

Virtual User Group

Rules 101 with Jeff Piepenburg



Workplace		Reagent		Calibration		QC		Utility	
Par	Test	Type	Remaining	Remaining	Res	Res	Res	Res	Exp
7	CEA 7	ASSAY	Current	46	00100100	00100100	00100100	00100100	08/03/18
5	DR UN	DR	Current	18	00107001	045884	045884	045884	08/03/18
3	A-HIS 3	ASSAY	Current	46	00108229	00108229	00108229	00108229	08/03/18
4	HBG 4	ASSAY	Current	46	00108230	00108230	00108230	00108230	08/03/18
6	CHMBSTA 6	ASSAY	Current	46	00108231	00108231	00108231	00108231	08/03/18
8	TRSA 8	ASSAY	Current	46	00108232	00108232	00108232	00108232	08/03/18
1	APP 1	ASSAY	Current	46	00108233	00108233	00108233	00108233	08/03/18
9	FT3 W 9	ASSAY	Current	117	00101432	00101432	00101432	00101432	07/03/18
10	A-HIS 10	ASSAY	Current	46	00108234	00108234	00108234	00108234	08/03/18
11	TRSA 11	ASSAY	Current	105	00108235	00108235	00108235	00108235	08/03/18
12	FT3 B 12	ASSAY	Current	149	00108236	00108236	00108236	00108236	08/03/18
13	R-HISCOM 13	PRE	Current	31	00102341	00102341	00102341	00102341	12/03/18
14	HISCOM 14	ASSAY	Current	31	00102342	00102342	00102342	00102342	12/03/18
15	CAIS 15	ASSAY	Current	18	00108237	00108237	00108237	00108237	08/03/18
16	P-HIS 16	PRE	Current	19	00108238	00108238	00108238	00108238	08/03/18
17	A-HIS 17	ASSAY	Current	19	00108239	00108239	00108239	00108239	08/03/18
18	CEA 18	ASSAY	Current	19	00108240	00108240	00108240	00108240	08/03/18
19	CEA 19	ASSAY	Current	19	00108241	00108241	00108241	00108241	08/03/18
20	CEA 20	ASSAY	Current	19	00108242	00108242	00108242	00108242	08/03/18
21	CEA 21	ASSAY	Current	19	00108243	00108243	00108243	00108243	08/03/18
22	CEA 22	ASSAY	Current	19	00108244	00108244	00108244	00108244	08/03/18
23	CEA 23	ASSAY	Current	19	00108245	00108245	00108245	00108245	08/03/18
24	CEA 24	ASSAY	Current	19	00108246	00108246	00108246	00108246	08/03/18
25	CEA 25	ASSAY	Current	19	00108247	00108247	00108247	00108247	08/03/18
26	CEA 26	ASSAY	Current	19	00108248	00108248	00108248	00108248	08/03/18
27	CEA 27	ASSAY	Current	19	00108249	00108249	00108249	00108249	08/03/18
28	CEA 28	ASSAY	Current	19	00108250	00108250	00108250	00108250	08/03/18
29	CEA 29	ASSAY	Current	19	00108251	00108251	00108251	00108251	08/03/18
30	CEA 30	ASSAY	Current	19	00108252	00108252	00108252	00108252	08/03/18
31	CEA 31	ASSAY	Current	19	00108253	00108253	00108253	00108253	08/03/18
32	CEA 32	ASSAY	Current	19	00108254	00108254	00108254	00108254	08/03/18
33	CEA 33	ASSAY	Current	19	00108255	00108255	00108255	00108255	08/03/18
34	CEA 34	ASSAY	Current	19	00108256	00108256	00108256	00108256	08/03/18
35	CEA 35	ASSAY	Current	19	00108257	00108257	00108257	00108257	08/03/18
36	CEA 36	ASSAY	Current	19	00108258	00108258	00108258	00108258	08/03/18
37	CEA 37	ASSAY	Current	19	00108259	00108259	00108259	00108259	08/03/18
38	CEA 38	ASSAY	Current	19	00108260	00108260	00108260	00108260	08/03/18
39	CEA 39	ASSAY	Current	19	00108261	00108261	00108261	00108261	08/03/18
40	CEA 40	ASSAY	Current	19	00108262	00108262	00108262	00108262	08/03/18
41	CEA 41	ASSAY	Current	19	00108263	00108263	00108263	00108263	08/03/18
42	CEA 42	ASSAY	Current	19	00108264	00108264	00108264	00108264	08/03/18
43	CEA 43	ASSAY	Current	19	00108265	00108265	00108265	00108265	08/03/18
44	CEA 44	ASSAY	Current	19	00108266	00108266	00108266	00108266	08/03/18
45	CEA 45	ASSAY	Current	19	00108267	00108267	00108267	00108267	08/03/18
46	CEA 46	ASSAY	Current	19	00108268	00108268	00108268	00108268	08/03/18
47	CEA 47	ASSAY	Current	19	00108269	00108269	00108269	00108269	08/03/18
48	CEA 48	ASSAY	Current	19	00108270	00108270	00108270	00108270	08/03/18
49	CEA 49	ASSAY	Current	19	00108271	00108271	00108271	00108271	08/03/18
50	CEA 50	ASSAY	Current	19	00108272	00108272	00108272	00108272	08/03/18
51	CEA 51	ASSAY	Current	19	00108273	00108273	00108273	00108273	08/03/18
52	CEA 52	ASSAY	Current	19	00108274	00108274	00108274	00108274	08/03/18
53	CEA 53	ASSAY	Current	19	00108275	00108275	00108275	00108275	08/03/18
54	CEA 54	ASSAY	Current	19	00108276	00108276	00108276	00108276	08/03/18
55	CEA 55	ASSAY	Current	19	00108277	00108277	00108277	00108277	08/03/18
56	CEA 56	ASSAY	Current	19	00108278	00108278	00108278	00108278	08/03/18
57	CEA 57	ASSAY	Current	19	00108279	00108279	00108279	00108279	08/03/18
58	CEA 58	ASSAY	Current	19	00108280	00108280	00108280	00108280	08/03/18
59	CEA 59	ASSAY	Current	19	00108281	00108281	00108281	00108281	08/03/18
60	CEA 60	ASSAY	Current	19	00108282	00108282	00108282	00108282	08/03/18
61	CEA 61	ASSAY	Current	19	00108283	00108283	00108283	00108283	08/03/18
62	CEA 62	ASSAY	Current	19	00108284	00108284	00108284	00108284	08/03/18
63	CEA 63	ASSAY	Current	19	00108285	00108285	00108285	00108285	08/03/18
64	CEA 64	ASSAY	Current	19	00108286	00108286	00108286	00108286	08/03/18
65	CEA 65	ASSAY	Current	19	00108287	00108287	00108287	00108287	08/03/18
66	CEA 66	ASSAY	Current	19	00108288	00108288	00108288	00108288	08/03/18
67	CEA 67	ASSAY	Current	19	00108289	00108289	00108289	00108289	08/03/18
68	CEA 68	ASSAY	Current	19	00108290	00108290	00108290	00108290	08/03/18
69	CEA 69	ASSAY	Current	19	00108291	00108291	00108291	00108291	08/03/18
70	CEA 70	ASSAY	Current	19	00108292	00108292	00108292	00108292	08/03/18
71	CEA 71	ASSAY	Current	19	00108293	00108293	00108293	00108293	08/03/18
72	CEA 72	ASSAY	Current	19	00108294	00108294	00108294	00108294	08/03/18
73	CEA 73	ASSAY	Current	19	00108295	00108295	00108295	00108295	08/03/18
74	CEA 74	ASSAY	Current	19	00108296	00108296	00108296	00108296	08/03/18
75	CEA 75	ASSAY	Current	19	00108297	00108297	00108297	00108297	08/03/18
76	CEA 76	ASSAY	Current	19	00108298	00108298	00108298	00108298	08/03/18
77	CEA 77	ASSAY	Current	19	00108299	00108299	00108299	00108299	08/03/18
78	CEA 78	ASSAY	Current	19	00108300	00108300	00108300	00108300	08/03/18
79	CEA 79	ASSAY	Current	19	00108301	00108301	00108301	00108301	08/03/18
80	CEA 80	ASSAY	Current	19	00108302	00108302	00108302	00108302	08/03/18
81	CEA 81	ASSAY	Current	19	00108303	00108303	00108303	00108303	08/03/18
82	CEA 82	ASSAY	Current	19	00108304	00108304	00108304	00108304	08/03/18
83	CEA 83	ASSAY	Current	19	00108305	00108305	00108305	00108305	08/03/18
84	CEA 84	ASSAY	Current	19	00108306	00108306	00108306	00108306	08/03/18
85	CEA 85	ASSAY	Current	19	00108307	00108307	00108307	00108307	08/03/18
86	CEA 86	ASSAY	Current	19	00108308	00108308	00108308	00108308	08/03/18
87	CEA 87	ASSAY	Current	19	00108309	00108309	00108309	00108309	08/03/18
88	CEA 88	ASSAY	Current	19	00108310	00108310	00108310	00108310	08/03/18
89	CEA 89	ASSAY	Current	19	00108311	00108311	00108311	00108311	08/03/18
90	CEA 90	ASSAY	Current	19	00108312	00108312	00108312	00108312	08/03/18
91	CEA 91	ASSAY	Current	19	00108313	00108313	00108313	00108313	08/03/18
92	CEA 92	ASSAY	Current	19	00108314	00108314	00108314	00108314	08/03/18
93	CEA 93	ASSAY	Current	19	00108315	00108315	00108315	00108315	08/03/18
94	CEA 94	ASSAY	Current	19	00108316	00108316	00108316	00108316	08/03/18
95	CEA 95	ASSAY	Current	19	00108317	00108317	00108317	00108317	08/03/18
96	CEA 96	ASSAY	Current	19	00108318	00108318	00108318	00108318	08/03/18
97	CEA 97	ASSAY	Current	19	00108319	00108319	00108319	00108319	08/03/18
98	CEA 98	ASSAY	Current	19	00108320	00108320	00108320	00108320	08/03/18
99	CEA 99	ASSAY	Current	19	00108321	00108321	00108321	00108321	08/03/18
100	CEA 100	ASSAY	Current	19	00108322	00108322	00108322	00108322	08/03/18

Agenda

- I. Intro
- II. COVID-19 News Summary
- III. Rules 101
- IV. Conclusion

Reminders

- Phone lines will be muted
- Chat questions into me at any time
- Must have an 83% participation in order to receive PACE credits
- PACE certificates will be emailed to you Wednesday

Upcoming Webinars & Virtual Events

Virtual User Group
High Availability & Disaster Recovery
Sept. 29, 2020
11:00 AM PT /2:00 PM ET

Virtual User Group
Lab Intelligence
Oct. 6, 2020
11:00 AM PT /2:00 PM ET

Virtual Thought Leadership Event
The Lab's "New Normal": Thought Leadership to Navigate and Embrace Industry Change
November 12, 2020
10:00 AM PT /2:00 PM ET



COVID-19 News Summary

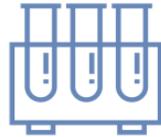
Current trending topics

COVID-19 News

Current trending topics



Laboratory Testing Volumes



EUAs for pooled COVID-19 testing



Treatment Plans and Test Utilization



Multiplex COVID-19 / Flu A/B



Getting Started with Rules - Rules 101

Getting Started with Instrument Manager Rules

Jeff Piepenburg, MT (ASCP)

Agenda

- I. The Basics
- II. Creating Rules
- III. Writing Rules

The Basics

Getting Started with Rules

- Rules are configuration-based
 - Allows for rules to be shared across multiple analyzers (one to many)
- Rules can be written against the information in IM
 - Review the Specimen Event Log (SEL) for available data elements
 - Example: Location-based rules

```
Location - Bed
Location - Facility
Location - Room
Location - Ward
Location Nurse Station
```

```
Record was a request message
Message Data:
Group Data:
Group Identifier = '105,701'
Group Entry Type = 'C'
Group Sequence Number = '6789'

Patient Data:
Patient ID = 'XY106789'
Patient Name = 'Lab Intel,Data'
Sex = 'M'
Date of Birth = '5/21/1962'
Location - Facility = 'First Floor'
Race = 'Cauc'
```

The Basics Continued

- Order of Operation
 - IM does not adhere to PEMDAS (Parenthesis, Exponents, Multiplication, Division, Addition Subtraction)
 - Will perform operations in the order that they appear
 - $3+5*3-2 = 22$ in IM rather than 16 if you follow PEMDAS
 - IM uses parentheses to force order of operation
 - $3+(5*3)-2 = 16$ in IM
 - Parentheses also used to group “thoughts” in IM together to make sure statements are properly evaluated
- Organization of Rules
 - Rules fire from top to bottom, left to right
 - Rules should be organized in a logical fashion
 - Example: Having a rule fire to perform a calculation on an invalid result

The Basics Continued

Overview of the Rules Screen

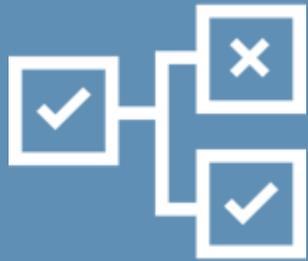
- Test/In Validation versus Live
- Red versus Black
- If/Then/Else
 - Initially, lots of “demand” for Else
 - Very rare to actually use Else...very few “it’s this or it’s that” in the Laboratory
- Request or Result Rule?
- Location of Rules
 - Lots of places to write rules
 - The vast majority of rules still written in Incoming Result>Before Message Queued Internally

The Basics Continued

Three basic levels of data elements in Rules

- Patient, Specimen and Test
- General Data Elements as well that do not fit in to those categories
- Patient and Specimen data elements are usually persistent
- Test Data Elements can be persistent but some/most are not

Creating Rules



Creating Rules

- Three ways to write rules
 - Drag and Drop
 - Double-Click
 - Free Text

- Likely to use a combination of those methods
 - Free text is the fastest

Creating Rules Continued

- Some users may find “sketching” out their rules helps
 - Write your rules out on paper first
- Parentheses are only used primarily in the IF statement
 - Used in the THEN statement only if doing a calculation to force order of operation
 - Also used to encase “conditions” that need to be true
- Add versus Set
 - Add adds on to the field you specify and leaves the original contents in place. Set replaces what was there with what you tell it to set
- Add Test versus Order Test
 - Add Test adds that test on to your existing message
 - Used primarily in Result messages to add on a test that was not part of the original result message, such as a calculated value

Creating Rules Continued

Add Test versus Order Test Continued

- Order Test used to order a new test that was not part of the original message
- Most commonly used in Request rules, or to order a reflex test

Writing Rules



Writing Rules

- Using the Drag and Drop Method
 - Write a rule that adds on test “HIL” if a Glucose is ordered
 - First, determine if this a Request or Result rule?
 - Where are we going to write this rule?
 - User Input Value
 - Allows you to define something specific, such as a test code, error code, test result

Writing Rules Continued

- If: ({Test Ordered} "GLU")
Then: {Add Test} "HIL"

Writing Rules Continued

- Using the Double-Click Method
 - Write a rule that adds a test comment of “Severe Hemolysis Present – Result may be elevated” to Potassium if Hemolysis is greater than or equal to 3+
 - What type of rule is this, request or result?
 - Where do you write it?
 - What 2 things do I need to check for this rule?
 - Is my hemolysis result $\geq 3+$?
 - Do I have a K result present?
 - Do I care what my Potassium result is?

Writing Rules Continued

- If: ({Test Resulted} "K") {AND} ({Hemolysis} >= "3+")
Then: {Add} {Test Comment(s)} "Severe Hemolysis Present –
Result may be elevated" {On Test} "K"

Writing Rules Continued

- Using the Free Text Method
 - If Sodium, Chloride and Bicarbonate results are present, add test AGAP and use the formula = $\text{Na} - (\text{Cl} + \text{HCO}_3)$
 - What type of rule? Where do you write it?
 - What do you need to check?
 - Since we are doing a calculation, we need to check that all values are numeric
 - We do not need to check to make sure all results are present and doing the numeric check takes care of that as well
 - IM is not very smart when it comes to multiple items...you will need to “explain” to it what you are trying to do very literally.
 - You can’t just say “If Na and Cl and HCO₃ are numeric”.
 - You’ll need to say “If Na is numeric AND Cl is numeric and HCO₃ is numeric”

Writing Rules Continued

- Using the Free Text Method Continued
 - If: (({Result} {On Test} "NA" {Is Numeric}) {AND} ({Result} {On Test} "CL" {Is Numeric}) {AND} ({Result} {On Test} "HCO3"))
Then: {Add Test} "AGAP" {AND} {Set} {Result} {On Test} "AGAP" =
{Result} {On Test} "NA" - ({Result} {On Test} "CL" + {Result} {On Test} "HCO3")

Writing Rules Continued

- Saving Rules
 - Save early, save often!
 - Save to Test/In Validation first, then move to Live
 - Saving rules checks for syntactical errors in the rules, not for “bad” rules
 - Warnings Versus Errors
 - Errors cannot be moved to Live
 - Errors can usually be deciphered, but occasionally can be quite cryptic in nature
 - Warnings are just that...something needs your attention but may be okay
 - Typical Issues
 - Parentheses
 - Is Numeric
 - Value Lists incomplete or not defined

Writing Rules Continued

- Using what you have learned so far, write a rule that changes numeric THC results to positive
 - Test Code = THC
 - Cutoff for Positive = 200 ng/mL
- Extra Credit – Add rules for indeterminate and negative values
 - Cutoff for Negative = 150 ng/mL
- Extra Extra Credit – Convert this rule to use a value list
 - Test Codes = COC, PCP
 - Same cutoffs

A photograph of two men in a server room. The man on the right, wearing glasses and a white shirt, is pointing at a computer monitor. The man on the left, also in a white shirt, is looking at the monitor. The room is filled with server racks and computer equipment. The entire image has a blue color overlay.

Testing and Validation

Agenda

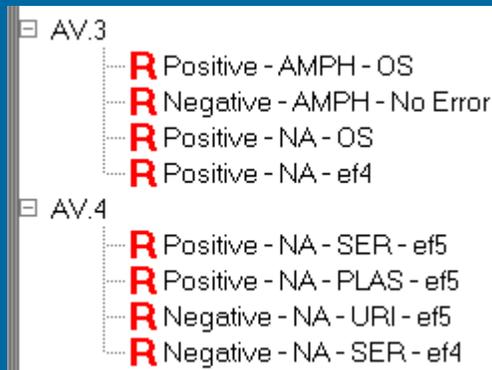
- I. Testing Strategy
- II. The Test Engine
- III. Testing Your Rules

Testing Strategy

- Overall Testing Strategy for IM Rules
 - Test what is needed
 - Look at the data elements the rule is using
 - Test multiple scenarios
 - Test in the affirmative, negative and the absurd
 - Testing of value lists
 - Test items in the beginning, the middle and the end of the value list
 - Testing the logic of the rule, not the value list
 - Do not test rules in a vacuum
 - Rules can be tested individually, but should also be tested as part of the whole rule set

Testing Strategy

- Overall Testing Strategy for IM Rules Continued
 - Spend the time to build a good set of test scenarios and cases
 - Saves time in the long run
 - Build your test cases to match your rule schema



- Print/save your audit trails
 - Regulators love to see these

Agenda

- I. Testing Strategy
- II. The Test Engine**
- III. Testing Your Rules

The Test Engine

- The Test Engine
 - One of the most powerful tools in IM
 - Virtually eliminates the need to do “wet-testing” with the analyzer
 - Allows for the simulation of any result; allows for easily testing the “edges” of rules
 - Easily create and recreate testing scenarios for regulatory purposes
- Tips and Tricks for the Test Engine
 - Age
 - Items needed to calculate a patient age:
 - DOB
 - Collection Date and Time
 - How old the sample is, not the patient

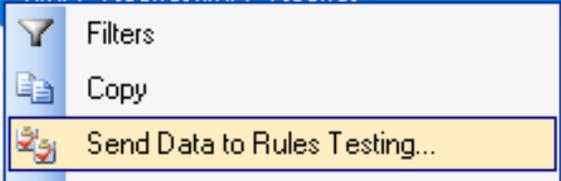
The Test Engine

- Tips and Tricks for the Test Engine Continued
 - Adding or Removing Fields
 - Not all fields are displayed
 - Use the Field Chooser to add or remove unneeded fields
 - Copying/Duplicating Test Cases
 - Test cases can be copied/pasted using standard Windows commands
 - Test cases can also be copied to other configurations as needed
 - Test cases can be imported and exported as well
 - Testing Scenarios
 - Allows for multiple test cases to be run at once
 - Test cases can build on each other; Something “set” in the first case can be used by the second test case
 - For this to happen, the test cases need to match up
 - Usually requires Patient ID and possibly the request ID being set in the test cases

The Test Engine

- Tips and Tricks for the Test Engine Continued
 - Send Data to Rules Testing
 - Allows you to send real-world examples to the testing engine
 - Realistic examples from the analyzer eliminate any testing bias that might exist
 - From the SEL, choose the appropriate entry to send to Rules Testing
 - Most likely you will want to choose the "System - Data Queued Internally to Update Orders Database"
 - This is the entry that has all of the data possible; includes all of the information from the analyzer as well as the information that IM "knows" for the sample
 - Cannot have the Rules configuration screen open to the configuration you are trying to copy to

7/14/2017 13:58:25	W223217634...	←	result	System - Data Updated with Specimen Management Info	NAT Tracker/NAT Tracker
7/14/2017 13:58:25	W223217634...	←	result	System - Data Queued Internally to Update Orders Database	NAT Tracker/NAT Tracker
7/14/2017 13:58:25	W223217634...	←	result	Tracking	
7/14/2017 13:58:25	W223217634...	→	result	System - Data Before Message is Sent to Destination	
7/14/2017 13:58:25	W223217634...	⊖		Fluid Code Mapping	



The Test Engine

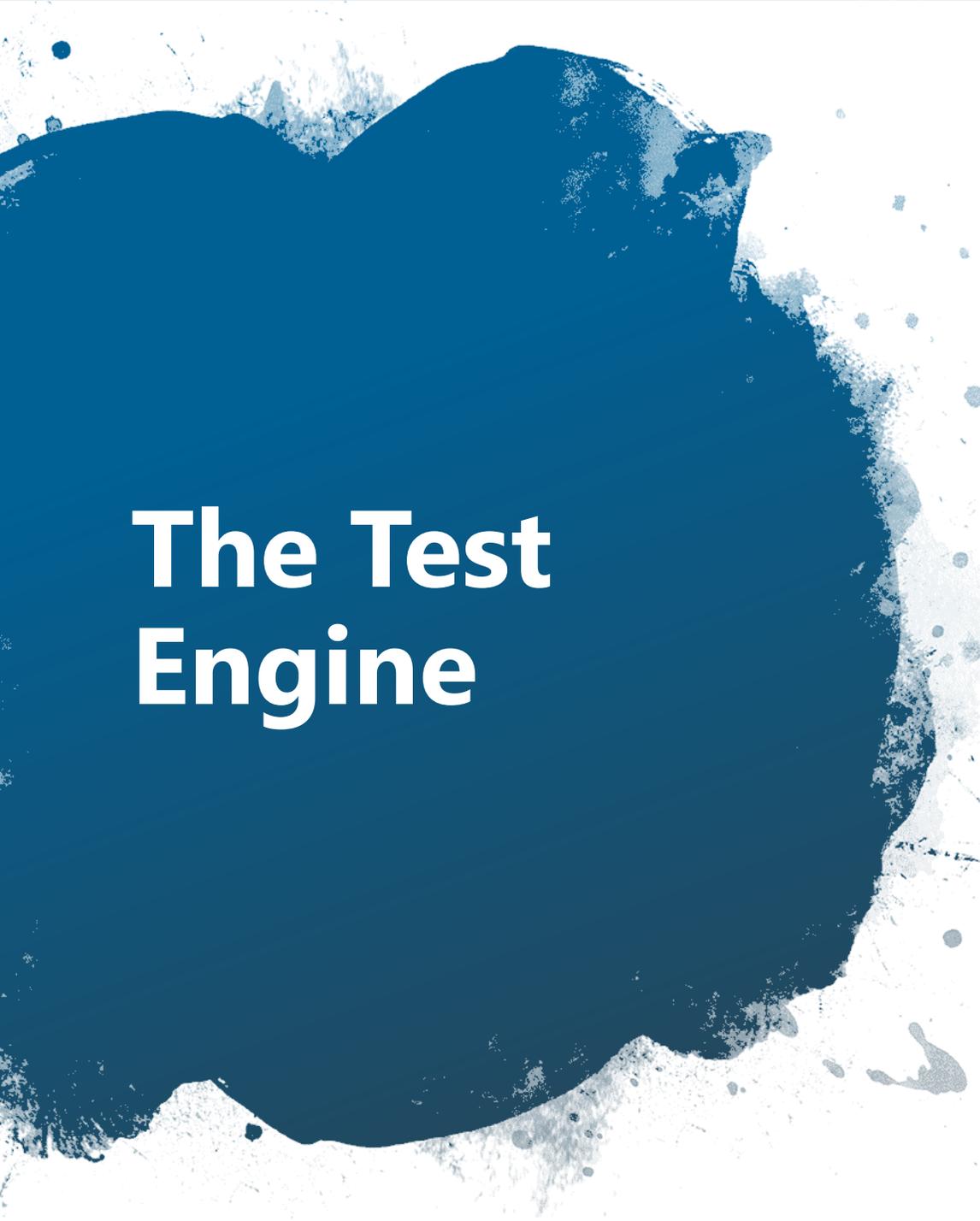
- Tips and Tricks for the Test Engine Continued
 - Send Data to Rules Testing Continued

The screenshot displays a software interface with three main panels. The left panel, titled 'Test Scenarios', contains a toolbar with various icons and a tree view showing 'Imported from Specimen Event Log' with a sub-entry 'From Specimen ID: W223217634590'. The top right panel, 'Patient Information', is a table with columns for Patient ID, Sex, Date of Birth, and Location - Facility. The bottom right panel, 'Specimen Information', is a table with columns for Specimen ID, Request ID, Last Run ID, Last Run Date/Time, and Specimen. Below it is a 'Test Information' table with columns for Test Code, Result, Result Date/Time, Test Instrument ID, and Test Name.

Patient ID	Sex	Date of Birth	Location - Facility

Specimen ID	Request ID	Last Run ID	Last Run Date/Time	Specimen
W22321763...	W2232176...	1	7/19/2017 03:55:24	205510

Test Code	Result	Result Date/Time	Test Instrument ID	Test Name
ULTRIO	Nonr...	7/13/2017 02:52:53	NAT Tracker	ULTRIO
*				

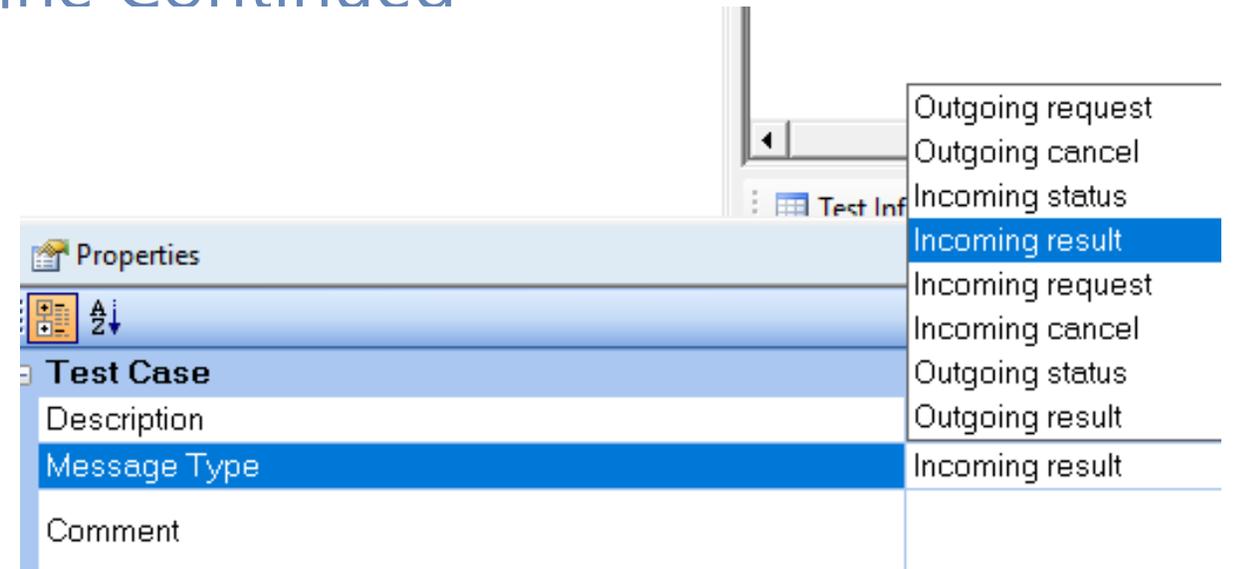
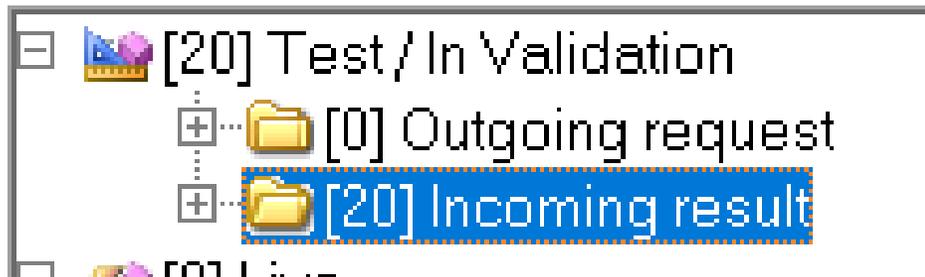


The Test Engine

- Tips and Tricks for the Test Engine Continued
 - Send Data to Test Engine Continued
 - You do not want to use Audit Trails for this purpose
 - Audit trails reflect the state of the message AFTER rules have already fired
 - Executing Test Cases
 - If you right-click, always click on the red letter of the test case
 - Right-clicking on the test case/scenario name usually causes IM to think you are trying to rename the test case
 - Depending on what you are trying to test, you may need to alter the properties of the test case
 - Always match the Message Type of the Test Case to the folder your rule is located in

The Test Engine

- Tips and Tricks for the Test Engine Continued
 - Executing Test Cases Continued



The Test Engine

- Tips and Tricks for the Test Engine Continued
 - SM rules
 - “Difficult” to test
 - Requires defining the connections used in the properties of the test case



The screenshot shows a 'Properties' window for a 'Test Case'. The window has a title bar 'Properties' and a toolbar with icons for search and zoom. Below the toolbar is a table with the following data:

Test Case	
Description	New Test Case 1
Message Type	Incoming result
Comment	
Origin Connection Name	
Test Case	
Process Origin Connection Rules First	No

The Test Engine

- Tips and Tricks for the Test Engine Continued
 - Testing complicated rules
 - May require that you break down the rule in to smaller pieces first to test
 - Add back in additional pieces once you have the smaller piece(s) working
 - Cut/Copy/Paste
 - Parentheses
 - Should always have an even number of parentheses
 - For every open parentheses, you need a close parentheses
 - If you get a parentheses error, add/remove 1 at a time
 - Best method I have found for "counting" parentheses?



Agenda

I. Testing Strategy

II. The Test Engine

III. Testing Your Rules

Testing Your Rules

- Let's go back and test the rules we wrote earlier
- The first rule was this:
 - If: {Test Ordered} "GLU"
Then: {Add Test} "HIL"
 - What type of test case is this? Request or Result?
 - What data elements do we need in our test case?
 - DOB?
 - Collection Date/Time?
 - Patient ID?

Testing Your Rules

- The second rule was:
 - If: ({Test Resulted} "K") {AND} ({Hemolysis} >= "3+")
Then: {Add} {Test Comment(s)} "Severe Hemolysis Present – Result may be elevated" {On Test} "K"
 - What type of test case is this? Request or Result?
 - What data elements do we need in our test case?

Testing Your Rules

- The third rule was:
 - If: (({Result} {On Test} "NA" {Is Numeric}) {AND} ({Result} {On Test} "CL" {Is Numeric}) {AND} ({Result} {On Test} "HCO3"))
Then: {Add Test} "AGAP" {AND} {Set} {Result} {On Test} "AGAP" = {Result} {On Test} "NA" - ({Result} {On Test} "CL" + {Result} {On Test} "HCO3")
 - What type of test case is this?
Request or Result?
 - What data elements do we need in our test case?

Testing Your Rules

- Testing the Delta Check What data elements are needed?
 - Patient ID
 - DOB
 - Collection D/T
 - Test Code
 - Test Result
 - "Previous" fields will be populated once we run the test cases
- We will need to build two cases
 - 1st Test Case will pass through without any issues
 - 2nd Test Case will be the one that triggers your delta check rule
 - Second test will have the same patient identifiers as the first test case, but a different collection date and time and specimen ID than the first test case
 - Both Test Cases will be under the same scenario and executed together

Common Issues and Tips and Tricks

Common Issues and Tips and Tricks

- Age
 - Items needed to calculate a patient age:
 - DOB
 - Collection Date and Time
 - IM uses days to calculate age
 - Fractions of days can be used. 0.5 days = 12 hours
 - To keep things simple, use Age in Days for all of your age-based rules
 - Months and Years data elements also available
 - These data elements do not recognize fractions. 0.5 years = 0 years
- Is Numeric
 - Lots of issues with calculations using non-numeric values
 - IM will often evaluate text as a zero

Common Issues and Tips and Tricks Continued

- “Persistent” data elements
 - There is often a need to remember information from one run to another of a sample (Criticals, repeats, “2 of 3” testing)
 - Prior versions of IM, this was difficult to do
 - Fields like Previous Test Dilution or Previous Test Error were unique in IM. Test-level data elements that were persistent from run to run
 - Only two available!
 - Several different options to store and recall information now
 - Previous Run data elements
 - Specimen User Fields
 - Test User Persistent Fields

Common Issues and Tips and Tricks Continued

- Any/That
 - "You can have an Any without a That, but you can't have a That without an Any"
 - If you want to use a That, you have to have used an Any in the IF statement
 - Only one Any per IF statement; Can have multiple That in your IF and THEN statement
- Any/That Bad Example:

[0] Any/That Bad Example 1

If: (({Result} {On Any Test} > "100") {AND} ({Result} {On Any Test} < "50"))

[0] Then: {Hold That Test for Verification}

[0] Else:

AND} (,
Else: - 'On

• De:
{Re

'Any Test' can not be used multiple times in an If statement

Common Issues and Tips and Tricks Continued

🔗 [0] Any/That Example 1

- If: ({Result} {On Any Test} > "100")
- [0] Then: {Hold That Test for Verification}
- [0] Else:

🔗 [0] Any/That Example 2

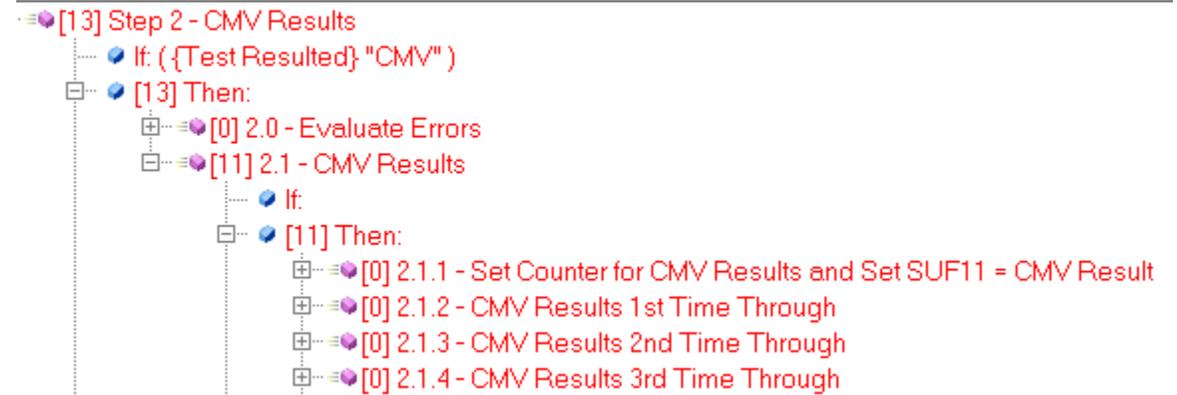
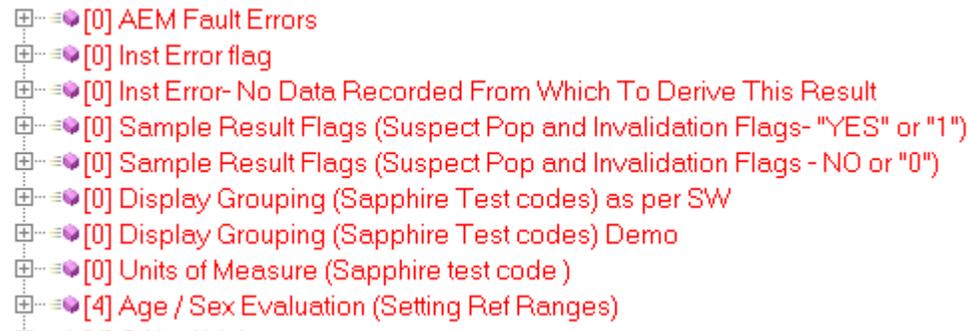
- If: (({Result} {On Any Test} > "100") {AND} ({Result} {On Test} "GLU" {NOT} = ""))
- [0] Then: {Hold Test for Verification} "GLU"
- [0] Else:

🔗 [0] Any/That Example 3

- If: (({Result} {On Any Test} {NOT} = "") {AND} ({Result} {On That Test} {NOT} = "Positive"))
- [0] Then: {Hold That Test for Verification}
- [0] Else:

Common Issues and Tips and Tricks Continued

- Organization of Rules
 - Rules can be used for organization purposes



- “Blank” rules can be read as IF: Always
- “Blank” rules can also be used to store value lists for the child rules underneath the parent rule

Common Issues and Tips and Tricks Continued

- SM rules
 - Limited functionality - Primarily a left-over function from earlier releases of IM
 - Used for comparing/evaluating results that came from different analyzers or at different times from the same analyzer
 - Requires that you specify the instrument connection(s) in the rule itself
 - Cannot change or edit a result, only add new tests and results
 - Almost all functionality can be done with regular rules now

Common Issues and Tips and Tricks Continued

- Request ID
 - This is an internal ID used by to keep samples unique
 - Typically consists of the Specimen ID + the year and the Julian day (1234-2018120)
 - If you ever see the same sample ID on different rows on the workspace, this is why
 - Created to prevent overwriting information on samples where they do not use unique Specimen IDs
 - If your LIS uses unique IDs (never repeats), Request ID can be manipulated by rules to help with this issue

Common Issues and Tips and Tricks Continued

- Request ID Continued
 - As of 8.15.10, setting Request ID = Specimen ID is a setting within the application
 - Configuration > Specimen Management
Configuration > Specimen ID Algorithm

Set Default Request ID equal to Specimen ID

- Will not work for unsolicited results; needs an order for this feature to work, otherwise rules will still be needed to set the Request ID

Common Issues and Tips and Tricks Continued

- Else
 - As previously mentioned, there are not many use cases for Else
 - Example:

```
[0] Stop Processing QC Samples
  [0] If: ({Specimen Type} {NOT} = "Q")
  [0] Then:
  [0] Else: {Stop Processing Rules}
```

Questions?

- Thank you for your time!

Upcoming Webinars & Virtual Events

Virtual User Group
High Availability & Disaster Recovery
Sept. 29, 2020
11:00 AM PT /2:00 PM ET

Virtual User Group
Lab Intelligence
Oct. 6, 2020
11:00 AM PT /2:00 PM ET

Virtual Thought Leadership Event
The Lab's "New Normal": Thought Leadership to Navigate and Embrace Industry Change
Sept. 29, 2020
10:00 AM PT /2:00 PM ET