SystmOne Auto-review Rules Engine

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Please note: All patient data shown in this document is fictitious.

Document History

This section should only be used when a new version of an existing document is created. Newer versions should detail which sections have been amended/added, including who reviewed and approved the document.

Version	Date	Updated by	Approved by	Description
1.0	30/10/2024	Thomas Rolfe	Dr Matt Curtis	Document created.

Introduction

This guide provides an overview of the results auto-review rules engine, which facilitates the automation of processing of incoming pathology and radiology results. The rules engine can assess the content of incoming results messages against user-defined parameters to determine whether a review by a clinician is required or not. The rules can also consider the incoming result in the context of the patient for whom it has been received. This supports the consideration of factors such as age, gender, and existing diagnoses, which can fundamentally alter a decision as to whether a result requires a review or not.

The functionality can be manually enabled for your organisation by a System Administrator from Organisation Preferences > Pathology > Auto-Reviewing, using the 'Use auto-review pathology rules' checkbox. With this enabled, you will get access to a new screen called Pathology /Radiology Auto-Review Rules Engine. In the menu it's under Setup > Workflow Support. This is where you configure the rule sets. Users that can configure rule sets is controlled by a separate preference within the Auto-Reviewing Organisation Preferences, called 'Staff members who can amend, create or delete auto-review rules'.

Rule Sets

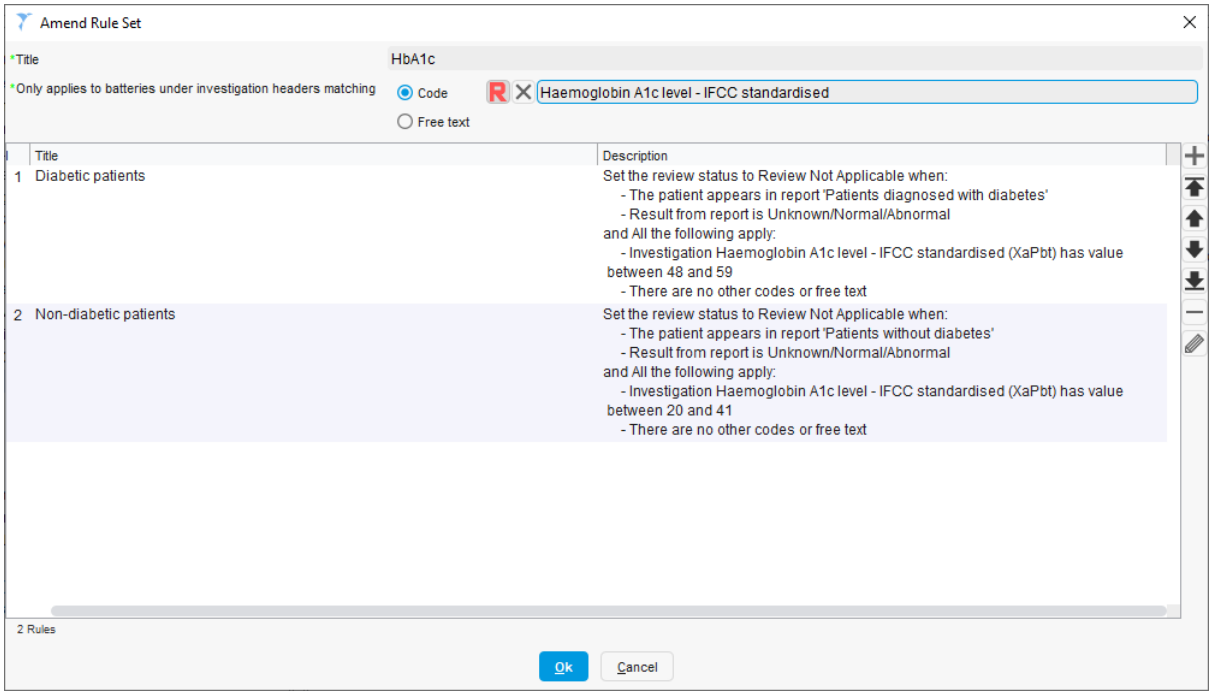

Figure 1.: Amending an Auto-review Rule Set

A rule set contains a number of rules that all pertain to a particular investigation header code e.g. Full Blood Count, or to a particular free text investigation header. There can only be one rule set per investigation header, so all rules that you want to apply to a given investigation header must be maintained within a single rule set. This restriction prevents the creation of conflicting rule sets that might otherwise attempt to apply rules with conflicting outcomes to the same investigation header.

Note that the free text option for setting an investigation header for a rule set is case sensitive.

You can control whether a rule set is in active use using the Active tickbox on the Rules Sets panel on the Rules Engine screen. You can make a rule set inactive while working on it to prevent it from being used when the Rules Engine is applied.

Rules

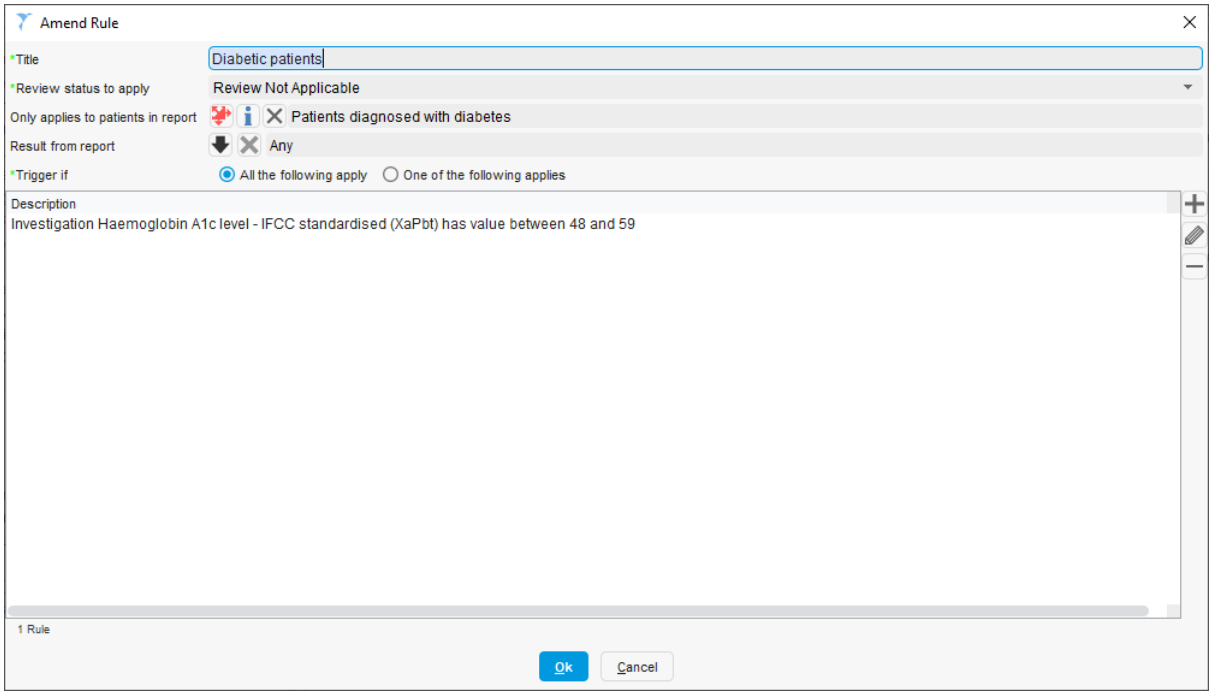

Figure 2.: Amending an Auto-review Rule

Once you have a rule set, you can add rules to it. You can specify whether each rule should set the review status of a relevant battery to either Review Required, or Review Not Applicable.

If a report contains a single battery which meets the conditions of a rule, where the Review Status to Apply is set to Not Applicable, then the report will be removed from the path inbox when the rules engine is run. If there are multiple batteries in a report, the rules engine will separately set the review status of each battery. This may mean that one battery requires manual review, and one battery is set to Review Not Applicable. In this case the report will remain on the path inbox until the remaining battery has been manually reviewed. An info box displays when viewing a report to show you the review status of the currently selected battery.

Each rule can also be configured to apply only to a subset of patients with shared characteristics, based on their presence within a specified clinical report. For example, you can have different rules for processing HbA1c results depending on whether the patient in question has a diagnosis of diabetes recorded. You may also want to consider using clinical reporting to exclude patients under a certain age, or a particular sex. In some scenarios you may also want to use this option to exclude recently registered patients if, for example, you test HbA1c for patients for whom you do not yet hold a full medical history, and cannot be sure whether the patient has a diabetes diagnosis or not.

You can also specify whether the rule should only be applied to reports that arrive from the lab with a certain result indicator – normal, abnormal, unknown.

Rules have an ordinal that can be changed using the arrow buttons on the Amend Rule Set dialog. The ordinal determines the primacy of the rules that are applied when the rules engine is run. The rule with an ordinal of 1 will be checked first, and if the conditions of that rule are met the appropriate review status will be applied and no more rules will be checked. If the conditions of the first rule are not met, the second rule will be checked, and so on. If none of the rules have their conditions met the report will be unaffected by the rules engine.

Parameters

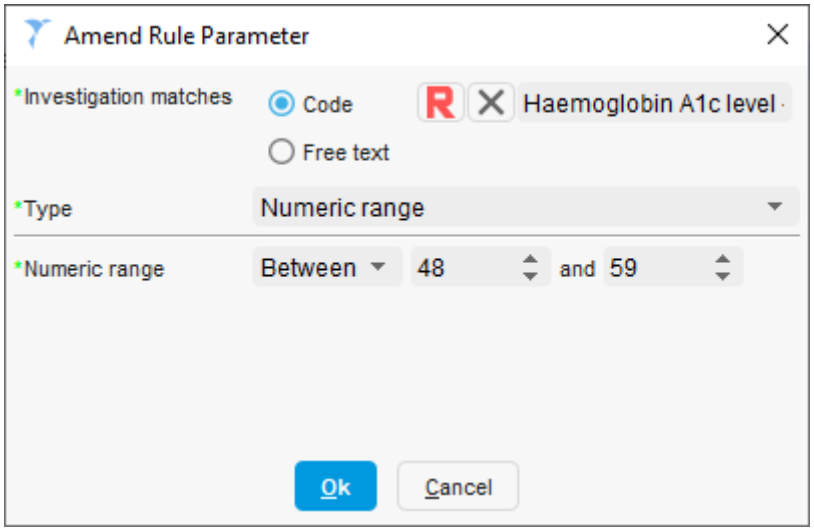

Figure 3.: Amending a Rule Parameter

Each rule can have multiple parameters. Parameters are what you use to specify the detailed conditions of the rule, and can be of different types:

Code exists: a specified code is contained within the battery.

Numeric range: the numeric value of a specified result in the battery is tested against your thresholds. e.g. white blood cell count is between 4 and 11.

Textual result equals: the result contains a textual result that exactly equals your specified free text.

Textual result contains: the result contains a textual result that contains your specified free text.

Comment equals: the result contains a free text comment from the lab that exactly equals your specified free text.

Comment contains: the result contains a free text comment from the lab that contains your specified free text.

Ignore if present and empty: If you receive a matching investigation that has no content, it will be ignored.

Ignore if present regardless of content: If you receive a matching investigation, it will be ignored regardless of the content.

Ignore if present textual results where content equals: If you receive a result that contains a textual result that equals your specified free text, it will be ignored. This differs from the ‘Textual result equals’ parameter in that the absence of the textual result is not a failure reason.

Ignore if present comments where content equals: If you receive a result that contains a comment that equals your specified free text, it will be ignored. This differs from the ‘Comment equals’ parameter in that the absence of the comment is not a failure reason.

N.B. textual results are identifiable in the result message by the tag ‘RIT’ (Result in Text). Comments are identifiable by the tag ‘SPC’ (Service Provider Comments).

When you have multiple parameters for a rule you can specify whether all parameters must be met to trigger the rule, or only one parameter needs to be met. This means you can create rules for different scenarios. Requiring all parameters to be met would generally be used when you are trying to determine that multiple numeric values within a battery are all within acceptable limits. Requiring just one parameter to be met would generally be used when you are trying to identify results that should not be auto-reviewed e.g. white blood cell count is less than 3, OR Haemoglobin is less than 114, etc.

Note that parameters where you specify free text are not case sensitive.

Running the engine

When the functionality is enabled you will get a new button on the path inbox called Apply Auto-Review Rules. Clicking this will run the rules you have configured in the rules engine against new reports in the path inbox, which have not yet been run through the engine.

The flags column on the path inbox has a new flag called 'Auto-review Rules Applied'. Reports with this flag have been run through the engine. The presence or absence of this flag gives you an indication of whether or not there is any point running the engine.

You can also right click on a report on the path inbox, or on the path node in the record, and use the option View Auto-Review Audit to see which rules were applied to the report when the engine was run.

Sharing rule sets

There are two ways to share rule sets that you have created – either by publishing them to an organisation group, or by exporting them as files that can then be imported at another unit.

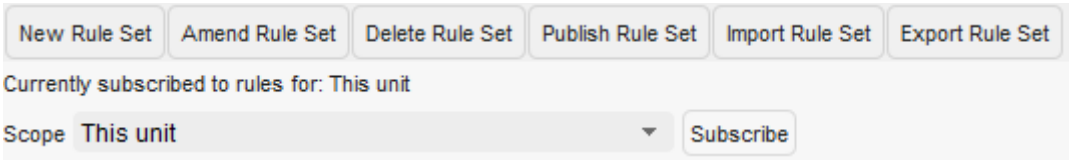

Figure 4.: Scope of Rule Sets

To publish a rule set to an organisation group select a rule set and then use the Publish Rule Set option on the engine's toolbar and choose the relevant organisation group. This feature allows a single unit to create, publish, and maintain rule sets for a group of units e.g. within a PCN or ICB, which removes the need for individual units to create and maintain their own rule sets.

When you are a member of an organisation group to which one or more rule sets have been published the screen will update with a Scope field and a Subscribe button. These options allow member organisations to choose between using their local rule sets or the rule sets published to the group. The default scope is set to use the rule sets locally created by the unit. To change a unit to use rule sets published to an organisation group, use the Scope dropdown to select the group and then click Subscribe. This will update the screen to show that the unit is subscribed to rule sets for the group. You can change Scopes whenever you like, but you cannot use a mix of rule sets from different scopes as this could result in conflict between two rule sets acting on the same investigation.

Rule sets are published to an organisation group's members in an inactive state. Member must decide for themselves whether to make a published rule set active at their unit. This ensures that members retain control of which rule sets are used by their unit. The publisher of the rule set remains the owner - any changes they make to it will immediately change the rule set for all members, but will not change the existing active/inactive status of the rule set at any given member's unit.

Member organisations are not notified within the system when organisation group rule sets are published, amended, or deleted, so you may wish to use existing comms channels to inform members of any relevant changes, especially in the case of newly published rules as these need to be made active by each unit.

If you want to share a rule set to someone without publishing it to an organisation group, use the Export Rule Set option to download an .xml file containing the selected rule set. Send the file by email or other means to the recipient. The recipient can then use the Import Rule Set option at their unit, select the file from wherever is stored on their PC, and import the rule set. This will recreate the rule set locally as if it had been created by the recipient unit, which means they own the rule set and can change it as they see fit.

When sharing rule sets bear in mind that there can be variations in how different labs send pathology messages, and rule sets may need to be amended accordingly in order for incoming results to successfully pass the parameters specified within the rules.

Tips on building rules

When building a rule it may help to follow these steps:

1. From the path inbox view a report for which you want to create a rule
2. When viewing the report click the Message button and then choose Textual Format
3. Make a note of the content of the message that relates to the result e.g. the numeric code and any free text comments
4. Add parameters to a rule that you expect would process it as you want, based on the content of the message
5. Go back to path inbox, right click on the report, then Preview Auto-Review Rules
6. If it shows failure reasons, make a note of them and then tweak the rules accordingly
7. Run the preview again, and tweak as necessary until the rule succeeds
8. You can then make the rule active and run the engine on the path inbox and it will successfully process any results matching your rules.

You can also refer to the separate document *Results Auto-Review Rule Examples* which provdes detailed examples of many different working rules created by practices using the Results Auto-Review Rules Engine. You can use these examples to help you create your own rules.

Results auto-review rule set examples.dc