

# **Abnormal Laboratory Value Alerts Rule**

## **Rule: Conceptual Structure**

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**Department of Veterans Affairs (VA)**



**Knowledge Based Systems (KBS)  
Office of Informatics and Information Governance (OIIG)  
Clinical Decision Support (CDS)**

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by Knowledge Based Systems (KBS), Office of Informatics and Information Governance (OIIG), and Clinical Decision Support (CDS)

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# Preface

**Table 1. Revision History**

Date	Life Cycle Event
March 23, 2018	Published
March 23, 2018	Reviewed
December 5, 2017	Pre-published
October 31, 2017	Created

**Table 2. Clinical White Paper Contributors**

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**Table 3. Artifact Identifier**

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:rl	87c046d0-0c41-542b-9d56-2e0207194fa2	

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# Artifact Applicability

**Table 4. Applicability Foci, Description and Codes**

Focus	Description	Code System Name	Code System	Code	Code System Version	Value Set	Value Set Version
PatientAgeGroup	All						
ClinicalVenue	All						
PatientGender	All						
WorkflowSetting	All						

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# Models

**Table 5. Model References**

Referenced Model	Description
urn:solor.io:anf-model:1.0	VA Analysis Normal Form Model

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# Chapter 1. External Data Definitions

Triggers

**Table 1.1. newLaboratoryResult**

Trigger: type=DataEventTrigger, DataElementAdded
Expression: type=elm:Retrieve , dataType=ClinicalStatement, codeProperty=topic
Annotation: Any receipt of a laboratory result by the laboratory management system
Codes: elm:element[elm:Code]: [15220000  Laboratory test (procedure)]



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# Chapter 2. Expression Definitions

**Table 2.1. abnormalLabResultQuery**

Expression: type=elm:Query
Annotation: Abnormal laboratory result query, Value outside of defined normal reference range for test
Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)] elm:operand[elm:Code]: [[404684003  Clinical finding (finding)] ->(363714003  Interprets (attribute))->[386053000  Evaluation procedure (procedure)] ->(363713009  Has interpretation (attribute))->[263654008  Abnormal (qualifi- er value)]]

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# Chapter 3. Primary Care: Abnormal Laboratory Value Alerts

Primary Care: Abnormal Laboratory Value Alerts

Notify the clinical provider of the noncritical abnormal laboratory test result through the laboratory management system

actionSentence[type=elm:Instance, classType=anf:TSR-NoModel]

"topic: Communicate abnormal lab result to the clinical provider for the abnormal lab value."

(Codes: )

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# Chapter 4. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 4.1. Terminology References**

System	Code	Display Text	References
SNOMED CT	15220000  Laboratory test (procedure)	Postcoordinated Expression	1
SNOMED CT	398166005  Performed (qualifier value)	Precoordinated Expression	1
SNOMED CT	[404684003  Clinical finding (finding)] ->(363714003  Interprets (attribute))->[386053000  Evaluation procedure (procedure)] ->(363713009  Has interpretation (attribute))->[263654008  Abnormal (qualifier value)]	Postcoordinated Expression	1

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# Chapter 5. Behavior Symbols

**Table 5.1. Group Organizational Behavior**

Sym- bol	Name	Definition
▶	Sentence Group	A group of related alternative actions is a sentence group if the item referenced by the action is the same in all the actions, and each action simply constitutes a different variation on how to specify the details for that item. For example, two actions that could be in a SentenceGroup are "aspirin, 500 mg, 2 times per day" and "aspirin, 300 mg, 3 times per day". In both cases, aspirin is the item referenced by the action, and the two actions represent two different options for how aspirin might be ordered for the patient. Note that a SentenceGroup would almost always have an associated selection behavior of "AtMostOne", unless it's a required action, in which case, it would be "ExactlyOne".
▷	Logical Group	A group with this behavior logically groups its sub-elements, and may be shown as a visual group to the end user, but it is not required to do so.
➤	Visual Group	Any group marked with this behavior should be displayed as a visual group to the end user.

**Table 5.2. Group Selection Behavior**

Sym- bol	Name	Definition
□	Any	Any number of the items in the group may be chosen, from zero to all.
⦿	All	All the items in the group must be selected as a single unit.
⦿	AllOrNone	All the items in the group are meant to be chosen as a single unit: either all must be selected by the end user, or none may be selected.
○	ExactlyOne	The end user must choose one and only one of the selectable items in the group. The user may not choose none of the items in the group.
✱	AtMostOne	The end user may choose zero or at most one of the items in the group.
⦿	OneOrMore	The end user must choose a minimum of one, and as many additional as desired.

**Table 5.3. Required Behavior**

Sym- bol	Name	Definition
◆	Must	An action with this behavior must be included in the actions processed by the end user; the end user may not choose not to include this action.

Sym- bol	Name	Definition
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.
➤	MustUnlessDocumented	An action with this behavior must be included in the set of actions processed by the end user, unless the end user provides documentation as to why the action was not included.

**Table 5.4. Precheck Behavior**

Sym- bol	Name	Definition
▲	Yes	An action with this behavior is one of the most frequent actions that is, or should be, included by an end user, for the particular context in which the action occurs. The system displaying the action to the end user should consider "pre-checking" such an action as a convenience for the user.
▽	No	An action with this behavior is one of the less frequent actions included by the end user, for the particular context in which the action occurs. The system displaying the actions to the end user would typically not "pre-check" such an action.

**Table 5.5. Cardinality Behavior**

Sym- bol	Name	Definition
◆	Single	An action with this behavior may only be completed once.
❖	Multiple	An action with this behavior may be repeated multiple times.

**Table 5.6. Item Flags**

Sym- bol	Name	Definition
☞	fillIn	This item, in a list entry, allows the user to enter a fill in value that is not present in the set of presented choices.

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# Appendix A. References

This appendix contains the list of related resources and supporting documents used in creating this KNART.

## List of References

### Related Resources

[CCWP] *Primary Care: Abnormal and Panic Laboratory Value Alerts Clinical Content White Paper*

[CSD] *Primary Care: Abnormal Laboratory Value Alerts Conceptual Structure Document*

[KVRpt] *Primary Care: Abnormal Laboratory Value Alerts KNART Validation Report*

### Supporting Evidence

[Callen 2012] J. L. Callen, J. I. Westbrook, A. Georgiou, and J. Li, "Failure to follow-up test results for ambulatory patients: a systematic review.," *J. Gen. Intern. Med.*, vol. 27, no. 10, pp. 1334–1348, Oct. 2012. (link [<https://doi.org/10.1007/s11606-011-1949-5>])

[Hickner 2005] J. M. Hickner, D. H. Fernald, D. M. Harris, E. G. Poon, N. C. Elder, and J. W. Mold, "Issues and initiatives in the testing process in primary care physician offices," *Joint Commission journal on quality and patient safety*, vol. 31, no. 2, pp. 81–89, Feb. 2005. (link [[https://doi.org/10.1016/S1553-7250\(05\)31012-9](https://doi.org/10.1016/S1553-7250(05)31012-9)])

[VHA Directive 1088] U.S. Department of Veterans Affairs, "Communicating Test Results to Providers and Patients," *VHA Directive 1088*, 07-Oct-2015. [Online]. Available: [https://www.va.gov/vhapublications/ViewPublication.asp?pub\\_ID=3148](https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3148). [Accessed: 07-Oct-2015]. (link [[https://www.va.gov/vhapublications/ViewPublication.asp?pub\\_ID=3148](https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3148)])

[VHA 1106.01] *VHA Handbook 1106.01: Pathology and Laboratory Medicine Service (P&LMS) procedures*. 2016. (link [[https://www.va.gov/vhapublications/ViewPublication.asp?pub\\_ID=3169](https://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3169)])