Scoring Calculator User Manual

Version 7.0

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Contents

1. Scoring Calculator

For general and detailed information about the Product environment and the instructions for use of the Control Bar software see the specific documents of the Product. The knowledge and understanding of these documents is mandatory for an appropriate and safe use of the Scoring Calculator, described in this document.

1.1. Introduction

The Scoring Calculator module makes it possible to collect and classify clinical information according to the “Standard Severity Scores”.
Scoring Calculator performs all the necessary scoring calculations, importing data both from the Product Database and from most Network-Accessible and shared remote databases.
Scores and parameters are clearly displayed on charts and grids. Detailed information about the various Severity Scores is available.
This system, after patient selection, makes it possible to:

- navigate the available score algorithms and display, for each of them, the score calculations performed for a patient (either by score or by parameters values);
- display, via html, a description of the selected score algorithms;
- display in a chart a visual representation of the various scores values;
- configure a subset of parameters for each score parameter (chart, query, limits etc…);
- calculate a new score.

1.2. Module selection

To select the Scoring Calculator module,

- Click the corresponding icon on the lateral bar (Fig 1).

Fig 1

The screen displayed in Fig 2 appears. If no patient is selected the buttons on the Control Bar are disabled and no data is displayed on screen.

1.3. Patient search and selection

To select a patient,

- Click the **Patient** button on the Control Bar.

The Patient Explorer module opens. See the patient explorer user manual (*USR ENG Patient Explorer*) for instructions.

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

When a patient is selected the patient data (if any) is displayed.

1.4. Screen structure

The screen shown in Fig 2 makes it possible to display in charts and grids the various data.

The screen is formed of three main areas:

1) the list of available “Scores” (Fig 2 **A**);
2) the data area (this area displays charts, grids and scores instructions Fig 2 **B**);
3) the command bar (Fig 2 **C**).

Fig 2 - Scoring grid - Patient selected

1.5. The list of available scores

The vertical area on the left (Fig 2 **A**, Fig 3) displays the list of all the available scores. These are some of the scores currently available (only the scores explicitely enabled by configuration are displayed):

- Aldrete
- APACHE II - Acute Physiologic and Chronic Health Evaluation
- APS - Acute Physiologic Score
- Braden – For Predicting Pressure Sore Risk
- Bromage – Motor Blockade Score
- MODS – Multiple Organ Dysfunction Score
- NRS – Numerical Rating Scale
- Ramsay – Sedation Scale
- SAPS II - Simplified Acute Physiology Score
- SAPS III
- TISS 28 - Therapeutic Intervention Score System
- GCS - Glasgow Coma Score
- NEMS - Nine equivalent of nursing manpower
- RTS - Revised Trauma Score
- MPM Admission - Mortality Probability Model
- MPM 24h Model - Mortality Probability Model every 24 hours of ICU stay
- SOFA - Sepsis-Related Organ Failure Assessment
- Euroscore - European System for Cardiac Operative Risk Evaluation
- HIGGINS CABG - ICU admission risk based on preoperative conditions and intraoperative events.

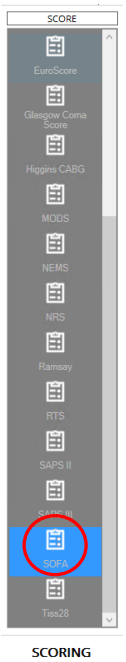
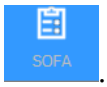


Fig 3 - Selectable scores

An icon and a name indicate each available score (for example “Apache II”, “Saps II” etc.).

The icon corresponding to the score currently in use is highlighted - 

.
To select a score,

- Click the corresponding icon.

The central part of the screen (“Data area” - Fig 2 **B**) displays the available data for the selcted score and patient.

1.6. Data area

The “data area” is the central part of each screen. In this area either charts, grids or score information are displayed. (Fig 4, Fig 2 **B**).

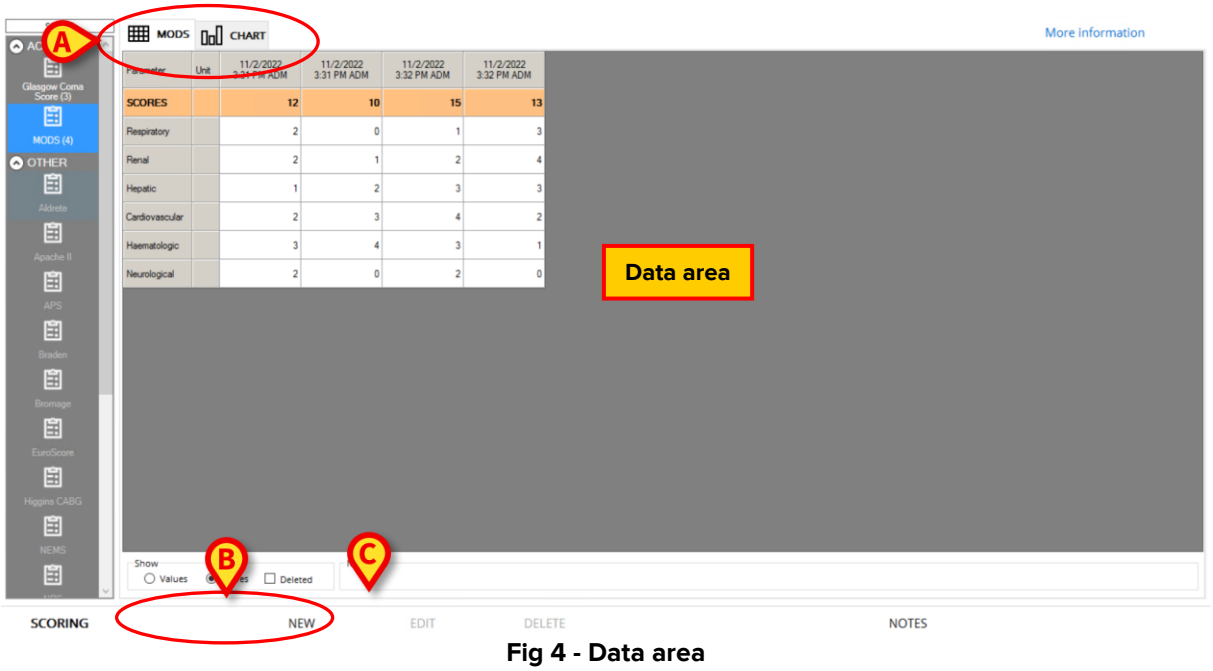


Fig 4 - Data area

This area always displays the data referring to the score selected on the bar on the left (Fig 3).

Two tabs are provided on the top left corner of the data area (Fig 4 **A**).

- The Score tab displays the grid containing the score values as shown in Fig 5.

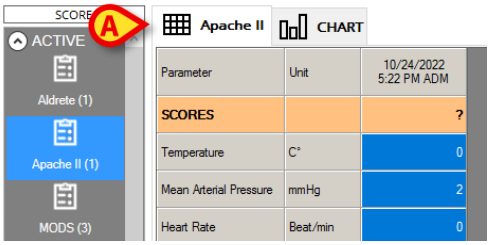


Fig 5

- The “Chart” tab displays the trends of the acquired score parameters values in a chart.

The area indicated in Fig 4 **C** displays the possible notes associated to a single score calculation. The note is displayed only if the column relating to the specific calculation is selected. See paragraph 1.8.

1.7. Score Tab

Selecting the grid tab, a grid is shown in the data area arranging and displaying the different scores (in the first highlighted row) and the values associated to the parameters that contribute to the score calculation.

Fig 6 - Scores grid - "MODS"

The first column displays the names of all the parameters (Fig 7).

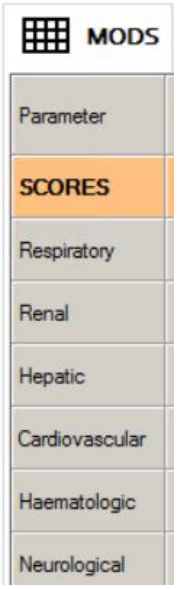


Fig 7 - Parameters

The second column indicates the unit of measure of the values displayed on the grid (Fig 8).

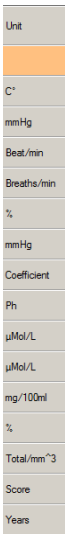


Fig 8 - Unit of measure

The other columns refer to a score calculation. Each cell displays the score calculated for the corresponding parameter (Fig 9).

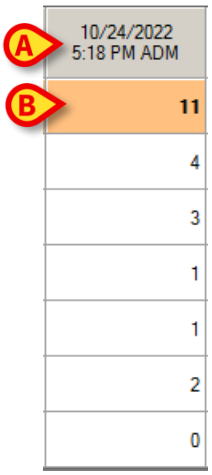


Fig 9 - Scores

The first cell of each column indicates the date, the time and the acronym of the user who recorded the information (Fig 9 **A**). The second cell indicates the score total value (Fig 9 **B**). For some parameters it is possible to display the parameter value instead of the corresponding score.

To do that

- Select the “Values” option on the bottom left corner (Fig 10, Fig 4 **B**).

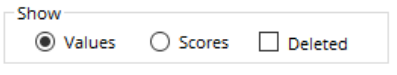


Fig 10 - Display values

The values are this way displayed in the grid (Fig 11).

Parameter	Unit	10/24/2022 5:02 PM ADM	10/24/2022 5:18 PM ADM	10/24/2022 5:19 PM ADM
SCORES		**19**	**11**	**10**
Respiratory		11	55	1
Renal		35	33	2
Hepatic		112	44	3
Cardiovascular		30	11	4
Haematologic		23	77	55
Neurological		1	22	6

Fig 11 – Values

1.7.1. Notes

The “Notes” area, indicated in Fig 4 **C** and Fig 12 **B**, displays the possible notes associated to a single score calculation. The note is displayed only when the column corresponding to the specific score calculation is selected. To select a column,

- Click the column.

The column is highlighted (Fig 12 **A**). If there is a note associated to that score calculation, the note is displayed in the “Notes” area (Fig 12 **B**).

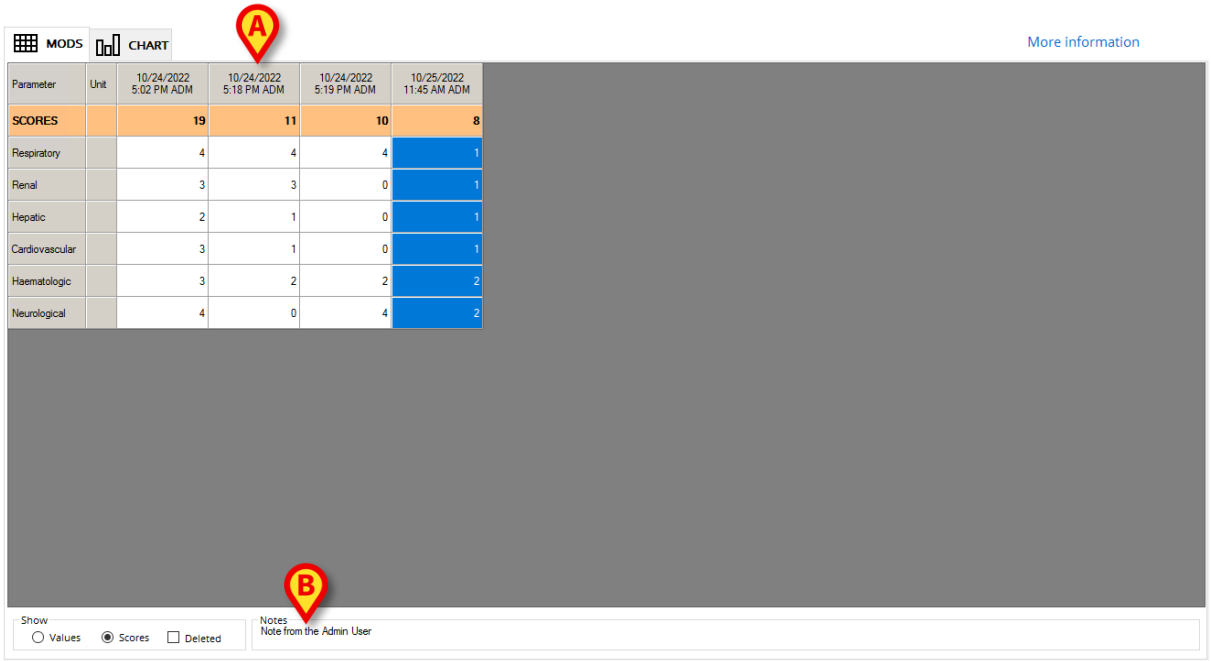


Fig 12

1.8. How to calculate a new score

To calculate a new score and to insert the corresponding values in the grid:

- Select, on the list on the left, the Standard Severity Score to be used (Fig 3).

➢ Click the **New** button on the command bar (Fig 13).

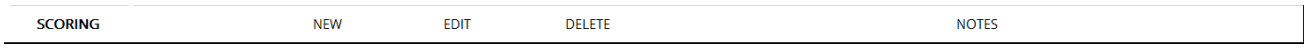


Fig 13 - Command bar

A window opens, making it possible to specify the values of all the parameters that are relevant for the selected score.

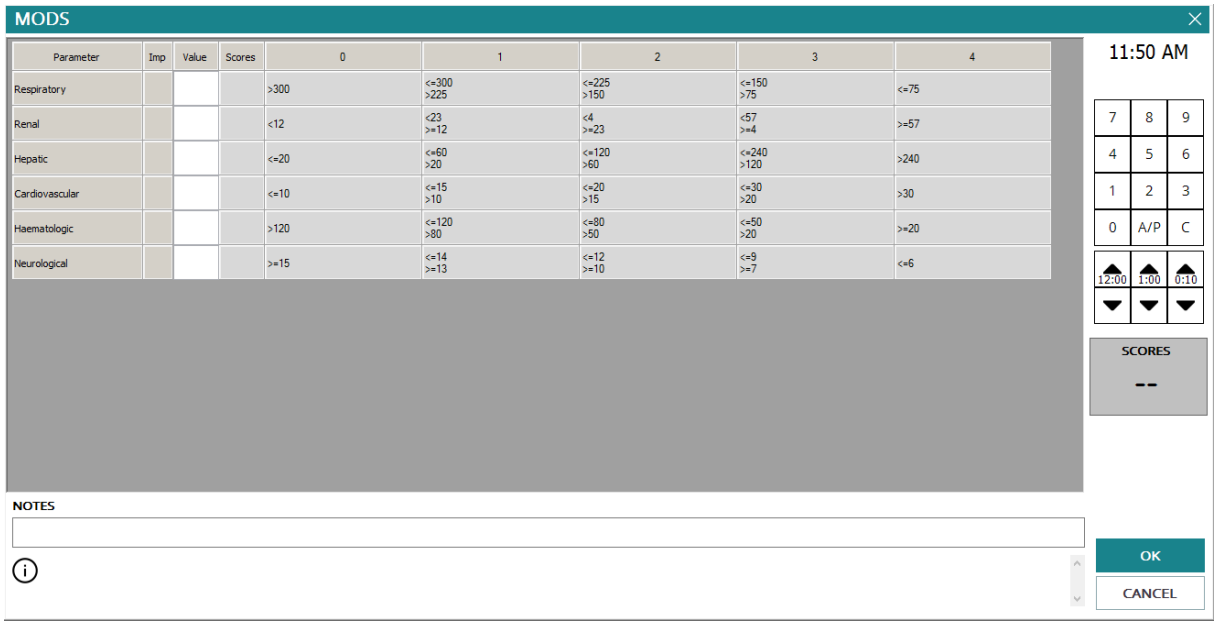


Fig 14 - Data entry window

Each score has its own parameters and points attribution criteria. Therefore the data entry window changes according to the selected scoring system. This paragraph describes, as example, the window relating to the "MODS" system. The data entry procedures remain the same for all the available scores.

➢ Insert the values and /or click on the buttons provided in the grid, that contains the specifications of the intervals under the corresponding points headers. The points are then assigned and recorded and under the "Scores" header (Fig 15 **A**).

When all the parameters are specified, the total value is displayed in the box indicated in Fig 15 **B**.

The total value is calculated only if all the parameters are specified.

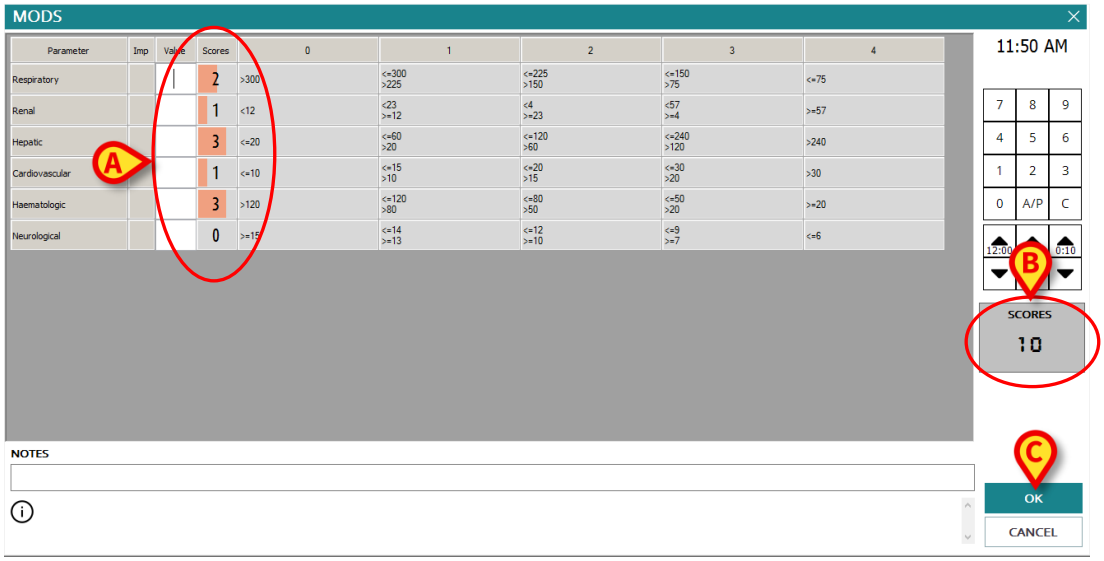


Fig 15 - Specified scores and values

- Click the **Ok** button (Fig 15 **C**).

A new column is this way added to the score's grid. The new column displays the new set of values (Fig 16).

The data entry window and the data entry procedures are described in paragrpahs 1.8.1 and 1.8.2.

Parameter	Unit	03/08/2020 07:19 07:19 ADM	03/08/2020 10:37 10:37 ADM	03/08/2020 11:58 11:58 ADM	04/08/2020 09:22 09:22 ADM	04/08/2020 10:19 10:19 ADM	04/08/2020 12:27 12:27 ADM	05/08/2020 13:52 13:52 ADM
SCORES		47	48	44	45	40	49	47
Temperature	C°	1	2	0	2	2	4	3
Mean Arterial Pressure	mmHg	2	2	2	0	0	2	2
Heart Rate	Beat/min	0	3	0	2	2	3	2
Respiratory Rate	Breaths/min	1	0	1	1	1	1	1
FIO2	%	21	21	21	21	21	21	21
Oxygenation PaO2	mmHg	4	1	0	0	3	4	1
Oxygenation AaDO2	Coefficient							
Arterial Ph	Ph	2	1	1	2	0	0	2
Serum Sodium	µMol/L	2	2	2	1	1	3	0
Serum Potassium	µMol/L	2	1	2	2	1	2	2
Serum Creatinine	mg/100ml	0	2	2	2	0	0	0
Hematocrit	%	2	1	2	1	2	2	1
White Blood Count	Total/mm^3	2	2	4	1	0	0	2
Glasgow Coma Score	Score	3	3	2	3	2	4	3
Age	Years	5	5	5	5	5	5	5
Chronic Health Points		0	2	0	2	0	0	2

A

Fig 16 - New score

Select the "Values" option on the bottom-left corner to display on the grid the actual values of the parameters (Fig 17, Fig 4 **B**) instead of the score points.

Fig 17 - Display values

1.8.1. Data entry window description

The data entry window (an example is shown in Fig 18), offers several tools to specify the relevant values and to calculate the corresponding scores.

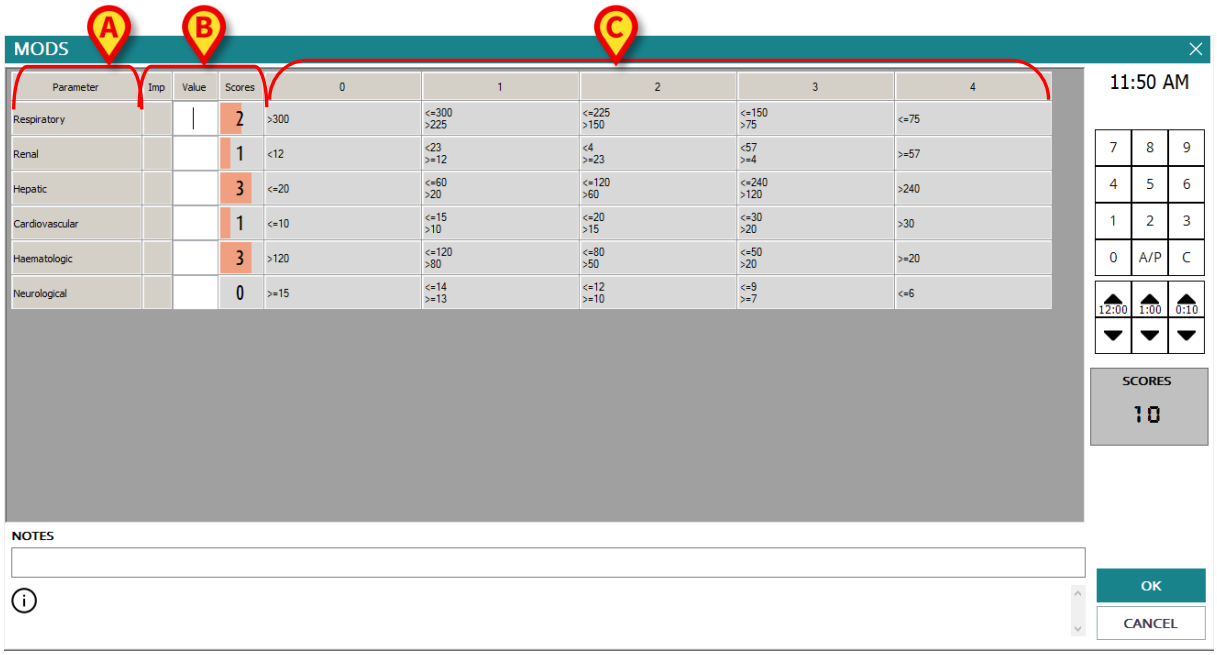


Fig 18 - Data entry window ("Apache II" system)

All the parameters, with their unit of measure, are listed on the left (Fig 18 **A**, Fig 19).

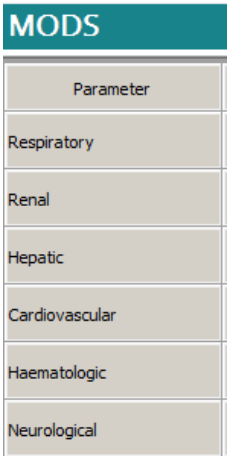


Fig 19 - Parameters list

The three successive columns (Fig 18 **B**, Fig 20),

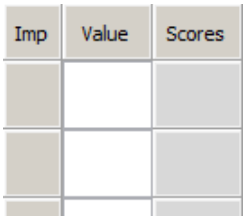


Fig 20 - Import, value and scores

display the following information:

1) the “Imp” column can display - if enabled by configuration - a button making it possible to automatically import the results of a query associated to the parameter. When this is the case, a button is displayed inside the cell, as in Fig 21. Click the button to specify the score.

Fig 21

2) the “Value” column makes it possible to specify the parameter’s value;
3) the “Scores” column displays the score (points) relating to the value specified for the corresponding parameter.

The rectangles on the central part of the window (Fig 18 **C**, Fig 22) are both scores specification buttons and reference guides indicating the value-points relationship.

0	1	2	3	4
>300	<=300 >225	<=225 >150	<=150 >75	<=75
<12	<23 >=12	<4 >=23	<57 >=4	>=57
<=20	<=60 >20	<=120 >60	<=240 >120	>240
<=10	<=15 >10	<=20 >15	<=30 >20	>30
>120	<=120 >80	<=80 >50	<=50 >20	>=20
>=15	<=14 >=13	<=12 >=10	<=9 >=7	<=6

Fig 22 - Values and scores grid

Each rectangle is a button. Click the rectangle to insert the score corresponding to the interval specified in the rectangle itself. The first rectangle on the top left corner, for instance, indicates a Respiratory value that is bigger than 300 and it corresponds to a score of 0 points. Click a chosen button to add the corresponding points to the “Scores” column (Fig 23).

MODS

Parameter	Imp	Value	Scores	0	1	2	3	4
Respiratory			2	>300	<=300 >225	<=225 >150	<=150 >75	<=75
Renal			1	<12	<23 >=12	<4 >=23	<57 >=4	>=57
Hepatic			3	<=20	<=60 >20	<=120 >60	<=240 >120	>240
Cardiovascular			1	<=10	<=15 >10	<=20 >15	<=30 >20	>30
Haematologic			3	>120	<=120 >80	<=80 >50	<=50 >20	>=20
Neurological			0	>=15	<=14 >=13	<=12 >=10	<=9 >=7	<=6

Fig 23

1.8.2. Data entry procedures

To specify a value on the data entry window

- Click the row corresponding to the wanted parameter under the “Value” column (Fig 24 **A**).

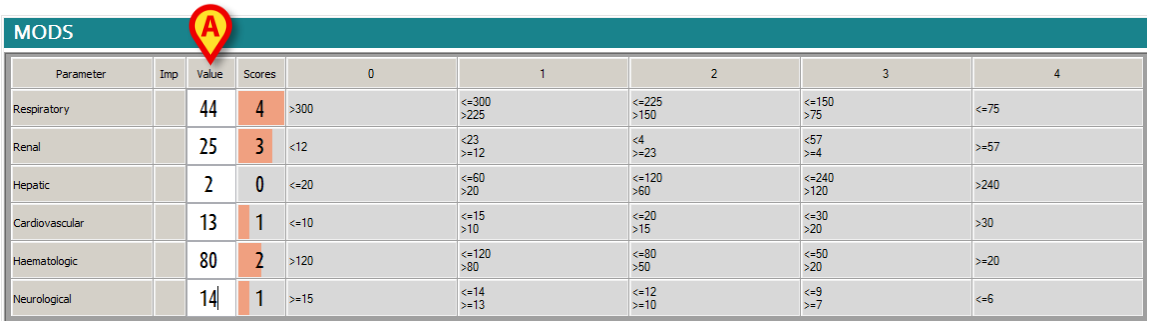


Fig 24

A cursor appears in the cell.

- Type the wanted value. The corresponding score is automatically displayed on the adjacent "Score" cell (Fig 25).

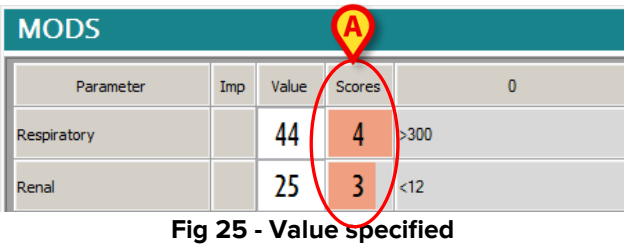


Fig 25 - Value specified

It is also possible to specify the score directly, without entering the exact parameter value. There are two ways to do that:

First way

- Click the button indicating the registered interval corresponding to score.

If, for instance, the button shown in Fig 26, that indicates a Mean Arterial Pressure between 50 and 70 mmHg and that corresponds to a "+2" value is clicked,

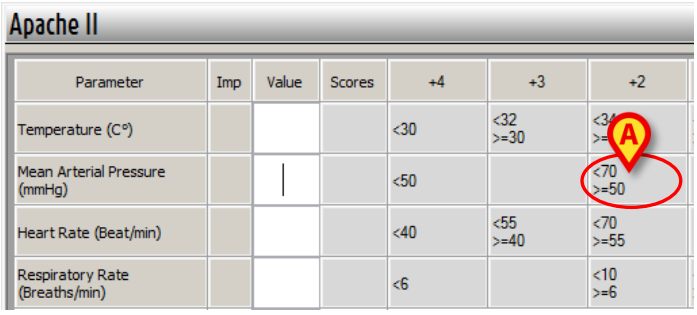


Fig 26

the score 2 for the Mean Arterial Pressure is automatically inserted in the "Scores" column (Fig 27).

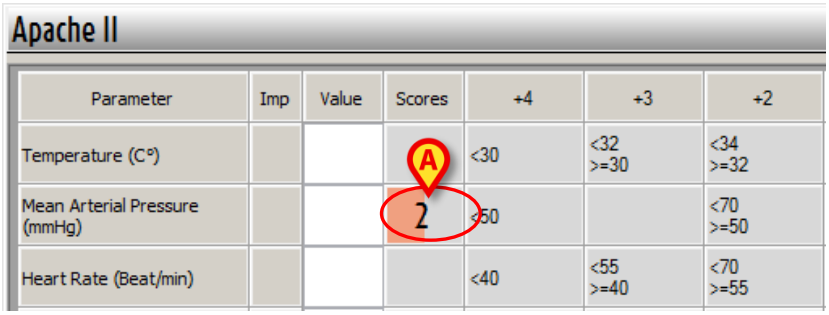


Fig 27

Second way

- Click the "Scores" cell corresponding to the parameter to be specified (Fig 28).

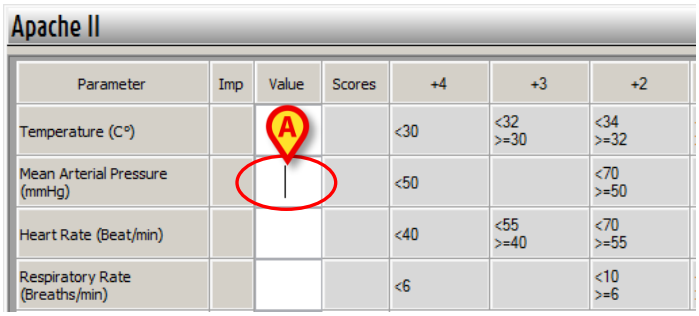


Fig 28

A new window opens with multiple choices menu (Fig 29) relating to the parameter to be specified, and it displays all the possible scores (on the left) and their corresponding values (on the right).

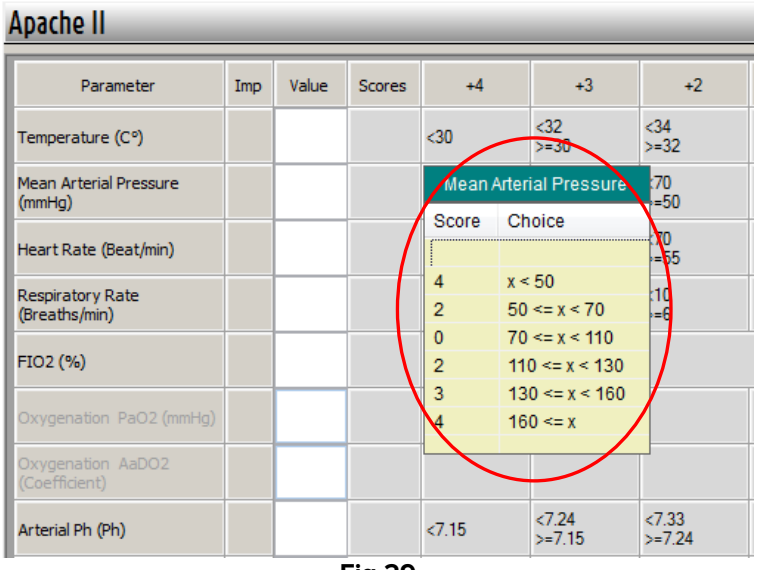


Fig 29

- Click the row corresponding to the desired value/score. For instance: the line indicated in Fig 30 (Mean Arterial Pressure between 50 and 70 mmHg) corresponds to a +2 score.

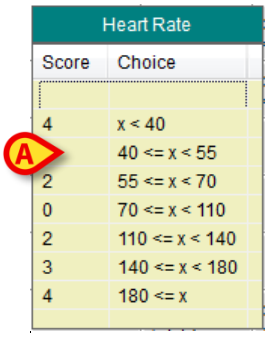


Fig 30

The score “2” appears in the provided cell under the “Scores” header (Fig 31).

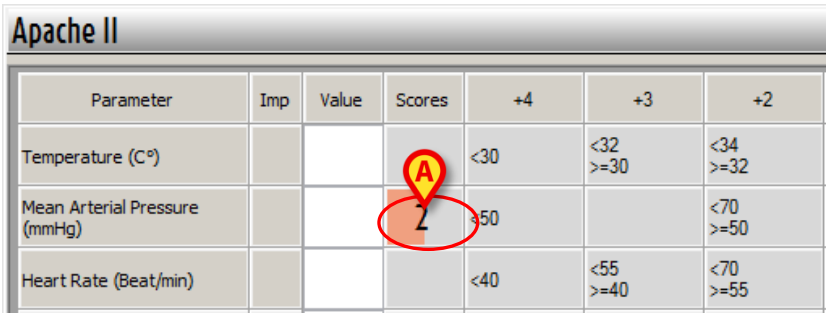


Fig 31

The box indicated in Fig 32 displays the total score.

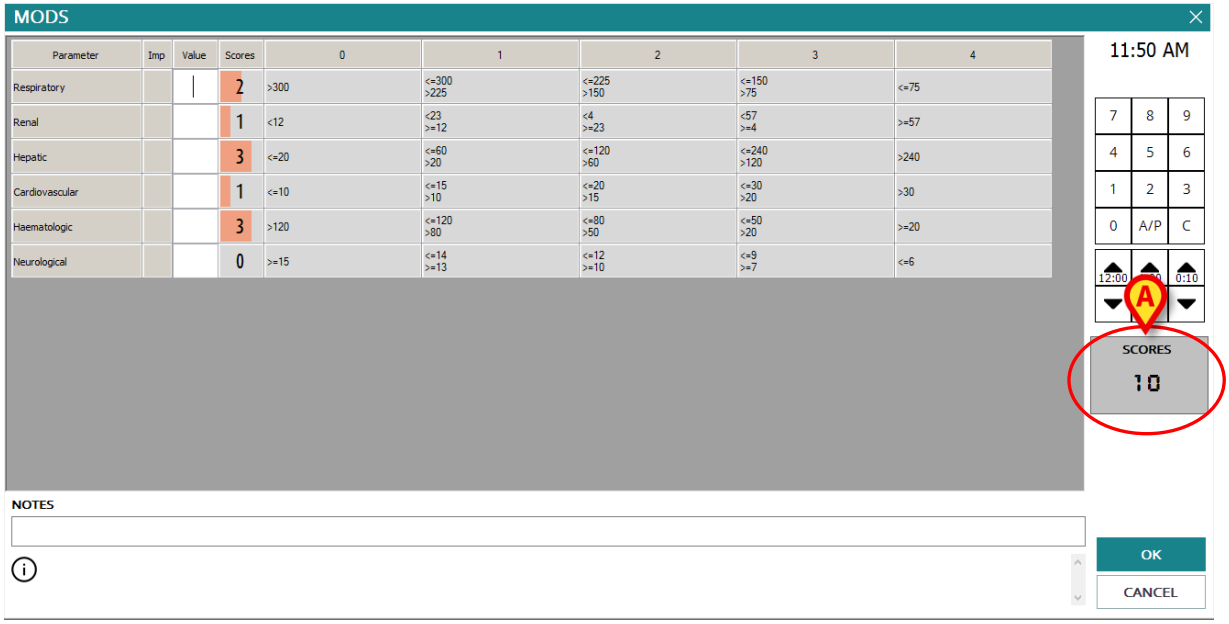


Fig 32

Totals are only displayed when all the parameters are specified.

1.9. Second score formula

A configuration option makes it possible to specify two formulas for the same score. For example: a “main” formula can be specified to calculate the score total value while a “second” formula can be specified to calculate another meaningful value (a value indicating the “mortality rate”, for instance).

In these cases the module’s interface slightly changes to display both values at the same time.
Both values are then displayed on the “Scores” grid on the module’s main screen (Fig 33 **A**).

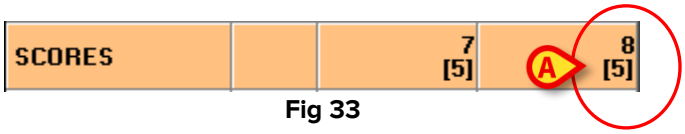


Fig 33

1.10. Contextual information on the parameters

The data entry window (Fig 34) can provide information on the relevant parameters.
The existing information (specified by configuration) is displayed on the bottom of the window every time the user clicks the cell displaying the parameter name.

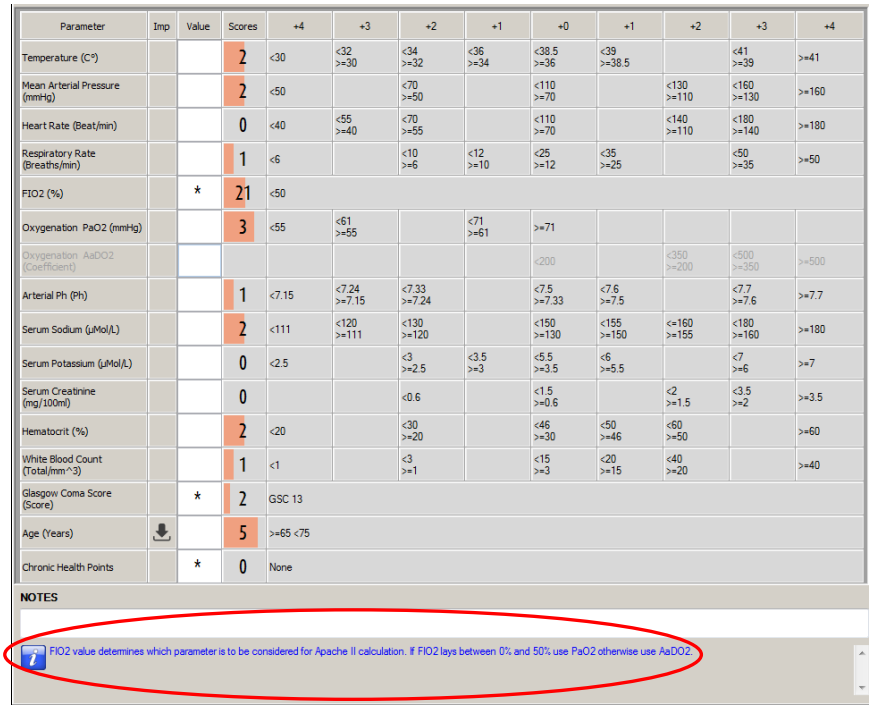


Fig 34 - Parameter information

1.11. Time settings

The box indicated in Fig 35 displays the time associated to the score specification. Also the date is displayed if it is different from the current date.

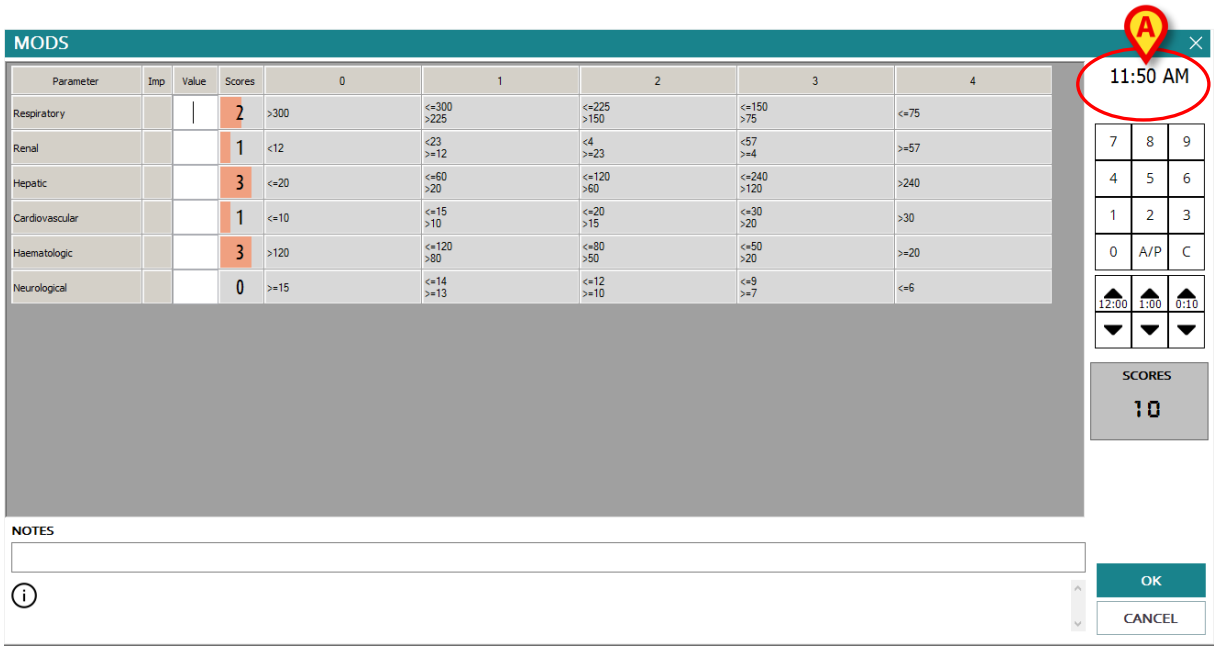


Fig 35 - Time specification

The time displayed in this box is the time displayed on the scores grid in the first cell of the specific column (Fig 36).

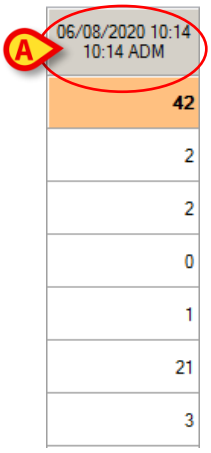


Fig 36

Current time is set by default. The user can set a different time, preceding or following the current one. To set the time use either the numeric keyboard on the right (Fig 37) or the up and down arrow buttons displayed in Fig 38.

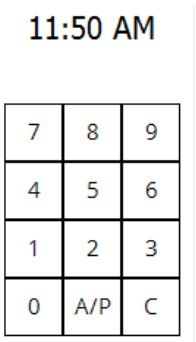


Fig 37

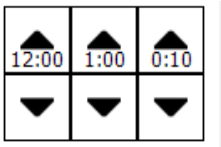


Fig 38

Use the **00:10**  button to set the time ten minutes in the future (ten minutes per click).

Use the **00:10**  button to set the time ten minutes back in the past (ten minutes per click).

Use the **01:00**  button to set the time one hour in the future (one hour per click).

Use the **01:00**  button to set the time one hour back in the past (one hour per click).

Use the **12:00**  button to set the time twelve hours in the future (twelve hours per click).

Use the **12:00**  button to set the time twelve hours back in the past (twelve hours per click).

1.12. The command bar

The command bar contains various buttons (Fig 39, Fig 2 **C**). Each button makes it possible to perform a specific procedure. The different functions are here listed and briefly described and they are explained in detail in the paragraphs indicated.

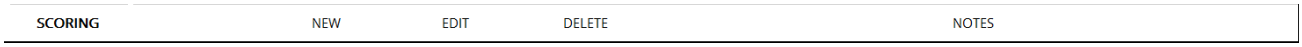


Fig 39 - Command Bar

NEW	Use this button to add a new score. The button opens a data entry window. The data entry window is described in paragraph 1.8.1, the related procedures are described in paragraph 1.8.2.
EDIT	Use this button to modify the values of a selected score. See paragraph 1.12.1 for the details on the procedure.
DELETE	Use this button to delete a selected score. See paragraph 1.12.2 for the detailed procedure.
NOTES	Use this button to add a patient note. See paragraph 1.12.4 for the details on the procedure.

1.12.1. How to edit an existing score

To edit the values of an existing score

- Click the corresponding column on the scores grid.

The column is highlighted in blue (Fig 40 **A**).

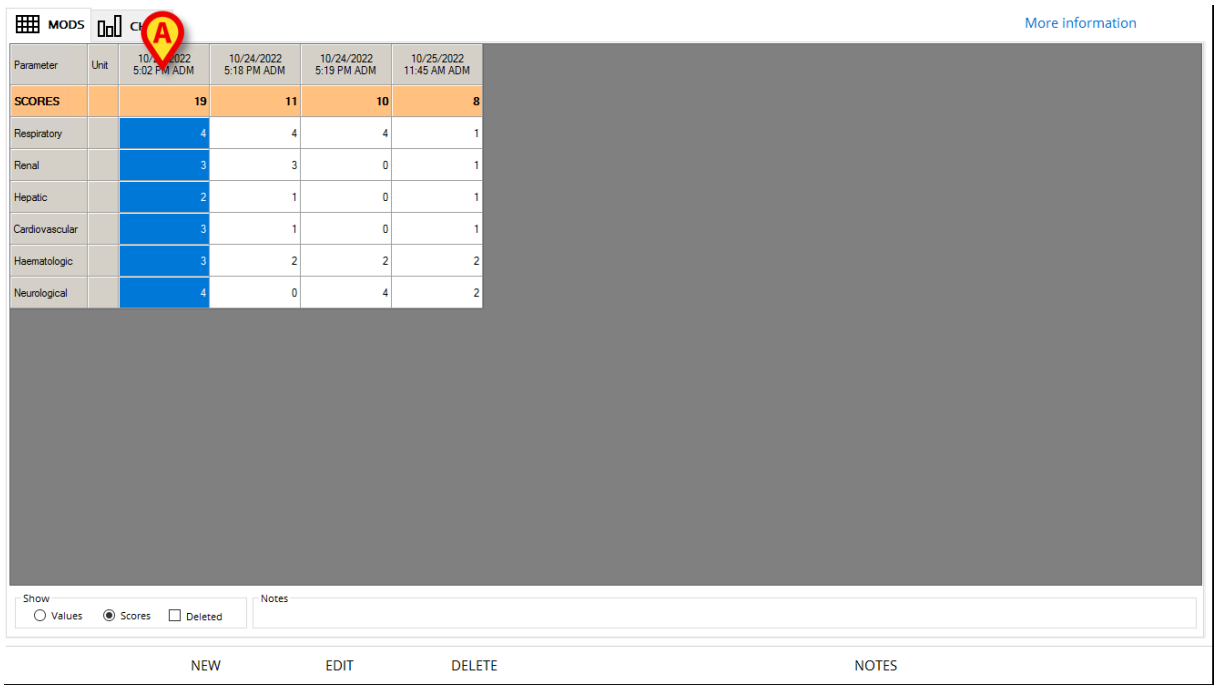


Fig 40 - Scores grid

- Click the **Edit** button on the command bar (Fig 41).

Fig 41 - Command bar

The corresponding data entry window is displayed (Fig 42).

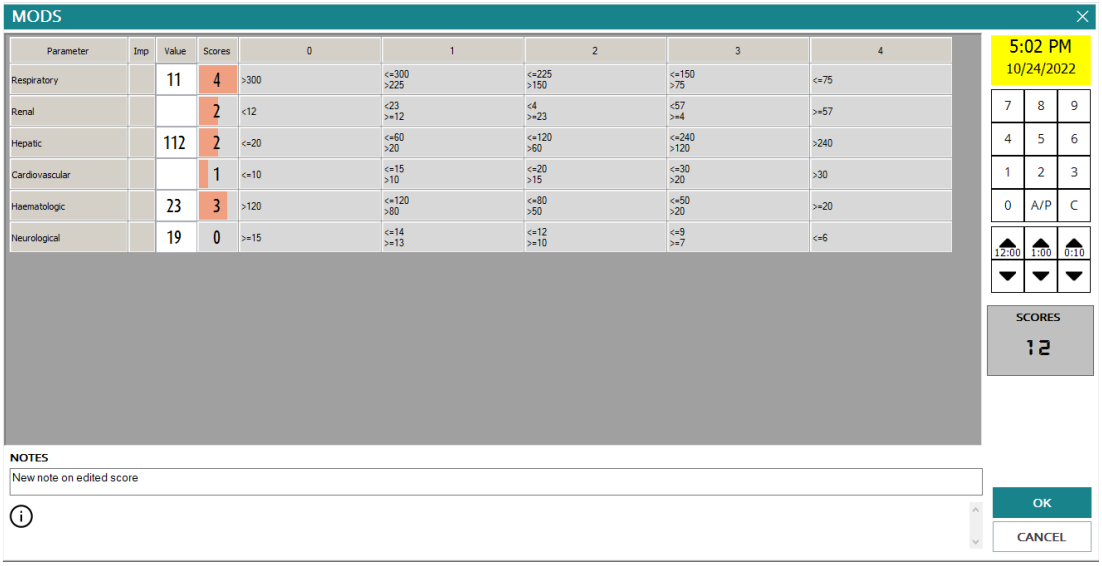


Fig 42 - Data entry window

- Edit the values on the window (see paragraphs 1.8.1 and 1.8.2 for the specific procedure).

- Click the **Ok** button.

The score values are this way edited.

The data entry window can also be displayed by double-clicking the corresponding column.

1.12.2. How to delete a score

To delete one of the scores on the grid

- Click the corresponding column on the scores grid.

The column is highlighted (Fig 43).

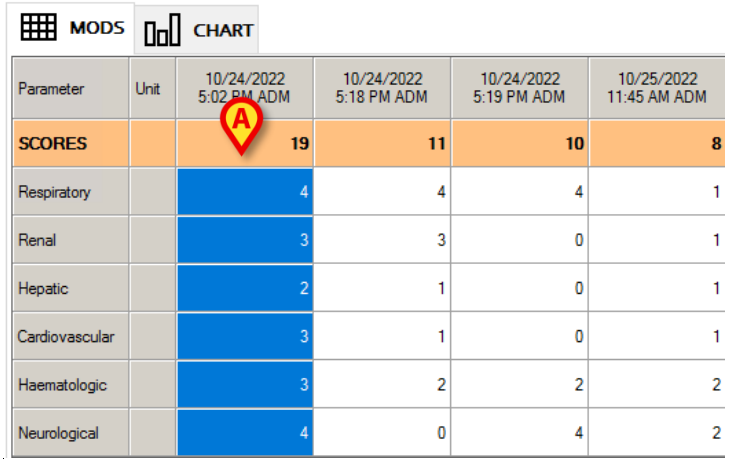


Fig 43 - Scores grid

- Click the **DELETE** button on the command bar (Fig 44).

Fig 44 - Command bar

User confirmation is required.

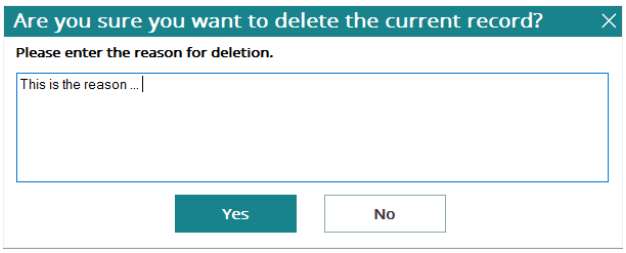


Fig 45 - Command bar

- Click **YES** to proceed. The selected column disappears from the grid.

1.12.3. Print reports

To access the Scoring Calculator module print functionalities

- Click the **PRINT** button on the command bar (Fig 46).

Fig 46 - Command bar

Different print options can be configured.

- Click the wanted option.

A print preview is displayed.

1.12.4. How to add a patient note

The **NOTES** button on the command bar (Fig 47) makes it possibile to add notes relating to the patient.

Fig 47 - Command bar

To add a patient note

- Click the **NOTES** button.

The following window opens.

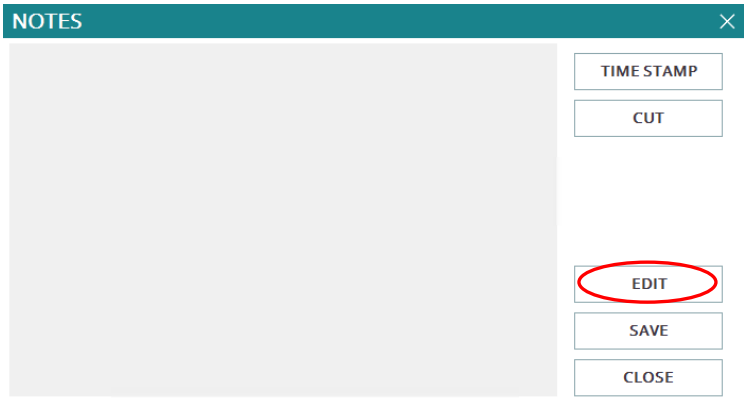


Fig 48 - "Notes" window

- Click the **Edit** button (Fig 48).

The window changes and turns to "edit" mode.

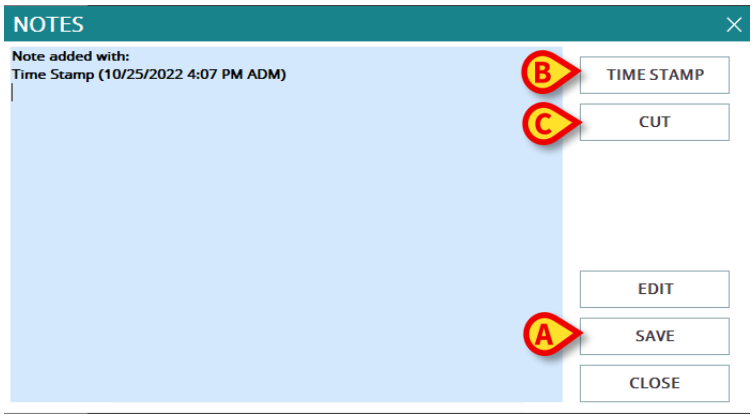


Fig 49 - "Notes" window (edit mode)

- Type the note. The text is displayed in the window.
- Click the **Save** button to save the note (Fig 49 **A**).

The window closes automatically. Click the "Notes" button again to display the note just entered and previous ones.

Use the **Time Stamp** button on the right (Fig 49 **B**) to display the date, time and the acronym of the user who is adding the note (Fig 50).

Fig 50 - Date and time

Use the **Cut** button (Fig 49 **C**) to cut a selected text portion from the note.
To cut a text portion from a note

- Click the **Edit** button (Fig 48 **A**).
- Select the text to be cut using either the mouse device or the workstation keyboard.
- Click the Cut button.

The selected text disappears from the note.

The notes inserted this way are visible - after clicking the **Notes** *button on the command bar - on every Product module currently in use implementing the* **Notes** *button.*

1.13. Charts

The patient scores can be displayed in charts.

To do that

- Click the “Chart” tab indicated in Fig 51 **A**.

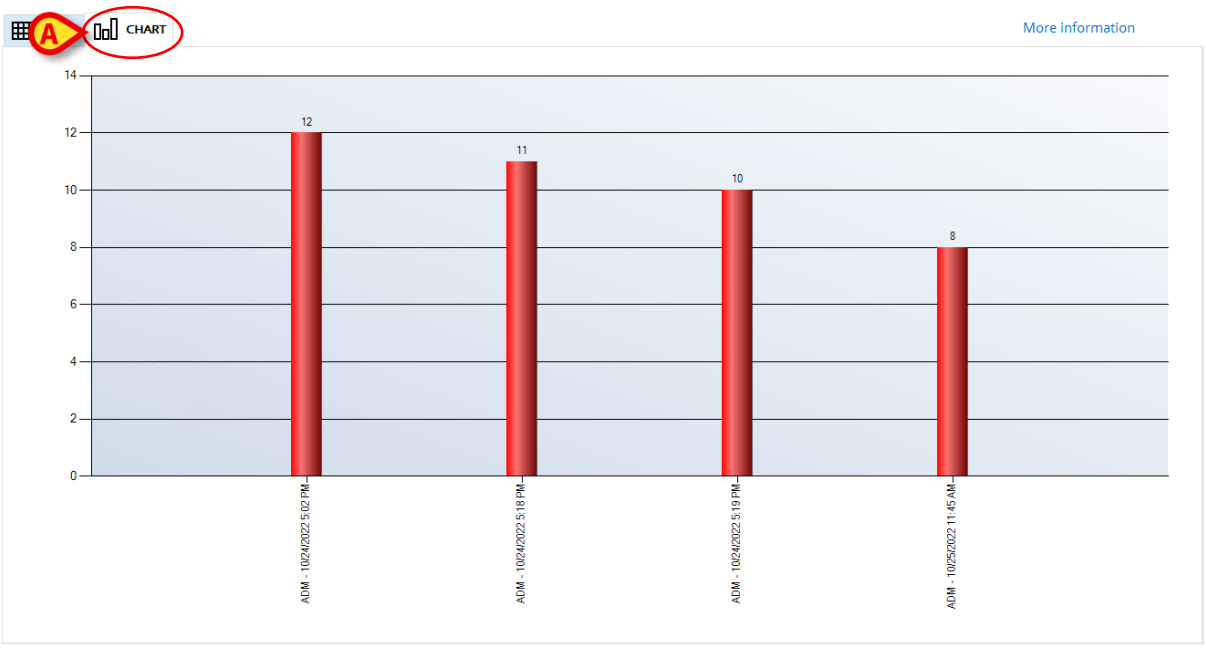


Fig 51 - Grafico

The chart shown in Fig 51 displays the trends of each parameter.