



CDSS Configurator Web User Manual

Version 0.5

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CDSS Configurator Web



For information about the Product environment, precautions, warnings and intended use see *USR ENG Digistat Care* and/or *USR ENG Digistat Docs* (depending on the modules installed - for the *Digistat Suite EU*) or *USR ENG Digistat Suite NA* (for *Digistat Suite NA*). The knowledge and understanding of the appropriate document are mandatory for a correct and safe use of “CDSS Configurator Web”, described in this document.

1. Introduction

This manual describes the features and functionalities of the “Digistat CDSS Configurator Web”. The “Digistat CDSS Configurator Web” is a tool, available for specifically trained users, that allows to configure the settings and the rule/patient association for the rules created on the Digistat CDSS (Clinical Decision Support System). The Digistat CDSS allows to create rules that generate sets of notifications for the clinical staff when specific patient conditions occur. The use of Digistat CDSS is reserved to system administrators (see the document *CFG ENG CDSS* for instructions).

The “CDSS Configurator Web”, described in this manual, is available for users having appropriate training and adequate permissions. It allows to specify the rule settings for the specific patient and to enable/disable a determined rule for a patient.



The CDSS Configurator is enabled only for specifically trained users having appropriate permissions.



CDSS Configurator Web is a submodule of Control Bar Web that can be enabled or not depending on the configuration in use in the specific Healthcare Organization. Refer to the system administrators for more information.

2. Patient selection

“CDSS Configurator Web” can only be launched after patient selection. To select a patient,

- Click the **Select Patient** button indicated in Fig 1 A.

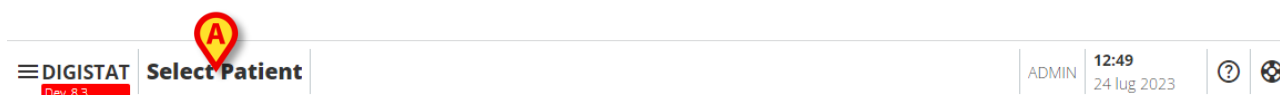


Fig 1

The Patient Explorer Web module opens. See the Digistat® Patient Explorer Web user manual (*USR ENG Patient Explorer Web*) for further instructions on patient management functionalities.



Other modules can be configured for the patient selection in place of Patient Explorer Web, depending on the configuration. If this is the case, see the specific documentation for instructions.

When a patient is selected the name and main data of the patient are displayed on the **Patient** button (Fig 2 **A**).



Fig 2

3. Launching “CDSS Configurator Web”


If the “CDSS Configurator Web” is available, the  icon is displayed on the patient button (Fig 3 **A**).



Fig 3

To launch “CDSS Configurator Web”:

- Click the  icon.

A drop-down window is displayed, containing additional patient data and the available sub-modules that can be launched on Control Bar (Fig 4).

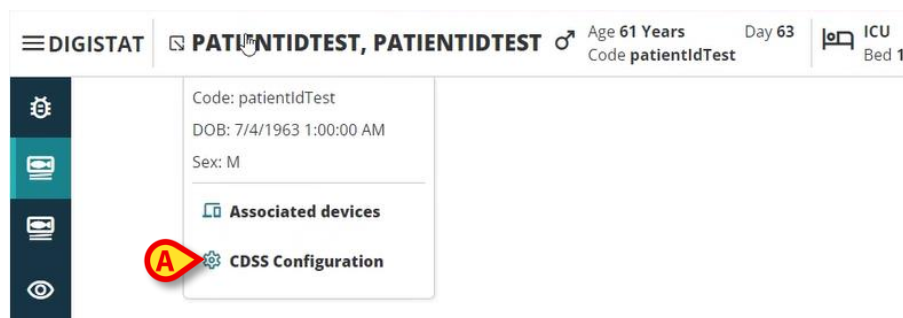


Fig 4

- Click on “CDSS Configuration” (Fig 4 **A**).

The following window is displayed, listing the rules associated to the currently selected patient (Fig 5).

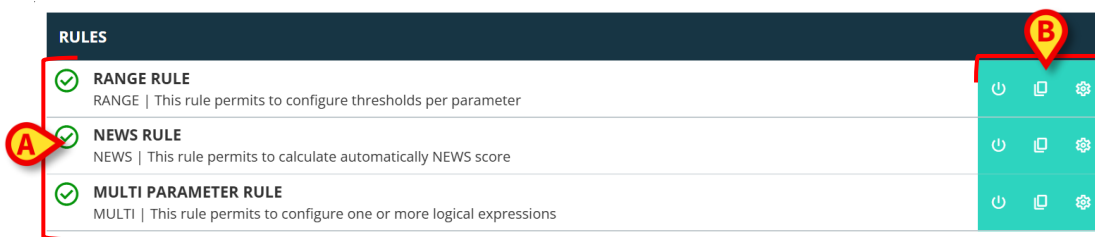


Fig 5

4. List of associated rules

The “Rules list” window (Fig 5) lists the existing rules for the patients of the selected location. Each row corresponds to an existing rule. The rule name and a short description of the rule are displayed in the row.



Which rules are here displayed depends on configuration choices. Refer to the system administrators for more information.

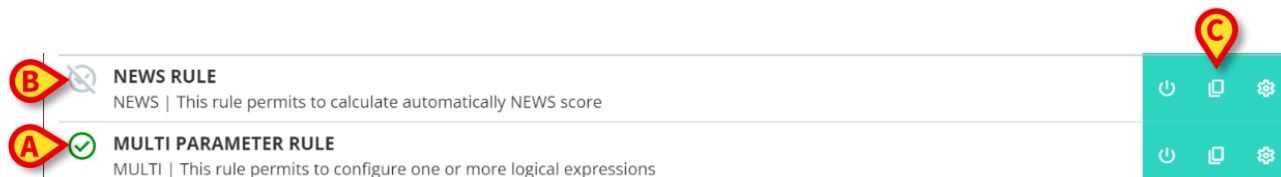




Fig 6

A rule can be enabled or not for the selected patient. The enabled rules are characterized by the  icon (Fig 6 **A**). Disabled rules are characterized by the  icon (Fig 6 **B**). See section 5 for instructions on how to enable/disable a rule for a patient. On the right, three buttons allow to perform the following procedures (Fig 6 **C**):



- Use this button to enable/disable the rule for the currently selected patient.



- Use this button to enable /disable the rule for other patients.



- Use this button to apply the specific rule settings to other patients.



The same rule can have, for different patients, different settings. For example: different threshold values or different relevant parameters to be monitored.

Each one of these buttons can be enabled or disabled according to configuration. Disabled buttons appear as in Fig 7.

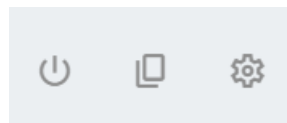


Fig 7

- Click the **Close** button to close the “Rules list” window (Fig 5 C).

5. How to enable/disable an existing rule



Disabled rules are characterized by the  icon on the left (Fig 8 A).



Fig 8

To enable a disabled rule:

- Click the  icon indicated in Fig 8 B.

User confirmation is required. The following pop-up window is displayed (Fig 9).

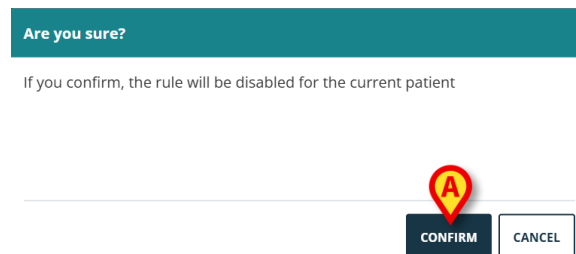


Fig 9

- Click **Confirm** (Fig 9).

The rule is this way enabled. The corresponding row changes in the following way (Fig 10).



Fig 10

The same procedure can be used to disable an enabled rule.

6. How to enable/disable a rule for other patients

It is possible to enable/disable a rule for patients that are not the one currently selected. To do that:


- Click the  icon indicated in Fig 11 A.



Fig 11

The following window opens (Fig 12).

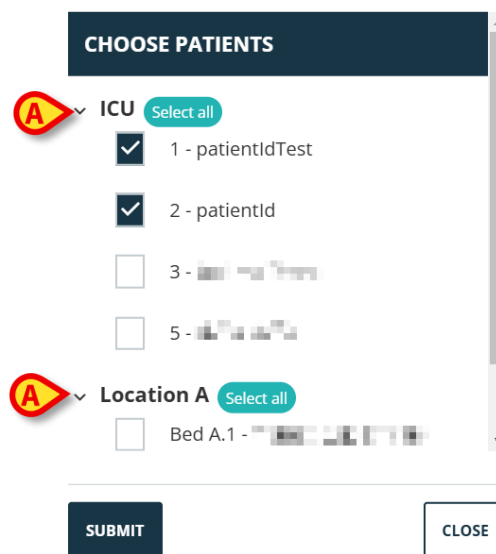


Fig 12

The window lists all the patients that are visible on the current workstation, including the current patient. The example shown in Fig 12 lists patients belonging to different departments, (ICU and Location A - Fig 12 A) because the same rule, according to configuration, can be available in different departments. The ▼ arrow can be clicked to collapse or expand the list of patients for a specific location (see, for example, Fig 13).

CHOOSE PATIENTS

- > ICU Select all
- ✓ Location A Select all
 - ☐ Bed A.1
 - ☒ Bed A.2

SUBMIT **CLOSE**

Fig 13

Each patient is associated with their bed (indicated before the name - Fig 13 **A**).

A checkbox is present on the left of each patient's name/bed (Fig 13 **B**). Selected checkboxes correspond to beds for which the rule is enabled. Deselected checkboxes correspond to beds for which the rule is disabled.

- Click the checkboxes to enable/disable the rule for the corresponding patients.
- Click the **Submit** button to apply the changes (Fig 13 **C**).

A window opens, summarizing the changes made (Fig 14).

Are you sure?

If you confirm, the rule will be enabled for the following beds

- ICU - 1
- ICU - 2
- Location A - Bed A.1
- Location A - Bed A.2

If you confirm, the rule will be disabled for the following beds

- ICU - 2

CONFIRM **CANCEL**

Fig 14

- Click **Confirm** to apply the changes (Fig 14 **A**).

7. How to apply the rule settings to other patients

The configuration of a rule, that is specific for a selected patient, can be copied and applied to other patients.



The same rule can have, for different patients, different settings. For example: different threshold values or different relevant parameters to be monitored.

To copy and export the rule settings:

- Click the  icon indicated in Fig 15 **A**.



Fig 15

The following window opens (Fig 16)

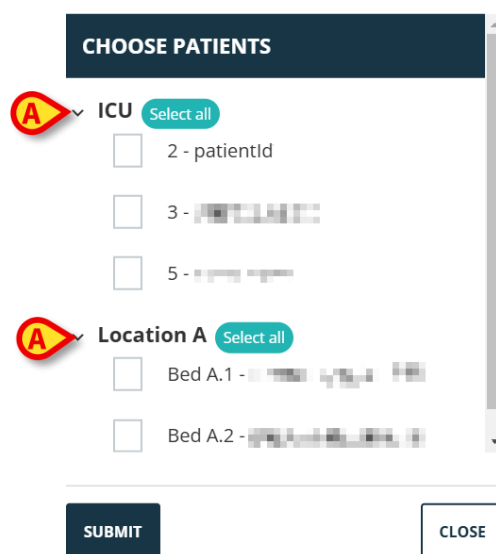



Fig 16

The window lists all the patients, visible on the current workstation, for which the rule is available. The currently selected patient is not displayed on the window. The example shown in Fig 16 lists patients belonging to different departments (ICU and Location A - Fig 16 **A**) because the same rule, according to configuration, can be available in different departments. The  arrow can be clicked to collapse or expand the list of patients for a specific department (see, for example, Fig 17).

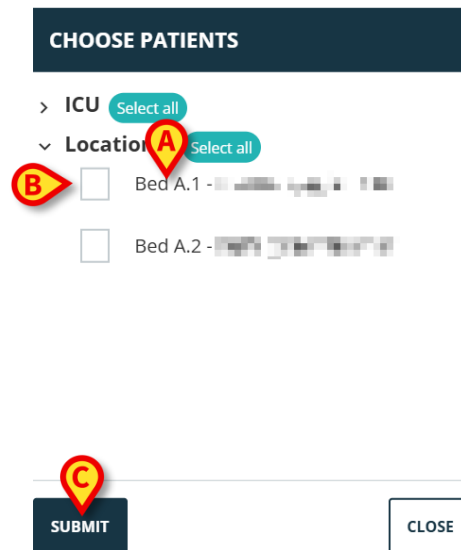


Fig 17

Each patient is associated with their bed (indicated before the name - Fig 17 **A**).

A checkbox is present on the left of each patient's name/bed (Fig 17 **B**).

- Select the checkboxes corresponding to the patients to which the settings of the rule will be applied.
- Click the **Submit** button (Fig 17 **C**).

A window opens, listing the beds to which the rule settings will be applied (Fig 18).

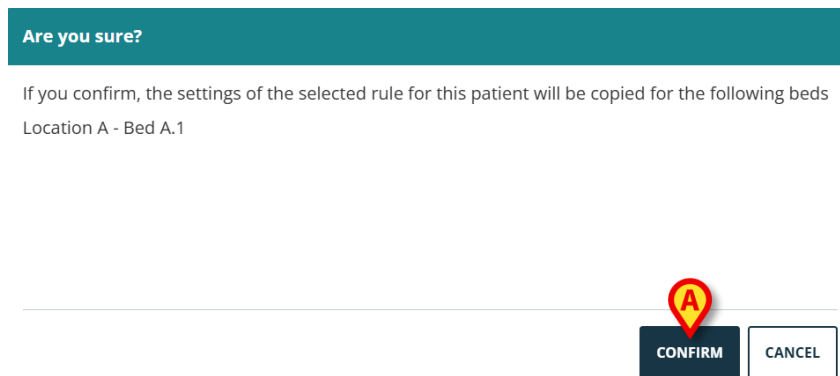


Fig 18

- Click **Confirm** to apply the changes (Fig 18 **A**).

8. How to modify the rule settings

CDSS Rules have a set of configuration parameters that are used by the CDSS engine to modify the behaviour of the rule. For example: a rule can generate a notification if the “Temperature” parameter is higher than a threshold value. The “threshold” is a value embedded in the rule that can be customized according to specific patient needs.

To modify the rule settings:

- Click the rule in the “Rules list” window (Fig 19 **A**).

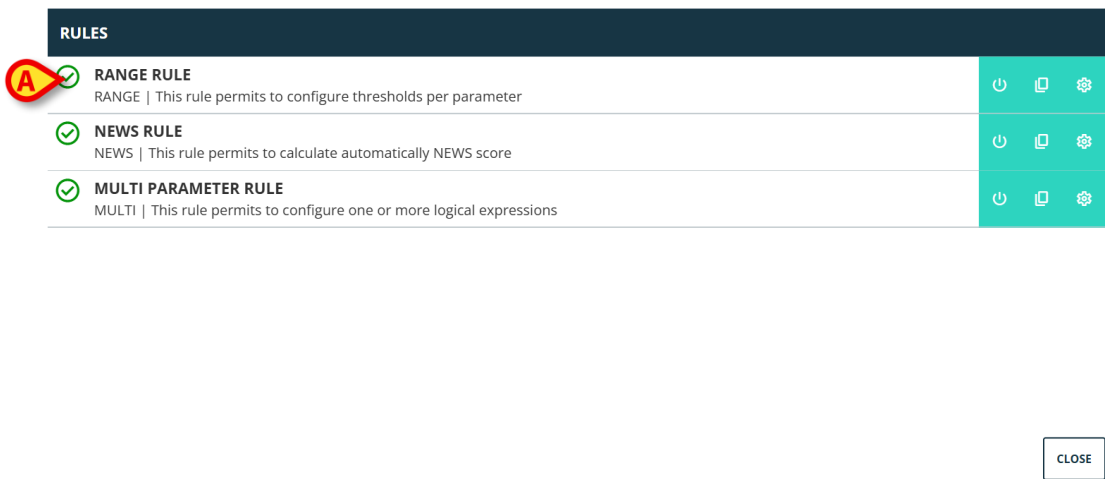


Fig 19

The corresponding settings are displayed (Fig 20).

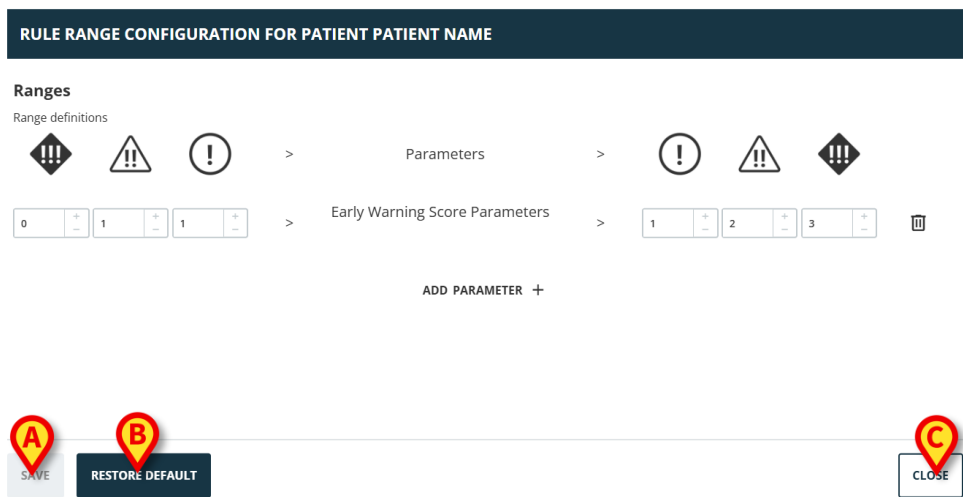


Fig 20

- Edit the available settings as described in section 9.
- Click the **Save** button (Fig 20 **A**). User confirmation is then required.

The **Restore default settings** button (Fig 20 **B**), always available, retrieves the original values. After clicking the button, the original values are displayed again on the window. They can either be edited again or saved and restored (click **Save** to do that).

- Click the **Close** (Fig 20 **C**) button to close the rule settings configuration window and display the “Rules list” again.

9. Types of settings

There are different types of settings that can be edited. This section describes the most used.

9.1. Range

A “Range” defines the thresholds after which the different notifications are triggered. The notifications are generated according to the values here defined. See Fig 21.

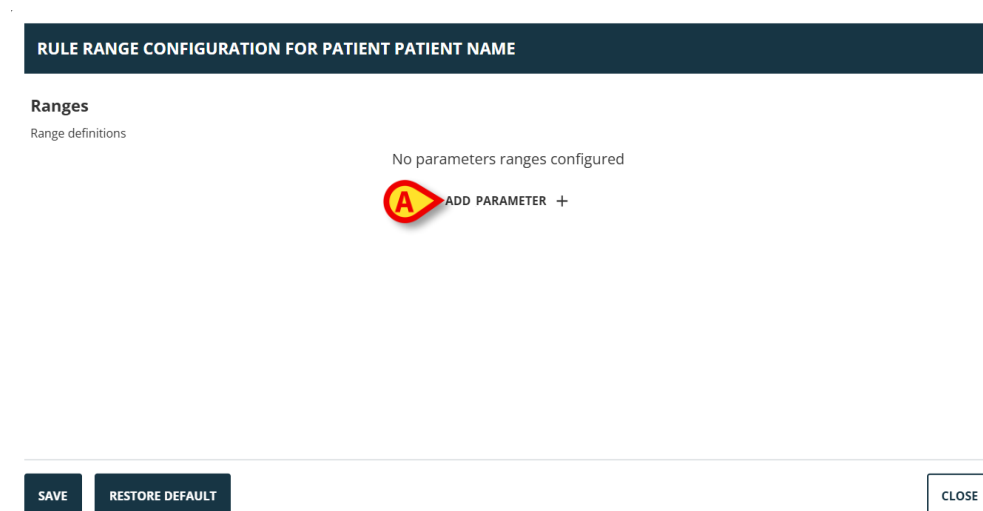


Fig 21

First, it is necessary to specify the parameters for which the range setting is applied. To select a parameter:

- Click on **Add Parameter** (Fig 21 **A**).

A parameter selection window is displayed (Fig 22). The window lists the configured devices with their parameters. Parameters are grouped by device (for example: Evita, Carescape etc...).

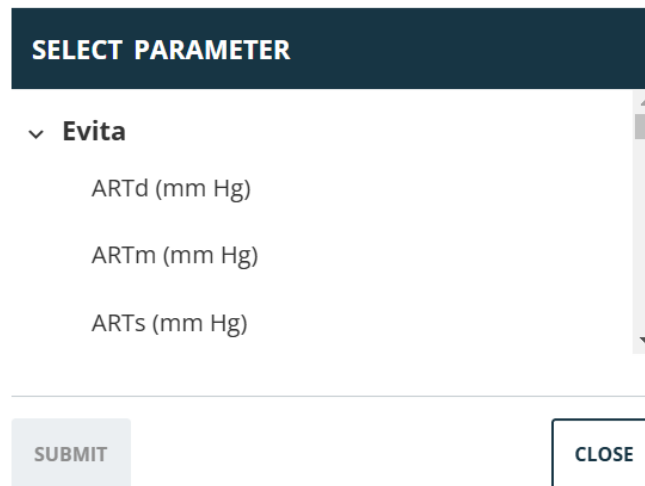


Fig 22

- Scroll the list to find the relevant parameter.
- Click the parameter to select it (Fig 23 **A**).

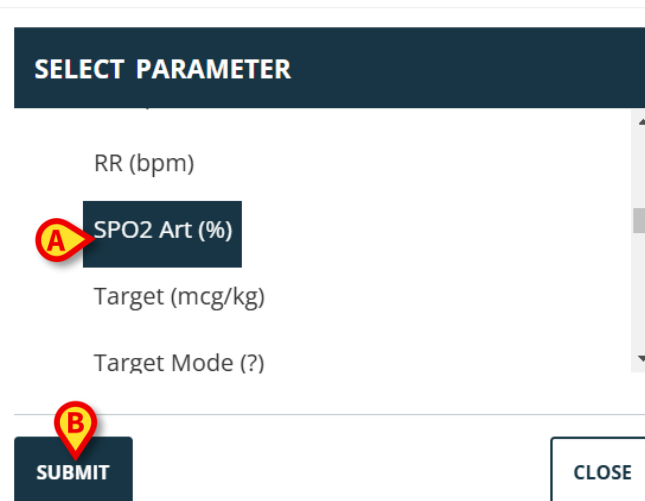


Fig 23

- Click **Submit** (Fig 23 **B**).

The parameter is displayed on the “Rule setting” window (Fig 24 **A**).

Fig 24

The diagram illustrates the relationship between Range definitions, Parameters, and SPO2 Art (%) for two different scenarios (A and B).

Range definitions: Scenario A (Red Pin) shows three range definitions: a diamond with three exclamation marks (!!!), a triangle with two exclamation marks (!!), and a circle with one exclamation mark (!). Scenario B (Blue Pin) shows three range definitions: a circle with one exclamation mark (!), a triangle with two exclamation marks (!!), and a diamond with three exclamation marks (!!!).

Parameters: Scenario A (Red Pin) shows a single parameter: SPO2 Art (%). Scenario B (Blue Pin) shows a single parameter: SPO2 Art (%).

SPO2 Art (%): Scenario A (Red Pin) shows three input fields with plus/minus buttons. Scenario B (Blue Pin) shows three input fields with plus/minus buttons and a trash icon.

Fig 25

Range definitions

Parameters

SPO2 Art (%)

5	10	15
+	+	+

85	90	95
+	+	+

Fig 26

- a low priority notification is triggered if the value for the considered parameter is between 15 and 10 or between 85 and 90;
- a medium priority notification is triggered between 9 and 5 or between 91 and 95;
- a high priority notification is triggered below 4 and above 96.


Range definitions

Parameters

SPO2 Art (%)

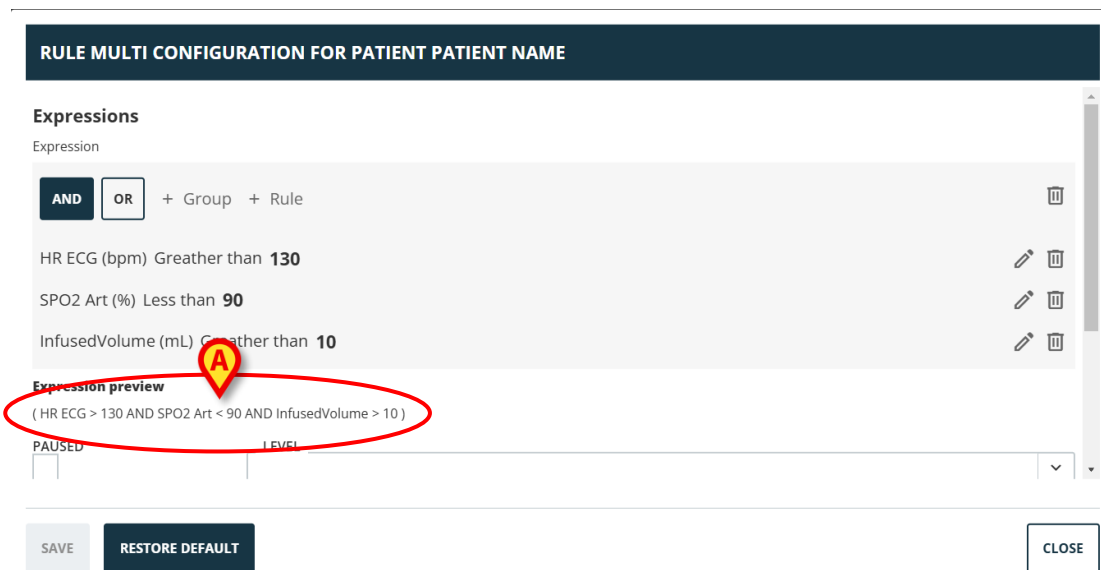
Fig 27

To remove a parameter

- Click the  icon on the right of the parameter to be removed (ex: Fig 27 **A**).

9.2. Formula

A “Formula” is an expression involving multiple related parameters and/or events. A notification is triggered when the expression is true. See, for example, Fig 28.



RULE MULTI CONFIGURATION FOR PATIENT PATIENT NAME

Expressions

Expression

AND **OR** + Group + Rule

HR ECG (bpm) Greater than **130**

SPO2 Art (%) Less than **90**

InfusedVolume (mL) Greater than **10**

Expression preview

(HR ECG > 130 AND SPO2 Art < 90 AND InfusedVolume > 10)

PAUSED LEVEL

SAVE RESTORE DEFAULT CLOSE

Fig 28

The expression in Fig 28 (previewed in the area indicated in Fig 28 **A**) is

HR > 130 AND SpO2 < 90 AND InfusedVolume > 10 ml

9.2.1. How to write an expression

An empty “Formula” type “Rule setting” window appears as shown in Fig 29.

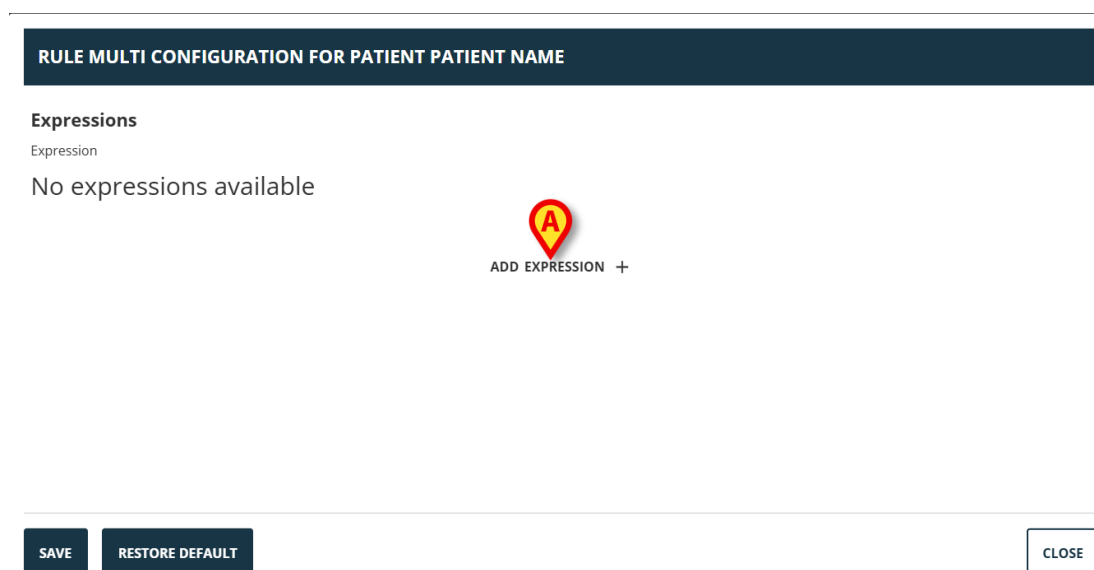


Fig 29

To write an expression

- Click the **Add Expression** button (Fig 29 **A**).

The window changes in the following way (Fig 30).

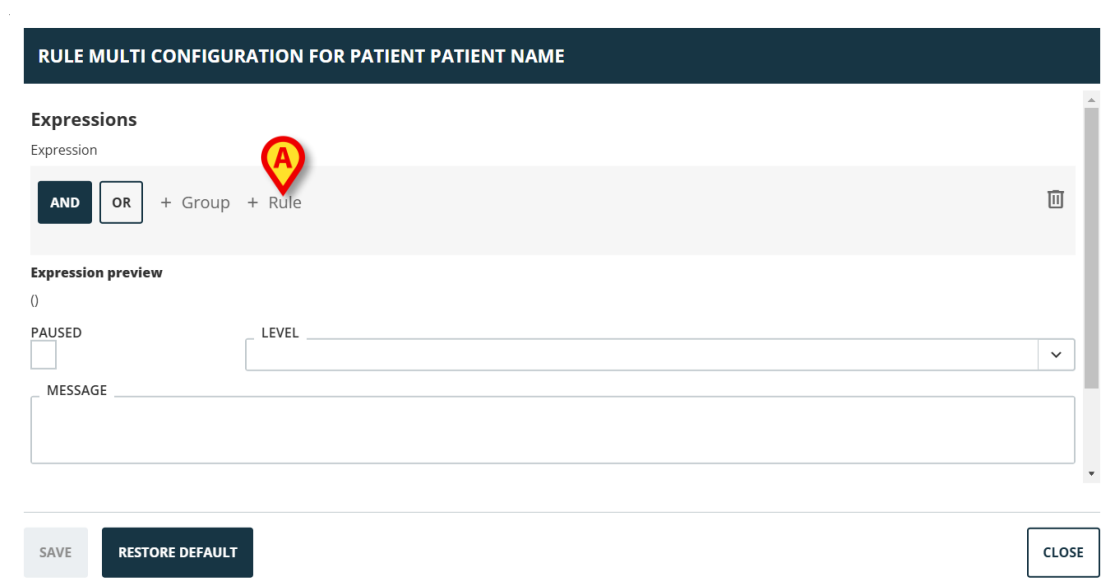


Fig 30

- Click the **Rule** button (Fig 30 **A**) to define a rule. The following window opens (Fig 31).

ADD RULE

▼ Evita

ARTd (mm Hg)

ARTm (mm Hg)

GT

VALUE

SUBMIT

CLOSE

Fig 31

The upper part of the window, indicated in Fig 31 **A** lists all the configured parameters, grouped by device.

Scroll the list to find and select the relevant parameter (Fig 32 **A**).

ADD RULE

Flow Peak (mL/s)

HR ECG (bpm)

GT

VALUE

SUBMIT

CLOSE

Fig 32

- Select the syntactic operator in the drop-down menu indicated in Fig 32 **B**. The available ones are:
 - GT - Greater than
 - GTE - Greater than or equal to
 - LT - Less than
 - LTE - Less than or equal to
 - EQ - Equal to
 - DF - Different from

- Specify the value in the field indicated in Fig 33 **A**.

Fig 33

- Click **Submit** (Fig 33 **B**).

The expression is displayed in the “Rule setting” window (Fig 34 **A**).

Fig 34

To add an expression within the same group of parameters:

- Click the **Rule** button again (Fig 34 **B**).

The expressions are progressively displayed on the window. See for example Fig 35.

RULE MULTI CONFIGURATION FOR PATIENT PATIENT NAME

Expressions

Express

AND **OR** + Group + Rule

HR ECG (bpm) Greather than **130**

SPO2 Art (%) Less than **90**

InfusedVolume (mL) Greather than **10**

Expression preview

(HR ECG > 130 AND SPO2 Art < 90 AND InfusedVolume > 10)

PAUSED LEVEL

SAVE RESTORE DEFAULT CLOSE

Fig 35

The overall expression is previewed in the area indicated in Fig 35 **A**.

All the expressions within the same group are related by the same operator (either AND or OR). The operator can be selected on the window by clicking on the appropriate button (Fig 35 **B**).

To define expressions containing both operators, it is necessary to embed another group. To do that:

- Click the **Group** button (Fig 35 **C**).

The window changes as shown in Fig 36.

RULE MULTI CONFIGURATION FOR PATIENT PATIENT NAME

Expressions

AND **OR** + Group + Rule

HR ECG (bpm) Greather than **130**

SPO2 Art (%) Less than **90**

InfusedVolume (mL) Greather than **10**

AND **OR** + Group + Rule

Expression preview

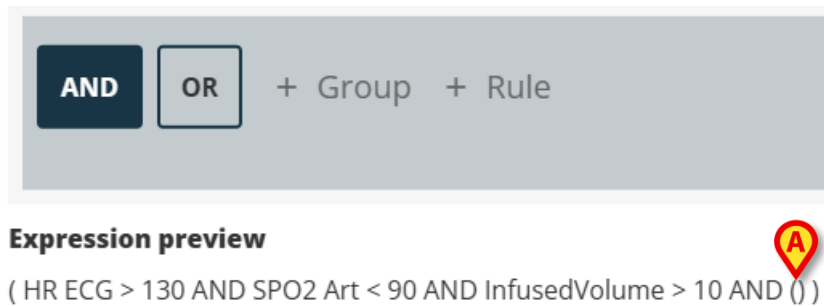
(HR ECG > 130 AND SPO2 Art < 90 AND InfusedVolume > 10 AND ())

PAUSED LEVEL

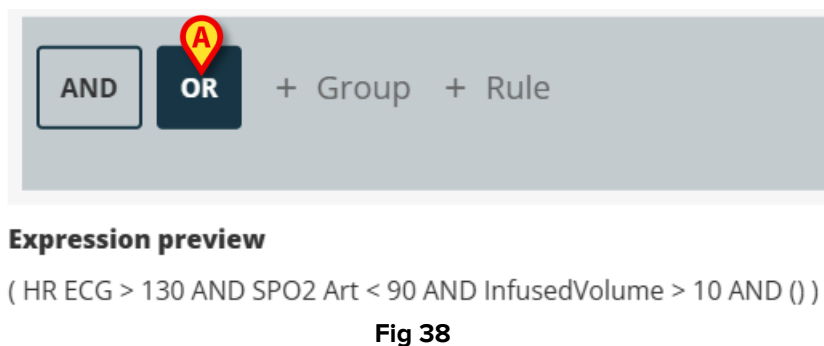
SAVE RESTORE DEFAULT CLOSE

Fig 36

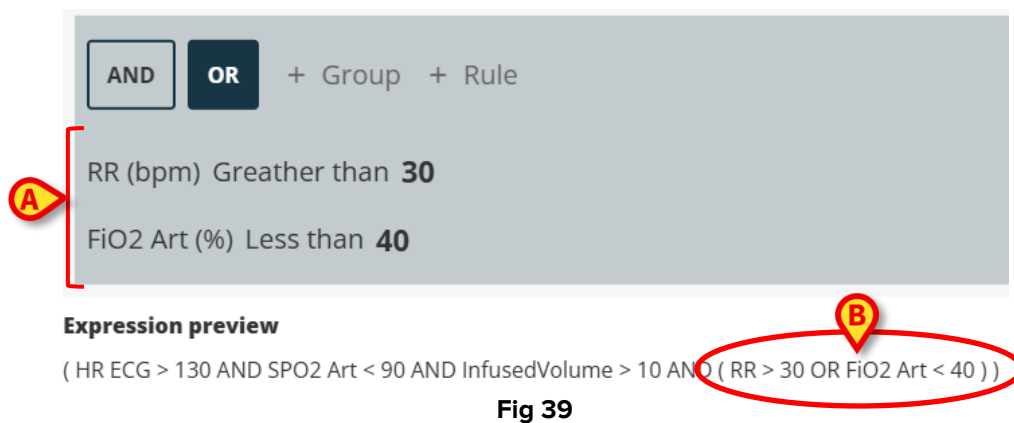
The new group is embedded in the existing expression, on the right end. In Fig 37 **A**, the position is indicated by the empty brackets.



- Select the operator for the new group (Fig 38 **A**).



- Define the rules for the new group as explained above.



To complete the rule definition, after the expression is defined, on the “Rule setting” window (Fig 40), it is necessary to:

RULE MULTI CONFIGURATION FOR PATIENT PATIENT NAME

AND OR + Group + Rule

RR (bpm) Greater than 30

FiO2 Art (%) Less than 40

Expression preview
(HR ECG > 130 AND SPO2 Art < 90 AND InfusedVolume > 10 AND (RR > 30 OR FIO2 Art < 40))

PAUSED ☐ LEVEL MEDIUM

MESSAGE Type here the message...

SAVE RESTORE DEFAULT CLOSE

Fig 40

- Define the priority level of the notification that will be triggered by the rule (high/medium/low - Fig 40 **A**).
- Type a text message to be displayed with the notification (Fig 40 **B**).
- Click the **Save** button to save the rule (Fig 40 **C**).

The rule will be saved.

The “Paused” checkbox on the “Rule setting” window allows to temporarily pause the rule for the selected patient (Fig 41 **A**).

RULE MULTI CONFIGURATION FOR PATIENT PATIENT NAME

FiO2 Art (%) Less than 40

Expression preview
(HR ECG > 130 AND SPO2 Art < 90 AND InfusedVolume > 10 AND (RR > 30 OR FIO2 Art < 40))

PAUSED ☒ LEVEL MEDIUM

MESSAGE Type here the message...

ADD EXPRESSION +

SAVE RESTORE DEFAULT CLOSE

Fig 41

Use the “Add expression” button to define multiple expressions for the same rule (Fig 41 **B**).

9.3. Table

A table allows to configure rules using a tabular view. For example: scores typically have multiple parameters contributing to the final score, and for every parameter it is possible to define thresholds. Instead of having many different rule settings, it is possible to have all thresholds aggregated in a table view (see Fig 42 for an example, the NEWS score parameters and thresholds are here shown).

RULE NEWS CONFIGURATION FOR PATIENT PATIENT NAME

NEWS Thresholds

NEWS Parameters

	3	2	1	0	1	2	3
Respir.Rate	8		9 11	12 20		21 24	25
Oxygen Saturation	91	92 93	94 95	96			
Temperature	35.0		35.1 36.0	36.1 38.0	38.1 39	39.1	
Systolic BP	90	91 100	101 110	111 219			

SAVE

RESTORE DEFAULT

CLOSE

Fig 42

The colors define the notification level (white to red).

It is possible to configure only the thresholds that are not disabled (i.e. grey fields are not editable). Values in disabled fields are automatically calculated from the other values. Possible inconsistent values are highlighted (Fig 43 **A**).

	3	2	1	0	1	2	3
Respir.Rate	8		9 11	12 20		21 24	25
Oxygen Saturation	91	92 93	94 95	96			
Temperature	35.0		35.1 34.9	35 38.0	38.1 39	39.1	
Systolic BP	90	91 100	101 110	111 219			

Fig 43

Depending on the kind of rule, it is possible to either trigger a single notification considering the overall score value or multiple notifications considering the single parameters values.

9.4. Other settings

Other data entry modes can be configured in the “Rule Setting” window.

Boolean

Value: true/false. Click to enable/disable.

Numeric (Decimal or Integer)

Value: numeric (either decimal or integer). Type the value. If decimal values are not allowed, then they are disabled. The acceptable range can be specified below the field.

List

Value: multiple choice list. Click the arrow to display the available choices in a drop-down menu. Click the required choice. The selected choice is displayed in the field.

Text

Value: free text. Type a free text.