

6.6 Using Rule Designer

In OpenClinica 3.3, you can build and test rules using OpenClinica and XML code or by using the OpenClinica Rule Designer interface. OpenClinica allows you to write the XML code for your rules, which requires familiarity with the rules template and XML. The Rule Designer provides an interface that allows you to drag-and-drop OpenClinica objects to build your rule, and OpenClinica writes your XML code for you behind the scenes - with this option, XML knowledge is not required!

In this section, we will learn more about the Rule Designer and its capabilities.

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6.6.1 Accessing Rule Designer

Accessing Rule Designer

You can access Rule Designer from the Build Study page or from the Manage Rules page. Each option is outlined below:

1. To access Rule Designer from the Build Study page:

- Log into OpenClinica.
- On the Tasks menu, select Build Study.
- In the **Create Rules** row **Actions** column, click **(the Rule Designer icon see below)**.

Accessing Rule Designer from the Build Study page

Open Clinica	Docetaxe	in Patients With (R01-123456)	Change Study/Site				root (Data Manager)	en Log Out
Community Edition	Home	Subject Matrix Notes & Discre	epancies Study Aud	lit Log Tasks	•	Report Issue Supp	oort Study Subject ID	Go
Alerts & Messages 🔹								
Instructions -	T Do	ocetaxel in Patients W	ith Completel	y Resected	NSCLC @			
Please see the instructions to the right on the main page.	o We	lcome to the Build Study page of OpenCl owing a task-based approach. The tasks	inica! This page is designe listed below need to be c	d to help you build	and configure your	Study by udv.		
Other Info -	On	ce you have finished each task, check "N	lark Complete" then click t	he "Save" button.	27			
Study: Docetaxel in Patient With Completely Resected NSCLC Start Date: 03-Jan-2011	ts	 To start a task, select the sicol Study. Select the sicol icon to edit the val Select the to view the specifie 	n. You can always select t ues for a task. ed values for that task.	he 🛨 icon to ad	d a new component	to your		
Rule Designer	То	add users to different Sites, you must fir	st change your Study/Site	e to the appropriate	e Site. Then, in the T	asks		
	mei	nu, from the Study Setup module, select	Users.					
PI: Thomas Katz MD, PhD	Wh	en you are ready to start adding Subjec	ts to your Study, select A	vailable from the Se	et Study Status drop	-down		
Protocol Verification/IRI Approval Date:	B	and click the save button, if the study	status is Design, Subject	s cannot be added.				
	Set	Study Status Available •	Save Status					
		Task	Status	Count	Mark Complete	Actions		
	1	Create Study	Completed	NA		٩ 🖉		
	2	Create CRF	Completed	24		S +		
	3	Create Event Definitions	Completed	6		+ ۷		
	4	Create Subject Group Classes	Completed	1		۰.		
	5	Create Rules	Completed	10		R + (2))	
						Rule Des	igner	
		Task	Status	Count	Mark Complete	Actions		
	6	Create Sites	Completed	4		< +		

- 2. To access Rule Designer from the Manage Rules page:
 - Log into OpenClinica.
 - On the **Tasks** menu, select **Build Study** and in the **Create Rules** row, click (the View icon)
 - OR

On the Tasks menu, in the Monitor and Manage Data section, select Rules.

• On the Manage Rules page, click 🖾. (See below).

Accessing Rule Designer from the Manage Rules page

OpenClinica Decet	Docetaxed in Patients With (R01-122456) Change Study/Site root: (Data Manager) en Log Out												
Community Edition	me S	ubject Hatri	x Notes & Discrepancies Study Au	adit Log Tasks *	Report Issue Support Study Subject ID	60							
Alerts & Hessages v Instructions - Manage Rules for Docetaxel in Patients With Completely Resected NSCLC ®													
This page allows you to view and manage your study rules.			15 🔹 🗐 🌒 🛃 Show More Test	Rules									
OpenClinica rules provide edit check, email action and other	CRF	Item Name	Rule Name	Rule OID	Expression	Execute On	Action Summary		Action	15			
capabilities during the course of data capture and in batch									Acoly	Filter C	ear Filte		
mode.		1_AEYN	Insert 2nd AE	AE_EVENT_2	I_ADVER_1_AEYN eq 1	true	Type:	ShowAction		<u>ر</u>	•	×.	
You may click on the action icons to view, test, execute							Message:	"Another AE was experienced. Please complete the following fields."	R	ule Desig	gner		
default the table is filtered by Rule Status (Available) and							Run On:	InitialDataEntry, DoubleDataEntry, AdministrativeDataEntry					
sorted by Item Name. Use the column headers and filter fields (may house) to sort							DestinationProperty:	IG_ADVER_AE2					
and filter, or filter by Event CRF by using the tree in the		1_AEYN	I_ADVER_1_AEYN_EVENTSCHEDULE	I_ADVER_1_AEYN_EVENTSCHEDULE	I_ADVER_1_AEYN eq 1	true	Type:	EventAction		8			
'Info' panel below							Run On:	Not Scheduled, Scheduled					
Info -							DestinationProperty:	STARTDATE					
Study: Docetaxel in Patients With Completely Resected		2_AEYN	Insert 3rd AE	AE_EVENT_3	I_ADVER_2_AEYN eq 1	true	Type:	ShowAction	8	٩.		x	
NSCLC - Study XML: Download - Unique CRFs: 24							Message:	"Another AE was experienced. Please complete the following fields."					
- Unique Items: 630 - Unique Rule Assignments: 13							Run On:	InitialDataEntry, DoubleDataEntry, AdministrativeDataEntry					
Study Events: (dick to filter by CRF)							DestinationProperty:	IG_ADVER_AE3					
© Registration Visit		3_AEYN	Insert 4th AE	AE_EVENT_4	I_ADVER_3_AEYN eq 1	true	Type:	ShowAction		٩.		X	
© Initial Treatment © Follow-up Treatment							Message:	"Another AE was experienced. Please complete the following fields."					
© Adverse Events							Run On:	InitialDataEntry, DoubleDataEntry,					
© Foo Event							DestinationDronerbu	IC ADVER AEA					
II for event							pescinecon Property:	10_00100_004					

The Rule Designer interface displays.

The Rule Designer interface

Cinica OpenClinica	J Rule Designer	New Rule Open Rule Exit Rule Designer
Show OIDs • or names • • View by CRF • B Verification of Informed Conse	Designer XML Test Validate Save	Help • Getting started
B Eligibility B Physical Exam B KitchenSink B DF3DM	Target:	Expand the tree on the left and drag a selected Item into the Target. Z. Provide an OID for your Rule and write an expression.You can build your
	Schedule: OFF	expression by dragging items from the tree on the left. 3. Select an action from the drop down.Fill the selected action.
		4. Submit your rule.
	Actions: Select One	
	Validate Save	
•		
View by CRF Version View by Event		Item Metadata Fntity Metadata

6.6.2 Building Rules in Rule Designer

The Rule Designer interface is divided into three main panes:

- The left hand pane, which is further divided into three subtabs: View by CRF, View by CRF Version, and View by Event. Every time each of these subtabs is selected, a list of CRFs/ Events will be listed. Each of these CRFs/ Events has an adjacent node which can be clicked to expand into a hierarchy/ minimize to display or hide any associated Item OID. You will then be able to locate, select, and finally drag and drop any of the desired OIDs to the applicable entries on the main (center) tab.
- The center pane, which is divided into three main tabs: Designer, XML and Test tab. The Designer tab contains entries that you can use to drag and drop OIDs to the desired fields (i.e. Target, Rule OID, Rule Expression). Note that if you hover to any of the entry fields on the Designer tab, there will be an associated pop-up help menu that will get displayed. For example, if your cursor is placed on the Target field, there will be a back pop-up message displayed to provide an explanation of a Target field. The XML tab displays the associated XML lines generated as you are updating the fields on the Designer tab. The Test tab can be accessed once all of the information entered on the Designer tab is valid.
- The right hand pane, which is further divided into two subtabs: The Help subtab and the Item Metadata subtab. The help tab contains direction how you can build your rule on the Designer tab. The Item Metadata subtab contains the metadata associated to selected OID/ record. The Item Metadata gets updated everytime a new OID/ record is selected.

On the top right of the page, there are 3 additional links that you may access at any point: New Rule, Open Rule and Exit Rule Designer.

Building a New Rule in Rule Designer

1. In order to create a new rule, you will initially need to access the Designer tab in Rule Designer.

2. Specify the target field. The Target field is the variable which you want the error message to appear on. It is also associated with any discrepancy note/ email action.

3. If you want the Rule to run at a specified time each day, turn on the option to Run On Schedule. These were specifically designed for Participate Notification Action Rules so that Participants can be notified of upcoming forms that should be completed. Though any Rule can be set to run on a schedule, it is not recommended to set a large number of Rules to run on schedule since this could slow server processing. Rules are run automatically whenever data is saved, and can also be run in batch via Manage Rules or Manage CRFs.

4. Specify the Rule_OID field. This is a unique identifier of any new rule that you are creating and this is how your rule will be referred in the database. It must be 32 characters or shorter, be in uppercase, cannot include any spaces/special characters (underscore permitted)

5. Specify the Rule Expression. This is the condition that will trigger certain actions. You may use the Arithmetic, Logical or Relational Operator in order to build the rule expression. For more information regarding using thee operators, refer to section 6.3: <u>Creating Rules</u>. You can also use the drag and drop CRF Item form the left hand pane in order to build your rule.

6. Specify what actions will be triggered as a result of implementing the rule. The available actions are in the "Actions" drop down menu:

- Discrepancy Note. This will trigger a discrepancy note on a certain CRF Item. Refer to Notes and Discrepancies section for more information.
- Email action. This will prompt the system to generate an automated email to individual(s). Both the email action and discrepancy notes form edit checks.
- Notification Action. This sends an SMS and/or email notification to Patient Participants, or an email to any specified email address. Variables can be used in the SMS/email Subject and/or in the body of the notification. Click on the button for the variable you want to include. For more information on the variables that can be included, see <u>Notification Action</u>.
- Show action. This will trigger a certain CRF Item be displayed as a result of meeting a certain criteria.
- Hide action. A CRF Item will be hidden if the rule condition is met. Note that both Show and Hide Action are used to implement dynamic logics.
- Insert action. This will prompt the system to insert data from one CRF item into another based on previously established rules.
- Event action. This allows you to pre-schedule an Event or Events based on the Startdate or Status of a specified Event.

7. Note that each rule may trigger one or more actions. To add more actions, simply access the drop down menu for the second time and select applicable actions. The second action will be lined below the first action. If you want to remove action, simply click on the remove icon next to each action.

8. Specify the data entry stages where the rule can be run. In OpenClinica, there are 4 possible values: Admin Data Entry, Initial Data Entry, Double Data Entry, Batch. Select all of the checkboxes if you want them to run at all stages.

9. Click Validate. This will verify if the form contains valid rule. If the rule is valid, you will get a successful confirmation message "Form has no errors. This is a Valid Rule"

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9. Click Validate. This verifies that the form contains valid rule. If the rule is valid, the following

confirmation message displays: "Form has no errors. This is a Valid Rule."

Designer XMI Test			Validate Save
 Alert - Form has no errors. 			
This is a valid Rule			
Target:			
I_PHYSI_APPEARAN	CE_COMMENTS		
Run on a Schedule: OFF			
Rule OID: PHYSI_APPEARANCE	_R1		
Rule Expression:	& or (.) + - * /		
I_PHYSI_APPEARAN	CE eq 2 and I_PHYSI_APPEARANCE_COMMENTS eq ""		
Actions: Select One	T		
Discropancy Note Action	7		
TE Dhurical Evam A	anorranco is abnormal, a commont		
Message: In Physical Exam Al must be specified o	or a discrepancy note logged.		
	/2		
Specify the mode where this action	should run		
Admin data entry	Initial data entry	Double data entry	Batch
1	e	a	4

If some of the rule components are invalid, an error message displays on the top of the page detailing the sources of the errors. Refer to the sample of screenshot below.

Kule Designer			
Designer X	ML Test	Validate	Save
Alert - Form ha	has errors.		
OCRERR_0005 : Sy OCRERR_0025: The	yntax Error in Expression. ne Rule you are trying to reference does not exist or is invalid.		
OCRERR_0027: The	e contextual expression in one of the Rules does not validate against the target expression in the current Rule assignment.		
Target:			
	I_PHYSI_APPEARANCE_COMMENTS		
Run on a Schedule:	OFF		
Rule OID:	PHYSI_APPEARANCE_R1		
Rule Expression:			
	I_PHYSI_APPEARANCE eq 2 and I_PHYSI_APPEARANCE_COMMENTS eq		
Actions: (Select One		
Discrepancy N	Note Action		
	true 🔻		
Message:	: If Physical Exam Appearance is abnormal, a comment must be specified or a discrepancy note logged.		
Specify the mo	ode where this action should run		
Admin data e	entry Initial data entry Double data entry	Batch	
		\$	
		Validate	Save

10. You also have the option of saving the rule to OpenClinica. To achieve this purpose, you select "Save". You will get a confirmation message "Submitted successfully to your instance".

6.6.3 Testing Rules in Rule Designer

Testing a New Rule in Rule Designer

OpenClinica Rule Designer offers an easy interface to test the rules so that you will be able to instantaneously observe the simulation of the rule that you just created on CRF Items. The Test tab serves as a "mock-up" of rules if it were to be deployed on actual CRF Items. Based on the outcome of the test, you can determine if further changes to the rule are necessary.

1. In order to test a rule, you must ensure that your rule is valid. Refer to Building a New Rule in Rule Designer section for more information. Once complete, access the Test tab on the center pane.

2. Initially, you will notice that there will be only 2 tabs displayed on the Test tab. The upper tab contains the information pertaining to the action you selected on the Designer tab. The bottom tab contains data fields for the impacted CRF items. You can modify the input variables on this tab as desired.

3. Modify the input parameters of the impacted CRF Items. Once complete, click "Test"

4. Once run, there will be an additional tab displayed on the bottom of the second tab named "Verify Results". This tab contains the outcome of the test if the rule were to be deployed as is in OpenClinica. You can evaluate the result and determine if you need to commit further edits on the rule. You can also modify the input variables from step 2 and rerun the test again as many times as possible.

)_ITEM4 + 3		5
)_ITEM4 + 3		
)_ITEM4 + 3		
)_ITEM4 + 3		
ata entry	Double data entry	Batch
	true	true
	ata entry ule expression	ata entry Double data entry true

The Test tab before the rule is executed. Note that there are only 2 tabs available.

🚀 RULE DESIGNER			
Designer XML Test			ाल
Target: L_DEMOG_SCD_ITEM3			
Rule Expression: I_DEMOG_SCD_ITEM3	eq I_DEMOG_NONSCD_ITEM4 + 3		
Discrepancy Note Action			
Evaluates to: true Nessage: Not applicable entry			
Specify the mode where this action s	hould run	Build data anti-	
true	true	true	true
Step 2: Specify test values for vari	ables in your rule expression		
LDEMOG_NONSCD_ITEM4: 1			
Step 3: Verify results			
Expression Evaluates To: false			
Actions Fired: N			
Rule Validation: Rule Valid			
			Test

The Test tab is displayed after the rule is executed (tested) for the first time. Note that "Verify Results" tab is now displayed.