected)

If “None” is selected, then nothing further happens.

If either “Dietary and exercise modifications” or “Self-monitoring of blood glucose (SMBG)” are selected, the following questions should be asked:

- Does the patient participate in “Diabetic Diets: Managing Blood-Glucose Through Diet” program:  
Y/N

If “Medication (Oral)” is selected, the following question should be asked:

- Specify the oral medication being used:
  - Metformin
  - Glyburide
  - Glipizide
  - Glimepiride
  - Repaglinide
  - Nateglinide
  - Pioglitazone
  - Rosiglitazone
  - Acarbose
  - Miglitol
  - Dapagliflozin

If “Medication (Injected)” is selected, the following question should be asked:

- Specify the injected medication being used:
  - Insulin – manual injections
  - Insulin – pump
  - Albiglutide
  - Dulaglutide
  - Exenatide
  - Liraglutide
  - Pramlintide

In this case, there are multiple answers to the first (parent) question, which drives the behavior of different child questions, and in fact, two answers in the parent drive the same child question. Here is how you would set up this type of parent/child relationship.

First, create the four questions:

Diabetic Management		
<input type="checkbox"/>	Diabetic Management	Procedure
<input checked="" type="checkbox"/>	Does the patient participate in "Diabetic Diets: Managing Blood-Glucose Through Diet" program?	Procedure
<input type="checkbox"/>	Specify the oral medication being used	Procedure
<input type="checkbox"/>	Specify the injected medication being used	Procedure

It will be important to note the value of the answers for the parent question which will be controlling the visibility of the child questions. Here is what that looks like, in this case, so we have it for reference:

Choices			
Seq. #	Value	Text	
1	1	None	✗
2	2	Self-monitoring of blood glucose (SMBG)	✗
3	3	Dietary and exercise modifications	✗
4	4	Medication (Oral)	✗
5	5	Medication (Injected)	✗

Next, we will add the visible expression logic to the 3 child questions. Select the first child question and open the Visible Expression editor:

### Edit Visible Expression

Does the patient participate in "Diabetic Diets: Managing Blood-Glucose Through Diet" program?

---

Insert Question
▼

☰

✓

↔

Cancel

Save

Add a short code for the parent question:

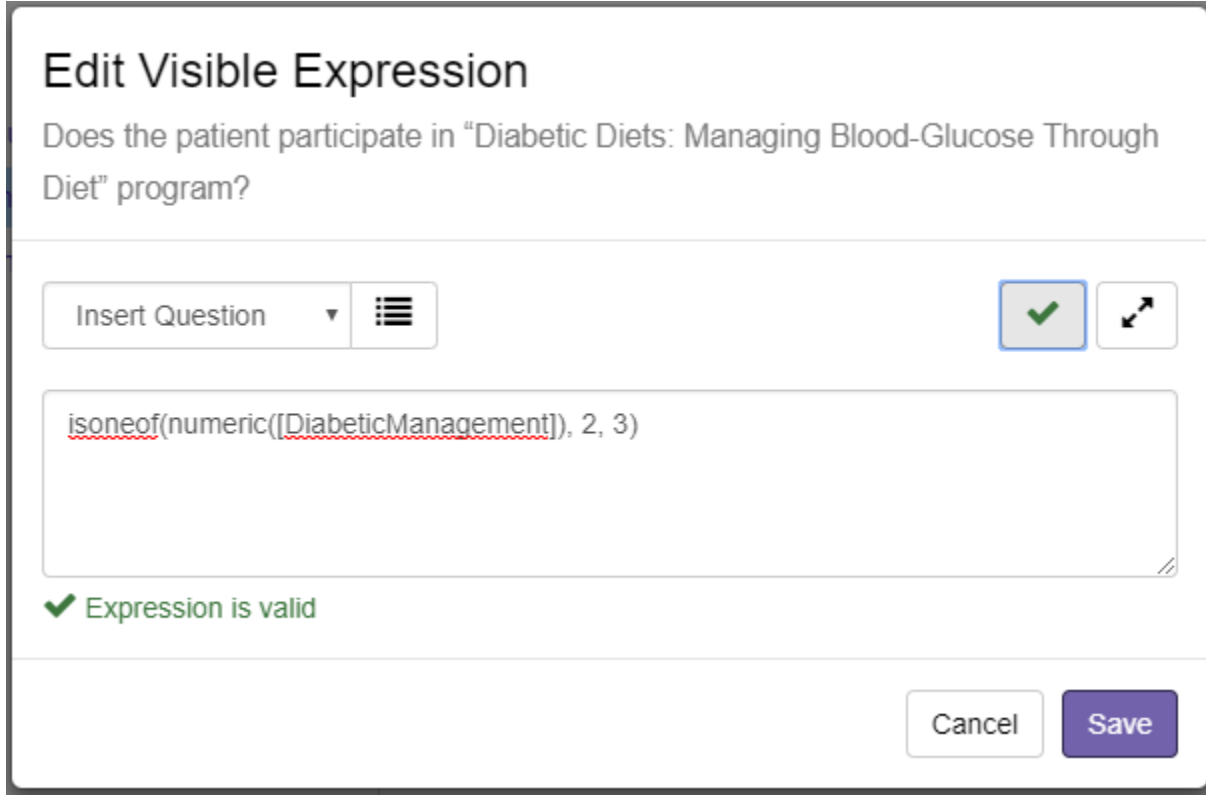
### Edit question short codes

Question	Short Code
Diabetic Management	DiabeticManagement

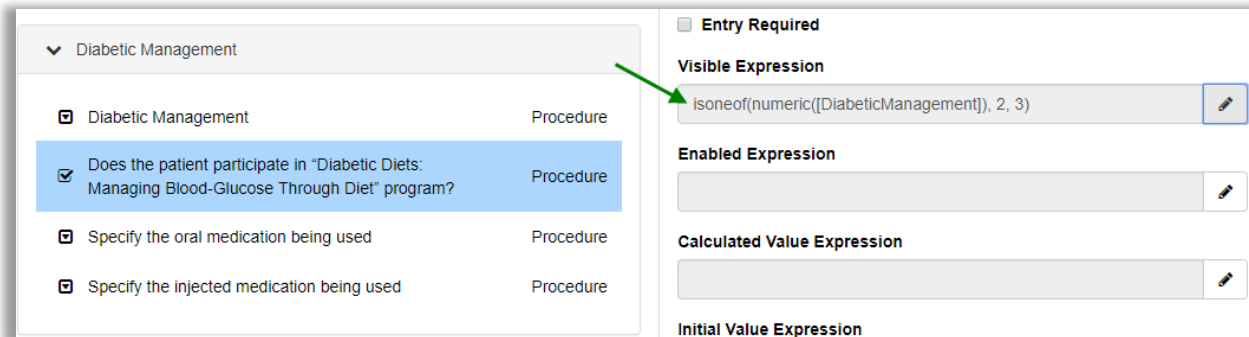
Now, create the logic for when this question should be visible. In this case, we have two different answers to the parent question, which would make the child question visible. We need to know the value of those answers. This child question should appear when "Dietary and exercise modifications"

(value: 2) or “Self-monitoring of blood glucose (SMBG)” (value: 3) are selected. This is done with the following expression `isoneof(numeric([<shortcode>]), <value list>)`. In our case this would be `isoneof(numeric([DiabeticManagement]), 2, 3)`.

Here is a screenshot showing validating the expression:






And the completed entry after save:




Next, use a similar process to create the visible expression for the remaining two child questions. As there is only a single value, you could still use the “isoneof” function and update the value list to correspond to the desired answer in the parent, or you could use an equality test. Here are the two options which both yield the same results:

### Edit Visible Expression

Specify the oral medication being used

Insert Question   




isoneof(numeric([DiabeticManagement]), 4)

 Expression is valid


Cancel Save

### Edit Visible Expression

Specify the oral medication being used

Insert Question   

numeric([DiabeticManagement]) = 4

 Expression is valid

Cancel Save

Often for a Single Choice Question, leaving the visibility expression using the “isoneof” formula is helpful. The reason is that if you later add a new choice to the parent, then it is easier to update by simply adding the new value to the list in the visible expression, rather than having to re-write the whole expression.

Here are screenshots of the finished properties for each:

This screenshot shows the configuration interface for the 'Diabetic Management' category. On the left, a list of procedures is displayed with checkboxes and labels: 'Diabetic Management' (Procedure), 'Does the patient participate in "Diabetic Diets: Managing Blood-Glucose Through Diet" program?' (Procedure), 'Specify the oral medication being used' (Procedure), and 'Specify the injected medication being used' (Procedure). The 'Specify the injected medication being used' item is highlighted in blue. On the right, the configuration details for the selected item are shown, including a 'Suffix' field, an 'Entry Required' checkbox (unchecked), a 'Visible Expression' field containing the formula `isoneof(numeric([DiabeticManagement]), 4)`, and an 'Enabled Expression' field.

This screenshot shows the configuration interface for the 'Diabetic Management' category, similar to the first one. The 'Specify the injected medication being used' item is highlighted in blue. The 'Visible Expression' field on the right contains the formula `isoneof(numeric([DiabeticManagement]), 5)`.

Here are the custom questions in action on a data form:

This screenshot shows a data form for 'Diabetic Management'. It features a dropdown menu with a question mark icon and the text 'Diabetic Management'. The selected value is '(unspecified)'. A small downward arrow is visible on the right side of the dropdown box.

This screenshot shows a data form for 'Diabetic Management'. It features a dropdown menu with a question mark icon and the text 'Diabetic Management'. The selected value is 'Dietary and exercise modifications'. Below the dropdown is a radio button question: 'Does the patient participate in "Diabetic Diets: Managing Blood-Glucose Through Diet" program?'. The radio buttons are labeled '(unspecified)', 'No', and 'Yes', with the '(unspecified)' option selected.



Diabetic Management

Diabetic Management

Medication (Oral)

Specify the oral medication being used

(unspecified)

Diabetic Management

Diabetic Management

Medication (Injected)

Specify the injected medication being used

(unspecified)

### Data Levels

When creating a custom question, you are prompted to select a **Data Level**.

Add Element

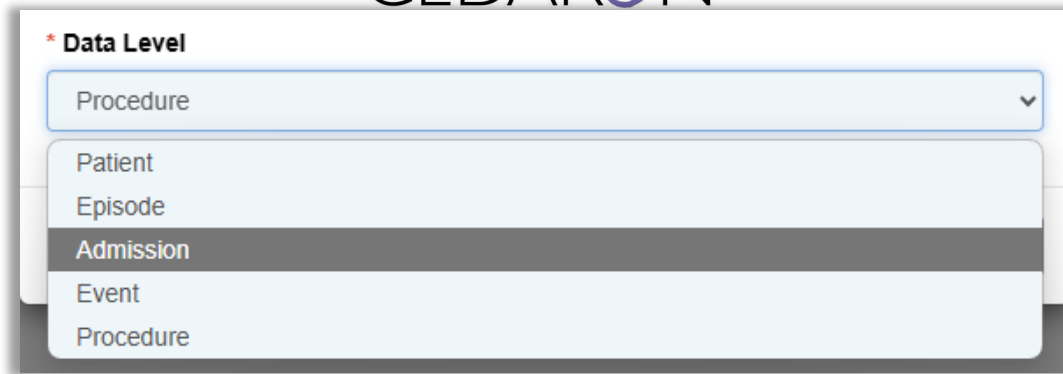
\* Question Text

\* Data Level ←

Procedure

Cancel Save

This menu has the following options: Patient, Episode, Admission, Event, and Procedure, as seen in this screenshot:



In most cases, you will be creating Procedure-level custom questions. These questions have an answer that can vary from one procedure to the next. For example, the patient’s weight is not a patient-level question but a procedure-level question, as the patient’s weight could change between two procedures.

There are considerations to be aware of when creating questions at different data levels, especially when creating dependencies (such as relationships) between questions.

A general rule of thumb is that you should make the data level of the question you are creating similar to the data level of the question it is going next to.

Here is a brief description of the various data levels:

**Procedure** – This is likely the most common data level for custom questions. This data-level covers any question where the answer can change for a second procedure done during the same episode of care or admission.

**Event** – This data level is rarely used. Before using the event data level, extra discussion should be conducted with Cedar.

**Admission** – This data level covers questions about admission, discharge, and items that do not change between admissions. When users consider an “episode of care,” it falls under this data level.

**Episode** – Very few items are stored at this data level. An example of what would go here is an item that would stay the same on an immediate re-admission after a discharge – for example; a patient was discharged, collapsed in the parking lot, and was therefore re-admitted.

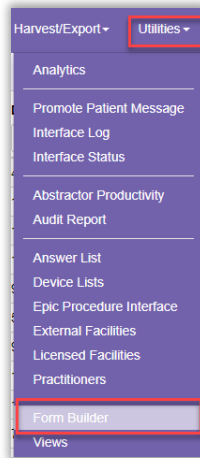
**Patient** – The patient data level is only suitable for base-level demographics. Items at the patient level rarely change, such as patient name and contact information. However, even contact information, if specified as “at time of admission” or similar, may not be appropriate at the patient data level.

For additional information about the data levels, please get in touch with Cedar.

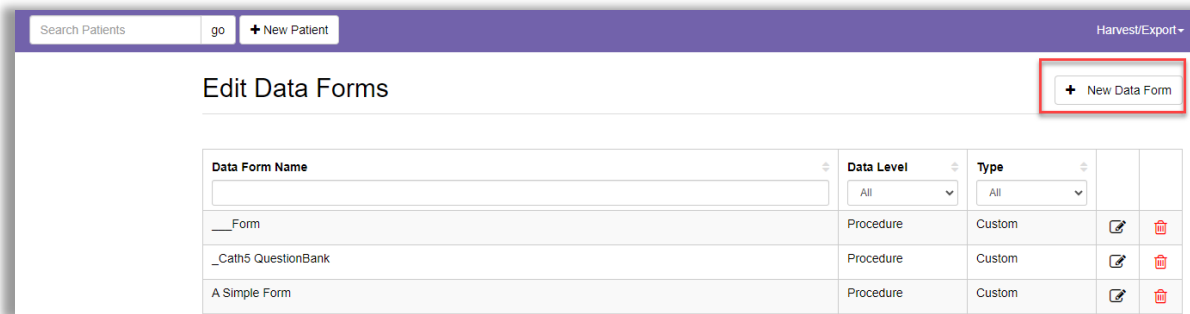
## How to Add Custom Questions in Cento Reports

CardiacCare allows you to add custom questions you create in the CardiacCare application into your Cento reports if desired. You must create the custom questions and answer them within a data form at least once; then, they will populate under **report fields** in Cento.

To start, hover over Utilities and select Form Builder.



Select **New Data Form** on the top right. You will name your Data Form, select the Data Form Type, and then select Save.



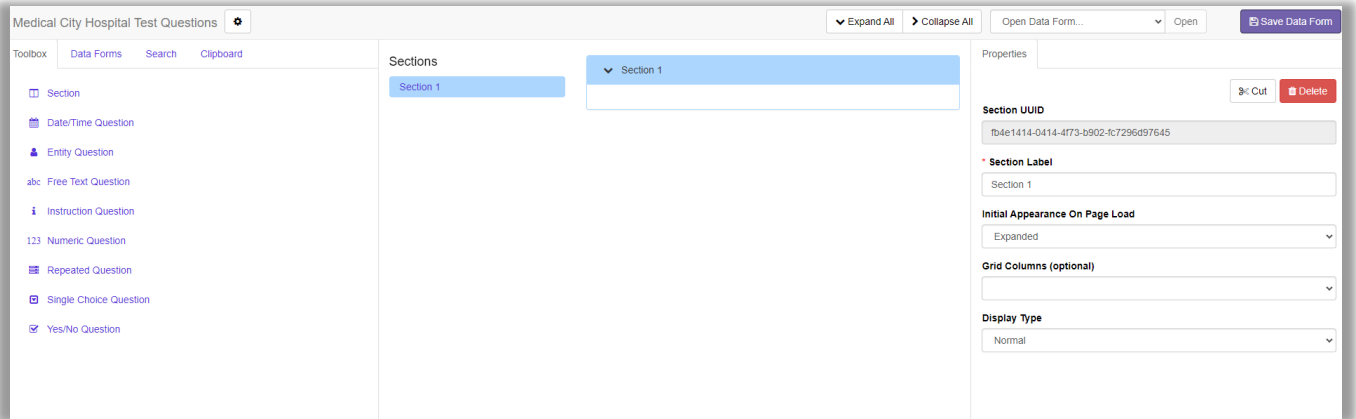
**Data Form Name**

**Data Form Type**

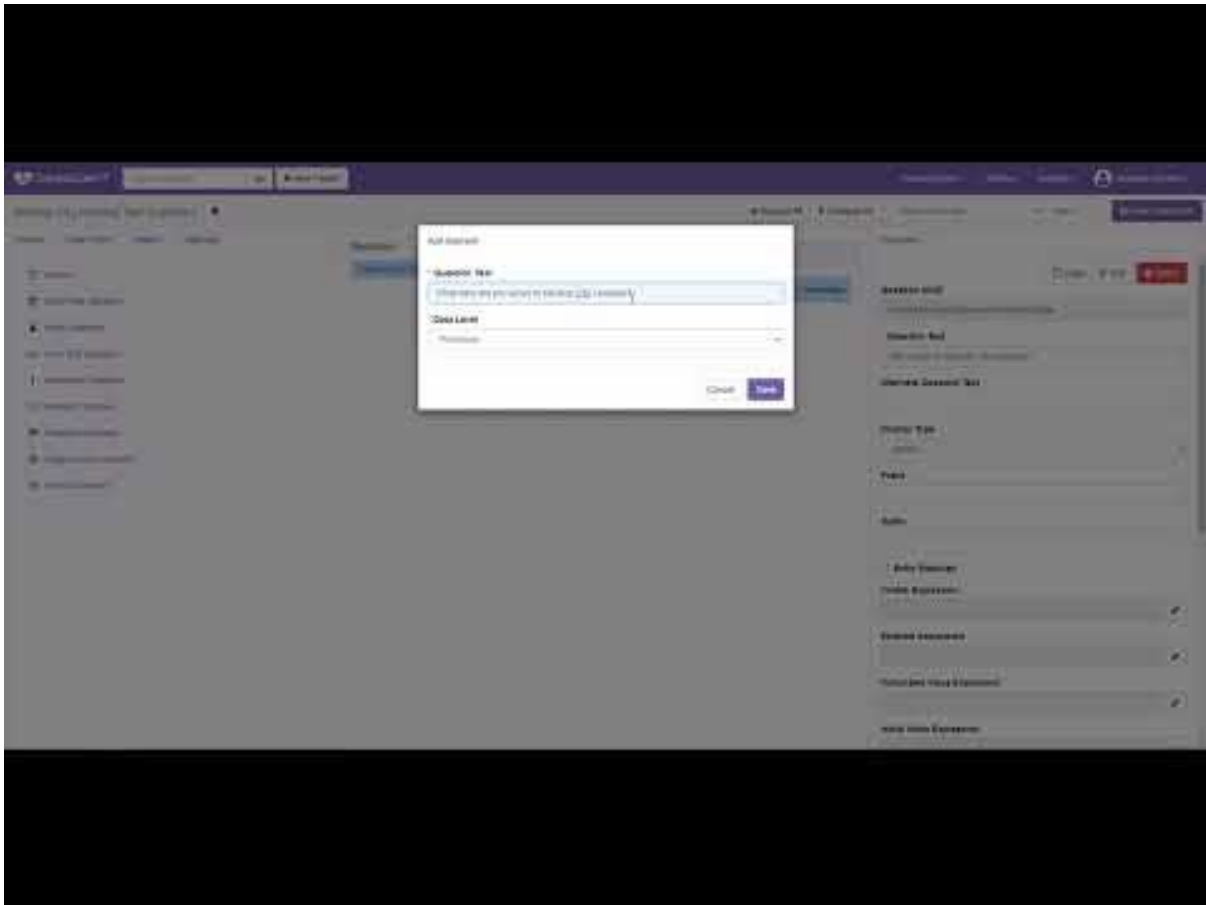
Clinical Form

Patient Survey

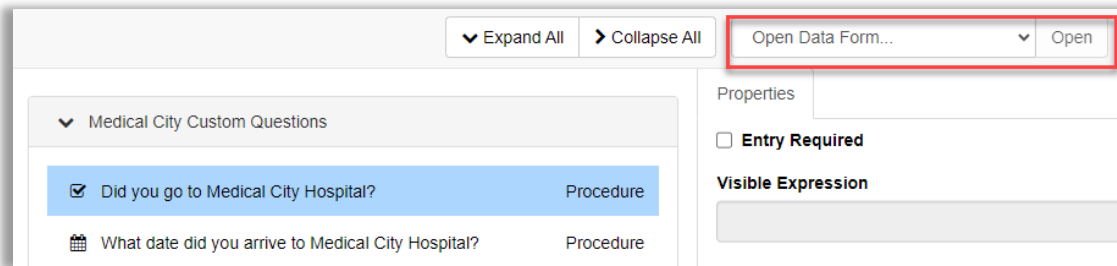
The blank form will open with one section for you to add questions.



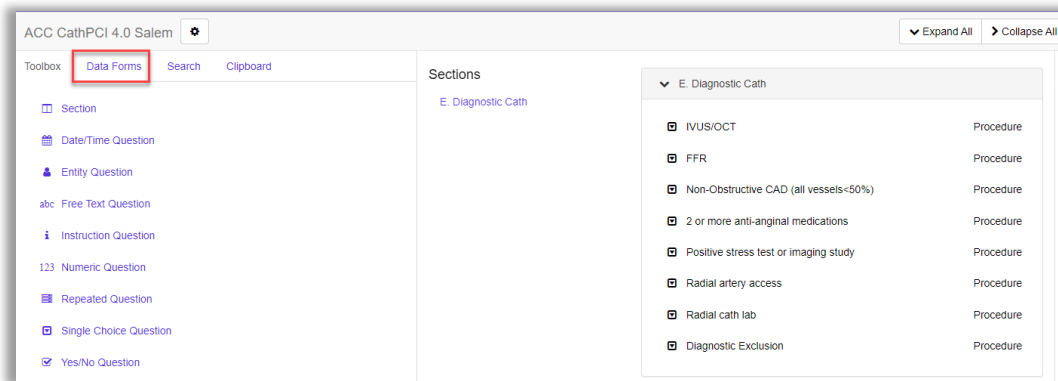
Name Your section under Section Label. You also have different options, such as initial appearance, grid columns, and display type. You can add questions to the section by dragging items from the Toolbox on the left. The Toolbox allows you to select different question types based on the information you seek. You will add the Question and choose the Data Level type before selecting Save. Please see the snippet video below for more details.



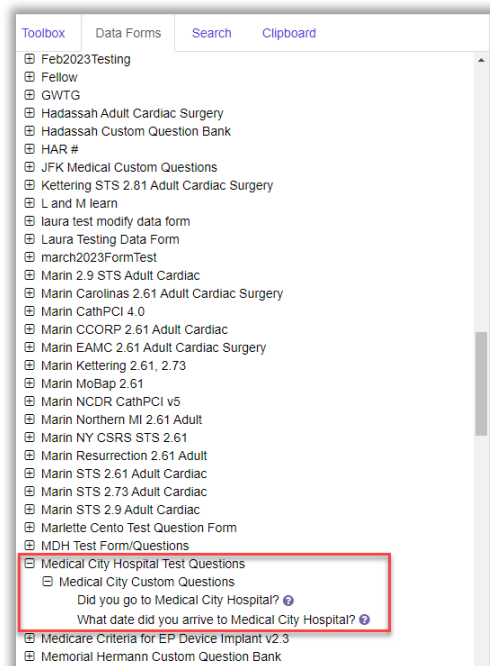
Once you have selected your desired questions and options, you can add your questions to a data form by choosing from the Open Data Form option and selecting Open.



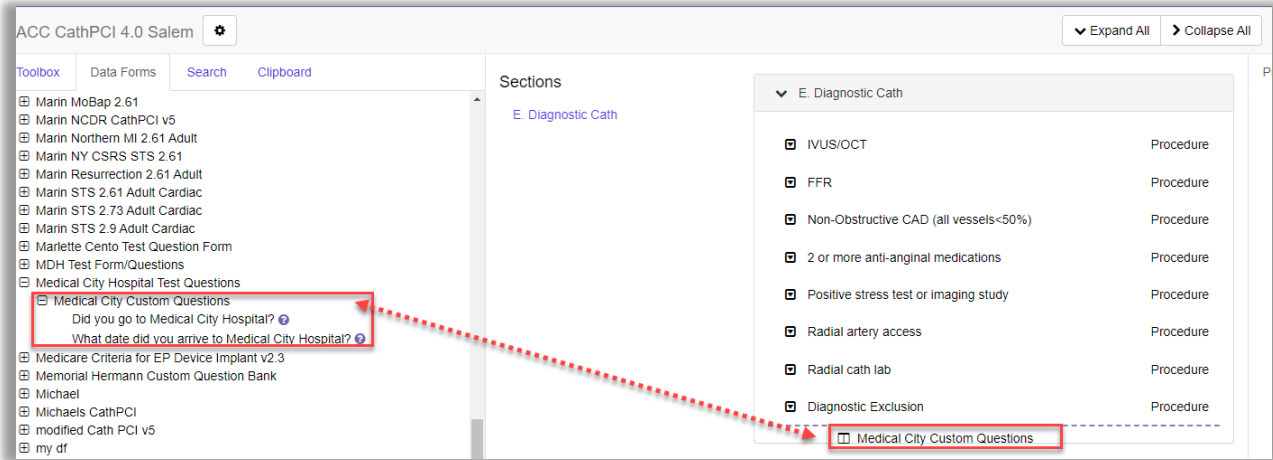
The example below shows that the ACC CathPCI 4.0 Salem form was chosen. Select Data Forms at the top left to add your questions.



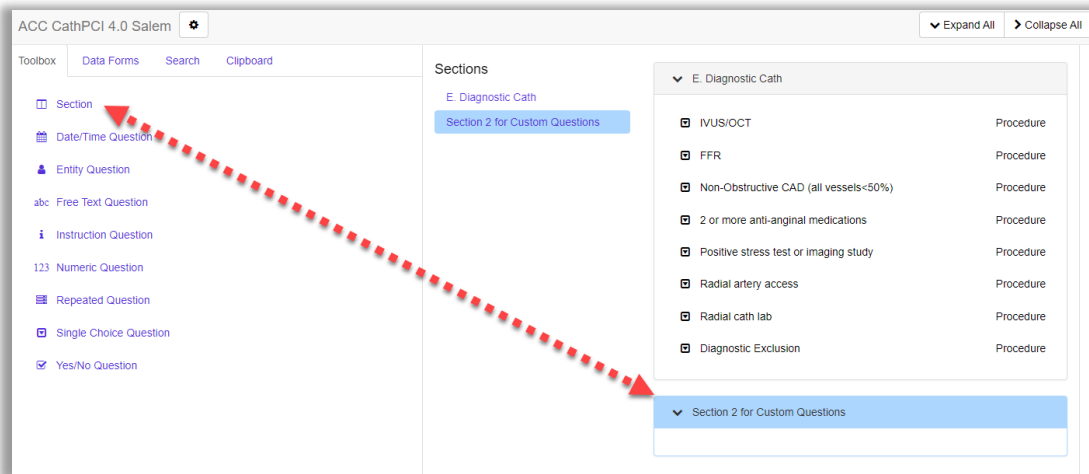
Once you locate the form you created, you can add individual questions or the whole section using the + drop-down next to each line item.



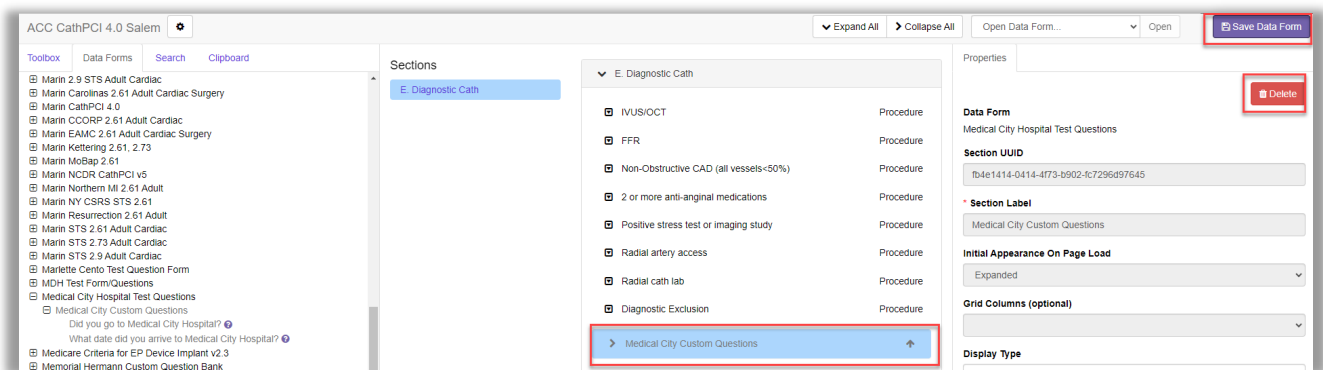
In this example, the section Medical City Custom Questions has been added.



You can also create a new section by dragging the Section option under Toolbox and adding custom questions.



Once you reach your desired results, you can select Save Data Form. (You can delete questions or forms anytime by selecting the section and pressing delete on the top right).



Once your form is saved, open it to fill out the new questions. The example shows custom questions added to the ACC CathPCI 4.0 Salem form, which is the data opened in the image below. Answer the new questions so CardiacCare can save the data and allow it to populate in Cento.

Once in Cento Analytics, navigate to the Report Fields section and locate your questions under Standard Fields. You can use CTRL F to search as well.

Select Add next to the questions you want to add to your report.

The screenshot shows a list of questions on the left and a 'Selected Report Fields' box on the right. The list includes items like 'CCORP 7.0', 'Custom Questions', and 'Medical City Hospital Test Questions'. Two questions are highlighted with red boxes: 'Did you go to Medical City Hospital?' and 'What date did you arrive to Medical City Hospital?'. A '+ Add' button is next to the second question. The 'Selected Report Fields' box contains the same two questions.

You can also search for your custom questions by selecting the Filter button with the name of your question, selecting the Data Level, and then selecting Add next to the questions you would like to add.

The screenshot shows a 'New Report' interface with a 'Filter attributes' dialog box open. The dialog has a search field with 'Medical City' entered. The 'Attribute name contains' label is highlighted with a red box. The 'Apply' button is also highlighted with a red box. The background shows a 'Filter' button in the 'Standard Fields' section, also highlighted with a red box.





### Add Report Field

#### Standard Fields

☰ ▼ Medical City ✕ Clear

- Patient
- Practitioner
- Episode
- Hospitalization
- Visit
- Procedure
  - Standard Fields
  - Medical City Hospital Test Questions
    - Medical City Custom Questions
    - + Add Did you go to Medical City Hospital?
    - What date did you arrive to Medical City Hospital?

### Selected Report Fields

Did you go to Medical City Hospital?

What date did you arrive to Medical City Hospital?

Continue creating your report with the desired filters, time frame, graph, etc. When you run the report, you will see the custom questions you made with the data you entered.

### Ad Hoc: Report (24)

Executed 8/1/2023 8:14 PM

**Report Filters**

- ACC CathPCI 4.0 Salem is Yes

Total Results: 1

Drag a column header here to group by that column
Q Search...

Name from Patient	Name from Episode	Facility from Episode	Specialty from Episode	Date from Hospitalization	Name from Hospitalization	Did you go to Medical City Hospital?	What date did you arrive to Medical City Hospital?
				8/1/2023 11:12 AM		Yes	8/1/2023 12:00 AM

For more information on how to build custom forms, please view the snippet video in our How-To series, titled [How-To Add a Section of Custom Questions to a Standard Data Form](#) - and the training video titled [CardiacCare Training – Custom Questions & Forms](#), located on the Cedaron University training portal.