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CentraBytes

Autoverification: Severities and rules


Welcome to CentraBytes, a monthly tutorial on how laboratories around the world are applying the power of Siemens CentraLink™ Data Management System to improve workflow and quality.

Today we will take a behind-the-scenes look at autoverification.

Answers for life.

Learning Objectives

1. Understanding how decision rules can be designed to prioritize human review
2. Understanding how to create a robust and efficient autoverification process



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Today, we will take a behind-the-scenes look at autoverification. We will discuss a best practice on how to create decision rules to prioritize human review of results. By directing your attention to the results that need it most, decision rules can help you use your time efficiently and achieve the highest standard of quality and consistency.

Benefits of Consistent Processes

Focus


“I need to focus on the exceptions/outliers that need my expertise.”

Errors

“I want to reduce errors by following a consistent decision process.”

Time

“I need to deliver test results quickly while maintaining high quality.”



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To convert the large amounts of data generated by your instruments into actionable information, your CentraLink Data Management System enables you to set up decision rules to identify results that require attention. This is exception management at its best. Once they are set up, the same rules are followed from technologist to technologist, shift to shift. With consistent processes, you can reduce subjective or inconsistent decision making that can be a source of errors. And by focusing on the most important, highest-priority issues, you can get to final results quickly and without compromising quality.


Key Concepts

Severity

- Flag problem severity using a consistent numerical scale so technologist knows which problem to address first.

Evaluation Order

- Prioritize human intervention based on severity of the problem.



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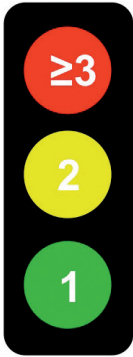
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Two underlying principles—evaluation order and severities—are at the core of the way the CentraLink system manages the autoverification process.

The evaluation order tells you the sequence of reference ranges to review. The severity rating ranks results by their deviation from a range of normal, expected values called the reference range. The more a test result deviates from its normal reference range, the more severe the problem with the result and the higher its priority for review.

If a test result triggers a high severity rating, the CentraLink system can easily hold a test or group of tests to allow for review of the test result and taking action. By reviewing and acting on only results that are exceptions to normal, you can quickly and efficiently process large amounts of data while ensuring consistent quality results.


The Traffic Light Analogy



Critical: Action needed
HIGH severity

Action may be needed
MODERATE severity

No immediate action
LOW severity



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The CentraLink system ranks severity on a scale of zero to 9. A result's severity ranking determines how much action it requires, if any.


Depending on your patient population, many of your lab's test results will rank as zero (normal). No action is required for results ranked zero.

A traffic light analogy is applied to results classified as other than normal (i.e., results with a severity of 1 or higher). A severity of 1 is a green light. The result deviates slightly from normal, but the severity of the problem is relatively low, so no action is required. A severity of 2 is a yellow light. This is considered moderate severity. It's up to the tech to decide whether to report the result or perform a rerun. A severity of 3 or higher is a red light (high severity), which means stop—an immediate action is required.

It's a simple system—greatly minimizing the need for "if-then-or" statements.



Evaluation Order vs. Severity



Category	Evaluation Order	Severity
>Linearity x Dilution	1	9
>Linearity	2	8
Rerun	3	7
Panic	7	3
Review	8	2
Slightly Abnormal	9	1
Within limits		

Actions*
Hold and follow up
Get-into decision
Release to LIS
Release to LIS

*Actions are driven by lab protocol.


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Here is an example of applying severities and rules to a result.

On the left-hand side you see an action to be taken, as defined by lab protocol, based on a range that's been established. The evaluation order, 1 being the most urgent, and the severity, 9 being the most severe, add up to 10.

In this case, according to preset criteria, when the result is greater than the linearity multiplied by the dilution factor, the severity is 9 and the result is held. At the other end of the continuum, a result that falls slightly outside the reference range has a severity of 1. The evaluation order is 9, and the result can be automatically released to the LIS by the CentraLink system.

Results within the reference range have a severity of zero and can also be automatically released to the LIS.



The Rules Wizard

Norm

Test: IGA

Evaluation order: ?

Method: ?

Sex: ?

Species: ?

Min age: ?

Max age: ?

Age unit: ?

Eligible: ?

Low limit: ?

High limit: ?

Severity: 1

Comment: ?

OK Cancel

In order for a result to acquire a severity, ALL defined criteria MUST be true.

→ Sets criteria by instrument

→ Default range or: Specific for male
Specific for female

→ Weeks, months, years, days; will change ranges, exceeding limitations of LIS

→ Eligible: by location, e.g., dialysis, physician; filter criteria by location; change ranges

→ Check to see if it is < or > range limits

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The Rules Wizard makes it easy to set up rules criteria. Rules can be configured to meet labs' specific review criteria and workflow needs. The test name automatically appears in the Test field. In the Method field, you can specify the name of the instrument. If you leave a ? in a field, no exception criteria is defined, and any value is acceptable. The Eligible field allows you to enter criteria such as patient location, physician name, etc. Low Limit and High Limit designate cutoffs. If a result falls below the low limit, a minus (-) sign will appear in front of the severity value. In order for a result to acquire a severity, it must match all the defined criteria.

Setting Autoverification Criteria

Norm

Test:

Evaluation order:

Method:

Sex:

Species:

Min age:

Max age:

Age unit:

Eligible:

Low limit:

High limit:

Severity:

Comment:

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Continue using the wizard to define your range needs, i.e., reference range, critical range, linearity range, location criteria, and physician criteria. Once the ranges are set, autovalidation is usually applied utilizing the traffic light concept to hold results at yellow and red.

Applying Autoverification Criteria



Review and Edit

Basic | Advanced | LAS

Sample ID: Priority: Age: Patient ID:

Patient name: Sex: DOB: Patient location:

Collection D/T: Sample comment:

Test	Sts	Current	P	Prior Run	Prev Samp	Date/Time	Norm	NS	DS	IS	CT	Instrument
> CREAT	REV	0.9	?	?	102	03/14/2014 09:00	74-156	3				Vista1500_1
> GLUC	REV	95	?	?	29	03/14/2014 09:00	23-29	1				Vista1500_1
> CO2	REV	2	?	?	5	03/14/2014 09:00	?					Vista1500_1
> BUN	REV	12.5	?	?	8.7	03/14/2014 09:00	8.6-10.0	1	2			Vista1500_1
> CA	REV	6.5	?	?	4.3	03/14/2014 09:00	?					Vista1500_1
> K	REV	99	?	?	100	03/14/2014 09:00	96-107					Vista1500_1
> Cl	REV	155	?	?	142	03/14/2014 09:00	?					Vista1500_1
> Na	REV		?	?								Vista1500_1

Select:

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In this example, results for the entire Basic Metabolic Panel test group are held in review due to the Glucose result, which has a severity of 3, and the Calcium result, which has a delta range failure. Note that negative failures are indicated by a minus sign in front of a severity, i.e., the result is less than the low cutoff for the range or the delta result is less than the previous result.

We just reviewed how fast and easy it is to set up autoverification rules. These rules ensure that the criteria and process for reviewing results are consistent and technologist time is focused on reviewing the results that need the most attention. This elevates quality and efficiency. You can download a copy of this presentation to share with your colleagues. Start by testing some of the ideas we shared with you today.

Thank you.

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