CAEMaestro
User Guide - Luna

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CAE

Contents

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SYSTEM REQUIREMENTS

This section describes the minimum and optimal requirements to run the simulator.

Software and Hardware

Any computer (or tablet) used to operate the Maestro software or TouchPro must meet hardware and software requirements. These requirements also apply to devices running Maestro Standalone.

Windows® Operating System

- Windows 10 64-bit

- 8GB of RAM

- 32 GB Hard drive space available

- 1366x768 screen resolution

- Wireless 802.11b/n/g

CAEMaestro Software

The following identifies the software version associated with the release of this user guide.

Document	Document Version	Software Version
Maestro for Luna	905K560452 V1.0	CAE Maestro V1.8

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INTRODUCING MAESTRO

CAE Maestro software allows facilitators to control and monitor CAE patient simulators.

On the Fly vs. SCE

There are two ways to run a simulation in Maestro: On the Fly and Simulated Clinical Experience (SCE). When operating On the Fly, no content is authored ahead of time, and the simulation is simply controlled in real time by the instructor.

With an SCE, at least some details of the simulation are defined ahead of time (like states, patient profile, and other scenario background information). During an SCE, users can also make on the fly changes as appropriate.

Modeled vs. Manual

In Modeled Mode, the simulated patient is automatically driven by CAE Physiology, a computational model of human physiology. It is an engine that powers patient behavior, progression of clinical signs, and response to interventions. In Modeled Mode, instructors also have the option to override the model's output.

In Manual Mode, the instructor is responsible for driving changes to the patient's condition and responses to interventions. The Manual Mode interface features a streamlined layout with only the required controls to maximize ease of use.

All four combinations are possible. You can run a Manual SCE, a Modeled SCE, Manual On the Fly, or Modeled On the Fly.

Instructor Tablet

This section describes the tablet Maestro operates on. Maestro can also be installed on a laptop. For more information, see *System Requirements* section in this guide.

Microsoft Surface Go

A Surface Go Instructor Tablet is used to run the software.

The Surface Go provides the capabilities of a laptop in an ultra-portable tablet. This mobile workstation features a Windows 10 operating system, a 10 in (25.4 cm) touchscreen, and up to nine hours of battery life. The Surface Go tablet comes equipped with pre-installed instructor software.

Note: If the on-screen keyboard does not appear after tapping in a text field, tap the Notifications icon in the lower-right corner and tap Tablet Mode. Tap anywhere outside of the Notifications window to minimize the Notifications screen.
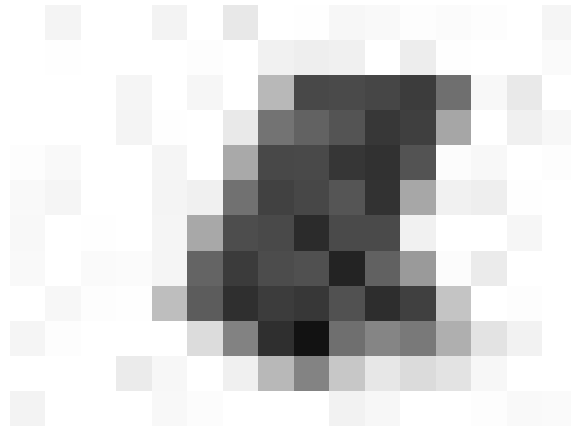
Surface Go Instructor Tablet

Maestro Application Overview

Users have three choices for managing their simulation in the Maestro software:

- Run simulations "on-the-fly" (manually) in Manual mode

- Run simulations "on-the-fly" (manually) in Modeled mode using CAE Physiology

- Run preconfigured simulations using simulated clinical experiences (SCEs)

Run On The Fly

The Run On The Fly mode has no predetermined scenarios or intended progression of events. Running exercises on-the-fly is designed to provide facilitators with a simple way to run a simulation with no advanced programming. Run On The Fly can be performed in manual or modeled mode.

Manual mode shows only required controls that allow facilitators to drive changes to the patient's condition and responses to interventions.

In Modeled mode, the simulation is automatically driven by CAE Physiology (a computational model of human physiology). This mode controls patient behavior, progression of clinical signs, and response to interventions. This mode also allows facilitators to override the model's output.

Note: Only systems that include the CAE Physiology (optional on some simulators) can be run in a modeled mode.

Simulated Clinical Experiences

Simulated Clinincal Experiences (more commonly referred to as SCEs) are process tools that enable facilitators to execute a learning strategy using simulation. Preconfigured CAE SCEs provide an extensive overview and outline of the learning exercise, and require minimal additional faculty development time for use. Each SCE is comprised of a patient and a scenario.

Starting Maestro

To start the Maestro software:

1. From the Instructor tablet desktop screen, tap the **CAEMaestro** icon.

CAEMaestro Icon

The Applications screen appears.

Applications Screen

2. Tap **CAEMaestro**.

Maestro Home Screen

From the Home screen, you can:

- Access the SCE Manager to create and manage SCEs

- Access the History of simulation sessions

- Access administrative tools and system settings

- Run simulations

CAEMaestro Home Screen

To return to the Home screen from the SCE Manager or History screens, tap **Home**.

IMPORTANT: If using a Surface Go tablet, ensure the Keyboard icon is visible at the bottom of the screen. This indicates the manual keyboard is available to use. Tap the icon when you need to use the keyboard to enter information into a field. If the Keyboard icon is not visible, refer to your Surface Go user manual to learn how to turn it on.

Maestro System Settings

From the Home screen, you can access information about the software or change system settings. Tap the **Gear** icon in the upper-right corner to select the following:

- **System:** to access information about the Maestro software version, the type of simulator, **Preferences**, **License Manager,** and **Maintenance.**

- **Language:** to change the Maestro language.

- **About**: to view the software version, the type of simulator and the serial number.

- **User Guide:** to download the user guide (English version). To access the User Guide in other languages, go to **www.caehealthcare.com** and click the **Support** link.

- **Support**: to access CAE support contact information.

- **Select Simulator** (only when using Maestro Standalone): to change the simulator.

SCE Manager

Using the SCE Manager, you can create new SCEs, import SCEs and Learning Modules, and manage existing modules.

History

From the History screen, you can view, export, rename or delete simulation session logs. Each simulation session is identified by the Start Time, Duration, Simulator, Session Name, and SCE Title. Each session consists of CPR data, Physiological data and an Event Log.

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USING MAESTRO

Using the Maestro software, you can create and run SCEs, assess learners and adjust system controls.

Note: For optimal performance, Maestro should be the only software program running.

Starting a Simulation

Upon launching the Maestro app, the Home screen appears and users have the option to choose one of the following simulations types: Run On the Fly (Modeled), Run On the Fly (Manual) or Run an SCE.

Run On the Fly Simulations

The **Run On the Fly (Modeled)** or **Run On the Fly (Manual)** simulation options start a simulation without an SCE.

To begin a Run On the Fly simulation:

1. Tap one of the simulation types: **Run on the Fly Manual** or **Run on the Fly Modelled** (only if Maestro Physiology license is installed).

2. Choose one of the patient ages: **Post-delivery (2 seconds to 2 minutes)**, **Neonate (2 minutes to 2 days)**, or **Infant (2 days to 1 month)**.

3. Select the **Gender** of the patient.

4. Tap **Start** to begin the simulation.

   From the Run screen, you can manually alter the patient's status and adjust parameters as needed for specific situations. The functionality in this mode is similar to, and described in *Run an SCE* section of this user guide.

Run an SCE

From the SCE Manager, you can run various simulations.

To run an SCE:

1. From the Home screen, tap **Run an SCE**.

   The **SCE Manager** tab is selected by default and a list of available SCEs appears.

SCE Manager Screen

   Note: Tap an SCE's title to view SCE details before launching. See *View Details* in the next section.

2. Tap the **Play** button to start an SCE.

   The Run screen appears and displays the Patient Baseline state.

3. Tap **Scenario** in the upper-right corner of the screen.

The list of scenario states appear. A scenario will remain in Patient Baseline until the **Play** button is tapped in another state.

SCE Run Screen

4. Tap the **Play** button to apply a state to the running SCE.

Run Screen Features

When an SCE is started, the Run screen appears and displays a series of panels that group related controls and information. The content for each control is dynamic and varies whether you run scenarios in On the Fly mode or as an SCE.

In Modeled mode, the panels contain additional controls.

Users can adjust the status of the patient while they proceed through a simulation using these controls.

Monitor Signals

The Monitor Signals tab gives users control over the values and signals that appear on the simulated patient monitor, TouchPro.

Tap **Monitor Signals** to adjust the controls for the simulator.

Monitor Signals

By default, all probes are on. When probes are turned off, it impacts different waveforms and numerical values on the patient monitor.

Probe Turned Off	Impact
ECG Leads	Hides the ECG waveform
Pulse Oximeter	Hides the PLETH waveform and SpO2 value
Capnograph	Hides the CO2 waveform and EtCO2 value
ECG and Pulse Oximeter	Hides the Heart Rate
Pulse Oximeter and Capnograph	Hides the Respiratory Rate
Blood Temperature	Hides the TBlood and TRectal values
Body Temperature	Hides the TAxilla and TBody values

Setting the catheter placement to Atmosphere causes a flat line to appear, even when an override is used. Available catheters include:

- Arterial Catheter
- Central Venous Catheter
- PA Catheter

If the catheter placement is *None*, no trace appears at all.

Event Log

During an SCE, all changes (manual or detected by the system) to simulation settings, learner actions, and checklist results are recorded in the Event Log.

To access the Event Log, tap the **Events** button in the lower-left corner of the Run screen.

The event log records the time and details of instructor and learner actions, which are color coded by category.

Event Log

In Manual SCEs, the medication information is tracked in the Event Log, but does not have an automatic effect on patient physiology.

Medication Information in Event Log

Display Patient Records in TouchPro

You can display patient records in the TouchPro software while an SCE is running.

To display a patient record:

1. From the Maestro Run screen, click **Records**.

   The Patient Records list appears with all available patient records shown.
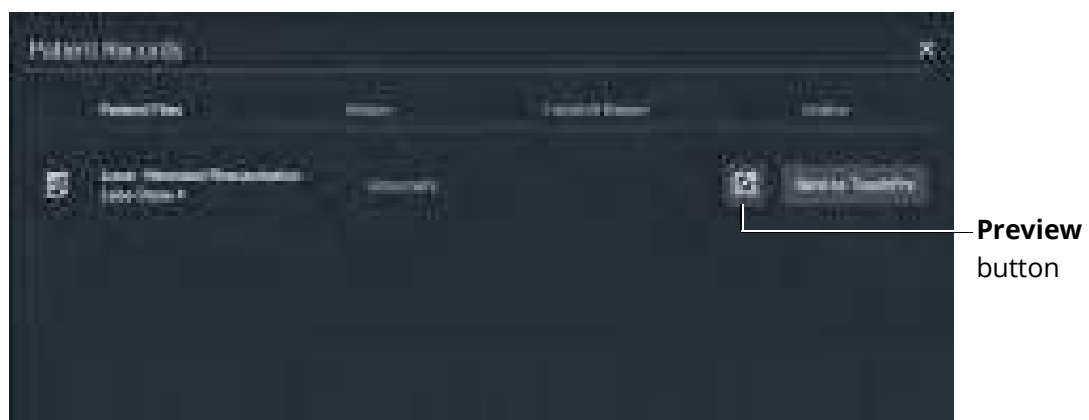
Patient Records

2. (Optional) To preview a patient record before sending to TouchPro, select the record and tap the **Preview** button.

3. Select a patient record and tap **Send to TouchPro**.

   The patient record opens in TouchPro.

   Note: Only one patient record displays at a time.

To stop displaying a patient record in TouchPro, on the patient record, tap **Remove from TouchPro**.

To close the Patient Record list, tap **Records**.

Reset an SCE

Resetting an SCE brings the patient's initial status data back to its original status. The SCE time is unaffected. Reset data appears in the Event Log.

To reset patient data:

1. While running an SCE, tap the first bookmark on the timeline.

Timeline

2. Tap **Revert**.

Revert to Marker

The patient returns to its original physiological state at the start of the SCE. The patient reset is indicated on the SCE timeline bar.
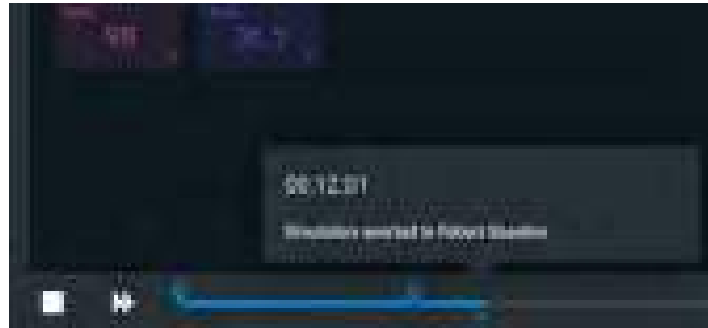
Reset Notification

Changing Patient Status

You can adjust the patient status while an SCE is running by:

- Using one of the parameter panels on the Run screen to modify parameters. For more information, see *Patient Status Display* section of this user guide.

- Using the Conditions, Treatments, and Medications Quicklinks.

- Applying Scenario states.

Patient Status Parameters

From the Run screen, select a parameter icon to display the associated parameters panel for various body systems and features. To access a parameters panel, tap the appropriate icon or button for:

- Cardiovascular

- Respiratory

- Neurological

- Fluids

- Sounds

- Pulse

Run Screen with Cardiac Parameters

Types of Parameters

There are two types of parameters: numeric and discrete.

Once a parameter is selected and set, the patient's physiology changes according to the model for that parameter.

Numeric Parameters

To change numeric parameters, tap in the relevant field and enter a new value in place of the existing one. Or, use the slider to move through the range of parameter values until the numeric value is established.

In Manual mode, parameters exist for each of the monitored patient values.

In Modeled mode, there are a larger set of parameters that are either monitored patient values, or physiological model inputs. When users set or modify monitored patient values, it overrides the output of the physiological model. To return to a physiologically modeled value, tap the **Modeled** button and tap **Accept**.

Changing physiological model inputs indirectly impacts the output of the physiological model. When a modeled input is called a factor, it acts as a multiplier. For example, Heart Rate Factor 2.0 is two times the baseline Heart Rate.

Discrete Parameters

Discrete parameters let users choose the appropriate option from a drop-down menu or toggle switch.

The following image shows the Bronchial Occlusion parameter. The Bronchial Occlusion parameter is set using a discrete parameter switch that toggles between **OFF** and **ON**.

Bronchial Occlusion Parameter

Some parameters have two toggle switches or buttons, one for each side of the manikin.

Changing a Patient's Parameters

To change a patient's parameters:

1. Tap the appropriate parameters icon to view the parameter panel.

Basic tab   **Advanced** tab

Cardiac Parameters panel

Cardiac Parameters icon
Respiratory Parameters icon
Neuro Parameters icon
Fluid Parameters icon

Parameters menu

Cardiac Parameters Panel
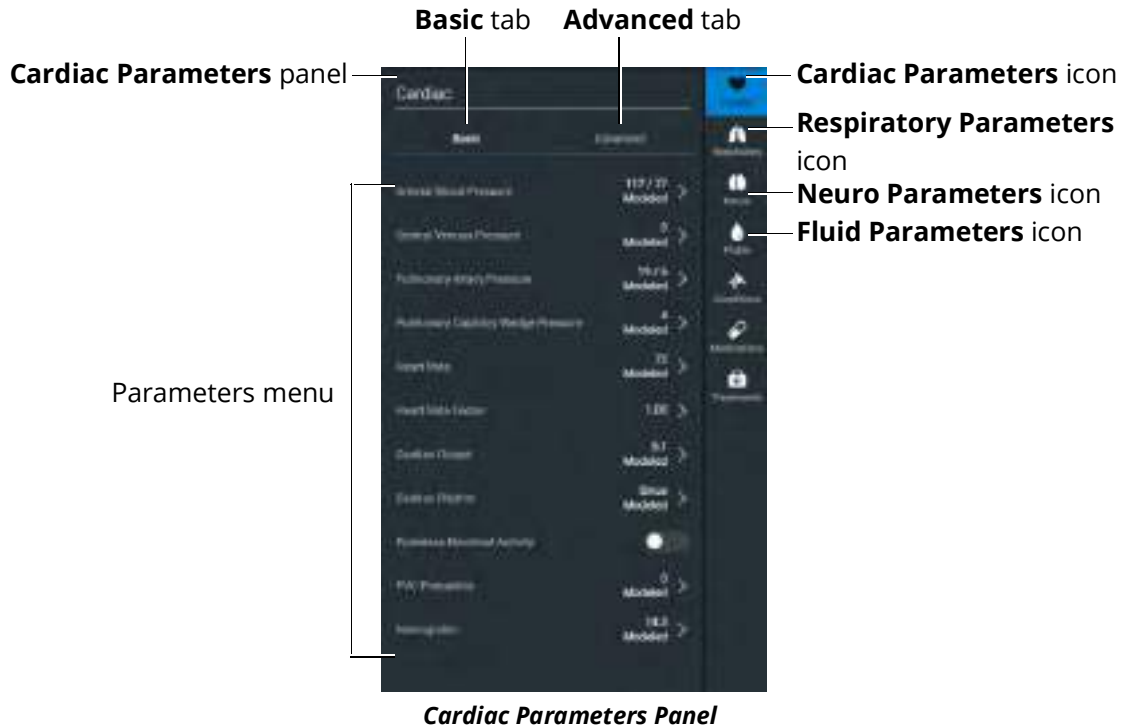
If an SCE is in Modeled mode, the parameters will display the physiological responses in real time. Otherwise, the parameters will be static until changed in Manual mode.

Note: Some simulators have **Basic** and **Advanced** tabs on the Respiratory and Cardiovascular panels. Basic parameters are shown by default. Tap the **Advanced** tab to display Advanced parameters.

2. Select the desired parameter. The Parameter Controls screen appears.

Heart Rate Parameter Controls

3. Set the new value and tap **Accept**.

Using Quicklinks

Quicklinks allow the application of conditions, medications, and treatments during simulation. Once applied, conditions are reflected in the patient's physiology and logged. All medications and interventions are also logged, and most affect the patient's physiology.

The Conditions, Medications, and Treatment controls used most often can be set up as Quicklinks Favorites and will appear in alphabetical order at the top of the panel. This lets you quickly administer changes in patient status.

Note: Quicklinks can only be added while creating or editing an SCE.

To learn more about setting up Quicklinks, see *Runtime Configuration* section of this user guide.
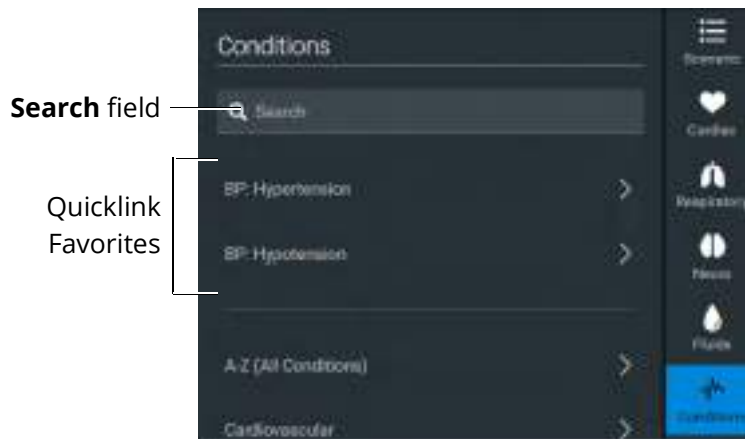
Conditions Panel

TIP: Tap the appropriate icon to collapse or expand the control.

Conditions

Conditions are similar to scenario states and can contain multiple parameter changes. These quicklinks make it easy to change the patient's status.
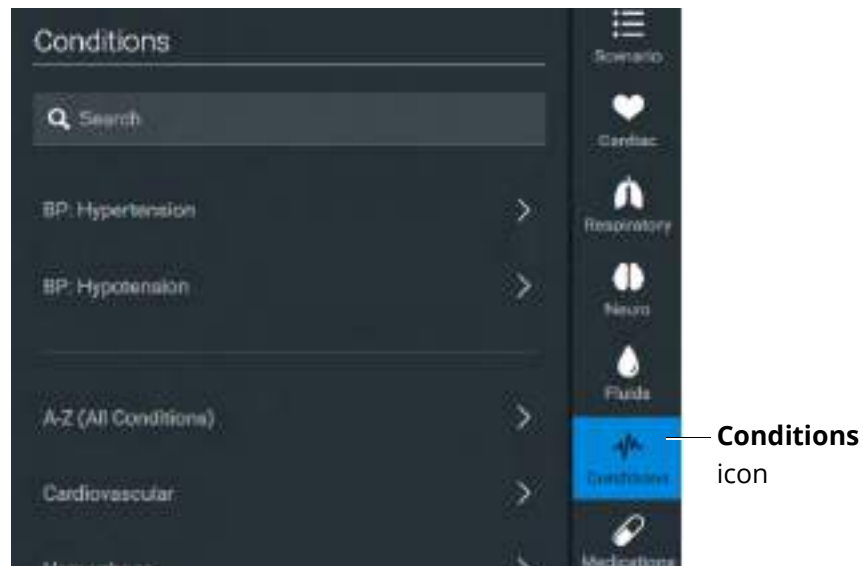
Conditions Panel

To set parameters using the Conditions Quicklinks, tap **Conditions** icon. In the Conditions panel, tap the **Condition Quicklink** to apply it to the simulation.

To apply a condition that is NOT set up as a Quicklink Favorite:

1. Browse the panel to find the desired condition.

    Conditions are organized by categories. You can also list All Conditions by tapping **A-Z (All Conditions)** to browse by group in alphabetical order or use the Search feature to quickly find a specific condition.

2. Tap the name of the desired condition.

    The condition is applied to the patient.

Medications

To choose a medication using the Quicklinks:

1. In the **Medications** panel, tap one of the Quicklinks.

Search field

Quicklink
Favorites
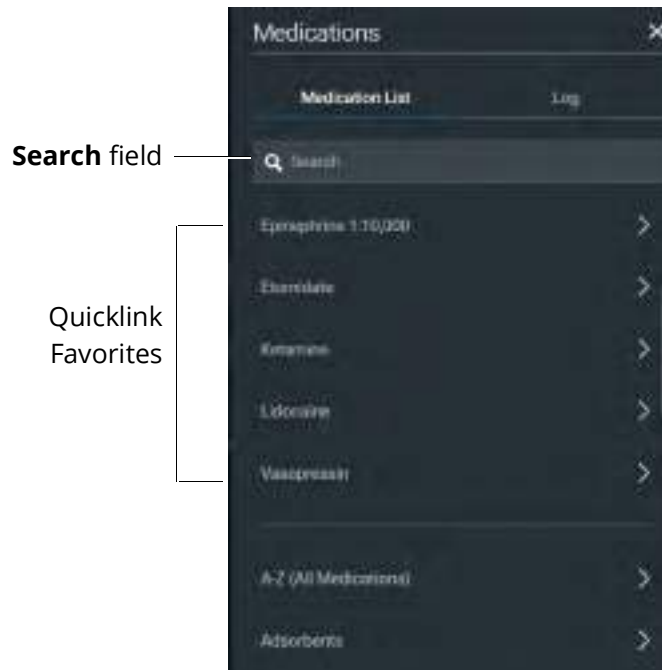
Medications Panel

A menu appears and shows the available medications.

2. Tap a specific **medication** to choose a dose and route of administration.

The Medication controls appear.

3. Tap the desired **Delivery Method** and select a pre-defined dose from the Amount menu, or choose Custom to enter a custom dose.

Note: All administered medications are added to the **Event** log in both Manual and Modeled modes (unless labeled Log only), but medications only affect the patient's status if the simulation is in Modeled mode. For Modeled mode SCEs, the medication is also logged in the **Log** tab on the **Medications** panel.

To administer a medication that is NOT set up as a Quicklink Favorite:

1. From the Medications list, tap **A-Z (All Medications)** to browse all medications in alphabetical order or use the Search feature to quickly find a specific medication. Medications are grouped in the list by type below the **A-Z (All Medications)** list option.

2. Navigate through the menus to locate the desired medication. Tap the desired medication in the list.

The Medication controls appear.   The delivery method and amount options, which include pre-defined doses and custom dose option, is displayed.

Medication Controls

3. Select a dose option in one of two ways:

- Under Delivery Method, choose a pre-defined dose and select an **Amount**.

- Under Delivery Method, choose a pre-defined dose and from the **Amount** drop-down menu, select **Custom**.
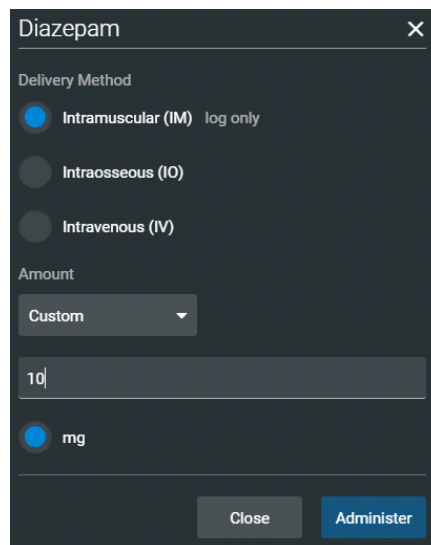
Custom Dose
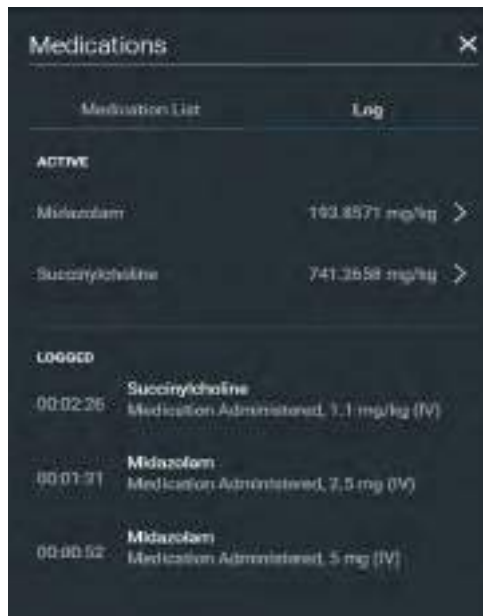
4. Enter the custom amount and tap **Administer**.

The Medication Log

The Medication Log tracks the infusion of medication administered and its effect on patient status. The Medication Log is present in Modeled mode only.

To view the Medication Log:

1. From the Run screen, tap the **Medications** control.

2. Tap the **Log** tab.

Medications Log

The medications that have previously been administered appear in the *Logged* section of the screen. Medications that are currently impacting the patient physiology appear in the *Active* section of the screen.

Tap on an active medication to display medication information.

Medication Information

The normalized effector site concentration is shown next to each medication listing. This represents the amount of medication that is affecting the patient physiology.

Reset a Medication

To reset a medication:

1. From the Medication Log, tap an active medication.

2. From the medication information, tap **Reset**.

    The medication is cleared from the model and from the Medication Monitor.

    With continuous infusions, the amount infused goes back to zero, but the infusion continues.

Treatments

To apply an intervention using Quicklink Favorites:

1. Tap **Treatments** icon and select a treatment from the Quicklink Favorites.
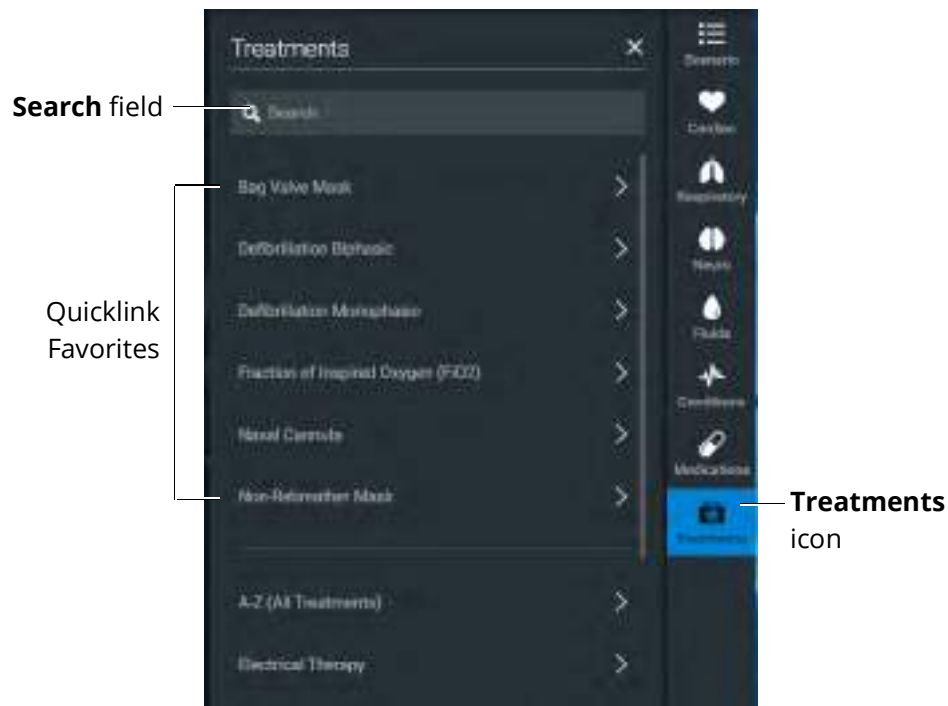
Treatments Panel

To apply a treatment that is NOT set up as a Quicklink Favorite:

1. Tap **Treatments**.

    Treatments are organized by type and all available treatments are listed under **A-Z (All Treatments).**

2. Navigate through the menus to locate the desired treatment.
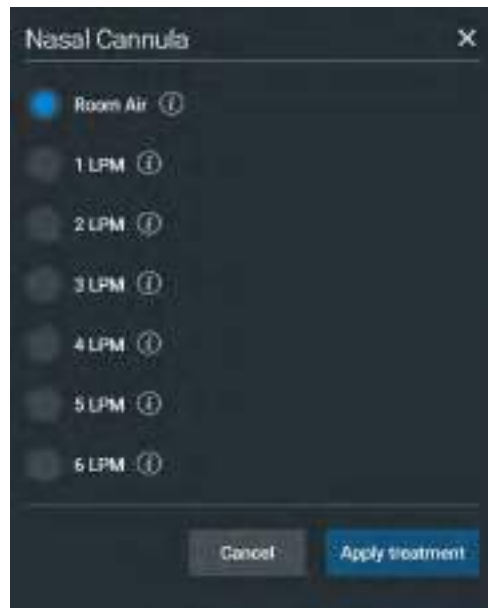
Treatments Menu

3. Select a treatment and tap **Apply treatment**.

Transitioning Scenario States

To move between scenario states from the Run screen:

1. Tap **Scenario** icon to expand the scenario panel.
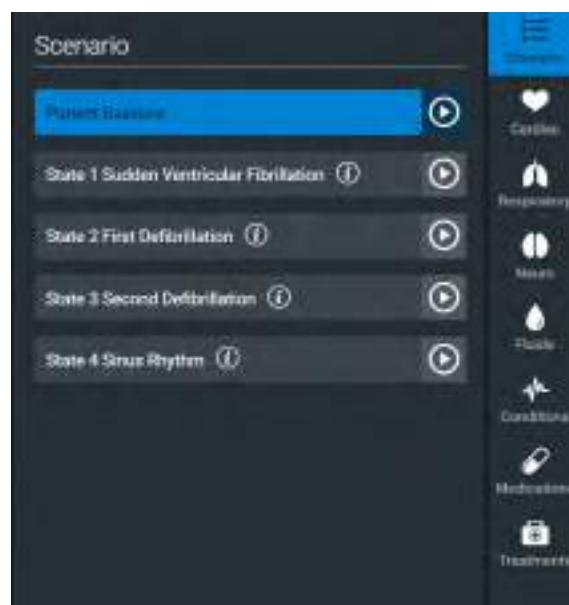
Scenario Management Panel

2. Tap the **Play** button in the desired state to advance from the Patient Baseline state.

   To pause or continue a scenario, tap the **Pause** or **Play** button from the Scenario Management menu.

SCE Timeline Controls

The SCE timeline controls are located at the bottom of the Run screen.

Timeline

- The **Timeline** bar shows the amount of time that has elapsed and bookmarks that have been created.

- The **Marker** button creates a bookmark at the current point in the SCE. The marker can be used later to reset the patient's physiology to what it was when the bookmark was created.

- The **Fast-Forward** button accelerates the SCE time to a 4:1 ratio.

- The **Pause/Play** button pauses the SCE time or starts the SCE if it has been paused. The **Pause/Play** button also returns the SCE time to normal speed after **Fast-Forward** has been selected.

Using Bookmarks

To annotate the timeline, tap the **Marker** button. A marker appears on the **Timeline** bar.

Timeline with Bookmarks

To return to the patient status at the time the marker was created, tap the marker on the timeline and tap **Revert**.

Note: The SCE time continues moving forward and does not reset to the marker time.

Revert to Bookmark

The patient's status returns to the selected point in the timeline.

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PATIENT DISPLAY

When you run an SCE, the patient's status appears.

Patient Status Display

Patient status display appears in the main frame on the Run screen. The status includes numeric data and waveforms.

Patient Status Display

From this screen, you can:

- Tap Alarms to mute or unmute alarm sounds.

- Tap Waveforms or numeric widgets to adjust parameters.

- Edit a layout.

Flags

Blue, rotating flags indicate a value of the parameter is in transition. A yellow System Override flag indicates the value of the parameter has been overridden by the system due to a special condition (for example, Apnea, Non-pulsatile rhythm or Pulseless Electrical Activity.)

Flags

Alarm State

When an alarm is not muted and a value reaches critical state, the associated widget flashes.

Editing Parameters

You can edit parameters in one of two ways:

- Parameter Editor
- Quick Edit

To edit parameter in the Parameter Editor:

1. Tap a waveform or vital sign widget to open the Parameter Editor window.

2. Use the sliders, text fields (+) and (-) to adjust parameters.

Parameter Window

3. Tap **Accept**.

To edit a parameter using Quick Edit:

1. Press and hold a waveform or vital sign widget until (+) and (-) icons appear over the widget.

Plus/Minus Widget

2. Tap the plus or minus signs to adjust the parameter.

3. Click outside of the Quick Edit area to save the changes and close the editor.

Change the Patient Vitals Display

You can change the layout of the patient vitals display and save parameters as part of the layout.

To change the Patient Vitals Display:

1. In the SCE Runtime screen, tap the **Patient Status** button.

Patient Status Button

The Edit Vitals Layout & Alarms screen appears.

2. Either begin modifying the baseline layout or tap **Load Saved Layout** to select another patient display layout to modify.

3. Drag and drop a waveform or numeric widget from the right panel to an available display in the left panel.

Once in place, the Select Waveform or Select Numeric Widget screen appears.

4. Select or change the physiological parameter(s) as needed. Tap **Save**.

5. When the Edit Vitals Layout & Alarms screen appears either:

  • Tap **Accept** to update the layout without saving it.

  • Tap **Save to Library** to save the layout for future use.

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MANAGING SCEs

The Maestro SCE Manager is where you can view and print information for all SCEs. You can also create, edit, copy, or delete custom SCEs and Learning Modules.

To access the SCE Manager screen, from the Maestro Home screen, tap **SCE Manager**.

SCE Manager Screen

The default screen shows Recently Used SCEs but you can easily locate any SCE and Module in the SCE Manager.

There are three ways to locate SCEs or modules from the SCE Manager screen:

- In the left column, tap either **Favorites**, **All**, **Preconfigured SCEs**, **User-created SCEs** or **User-created Modules**.

- In the **Search** field, type part or all of the name of an SCE or module.

- Tap the **Sort by** drop-down to filter the list by ascending or descending order.

Review an SCE

To review details about an SCE, tap on the name of an SCE, or tap the **Gear** icon and select **Review** from the drop-down menu.
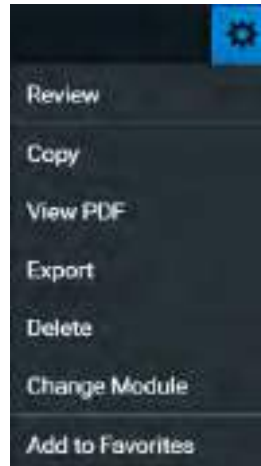
SCE Gear Drop-Down Menu Options

The SCE Editor screen appears.

View SCE Details

From the SCE Editor screen, you can select a tab or panel to view details.

The SCE Editor screen is where users can enter specific details for custom SCEs.
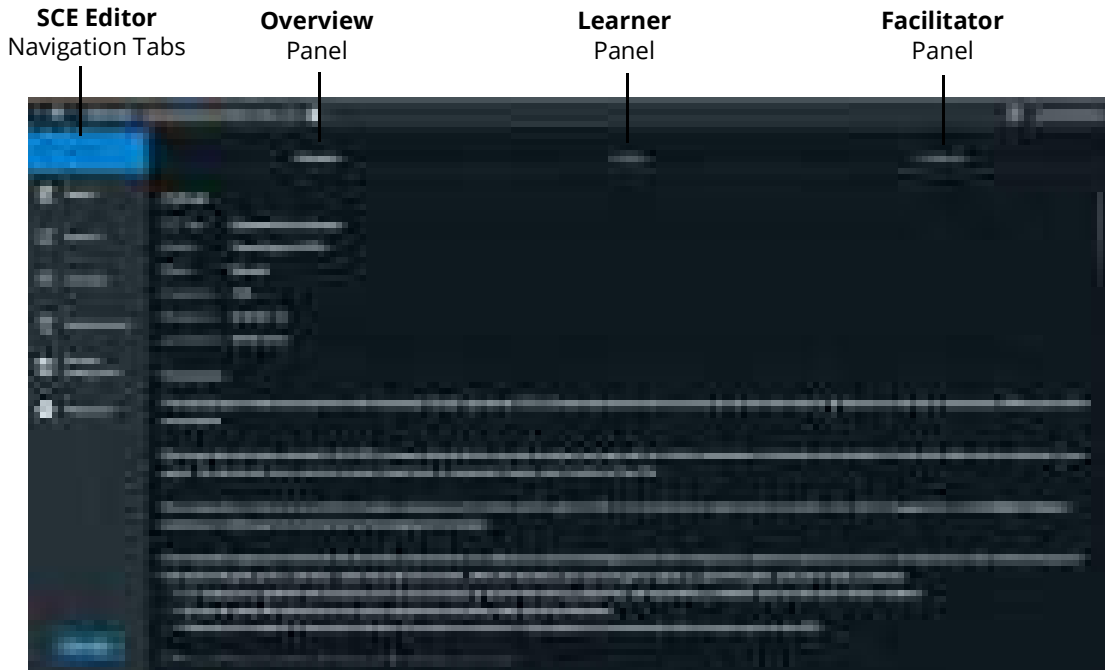
SCE Editor Screen - Overview Panel

For more information on entering SCE details into a new SCE, see *Create a Custom SCE* section of this user guide.

SCE Editor Navigation Tabs

- **Details:** Lists relevant information about the SCE. Allows access to the Overview, Learner, and Facilitator panels

- **Patient**: Describes the patient profile

- **Scenario:** Includes states pertaining to the SCE

- **Checklists:** Includes checklists related to learner milestones for the SCE

- **Patient Records:** Stores patient records including but not limited to:
    - Lab reports
    - X-rays
    - Medical history
    - Healthcare Provider's orders
    - Handoff reports

- **Runtime Configuration:** Lists condition, medication, and treatment information

- **Preparation:** Lists recommended equipment and supplies needed to run the SCE

SCE Editor Panels

- **Overview**: Includes information about the SCE synopsis and descriptions of the states

- **Learner**: Displays learning objectives, performance measures for each state, and preparation questions

- **Facilitator**: Includes notes, debriefing points, teaching questions and answers, as well as clinical references about the SCE

Create a Custom SCE

You can quickly create an SCE by copying an existing SCE, or by creating a new SCE and entering all of the details. Custom SCEs can be used alone or in a Learning Module. For more information, see *Learning Modules* section of this user guide.

Note: The Lock icon on any screen indicates the SCE was installed by CAE and cannot be edited or deleted.

Copy an SCE

When an SCE with specific physiological characteristics is needed for repeated use, create the SCE from an existing SCE.

To copy an SCE:

1. On the SCE Manager screen, tap the **Gear** icon on the right of the desired SCE.
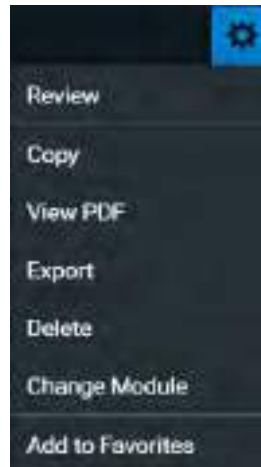
SCE Gear Drop-Down Menu Options

2. Tap **Copy**.

   The Copy SCE screen appears and lists sections of the SCE you can copy.
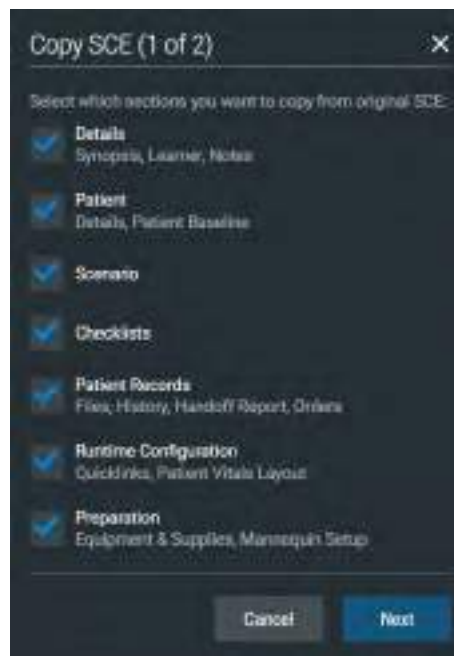
Copying SCE

3. Select the elements of the SCE to copy. When finished, click **Next**. In the **SCE Title** field, enter a new SCE name.

4. (Optional) Assign the SCE to a Module using the drop-down menu.

5. Click **Copy**.

Saving Copied SCE

The new SCE is copied and available for selection from the SCE Manager.

Note: Overwriting an SCE will only impact the running SCE, not any other SCE copied from the same base patient.

Creating a New SCE

Creating a new SCE is a two-step process.

1. Create the SCE in the SCE Manager as described in this section.

2. Enter details about the SCE in the SCE Editor as described in *Using the SCE Editor* section of this user guide.

To create an SCE:

1. From the SCE Manager screen, tap **New SCE.**

   The New SCE screen appears.

New SCE WIndow

2. Type a title for the SCE in the **SCE Title** field.

3. (Optional) To add an SCE to a module, tap the drop-down arrow and select a module. Or, tap the **+** icon to create a new module.

Select Module

4. Type a name for the module in the Enter New Module Name screen and tap **Add**.
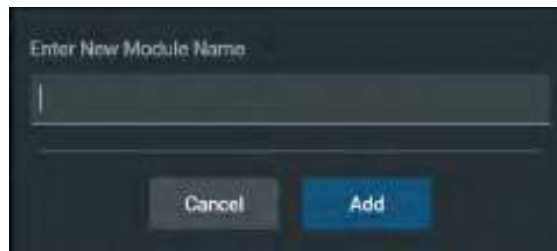
New Module Name Screen

5. Complete the remaining fields in the New SCE screen or select options as required. When finished, tap **Create**.

    The SCE Editor screen appears with the **Details** tab displayed.

SCE Editor - Details Tab

6. In the **Overview**, **Learner**, and **Facilitator** panels, tap the **Edit** icons to enter additional information.

7. Tap the navigation tabs to enter additional details about the SCE as needed. To learn more, see *Using the SCE Editor* section.

Import or Export an SCE

SCEs can be imported from an external device or the hard disk drive where the SCE file is saved. The SCE file extension is *msce*.

To import from SCE Manager screen, tap the **More** drop-down menu and tap **Import SCEs**.

More Drop-Down Menu Options

Note: The step-by-step instructions for importing SCEs and Learning Modules are located in *Appendix - Importing Learning Modules* of this user guide.

To export an SCE:

1. In the **SCE Manager**, tap the gear icon next to the desired SCE.
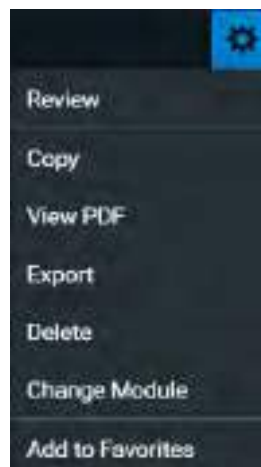
SCE Gear Drop-Down Menu Options

2. Tap **Export**.

3. Select the desired location for the *msce* file in your File Explorer window and tap **Save**.

   The file is saved in the designated location. If using a tablet, the files can be exported to an external device via USB-C cable.

To view the PDF of an SCE:

1. Tap **View PDF**.

2. Select the desired location for the *msce* file in your File Explorer window and tap **Save**.

   The file is saved in the designated location. If using a tablet, the files can be exported to an external device via USB-C cable.

USING THE SCE EDITOR

Use the SCE Editor to review or manage any purchased, preconfigured SCEs and to complete or edit information for custom SCEs. From the SCE Editor screen, you can also view checklists, and patient records, or delete information as needed.

To access the SCE Editor, tap on the name of an SCE from the SCE Manager screen.

SCE Details

The buttons in the Navigation panel provide options to:

- Run the SCE.

- Edit the patient or scenario.

- Add checklists or patient records.

- Modify the runtime configuration including preparation information.

Some sections in the SCE Editor include a rich-text editor to allow free-form data entry.

Note: If the SCE is locked, you cannot modify or delete information.

Patient Profile

To edit the Patient Profile:

1. From the SCE Editor, in the **Patient** section, tap the **Edit** button.

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Patient Profile

The Patient Profile Editor appears.

2. Modify the patient's name, eye color, age, gender, weight, and height in the appropriate fields.

.

Patient Profile

3. (Optional) Tap **Change Picture** to change the patient's picture.

4. Tap **Save**.

IMPORTANT: No part of the patient's profile can contain any special characters, such as / \ : * ? < > % | "

Setting a Patient's Baseline

The patient baseline is the patient's initial status at the start of an SCE.

To set the Patient's Baseline:

1. In the **Patient** section, tap the **Edit** button on the right of **Baseline.**

   The Patient Baseline Editor appears.
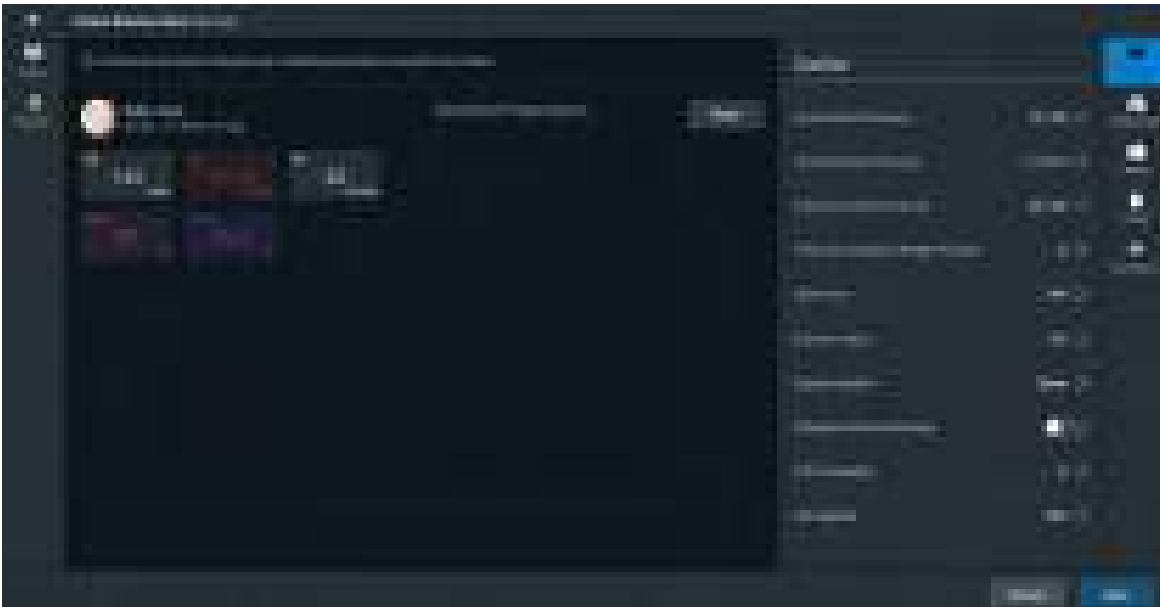
Patient Baseline Editor

2. Set the Patient's baseline status by modifying the desired parameters and tap **Save**.

   When the SCE begins, the Patient status reflects the selected baseline settings.

To use the text editor:

1. Where available, tap the **Edit** button.

2. Enter or edit information as needed.

Note: Text can be copied into the fields from Text Editor or Notepad only.
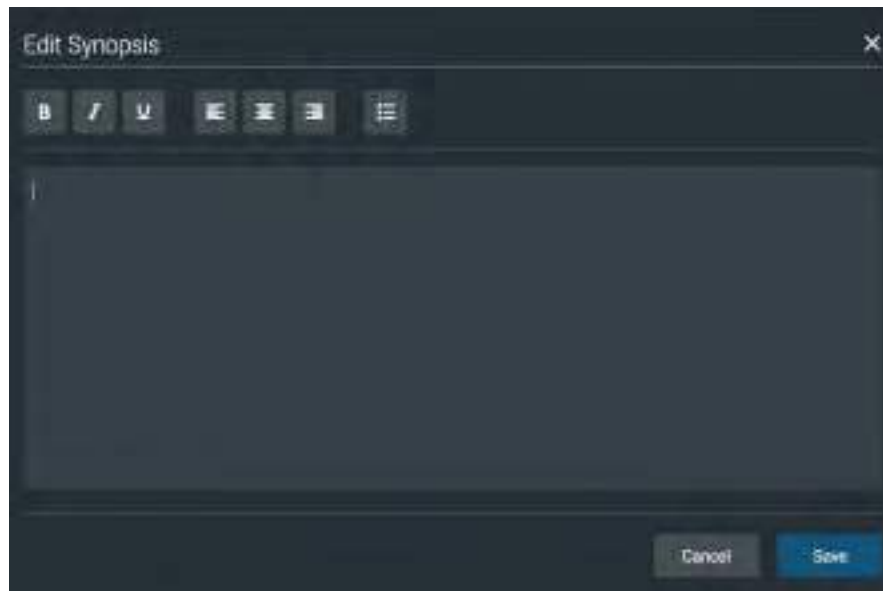
Text Editor

3. When finished, tap **Save**.

Note: Notes can also be added to each scenario state when editing a Scenario.

Scenarios

For any custom SCE, users can create scenarios, or if a scenario is not locked, users can edit a scenario.

You may edit scenarios to modify patient status from the Scenario Editor or Live Scenario Editor.

Note: The live editor allows edits to the scenario while running the simulation, and is only available when the optional Maestro Physiology feature is active.

To edit from the Scenario Editor:

1. From the SCE Manager screen, select an SCE to edit.

   The SCE Editor screen appears.

2. Tap the **Scenario** tab.

3. Tap the Scenario **Edit** icon.

   Note: If it is a brand new SCE, tap the **Open Scenario Editor** button to open the Scenario Editor.

The Scenario Editor appears.
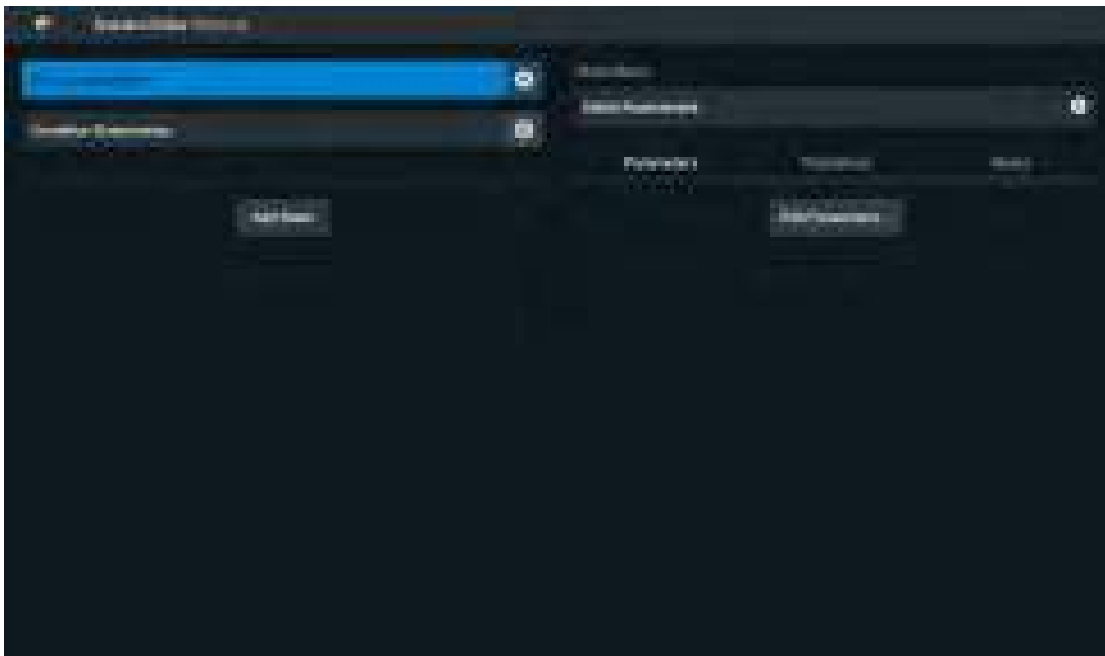
Scenario Editor

4. Tap the **Gear** icon located on the side of a state to do one or more of the following:

- ° **Rename**: to rename the state.

- ° **Copy:** to copy the state.

- ° **Delete:** to delete the state.

- ° **Edit Parameters:** to edit the state parameters without jumping to the specified state.

- ° **Add Transition:** allows transitions to be added from one state to another.

- ° **Edit Note**: to add state notes.

To edit from the Live Scenario Editor:

Note: From the Live Scenario Editor, states can be added, modified and deleted.

1. From the Scenario Editor screen, tap **Live Scenario Editor**.

   The Live Scenario Editor screen opens.

Live Scenario Editor

2. Tap the **Gear** icon located on the side of a state. Then, tap one or more of the following:

   ° **Add State:** to add new states.

   ° **Restart Simulation:** to revert the simulation to the patient baseline.

   ° **Gear** icon, located on the side of a state to do the following:

   ° **Jump to State:** allows users to jump to the desired state. It is possible to perform a live edit, by selecting the **Edit Live** button. Once completed, parameter changes will be applied to the state. This option allows users to edit state parameters and see the resulting physiological impact on the patient.

   ° **Rename**: to rename the state.

   ° **Copy**: to copy the state.

   ° **Delete:** to delete the state.

   ° **Edit Parameters**: to edit the state parameters without jumping to the specified state.

   ° **Add Transition:** allows transitions to be added from one state to another.

   ° **Edit Note:** to add state notes.

Add, Modify or Delete Scenario States

A scenario state is comprised of conditions and parameters. A state may also include automated transitions to other states and notes for the instructor.

For scenarios, users can:

- Create new states and options.

- Add conditions and parameters to a state, or copy a state into a new state.

- Modify or delete portions of a state such as parameters or transitions, or the entire state itself.

- Add and delete transitions.

Add Scenario States and Parameters

You can add states, conditions, and parameters in the Scenario Editor or Live Scenario Editor.

To add a scenario state:

1. In the Scenario Editor or Live Scenario Editor, tap **Add State**.

2. In the window that appears, enter a name for the new state. Tap **Create**.

   The State window appears, where you can add parameters to the state.

New State

To add parameters in the Live Scenario Editor:

1. In the Live Scenario Editor, select the desired state, and then select **Jump to State**. All changes made to controls will be added to active state.

2. Tap the **Gear** icon and select **Edit Live**.

3. Add as many parameters as needed.

   Parameters appear consecutively within the state.

4. Move to different states to add or edit parameters as needed using the **Jump to State** feature. Repeat this step as needed through multiple states.

5. When finished, click **Return** to save and exit the editor.

   IMPORTANT: If the physiology of any parameter conflicts with other parameters, Maestro will retain the last parameter entered.

To add parameters in the Scenario Editor:

1. In the Scenario Editor, select the desired state.

2. On the right side of the screen, click **Edit Parameters**.

3. Add conditions or parameters as needed by selecting them from the list on the left side of the screen. Once added, they appear on the right side of the screen.

4. Tap **Save**.

Modify or Delete Scenario States or Parameters

To modify a scenario state:

1. In the Scenario Editor or Live Scenario Editor, select the desired scenario state. Then, Tap **Edit Parameters**.

2. Make necessary changes. Tap **Save**.

To delete a scenario state in the Scenario Editor or Live Editor, tap the **Gear** icon, then tap **Delete**.

To delete parameters:

1. In the Scenario Editor or Live Scenario Editor, tap the **Information** icon to expand the state.

Information Icon

2. Tap the **Parameters** tab. Tap the **X** icon next to the parameter to delete.

Parameters Tab

Add and Delete Transitions

To add transitions, the scenario must have both an original state and a state that results from the transition. Add or delete transitions from the Scenario Editor or Live Scenario Editor.

To add transitions:

1. In the Scenario Editor or Live Scenario Editor, tap the **Gear** icon next to the desired state.

2. Tap **Add Transition**.

The New Transition screen appears.

New Transition Screen

3. Select an option from the list of transition types, then select additional options as prompted.

   Example: If the administration of medication is a desired transition, select Medications, then select the desired medication from the list that appears.

4. Once the transition option is selected (for example Medication), enter the criteria, transition value ,and state that results from the transition.

5. (Optional) Follow the same steps to make selections and assign values to the Treatment, Assessment, Vitals, Medication concentration, Fluids, Time in Scenario, and Time in State variable types.

6. When finished, tap **Save**.

To delete a transition in the Scenario Editor or Live Scenario Editor:

1. Tap the **Information** icon next to the state.

Information Icon

2. Select the **Transitions** tab, then tap the **Trash** button next to the transition to delete.

Scenario Editor - Transition Tab
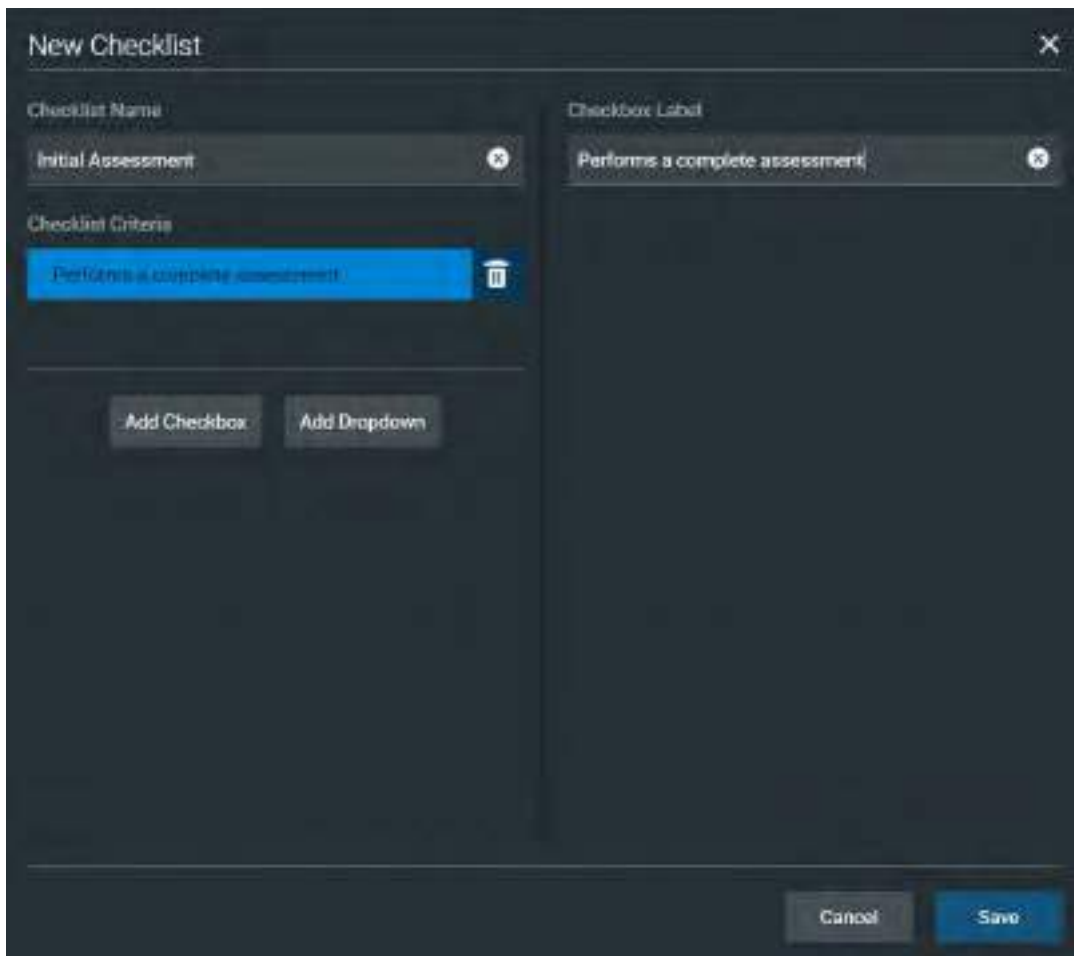
Checklists

You can create new checklists or import existing checklists from the library.

To create a new checklist:

1. In the SCE Editor, tap the **Checklists** tab.

2. When the Checklists screen appears, tap **Create New**.

    The New Checklist screen appears.

New Checklist Screen

3. Enter a name for the checklist in the **Checklist Name** field.

4. (Optional) Tap **Add Checkbox** to add a checkbox to the checklist.

    a. Enter a label name in the **Checkbox Label** field.

    b. (Optional) Tap **Add Checkbox** to continue entering labels as needed.

    c. Tap **Save**.

5. (Optional) Tap **Add Dropdown** to add list items to the checklist.

    a. Enter a name for the dropdown list in the **Dropdown Label** field.

    b. Tap **Add Option** to provide items that can be selected from the dropdown list.

    c. Enter a name for the list item in the **Dropdown Options** field.

    d. (Optional) Tap **Add Dropdown** to continue entering dropdown lists as needed.

    e. Tap **Save**.

To import a checklist:

1. In the SCE Editor, tap the **Checklists** tab.

2. When the Checklists screen appears, tap **Import from Library**.

The Import Checklist screen appears and displays all checklists from all SCEs in the system.
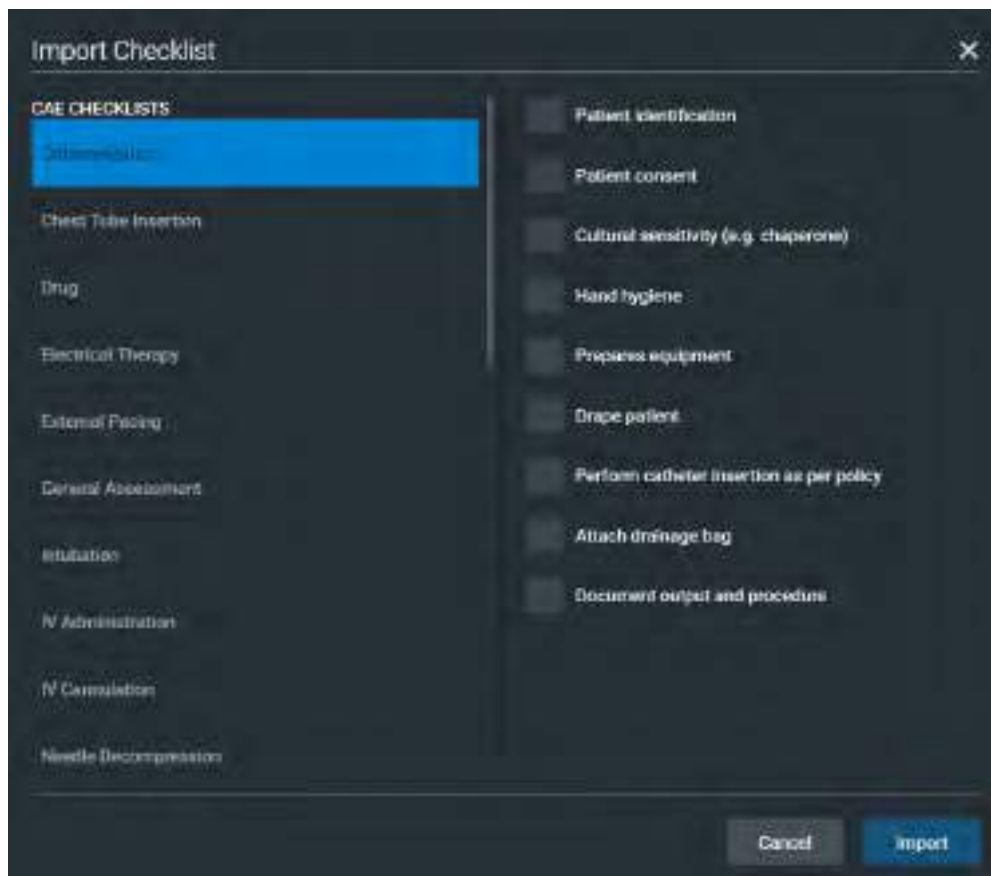
Import Checklist Screen

3. In the checkboxes on the right, select items to import.

4. Tap **Import**.

Patient Records

Patient records can be uploaded into Maestro for display in the TouchPro software. Once uploaded, a patient record is available for use with the SCE.

Note: A single patient record file cannot exceed 20MB.

Maestro can store up to of patient record files. To ensure adequate space, delete patient records that are no longer needed.

To access a patient record:

1. From the SCE Editor screen, tap the **Patient Records** tab.

   The Patient Records list appears with all available patient records shown.

Patient Records Screen

2. (Optional) To preview a patient record before sending to TouchPro, select the record, and tap the **Preview** button.

Preview Button

3. Select a patient record, then tap **Send to TouchPro**.

Upload Patient Records

You can upload the following file types:

- GIF, JPG, PNG, and XPS images
- MPEG and MOV videos
- PDF documents
- MP3 audio Files

To upload a patient record:

1. In the SCE Editor, tap the **Patient Record** tab.

2. In the screen that appears, tap **Patient Files > Add File**.

    The New Patient File screen appears.

New Patient File - Upload Screen

3. Click **Upload**. Select the desired file and tap **Open**.

4. When the file name and description appear, modify as needed in the text fields to reflect the desired file name and description.

5. Tap **Create**.

To view a patient record, select the record in **Patient Records**.

Edit or Delete Patient Records

You can only change the name or description of the patient record. You cannot edit the content of the record from the Patient Record tab.

To edit a patient record name:

1. From the list of Patient Files, tap the **Gear** icon next to the desired file.

2. Tap **Edit**. Change the **Name** or **Description** as needed.

3. Tap **Save**.

To delete a patient record:

1. From the list of Patient Files, tap the **Gear** icon next to the desired file.

2. Tap **Delete**.

3. When the message appears to confirm your selection, **click Delete**.

Runtime Configuration

Tap **Runtime Configuration** to access the Condition Setup screen. From the Quicklinks Setup screen, conditions, medications, and treatments can be preconfigured for the SCE by creating Quicklinks.

To navigate through available conditions, medications, and treatments, tap the **Conditions**, **Medications** and **Treatments** buttons.
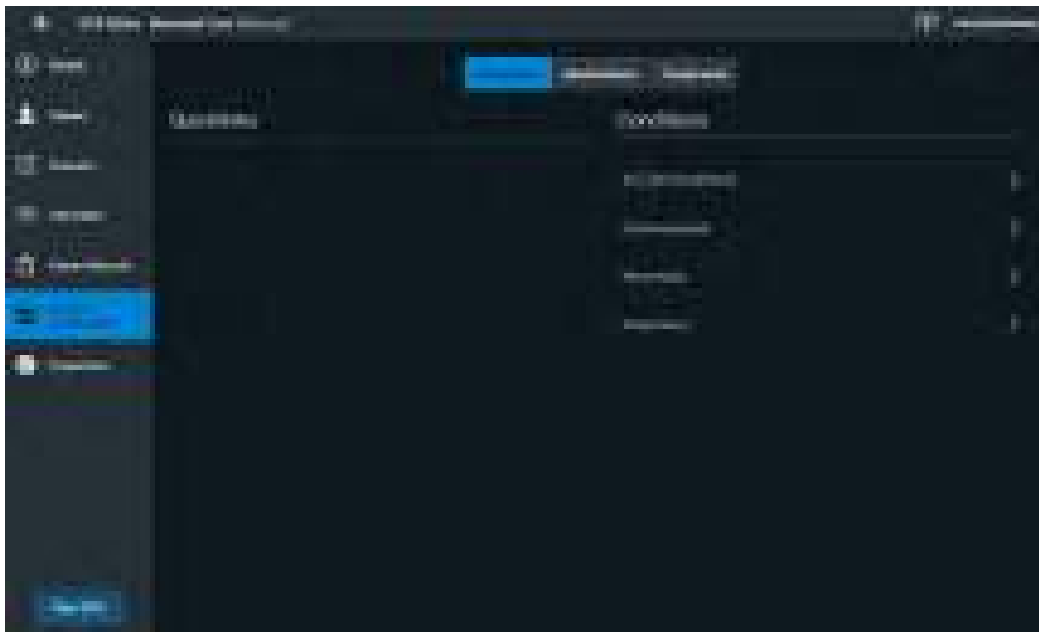
Runtime Configuration Screen

To create a Quicklink Favorite, select a Quicklink from the **Conditions**, **Medications** or **Treatments** lists.

Creating a Quicklink Favorite

To remove a Quicklink Favorite, deselect the option.

Preparation

From the Preparation tab, users can create a list of equipment and supplies, or notes about preparing the manikin for the SCE.

To create a list preparation items:

1. From the SCE Editor, tap the **Preparation** tab**.** Tap either **Equipment & Supplies** or **Manikin Setup.**

2. Tap the **Edit** button and enter items.

3. Tap **Save**.

LEARNING MODULES

Learning Modules are comprised of multiple SCE's. You can import or delete existing Learning Modules, or create new Learning Modules in Maestro.

Import a Learning Module

To import a Learning Module in Maestro:

1. From the SCE Manager screen, tap **More > Import Module.**

More Button

2. Locate the correct learning module file on the external storage device or hard disk drive where the learning module is located. The file extension is ***mlm***.

3. Select the file. Tap **Open.**

Delete a Learning Module

To delete a Learning Module from Maestro:

1. From the SCE Manager screen, tap **More > Manage Modules.**

Manage Modules Screen

2. Tap the **Trash** icon next to the module you want to delete.

3. When the message appears for you to confirm your selection, tap **Delete All**.

   All of the SCE's in the learning module will be deleted.

Create a Learning Module

To create a Learning Module

1. From the SCE Manager screen, tap **New SCE.**

   The New SCE screen appears.

New SCE Screen

2. Type a title for the SCE in the **SCE Title** field.

3. To select a module to add the SCE to, tap the dropdown arrow, then select a module. Or, tap the **+** icon to create a new module.

  • If creating a new module, type a name for it in the Enter New Module Name screen. Then, tap **Add**.
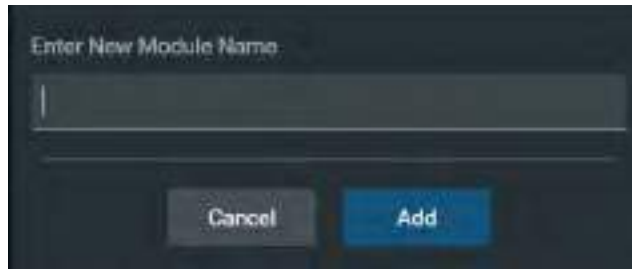
New Module Name Screen

4. Complete the remaining fields or select options as required. Tap **Create**.

ADMINISTRATIVE TOOLS

The Maestro software includes administrative tools to access and manage system settings, preferences, and additional information such as historical data about simulation sessions.

Administrative Tools

Access Administrative tools via the **Gear** icon located on the upper-right corner of the Home page.

Gear Icon

Select one or more of the following to access system settings:

- **System:** Access information about the Maestro software version, the type of simulator, along with **Preferences**, **License Manager** and **Maintenance**

- **Select Simulator:** Change the simulator (only available when using Maestro Standalone)

- **Language:** Change the Maestro language

System Administration

From the System Administration screen, you can access system information, set preferences, manage licenses and maintenance information for Maestro.

System Information and Settings

To access the System Settings, from the Home screen, tap the **Gear** icon. Then, select **System**.

System Administration

From this screen, you can select:

- **About**: to view simulator type, software version and system configuration.

  - Under Data Management, you can backup and restore data through the **Backup Data** and **Restore Data** buttons respectively.

    CAUTION: Restoring data permanently replaces all current data on the device. Make sure all users are disconnected from simulators before proceeding.

- **Preferences**: to change settings to different software features.

  - **General Preferences**: to adjust language, units of measure (metric or imperial), pressure and CPR settings.

- **License Manager:** to access license information. From here, you can start a trial of the Maestro software, and activate or deactivate the license.

- **Maintenance:** to access maintenance options, including simulator configuration and connected devices.

- **Peripherals**: to see which devices are connected and which ones have low battery.

Specify a Default Simulator

If using Maestro Standalone software, you can select a simulator and set it as the default when using Maestro.

To change the simulator type:

1. From the Home screen, select the **Gear** icon and tap **Select Simulator**.
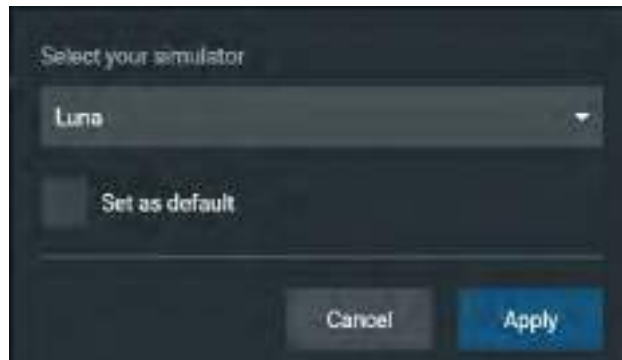
Select Simulator Screen
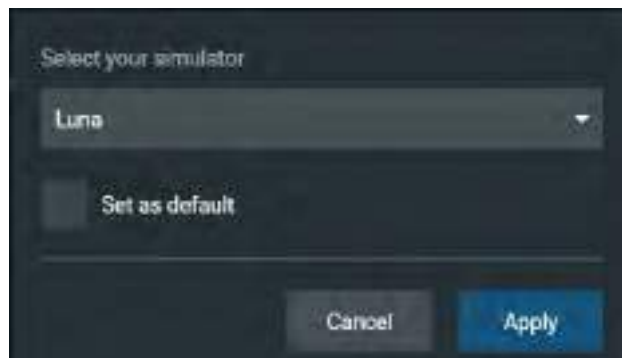
Select Simulator Screen

2. (Optional) Select **Set as default**.

3. Tap **Apply**.

Set the Default System Language

To set Maestro's language:

1. From the Home screen, click the **Gear** icon.
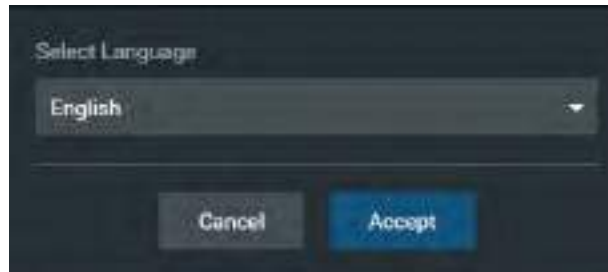
Select Language Screen

2. Select the desired language. Tap **Accept**.

    Note: Language can also be set from System > Preferences.

Additional Administrative Tools

You can access the CAEMaestro User Guide, support information, or system information.

From the Home screen, click the **Gear** icon, and then select one of the following:

-   **User Guide:** to download the user guide (English version). Go to: **www.caehealthcare.com** and click the **Support** link.

-   **Support**: for CAE Support contact information.

-   **About:** to access information about the Maestro software version, the type of simulator and the serial number.

SCE Management

The SCEs in Maestro are managed in the SCE Manager screen. For more information on managing and modifying settings of the SCEs using the SCE Manager, see *Using Maestro* section of this user guide.

Session History - History Screen

The History screen displays a log of simulation event data.

History Log Options

History Log Options

To view session data:

1. Tap the **History** tab.

2. Tap the **Gear** icon for the desired simulation session, then select **View Session Data**.
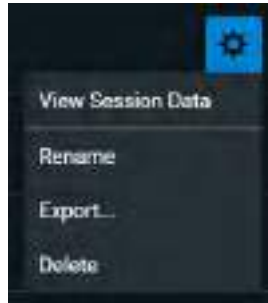
History Log Options

The Event Log, Physiological Data, and CPR Data appears. Click the Physiological Data for a session to view all physiological data that occurred during the SCE.

You can export data to a CSV or MSS file (session file in Maestro format) and store it on an external device.

To export data from the History screen, tap the **Gear** icon for the desired simulation session, then tap **Export**.

Peripheral Devices

This features identifies the devices associated with the simulator and whether they are connected to the simulator's network.

Peripheral Devices Icon

Tap the **Peripherals Device** icon to view the connection status and battery level to the right of each device name.

Peripheral Devices Menu

The full device details appear on the Peripherals Devices screen.
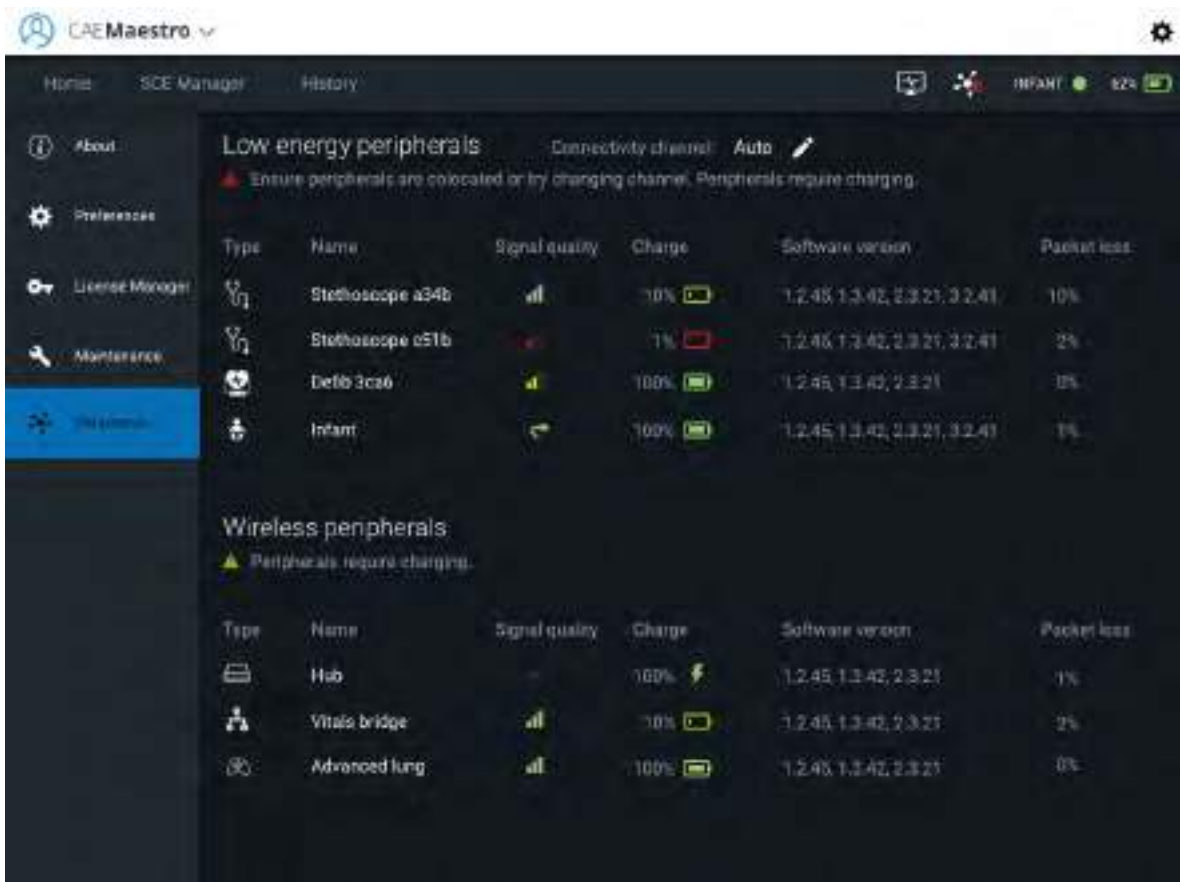
Peripheral Devices Screen

To adjust settings:

1. Tap the **Edit** icon to access the Low Energy Peripherals Channel.
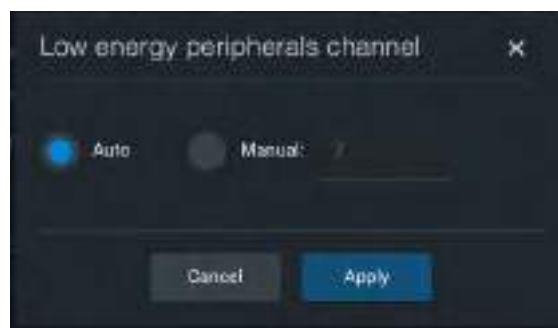
Low energy peripherals channel

2. Adjust settings as needed.

3. Tap **Apply**.

USING THE TOUCHPRO PATIENT MONITOR

TouchPro allows you to view the patient's physiology, expressed in waveforms and numeric values. This section will show you how to access and configure the TouchPro software.

The software can be used from the Instructor Tablet, or on another computing device, provided it has joined the simulator's wireless network and meets the minimum system requirements.

Access the TouchPro Patient Monitor

The TouchPro Patient Monitor software is compatible with computers that have touch-screen capabilities.

To run TouchPro, the Instructor Tablet (or other computing device) must be connected to the simulator's network.

Note: An SCE must be running in the Maestro software for any physiological data to appear in TouchPro. TouchPro can only show one patient at a time.

To launch TouchPro from the Instructor Tablet:

1. With an SCE running, tap the **CAETouchPro** icon in the upper-right corner of the screen.
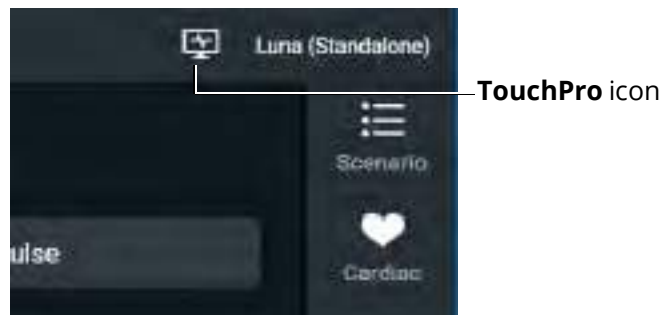
CAETouchPro icon

When TouchPro opens, the simulated patient monitor appears.

TouchPro Patient Monitor

Running TouchPro From Your Own Computing Device

If you want to use your own computing device to run the TouchPro software, it must meet the system requirements and be joined to the simulator network prior to use.

The simulator and Instructor Tablet form a local area network with static IP addresses. Refer to the following instructions or contact your system administrator to configure the network properties and connect the TouchPro software.

To connect to the TouchPro software using your own a computing device:

1. Ensure the Instructor Tablet is connected to the simulator network.

2. Unlock the Instructor tablet.

3. Tap **Apps > Settings > Connections > WiFi.**

4. Tap **ADVANCED** link in upper, right corner of the screen.

5. Write down the IP Address at the bottom of the window.

To launch TouchPro:

1. Power on the computing device with TouchPro installed.

2. Open a web browser, and then enter the **IPv4** address in the address field.

3. When prompted, download and install the Maestro application, then click on the TouchPro icon on desktop.

Configure TouchPro

The vital signs and colors, alarm suspension time, alarm ranges, and audible settings can be configured from the Settings panel.

To access the Settings panel:

1. Tap **Settings** in the bottom-right corner of the screen.

   The Settings menu appears.

2. Tap the **Layout** tab.

3. From the Layout that appears, select a Layout and tap **Edit**.

Settings Window

The Layout Edit window appears.

Layout Edit Window

4. Tap a signal to edit its parameters.

   The Insert a parameter window appears.

Insert a parameter Window

5. Adjust the signal's **Color**, **Alarm**, and **Graph Scale** parameters as needed.

6. Select a parameter to insert it in the place of the selected parameter.

7. When finished, tap the **X** in the upper-right corner to close the window.

    The Layout Edit window reappears.

8. Use the plus (**+)** buttons to add waveforms to the layout.

Layout Edit Window

TouchPro adds a line to the Layout.

9. Tap the new line to open the Insert a Parameter window.

10. Select the parameter to display on the new line.

11. Set the parameter's **Color** and **Alarms.** When finished, close the screen.

12. Tap **Done** to close the window.

    The Settings Layout Edit window opens.

13. Tap **Edit** to resume editing the layout.

14. Tap **Save As** to save the layout.

15. Type a name for the layout, then tap **Save**.

Sounds

To silence all sounds, click the **Mute** button in the bottom-left corner of the screen.
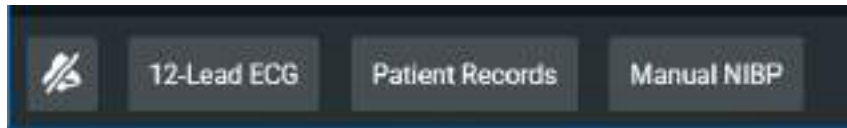
TouchPro Controls

To set up the audio for TouchPro:

1. Tap the **Settings** button in the bottom-right corner of the TouchPro screen.

2. From the Settings window, tap the **Audio Setup** tab.

TouchPro Audio Setup Window

3. (Optional) Select a waveform to set it as the pulse sound trigger.

4. (Optional) Select an Alarm Suspension Time to disable the selected waveform for an indicated amount of time.

5. When finished, tap **X** to close the window.

NIBP Cycling

When non-invasive blood pressure (NIBP) is displayed, the patient's NIBP can be updated at specified intervals using NIBP Cycling.

To set NIBP cycling:

1. Tap **Settings** in the bottom-right corner of the screen.

2. From the Settings menu, tap **NIBP Cycling.**

   The NIBP Cycling window appears.
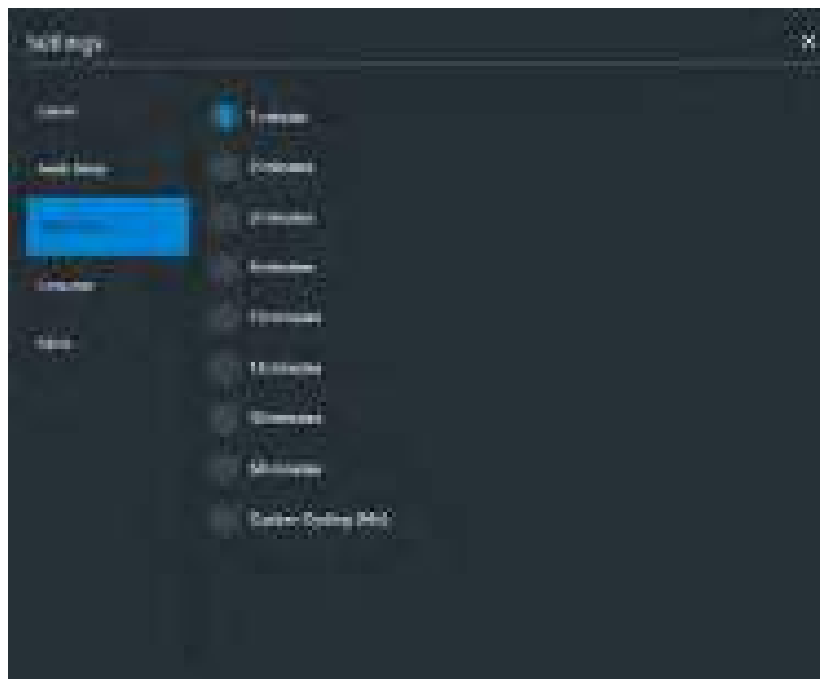
NIBP Cycling Window

3. Select the desired interval for the cycling.

Note: Custom cycling is also available.

Manual NIBP

To display the patient's current NIBP, from the TouchPro controls, tap the **Manual NIBP** button.
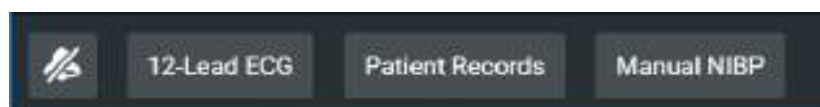
TouchPro Controls

Note: Manual NIBP can be used at any time during cycling, however it turns off auto-cycling.

CHANGE THE TOUCHPRO LANGUAGE

To change the default language of the software:

1. Tap **Settings** in the bottom-right corner of the screen.

2. From the Settings menu, tap the **Language** tab.

   The Language Selection window appears.
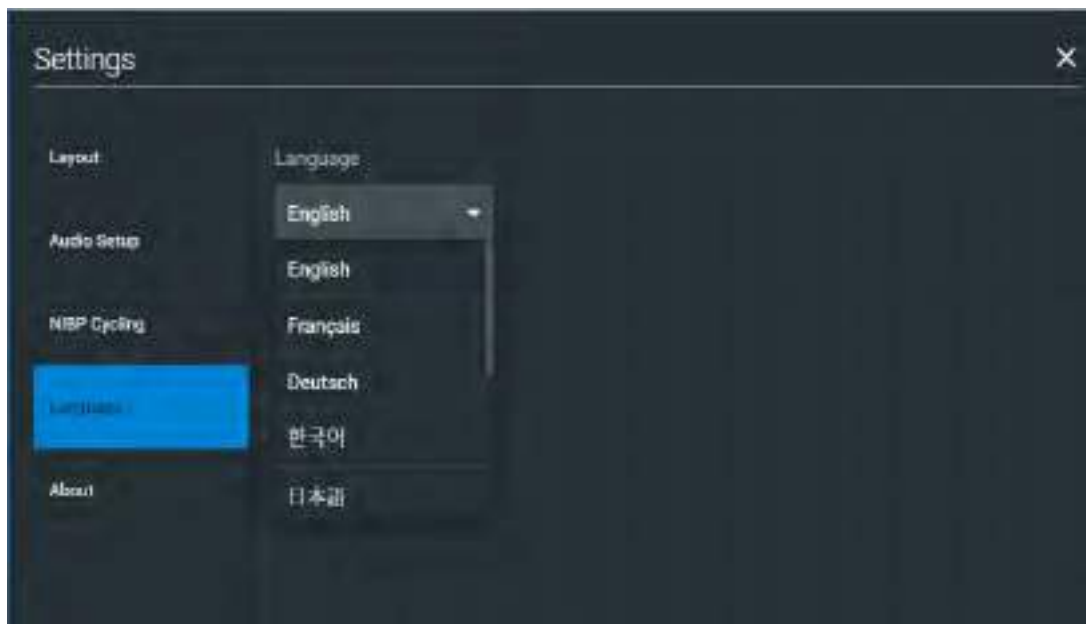
Language Selection Window

3. Select a language.

   The TouchPro software changes to the selected language.

Select a Preconfigured Layout

These are the preconfigured CAE Healthcare Layouts:

- **Nursing –** preconfigured with waveform and numeric readouts for ECG Lead II and SPO2 and numeric readouts for NIBP (noninvasive blood pressure) and body temperature

- **NICU Newborn –** preconfigured with waveform and numeric readouts for ECG Lead II, ABP, Preductal SpO2, Postductal SpO2, EtCO2 and numeric readouts for NIBP, MAP and body temperature

- **NICU Infant –** preconfigured with waveform and numeric readouts for ECG Lead II, ABP, SpO2 and EtCO2 and numeric readouts for NIBP, MAP and body temperature

- **Delivery Room –** preconfigured with waveform and numeric readouts for ECG Lead II, Preductal SpO2, Postductal SpO2 and EtCO2 and numeric readouts for NIBP and body temperature

To select a preconfigured layout:

1. Click the **Layout** drop-down menu in the upper-right corner of screen.

   The TouchPro Settings menu appears.

2. Select a layout.

12-Lead ECG

To view a 12-lead ECG report:

1. Tap the **12-Lead ECG** on the screen.
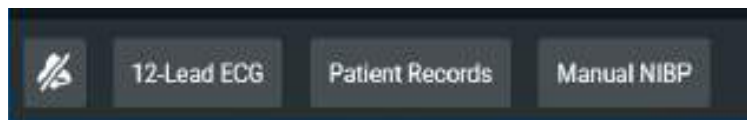
TouchPro Controls

The report appears.
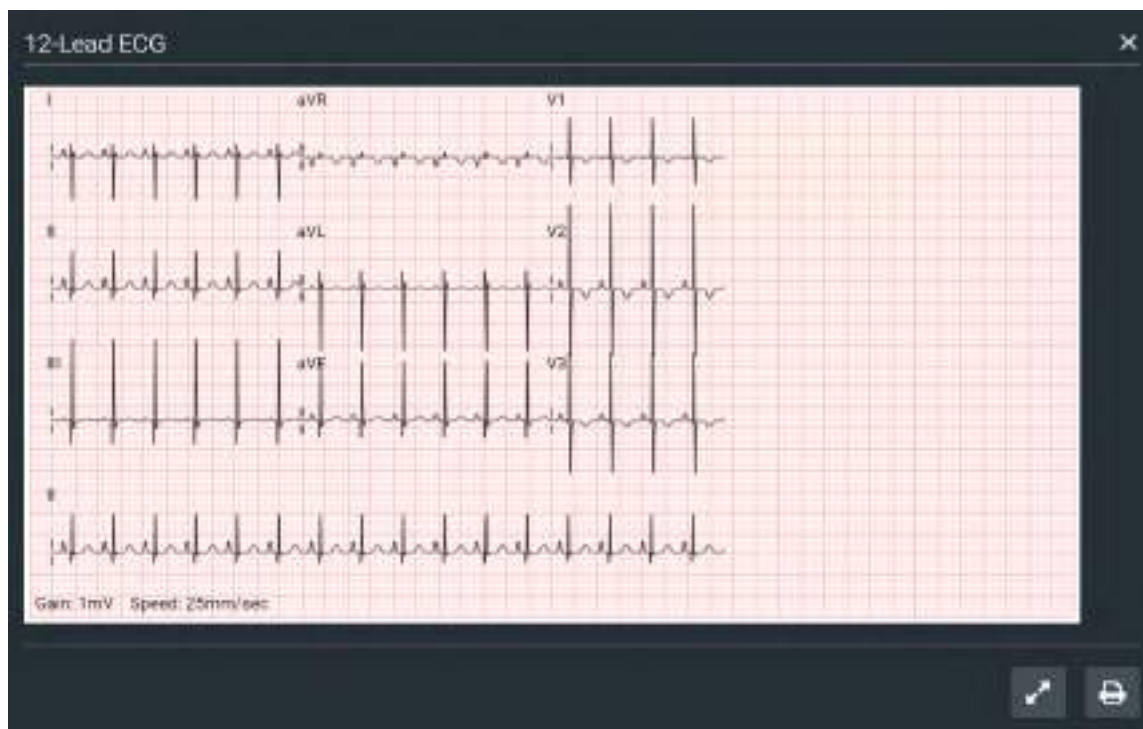
A 12-Lead ECG Report

2. (Optional) To view the full screen, tap the **Full Screen** button bottom-right corner of the 12-lead ECG report. Then, tap **Return** to return to the inset view.

— **Print**

— **Return** icon
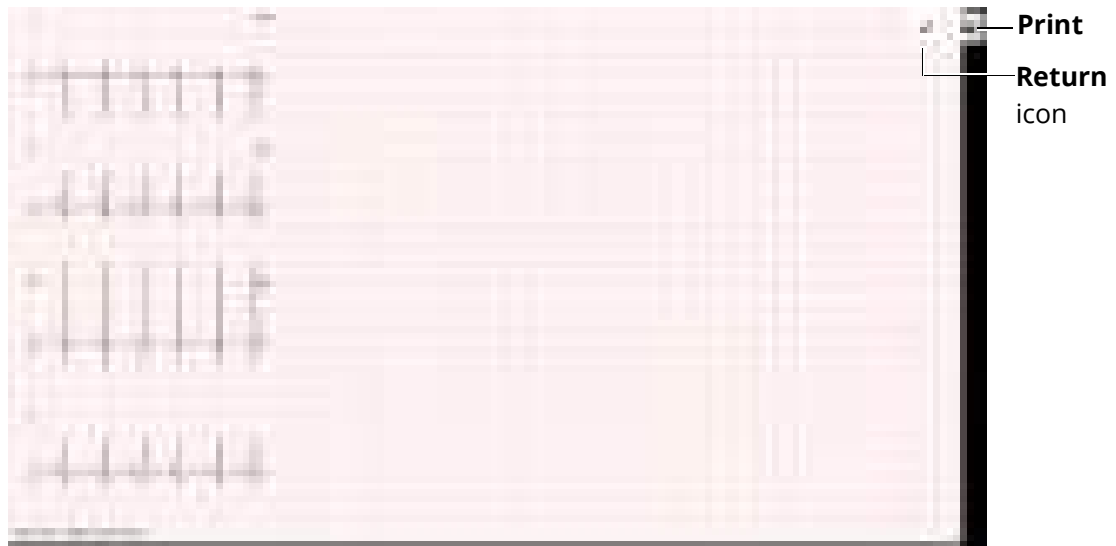
Full-screen 12-Lead ECG Report

3. Tap **Print** button to print the report.

    The Select a destination window appears.

4. Tap a new print destination.

5.   When the newly selected destination appears, tap **Print** to print the report.

Patient Record

To view Patient Records:

1. Tap **Patient Record** in the lower-left corner of the screen.
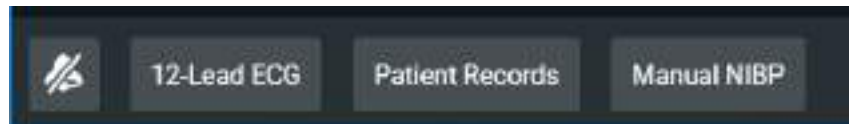
TouchPro Controls

The Patient Records window appears.
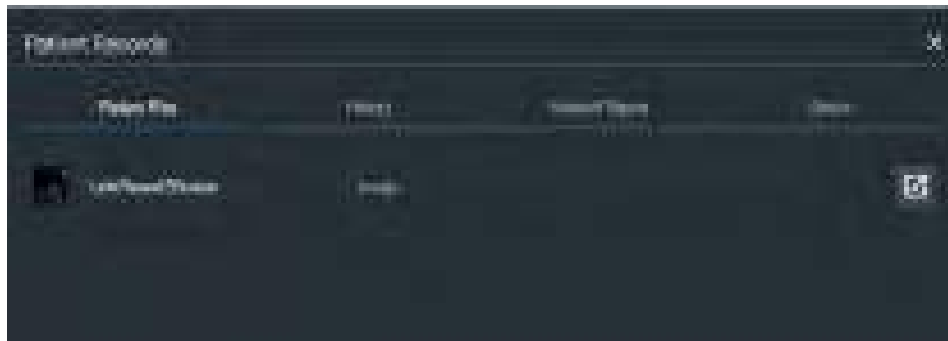
TouchPro Patient Records Window

This information provides access to the same Patient Files, History, Hand Off Record, and Orders information contained in Maestro.

Note: For this information to be visible in TouchPro, the facilitator must send it from the Maestro software.

Snapshot

The snapshot tool lets you capture an image of data on the screen, and then save it to your laptop or tablet. You might do this if you are connected to a wireless network where you cannot print a report.

To capture an image:

1. Tap **Snapshot** at the bottom of the screen.

   The Snapshot window appears showing the live date you want to capture.

Snapshot Window

2. To take another snapshot, tap the **Capture Snapshot** (camera) button at the bottom-right corner of the screen.

3. (Optional) Tap the **Expand** button at the bottom, right corner of the screen to open it to a full screen view.

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APPENDIX A - MAESTRO MANUAL PARAMETER DESCRIPTIONS

The Maestro software has a number of parameters that control the patient status and software-controlled features of the simulator. The parameters are grouped by category: Cardiac, Respiratory, Neuro, Fluids, Sounds, and Pulse.

The following is a brief description of each parameter. Each parameter description lists the default settings for Newborn patient as well as the ranges and/or controls for all patients.

Cardiovascular: Basic Parameters

Arterial Blood Pressure

The **Blood Pressure** parameter is used to set the value of the blood pressure (Manual mode) or override the physiological modeling for blood pressure in Modeled mode. The systolic and diastolic blood pressures can both be set to fixed numeric values, regardless of interventions performed. Resetting the parameter to **Modeled** returns control of the underlying blood pressure to the physiological models.The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 73/40 (Manual mode)
>
> **Range:**
>
> ° Systolic: 0 mmHg - 300 mmHg
>
> ° Diastolic: 0 mmHg - 300 mmHg

Central Venous Pressure (CVP)

The **CVP** parameter is used to set the CVP baseline and atrial contraction amplitude to fixed numeric values, thereby overriding the physiologic modeling for central venous pressure. Once set, intravascular volume changes have no effect on the CVP. In addition, once an override is applied, changes in tidal volume have no effect on the CVP waveform with the exception of an apneic patient where the minimum and maximum would be the same value since there is no inspiration or expiration. Depending on the volume status of the patient, the minimum/maximum value can be shifted up or down.

The available CVP controls are as follows:

- Minimum Diastolic: Baseline of the CVP at the end of an inspiration

- Maximum Diastolic: Baseline of the CVP at the end of an exhalation

- Pulse Amplitude: Size of the CVP wave during atrial contraction

For the override to take effect, the **Central Venous Catheter** must be set to the *Intrathoracic Vein*.

For example, with the minimum diastolic set to 5 mmHg, maximum diastolic set to 15 mmHg and pulse amplitude set to 2 mmHg, the CVP baseline is 15 mmHg, dipping to 5 mmHg with each inhalation, and the amplitude of the wave is 2 mmHg with each atrial contraction. The CVP baseline remains the same even in the event of intravascular volume changes and the depth of each dip due to inhalation remains at 5 mmHg even in the event of tidal volume changes. However, if the respiratory rate increases or decreases, the frequency of the dips will show a corresponding increase or decrease. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or
>
> - ° Minimum Diastolic: -1 mmHg
>
> - ° Maximum Diastolic: 4 mmHg
>
> - ° Pulse Amplitude: 2 mmHg
>
> **Range:**
>
> - ° Minimum Diastolic: -10 mmHg - 25 mmHg
>
> - ° Maximum Diastolic: -10 mmHg - 25 mmHg
>
> - ° Pulse Amplitude: 0 mmHg - 50 mmHg

Pulmonary Artery Pressure (PAP)

The **PAP** parameter is used to set the pulmonary artery pressure in Manual mode or override the physiological modeling for pulmonary artery pressure in Modeled mode. The systolic and diastolic pressures can both be set to fixed numeric values, regardless of interventions performed. Resetting the parameter to **Modeled** returns control of the underlying pulmonary artery pressure to the physiological models. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 45/35 (Manual mode)
>
> **Range:**
>
> - ° Systolic 0 mmHg - 70 mmHg
>
> - ° Diastolic 0 mmHg -70 mmHg

Pulmonary Capillary Wedge Pressure (PCWP)

The **PCWP** parameter is used to display the patient's pulmonary capillary wedge pressure. It is used to simulate the pressure as measured by wedging a pulmonary catheter with an inflated balloon into a small pulmonary arterial branch. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 8 mmHg (Manual mode)
>
> **Range:** -10 mmHg - 100 mmHg

Heart Rate

The **Heart Rate** parameter is used to set the heart rate to a given (fixed) number of beats per minute. Once the heart rate is set to a numeric value, administered drugs or intravascular volume changes have no effect on the heart rate, Use this parameter to "fix" or set the heart rate to a specific number. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 145 bpm (Manual mode)

> **Range**: 30 beats per minute - 220 beats per minute

Cardiac Output

The **Cardiac Output** parameter displays the volume of blood pumped by the heart per minute. **Cardiac Output** is a function of heart rate (the number of heart beats per minute) and stroke volume (the volume of blood pumped out of the heart with each beat). **Cardiac Output** does not affect the rest of the physiology. For example, if cardiac output is set to zero, it will be shown on the TouchPro as zero, but the patient will still have a blood pressure and pulses. The set change can also be programmed to occcur over time using the onset control.

> **Default:** Modeled or 0.8 L/min (Manual mode)

> **Range:** 0 L/min - 3 L/min

Cardiac Rhythm

The **Cardiac Rhythm** parameter is used to change the patient's underlying cardiac rhythm displayed on the Patient Status Display or TouchPro patient monitor. To change the cardiac rhythm, click the **Cardiac Rhythm** parameter and select the desired rhythm from the available list. If a number appears following the cardiac rhythm on the list, this overrides the heart rate to the rate indicated.

> **Default**: Modeled or Sinus (Manual mode)

> **Options:**

> **A**

> Abnormal P wave

> Asystole

> AV Block, First-Degree

> AV Block, Second-Degree, Mobitz I

> AV Block, Second-Degree, Mobitz II

> AV Block, Third-Degree

> **B**

> Bundle Branch Block, Left

Bundle Branch Block, Right

H

Hypertrophy, Left Ventricular

Hypertrophy, Right Ventricular

L

Long QT Syndrome

Low QRS voltage

S

Sinus

Sinus Tachycardia

ST Segment Elevation

Supraventricular Tachycardia

T

Third Degree AV Block

V

Ventricular Fibrillation, Coarse

Ventricular Tachycardia

W

Wolff Parkinson White Waveform

Pulseless Electrical Activity

The **Pulseless Electrical Activity** parameter triggers a clinical condition characterized by unresponsiveness and lack of palpable pulse in the presence of organized cardiac electrical activity. It is either ON or OFF.

Default: OFF

PVC Probability

The **PVC Probability** parameter represents the percentage of cardiac cycles containing a premature ventricular contraction (contraction of the ventricles that occurs earlier than usual due to abnormal electrical activity of the ventricles).

The **PVC Probability** is used to set the frequency of PVCs within any cardiac rhythm. The set change can also be programmed to occur over time using the onset control.

> **Default:** 0

> **Range:** 0% - 90%

Hemoglobin

The **Hemoglobin** parameter is used to set a fixed hemoglobin value. Hemoglobin does not affect the rest of the physiology. The value set will be shown on the Touch Pro if selected in one of the numeric fields. The set change can also be programmed to occur over time using the onset control.

> **Default:** 14.0

> **Range:** 10.0 g/dL - 20.0 g/dL

Respiratory: Basic Parameters

Apnea

The **Apnea** parameter triggers a clinical condition characterized by no spontaneous breathing. Active arm movement, lung sounds and vocal sounds will cease when apnea is enabled. It is either ON or OFF.

> **Default:** OFF

Breathing Pattern

The **Breathing Pattern** parameter is used to demonstrate different spontaneous breathing patterns on the manikin.

> **Apneustic:** 15.0

> **Regular:** 10.0 g/dL - 20.0 g/dL

> **Default:** Regular

Laryngospasm

Use the **Laryngospasm** parameter to simulate closed cords. Enable the laryngospasm paramater, then close the cords manually using the syringe and tubing assembly connected to the layrngospasm port underneath the back side of the manikin's neck. When the cords are closed, a "cannot intubate, cannot ventilate" crisis scenario is achieved. To open the cords, turn the Laryngospasm parameter OFF.

> **Default:** OFF

Substernal Retractions

Use the **Substernal Retractions** parameter to display substernal retractions on the manikin. It is either ON or OFF.

> **Default:** OFF

Cyanosis

The **Cyanosis** parameter is used to display circumoral cyanosis (blue coloring). The intensity of the blue coloring can be set. The set intensity can also be programmed to occur over time using the onset.

> **Default:** 0

> **Range:** 0% - 100%

Bronchial Occlusion (Left and Right)

Turning on the **Bronchial Occlusion** parameter completely obstructs the right or left bronchi, simulating a lower airway obstruction (e.g., mucus plug).

Right and left bronchi can be occluded individually.

Improper intubation creates a mainstem occlusion, yielding an inability to ventilate the lungs. However, the right and left bronchi are not occluded individually.

> **Default:** OFF

Respiratory Rate

The **Respiratory Rate** parameter is used to set the respiratory rate to a given number of breaths per minute. The patient continues to breathe at the set number of breaths per minute, regardless of the arterial oxygen or carbon dioxide levels.

For example, when the respiratory rate is set to 10 breaths per minute, the respiratory rate remains at 10 breaths per minute, regardless of arterial oxygen or carbon dioxide levels.

> **Default**: Modeled or 45 (Manual mode)

> **Range**: 0 breaths per minute - 75 breaths per minute

Pre-ductal SpO$_2$

The **Pre-ductal SpO$_2$** parameter is used to set a fixed numeric value, regardless of the oxygen applied. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 97% (Manual mode)

> **Range:** 0% - 100%

Post-ductal SpO$_2$

The **Post-ductal SpO$_2$** parameter is used to set a fixed numeric value, regardless of the oxygen applied. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 96% (Manual mode)

> **Range:** 0% - 100%

SpO$_2$

The SpO$_2$ parameter is used to override the normal pulmonary circulation and set the SpO$_2$ at a fixed numeric value, regardless of the oxygen applied. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 97% (Manual mode)

> **Range:** 0% - 100%

EtCO$_2$

The EtCO$_2$ parameter is used to set the end-tidal CO$_2$ to a fixed numeric value, measured in mmHg, regardless of the minute ventilation. The end exhalation point of the capnogram waveform will also reflect the set end-tidal CO$_2$ value. Setting the EtCO$_2$ has no effect on the arterial carbon dioxide values (PaCO$_2$), respiratory rate or tidal volume.

For example, when the EtCO$_2$ is set to 50 mmHg, the numeric end-tidal CO$_2$ will display a value of 50 mmHg and the capnogram waveform rises to an end-tidal of 50 mmHg. However, the respiratory rate and tidal volume will remain the same unless the Respiratory Rate and/or the Tidal Volume parameter(s) is adjusted. The set change can also be programmed to occur over time using the onset control.

> **Default:** Modeled or 38 mmHg (Manual mode)
>
> **Range:** 0 mmHg – 100 mmHg

Tidal Volume

The **Tidal Volume** parameter is used to set the tidal volume to a given volume per breath. Once Tidal Volume is set to a numeric value, arterial oxygen and carbon dioxide values have no effect on the tidal volume, .

For example, with the tidal volume set to 200 mL, the tidal volume remains a constant (set) 200 mL even in the event of falling arterial oxygen levels. In such situations, the patient can only respond to arterial oxygen or carbon dioxide levels by altering the respiratory rate, either automatically via the model-driven controls or when thewith the **Respiratory Rate** parameter is adjusted. The set change can also be programmed to occur over time using the onset control.

> **Default**: Modeled or 25 mL (Manual mode)
>
> **Range**: 0 mL - 250 mL

I to E Ratio (1:X)

The **I to E Ratio (1:X)** parameter can be used to change the ratio of inspiratory time:expiratory time (I:E). The I to E Ratio does not affect physiology. The set change also be programmed to occur over time using the onset control.

> **Default:** 1.75
>
> **Range**: 0.5 - 7.0

Intrapleural Volume (Vol): (Left and Right)

The **Intrapleural Vol** parameters allow intrapleural volume to accumulate, for example, as happens during pneumothorax, hydrothorax or hemothorax.

To simulate a pneumothorax, set the corresponding **Intrapleural Vol** to a value greater than 0 mL. Breath sounds and chest rise are automatically diminished on the appropriate side due to decreased ventilation of the affected lung. The set change can also be programmed to occur over time using the onset control.

> **Default**: 0

> **Range**: 0 mL - 100 mL

pH

Use the pH parameter to set a fixed pH value. The pH does not affect the rest of the physiology. The value set will be shown on the patient monitor if selected in one of the numeric fields. The set change can also be programmed to occur over time using the onset control.

> **Default:** 7.39

> **Range**: 6.9 - 7.9

Neurological:

Intracranial Pressure (ICP)

The ICP parameter is used to set the ICP displayed as a numeric value on the Patient Status Display and on the TouchPro monitor.

> **Default**: Modeled or 10 mmHg (Manual mode)

> **Range:** 0 mmHg - 65.0 mmHg

Temperature: Body

The temperature measured at the body surface can be set using this parameter and can be displayed on the Patient Status Display and TouchPro software.

The body temperature is not linked to the physiologic models. However, changes can be made "on the fly" or scripted using the Scenario Designer. The set change can also be programmed to occur over time using the onset control.

> **Default**: 36.5°C

> **Range**: 32.0°C - 42.0°C

Temperature: Blood

The arterial blood temperature can be set using the **Temperature: Blood** parameter. The arterial blood temperature can then be displayed on the Patient Status Display and TouchPro software.The set change can also be programmed to occur over time using the onset control.

> **Default**: 37°C

> **Range**: 32.0°C - 42.0°C

Reflex Irritability

Use the **Reflex Irritability** parameter to log the level of the infant's reflexes during the learner's assessment. This parameter is log only and has no effect on physiology or the manikin.

> **Type:**
>
> ° Absent
>
> ° Vigorous
>
> ° Weak

Arm Movement

Use the **Active Arm Movement** parameter to demonstrate active, asynchronized, random arm movement of both arms. If apnea or loss of consciousness are enabled, active arm movement will cease. This parameter is either ON or OFF.

> **Default:** OFF

Loss of Consciousness

Use the **Loss of Consciousness** parameter to simulate loss of consciousness of the patient. When enabled, active movement and vocal sounds will cease. This parameter is either ON or OFF.

> **Default:** OFF

Convulsions

Use the **Convulsions** parameter to demonstrate a faster movement than the Arm Movement paramater. If apnea or loss of consciouness are enagled, convulsions will cease. This parameter is either ON or OFF.

> **Default:** OFF

Stimulation

Use the **Stimulation** parameter to log that the learner stimulated the infant by clicking on the **Infant Stimulation** button. This parameter has no effect on the manikin.

Fluids

There are two categories of fluids: BLEEDING and INFUSION.

BLEEDING

Fluid Loss Blood

When used, the **Fluid Loss Blood** parameter reflects a decrease in total blood volume. Blood loss proportionally decreases both the red blood cell volume and the plasma volume according to the current hematocrit. The loss of the volume set can be an immediate one time loss or the volume loss over time.

> **Range:** 0 mL - 200 mL

Fluid Loss Plasma

When used, the **Fluid Loss Plasma** parameter reflects a decrease in plasma volume. Plasma loss decreases the plasma volume without changing the red blood cell volume. It refers collectively and generically to all fluid losses, including evaporative, transcellular, bowel and third space fluid losses.

> **Range:** 0 mL - 200 mL

INFUSION

Colloid Infusion

When used, the **Colloid Infusion** parameter reflects an addition to the plasma volume without changing the red blood cell volume. Colloids include modified fluid gelatin starch solutions, dextran and human albumin. The volume selected can be administered as an immediate bolus or as an infusion over time.

> **Range:** 0 mL - 200 mL

Crystalloid Infusion

When used, the **Crystalloid Infusion** parameter reflects an addition to the plasma volume without changing the red blood cell volume. The term crystalloid is used to describe salt solutions for infusion (e.g., normal saline, dextrose in water, Ringer's Lactate). The volume selected can be administered as an immediate bolus or as an infusion over time.

> **Range:** 0 mL - 200 mL

PRBC Infusion

Packed red blood cells are a preparation of 70% red blood cells and 30% liquid plasma, often administered in severe anemia to restore adequate levels of hemoglobin and red cells without overloading the vascular system with excess fluids. The volume selected can be administered as an immediate bolus or as an infusion over time.

> **Range:** 0 mL - 200 mL

Whole Blood Infusion

The term whole blood is used to refer to blood that has not been separated into its various components. It represents a preparation of 40% red blood cells and 60% liquid plasma. The volume selected can be administered as an immediate bolus or as an infusion over time.

> **Range:** 0 mL - 200 mL

Sounds

A variety of simulated sounds are available to create a realistic experience. Click the **Sounds** button on the Run screen to access the Sounds controls.

Heart Sounds

Heart sounds are synchronized with the cardiac cycle and can be auscultated over the left upper and lower sternal border.

Heart sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Heart Sounds**. The Heart Sounds menu will appear.

Independent control of the type and volume of heart sounds may be selected in each anatomical region.

Type:

° Upper

° Lower

To affect the heart sounds simultaneously in all anatomical regions, select **All** and the desired sound.

Default: Normal

Type:

° Normal Mitral

° Normal S1

° S3

° S4

° S3 and S4

° Early Systolic Murmur

° Mid Systolic Murmur

° Late Systolic Murmur

° Holosystolic Murmur

° Late Diastolic Murmur

Note: The volume control slider can be used to adjust the amplitude of the sound.

Lung Sounds

Normal and abnormal breath sounds are selected using this parameter. Breath sounds are synchronized with ventilation of the left and right lungs.

Breath sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Lung Sounds**. The Lung Sounds menu will appear.

Independent control of the type and volume of heart sounds may be selected in each anatomical region.

> **Type:**
>
> - ° Left Upper
> - ° Left Lower
> - ° Right Upper
> - ° Right Lower

To change breath sounds, select the desired sound from the **Lung Sounds** menu.

> **Default:** Normal
>
> **Type:**
>
> - ° Normal
> - ° Stridor
> - ° Wheezing
> - ° Pneumothorax
> - ° Bronchovesicular
> - ° Crackles
> - ° Rhonchi

NOTE: *The volume control slider can be used to adjust the amplitude of the sound.*

Bowel Sounds

Bowel sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Bowel Sounds**. The Bowel Sounds menu will appear.

Normal, **Hypoactive**, **Hyperactive** and absent bowel sounds (**None**) are selected using this parameter. For no bowel sounds, click the status toggle to OFF.

> **Type:**
>
> - ° Normal
> - ° Hypoactive
> - ° Hyperactive

Independent control of the type and volume of bowel sounds may be selected in each anatomical region.

> **Locations:**
>
> - ° Left Upper
> - ° Right Upper
> - ° Left Lower
> - ° Right Lower

To affect the bowel sounds simultaneously in all anatomical regions, select **All Bowel Sounds** and the desired sound.

> **Default**: Normal

Note: The volume control slider underneath each area may be used to adjust the amplitude of the sound. The volume control slider is only enabled while connected to a simulator.

Vocal Sounds

Vocal sounds are selected using this parameter.

Vocal sounds can be adjusted by clicking on the Sound icon on the Run screen. When the Sounds panel appears, select **Vocal Sounds**. The Vocal Sounds menu will appear.

> **Default**: None
>
> **Type:**
>
> - None
> - Breathing
> - Strong Cry
> - Weak Cry
> - Gasping
> - Expiratory Grunting
> - Hiccups
> - Stridor
> - Wheezing
> - Sneezing
> - Screaming
> - Coughing
> - Cooing

Note: The volume control slider can be used to adjust the amplitude of the sound.

Pulses

All pulses are enabled by default, unless altered by an SCE. To change a pulse setting, tap the **Pulse** icon on the Run screen. Tap the desired pulse location on the image.

Pulse	Default	Range
Left Brachial	ON	Not Applicable
Right Brachial	ON	Not Applicable
Brachial Deficit	40 mmHg	0 - 300
Left Fermoral	ON	Not Applicable
Right Femoral	ON	Not Applicable
Femoral Deficit	40 mmHg	0 - 300
Umbilical Pulse	Post-delivery: ON Newborn: OFF Infant: OFF	Not Applicable
Umbilical Deficit	40 mmHg	0 - 300

The pulse can be turned ON or OFF.

The pulse intensity can be set to:

- ° Absent
- ° Weak
- ° Normal
- ° Bounding

The pulse deficit can be changed from default to another value. When the systolic pressure falls below the set pulse deficit, the pulse will turn off.

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APPENDIX B - CONDITION GUIDELINES FOR PROGRAMMING LUNA WITH MAESTRO

These guidelines are intended to help you select Maestro conditions to achieve desired vital signs within each programmed state. All four conditions should be programmed into each state in the order presented below.

- Respiratory: Desaturation
- Cardiovascular: Blood Pressure
- Cardiovascular: Heart Rate
- Respiratory: Respiratory Rate

The Maestro software is physiologically driven. When using multiple conditions (e.g., Desaturation + Hypertension + Tachycardia + Tachypnea), physiological regulatory mechanisms such as the baroreceptor reflex and ventilatory control cause compensatory changes within parameters. To achieve the desired vital sign, select one condition level above (greater) or below (less) to achieve the desired physiological effect.

Respiratory: Desaturation

Desaturation	Pre-ductal SpO$_2$	Post-ductal SpO$_2$
Reset	99%	94%
High 90s	97%	92%
Mid 90s	95%	90%
Low 90s	92%	87%
High 80s	87%	82%
Mid 80s	84%	79%
Low 80s	81%	76%
High 70s	78%	73%
Mid 70s	75%	70%
Low 70s	72%	67%
Less than 70	58%	53%

Cardiovascular: Blood Pressure

Hypertension		Hypotension	
Reset	73/40	Reset	73/40
Mild	90/47	Mild	59/36
Moderate	95/51	Moderate	55/34
Severe	100/60	Severe	50/30

Cardiovascular: Heart Rate

Tachycardia		Bradycardia	
Reset	140	Reset	140
Mild	170	Mild	100
Moderate	180	Moderate	90
Severe	190	Severe	80

Respiratory: Respiratory Rate

Tachypnea		Bradypnea	
Reset	42	Reset	40
Mild	60	Mild	10
Moderate	65	Moderate	8
Severe	72	Severe	6

APPENDIX C - MEDICATION INFORMATION

The following table describes the medications available for administration in the Maestro software. Each medication is listed along with:

- Any effects on the patient's physiology (modeled or log-only)

- The medication category

- The predefined dosage choices

- The units used for custom dosages

- The route of administration.

When a medication has more than one possible route of administration, it is listed on a separate row for each route.

Medication	Modeled or Log Only	Category	Predefined Dosages	Custom Dosage Options Units	Route
Acetaminophen	L	Analgesic	10mg/kg 15 mg/kg	mg/kg	PO, PR, IV
Adenosine	M	Cardiovascular	0.05 mg/kg 0.1 mg/kg	mg/kg	IV/IO
Albumin 5%	L	Volume Expander	0.5 gram/kg	gram/kg	IV/IO
Albuterol	L	Bronchodilator	0.05 mg/kg 0.10 mg/kg 0.15 mg/kg	mg/kg	Nebulizer
Alprostadil	L	Cardiovascular	0.01 mcg/kg/min 0.05 mcg/kg/min 0.1 mcg/kg/min 0.4 mcg/kg/min	mcg/kg/min	IV/IO
Amiodarone	M	Cardiovascular	5 mcg/kg/min 10mcg/kg/min 15mcg/kg/min 5mg/kg	mg/kg mcg/kg/min	IV/IO
Atropine	M	Cardiovascular	0.02 mg/kg 0.04 mg/kg 0.05 mg/kg 0.06 mg/kg	mg/kg	IV/IO, IM, ET
Caffeine Citrate	L	Stimulant	5 mg/kg 10 mg/kg 20 mg/kg 25 mg/kg	mg/kg	IV, PO
Calcium Chloride 10%	L	Cardiovascular	10 mg/kg 20 mg/kg 50 mg/kg/hr	mg/kg mg/kg/hr	IV/IO
Calcium Gluconate	L	Mineral	100mg/kg 200 mg/kg	mg/kg	IV

Captopril	L	Cardiovascular	0.01 mg/kg 0.05 mg/kg 0.1 mg/kg	mg/kg	PO
Chloral Hydrate	L	Hypnotic	25 mg/kg 50mg/kg	mg/kg	PO, PR
Chlorothiazide	L	Diuretic	5 mg/kg 10 mg/kg 20 mg/kg	mg/kg	IV, PO
Curosurf	L	Respiratory	1.25 ml/kg 2.5 ml/kg	mL/kg	ET
Dexamethasone	L	Corticosteroid	0.25 mg/kg 0.5 mg/kg	mg/kg	IV, PO
Dextrose	L	Anti-Hypoglycemic	0.2 gram/kg 1 gram/kg	gm/kg	IV/IO
Diazepam	L	Hypnotic	0.1 mg/kg 0.2 mg/kg 0.3 mg/kg	mg/kg	IV, IM, PO
Digoxin	L	Cardiovascular	6 mcg/kg 8 mcg/kg 10 mcg/kg	mcg/kg	IV, PO
Diphenhydramine	L	Histamine Blocker	1 mg/kg 2 mg/kg	mg/kg	IV/IO, IM, PO
Dobutamine	M	Cardiovascular	2 mcg/kg/min 5 mcg/kg/min 10 mcg/kg/min 20 mcg/kg/min	mcg/kg/min	IV/IO
Dopamine	M	Cardiovascular	2 mcg/kg/min 5 mcg/kg/min 10 mcg/kg/min 20 mcg/kg/min	mcg/kg/min	IV/IO
Enalapril	L	Cardiovascular	0.04 mg/kg 0.1 mg/kg	mg/kg	PO
Enalaprilat	M	Cardiovascular	5 mcg/kg 10 mcg/kg	mcg/kg	IV
Epinephrine 1:10,000	M	ACLS/Cardiovascular	0.01 mg/kg (IV, IO) 0.05 mg/kg (ET) 0.1 mg/kg (ET)	mg/kg mcg/kg/min	IV,IO, ET
Esmolol	M	Cardiovascular	25 mcg/kg/min 50 mcg/kg/min 100 mcg/kg/min	mcg/kg/min	IV
Etomidate	M	Hypnotic	0.2 mg/kg 0.4 mg/kg	mg/kg	IV/IO
Fentanyl	M	Narcotic	1 mcg/kg 2 mcg/kg 3 mcg/kg 4 mcg/kg 1 mcg/kg/hr 2 mcg/kg/hr 3 mcg/kg/hr 4 mcg/kg/hr 5 mcg/kg/hr	mcg/kg mcg/kg/hr	IV

Flumazenil	L	Antagonist	0.01 mg/kg	mg/kg	IV
Furosemide	L	Diuretic	1 mg/kg 2 mg/kg	mg/kg	IV, IM
Hydralazine	L	Cardiovascular	0.1 mg/kg 0.2 mg/kg	mg/kg	IV, IM
Hydrocortisone	L	Corticosteroid	1 mg/kg 2 mg/kg 3 mg/kg 4 mg/kg 5 mg/kg	mg/kg	IV
Indomethacin	L	Prostaglandin Inhibitor	0.1 mg/kg 0.2 mg/kg	mg/kg	IV
Infasurf	L	Respiratory	3 ml/kg	mL/kg	ET
Insulin	L	Hormone	0.05 u/kg 0.1 u/kg	units/kg	IV
Ipratropium bromide	L	Respiratory	25 mcg/kg/dose 175 mcg/dose	mcg mcg/kg	Nebulizer
Isoproterenol	M	Cardiovascular	0.05 mcg/kg/min 0.1 mcg/kg/min 0.15 mcg/kg/min 2 mcg/kg/min	mcg/kg/min	IV
Lidocaine	M	Cardiovascular	0.5 mg/kg 1.0 mg/kg 2 mg/kg 20 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Lorazepam	L	Hypnotic	0.05 mg/kg 0.1 mg/kg	mg/kg	IV
Magnesium Sulfate	L	ACLS	25 mg/kg 50 mg/kg	mg/kg	IV/IM
Mannitol	L	Diuretic	0.5 gm/kg 1.0 gm/kg	gm/kg	IV
Meperidine	L	Narcotic	0.2 mg/kg 0.5 mg/kg	mg/kg	IV, IM, PO,SQ
Methadone	L	Narcotic	0.05 mg/kg 0.1 mg/kg	mg/kg	PO, SC, IM, IV
Methylprednisolone	L	Corticosteroid	1 mg/kg	mg/kg	IV/IO, IM
Midazolam	M	Hypnotic	0.05 mg/kg 0.1 mg/kg 0.15 mg/kg 1 mcg/kg/min	mg/kg mcg/kg/min	IV
Milrinone	L	Vasodilator	50 mcg/kg 0.25 mcg/kg/min 0.5 mcg/kg/min 0.75 mcg/kg/min	mcg/kg mcg/kg/min	IV/IO
Morphine	M	Narcotic	0.05 mg/kg 0.1 mg/kg 0.01 mg/kg/hr 0.02 mg/kg/hr	mg/kg mg/kg/hr	IV
Naloxone	M	Antagonist	0.1 mg/kg	mg/kg	IV/IO, ET, IM, SC

Neostigmine	L	Neuromuscular Blockade	0.03 mg/kg 0.05 mg/kg 0.07 mg/kg	mg/kg	IV
Nitroglycerin	L	Cardiovascular	0.25 mcg/kg/min 0.5 mcg/kg/min	mcg/kg/min	IV/IO
Nitroprusside	L	Cardiovascular	0.5 mcg/kg/min 1.0 mcg/kg/min 2.0 mcg/kg/min	mcg/kg/min	IV/IO
Norepinephrine	L	Cardiovascular	0.05 mcg/kg/min 0.1 mcg/kg/min	mcg/kg/min	IV/IO
Pancuronium	L	Neuromuscular Blockade	0.05 mg/kg 0.1 mg/kg	mg/kg	IV
Phenobarbital	L	Hypnotic	3 mg/kg 5 mg/kg 15 mg/kg 20 mg/kg	mg/kg	IV, IM, PO
Phenylephrine	L	Cardiovascular	0.1 mcg/kg/min 0.5 mcg/kg/min	mcg/kg/min	IV
Phenytoin	L	Anticonvulsant	5 mg/kg 15 mg/kg 20 mg/kg	mg/kg	IV, PO
Procainamide	M	Cardiovascular	7 mg/kg 10 mg/kg 20 mcg/kg/min 40 mcg/kg/min 80 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Propranolol	L	Cardiovascular	0.01 mg/kg 0.1 mg/kg 0.15 mg/kg 0.25 mg/kg	mg/kg	IV, PO
Racemic Epi	L	Bronchodilator	0.25 ml	mL	IN
Rocuronium	L	Neuromuscular Blockade	0.4 mg/kg 0.5 mg/kg 0.6 mg/kg	mg/kg	IV/IO
Sodium Bicarbonate 4.2%	L	Cardiovascular	1m Eq/kg 2m Eq/kg	mEq/kg	IV, IO
Succinylcholine	M	Neuromuscular Blockade	2 mg/kg	mg/kg	IV
Survanta	L	Respiratory	4 ml/kg	mL/kg	ET
Terbutaline	L	Respiratory	2 mcg/kg 10 mcg/kg 0.1 mcg/kg/min	mg/kg mcg/kg/min	IV/IO
Theophylline	L	Bronchodilator	2 mg/kg 5 mg/kg	mg/kg	PO
Vasopressin	L	ACLS/Cardiovascular	0.1 mu/kg 0.5 mu/kg 0.1 mu/kg/min 0.5 mu/kg/min	milliunits/kg milliunits/kg/min	IV/IO
Vecuronium	L	Neuromuscular Blockade	0.03 mg/kg 0.1 mg/kg 0.15 mg/kg	mg/kg	IV

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