caehealthcare.com

For more information about CAE products, contact your regional sales manager or the CAE distributor in your country, or visit caehealthcare.com.
Tel +1 941-377-5562 or 866-233-6384\

For customer service, please contact CAE Healthcare.

Customer Service Headquarters - United States and Latin America
Monday - Friday from 7:00 a.m. to 6:00 p.m. ET
Phone 1-866-462-7920
Email: customerservice@caehealthcare.com

Customer Service – Canada
Monday - Friday from 8:00 a.m. to 5:00 p.m. ET
Phone 1-877-223-6273
Email: can.service@caehealthcare.com

Customer Service - Europe, Middle East, Africa, India, Asia and Australia
Monday - Friday from 8:00 a.m. to 5:00 p.m. CET
Phone +49 (0) 6131 4950354
Email: international.service@caehealthcare.com

Customer Service - United Kingdom and Ireland
Monday - Friday from 9:00 a.m. to 5:00 p.m. GMT
Phone +44 (0)800-917-1851
Email: uk.service@caehealthcare.com

165K146400 v2.7

BabySIM®
User Guide

CAE

Table of Contents

INTRODUCTION

As the worldwide leader in patient simulation technology and education, CAE is excited to introduce the BabySIM®. With the powerful Müse software, the BabySIM incorporates highly developed infant patient physiological models that generate realistic and automatic responses to clinical interventions and medication administrations that are specific to infant patients.

BabySIM

What makes the BabySIM so unique is its versatility and usability. Combining intricate systems design and flexible user-oriented software achieves a high-tech, high-touch synergy that creates realistic learning experiences. The ultra-sophisticated system captures the complexities of human physiology with heart and breath sounds, palpable pulses and a myriad of other features that mirror a true and accurate representation of the human body. The intuitive design of the BabySIM and the realistic physiological models make it easy for instructors as well as learners to use the system.

The educational value of the BabySIM is summed up in the fact that critical care interventions such as infant CPR, airway management, medication administration and defibrillation, to name a few, can be applied to the simulator, better preparing healthcare professionals for critical events involving infants. With the flexibility of using preprogrammed or user-initiated Simulated Clinical Experiences™, or SCEs, instructors can create real-life drama to help hone and perfect the skills of their learners.

Equipment Overview

The BabySIM has been designed to be used in any learning environment. The BabySIM's standard features are easily integrated into a laboratory setting where the BabySIM can be operated using controlled central air/gas supply sources and regular AC power. However, because the portability of the BabySIM allows for its use in offsite locations, an optional Air Compressor and an optional Auxiliary Power Supply are available for those areas that do not have a central air/gas supply or an electrical power source.

Components Inventory

The BabySIM comes with all the necessary equipment for establishing an educational simulation center for the study of infant care.

Standard Equipment	
	BabySIM Manikin and Umbilical Assembly
	Manikin Carrying Case
	Inventory Kit
	PCU with Wireless Receiver
	Wireless Microphone
	laptop Instructor Workstation

IMPORTANT: *CAE packaging is specially designed to protect CAE products during shipping. It is important that you KEEP all of your original SHIPPING MATERIALS, including the boxes. All warranty and repair items must be return shipped to CAE in the original packaging.*

Optional equipment is available to accommodate special customer requirements. For example, options like auxiliary power, air compressors and a Wireless Remote Control enable instructors to create real-life scenarios at authentic locations.

Optional Equipment	
	Tablet Instructor Workstation
	Wireless Remote Control (Laptop)
	Computer Stand
	Shoulder Bag and Sleeves
	Auxiliary Power Supply
	Air Compressor
	Gas Accessory Kit
	ECS Portability Kit
	Trauma/Disaster Casualty Kit (TDCK)
	Moulage Kit

As you would with any shipment, cross-check this inventory with your CAE packing invoice to verify that all components have been received.

Contact a CAE Sales Representative at 866-462-7920 if there are any questions or if optional equipment is needed.

BabySIM Standard Equipment

The design of the BabySIM system allows students to focus on the patient manikin while giving instructors the ability to create an endless number of possible clinical situations.

Full-Body Infant Manikin and Umbilical Assembly

All patient assessments and clinical interventions are played out on the BabySIM manikin, which represents a three- to six-month-old infant. At 25 3/4 inches (65.4 cm) in height and weighing 16 1/4 pounds (7.37 kg), the manikin is fully operational in the supine position and can be placed on any flat surface such as a gurney, an emergency room operating table, the ground or even in a vehicle. The manikin offers features like breath and heart sounds, palpable pulses, baby vocal sounds, genitourinary features and airway management features.

Full-Body Infant Manikin

A bundled system of hoses known as the fluidic/pneumatic pigtail and an electrical cable called the electrical pigtail are attached to the Manikin in the perineum area. Both pigtails attach to the Umbilical Assembly.

The Umbilical Assembly holds a bundle of color-coded hoses and an electrical cable. The electrical cable, which provides power and transmits information from the Instructor Workstation, has a specialized fitting that connects to the PCU's 12-volt DC power source. The bundle of colored hoses connects to the receptacle beneath the electrical cable on the PCU. These hoses provide for a variety a functions:

Red	**IV Source (unused)**
Blue	**IV Drain**
White	**Trauma Source**
Orange	**GU Source**

Hard-Sided Manikin Carrying Case

The Hard-Sided Manikin Carrying Case is designed to keep the manikin secure during transport and storage.

Hard-Sided Manikin Carrying Case

Inside the case are foam inserts that hold the manikin in place and enough extra room for storing clinical accessories.

With heavy-duty wheels and durable handles, the case can be rolled or carried easily between locations.

Inventory Kit

The Inventory Kit, which includes replacement parts, comes with the BabySIM. Details on how to use the replacement parts can be found in the **Using the System** section of this User Guide.

The Inventory Kit includes:

- BabySIM Startup Kit
- Manual Blood Pressure Adapter
- PCU Fuse Kit
- Silicone Lubricant Spray
- Red Tape
- PCU Hose Fittings (2)
- Cable Clamps (2)
- Secretion Adapters (3)
- Interchangeable Female Genitalia (The manikin is shipped with the male genitalia attached)
- Chest Tube Priming Tube
- Male Quick Connect Fitting for the Air Hose

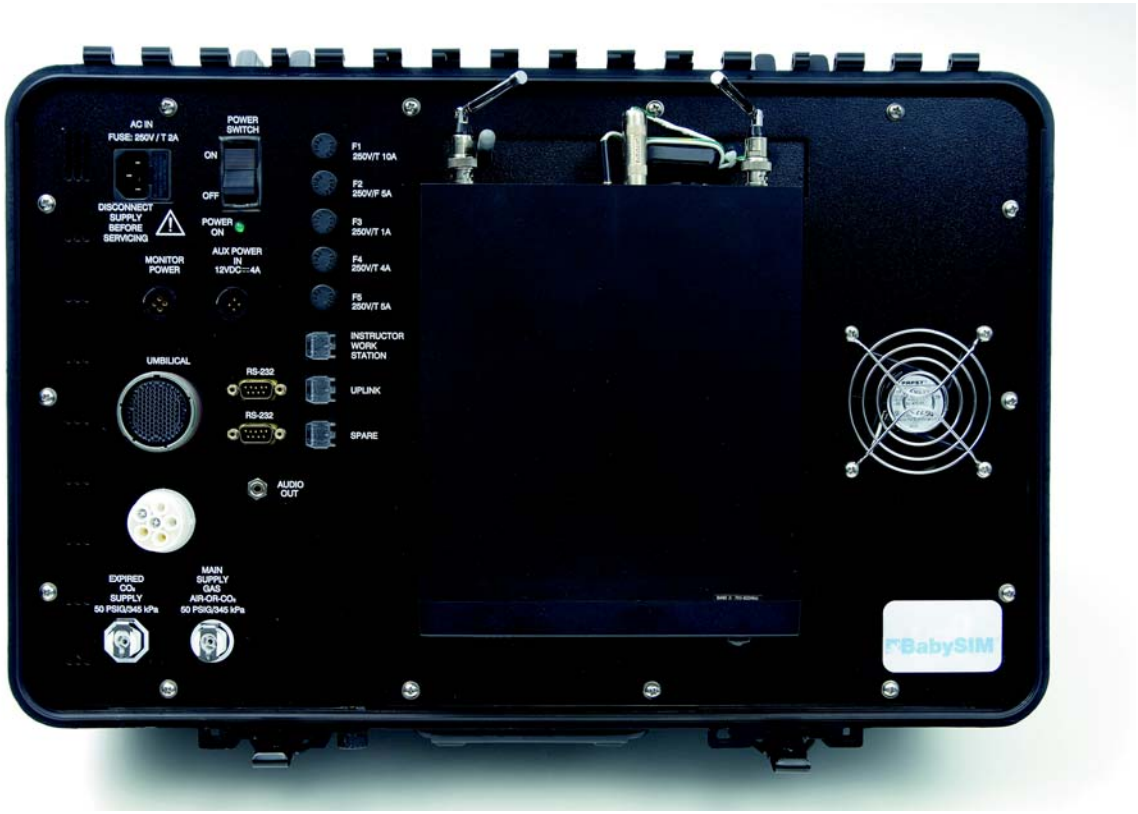
Power and Communications Unit (PCU)

The PCU is the hub of communication and power for the BabySIM system. This unit is about 24” tall x 15” wide x 10” deep (610 mm tall x 380 mm wide x 254 mm deep) and weighs about 10 pounds (5 kg). Conveniently contained in a rolling, hard-sided case, the PCU is the most central of all the BabySIM system components. Inside the PCU is a DC power supply and the Wireless Ethernet Switch.

BabySIM PCU

When in operation, the PCU should be placed horizontally so that the cover opens upward as shown in the picture above.

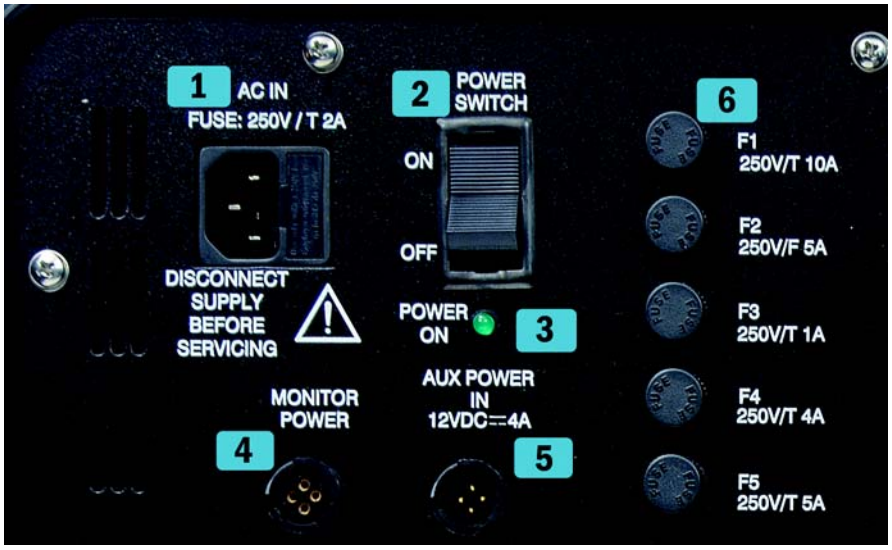
Located beneath the cover on the PCU Interface Panel is the Wireless Receiver, the power switch and a number of labeled ports.



PCU Interface Panel

PCU Power Ports, Fuses and Switch

Located in the upper left of the PCU are the electrical controls and the source of the power for the PCU and the monitor.



PCU Power Ports, Fuses, and Switch

1. In a standard laboratory configuration (using AC Power), the power cord is plugged into the **AC IN** port. This should be done prior to plugging the cord into the power source, which should be a surge-protected outlet to protect the integrity of the electrical system and reduce the chance of blowing fuses.

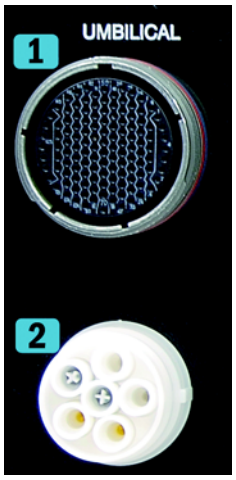
   Note: Beside the AC IN port is a small fuse panel labeled Fuse: 250V/T2A. Before replacing a burnt fuse, refer to the Cautions/Warnings found in the Introduction section of this User Guide.

2. The **POWER SWITCH** is used to turn the PCU **ON** and **OFF**, whether running on standard AC current or utilizing a 12-volt DC power supply
3. A green indicator light labeled **POWER ON** illuminates when the PCU is running
4. If users have a Waveform Display Monitor (optional), it can be operated on 12-volt DC power using the **MONITOR POWER** port and the supplied adapter cord
5. The **AUX POWER IN 12VDC-4A** port allows the BabySIM system to be run from a 12-volt DC power source such as the optional Auxiliary Power Supply
6. The five fuses housed in the ports labeled **F1** through **F5** are identified by their voltage and amperage. To change a fuse, open the port cap with a flathead screwdriver so that the burnt fuse pops out. Be sure to choose the correct fuse from the Spare Fuse Kit when selecting a replacement. The new fuse is secured by replacing the cap and tightening it with a flathead screwdriver.

Note: Before replacing a burnt fuse, refer to the Cautions/Warnings found in the Introduction section of this User Guide.

Umbilical Ports

The two large circular fittings labeled **UMBILICAL** are used to connect the manikin via the umbilical to the PCU.

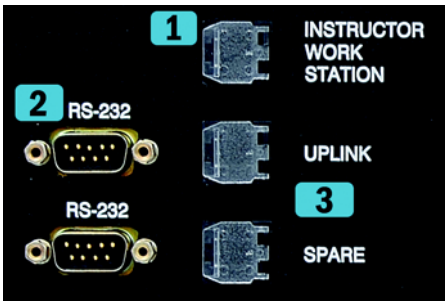


Umbilical Ports

7. The upper circular port is the receptacle for the umbilical's electrical cable and has a notched fitting where the cable connects and locks into place. This connection establishes the communication of electrical input/output and computer signals to the manikin.
8. The lower circular port is the receptacle for the pneumatic/fluidic portion of the umbilical and has a white plastic fitting into which the five hoses wrapped in the umbilical are secured. The pneumatic/fluidic assembly allows gases (CO_2 and air) to flow to the PCU and back to the manikin.

Instructor Workstation Uplink and Expansion Ports

There are three Ethernet and two RS-232 ports on the PCU.



Instructor Workstation Uplink and Expansion Ports

9. The **INSTRUCTOR WORK STATION** port connects the Instructor Workstation to the PCU through an Ethernet cable. A Wireless Ethernet Switch inside the PCU directs signals from the Instructor Workstation to the patient manikin. The switch is maintenance-free and requires no usage or care instructions.
10. The two **RS-232** ports are used to connect accessories such as the Trauma/Disaster Casualty Kit (TDCK)
11. The **UPLINK** and **SPARE** Ethernet ports can be used with METIVision

Gas Supply Connections

At the bottom-left of the PCU Interface Panel are two ports labeled **MAIN SUPPLY GAS AIR-OR-CO_2** and **EXPIRED CO_2 SUPPLY**, along with their pressure specifications: **50 psig/345 kPa**.

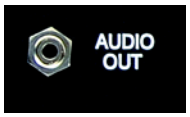
Gas Supply Connections

12. The **MAIN SUPPLY GAS AIR-OR-CO_2** port is used to connect compressed air or gas via a hose to the PCU. With this connection, various “life signs” can be displayed on the manikin, such as breathing and pulses.
13. For the manikin to exhale CO_2, a CO_2 source must be connected to the **EXPIRED CO_2 SUPPLY** port

An optional Gas Accessory Kit is available for connecting centrally supplied compressed air and CO_2 to the PCU.

Audio Jack and Wireless Channel Set

The small jack labeled **AUDIO OUT** allows you to connect the simulator's audio outputs directly into an available audio/visual system to amplify the patient's sounds for a larger audience.



Audio Jack

All sounds are reproduced from one channel.

The Wireless Receiver works in tandem with the Wireless Remote Microphone to provide the instructor with a means of verbal communication through the manikin.

Wireless Channel Set

The dual antennas of the microphone pull out to increase range, and the receiver has a channel selection and volume control feature to produce high quality sound. The receiver is powered from a power supply inside the PCU.

Laptop Instructor Workstation

The Laptop Instructor Workstation is a laptop computer that utilizes the Müse software to operate as the main simulation control center.

Instructor Workstation

IMPORTANT: *All computer components are preconfigured for use with BabySIM. Only approved CAE applications should be installed or run on the BabySIM computer system.*

Optional Equipment for the BabySIM

Additional components enable the BabySIM system to be customized to fit the specific needs of a wide variety of education environments.

Tablet Instructor Workstation

The Tablet Instructor Workstation is an optional, ruggedized tablet computer that can be used instead of the Laptop Instructor Workstation to run the Müse software. An additional Müse license is provided with this option.

Note: The Tablet Instructor Workstation cannot perform calibration utilities. The Laptop Instructor Workstation is needed to perform these functions. Additionally, the Tablet Instructor Workstation and the Laptop Instructor Workstation cannot be used at the same time. Müse content is not shared between the Tablet and Laptop Instructor Workstations.

IMPORTANT: *All computer components are preconfigured for use with BabySIM. Only approved CAE applications should be installed or run on the BabySIM computer system.*

Wireless Remote Control

CAE offers an optional Wireless Remote Control laptop to be used when the use of an Ethernet cable is restrictive.

Wireless Remote Control

After configured into the BabySIM network, the Wireless Remote Control connects to the PCU using a wireless signal.

Computer Stand

CAE offers an optional computer stand that is designed to support the Instructor Workstation or the optional Wireless Remote Control unit.

Wireless Remote Control and Computer Stand

Each stand is made of sturdy metal and weighs less than 2 pounds (less than 1 kg).

Shoulder Bag and Sleeves

The optional Shoulder Bag with padded sleeves can be used to carry computer components to another location or to store the system when it is not in use.

Shoulder Bag and Sleeves

The shoulder bag is soft-sided and large enough to hold all of the available computer components as well as the various power supply and cables.

Auxiliary Power Supply

CAE makes available two different Auxiliary Power Supply options for running the BabySIM system in a remote location. Both components include a 12-volt DC power source and a 25' (7.5 meter) cable with the appropriate fittings to connect to the PCU Interface Panel in the port labeled **AUX IN 12VDC**.

Auxiliary Power Supply Kit #APS-001

Auxiliary Power Supply Kit #APS-001

The Auxiliary Power Supply should run the system for approximately three hours. Both of the options are rechargeable using a local AC power source.

Any auxiliary power supply used with the BabySIM must agree with the following specifications:

- AC Input: AC 100-240VAC, 50/60 Hz
- Consumption: Approx. 94W
- DC Input: DC 12.0 – 13.5VDC
- Consumption: Approx. 72W

Air Compressor

For educational environments with power but no central air/gas supply, two air compressors are available as options. An air compressor designed for quiet operation is available for in-room use, and an alternative air compressor is available for situations where the compressor resides in a location, such as a storage room, set apart from the simulator.

Out-of-Room Air Compressor #AIR-002

Out-of-Room Air Compressor #AIR-003

Both Air Compressors are AC powered and include a regulator and an air hose with the appropriate connector fitting.

Gas Accessory Kit

The Gas Accessory Kit includes two complete assemblies for connecting a central supply of compressed air and CO_2 to the PCU.

Gas Accessory Kit

Both assemblies have color-coded hoses (yellow for air and gray for CO_2) that are attached to independent adjustable pressure regulators. These regulators are used to ensure the pressure supplied to the system is 50 psig/345 kPa. The appropriate PCU fittings are attached to the other end of the hoses for easy configuration.

Trauma/Disaster Casualty Kit (TDCK)

The TDCK adds to the fidelity of a training session by providing the means to add the flow of blood, mucous and secreted fluids from the manikin while using the moulage kit to give a realistic look to the injury or condition.

The Trauma Disaster Casualty Kit

ECS Portability Kit

The ECS Portability Kit includes a power kit (with battery) and a CO_2 regulator set for 50 psig/ 345 kPa that attaches readily to a small (E-cylinder) CO_2 canister.

A wrench is supplied with the regulator to open the CO_2 valve on the canister. A blue nylon bag is also included for the E-cylinder.

The CO_2 regulator attaches readily to a small CO_2 canister.

Attaching the CO_2 Regulator

CO_2 Regulator Connected

A 22-Amp Portability Kit is also available.

Please refer to the **Cautions/Warnings** section of this User Guide for safety instructions.

- Follow local warnings for the handling and use of compressed gas
- Use extreme caution when fastening the regulator into place
- Keep the CO_2 canister in an upright position when attached to the regulator. Failure to do so could cause damage to the CO_2 regulator.

Moulage Kit

The Moulage Kit may also be ordered separately.

The Moulage Kit

The kit provides the materials needed to create wounds on BabySIM.

Using Müse

The Müse software is a browser-based application that can communicate directly with the simulator. With the software, users can run SCEs, create scenarios and SCEs, import and export educational content and perform administrative functions.

Note: For optimal Müse performance, no other software programs should be open while Müse is running.

IMPORTANT: *Only one Müse application window or tab and one TouchPro window or tab can be used per Instructor Workstation at a time.*

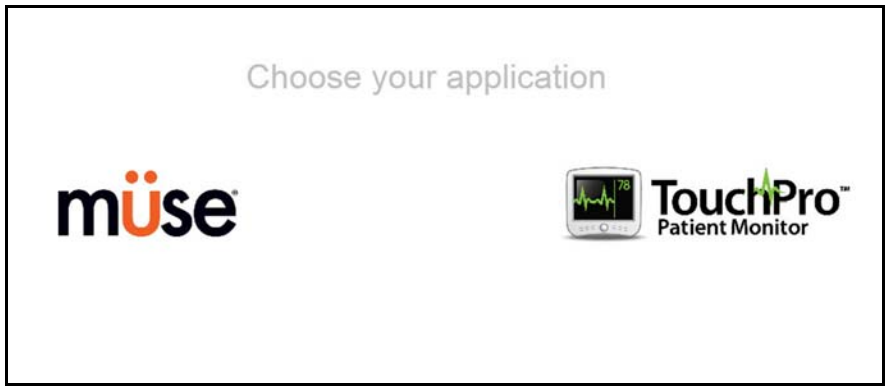
IMPORTANT: *Do NOT use any of the browser's navigational tools (i.e., back and forward buttons) while operating Müse.*

Starting Müse

Once the simulator is powered on and the Instructor Workstation is connected to the simulator network, the Müse software can be launched.

To launch the software:

1. Using the Laptop or Tablet Instructor Workstation, launch the web browser



The Müse Start Screen

2. Select **Müse**

The Müse Login Screen

The icons in the bottom left corner of the screen provide access to additional information about the software:

Clicking the **Info** icon to access the Info menu. From the Info menu, users can select from the following options:

- Select **About** to access information about the Müse software version, the type of simulator and the serial number
- Select **User Guide** to download the user guide (English version). To access the User Guide in other languages, please visit www.caehealthcare.com and click the **Support** link.
- Select **Support** for CAE Support contact information

Click the globe-shaped **Language** icon in the bottom left corner to change the language of the Müse software.

3. On the Login screen, enter the **Username** and **Password** in the appropriate fields and click **Login** to access Müse

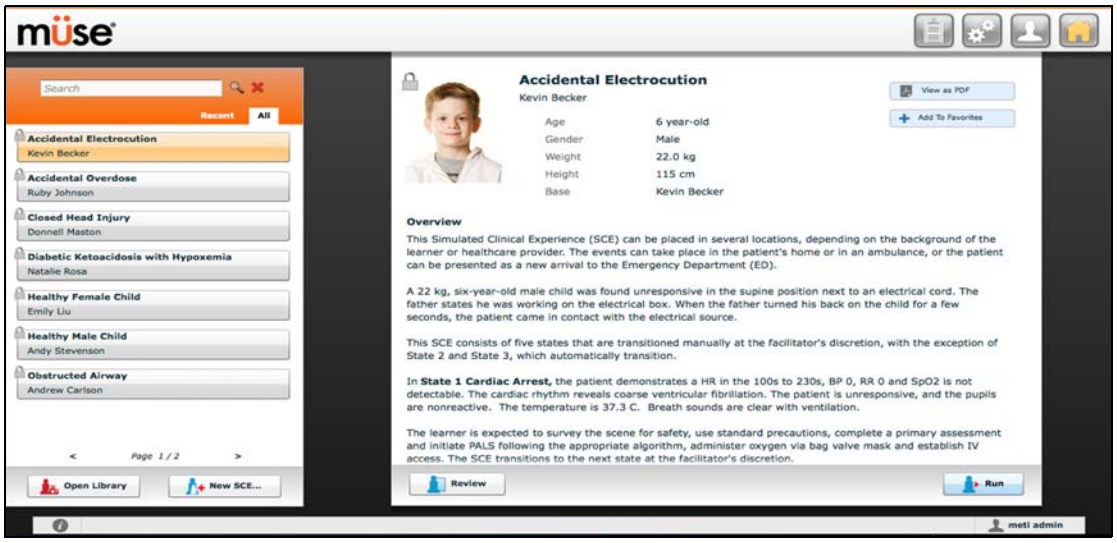
   The default **Username** is *admin* and the default **Password** is *admin*.

The Müse Login Fields

The Home Page View

From the Home page, users can run, create, edit, search for and print SCEs.

The Home page can be accessed by clicking the **Home** button in the upper right corner of the Müse software or, on any screen without a **Home** button, by clicking the **Return** button in the upper left or right corner of the screen.

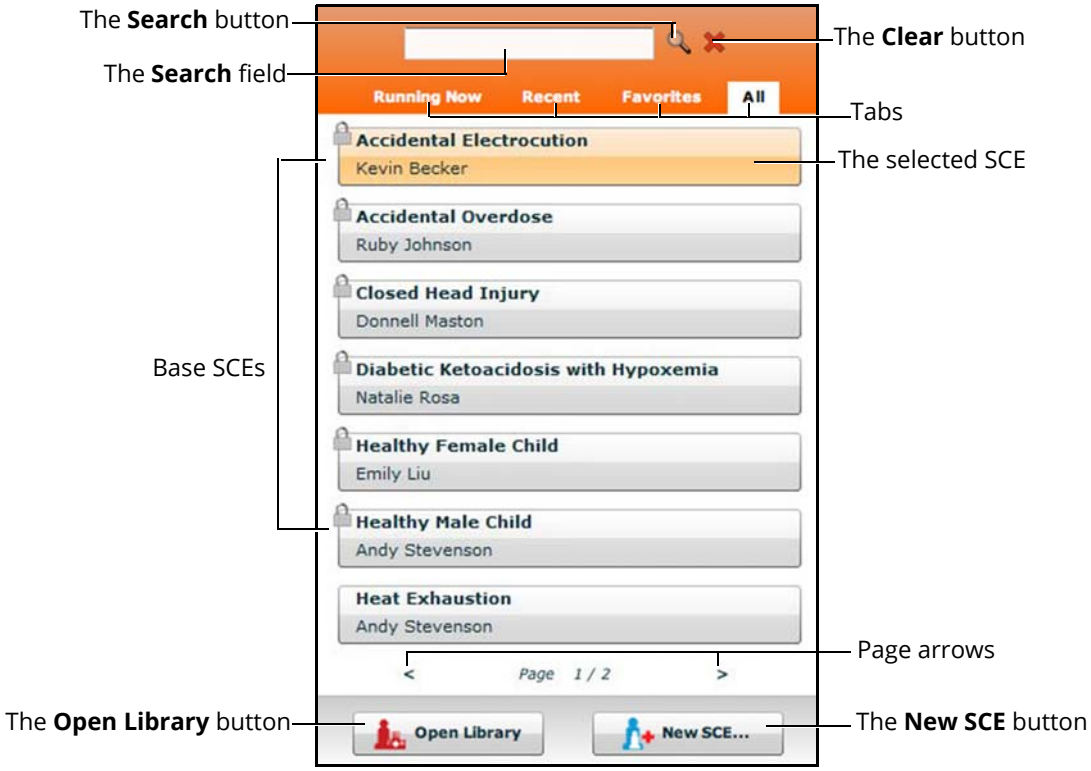


The Home Page

The SCE Selection Panel

SCEs are process tools that enable the facilitator 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 up to four scenarios.

Available SCEs appear in the SCE Selection panel on the Home page.



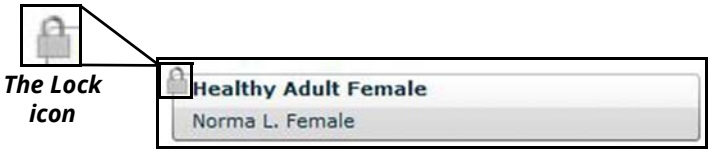
The SCE Selection Panel

The SCE Selection panel has four tabs that access SCEs: Running Now, Recent, Favorites and All.

- **Running Now** tab: Lists the SCE that is currently running and is only available when an SCE is running

  Note: Only one SCE is allowed to run at a time
- **Recent** tab: Lists all the recently run or edited SCEs
- **Favorites** tab: Lists all SCEs that have been selected as favorites and is only displayed after favorites have been selected. To add a favorite SCE to your profile, click the **Add to Favorites** button at the top of any SCE on the Home page. Managing favorites is achieved in the Account Profile portion of the software.
- **All** tab: Lists all SCEs, including user-created SCEs and all SCEs from available learning modules

The **Lock** icon indicates a locked SCE. Locked SCEs are installed by CAE and cannot be edited or deleted.



A Locked SCE

To search for an installed SCE, enter part of the name of an SCE in the **Search** field and click the **Search** button.

Click the page arrows to view additional pages of installed SCEs.

Click any SCE to select it. Once an SCE is selected, it appears in the SCE Summary panel.

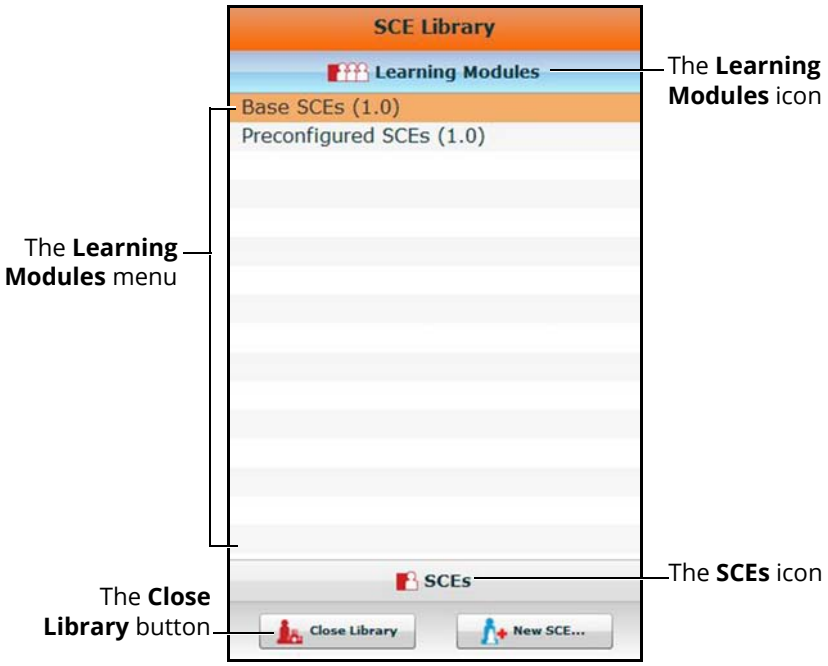
To run an SCE, click **Run** in the SCE Summary panel to execute the SCE.

To open the SCE Library, click the **Open Library** button.

To create a new SCE, click the **New SCE** button.

The SCE Library

The SCE Library lists all SCEs available on your workstation. Access SCEs from your library by clicking the **Open Library** button at the bottom of the SCE Selection panel. The SCE Library appears.



The SCE Library

The Learning Modules menu is open by default. The Learning Modules menu lists Base SCEs, Preconfigured SCEs, and all installed learning modules. Click the desired learning module name to access its SCEs, or click Base SCEs or Preconfigured SCEs. The selected SCEs appear.

Clicking the **SCEs** icon reveals the SCEs menu, which lists all user-created SCEs.

Clicking the **Learning Modules** icon again reveals the Learning Modules menu.

To open an SCE, click the name of the SCE.

Click **Close Library** to exit the SCE Library.

Base SCEs

Base SCEs are fundamental SCEs with no scenarios and no progression of events. Each base SCE is designed to provide facilitators with a baseline to run simulations “on the fly” or as a physiological baseline from which to design their own SCEs.

To access a base SCE from the SCE Library, choose **Learning Modules**, then click **Base SCEs**. The base SCEs are displayed and available for selection.

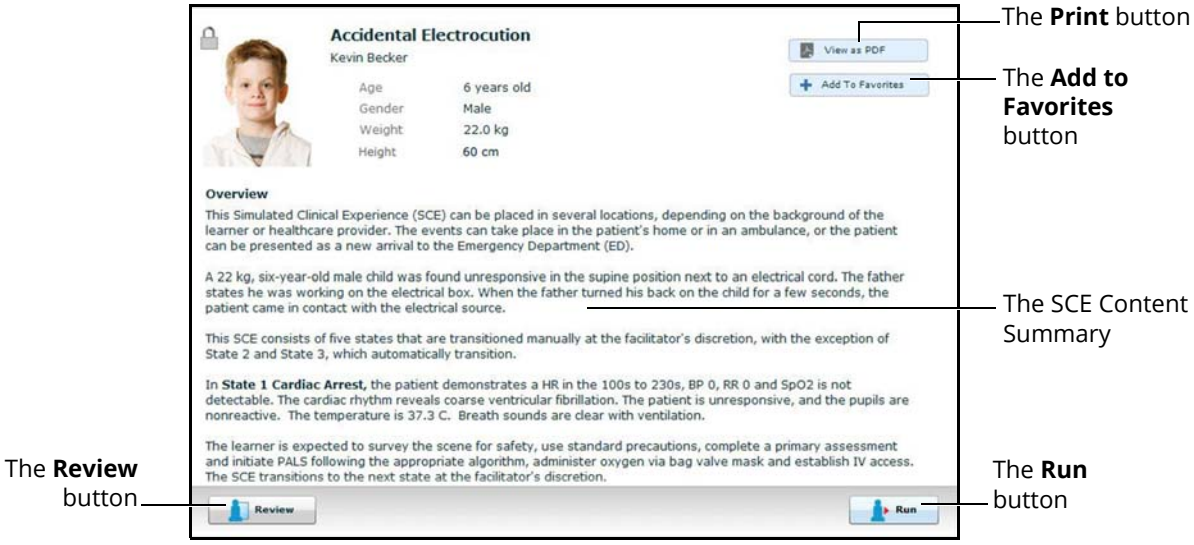
Preconfigured SCEs

Preconfigured SCEs are training tools with scenarios and multiple states. They are intended to be used for learner education and training.

To access a preconfigured SCE from the SCE **Library**, click **Learning Modules**, then click **Preconfigured SCEs**. The available preconfigured SCEs will be displayed and available for selection.

The SCE Summary Panel

The SCE Summary Panel provides information about the selected SCE.



The SCE Summary Panel

The **View as PDF** button can be used to generate a printable PDF of the selected SCE.

The **Add to Favorites** button adds the SCE to your Favorites list.

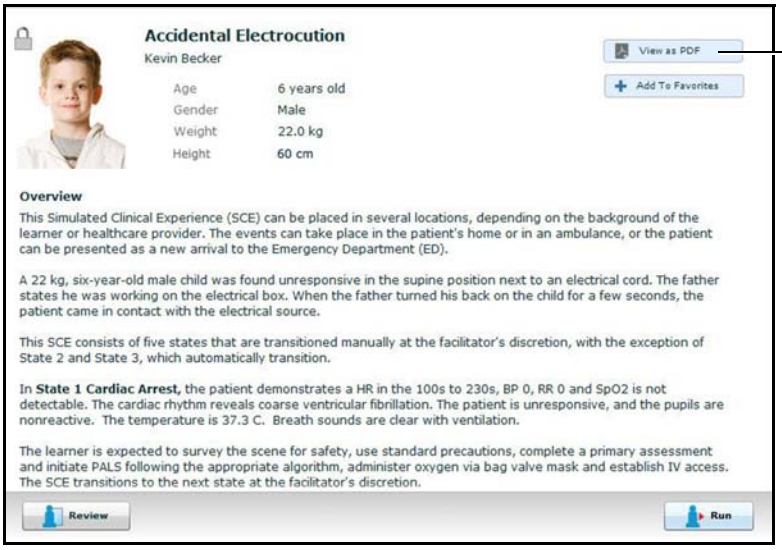
Click the **Review** button to review all information about an SCE; and edit any unlocked SCE.

Select the **Run** button to run the SCE.

Printing SCEs

To print an SCE:

1. From the Home page, select the SCE to print



The SCE Summary Panel

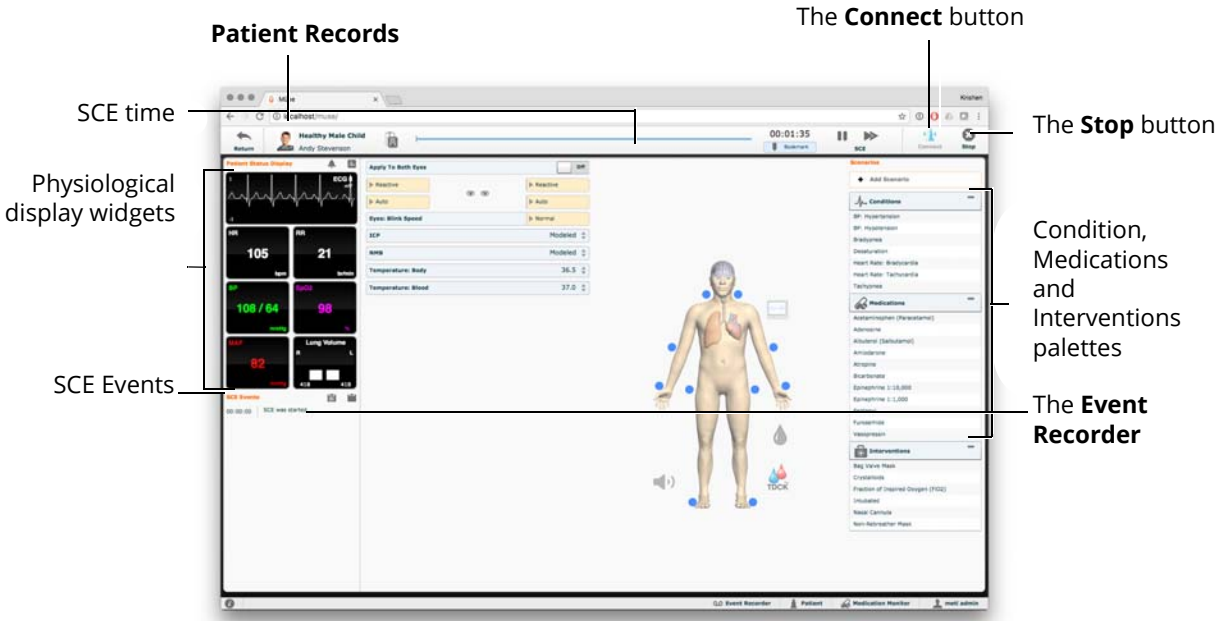
2. From the SCE summary panel, click the **View as PDF** button
3. Save the PDF to an external storage device to print from another computer

   Note: To print from the Instructor Workstation, consult your network administrator for assistance connecting to a printer.
4. When finished saving or printing the PDF, close the browser window containing the PDF to return to Müse

Running an SCE

To run an SCE, from the Home screen, select an SCE and click the **Run** button. The Run screen can also be accessed from the Scenario Designer or SCE Editor by clicking the **Run** button near the top of the screen.

The Run Button



The Run Screen

From the Run screen, users can manage the SCE, perform interventions, view physiological status and events, save events as states, save the Patient and associate records with the Patient.

Connecting to the Simulator

After starting an SCE by clicking the **Run** button, click **Connect** to connect to the simulator. The **Connect** button is located in the upper right corner of the Run screen.

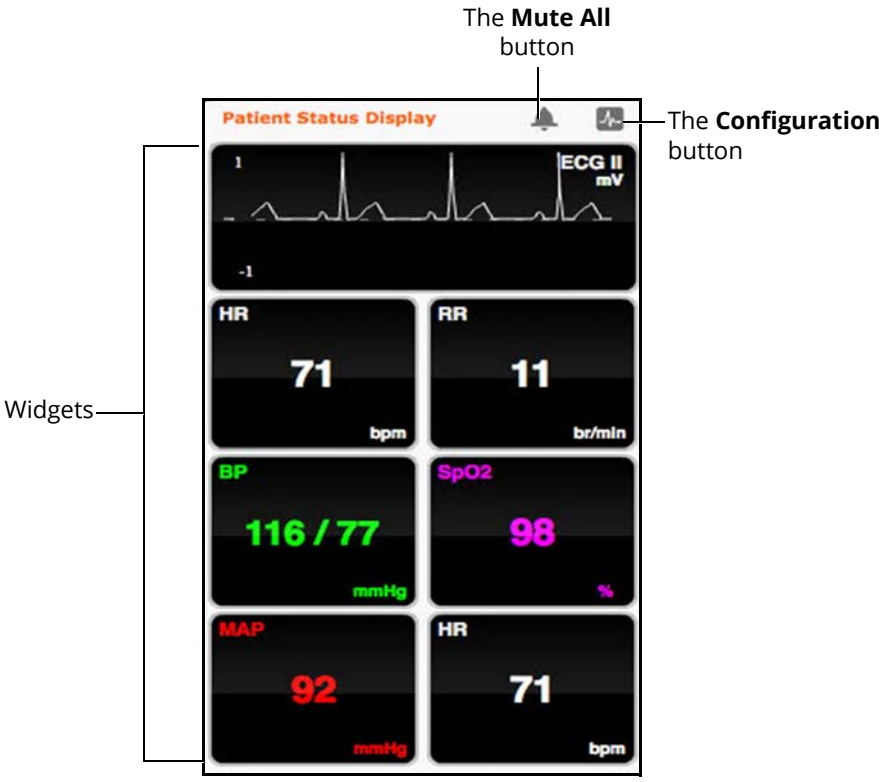
The Connect Button

An SCE must be running before you can connect to the simulator.

Using the Patient Status Display

On the Run screen, there are widgets that display the patient's physiological status. The **Patient Status Display** widgets can be changed to reflect the user's needs.

There are eight available display spaces for the widgets. Waveform widgets utilize two display spaces.



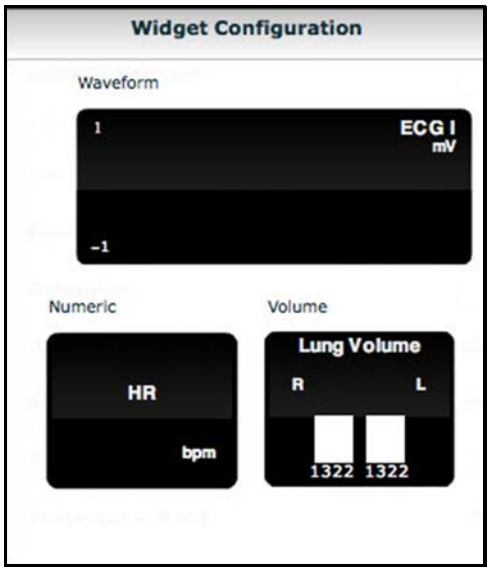
The Patient Status Display Widgets

Use the **Mute All** button to mute all Patient Status Display alarms.

To change the information displayed in a **Patient Status Display** widget, click on a desired widget. A list appears, showing all the parameters available for the selected widget type.

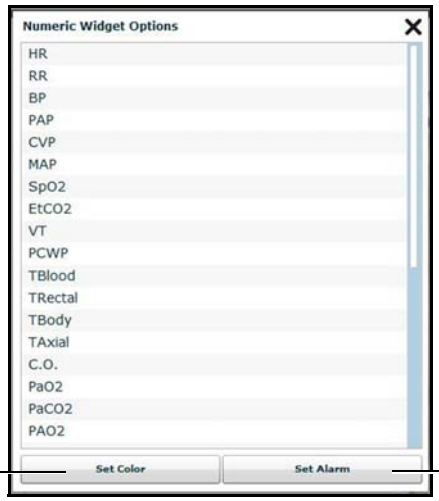
To adjust the widget layout, click the **Configuration** button.

The Widget Configuration menu opens, displaying available widget types: Waveform, Numeric and Volume.



The Widget Configuration Menu

Adjust the Patient Status Display layout by dragging a widget type from the Widget Configuration Menu and dropping it over the Patient Status Display. The new widget type replaces the old.



The **Set Color** button

The **Set Alarm** button

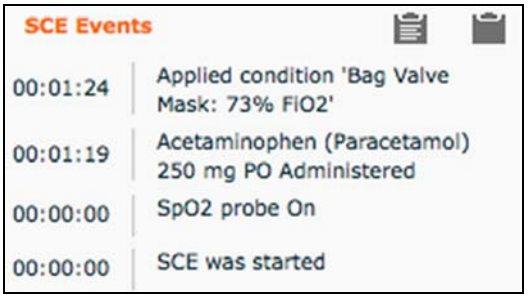
The Numeric Widget Options Panel

Choose the desired option from the list and the widget changes to reflect the new selection.

From the numeric widget menu, the **Set Color** button can be used to change the display color of the widget and the **Set Alarm** button can be used to change the alarm settings for the selected widget.

The Event Logs

During an SCE, all software operations sensed by the simulator or entered manually (e.g., virtual defibrillation, setting a physiological parameter value) are recorded by an event entry that appears on the screen. The event entry notes what occurred and the time it happened.



The Event Logs

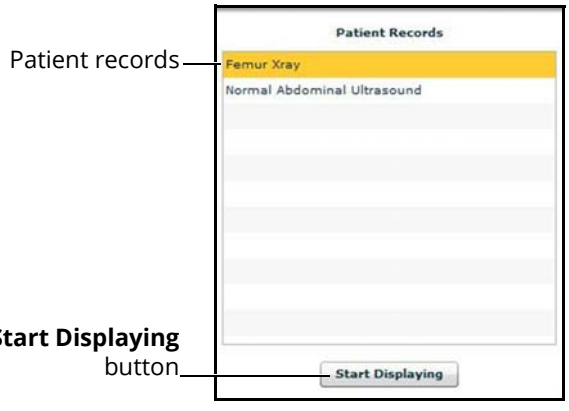
Displaying Patient Records

Patient records can be uploaded to Müse and displayed in the TouchPro software while an SCE is running.

To display an uploaded patient record:

1. From the Müse Run screen, click the **Patient Records** button

The Patient Records Button



The Patient Records List

2. Select a patient record from the list
3. Click **Start Displaying**

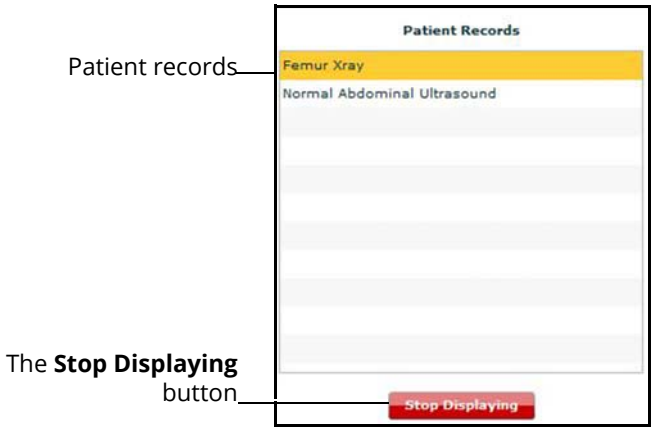
   IMPORTANT: *Ensure pop-up blocking is turned OFF in the web browser of the Instructor Workstation and any TouchPro workstations. Consult the web browser's help menu for assistance.*

   Note: The web browser window containing the patient record may be minimized initially. If the window is not readily visible, click the web browser icon on the Dock (Macintosh Instructor Workstation) or Taskbar (Windows Instructor Workstation) to locate the new window.

   The **Patient Records** button turns red, indicating that a patient record is being displayed.

The Patient Records Button

The **Start Displaying** button at the bottom of the Patient Records list changes to a red **Stop Displaying** button.



The Patient Records List

To stop displaying a patient record, click **Stop Displaying** at the bottom of the Patient Records list.

To close the Patient Records list, click the **Patient Records** button. The list closes. If a patient record is being displayed, the **Patient Records** button remains red until the list is re-opened and **Stop Displaying** is chosen.

Note: Only one patient record can be displayed at a time.

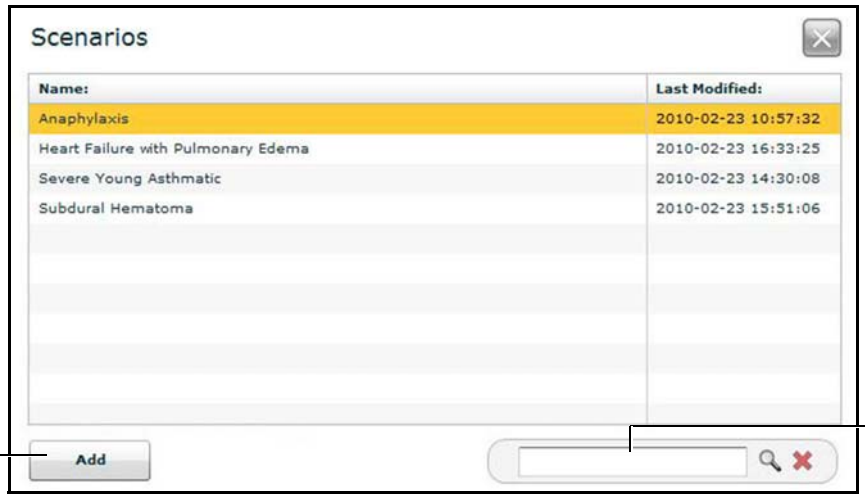
Adding a Scenario to a Running SCE

SCEs incorporate scenarios that contain pre-programmed physiology and events. Scenarios can be added to SCEs to enhance patient physiology.

To add a scenario to an SCE that is running:

1. Click the **Add Scenario** button on the Run screen

The Add Scenario Button



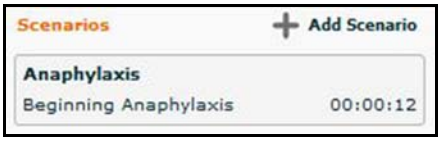
The Choose Scenario Dialog Box

2. Select a scenario from the Choose Scenario Dialog Box

   The **Search** field can be used to search for a scenario to select.

3. Click **Add**

   The scenario is added to the SCE and appears under the **Scenarios** heading on the Run screen.



An Added Scenario

Changing Physiology

The patient physiology can be adjusted while an SCE is running in two ways: by using one of the physiological views on the Run screen to modify parameters or by using the Conditions, Interventions and Medications palettes.

Using the Physiological Views

From the Run screen, users can select from six different views representative of various body systems and features:

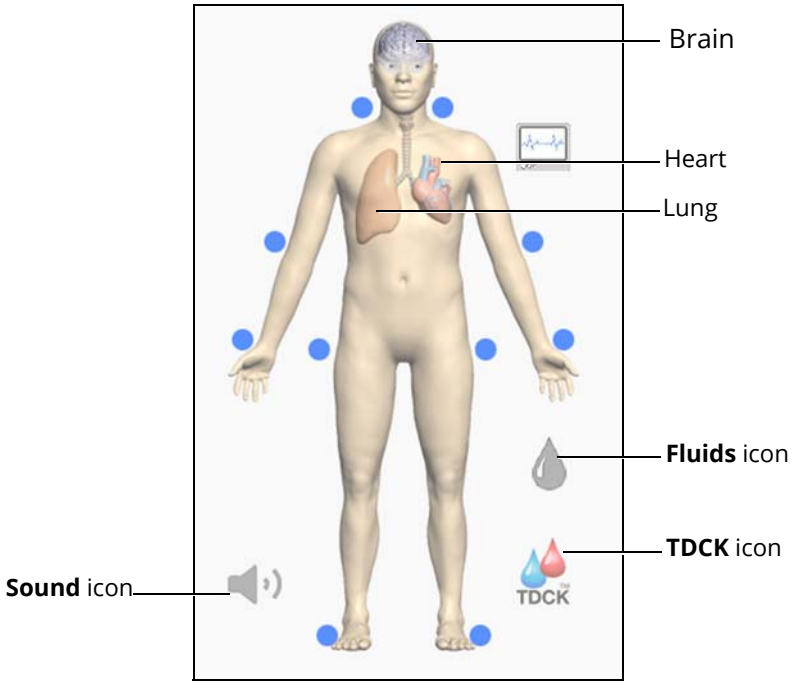
From the Run screen, users can select from different views representative of various body systems and features:

- Neurological
- Respiratory
- Cardiovascular
- Fluids
- TDCK
- Sounds

To access each view, click the appropriate organ, icon or button.

- For Neurological, click the brain
- For Respiratory, click the lung
- For Cardiovascular, click the heart
- For Fluids, Click the **Fluids** icon
- For TDCK, click the **TDCK** icon
- For Sounds, click the **Sound** icon

From each view, various parameters can be viewed and adjusted.



The Physiological Views

To change a patient's physiology using the physiological views:

1. Click the appropriate organ, icon or button from the homunculus to select the desired physiological view

The Run Screen

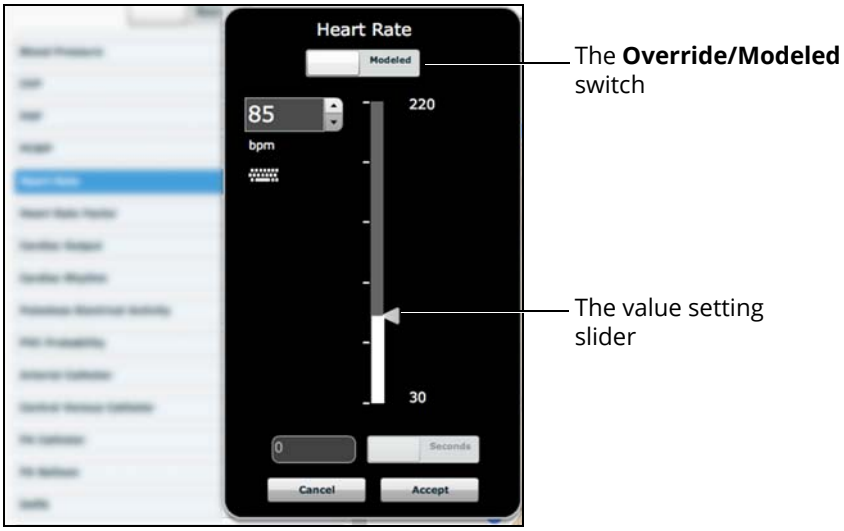
The associated parameters appear to the left of the homunculus.

2. Locate the desired parameter

   Note: Some simulators have a **Basic/Additional** switch on the Respiratory and Cardiovascular views. Basic parameters are shown by default. The **Basic/Additional** switch can be toggled to show more parameters.

3. Select the parameter and set the new value

   Parameters have varying controls, such as sliders, switches and menus. In the image below, the Heart Rate parameter is shown. Within the Heart Rate parameter, there are switches that toggle between **Modeled** and **Override** and **Seconds** and **Minutes**, a slider that sets the beats per minute and an available field where the beats per minute value can be keyed in.



The Heart Rate Parameter

Once the parameter has been set, it is reflected in the patient's physiology.

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

Numeric parameters set either a measured value (e.g., 20 mL), a multiplied value called a factor (e.g., Heart Rate Factor 2.0 is two times the baseline Heart Rate) or a coefficient that affects a physiological value in a non-linear way (e.g., FHR Variability Coefficient).

Numeric parameters are changed by clicking in the relevant field and entering a new value in place of the existing one or using a slider to move through the range of parameter values until the desired numeric value is established.

Once a measured value is set, that value overrides the physiologically modeled parameter value. To return to a physiologically modeled value, switch the slider in the parameter dialog from **Override** to **Modeled**.

Discrete Parameters

Discrete parameters enable users to select one of two or more options.

Discrete parameters are changed by choosing the appropriate option using a drop-down menu or toggle switch.

In the image below, the **Bronchial Occlusion** parameter is shown. The **Bronchial Occlusion** parameter is set using a discrete parameter switch that toggles between **Off** and **On**.

The Bronchial Occlusion Parameter

Once the parameter has been set, it is reflected in the patient's physiology.
Some parameters have two toggle switches or buttons, one for the left side of the manikin and one for the right.

In the image below, the **Reactive Pupils** parameter is shown.

The Reactive Pupils and Apply to Both Eyes Parameters

When the **Apply to Both Eyes** parameter is set to **On**, any change made to the left or right side is also automatically applied to the other side.

Note: Not all changes to parameters affect the patient's physiology, but all are logged.

Eyes: Consensual Pupil Response

Setting the **Consensual Pupil Response** option to **Yes** enables synchronized pupil reactivity between both eyes. When enabled (default action), shining a light in either eye will cause the opposite eye to also react. When disabled, only the pupil of the eye where light is shined will react.

Default: Yes

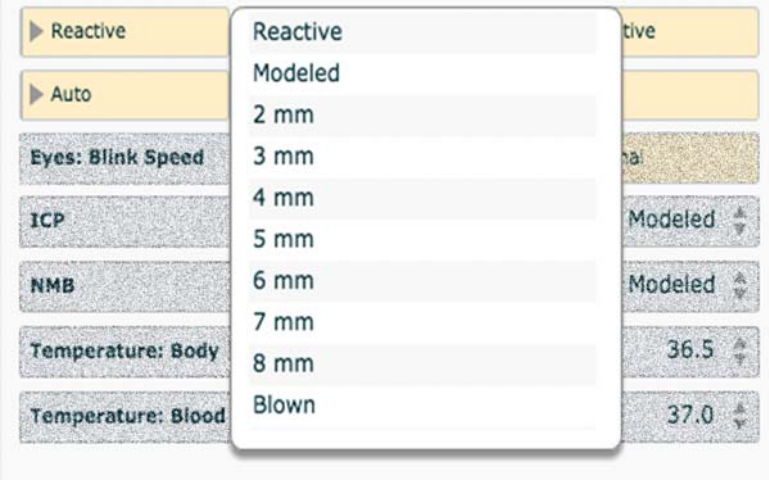
Reactive Pupils

The **Reactive pupils** parameter determines whether pupils re-size in response to changes in light. When **Reactive** is selected, pupils re-size in response to changes in light.

Reactive Options:

- Reactive
- Modeled
- 2 mm
- 3 mm
- 4 mm
- 5 mm
- 6 mm
- 7 mm
- 8 mm
- Blown

Default: Reactive



The Reactive Pupils Options

When the Reactive Eyes option is selected, shining a light in either eye will cause the pupils to expand or contract based on amount of light received.

Light Reactivity Speed

The **Light Reactivity Speed** parameter determines the speed at which the eyes react to light when the **Reactive pupils** parameter is set to **Yes**. **Light Reactivity Speed** can be set to **Sluggish** or **Brisk**.

Default: Brisk

Eyes: Consensual Pupil Response

Setting the **Consensual Pupil Response** option to **Yes** enables synchronized pupil reactivity between both eyes. When enabled (default action), shining a light in either eye will cause the opposite eye to also react. When disabled, only the pupil of the eye where light is shined will react.

Default: Yes

Using the Conditions, Medications and Interventions Palettes

The Conditions, Medications and Interventions palettes on the Run screen enable the application of conditions, medications and interventions 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.

TIP: *Click on the palette collapse/expand button to collapse or expand the palette.*

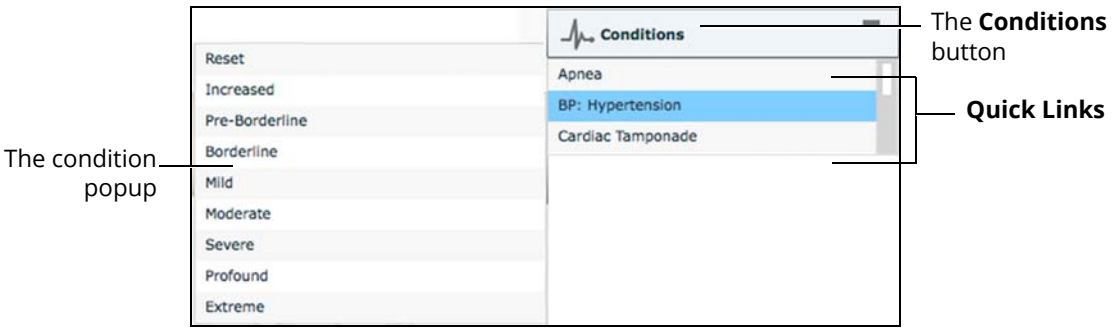
The Palette Heading

Using the Conditions Palette

Conditions are pre-programmed pathophysiological states that use one or more physiological parameters and are designed to enable you to create physiological changes on the fly.

There are two ways to apply conditions using the Conditions palette: using a Quick Link or using the complete Conditions menu. Quick Links are pre configured conditions that are made accessible in the Conditions palette for quick application. Quick Links can also be created for the Medications and Interventions palettes.

To set parameters using the Quick Links in the Conditions palette, click one of the Quick Link conditions. A popup menu will show the available conditions; and hovering over the condition will show the parameters. Click a specific condition to apply it and affect the patient's physiology.



The Medications Palette

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

To apply a condition that is not set up as a Quick Link in the **Conditions** palette:

1. Click the **Conditions** button

   Conditions are organized by system, or all available conditions are listed under **ALL CONDITIONS**.

The Conditions Menu

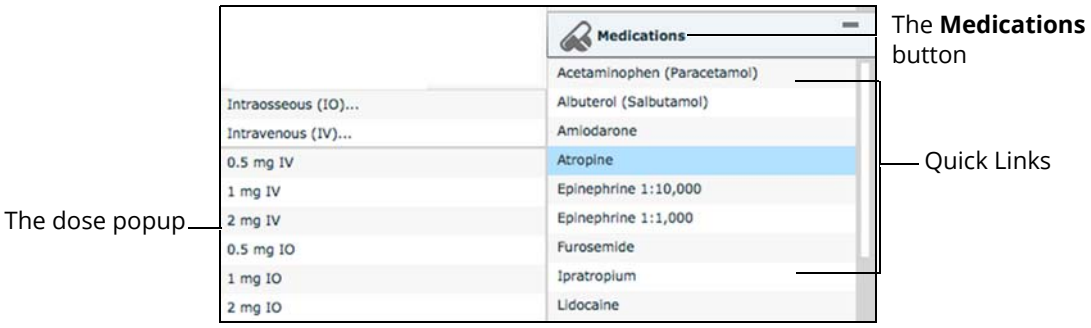
2. Navigate the menus to find the desired condition

Using the Medications Palette

There are two ways to administer medications using the **Medications** palette: using a Quick Link or using the **Medications** menu. Quick Links are preconfigured medications that are made accessible in the **Medications** palette for quick application. Quick Links can also be created for the **Conditions** and **Interventions** palettes.

To set parameters using the Quick Links in the **Medications** palette, click one of the Quick Link medications. A popup menu will show the available doses. Click a specific dose to apply it and affect the patient's physiology.
The option for custom doses will also be in the popup menu. Click the route of administration to get the Custom Dose Administration menu.

Note: Not all medications affect the patient's physiology, but all are logged.

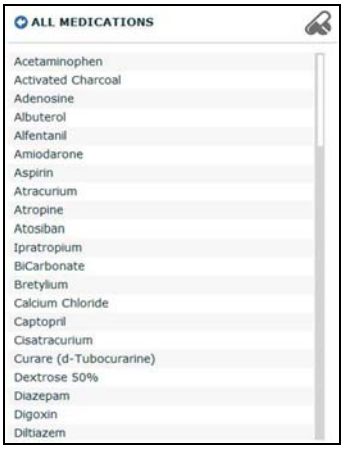


The Medications Palette

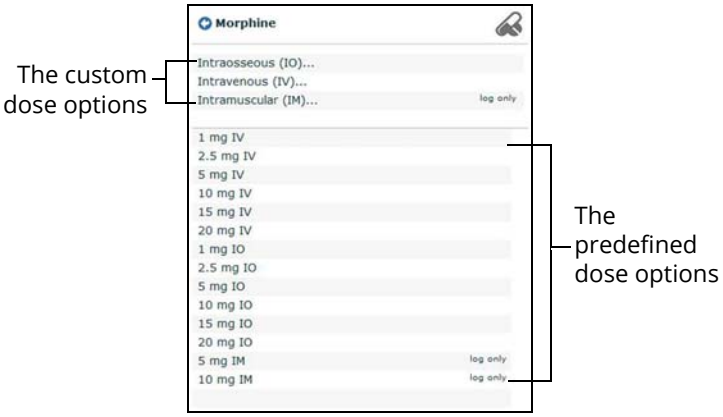
Note: Quick Links can only be added while creating or editing an SCE.

Or, to apply a medication that is not set up as a Quick Link in the **Medications** palette:

1. Click the **Medications** button. Medications are organized by type, and all available medications are listed under **ALL MEDICATIONS**
2. Navigate through the menus to locate the desired medication
3. Once the medication has been located, click the medication's name from the list



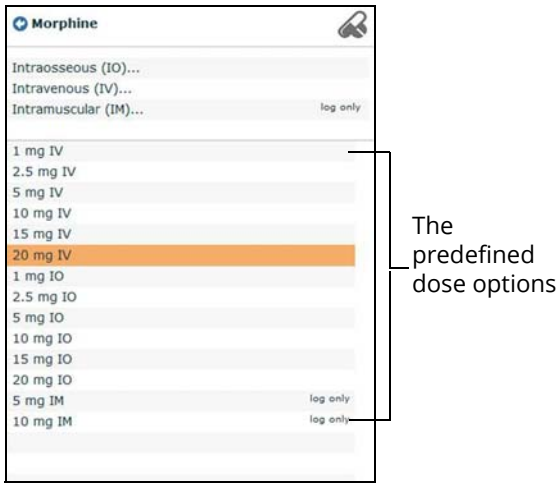
The All Medications Menu



The Medication Dose Menu

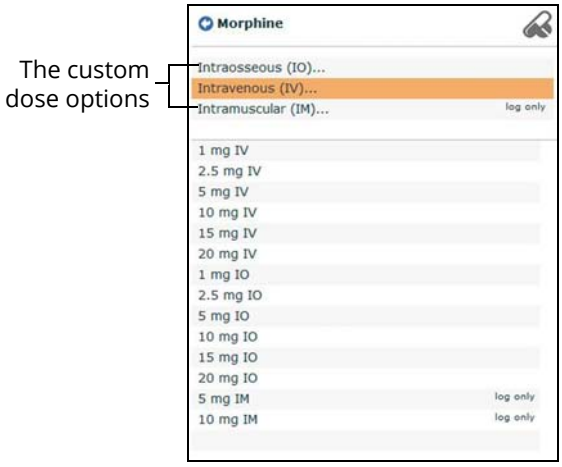
4. Select a dose option. This can be done one of two ways:

a. Choose a pre-defined dose

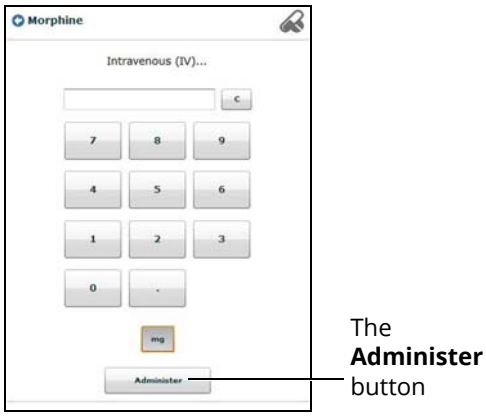


The Medication Dose Menu

b. Choose a route of administration to administer a custom dose



The Medication Dose Menu



The Custom Dose Administration Menu

5. Enter the desired dose and click the **Administer** button

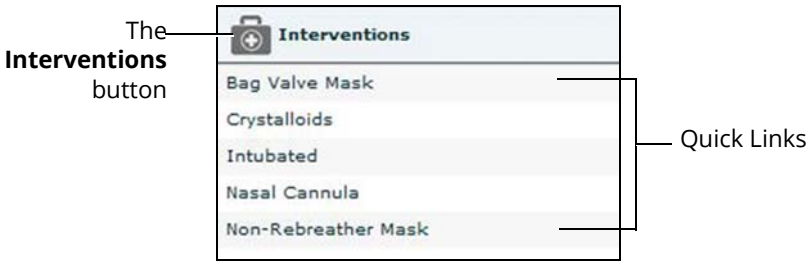
   Note: Not all medications affect the patient's physiology, but all are logged.

Using the Interventions Palette

There are two ways to perform and/or administer interventions using the Interventions palette: using a Quick Link or using the complete **Interventions** menu. Quick Links are preconfigured interventions that are made accessible in the **Interventions** palette for quick application. Quick Links can also be created for the **Conditions** and **Medications** palettes.

To apply an intervention using the Quick Links in the **Intervention** palette, click an Intervention Quick Link.

Note: Not all interventions affect the patient's physiology, but all are logged.



The Interventions Palette

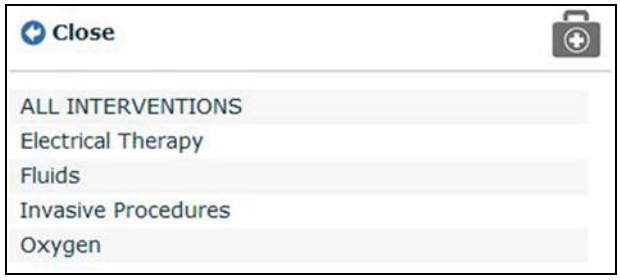
Once an Intervention is selected, a menu appears with available options for the selected Intervention. Click the desired option to select it. The intervention is applied and appears in the patient's physiology.

The Selected Intervention Options

Note: Quick Links can only be added while creating or editing the SCE.

To apply an intervention that has not been set up as a Quick Link in the **Interventions** palette:

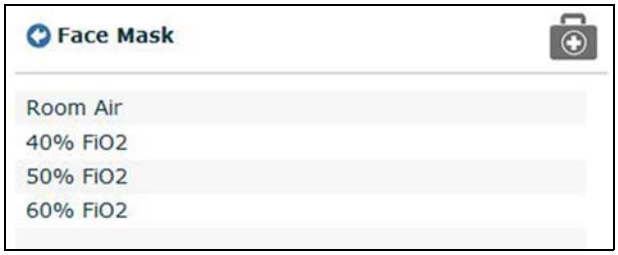
1. Click the **Interventions** button



The Interventions Menu

Interventions are organized by type, or all available interventions are listed under **ALL INTERVENTIONS**.

2. Navigate through the menus to find the desired intervention
3. Once the desired intervention has been located, click the intervention's name from the list



The Intervention Options Menu

4. Click the desired option

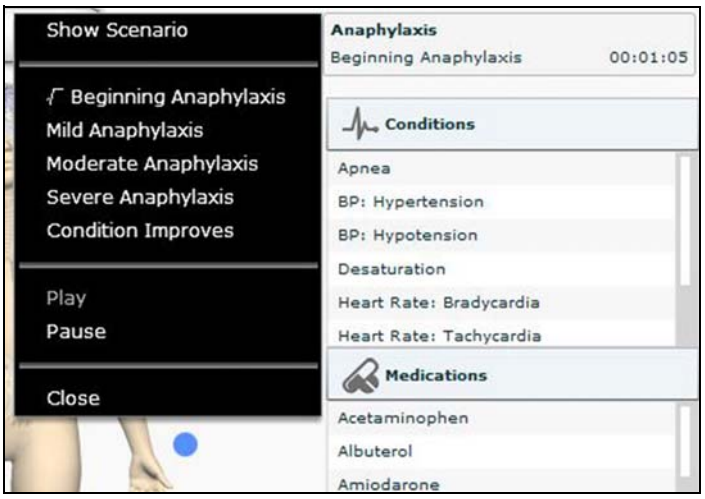
   The intervention is applied and appears in the patient's physiology.

Transitioning Scenario States from the Run Screen

To move between scenario states from the Run screen:

1. Click the desired scenario

A Scenario



The Scenario Management Pop-Up Menu

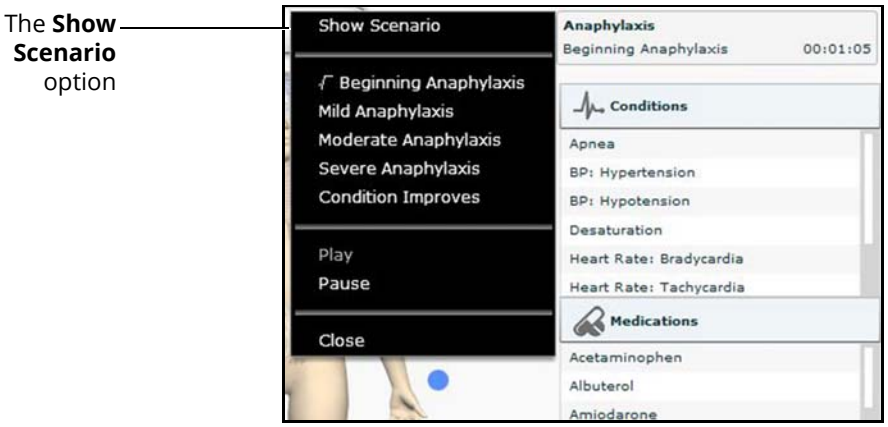
2. Select the desired state. The scenario proceeds to the selected state

   The scenario can also be paused or continued by selecting the **Pause** and **Play** options from the Scenario Management Pop-Up menu.

Transitioning Scenario States from the Scenario Screen

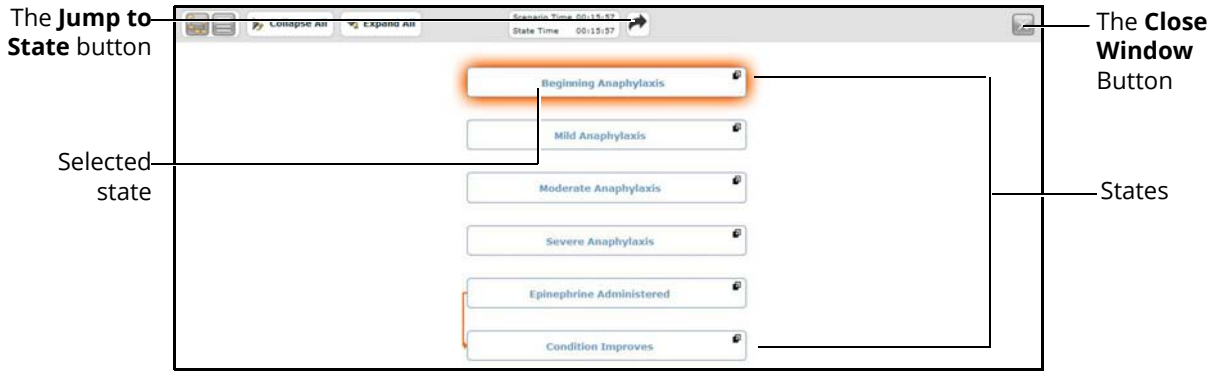
To move between scenario states from the Scenario Screen:

1. From the Run screen, click the desired loaded scenario



The Scenario Management Pop-Up Menu

2. From the menu, select **Show Scenario**

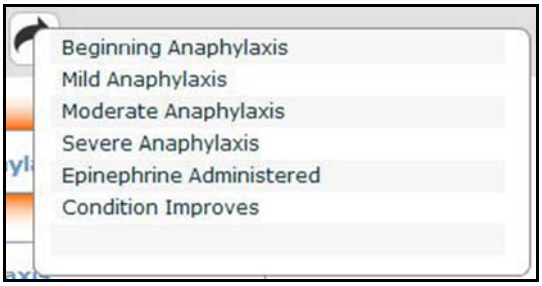


The Scenario Screen

At the top of this screen, the Scenario Time and State Time are visible. Additionally, users can pause and continue playing the scenario by clicking the Scenario **Pause** and **Play** button on the top of the screen.

3. Click the **Jump to State** button

The Jump to State menu appears, displaying the available states.



The Jump to State Menu

4. Select the desired state

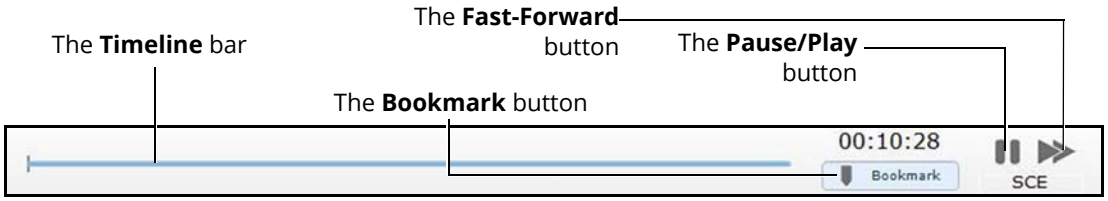
   The scenario transitions to the selected state and the state is highlighted on the Scenario screen.

   Note: Double-click on the states to expand to the full view.

5. Click the **Close Window** button to return to the Run screen

SCE Time Controls

The SCE time controls are located at the top of the Run screen.

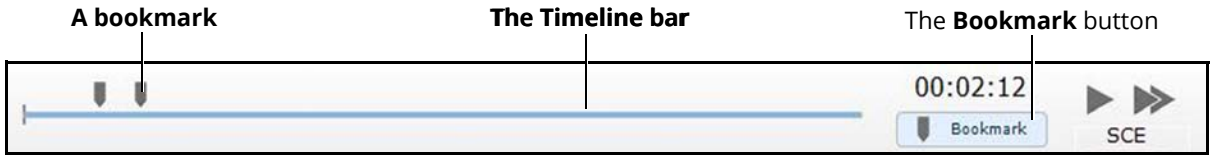


The SCE Time Controls

- The **Timeline** bar shows the amount of time that has elapsed and bookmarks that have been created
- The **Bookmark** button creates a bookmark at the current point in the SCE. The bookmark can be used later to reset the patient's physiology to what it was when the bookmark was created.
- Clicking the **Fast-Forward** button once accelerates the SCE time at a 4:1 ratio. Clicking the **Fast-Forward** button a second time accelerates the SCE time at an 8:1 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

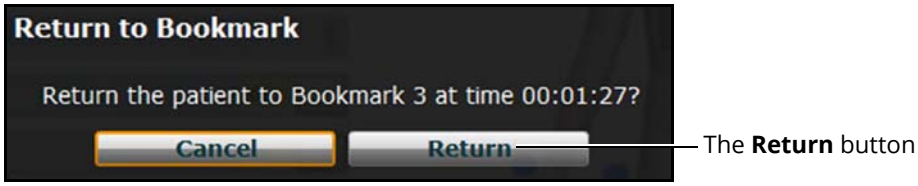
To create a bookmark, click the **Bookmark** button. A bookmark appears on the **Timeline** bar.



The SCE Time Controls

To return to a bookmarked time in the SCE:

1. Click the bookmark on the timeline



The Return to Bookmark Message

2. Click **Return**

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

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

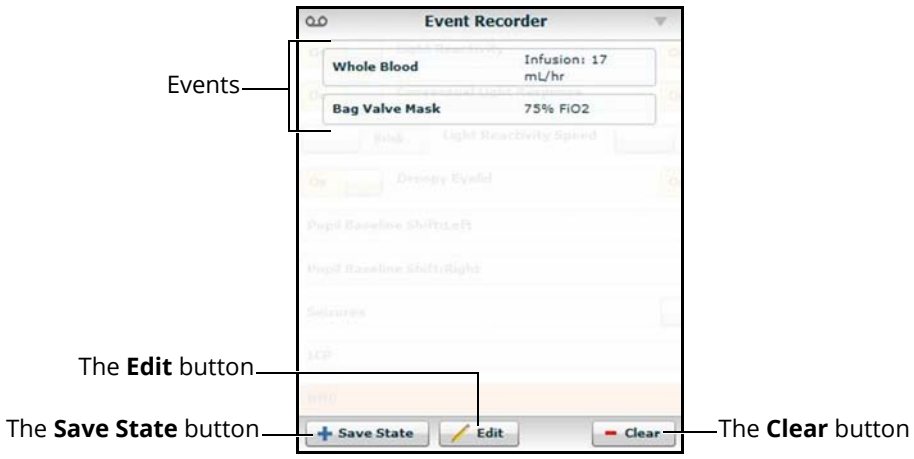
Using the Event Recorder to Save States

The Event Recorder displays all events that have occurred since the start of the SCE and can be used to save conditions, interventions and parameter changes as states.

To save a state using the Event Recorder:

1. Apply the desired conditions, interventions and parameters
2. Click the **Event Recorder** button at the bottom of the Müse screen

The Event Recorder Button



The Event Recorder

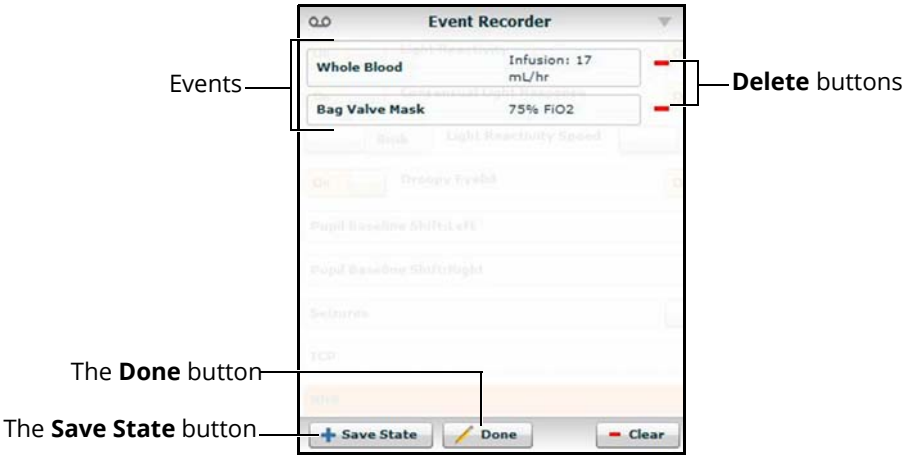
WARNING: *The **Clear** button deletes all recorded events. This action cannot be undone.*

3. Review the list of events

   If you wish to remove any events from the state to be saved:

   a. Click **Edit**

A **Delete** button appears next to each recorded event



The Event Recorder

b. Click the Delete button next to each event to be removed

c. Click Done

4. Click Save State

The New State Name Window

5. Enter a state name
6. Click **Save**

Creating a New Patient

When an additional patient with specific physiological characteristics is needed for repeated use, a new patient can be created from the Run screen.

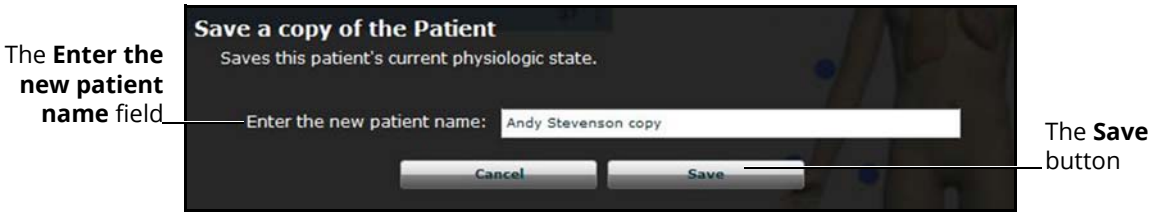
To create a new Patient:

1. From the Home page, run an SCE that has a Patient with the same gender as the Patient to be created
2. From the Run screen, apply the desired conditions and set the necessary parameters
3. Once complete, click the **Patient** button at the bottom of the Run screen

The Patient Button

The Patient Pop-Up Menu

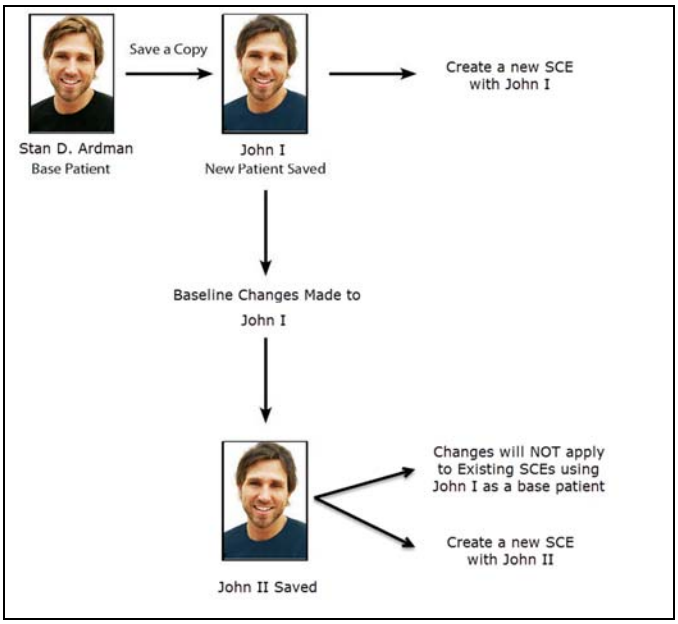
4. Click **Save**



The Save a Copy of the Patient Dialog Box

5. Enter a name for the new Patient in the **Enter the new patient name** field
6. Click **Save**

Note: Overwriting a patient will only impact the running SCE, not the base patient library or any other SCE created with the same base patient.



The New Patient Diagram

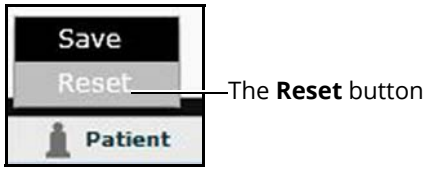
Resetting a Patient

Resetting a Patient brings the Patient back to its original physiological state before any scenarios were applied or modifications were made. Any running scenarios are paused. However, the SCE time is unaffected. Additionally, the reset appears in the Event Logs.

To reset a patient:

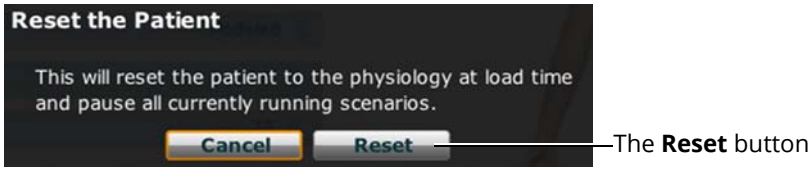
1. While running an SCE, click **Patient** at the bottom of the Run screen

The Patient Button



The Patient Pop-Up Menu

2. Click **Reset**



The Reset the Patient Dialog Box

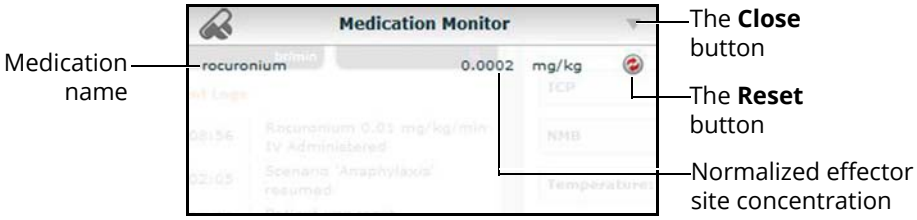
3. Click **Reset**

   The patient reset is indicated with a red marker on the SCE timeline bar.
4. To resume any paused scenarios, click the loaded scenario on the left side of the screen
5. From the Scenario Management pop-up menu, select **Play**

The Medication Monitor

The Medication Monitor tracks the infusion of medication administered for medications that affect patient physiology. To activate the Medication Monitor, from the Run screen, click the **Medication Monitor** button in the bottom, right portion of the screen.

The Medication Monitor Button



The Medication Monitor

The normalized effector site concentration is shown next to each medication listing.

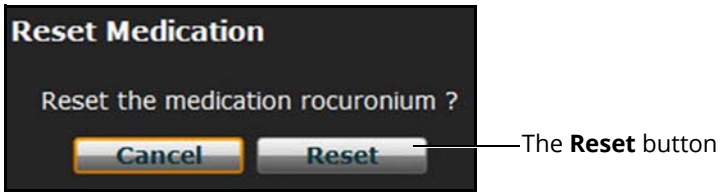
The **Reset** button is used to clear a medication from the physiological model and the Medication Monitor.

To close the Medication Monitor, click the **Close** button in the upper right corner of the medication Monitor window.

Resetting a Medication

To reset a medication from the Medication Monitor, click the **Reset** button on the Medication Monitor.

The Reset Medication dialog box appears, asking you to confirm that you wish to reset the medication.



The Reset Medication Dialog Box

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. To stop the infusion, you must select the medication from the medication library and set the infusion rate to zero.

Returning to the Home Page

To exit the SCE and return to the Home page, click the **Return** button in the upper-left of the run screen.

The Return Button

The SCE continues running and the Home page appears.

To return to the SCE from the Home page, click the **Continue** button in the SCE summary panel of the running SCE.

The SCE Summary Panel

Stopping the SCE

Running SCEs can be stopped from the Run screen or the Home page.

To stop an SCE from the Run screen:

1. Click **Stop** in the upper right corner of the screen

The Stop Button

The Stop The SCE Dialog Box

2. Click **Stop SCE**

To stop an SCE from the Home page:

1. Click the **Stop** button in the bottom left corner of the SCE Summary Panel

The Stop Button

The Stop The SCE Dialog Box

2. Click **Stop SCE**

IMPORTANT: *Always stop all running SCEs before logging out of Müse.*

Developing SCEs

Creating and editing SCEs are similar processes. Once an SCE is created, the steps for modifying the SCE are the same as those for editing a previously-created SCE. The processes of creating and editing SCEs each begin with a unique button on the Home screen.

Use the **New SCE** button to create a new SCE.

The New SCE Button

The minimal requirements for creating a new SCE include selecting a Patient, naming the SCE and saving the SCE. Once the new SCE is created, you can continue with the SCE development or edit it later.

Use the **Review** button to edit an existing SCE.

The Review Button

Creating a New SCE

Creating an SCE requires naming the SCE and selecting a Base Patient.

To create a new SCE:

1. From the Home screen, click **New SCE**

The New SCE Button

The Patients Palette

2. Click on a patient to select that patient from the palette and click **Create**

The SCE Editor

3. Enter the name for the SCE

   Note: The name of the SCE may NOT exceed 80 characters. Additionally, SCE file names CANNOT contain any special characters, such as (' / \ : * ? < > % | ") .

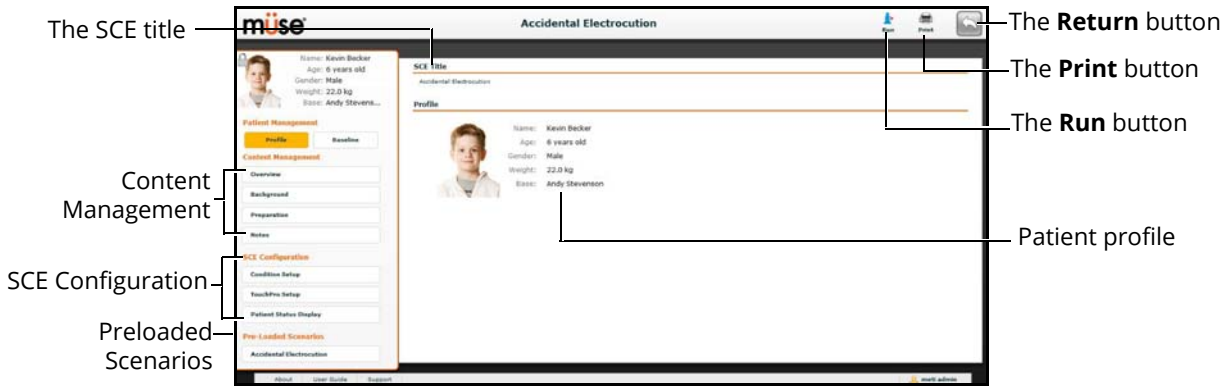
4. Click **Save**

   Once the SCE is saved, it is stored and can be edited and reviewed at any time, including creating a Patient Profile and content, determining settings and programming scenarios.

The SCE Editor

The SCE Editor can be used to review preconfigured SCEs and to create or edit custom SCEs.

To access the SCE Editor, click the **Review** button in the SCE Summary Panel or create a new SCE.



The SCE Editor

The buttons in the upper right corner of the SCE Editor provide options for running the SCE, generating a printable PDF, or returning to the Home page.

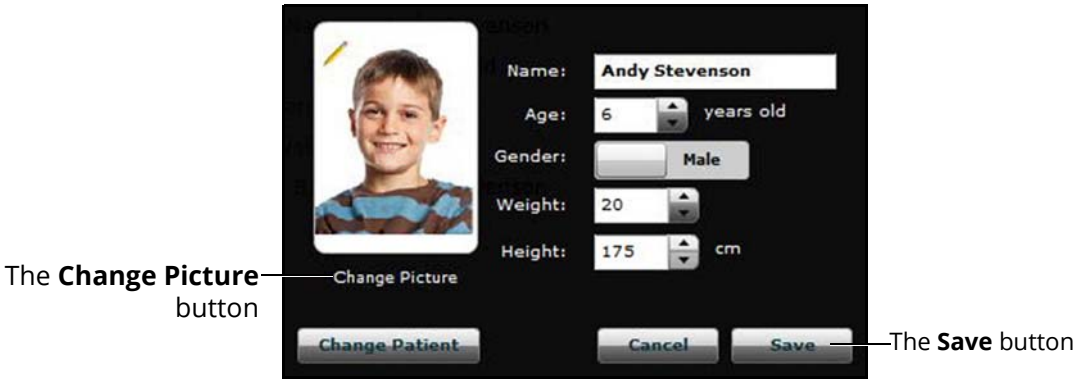
The **Content Management**, **Patient Management**, **SCE Configuration** and **Preloaded Scenarios** links in the left panel are used to review the SCE content and configuration, and to view scenarios applied to the SCE.

Editing a Patient's Profile

To edit the Patient Profile:

1. From the SCE Editor, in the **Profile** section, click **Edit**

The SCE Editor Screen



The Profile Editor

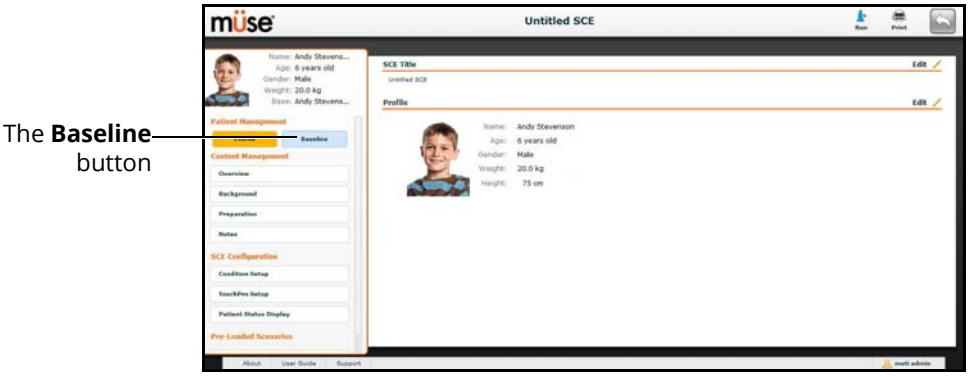
2. Set the Patient's name, age, gender and weight by filling in the appropriate fields
3. Click the **Change Picture** button to change the patient's picture (optional)
4. Click **Save**

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

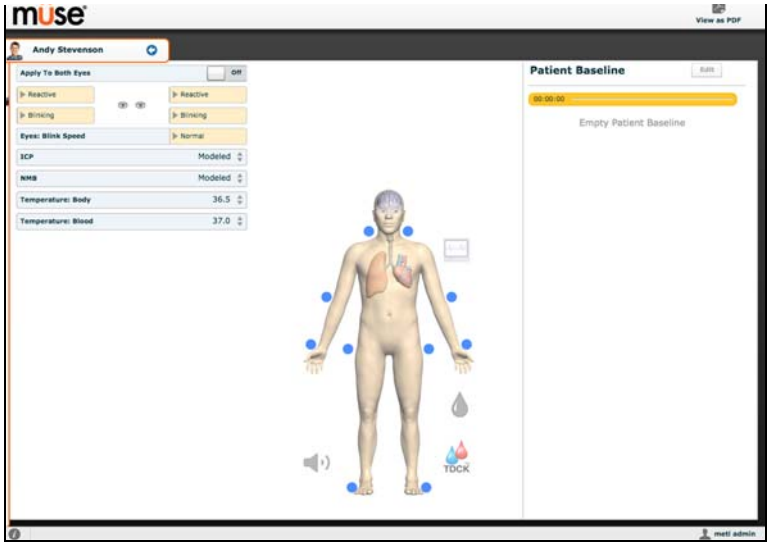
Setting a Patient's Baseline

The patient baseline is the patient's initial physiology at the beginning of an SCE. To set the Patient's Baseline:

1. From the SCE Editor, click **Baseline**



The SCE Editor Screen



The Patient Baseline Screen

2. Set the Patient's baseline physiology by modifying the desired parameters

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

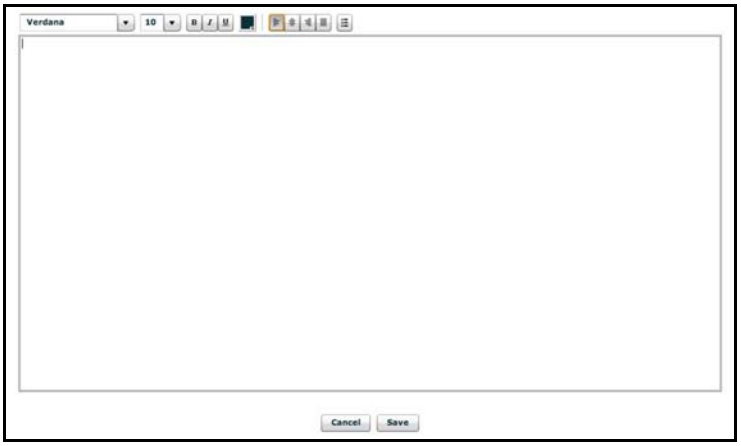
Content Management

SCE Content is entered from the SCE Editor using the **Overview**, **Background**, **Preparation** and **Notes** buttons under the **Content Management** heading.

The Content Management Buttons

Each button accesses a screen that allows users to enter information for the chosen section (Overview, Background, Preparation or Notes). Click the **Edit** button of each section on the SCE Editor to access a rich-text editor that enables data entry.

IMPORTANT: *Text can be copied and pasted into the fields from TextEdit or Notepad only.*



The Rich-Text Editor

Click **Save** when all data for the field has been entered.

SCE Configuration

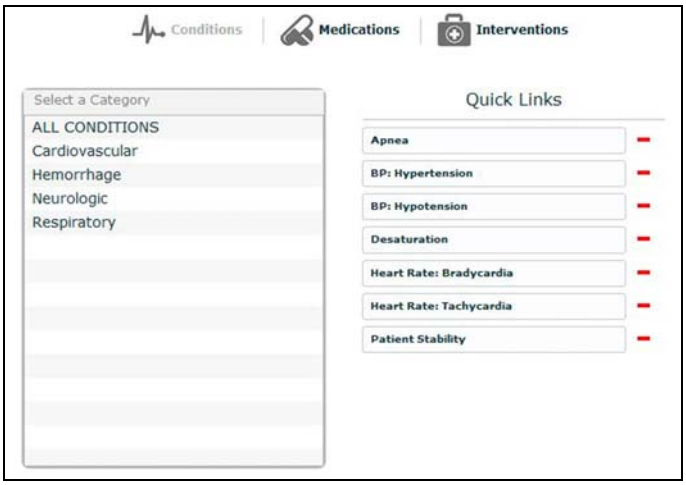
Setting up the Conditions, the TouchPro software and the Patient Status Display is achieved by clicking the buttons under the **SCE Configuration** heading in the SCE Editor.

The SCE Configuration Buttons

Condition Setup Screen and Creating Quick Links

Click **Condition Setup** to access the Condition Setup screen. From the Condition Setup screen, conditions, medications and interventions can be preconfigured for the SCE creating Quick Links.

On the Condition Setup screen, **Conditions**, **Medications** and **Interventions** buttons are available. To navigate through available conditions and interventions, click the **Conditions, Medications** and **Interventions** buttons.



The Condition Setup Screen

To create a Quick Link, drag and drop the desired choice from the Conditions, Medications or Interventions palette to the list of Quick Links.

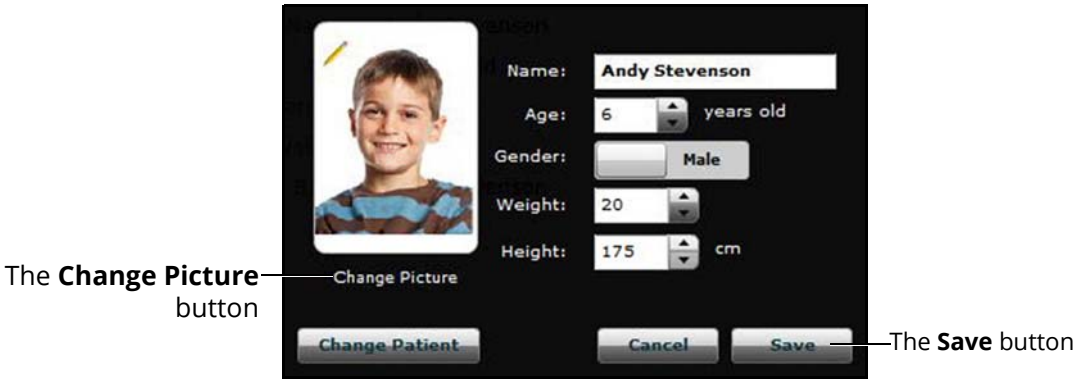
Click the minus sign to remove a Quick Link from the SCE.

Editing a Patient's Profile

To edit the Patient Profile:

1. From the SCE Editor, in the **Profile** section, click **Edit**

The SCE Editor Screen



The Profile Editor

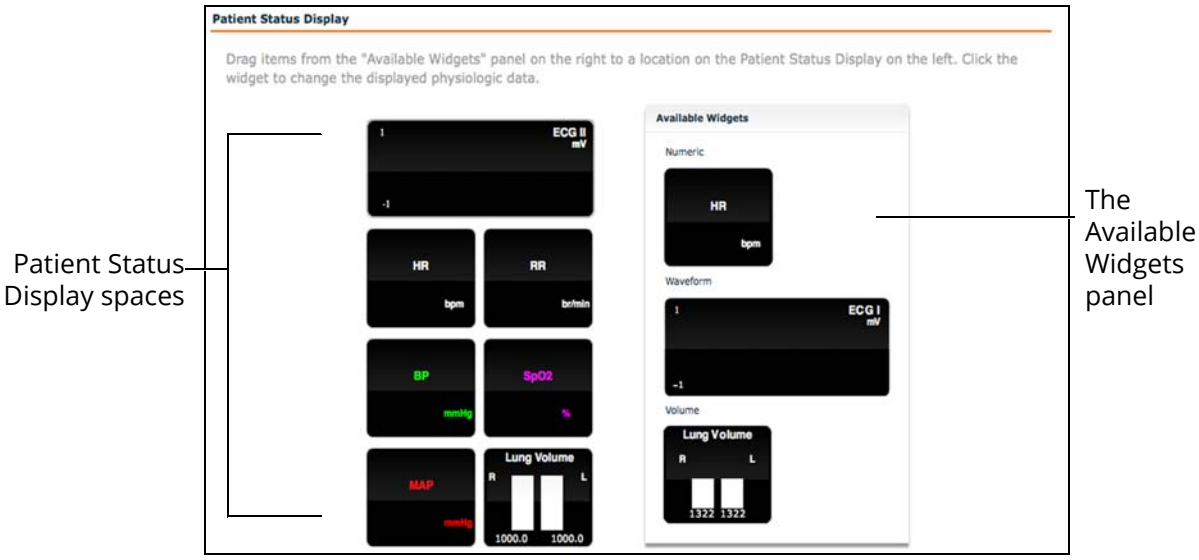
2. Set the Patient's name, age, gender and weight by filling in the appropriate fields
3. Click the **Change Picture** button to change the patient's picture (optional)
4. Click **Save**

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

Patient Status Display

To configure the Patient Status Display displayed on the Run screen, click **Patient Status Display** under the SCE Configuration heading on the SCE Editor.

The Patient Status Display screen appears.



The Patient Status Display Screen

To modify the Patient Status Display, drag and drop the desired waveform, numeric or volume widgets from the Available Widgets panel to an available Patient Status Display space.

Note: Waveforms occupy two spaces.

Once the desired widget is placed, click the widget to change the physiologic parameter displayed.

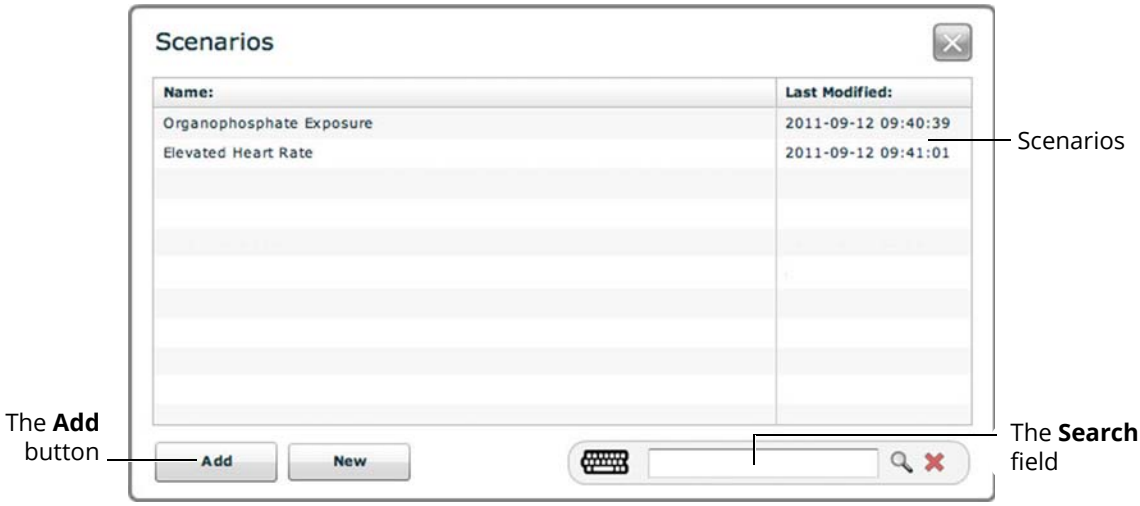
Adding a Scenario from the SCE Editor

SCEs incorporate scenarios that contain preprogrammed physiology. Scenarios can be added to SCEs to enhance patient physiology. When a scenario is added to an SCE from the SCE Editor, the scenario becomes associated with the SCE and begins automatically when the SCE is run.

To add a scenario to an SCE from the SCE Editor:

1. From the Review screen, click the **Add Scenario** button under the Preloaded Scenarios heading

The Add Scenario Button



The Choose Scenario Dialog Box

2. Select a saved scenario from the Choose Scenario Dialog Box

   The **Search** field can be used to search for a scenario to select.

3. Click **Add**

   The scenario is added to the SCE and is listed on the SCE Editor beneath the Pre-Loaded Scenarios heading.

Developing Scenarios

The Scenario Designer allows users to create and edit scenarios.

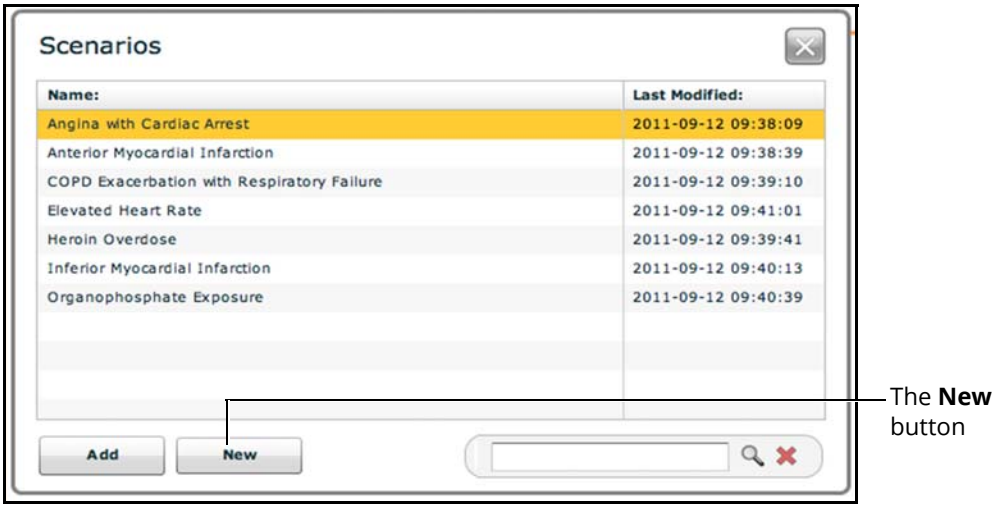
Creating a New Scenario

To create a new scenario:

1. From the SCE Editor, under the Pre-Loaded Scenarios heading, click the **Add Scenario** button

The Pre-Loaded Scenarios Heading

The Choose Scenario dialog box appears.



The Choose Scenario Dialog Box

2. Click **New**

   The Scenario Designer appears, displaying the new, untitled scenario.

From the Scenario Designer, scenario states can be added, modified, and deleted.

The Scenario Designer

The **Scenario** button is used to manage states and save the scenario.

The **View** buttons toggle between Scenario Designer views.

The **New State** button is used to add new states.

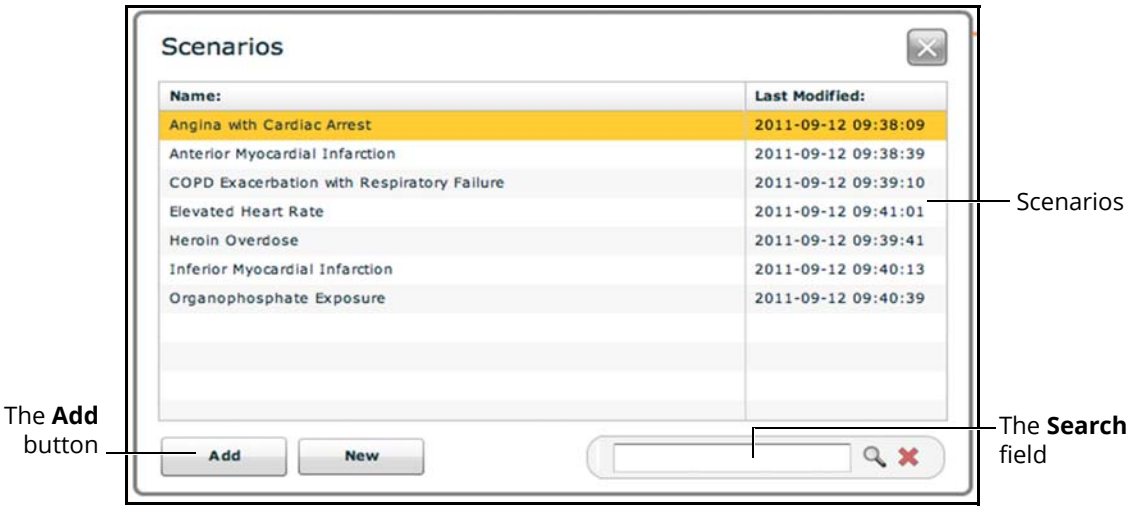
Once created, states are displayed on the Scenario Designer canvas.

Editing a Scenario

To edit a scenario:

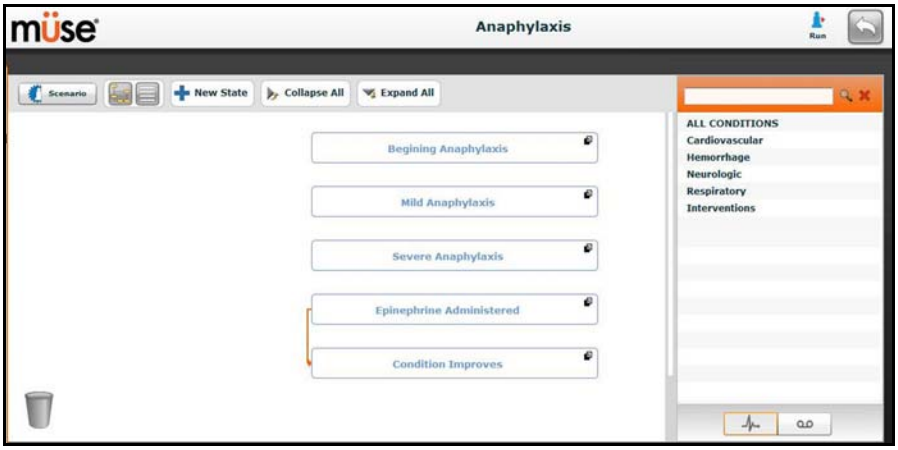
1. From the SCE Editor, under the Pre-Loaded Scenarios heading, click the **Add Scenario** button

The Pre-Loaded Scenarios Heading



The Choose Scenario Dialog Box

2. Select a saved scenario from the Choose Scenario Dialog Box
3. Click **Add**
4. Click the scenario's name under the Pre-Loaded Scenarios heading

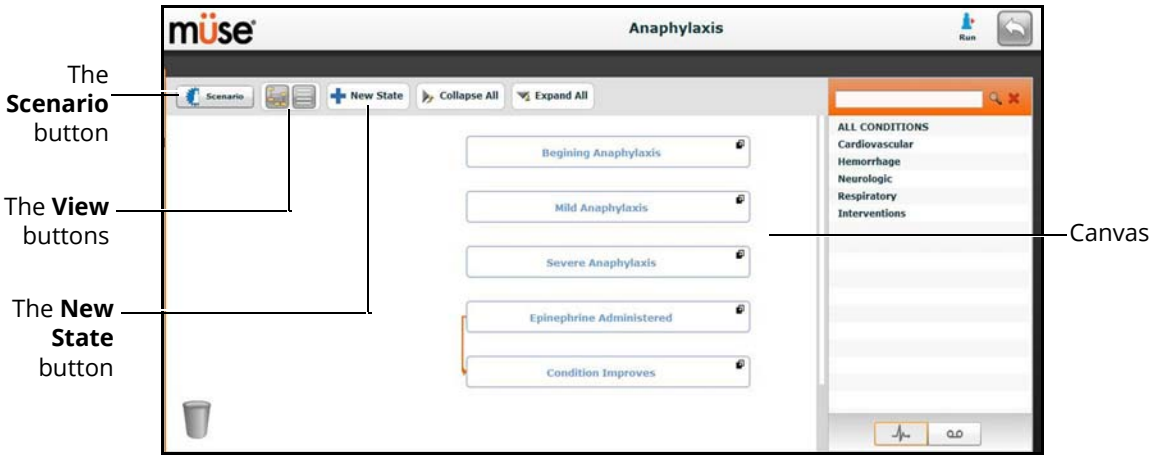


The Scenario Designer

The Scenario Designer

The Scenario Designer is accessed by creating or editing a scenario from the SCE Editor.

From the Scenario Designer, scenario states can be added, modified and deleted.



The Scenario Designer

The **Scenario** button is used to manage states and save the scenario.

The **View** buttons toggle between Scenario Designer views.

The **New State** button is used to add new states.

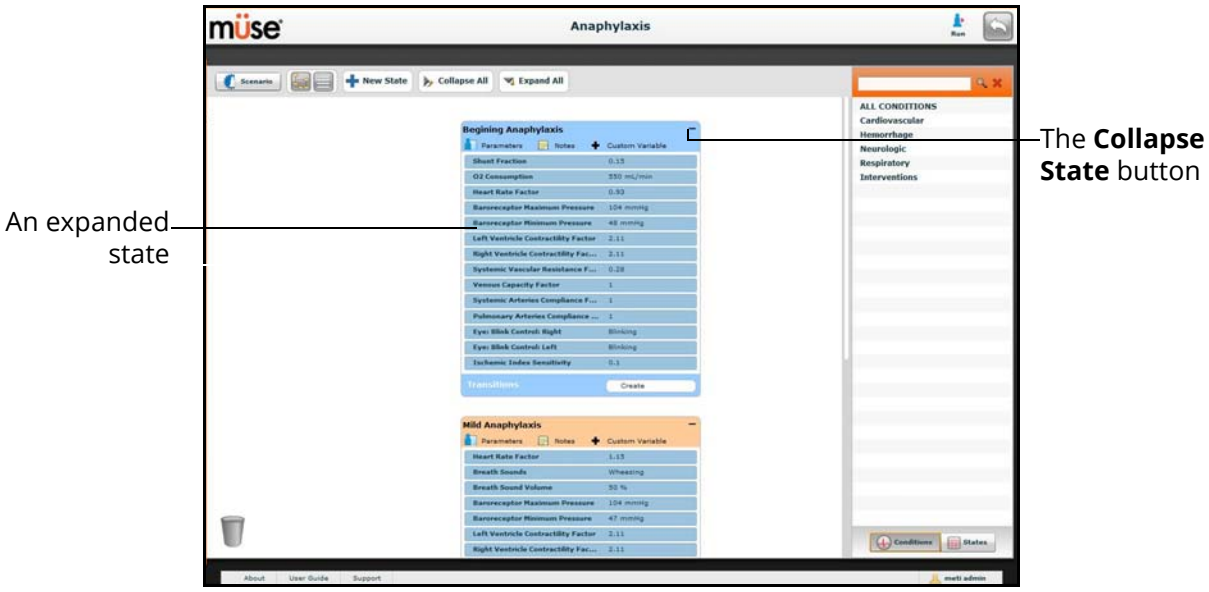
Once created, states are displayed on the Scenario Designer canvas.

Scenario Designer Views

The Scenario Designer has two views: the Graphical view and the List view. The Graphical view allows users to map out scenario states. The List view places the states and transitions into a linear format.

The Scenario Designer View Buttons

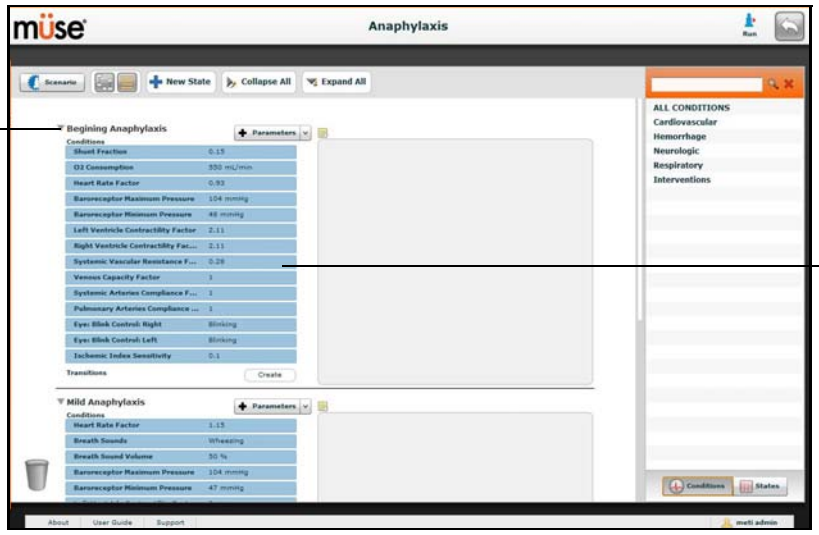
Click the **Graphical view** button to utilize the Graphical View.



The Graphical View

From the Graphical View, double-click on any state to expand it and view all of its components. Click the **Collapse State** button to collapse an expanded state.

Click the **List view** button to utilize the List view.

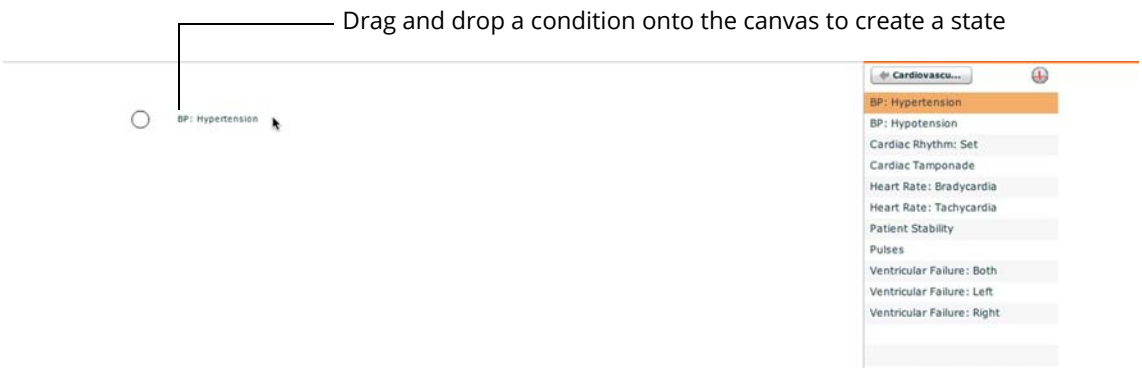


The List View

From the List View, click the **Expand/Contract** arrow to the left of any state to expand it to view all of its components. Click the arrow again to collapse the state.

Adding Scenario States

When beginning to create a new scenario, the canvas is blank. Scenario states can be created by dragging and dropping conditions from their respective menus on the right side of the Scenario Designer to the canvas.



The Scenario Designer Canvas

Or, a new, empty state can be added using the **New State** button.

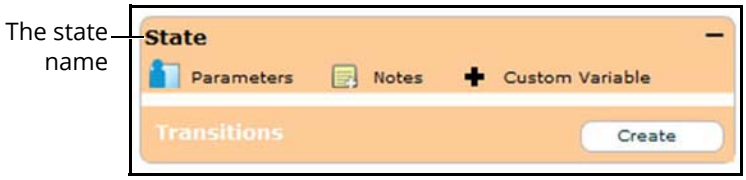
To add a new state using the **New State** button:

1. Click the **New State** button on the upper left side of the Scenario Designer

The New State Button

A New State

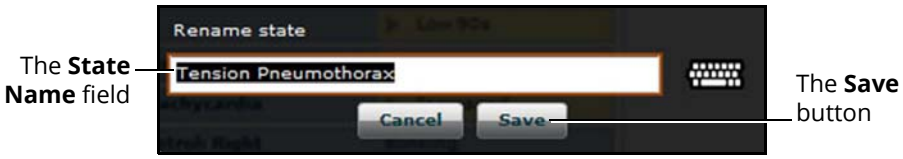
2. From the Graphical View, double-click the new state, or from the Line Item View, click the **Expand/Collapse** arrow to the left of the state to expand it



The Expanded State

3. Double-click the state name

   By default, new states are named “State.”



The Rename State Window

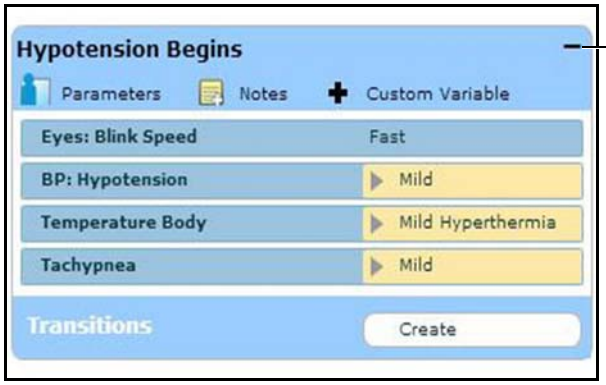
4. Enter a new state name

   Note: When naming a Scenario State, the state name may NOT exceed 127 characters Additionally, scenario file and state names CANNOT contain any special characters, such as (‘ / \ : * ? < > % | “).

5. Click **Save**

Modifying Scenario States

Once a scenario state has been placed on the canvas, it can be modified. Additional parameters, transitions and notes can be added. Each state can contain multiple parameters and transitions. Double-click the state name to rename it.



A State

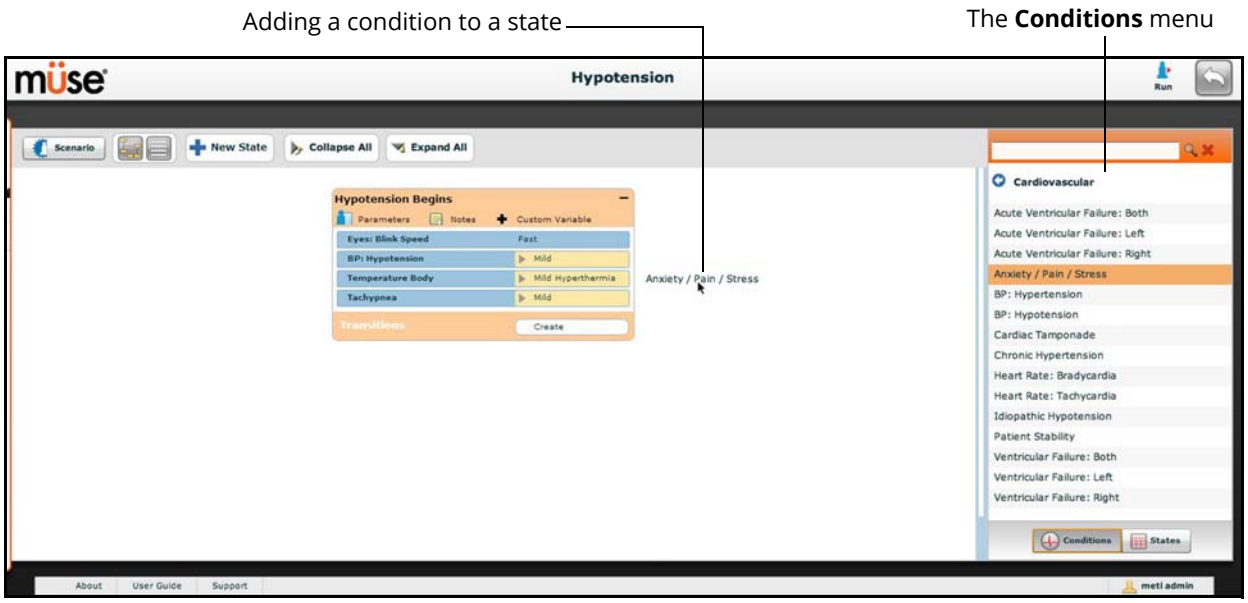
Click the **Collapse State** button to minimize the state.

Double-click the collapsed state to expand it.

TIP: *Parameters can also be adjusted by clicking on the parameter within the state.*

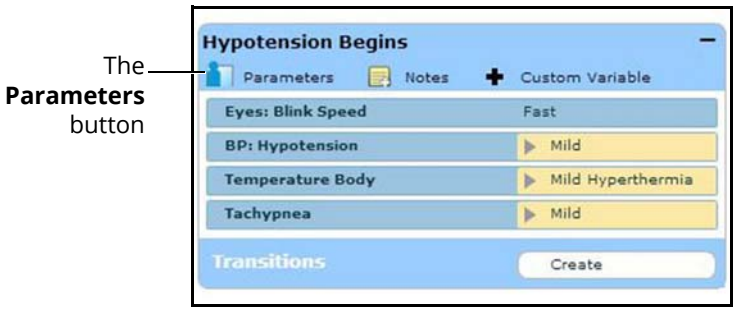
Adding Conditions, Interventions and Parameters

Conditions can be added to states by dragging and dropping them from the **Conditions** menu to the desired state.



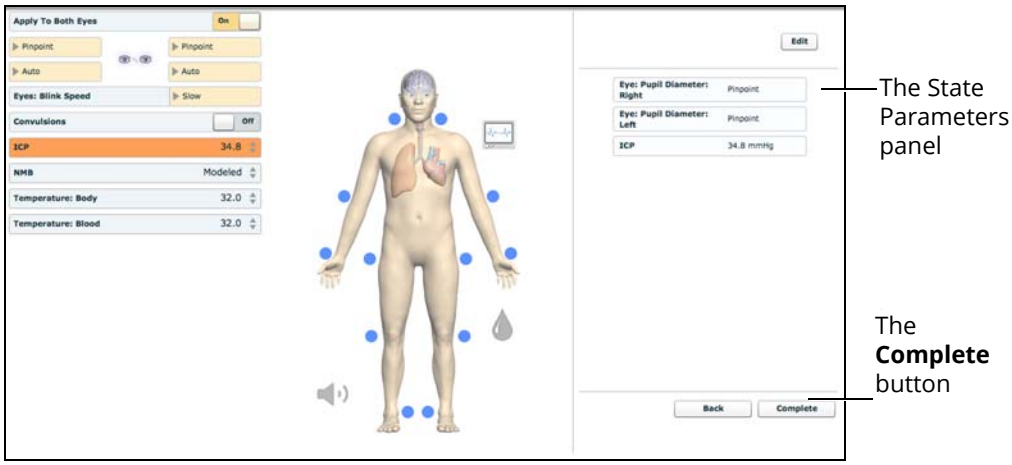
The Scenario Designer

To add parameters to a state, click the **Parameters** button within the state.



A State

The State Parameters screen appears.



The State Parameters Screen

Click the various organs to change the views, and then select the desired parameter. Once a parameter has been selected, it appears in the State Parameters panel on the right side of the screen.

Add as many parameters as needed. Added parameters appear consecutively within the state. Drag and drop to reorder as needed. Click **Complete** to save and exit the State Parameters screen, or click **Back** to exit without saving.

Note: If the physiology of any of the parameters conflicts, the Müse software reflects the physiology of the last parameter entered.

Adding Transitions

To add a transition, the scenario must have both an original state and a state that results from the transition.

To add a transition:

1. Click the **Create** button in the original state

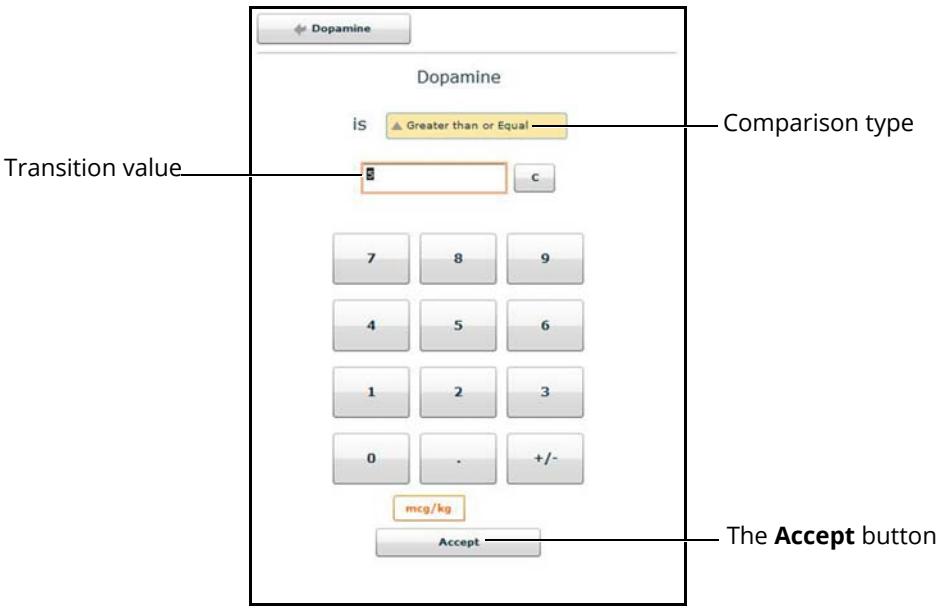
A State

The Transitions Window

2. Select the desired variable type. For example, if a transition based on the administration of medication is desired, select **Medications** and then select the desired medication from the list

   Once a medication is selected, The Medication Transition window appears, asking for the comparison type and transition value.

Follow the same steps to make selections from similar menus for the **Assessment**, **Intervention**, **Physiology**, **Scenario,** and **Vitals**variable types.

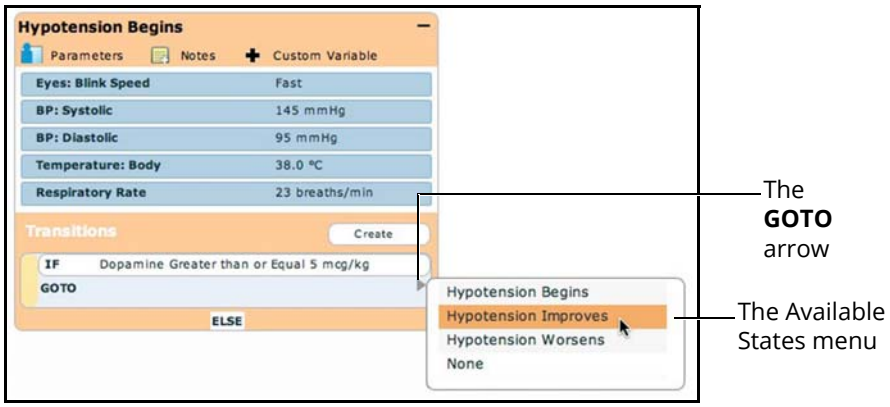


The Medication Transition Window

3. Once the variable values (e.g., comparison type and transition value) have been selected, click **Accept**

   The selected transition variable is listed beneath the original state on the Scenario Designer.

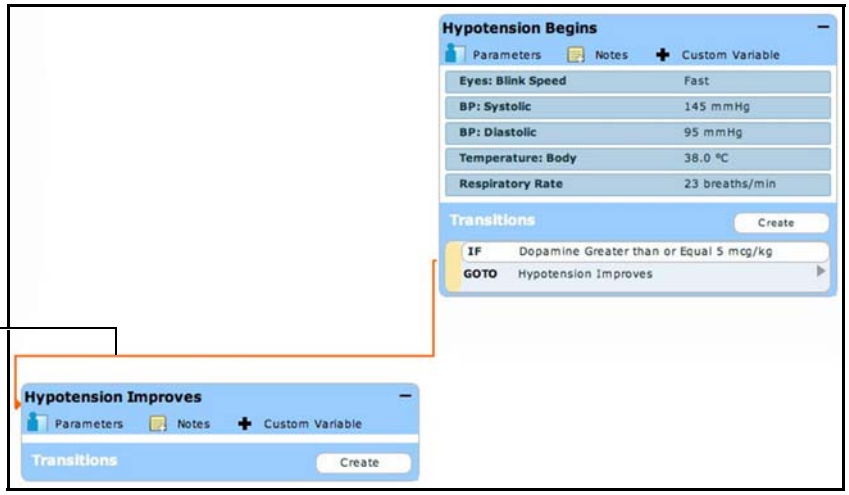
4. From the Scenario Designer, click the **GOTO** arrow beneath the new transition variable



The Scenario Designer

5. Select a state from the menu

An orange connector line appears, indicating that the states are now linked by a transition.



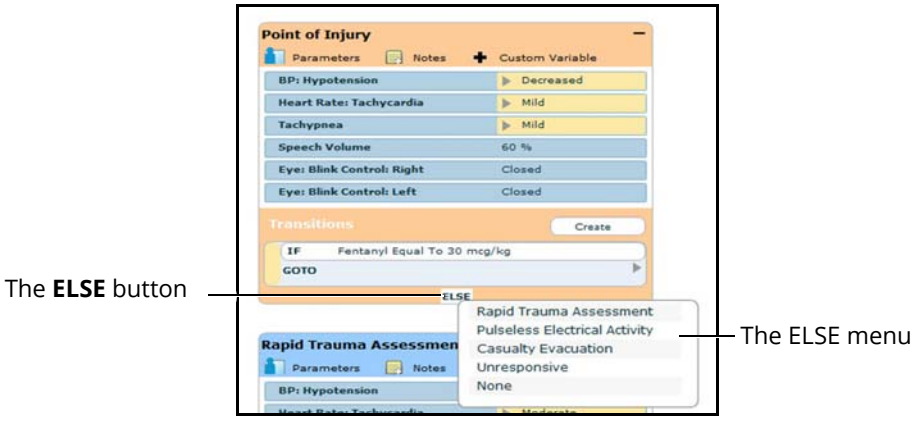
The Scenario Designer

ELSE Transitions

An ELSE transition is used to transition to a state automatically when none of the other programmed transitions occur.

Before specifying an ELSE transition from a state, the state must first contain at least one other transition.

To add an ELSE transition, click **ELSE** in the original state. The ELSE menu appears, listing all the available states.



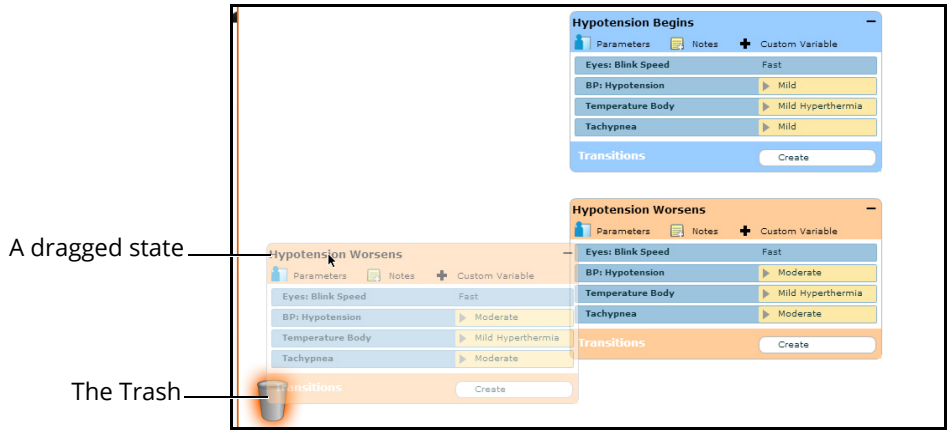
The Scenario Designer

Select the desired state. A black connector line appears, indicating that the states are now linked by an ELSE transition.

The Scenario Designer

Deleting Scenario States

To delete a state, drag and drop the state into the Trash.



The Scenario Designer

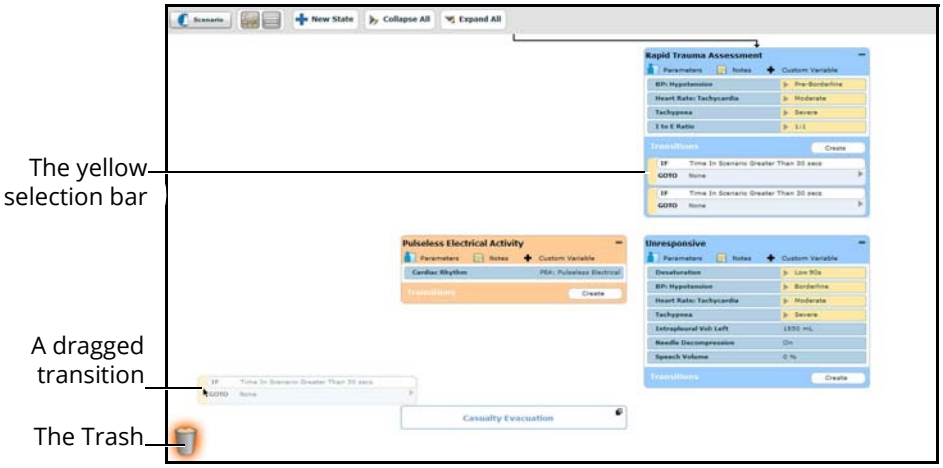
States can be dragged and dropped to the Trash from the Graphical view or the Line Item view.

Deleted states remain in the Trash until you log out of the software or the Trash is cleared.

Deleting Parameters and Transitions

To delete a parameter or transition, from an active state, drag and drop the desired parameter or transition into the Trash.

To drag a parameter, click anywhere within the parameter. To drag a transition, click the yellow selection bar to the left of the transition.



The Scenario Designer

Parameters and transitions can be dragged and dropped to the Trash from the Graphical view or the Line Item view.

Deleted parameters and transitions remain in the Trash until you log out of the software or the Trash is emptied.

Saving the Scenario

At any time during scenario creation or modification, the scenario can be saved.

To save a scenario:

1. Click the **Scenario** button in the upper left of the Scenario Designer

The Scenario Drop-Down Menu

2. To save the most recent version of a modified scenario, click **Save**

   To save a modified scenario as a new scenario, leaving the original scenario intact:

   a. Click **Save As**

The Save Scenario Dialog Box

   b. Enter the name for the scenario in the **Enter scenario name** field

   c. Click **Save**

Note: When naming a scenario, the scenario name CANNOT exceed 127 characters. Additionally, scenario file names CANNOT contain any special characters, such as (‘ / \ : * ? < > % ! | “).

Saving States to the State Library

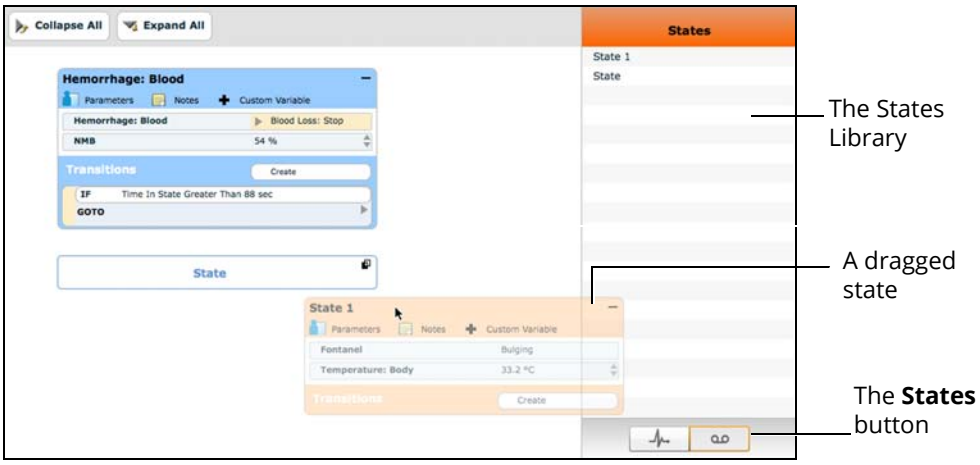
Users can save states to the State Library for later use.

To access the State Library, click the **States** button in the bottom right corner of the Scenario Designer.

The States Button

The State Library

To save a state, drag and drop the state into the States Library.



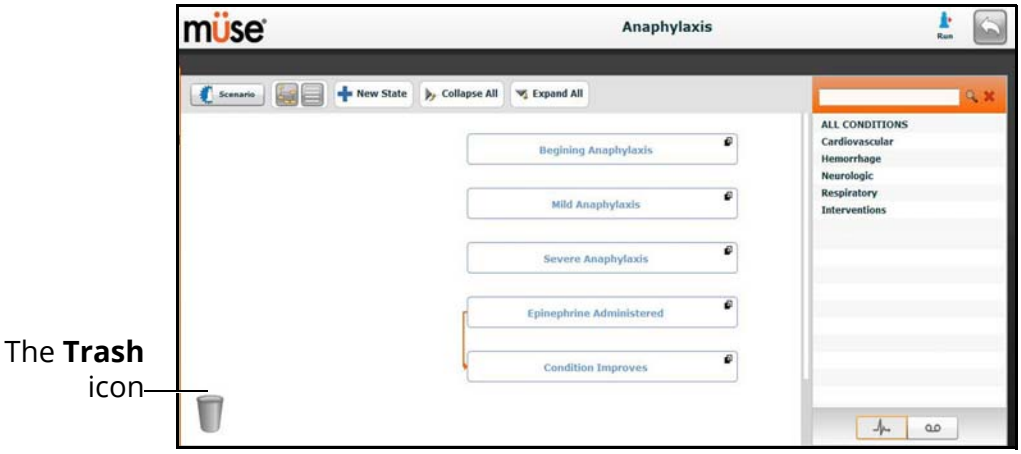
The Scenario Designer

To exit the State Library, click **Conditions**.

The Conditions Button

Emptying the Trash

To empty the Trash, click the **Trash** icon in the lower left corner of the Scenario Designer.



The Scenario Designer

The Trash List appears.

The Trash List

Click **Empty Trash** to empty the Trash. If you do not wish to delete the items listed, they can be dragged back into the scenario, at which time they are removed from the Trash.

Logging out of the software automatically empties the Trash.

IMPORTANT: *Items emptied from the Trash cannot be retrieved.*

ADMINISTRATIVE TOOLS

The Müse software has administrative tools that allow users to manage logs, stored content, users and system settings. The administrative tools are accessed via the Administrative Tools buttons, located on the Home page.

The Administrative Tools Buttons

Click the **History** button to view and manage simulation session logs.

Click the **System Administration** button to manage stored content, user accounts, groups and system settings.

Click the **Account Profile** button to manage and determine preferences for the active account.

History

From the History screen, users can view and export simulation session logs. Each simulation session is listed with the Start Time, the title of the SCE and the Patient's name. In addition, the SCE Events, Physiological Data, CTG data, Traction data, and CPR data are available for review or export.

The History Screen

By clicking the **Simulation Events** link of a Simulation Session, users can view the entire log of the simulation and all the events that occurred during the SCE.

When the **Physiological Data** link of a Simulation Session is clicked, users can view all the physiological data that occurred during the SCE.

On the Simulation Events and Physiological Data screens, there is an **Export** button that, when clicked, exports the data to a CSV file that can be stored on an external device.

System Administration

From the System Administration screen, users can control and access Content Management, User Accounts, Groups, and System Settings.

To access the System Administration screen, click the **System Administration** button from the Home page.

The System Administration Button

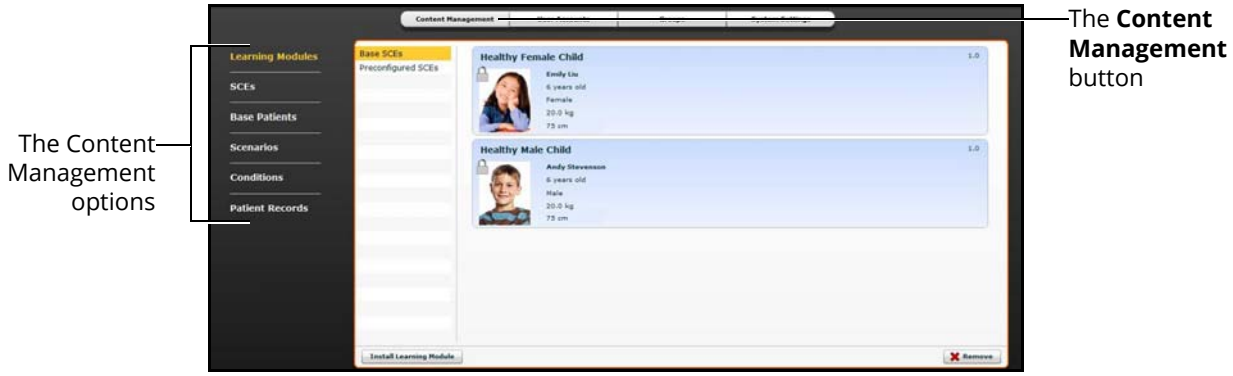
The System Administration screen is displayed.

The System Administration Screen

Content Management

To access the Content Management options, from the System Administration screen, click **Content Management**.

From the Content Management options, users can manage learning modules, SCEs, Base Patients, Scenarios, Conditions, Patient Records, and Vocalization List.

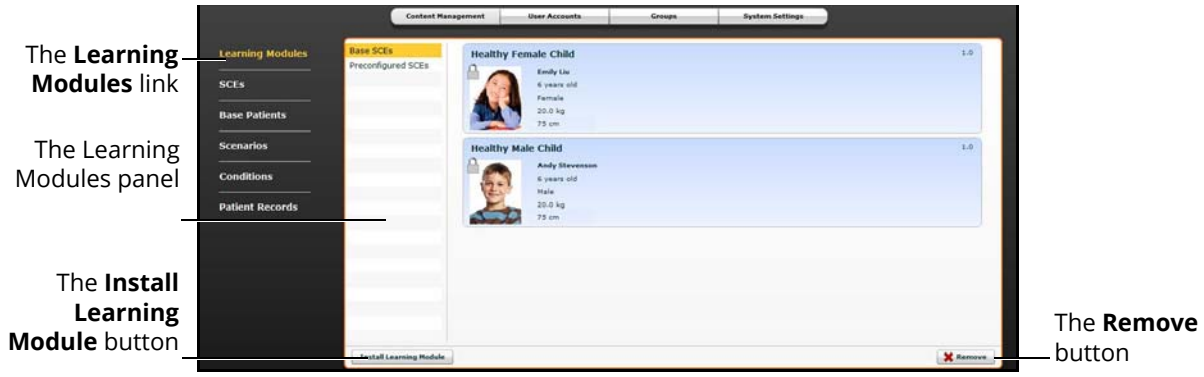


The System Administration Screen

Learning Modules

From the Learning Modules panel, learning modules can be installed or deleted.

When the Content Management button is selected, the Learning Modules panel appears by default. If another panel has been selected, return to the Learning Modules panel by clicking the **Learning Modules** link.



The Learning Modules Panel

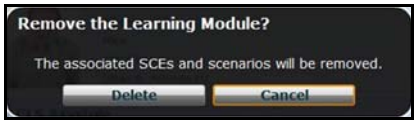
To install a learning module:

1. Click **Install Learning Module**
2. Locate the correct learning module file on the external storage device or the hard drive location where the file is saved

   Note: The file extension is ***mlm***.
3. Select the file and click **Select** or **Open**

To delete a learning module from Müse:

1. Select a learning module from the Learning Modules panel
2. Click the **Remove** button



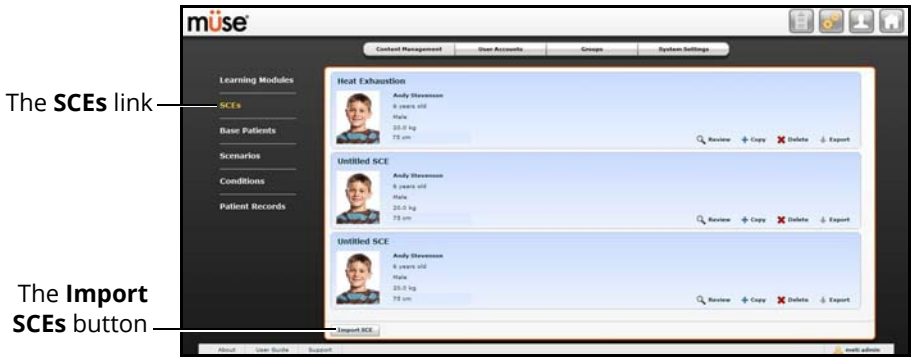
The Remove Learning Module Warning

3. Click **Delete**

   Note: Preconfigured learning modules cannot be deleted. If a user attempts to delete them, a failure message appears.

SCEs

From the Content Management options, click **SCEs** to access the SCEs panel.



The SCEs Panel

All user-created SCEs are listed in the SCEs panel.

On the SCEs panel, users can **Review**, **Copy**, **Delete**, **Import** and **Export** the SCEs they have created.

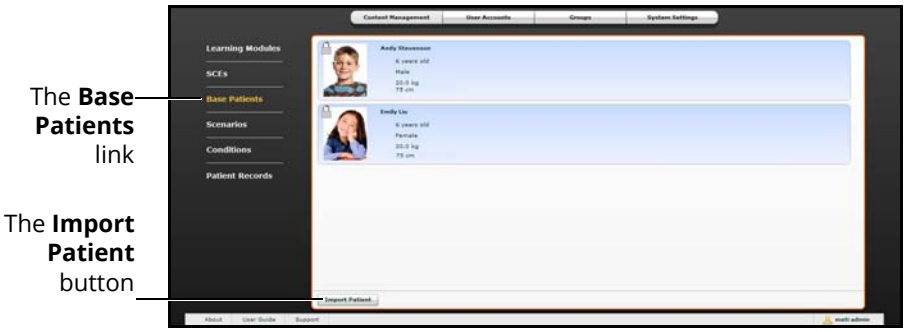
Note: SCEs purchased from CAE CANNOT be exported.

Click **Import SCE** to import an SCE from an external device or the hard drive location where the SCE file is saved. Click **Export** to export an SCE to an external device. The SCE file extension is ***sce***.

Base Patients

From the Content Management options, click **Base Patients** to access the Base Patients panel.

The Base Patients panel appears.



The Base Patients Panel

All Patients are listed in the Base Patients panel.

From the Base Patients panel, users can rename, review, delete and export Patients they have created by clicking the respective buttons next to each Patient.

Click **Import Patient** to import a Patient file from an external device or the hard drive location where the file is saved.

Use the **Rename** button next to a patient to give the patient a different name or the **Delete** button to delete the patient.

The **Export** button next to each patient can be used to export the Patient file to an external device. The Patient file extension is **pat**.

Note: Preconfigured CAE Base Patients have a lock symbol in the upper-left corner of the picture and CANNOT be renamed, deleted, or exported.

Scenarios

From the Content Management options, click **Scenarios** to access the Scenarios panel.

The Scenarios Panel

From the Scenarios panel, users can rename, review, delete, import and export scenarios they have created by clicking the respective buttons within each scenario. Locked scenarios can only be reviewed.

Users can also create new scenarios from the Scenarios screen by clicking the **Create New Scenario** button.

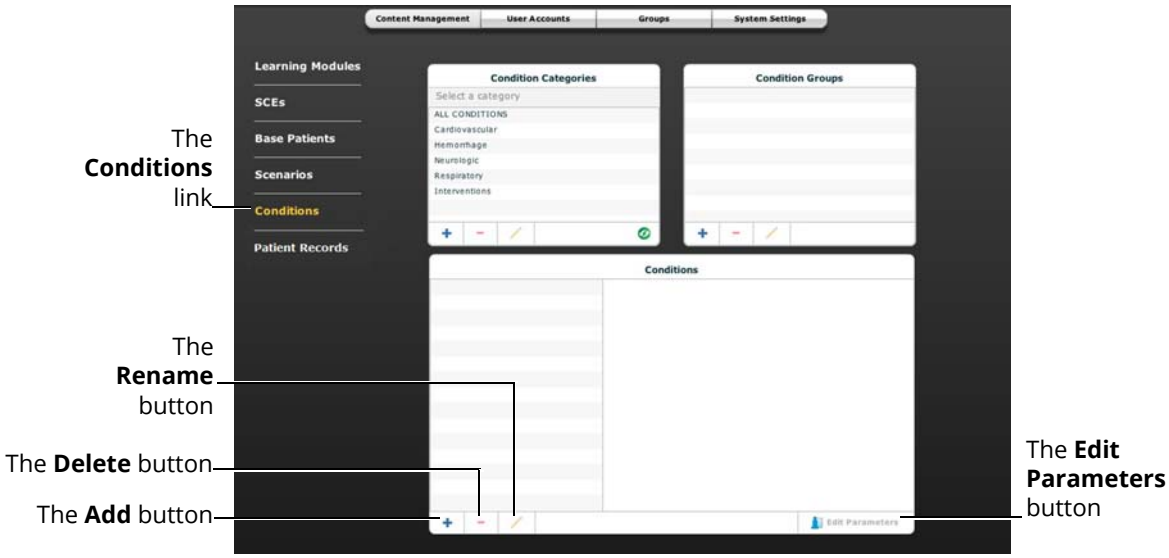
Click **Import** to import a scenario file from an external device or the hard drive location where the file is saved. Click **Export** to export a scenario file to an external device. The scenario file extension is ***mss***.

Note: Locked CAE scenarios CANNOT be exported, deleted, or renamed.

Conditions

From the Content Management options, click **Conditions** to access the Conditions Editor.

The Conditions Editor appears.



The Conditions Editor

All conditions can be viewed in the Conditions panel by selecting their associated categories and groups from the Condition Categories and Condition groups panels.

From the Conditions Editor, users can create new Conditions to be used in SCEs. To create a new condition:

1. From the Condition Categories panel, select a category
   Note: Conditions CANNOT be added to the Interventions category.
2. From the Condition Group panel, select a group
3. In the Conditions panel, click the **Add** button
4. Enter a name for the condition in the New Condition Name dialog box
5. Click **Save**
6. From the Conditions panel, select the new Condition
7. Click the **Edit Parameters** button
8. From the Parameters screen, select the desired Condition parameters
9. Click **Complete**

New condition categories and groups can also be added by clicking the **Add** button in the Condition Categories and Condition Groups panels.

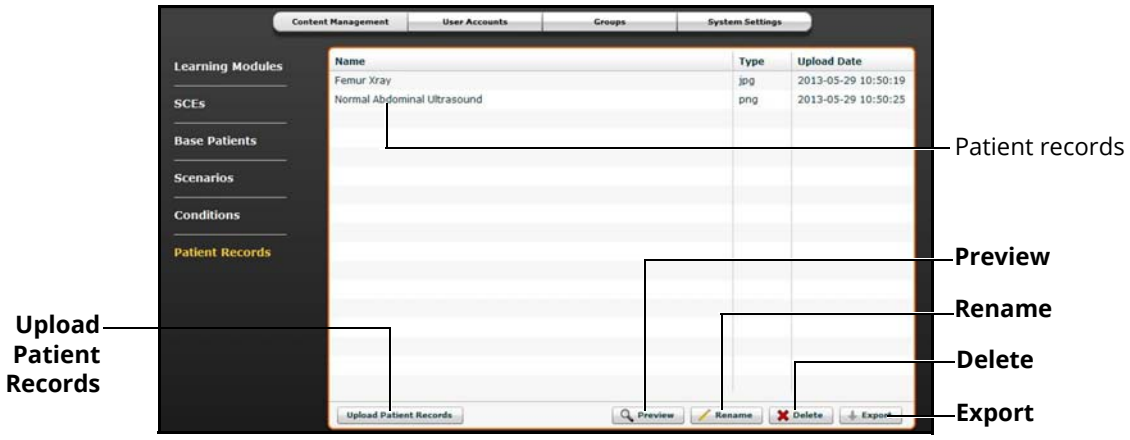
Use the **Delete** and **Rename** buttons in each panel to delete or rename a Condition, group or category.

Note: CAE conditions, groups and categories cannot be deleted or renamed.

Patient Records

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

Patient Records are managed from the Patient Records panel on the **Content Management** tab of the System Administration screen.



The Patient Records Panel

The following patient record file types can be uploaded to Müse:

- JPG or JPEG images
- GIF images
- PNG images
- XPS images
- PDF documents
- MPEG videos
- MOV videos
- MP3 audio files

A single patient record file cannot exceed 20MB.

To upload a patient record:

1. From Patient Records panel, click **Upload Patient Records**
2. Select the desired file and click **Open** or **OK**

Müse can store up to 100GB of patient record files. To ensure adequate space, please delete patient records when they are no longer needed.

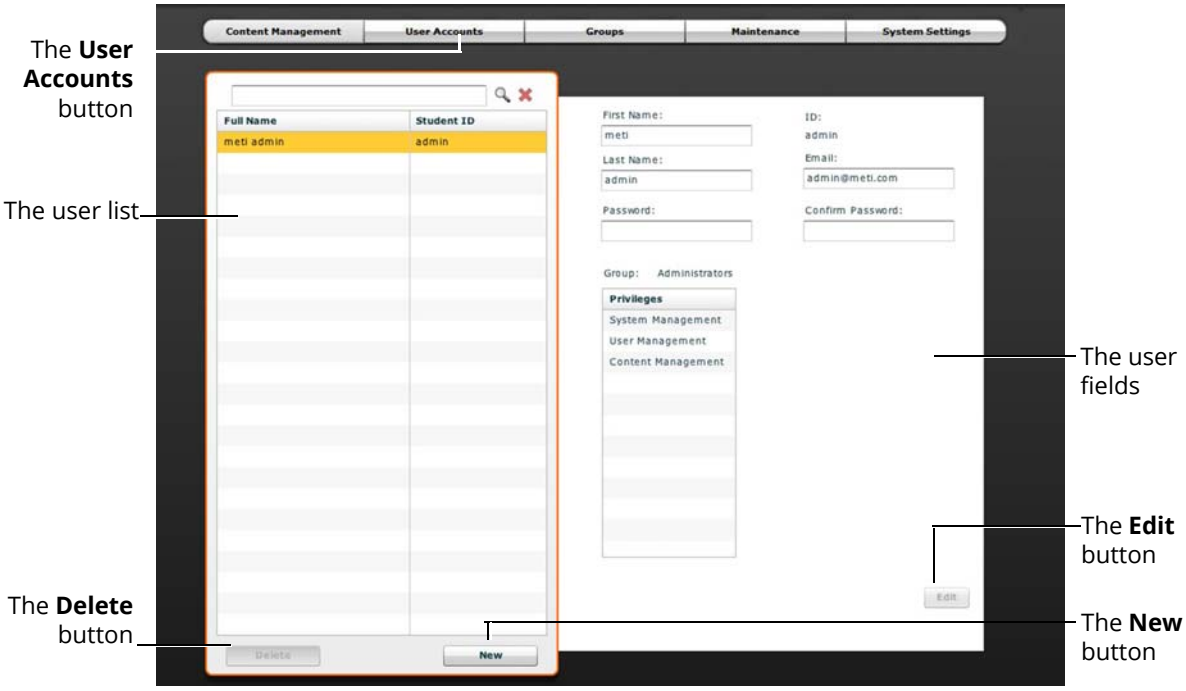
To delete a patient record:

1. From the Patient Records panel, select the patient record to delete
2. Click **Delete**

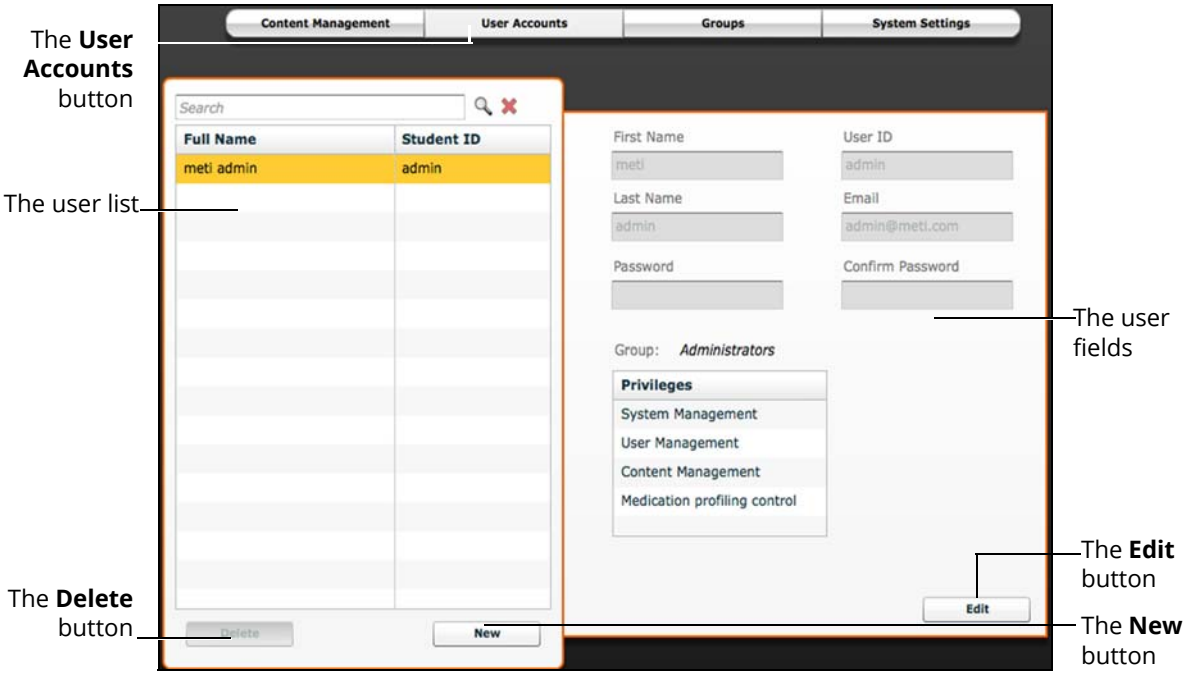
Individual patient records can also be Previewed, Renamed or Exported by selecting the record and clicking **Rename**, **Export** or **Preview**.

User Accounts

To access the User Accounts panel, from the System Administration screen, click the **User Accounts** button. Users can create, edit and delete users.



The User Accounts Panel



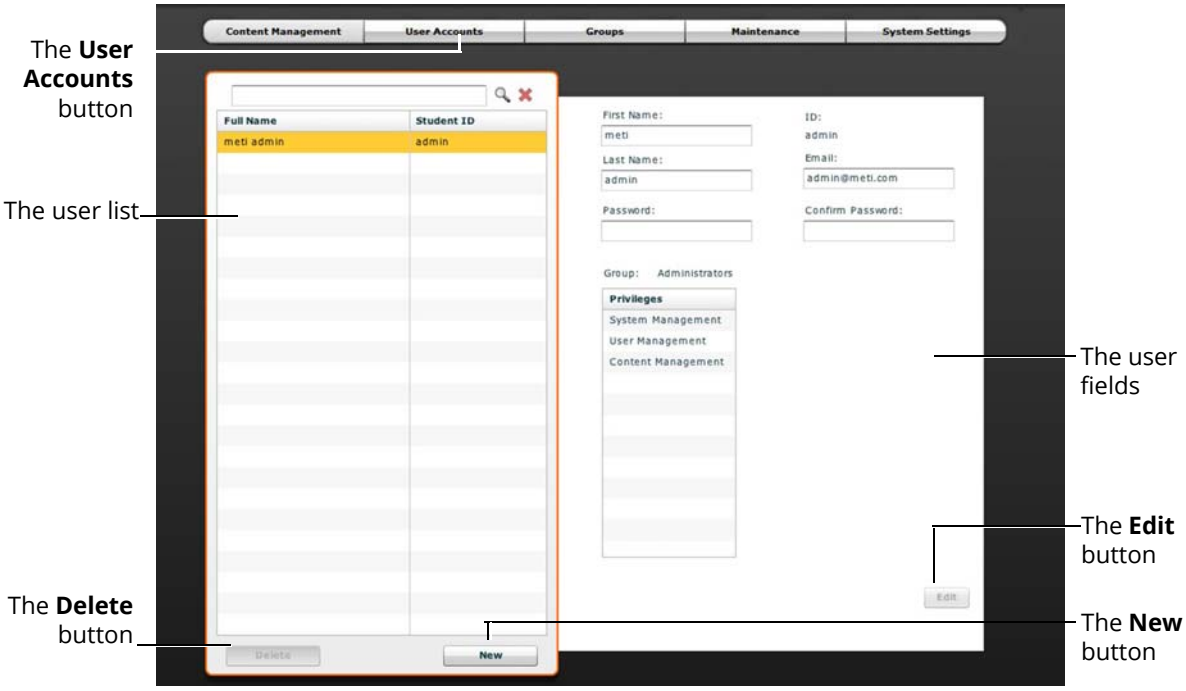
The User Accounts Panel

Note: User Accounts functions are available only to users with the User Management or System Management privilege.

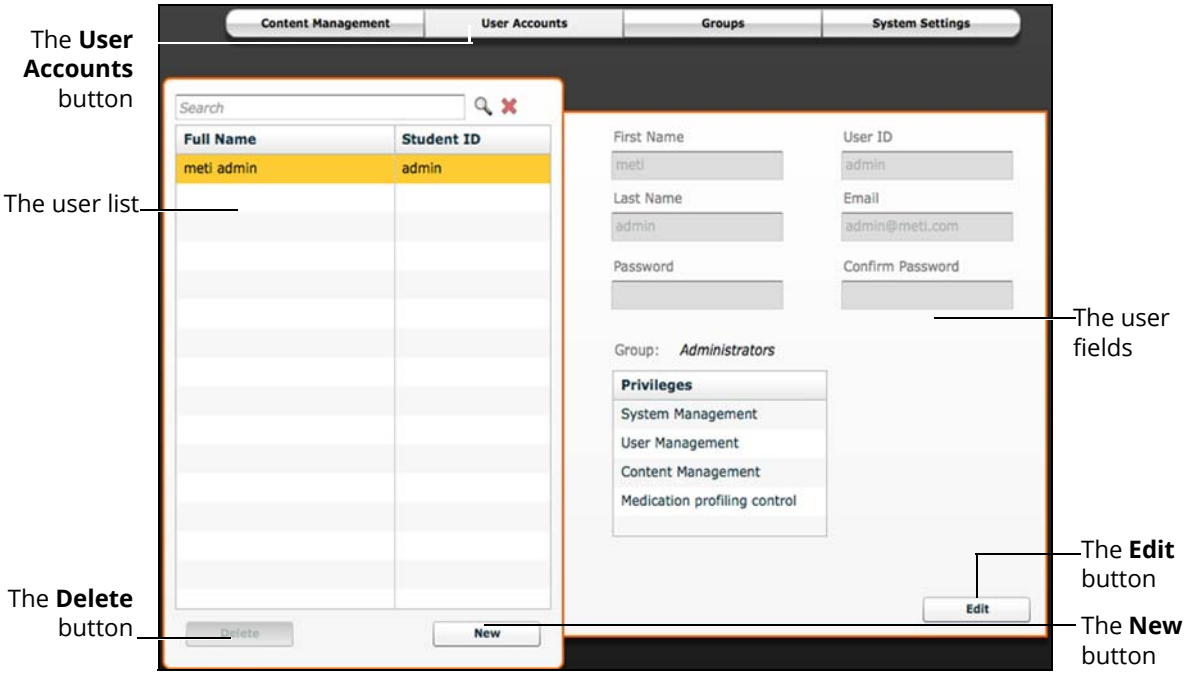
IMPORTANT: Changes made to Müse for HPS DO NOT affect Müse for PediaSIM HPS. If a user requires access to both Müse for HPS and Müse for PediaSIM HPS, separate accounts must be created within Müse for HPS and Müse for PediaSIM HPS.

User Accounts

To access the User Accounts panel, from the System Administration screen, click the **User Accounts** button. Users can create, edit and delete users.



The User Accounts Panel



The User Accounts Panel

Note: User Accounts functions are available only to users with the User Management or System Management privilege.

IMPORTANT: Changes made to Müse for HPS DO NOT affect Müse for PediaSIM HPS. If a user requires access to both Müse for HPS and Müse for PediaSIM HPS, separate accounts must be created within Müse for HPS and Müse for PediaSIM HPS.

Editing a User

To edit a user's information or privileges:

1. On the User Accounts panel, select the user to edit
2. Click **Edit**
3. Make the desired changes
4. Click **Save**

Deleting a User

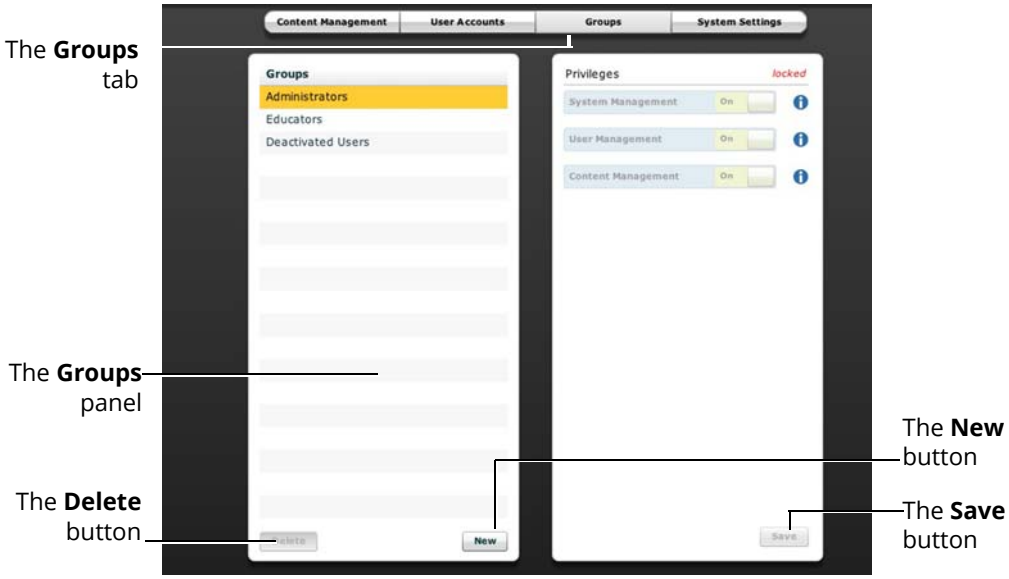
To permanently delete a user, from the User Accounts panel, select a user and click **Delete**. When the User Deletion Warning box appears, click **Yes**.

The user account and the data associated with it are deleted. However, the administrative user deleting the account becomes the owner of any SCEs, scenarios or patients created by the user being deleted (i.e., the SCEs, scenarios and patients created by the deleted user are moved to the deleting user's account).

Groups

Users are assigned to groups to define access privileges. To access the Groups panel, from the System Administration screen, click **Groups**.

The Groups panel appears.



The Groups Panel

Note: Groups functions are available only to users with the User Management or System Management privilege.

From the Groups panel, users can create new groups, delete groups and assign privileges to groups.

In the Groups panel, three groups appear by default:

- Administrators
- Educators
- Deactivated Users

Each default group has privileges assigned.

Privilege System

The Müse software has three different privileges:

- System Management
- User Management
- Content Management

User Management and Content Management can be assigned independently or combined. The System Management privilege contains all privileges.

System Management

Users with the System Management privilege have access to all features of the Müse software, including the benefits of the User Management and Content Management privileges, listed below. Users with the System Management privilege can also view system settings, backup and restore data and apply software updates.

User Management

Users with the User Management privilege can manage all users and groups.

Content Management

Users with the Content Management privilege can create and manage all SCEs.

Creating a new Group

To create a new Group:

1. From the Groups panel, click **New**
2. Enter the name of the Group in the **Group Name** field
3. Click **Create Group**

   The group appears in the Groups panel. Privileges can now be selected.
4. Select the privilege(s) to be assigned to the Group
5. Click **Save**

Deleting a Group

Groups can be deleted when they are no longer needed. Once a Group is deleted, all users who were affiliated with the Group are moved to the Deactivated Users Group.

To permanently delete a Group, select the group to be deleted from the Groups panel and click **Delete**. When the Group Deletion warning box appears, click **Yes**.

Providing Access to Content Only

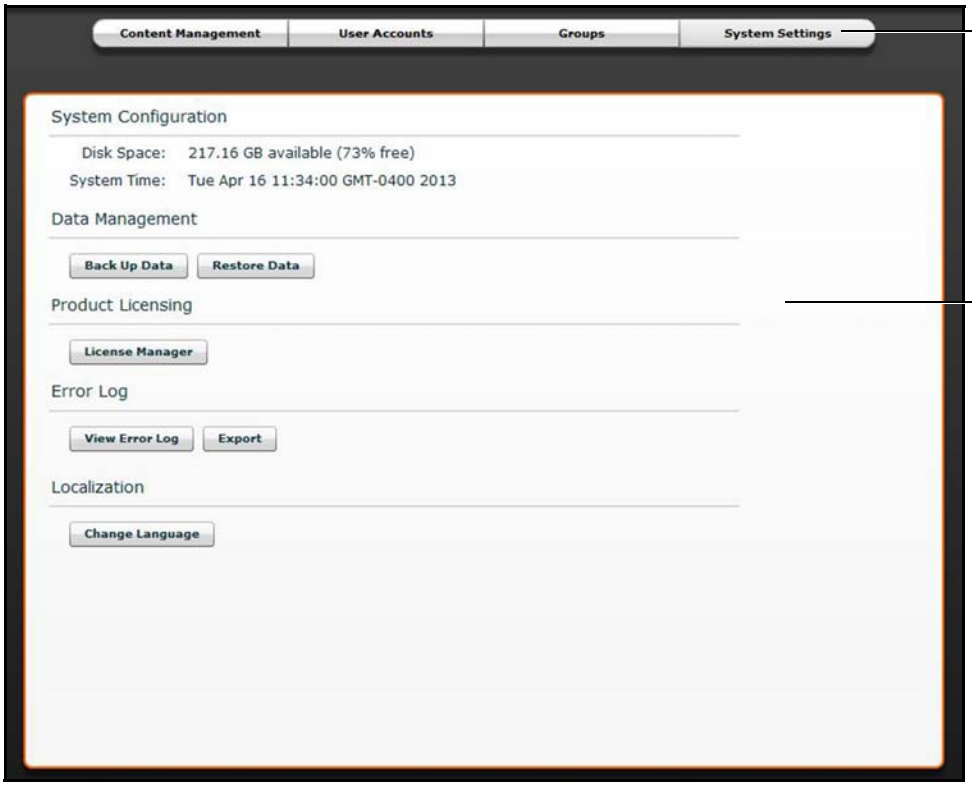
To provide users with the ability to create and manage SCEs, but NOT the ability to manage users or groups:

1. Create a new group called Content Only
2. Assign the group the Content Management privilege. Do NOT assign any other privileges to the group
3. On the **User Accounts** tab, create or edit the desired users, placing each user in the Content Only group

System Settings

From the System Settings panel, users can manage the System Configuration, Data Management, Product Licensing, Language, Updates, Error Log, and Performance Metrics of the Müse software.

To access the System Settings panel, from the System Administration screen, click **System Settings**.



The System Settings Panel

TIP: *Height and weight can be set to display in Metric or Imperial units.*
Note: System Settings functions are available only to users with the System Management privilege.

System Configuration

Under System Configuration, Disk Space and System Time are displayed.

Data Management

The Data Management feature allows users to back up data to an external device. Users can also restore the backup data.

Backing Up Data

Users should back up data frequently to protect and store content and user data.

To back up data:

1. On the System Settings panel, click the **Back Up Data** button

The Back Up Data Button

2. Select a location to save the backed-up data
3. Click **Save**

IMPORTANT: Always back up important content and data. A weekly backup should be done to protect content and user information.

Restoring Data

IMPORTANT: Restoring data ERASES all current data and replaces it with the backed-up data.

Users can restore data when the backed-up data needs to be replaced on the software. Restoring data only restores the last backup and does NOT merge the backup data with the current data.

To restore backup data:

1. On the System Settings panel, click **Restore Data**

The Restore Data Button

The System Restore Warning Box

IMPORTANT: Restoring data ERASES all current data and replaces it with the backed-up data.

2. Click **Yes**
3. Locate the appropriate .bak backup file to restore
4. Click Select

   Note: The computer may require a restart after the data is restored.

Product Licensing

To view product licensing information for your simulator or to enter a license key to activate your software, click **License Manager**.

Error Log

The Error Log is available for technicians and is used when diagnosing the Müse software.

IMPORTANT: *Do not clear the Error Log.*

Language

To change the language of the Müse software:

1. From the System Settings panel, under the Localization heading, Click **Change Language**
2. Select a language from the dialog box
3. Click **Accept**

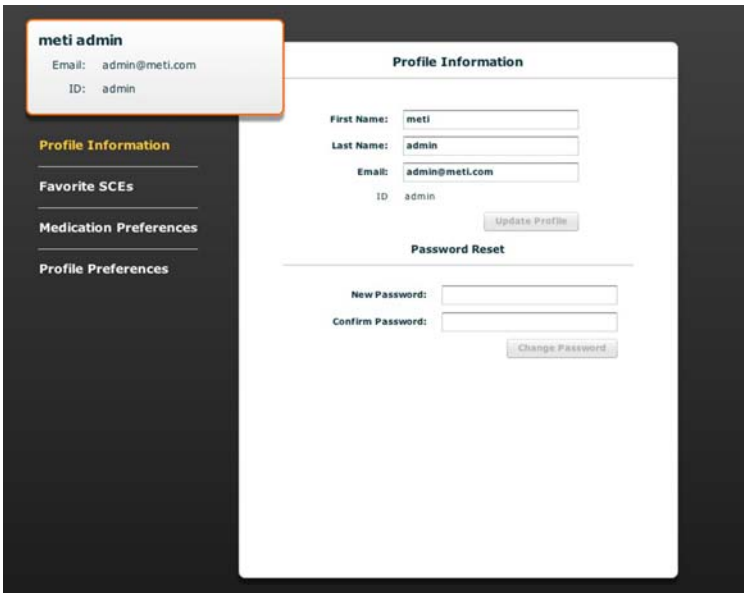
Note: Only the English version of the User Guide is available via the software, regardless of the Müse language selection.

Account Profile

From the Account Profile screen, users can view, update and reset personal profile information. Users can also view and add favorite SCEs from this screen.

Click the **Account Profile** button to access the Account Profile features.

The Account Profile Button

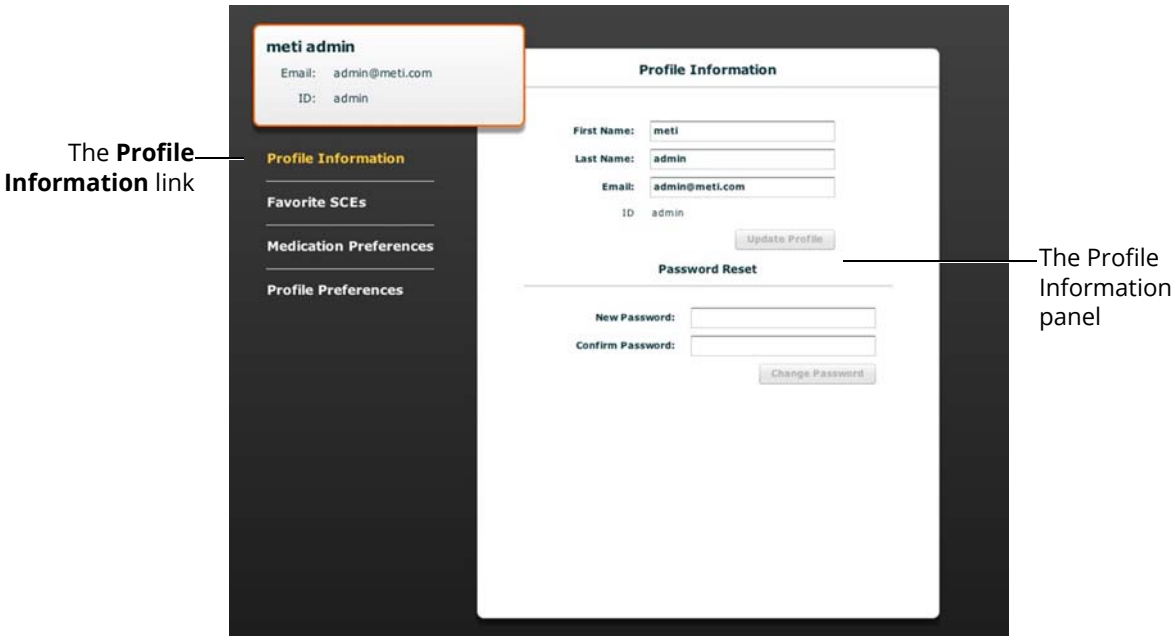


The Account Profile Screen

Profile Information

From the Account Profile screen, the Profile Information panel appears by default. If another panel has been selected, click **Profile Information** to return to the Profile Information panel.

From the Profile Information panel, users can change their profile information and reset their passwords.



The Account Profile Screen

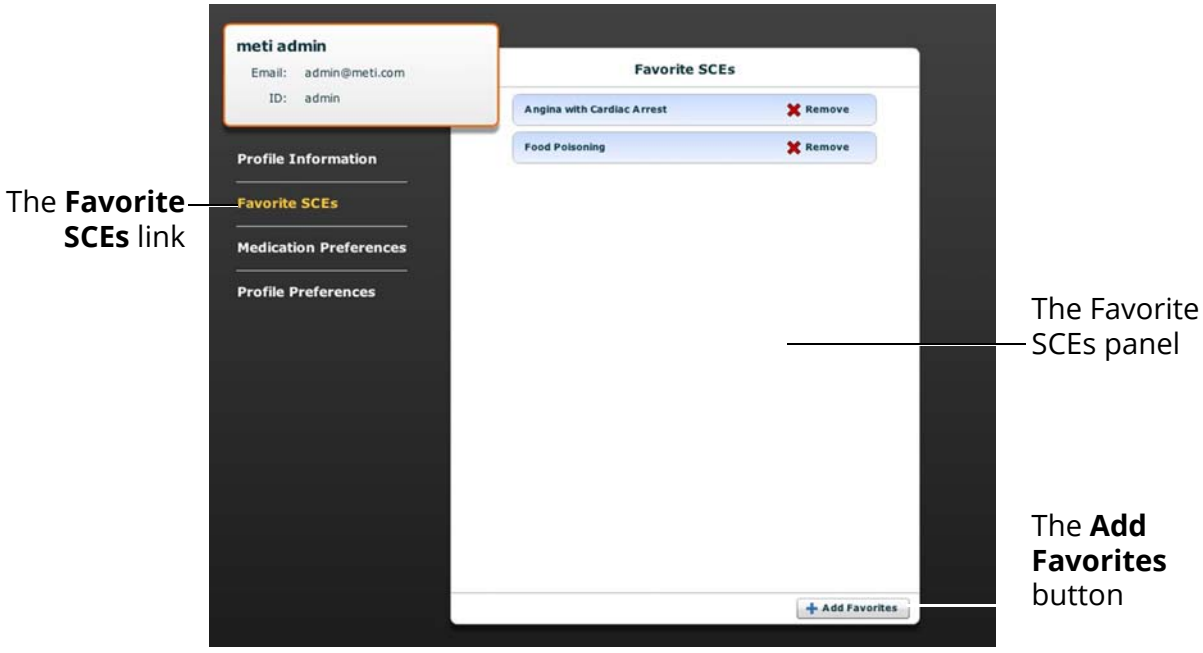
To change profile information, enter the new information in the appropriate fields and click **Update Profile** when finished.

To reset a password, enter the new password in the **New Password** field and re-enter the new password in the **Confirm Password** field. Click **Change Password** when finished.

IMPORTANT: *If you change your username or password, you MUST use the new username and/or password upon your next login. You cannot access the system with the old username or password once it has been changed.*

Favorite SCEs

To access the Favorite SCEs panel, click **Favorite SCEs** from the Account Profile screen. All of the logged-in user's favorite SCEs appear in the Favorite SCEs panel.



The Account Profile Screen

To add SCEs to the Favorite SCEs panel, click **Add Favorites**. The SCE Library appears. Select the desired SCE and it automatically appears in the Favorite SCEs panel.

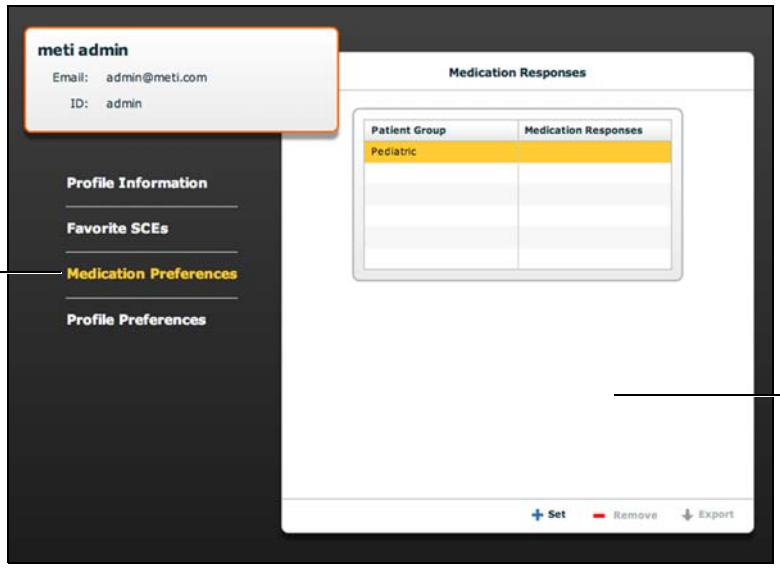
To remove a SCE from the Favorite SCEs panel, click the **Remove** button next to the name of the SCE.

Medication Preferences

From the Medication Preferences panel, users can import customized medication response files created in the Pharmacology Editor software.

To access Medication Preferences, click **Medication Preferences** on the Account Profile screen.

The Medication Preferences panel appears.



The Account Profile Screen

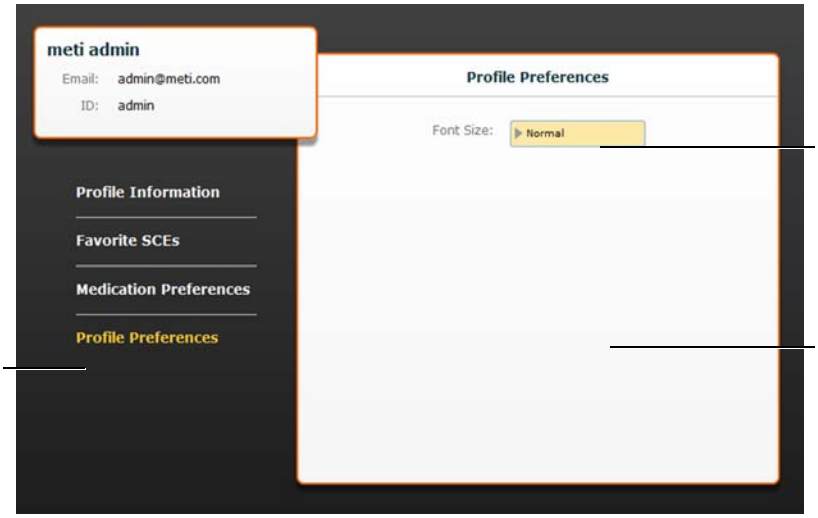
To import medication response files, click the **Set** button. The **Select File** dialog box appears. Select the medication response file to be added and click **Open** or **OK**.

Medication response files can also be removed or exported.

Profile Preferences

From the Profile Preferences panel, users can change the font size used in the software.

To access Profile Preferences, click **Profile Preferences** on the Account Profile screen.



The Account Profile Screen

To change the font size, click on the **Font size** selection. From the **Font size** drop-down menu, select **Normal**, **Small** or **Large**.

USING THE TOUCHPRO PATIENT MONITOR

In this section, you will learn how to use the TouchPro software, which enables users to view the patient's physiology, expressed in waveforms and numeric values.

The TouchPro Patient Monitor software enables users to view patient physiology.

The software can be used from the Instructor Workstation or on another computer provided the computer has joined the simulator's wireless network.

IMPORTANT: *Only two TouchPro software screens can be open at a time.*

Accessing the TouchPro Patient Monitor Software

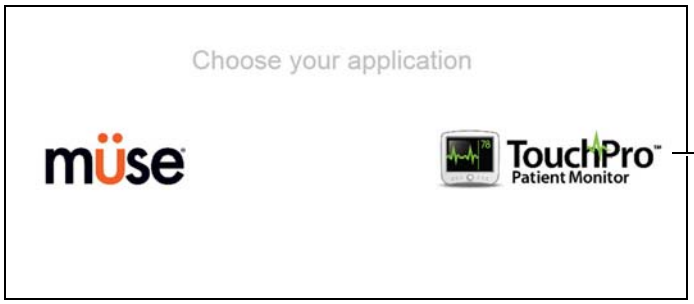
Like the Müse software, the TouchPro Patient Monitor software is compatible with computers that have touch-screen capabilities.

To run the TouchPro Patient Monitor software, the Instructor Workstation must be connected to the simulator's network.

IMPORTANT: An SCE must be running on the Müse software for any physiological data to be displayed on the TouchPro Patient Monitor software. The TouchPro Patient Monitor software can only show one Patient at a time.

To launch TouchPro Patient Monitor from the Instructor Workstation:

1. With the Müse software running, open a new tab in the web browser and go to the **Home** page of the web browser



The Müse Start Screen

2. Select the **TouchPro Patient Monitor** icon

When TouchPro Patient Monitor software launches, the simulated patient monitor appears.conditional

The TouchPro Display

Note: The capnogram waveform is not displayed on the TouchPro Patient Monitor software from the Instructor Workstation. Capnogram information can be found on the clinical patient monitor if one is connected to the simulator.

Modifying the TouchPro Patient Monitor Display

The layout of the waveforms and numeric data shown on the software can be customized. The software can show up to six waveforms plus an additional four numeric readouts.

Selecting a Preconfigured Layout

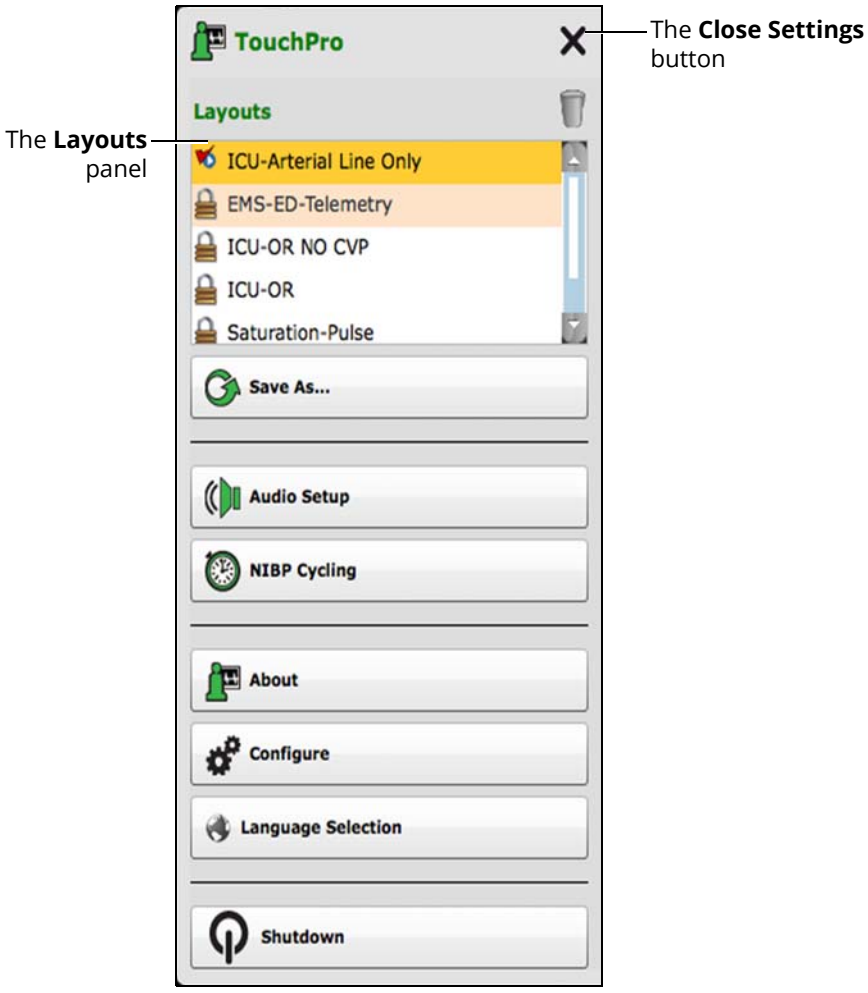
There are five preconfigured CAE Layouts:

- **ICU-Arterial Line Only** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, Pleth, and a numeric readout for Body Temperature
- **EMS-ED-Telemetry** - preconfigured with a waveform and numeric readout for ECG Lead II and numeric readouts for SpO_2, and NIBP (noninvasive blood pressure)
- **ICU-OR No CVP** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, PAP and Pleth, and numeric readouts for NIBP, Blood Temperature, and Body Temperature
- **ICU-OR** - preconfigured with waveform and numeric readouts for ECG Lead II, ECG Lead V, ABP, PAP, CVP and Pleth, and numeric readouts for NIBP, Blood Temperature, and Body Temperature
- **Saturation-Pulse** - preconfigured with numeric readouts for SpO_2 and pulse

To select a preconfigured layout:

1. Click the **Settings** button in the bottom right corner of the display

The Settings Button



The TouchPro Settings Menu

2. Select a layout from the Layouts panel
3. Click the **Close Settings** button

Note: Preconfigured layouts must be enabled in the Müse TouchPro Setup for the currently running SCE to be accessible in the Layouts panel.

Changing a Waveform or Numeric Display

Waveforms and numeric displays can be changed to suit the user's needs.

To change a waveform or numeric display:

1. Click the waveform or numeric to be changed

The Wave Vital Selection Menu

2. Select the desired waveform or numeric

From the **Wave Vital Selection** menu, the alarm, color and scale can be set for the waveform using the **Set Alarm**, **Set Color** and **Set Scale** buttons. From the **Numeric Vital Selection** menu, the color and alarm for the numeric can also be established using the **Set Color** and **Set Alarm** buttons.

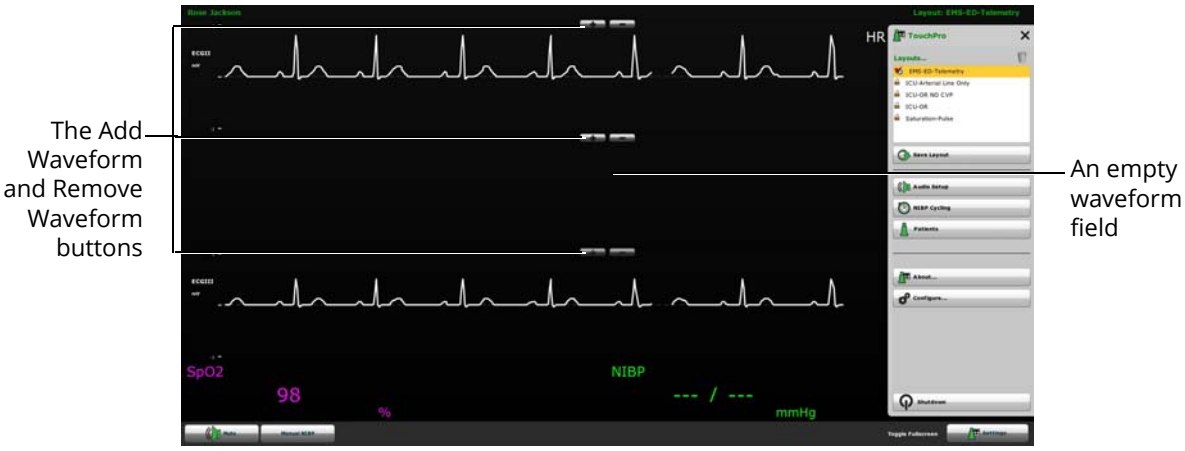
Adding a Waveform

The TouchPro software supports up to six waveforms.

To add a waveform:

1. Click the **Settings** button in the bottom right corner of the TouchPro display

The Settings Button



The TouchPro Display

2. Click the **Add Waveform** (**+**) button in the location above which you want the empty waveform to appear
3. Click the empty waveform field

The Wave Vital Selection Menu

4. Select the desired waveform from the Wave Vital Selection menu

Adding a Numeric Display

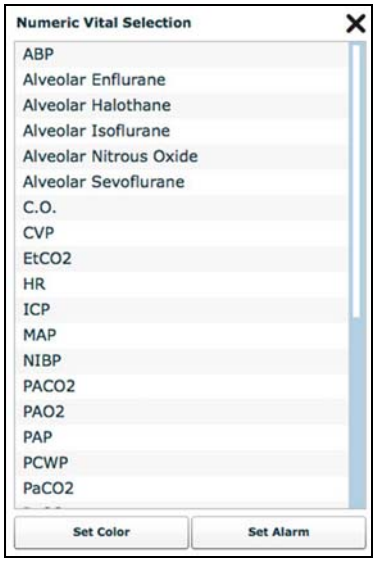
The TouchPro software contains four numeric display fields. All four numeric display fields are located on one row beneath the waveform displays.

When fewer than four numeric readouts are being displayed, the remaining fields are blank.

To add or change a numeric display field:

1. Click an existing or a blank numeric display field

The TouchPro Display



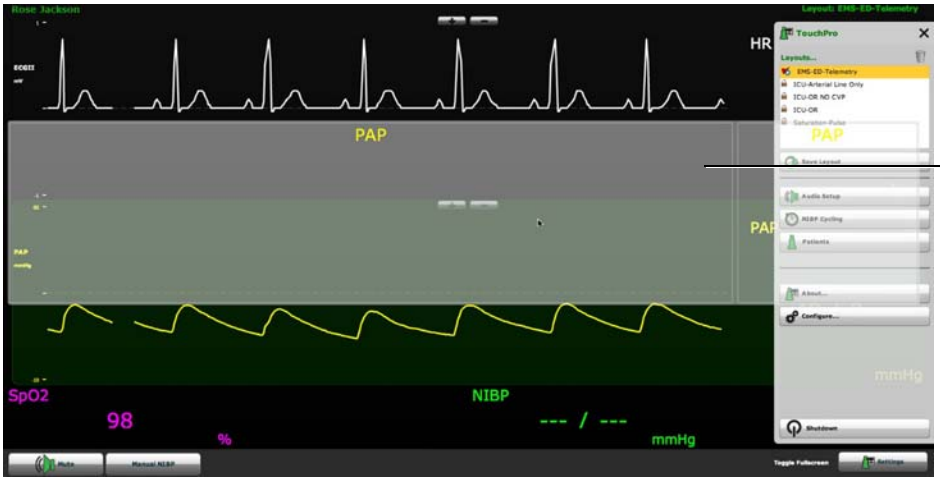
The Numeric Vital Selection Menu

2. Select the desired numeric (scroll for all listings)

Moving a Waveform or Numeric Display

Waveforms and numerics can be moved on the screen to suit the user's needs.

To move a waveform or numeric, click the desired waveform or numeric and drag and drop the display to a desired location.



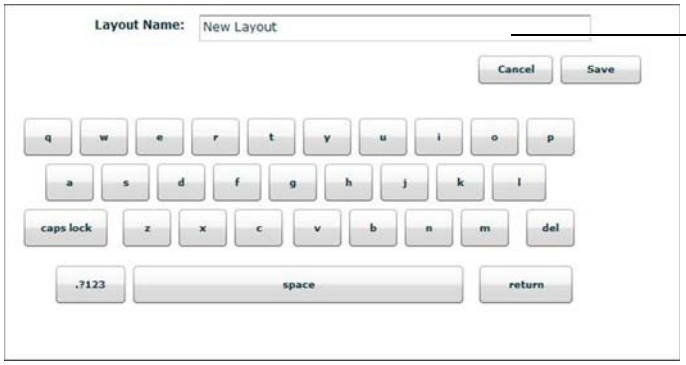
The TouchPro Display

Saving a Layout

Once a layout has been configured, it can be saved and reused.

To save a layout:

1. Ensure the desired waveforms and numerics are in place
2. Click **Settings**
3. Click **Save As**
4. In the Save Layout window, in the **Layout Name** field, enter a name for the layout



The Save Layout Window

5. Click **Save**
6. Click the **Close** button to exit the Settings menu

Saved layouts can be deleted from the Settings menu by dragging and dropping them in the Trash.

Note: When a layout is saved, it is available for use only with the current SCE. To enable the layout for use with any other SCE, enable the layout from the TouchPro Setup panel for the desired SCE.

Sounds

All sounds can be silenced by clicking the **Mute** button in the bottom left corner of the TouchPro display.

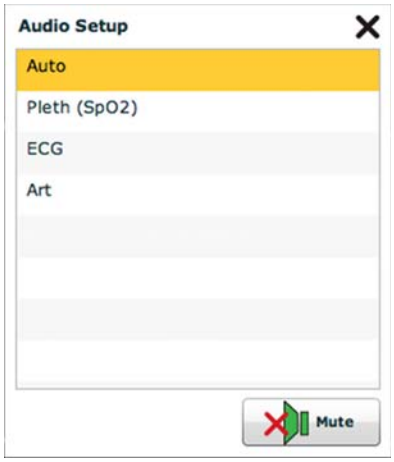
The Mute Button

To set up the audio for the TouchPro:

1. Click the **Settings** button in the bottom right corner of the TouchPro display

The Settings Button

2. From the Settings menu, click **Audio Setup**



The Audio Setup Window

3. From the Audio Setup window, select a waveform to set it as the pulse sound

   Once a waveform is selected, the Audio Setup window automatically closes.

4. Click the **Mute** button from the Audio Setup window to mute all alarms. Click the **Mute** button again to return the alarms to their original state.

NIBP Cycling and Manual NIBP

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

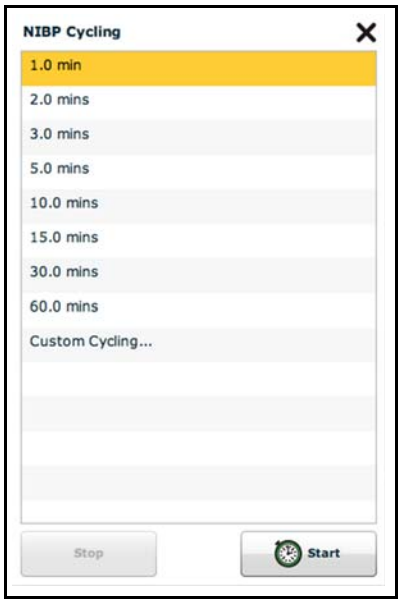
NIBP Cycling can be used to set the patient's NIBP to be updated at regular intervals.

To set NIBP cycling:

1. Click the **Settings** button in the bottom right corner of the TouchPro display

The Settings Button

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



The NIBP Cycling Window

3. From the NIBP Cycling window, select the desired interval for the cycling
4. Click **Start**

Note: Custom cycling is also available.

To display the patient's current NIBP, click the **Manual NIBP** button.

The TouchPro Display

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

Patients

To view the available Patients:

1. Click the **Settings** button in the bottom right corner of the TouchPro display

The Settings Button

2. From the Settings menu, click the **Patients** button

The Patients Window

Note: When connected to the simulator, the TouchPro only displays the active Patient.

Configuring the TouchPro Software

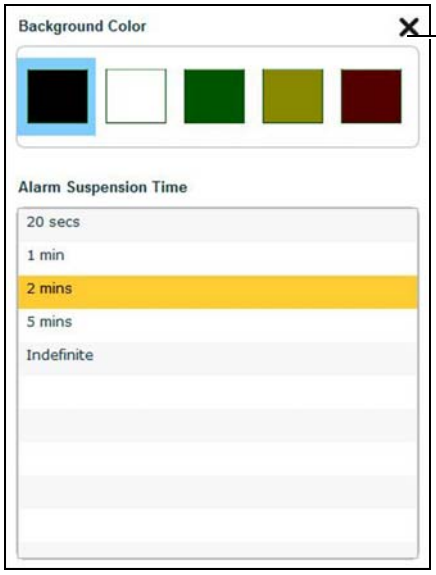
The background color and alarm suspension time can be set from the TouchPro Configure panel.

To access the Configure panel:

1. Click the **Settings** button in the bottom, right corner of the TouchPro screen

The Settings Button

2. From the Settings menu, click the **Configure** button
3. From the Configure window, set the background color and alarm suspension time



The Configure Window

4. Click the **Exit** button to exit the Configure window when finished

Changing the TouchPro Language

To change the language of the TouchPro software:

1. Click the **Settings** button in the bottom, right corner of the TouchPro screen

The Settings Button

2. From the Settings menu, click the **Language Selection** button
3. From the Language Selection window, select a language
4. Click **Accept**

Exiting the TouchPro Software

To exit TouchPro:

1. Click the **Settings** button from the bottom, right corner of the TouchPro screen

The Settings Button

2. From the Settings menu, click **Shutdown**
3. Click **Shutdown**

BabySIM Clinical Features

The BabySIM represents the latest in the state-of-the-art simulation technology for educating clinicians at all levels of medical education. Sophisticated mathematical models of human physiology and pharmacology automatically determine the effect of user actions and interventions on the patient, embodied by the manikin. In this way, patient outcomes result from clinical interventions and provide a platform for objective performance assessment.

Manikin

The BabySIM manikin displays the physical characteristics of a three- to six-month-old patient and has interchangeable male and female genitalia. Fully operational in the supine position, the manikin can be placed on standard operating room tables, in ICU beds, on the ground or even in a vehicle (in the case of a simulated accident).

The BabySIM Manikin

The manikin allows for the physical assessment of various clinical signs (i.e., heart and breath sounds, palpable pulses, chest excursion, airway patency, etc.) that are dynamically coupled with the mathematical models of human physiology and pharmacology.

Physiological and Pharmacological Features

The BabySIM simulates patient reactions based on complex neurological, cardiovascular, respiratory and pharmacological models.

Neurologic System

The BabySIM is equipped with a number of features specifically targeted to support training for neurological care. The following provides a general overview of each feature. In addition to the preconfigured sounds provided with the system, phonation and patient voice are available via a wireless microphone transmitter/receiver and speaker in the head of the manikin. A palpable anterior fontanel displays bulging upon activation via the software.

***Eye Signs*:** Each eye has functional eyelids that blink and pupils that can be adjusted independently to three levels of dilation (e.g., pinpoint, normal, blown).

***Secretions*:** Body fluids can be excreted from the eyes, ears and mouth.

Respiratory System

The BabySIM represents a realistic Respiratory System, using both physical and mathematical models to achieve an extremely accurate simulation of respiration. This system is tightly integrated with the Cardiovascular System, as well as other models within the BabySIM system.

Normal and Difficult Airway

The manikin provides an anatomically realistic upper airway (oropharynx, nasopharynx and larynx), representing that of a three- to six-month-old patient.

Airway Module Features
Direct laryngoscopy as well as oral and nasal tracheal intubation can be performed.
Esophageal intubation is fully supported, in which case breath sounds, chest excursion and carbon dioxide output are absent and gastric distension occurs.
A laryngospasm actuator closes the patient's vocal cords and prevents both ventilation and intubation.
Bronchial Occlusion, when enabled, guarantees that no ventilation is possible, creating a "cannot ventilate, cannot intubate" crisis scenario.

Intubation

In addition, the patient's airway supports the use of standard clinical devices such as:

- Endotracheal Tube
- Laryngeal Mask Airway
- Combitube
- Lighted Stylets

Airway Management and Ventilation: Alveolar and arterial gas concentrations appropriately reflect the efficacy of the employed ventilatory technique, such as bag-valve-mask, and endotracheal intubation. Administration of supplemental oxygen is entered by the instructor with automatic and appropriate patient clinical responses.

Pulmonary System Features
The simulated patient breathes spontaneously with a self-regulated rate and tidal volume sufficient to maintain a target arterial carbon dioxide partial pressure, typically 40 mmHg, which can be adjusted by the instructor. The respiratory system is capable of simulating crisis events.
The patient's lungs simulate consumption of oxygen and the production of carbon dioxide in accordance with the principles of uptake and distribution.
Alveolar and arterial gas concentrations are dynamically coupled with spontaneous or mechanical ventilation.
The lungs are realistically modeled with respect to the range of tidal volumes and functional residual capacity.
Lung and chest wall compliance are modeled with independent control of the left and right lungs.
Ventilation results in the appropriate concentrations of alveolar and arterial carbon dioxide. Presence or absence of exhaled carbon dioxide can be monitored using a colormetric indicator.

Pulmonary System Features
Spontaneous and mechanical modes of ventilation are supported.
Symmetric and asymmetric lung ventilation are automatically supported in response to bilateral and unilateral compliance and resistance changes, proper or incorrect intubation, and pathophysiological states such as tension pneumothorax. This capability can be accomplished automatically without intervention of the instructor.
The manikin's upper chest rises and falls synchronously with the inflationary state of the underlying lungs. This movement is synchronized with inspiration and expiration of spontaneous, manual and automatic ventilation of the lungs and combinations thereof. The depth of chest excursion correlates to the physiologic tidal volume displayed on the user interface.
The simulated patient generates both normal and abnormal breath sounds, bilateral and unilateral, which are appropriately synchronized with the respective phases of respiration. Breath sounds are audible over the apex of each lung with the use of a standard stethoscope.
In the case of esophageal intubation, breath sounds, chest excursion and carbon dioxide output are automatically absent, but the stomach distends with positive pressure ventilation attempts.
Pulse oximetry is fully supported. The reported oxyhemoglobin saturation correlates correctly and dynamically with the alveolar oxygen concentration, the patient's intrapulmonary shunt fraction and the temperature and pH of the arterial blood. The saturation value can be displayed on the Instructor Workstation or on the optional Wireless Remote Control.
The pulmonary response to administered medications is automatic and dose dependent.
The physiological mathematical models continuously calculate the patient's arterial and venous blood gases and pH. This data can be displayed on the Instructor Workstation or on the optional Wireless Remote Control.
Seesaw respiratory patterns of breathing are demonstrated on the manikin.

***Needle Decompression of Tension Pneumothorax*:** Decompression of a tension pneumothorax can be performed by inserting a needle at the mid-clavicular line of the second intercostal space on the right side of the manikin. Proper needle placement results in rapid decompression, a rush of air exiting the proximal end of the needle and improvement in pulmonary mechanics and gas exchange.

***Chest Tube Placement and Management*:** A chest tube can be inserted into the mid-axillary line of the fifth intercostal space on the right side of the manikin. Using ordinary pediatric chest tube suction equipment, fluid and air can be withdrawn from the pleural space. The volume removed influences the patient's physiology to reflect improvement in pulmonary mechanics and gas exchange.

Cardiovascular System

Like the BabySIM's Respiratory System, with which it is tightly integrated, the Cardiovascular System accurately simulates a wide variety of hemodynamic conditions and responses.

Cardiovascular System
The simulated patient generates heart sounds, including a range of pathological ones that are synchronized to the QRS complex of the ECG and are audible with a standard stethoscope over the left and right upper sternal border, right lower sternal border and apex.
A 3-lead ECG is emitted from the appropriate positions on the patient's chest for display on a standard monitor. The simulator generates a normal sinus ECG, as well as a broad range of abnormalities such as sinus tachycardia, bradycardia, ventricular fibrillation and asystole
The hemodynamic response to the arrhythmias is physiologically correct.
Palpable brachial and femoral pulses are provided and are synchronous to the ECG. A pulse deficit automatically occurs if the systolic arterial blood pressure falls below the following thresholds: Brachial: 30 mmHg Femoral: 30 mmHg
The pulse threshold set points can be adjusted by the instructor to meet specific clinical and educational requirements. The left and right brachial and femoral pulses are independently controllable by the instructor for presence and absence in the case of trauma to a specific extremity.
A standard blood pressure cuff and sphygmomanometer can be used to assess blood pressure by palpation or by auscultating Korotkoff sounds.

The invasive hemodynamic monitoring package provides the capability to measure and monitor the following:

- Arterial blood pressure
- Left ventricular pressure
- Central venous pressure
- Right arterial pressure
- Right ventricular pressure
- Pulmonary artery pressure
- Pulmonary artery occlusion (wedge) pressure

In addition, the following responses and interventions are available with the invasive hemodyamic monitoring package:

- The introduction and progressive insertion of a pulmonary artery catheter, synchronous with the appropriate waveforms, can be simulated with the results shown on the TouchPro software
- The patient has a baroreceptor reflex, the sensitivity of which can be controlled by the instructor
- The Cardiovascular System simulates both hypovolemia and hypervolemia as well as right and/or left heart failure
- The patient's cardiovascular response to medications is automatic and dose dependent

***Chest Compression*:** In accordance with PALS guidelines, effective chest compression of the patient's sternum results in artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses and CO_2 return. Pressure fluctuations are seen on invasive catheter waveforms. The presence or absence of exhaled CO_2 is directly related to chest compression effectiveness and automatically and significantly increases when cardiac resuscitation is successful.

***Cardiac Arrhythmias*:** The instructor is able to select and maintain a desired arrhythmia and control the simulated patient's response to clinical interventions.

***Electrical Therapy*:** Conventional defibrillators can be applied to the simulator. With this device, the delivered energy is quantified in real-time to trigger the appropriate patient response. The ECG can be monitored via the defibrillator contacts (paddles or pads). Also, transcutaneous pacemakers can be applied. The instructor is able to adjust the levels at which electrical capture and mechanical capture occur.

Metabolic System

Arterial blood gases (ABGs), including pH, $PaCO_2$ and PaO_2, and venous blood gas values ($PvCO_2$, PvO_2) are physiologically modeled within the system so that the results are made available on the Instructor Workstation and on the optional Wireless Remote Control. The data displayed corresponds accurately and dynamically to the alveolar concentration of CO_2 and O_2. Metabolic acidosis and alkalosis are simulated under instructor adjustment of the pH level, thus facilitating simulation of patients with diabetic ketoacidosis. Bowel sounds are able to be auscultated to the left and right of the umbilicus.

Genitourinary System

The manikin is provided with both male and female genitalia. The genitourinary system provides for excretion of urine with a flow rate that is controlled by the instructor.

Pharmacology System

The BabySIM Pharmacology System facilitates the administration of IV drugs.

Pharmacology System Features
The pharmacology module contains pre-programmed pharmacokinetic and pharmacodynamic parameters for six intravenous medications: Atropine Epinephrine Dopamine Fentanyl Morphine Succinylcholine
The patient manikin allows for intravenous access through a permanent access catheter located at the left femoral vein.
Bolus injections are administered utilizing standard syringes while continuous intravenous infusions can be administered utilizing a wide variety of standard infusion pumps. Both injection methods are entered from either the Instructor Workstation or optional Wireless Remote Control. Once the dosage is entered, the patient response is automatic and dependent on patient weight, physiological status, ongoing therapeutic interventions and injury/disease status.
The patient appropriately and automatically responds to incorrect medications with no user intervention necessary. Likewise, over- and under-dose response is appropriate.
The Medication Log feature of the software allows the instructor to quickly review all boluses and current drug infusions given by the learner.

Pharmacological Therapy: Common IV drugs required by the PALS algorithms are supported.

Simulated Clinical Experiences

The BabySIM is a model-driven, script-controlled system designed to simulate a patient's physiological condition, clinical signs, symptoms and responses to certain clinical interventions. Simulated Clinical Experiences, or SCEs, are process tools that enable the faculty/educator to execute a learning strategy using simulation. Each process tool provides an extensive overview and outline of the learning exercise and requires minimal additional faculty development time for use. Each SCE is comprised of a patient and can include up to four (4) scenarios.

The BabySIM system includes four preconfigured SCEs, or clinical simulations, that cover a range of events and crises:

- Increased Intracranial Pressure
- Shock
- RSV Bronchiolitis
- Sedation Induced Apnea

Each SCE includes the information below and can be printed from the Müse software:

- Background Information and Patient History
- Synopsis
- Learning Objectives
- Learning Performance Measures
- Equipment and Supplies suggested for the simulation
- Facilitator Notes
- Debriefing Points
- Teaching Q&A
- References

Base Patients

In the software, each patient is represented by a Base Patient that defines the initial condition of the simulated patient's physiology and sets the values of the parameters and variables upon which that patient's physiological and pharmacological models are based. For example, a Base Patient initially sets the respiratory rate of the simulated patient's lungs — as well as other specific values. Once a Base Patient is loaded, the models automatically regulate the simulated patient's physiology in accordance with the type of patient defined.

The BabySIM is supplied with two preconfigured patients, Ryan Summers and Rose Jackson, representing six-month-old male and female patients.

Preconfigured Base Patients cannot be overwritten, but new Base Patients can be created and saved, and existing Base Patients can be modified, depending on the needs of the instructor.

Scenarios

Each scenario is a set of simulator commands that instruct or cause the simulator to react or respond in a specific manner. Scenarios are used to determine the initial and subsequent physiological states as well as the different conditions that arise during the simulation exercise. Each scenario also includes logged documentation to support its use.

By utilizing the Scenario Designer feature of the Müse software, users can modify the preconfigured scenarios or create custom scenarios to meet specific educational objectives.

Instructors may also modify events within a given scenario in real-time to increase or decrease event severity and shorten or prolong the duration of an event at any time during a simulation exercise. Any Base Patient can be combined with any scenario, creating a wide variety of clinical care simulations.

For instructions on modifying scenarios and creating new scenarios, refer to the **Using the Software** section of this User Guide.

System Controls

The BabySIM has been designed to allow the instructor to focus attention on learner actions and reactions by providing a flexible set of tools that adjust readily to the instructor's needs.

Main Application Software

The Müse software is the main application software that provides the instructor a means to control all features of the simulator. Instructors can select SCEs as well as control the flow of the scenarios via the user interface. Various medication, cardiovascular, respiratory, fluid and other parameters can be individually applied "on the fly" to enhance the course of a simulation exercise. A Patient Status Display and set of simulation log entries provide a real-time display of vital signs, blood gases, medications administered and other events. This data can be exported into permanent storage or printed for future reference.

System Tools

Instructor Workstation: An Instructor Workstation enables the instructor to control all aspects of the simulator. Instructors can select an SCE and control the flow of a simulation exercise while monitoring patient parameters, medications administered and other interventions. Additionally, all patient parameters can be adjusted "on the fly" to enhance the teaching points of the simulation in progress. The software provides an intuitive, easy-to-learn and easy-to-use operator/instructor interface.

Wireless Remote Control (Optional): A fully-functional Wireless Remote Control (laptop) enables the instructor to control all aspects of the simulator from the bedside. Because the user interfaces on both the Instructor Workstation and Wireless Remote Control are identical, instructors only have to familiarize themselves with a single control interface.

GETTING STARTED

The BabySIM system is comprised of three basic components:

- The Manikin
- The PCU
- The Instructor Workstation

Basic setup requires connecting these three components as well as the air/gas and electrical supplies. Setting up the BabySIM system the first time should take approximately 30 minutes, but setup time is reduced with practice.

The table below outlines the steps required for configuring the BabySIM system.

Setup Steps	
1	Place the Manikin in the Work Area
2	Attach the Umbilical Assembly to Manikin
3	Connect the Fluidic/Pneumatic Umbilical to the PCU
4	Connect the Electrical Umbilical to the PCU
5	Set Up the Instructor Workstation
6	Establish an Ethernet Connection
Optional	Set Up the TDCK
7	Power On the PCU
8	Power On the Instructor Workstation
9	Connect and Turn On the Compressed Air/CO2
Optional	Set Up the Wireless Microphone
Optional	Configure the TouchPro and/or Wireless Remote Computers

Before Beginning

Proper operation of the BabySIM requires correct configuration. Before setting up the system, keep in mind these basic guidelines:

Understand the **Cautions/Warnings** information section of this User Guide.

Follow the sequence of steps carefully:

- Complete all steps in order
- Do not power on any components until instructed in the text
- Do not attach air/gas supplies until instructed in the text

KEEP all original shipping materials, including the BOXES - warranty and repair items must be return-shipped to CAE in their original packaging.

If unpacking the BabySIM system for the first time, careful use of a box cutter protects both the packaging and the product.

Because shipping materials should be stored and retained, ensure all protective packing materials and unused ancillary computer parts are secured as well.

Additional tools required for setup include:

- Flathead screwdriver
- Paper towels or clean cloth
- Power strip or surge protector

A Setup Map and Quick Start Chart cover these same steps in abbreviated fashion and are included with the BabySIM system.

Step 1: Place the Manikin in the Work Area

Select a work area with enough room for the equipment as well as necessary hoses and cables, providing ample space for easy access to the manikin. As least a 10-foot x 12-foot (3-meter x 4-meter) work area is recommended for movement and positioning of components around the manikin.

The BabySIM Manikin and Case

Place the manikin in the supine position on the work surface (e.g., gurney, table, ground, etc.) and prepare all other components.

In a lab environment, make sure that a multi-plug AC power outlet exists within the workspace. This outlet should be surge-protected.

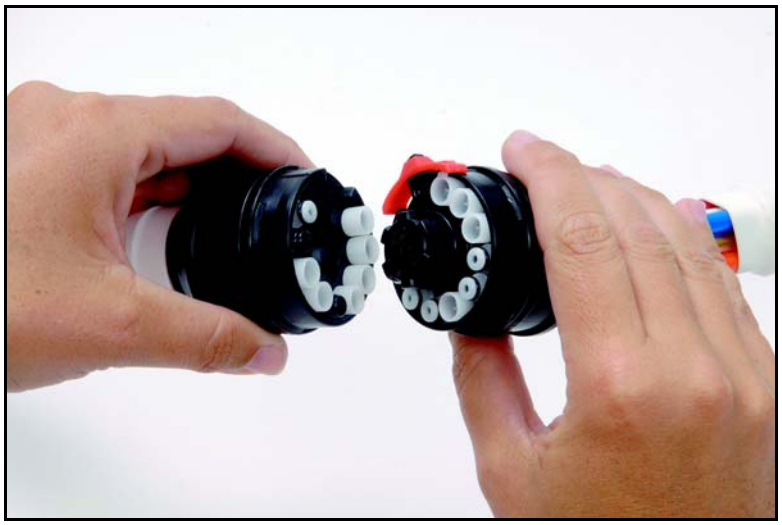
In a remote setting, the OPTIONAL Wireless Remote Control, Air Compressor and Auxiliary Power Supply may be used in the place of the Instructor Workstation, laboratory gas and power supplies.

Step 2: Attach the Umbilical Assembly to the Manikin

A bundled system of hoses and the electrical pigtail, known as the fluidic/pneumatic pigtail, extend from the left side of the baby manikin. Both pigtails attach to the Umbilical Assembly.

The Manikin with Pigtails

Attach the fluidic/pneumatic pigtail fitting to the Umbilical Assembly using the end with the rounded hose attachment, called the pneumatic coupler.



Fluidic/Pneumatic Connection to Umbilical

Once the two assemblies are fit into place, the tab lock secures them into position.

There are four unattached hoses coming from the attached Umbilical Assembly: red (IV Source, currently not used), blue (IV Drain), orange (GU Source) and white (Trauma Source). These hoses are used in various clinical procedures and are discussed with those procedures later in this User Guide.

Connect the electrical cable from the Umbilical Assembly to the fitting on the electrical pigtail. Use the small notches on the inside edge of the pigtail as a guide when sliding the fittings together.

Electrical Connection to Umbilical

Once the two ends are connected, rotate the fitting on the outside portion of the connection clockwise until tight.

Tighten the Fitting

Step 3: Connect the Fluidic/Pneumatic Umbilical to the PCU

To connect the Fluidic/Pneumatic Umbilical to the PCU:

a. Position the PCU to allow enough space for movement around the manikin without jeopardizing the Umbilical Assembly that extends from the manikin to the PCU. When connected to the manikin (pigtail), the assembly length is 15 feet.

b. Place the PCU case flat on the floor (like an open suitcase) and open the door to expose the PCU Interface Panel

The PCU Positioned for Connections

Note: Do NOT plug in the PCU at this time.

c. Leave the power switch in the **OFF** position

d. Attach the fluidic/pneumatic coupler to the lower **UMBILICAL** port on the PCU

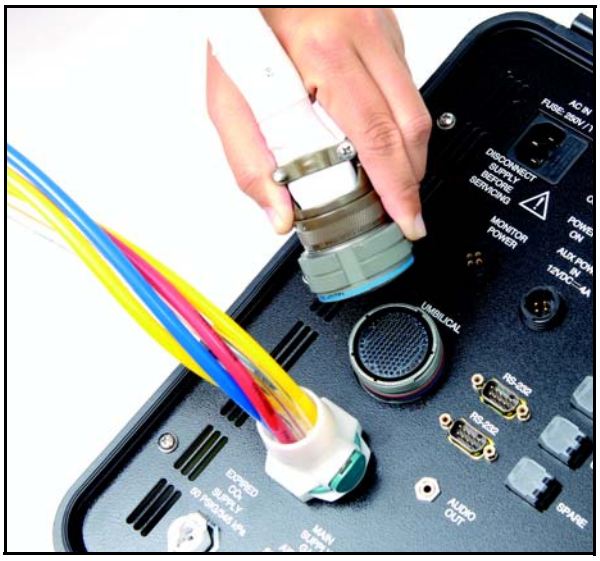
Connecting the Fluidic/Pneumatic Coupler to the PCU

The fitting slides into position and locks into place.

Step 4: Connect the Electrical Umbilical to the PCU

To connect the Electrical Umbilical to the PCU:

a. Attach the electrical portion of the umbilical to the upper **UMBILICAL** port



Electrical Umbilical Connected to PCU

b. Line up the small tabs and notches on the fittings to slide them together before turning and tightening the connection

Step 5: Set Up the Instructor Workstation

Place the Laptop or Tablet Instructor Workstation at the location (e.g., desk, table) where it will be used. Ensure the battery is charged or connect the Instructor Workstation to AC power.

Step 6: Establish the Ethernet Cable Connection

a. Plug one end of the Ethernet cable into the Laptop or Tablet Instructor Workstation

b. Plug the other end of the Ethernet cable into the port on the PCU labeled **INSTRUCTOR WORK STATION**

Connect the Ethernet Cable to the PCU

Step 7: Power On the PCU

To power on the PCU:

a. In standard laboratory settings, plug the power cord into the PCU port labeled **AC IN**

Connecting the Power Cord to the PCU

b. Connect the remaining end into a surge-protected AC power outlet

c. Press the **POWER SWITCH** on the PCU into the **ON** position

Powering On the PCU

OPTIONAL: If operating at a remote setting with the OPTIONAL Auxiliary Power Supply, connect the supplied power cable to the Auxiliary Power Supply before connecting the other end to the PCU port labeled **AUX POWER IN 12VDC**.

Power on the Auxiliary Power Supply before pressing the **PCU POWER SWITCH** to **ON**.

The PCU's Auxilary Power Port

Step 8 - Option 1: Power on the Laptop Instructor Workstation

Power on the Laptop Instructor Workstation by pressing the Power button located to the upper right of the keyboard. The Instructor Workstation powers on and the desktop appears.

Step 8 - Option 2: Power on the Optional Tablet Instructor Workstation

Power on the Tablet Instructor Workstation by pressing the Power button on the side of the tablet computer. The computer automatically logs in and the desktop appears.

If the computer does not automatically log in, enter the Username *METI User* and leave the Password field blank.

Step 9: Connect and Turn On the Compressed Air/CO_2

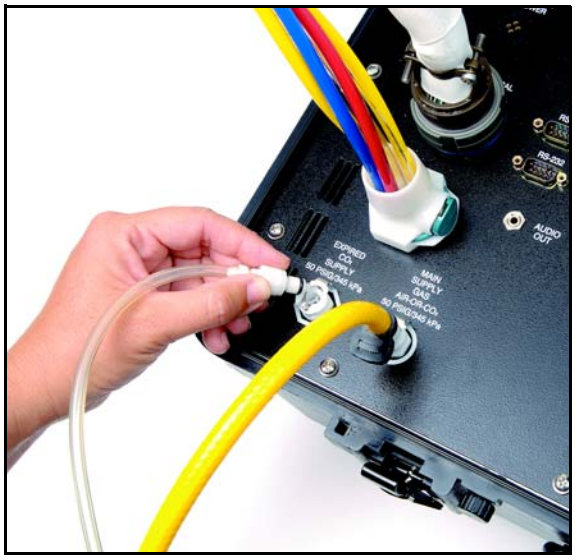
Connect either a compressed air source hose or a CO_2 supply hose to the port labeled **MAIN SUPPLY GAS AIR-OR-CO_2.** This connection provides either the air or carbon dioxide used to create various manikin life signs.

Connecting Air or CO_2 to the PCU

In remote settings, or in locations without a central air supply, an OPTIONAL Air Compressor is connected to the PCU at the **MAIN SUPPLY GAS AIR-OR-CO_2** port. This system is factory-calibrated to apply pressure only at 50 psig/345 kPa.

The OPTIONAL Gas Accessory Kit is available for locations with a central air and gas supply. The regulators included with the assemblies are user-adjustable to psig/345 kPa.

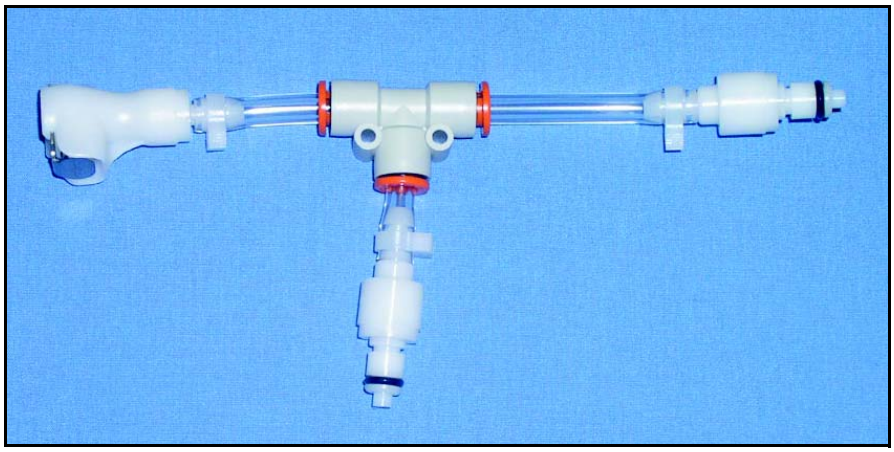
For the manikin to expire CO_2, attach a clear CO_2 source hose to the **EXPIRED CO_2 SUPPLY** port.



Connecting Expired CO_2 to PCU

CO_2 sources must be pressurized to 50 psig/345kPa.

In remote settings, or in locations without a central gas supply, the OPTIONAL CO_2 Adapter connects with a portable CO_2 supply and the PCU to enable the manikin to expire CO_2 and operate off the portable gas source.



OPTIONAL CO_2 Adapter

The branches of the Y-shaped adapter are connected to the MAIN SUPPLY GAS AIR-OR-CO_2 and the EXPIRED CO_2 SUPPLY ports, and the remaining connection is made to the portable CO_2 supply.

After the PCU and Instructor Workstation are powered on, turn on the compressed air or the CO_2 being used as the main gas supply.

Compressed air and gas sources must be pressurized to 50 psig/345 kPa.

Optional: Set Up the Wireless Microphone

To use the Wireless Microphone:

1. Unfold the two antennas located on the front of the Wireless Receiver on the PCU
2. Attach the lapel microphone to the desired piece of clothing or surface
3. Turn on the microphone using the switch on the top of the unit

Optional: Configure the TouchPro and Wireless Remote Computers

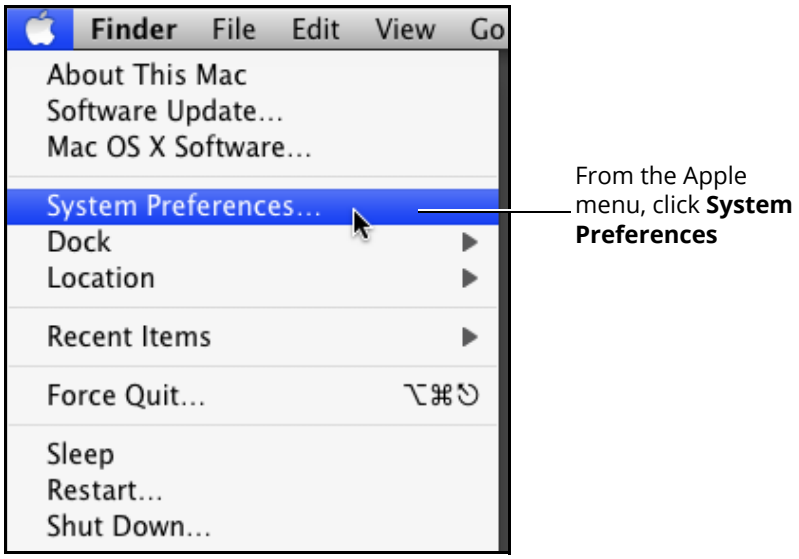
The BabySIM network supports up to four computers: the Instructor Workstation and three additional computers (a Wireless Remote Control and two TouchPro workstations). All computers must meet the system requirements mapped out in the **Specifications** section of this User Guide. Follow the steps below to be able to use the Müse or TouchPro software on either a TouchPro computer or a Wireless Remote computer.

Step 1 – Set Up the BabySIM

The BabySIM simulator must be set up and powered on, and the Instructor Workstation must be connected to the BabySIM Network via the Ethernet connection to the PCU.

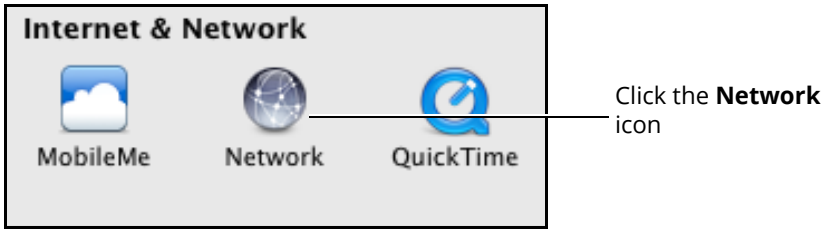
Step 2 – Obtain the IP Address from the Laptop Instructor Workstation

a. On the Instructor Workstation that is connected to the BabySIM Network, from the **Apple** menu, click **System Preferences**



Accessing the System Preferences

b. On the System Preferences dialog box, click the **Network** icon

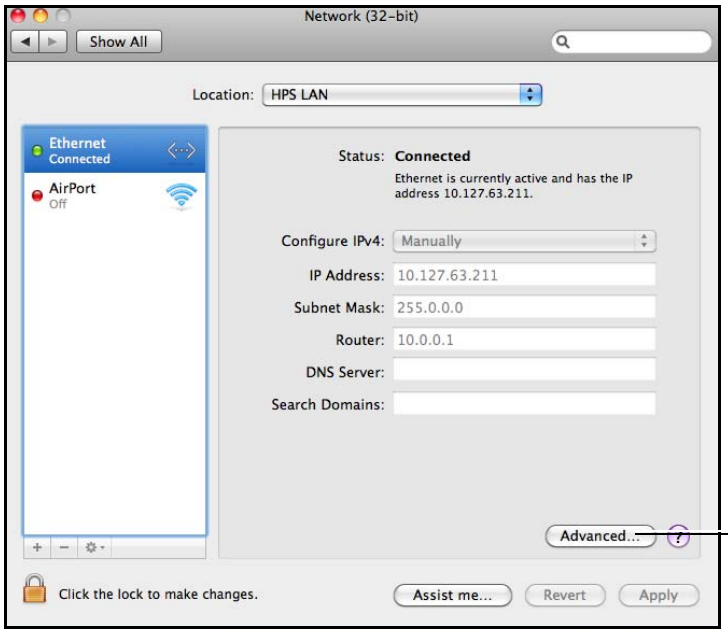


Clicking the Network Icon

c. On the panel on the left side of the Network dialog box, select **Ethernet** and ensure it is connected

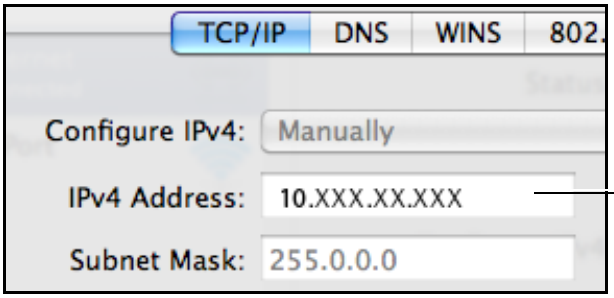
Select Ethernet

d. From the bottom, right-hand corner of the Network dialog box, click the **Advanced** button



Clicking the Advanced Button

e. Write down the IP address next to the **IPv4 Address** heading



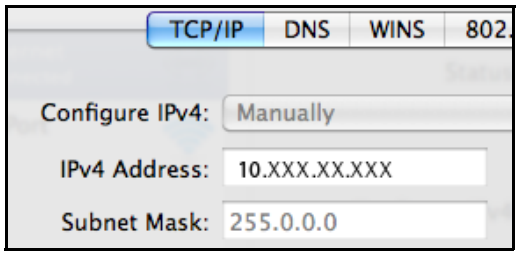
The Instructor Workstation's IP Address

f. Click **Cancel** to close the TCP/IP Network screen

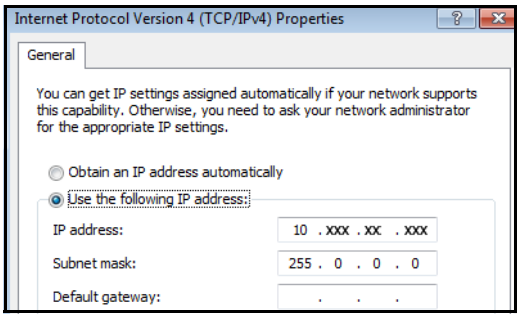
g. Close the Network settings screen

Step 3 – Configure the Wireless Remote/TouchPro Computer's Network Settings

Access the Networking screens (the TCP/IP settings screens) for your operating system. If you are unfamiliar with these screens, contact your Network Administrator or CAE Customer Service (1-866-462-7920) for help with this step.



TCP/IP Network Screen – Macintosh



Internet Protocol Version 4 (TCP/IPv4) Properties Screen – Windows

Enter a unique IP address and the Subnet Mask (listed below) for the TouchPro or Wireless Remote computer.

The unique IP address must match the IP address obtained in **Step 2** except for the number after the third and final period. This number can be any number between 2 and 254 BUT must be different from the final number of the IP address of the Instructor Workstation and any other computers on the network. No two IP addresses can be the same, including the Instructor Workstation's IP address.

Unique IP Address: 10.XXX.XX.XXX

Subnet Mask: 255.0.0.0

Router/Gateway: (Leave Blank)

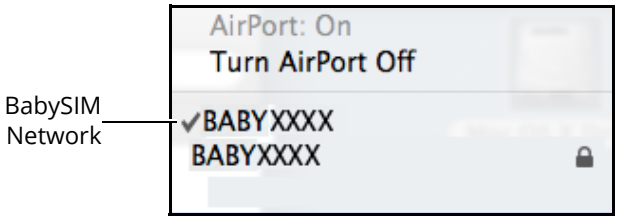
Example: If the IP address of your Instructor Workstation is 10.127.91.223, you could assign the TouchPro computer the IP address 10.127.91.224 and the Wireless Remote computer the IP address 10.127.91.225.

Step 4 – Option 1: Join the BabySIM Network Using a Macintosh Operating System

a. Click the **AirPort** icon located at the top, right-hand corner of the screen of the TouchPro or Wireless Remote Computer

A list appears with the BabySIM network listed.

b. Select the **AirPort** network labeled *BABYXXXX* (where "XXXX" is the unit number of your BabySIM)



Selecting the BabySIM Network

An AirPort dialog box appears requesting the password for the BabySIM network.

c. Enter the password. ** *See the note at the end of this step.*

d. Click **OK**

Airport Dialog Box

The computer has joined the BabySIM network. You can now proceed to **Step 5**.

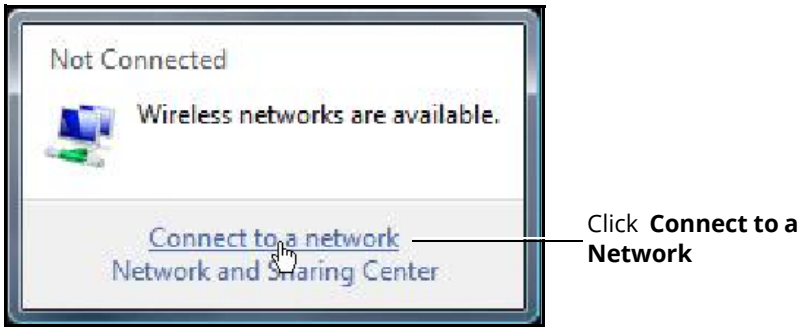
***The BabySIM WPA password contains eight characters. The password is BABY, followed by four numbers. The numbers are the BabySIM unit number preceded by the number of zeros required to make the password total eight characters. (Examples: BABY0123, BABY0012 or BABY0001, where 123, 12 or 1 is the BabySIM unit number.) The password is case sensitive, and BABY is typically all capital letters.*

Step 4 – Option 2: Join the BabySIM Network Using a Windows Operating System

a. Click the **Wireless Network** icon located in the bottom, right-hand corner of the screen of the TouchPro Computer

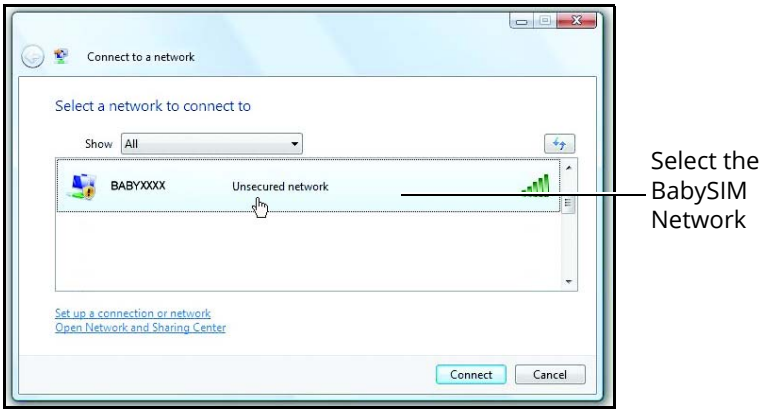
The Wireless Network Icon

b. Click **Connect to a network**



Clicking Connect to a Network

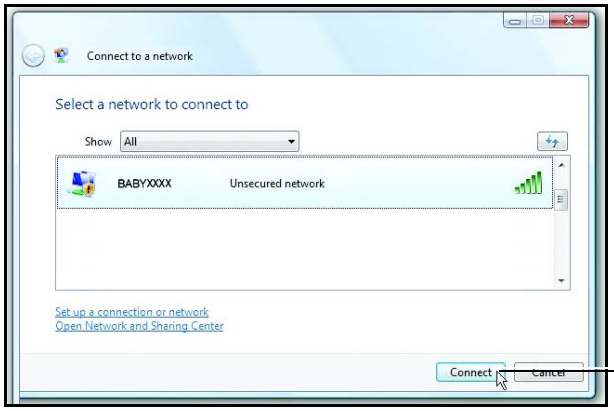
c. Select the network labeled *BABYXXXX* (where "XXXX" is the unit number of your BabySIM)



Selecting the BabySIM Network

d. Enter the Password. *** See note at the end of this step.*

e. Click **Connect**



Clicking Connect

The computer has joined the BabySIM network. You can now proceed to **Step 5**

***The BabySIM WPA password contains eight characters. The password is BABY, followed by four numbers. The numbers are the BabySIM unit number preceded by the number of zeros required to make the password total eight characters. (Examples: BABY0123, BABY0012 or BABY0001, where 123, 12 or 1 is the BabySIM unit number.) The password is case sensitive, and BABY is typically all capital letters.*

Step 5 – Access the Software from the TouchPro or Wireless Remote Computer

a. On the TouchPro computer or Wireless Remote computer, launch the web browser, (e.g., Safari®)

b. Enter the IP address obtained in **Step 2** into the browser's address field. The Müse Start screen appears

The Müse Start Screen

The Müse software or the TouchPro software can now be launched, and the software can be used in the same fashion as on the Instructor Workstation.

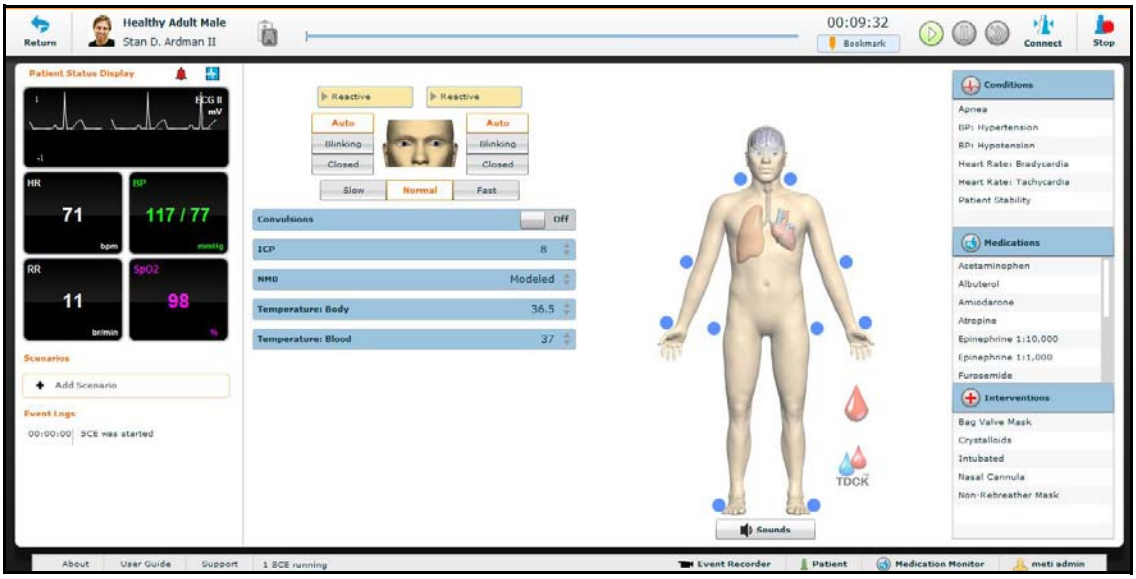
OPTIONAL: From your web browser, a bookmark can be created on the TouchPro or Wireless Remote computer for ease of access to the Müse or TouchPro software. Please consult your web browser's help menu for aid in creating a bookmark.

IMPORTANT: The Instructor Workstation MUST remain on and connected to the BabySIM network for the Wireless Remote or TouchPro computers to be able to operate.

USING THE SYSTEM

Once the BabySIM has been set up (see the **Getting Started** section), the software has been loaded and an SCE has been started (see the **Using the Software** section), the simulator is ready for learner interventions. The method of producing a specific clinical situation may involve the manikin, the software or both. Likewise, user interventions can take place with the manikin, the software or a combination of the two.

From the Run screen, the features of the BabySIM can be accessed. On the following pages is a breakdown of the various clinical features and how they are utilized. It is separated into the following categories: Neurological, Respiratory, Cardiovascular, Fluids and Sounds. (The TDCK is optional.)



The Run Screen

Parameters

The Müse software has a number of parameters that control the physiological features of the BabySIM. The parameters are grouped by category: Neurological, Respiratory, Cardiovascular, Fluids and the TDCK (Optional). Each screen lists default Basic parameters. However, when the **Basic/ Additional** switch, located on the Run screen, is activated, more parameters become available.

The Basic/Additional Switch

Below is a table that lists all of the Basic BabySIM parameters.

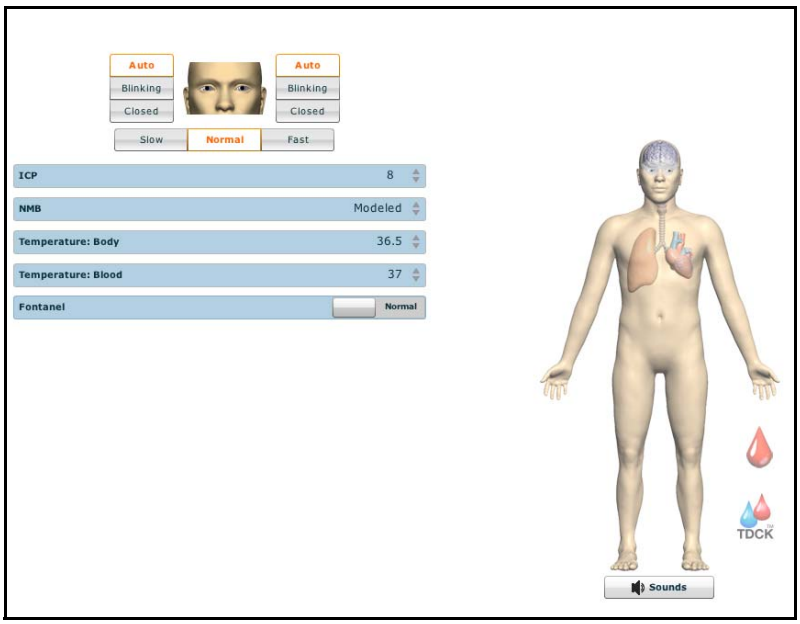
Basic Parameters				
Neurological	Respiratory	Cardiovascular	Fluids	TDCK
Eyes: Blink Speed	Laryngospasm	Blood Pressure	Fluid Loss Blood	Hemorrhage Channel 1
ICP	Needle Decompression	Heart Rate	Fluid Loss Plasma	Hemorrhage Channel 2
NMB	Seesaw Breathing	Heart Rate Factor	Colloid Infusion	Hemorrhage Channel 3
Temperature: Body	Bronchial Occlusion	Cardiac Rhythm	Crystalloid Infusion	Hemorrhage Channel 4
Temperature: Blood	Respiratory Rate	Arterial Catheter	PRBC Infusion	Hemorrhage Channel 5
Fontanel	Respiratory Rate Factor	Central Venous Catheter	Whole Blood Infusion	Hemorrhage Channel 6
	Shunt Fraction	PA Catheter		
	SpO_2	PA Balloon		
	NMB	Defib		
	Tidal Volume	Pacing Current		
	Intrapleural Volume: Left	Pacing Rate		
	Intrapleural Volume: Right	Pacing Capture Threshold		
	Fraction of Inspired O_2			

Additional parameters available are shown in the table below.

Additional Parameters				
Neurological	Respiratory	Cardiovascular	Fluids	TDCK
None	Respiratory Rate Tidal Volume Tidal Volume Factor pH Shift PEEP O_2 Consumption CO_2 Production Factor $PaCO_2$ Set-point I to E Ratio (1:X) $PetCO_2$-$PaCO_2$ Factor Respiratory Gain Factor Respiratory Quotient Volume/Rate Control Factor Chest Wall Compliance Factor Functional Residual Capacity Lung Compliance Factor: Left Lung Compliance Factor: Right Venous CO_2 Shift Bronchial Resistance Factor: Left Bronchial Resistance Factor: Right	Baroreceptor Maximum Pressure Baroreceptor Minimum Pressure Left Ventricle Contractility Factor Right Ventricle Contractility Factor Systemic Vascular Resistance Factor Venous Capacity Factor Systemic Arteries Compliance Factor Pulmonary Arteries Compliance Factor Pulmonary Vasculature Resistance Factor Venous Return Resistance Factor Baroreceptor Gain (Overall) Factor Baroreceptor Gain (Cardiac) Factor Baroreceptor Gain (Peripheral) Factor Chest Compression Efficacy Aortic Valve Resistance Factor Mitral Valve Resistance Factor Pulmonic Valve Resistance Factor	None	None

Neurological System

The BabySIM can simulate a variety of neurological clinical indicators, such as blinking eyes, head secretions and a bulging fontanel.

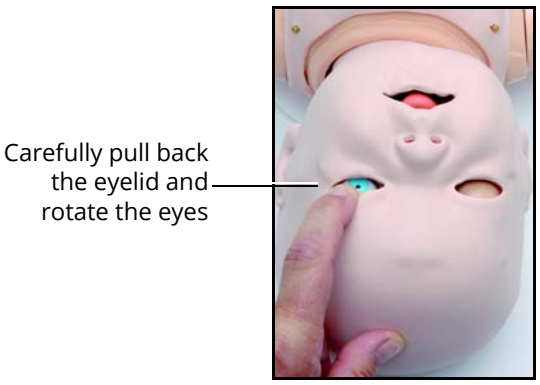


The Neurological View

Neurological System Anatomy, Physiology and Clinical Signs	Clinical Interventions, Patient Monitoring and Scenarios	Software Control	Manual Control
Eye Signs	Eye blinking and pupil size can be set independently for the left and right eye.	Eye blinking can be set by the instructor. VIEW: Neurological PARAMETERS: Eyes: Blink C	Manual adjustments for normal (3.5 mm), blown (8 mm) and pinpoint (2 mm) settings. *See Eyes.*
Secretions	Body fluids can be excreted from the eyes, ears and mouth.	None required.	*See Secretions*

Eyes

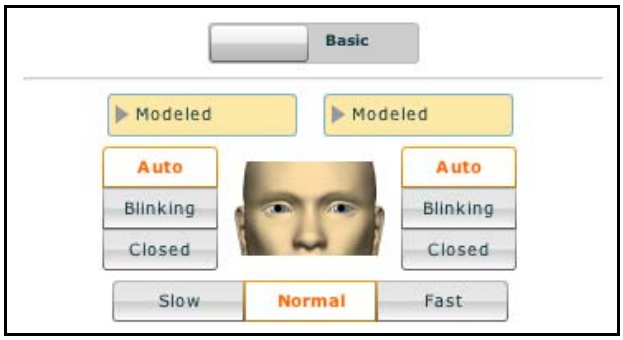
Each pupil of the BabySIM can be set independently to a fixed diameter of 2, 3.5 or 8 mm (pinpoint, normal or blown) by carefully lifting the eyelid and rotating the eye from left to right or right to left until the proper size appears.



Adjusting the Eyes

Additionally, eyelids can be programmed to open and close spontaneously or can be fixed in the closed position. When closed, a learner can manually open the eyelids for clinical inspection.

The settings for Blink Control are located on the **Neurological** view.



Blink Speed Controls

Choosing the **Auto** setting (which is also the default setting) sets the eyes in a blinking mode but allows the simulator to react to physiological changes that cause the eyes to close such as unresponsiveness or a comatose condition.

Click **Blinking** to force the eyes to be open and blinking regardless of patient consciousness.

When set in the **Closed** position, the eyelids can remain closed but still be manually opened for clinical inspection.

Additionally, eyelids can be programmed in scenarios to open and close spontaneously or can be fixed in the closed position.

Blinking frequency can be set at one of three speeds: **Normal** (the default), **Slow** and **Fast**. To adjust the blinking frequency, click the desired option on the **Neurological** view.

Secretions

Fluids can be excreted from the baby manikin's eyes, ears and mouth using the three tubes extending from the left side of the baby.

The Secretions Connections

The fittings at the ends of these tubes connect to the three Secretion Adapters included in the Replacement Parts Kit. The opposite end of the Secretion Adapter connects to either an IV bag for gravity-flow secretions or to a syringe, which can be used to push fluid through the baby's eyes, ears and/or mouth.

When disconnected, a small valve in the fittings prevents leakage into the system.

Fontanel

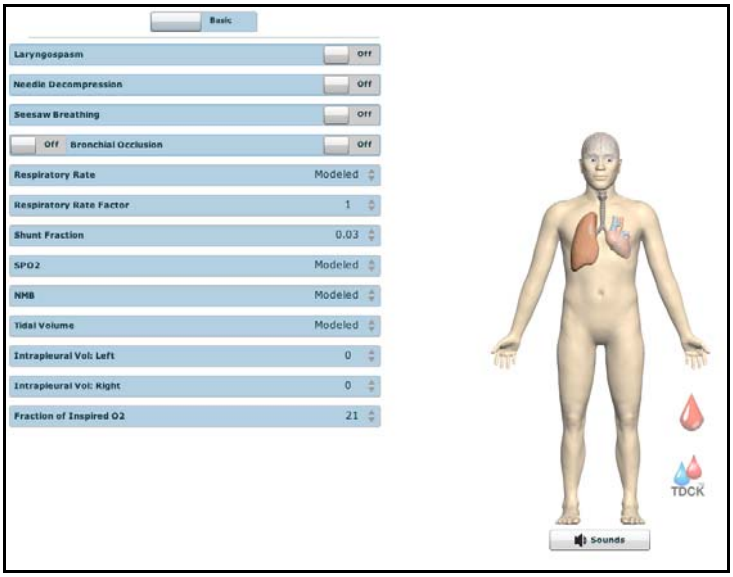
The fontanel can be activated to simulate increased intracranial pressure or hydrocephalus.

The fontanel feature is activated on the Neurological view by setting the **Fontanel** parameter to **Bulging**.

The Fontanel Parameter

Respiratory System

The manikin's lungs produce carbon dioxide and react realistically to intubation as well as to pathophysiologic states. The patient's upper chest rises and falls synchronously with the inflationary state of the underlying lungs. The manikin's anatomically realistic upper airway provides for the opportunity to intubate the infant patient, while various clinical signs (i.e., breath sounds, chest excursion, airway patency) can be simulated using software commands. Breath Sounds can be auscultated over the left and right apex, axilla and posterior.



The Respiratory View

Respiratory System			
Anatomy, Physiology and Clinical Signs	**Clinical Interventions, Patient Monitoring and Scenarios**	**Software Control**	**Manual Control**
Airway Management and Ventilation	**Alveolar and arterial gas concentrations appropriately reflect the efficacy of ventilation and oxygen administration.**	**Oxygen administration must be input by the instructor.** **VIEW: Respiratory** **PARAMETER: Fraction of Inspired O_2 Override**	**None required.**
Arterial Blood Gases	**PaO_2, $PaCO_2$ and pH are continuously calculated and displayed on the Patient Status Display and the TouchPro software.**	**None required, but adjustable.** **VIEW: Respiratory** **PARAMETERS: Multiple**	**None required.**

Respiratory System			
Anatomy, Physiology and Clinical Signs	**Clinical Interventions, Patient Monitoring and Scenarios**	**Software Control**	**Manual Control**
Bronchial Occlusion	**Completely obstructs the right and left mainstem bronchi, simulating a lower airway obstruction (e.g., mucus plug). This yields an inability to ventilate the lungs.**	**VIEW: Respiratory** **PARAMETER(S): Bronchial Occlusion**	**None required.**
Chest Excursion	**Synchronized with ventilation (spontaneous or mechanical). Excursion depth proportional to tidal volume.**	**None required.**	**None required.**
Chest Tube Placement	**Chest tubes can be inserted into the mid-axillary line of the fifth intercostal space on the right. Suction equipment can be applied to withdraw fluid from the simulated intrapleural space.**	**The instructor must adjust the amount of physiologic intrapleural fluid present.** **VIEW: Respiratory** **PARAMETER(S): Intrapleural Volume**	**See *Chest Tube Setup.***
Esophagus, Lower Esophageal Sphincter and Stomach	**Esophageal intubation results in gastric distention and the absence of breath sounds, chest excursion and CO_2 output.**	**None required.**	**None required.**
Exhaled CO_2	**The presence or absence of exhaled CO_2 can be measured.**	**None required.**	**CO_2 source required.**
Laryngospasm	**Closes vocal cords and prevents intubation and ventilation.**	**VIEW: Respiratory** **PARAMETER(S): Laryngospasm**	**None required.**
Needle Decompression	**Decompression of a pneumothorax can be performed by inserting a needle at the midclavicular line of the second intercostal space on the right side.**	**The instructor must adjust the amount of physiologic intrapleural air present.** **VIEW: Respiratory** **PARAMETER(S): Needle Decompression**	**See *Needle Decompression***

Respiratory System			
Anatomy, Physiology and Clinical Signs	Clinical Interventions, Patient Monitoring and Scenarios	Software Control	Manual Control
Pulse Oximetry	Oxyhemoglobin saturation (SpO_2) automatically correlates with the oxygen concentration in the lungs and the intrapulmonary shunt fraction.	None required, but adjustable. VIEW: Respiratory PARAMETER(S): Shunt Fraction	None required.
Realistic Upper Airway (Oropharynx, Nasopharynx and Larynx)	Direct laryngoscopy, oral and nasal intubation and specialty airway devices (e.g., endotracheal tubes, combitubes and oropharyngeal airways).	None required.	None required.
Spontaneous, Self- Regulating Breathing	Normal tidal breathing and pathophysiological conditions such as atelectasis, pneumothorax and asthma.	None required, but adjustable. VIEW: Respiratory PARAMETER(S): Multiple	None required.
Symmetric and Asymmetric Lung Ventila-tion	Tracheal, pathophysiologic conditions such as pneumothorax.	None required, but adjustable. VIEW: Respiratory PARAMETER(S): Multiple	None required.
Venous Blood Gases	PvO_2 and $PvCO_2$ are continuously calculated and displayed on the Patient Status Display and the TouchPro software.	None required, but adjustable. VIEW: Respiratory PARAMETER(S): Multiple	None required.

Airway Management

The manikin's anatomically realistic upper airway provides for the opportunity to intubate the infant patient, while various clinical signs (e.g., breath sounds, chest excursion, airway patency) can be simulated using software commands. Other airway features include:

- Hard and Soft Palate
- Oropharynx
- Nasopharnx
- Laryngopharynx
- Conical Trachea
- Carina

Intubation

The upper airway of the BabySIM is designed to allow for intubation and laryngoscopy. Direct laryngoscopy as well as oral and nasal tracheal intubation can be performed using devices such as LMAs, endotracheal tubes, nasopharyngeal airways and oropharyngeal airways.

Intubation of the BabySIM

WARNING: Airways can be damaged by improper insertion of an airway adjunct (e.g., endotracheal tube). To protect the airway, lubricate the adjunct prior to insertion using the silicone spray provided.

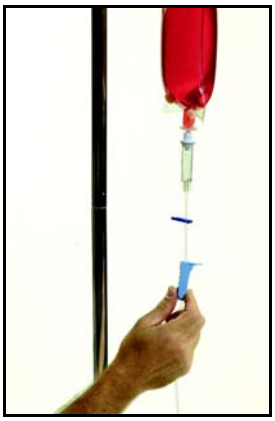
Use ONLY the provided SILICONE SPRAY to lubricate the adjunct. NEVER use a water-based lubricant because of resulting residue damage.

Chest Tube Setup

A chest tube can be inserted on the left side of the manikin.

To use the chest tube feature:

1. Set up an IV pole near the PCU
2. Fill an empty IV bag with the appropriate colored liquid (e.g., for simulated blood, mix distilled water with 5 mL of red food coloring and fill the bag). Be careful not to make the mixture too thick, as this can clog the system.
3. Attach the IV solution set to the IV bag and ensure the blue clamp is closed



Simulated Blood

4. Hang the bag on an IV pole set up near the PCU
5. Connect the hose from the IV solution set to the white Trauma Source hose in the Umbilical Assembly
6. Once the hoses are connected, open the clamp and allow the fluid to flow into the manikin. A reservoir inside the manikin collects the fluid
7. Insert a chest tube lubricated with silicone spray into the insertion point at the mid-axillary line of the fifth intercostal space on the right side of the manikin

   The tube must be inserted far enough to engage the valve on the reservoir. The system is primed when water flows from the hose.

Chest Tube Insertion Point

8. Remove the chest tube if the procedure is to begin with chest tube insertion

Needle Decompression Setup

A needle decompression can be performed on the left side of the manikin.

To set up Pneumothorax Needle Decompression:

1. In the Müse software, from the Respiratory view, locate the **Needle Decompression** parameter
2. Toggle the switch to the **On** position. After a few seconds, toggle the switch to the **Off** position

Needle Decompression Switch

The momentary enabling of Needle Decompression allows air pressure into the manikin's internal air reservoir, charging the reservoir. Once the air reservoir is filled, the system is primed and ready for a Pneumothorax puncture.

3. Insert a needle and catheter into the small hole located in the mid-clavicular line of the second intercostal space until the hissing sound of the valve release is heard. If no sound is heard, the needle wasn't inserted properly (either in terms of depth or location).

Needle Decompression

4. In the Müse software, adjust the **Right Intrapleural Volume** parameter located on the **Respiratory** view

Seesaw Breathing

Seesaw breathing can be enabled when you want to simulate severe respiratory distress.

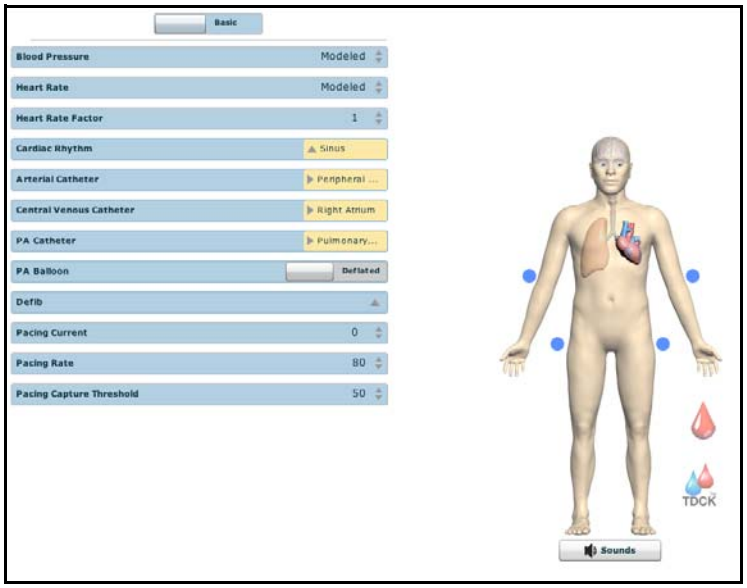
To enable seesaw breathing, in the Müse software, from the Respiratory view, locate the **Seesaw Breathing** parameter and toggle the switch to the **On** position.

Seesaw Breathing Switch

To disable seesaw breathing, toggle the **Seesaw Breathing** parameter switch to the **Off** position.

Cardiovascular System

The manikin produces realistic heart sounds and a wide range of pathophysiologic conditions synchronized to the QRS complex of the ECG and audible to a standard stethoscope. Heart Sounds can be auscultated over the left and right of the sternal border.



The Cardiovascular View

Cardiovascular System			
Anatomy, Physiology and Clinical Signs	**Clinical Interventions, Patient Monitoring and Scenarios**	**Software Control**	**Manual Control**
3-Lead ECG	**ECG waveforms can be viewed on a standard monitor, the Patient Status Display and/or the TouchPro Software. Normal and abnormal cardiac rhythms are linked to patient physiology (e.g., blood pressure, cardiac output).**	**None required, but specific rhythms can be selected.** **VIEW: Cardiovascular** **PARAMETER(S): Cardiac Rhythm Override**	**None required.** **See *ECG Signals* for lead locations and instructions.**

Cardiovascular System Anatomy, Physiology and Clinical Signs	Clinical Interventions, Patient Monitoring and Scenarios	Software Control	Manual Control
Baroreceptor Reflex	Cardiovascular system automatically compensates for changing hemodynamic conditions.	None required, but adjustable. VIEW: Cardiovascular PARAMETER(S): All Baroceptor Selections	None required.
Cardiac Arrhythmias	The desired arrhythmia can be selected.	The response to clinical intervention must be controlled by the instructor. VIEW: Cardiovascular PARAMETER(S): Cardiac Rhythm Override	None required.
Cardiac Pacing	Transthoracic cardiac pacers can be used with the BabySIM. Pacing results in appropriate physiological changes in blood pressure and cardiac output.	The instructor can set the level at which electrical capture and mechanical capture occur. VIEW: Cardiovascular PARAMETER(S): All Pacing Parameters	See *Pacing* for cardiac pacing disk locations and instructions
Chest Compression	Effective chest compression results in artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses and CO_2 return.	None required, but adjustable. VIEW: Cardiovascular PARAMETER(S): Chest Compression Efficacy	None required.

Cardiovascular System			
Anatomy, Physiology and Clinical Signs	**Clinical Interventions, Patient Monitoring and Scenarios**	**Software Control**	**Manual Control**
Circulation	**Normal and abnormal circulation (e.g., hypovolemia, hypervolemia and right/left heart failure).**	**None required, but adjustable.** **VIEW: Cardiovascular** **PARAMETER(S): Left Ventricle Contractility Factor and Right Ventricle Contractility Factor**	**None required.**
Defibrillation	**The BabySIM supports operation with a variety of manual defibrillators.**	**Defibrillation can be simulated by the instructor.** **VIEW: Cardiovascular** **PARAMETER(S): Defibrillation**	**See *Defibrillation* for defibrillation disk locations and instructions.**
Invasive Hemodynamic Monitoring	**See the Invasive Hemodynamic Monitoring chart.**	**None required, but adjustable.** **VIEW: Cardiovascular** **PARAMETER(S): Multiple**	**None required.**
Manual Blood Pressure	**Systemic blood pressure can be measured using the return-to-flow technique. Korotkoff sounds can also be auscultated.**	**None required.**	**See *Manual Blood Pressure* for using the modified blood pressure cuff.**

Cardiovascular System			
Anatomy, Physiology and Clinical Signs	**Clinical Interventions, Patient Monitoring and Scenarios**	**Software Control**	**Manual Control**
Palpable Pulses	**Brachial and femoral pulses can be palpated bilaterally and are synchronous with the cardiac cycle. A pulse deficit automatically occurs if the systolic arterial blood pressure falls below specified thresholds.** ***See the Palpable Pulse Thresholds chart.***	**None required, but adjustable.** **VIEW: All** **PARAMETER(S): Pulses**	**None required.**

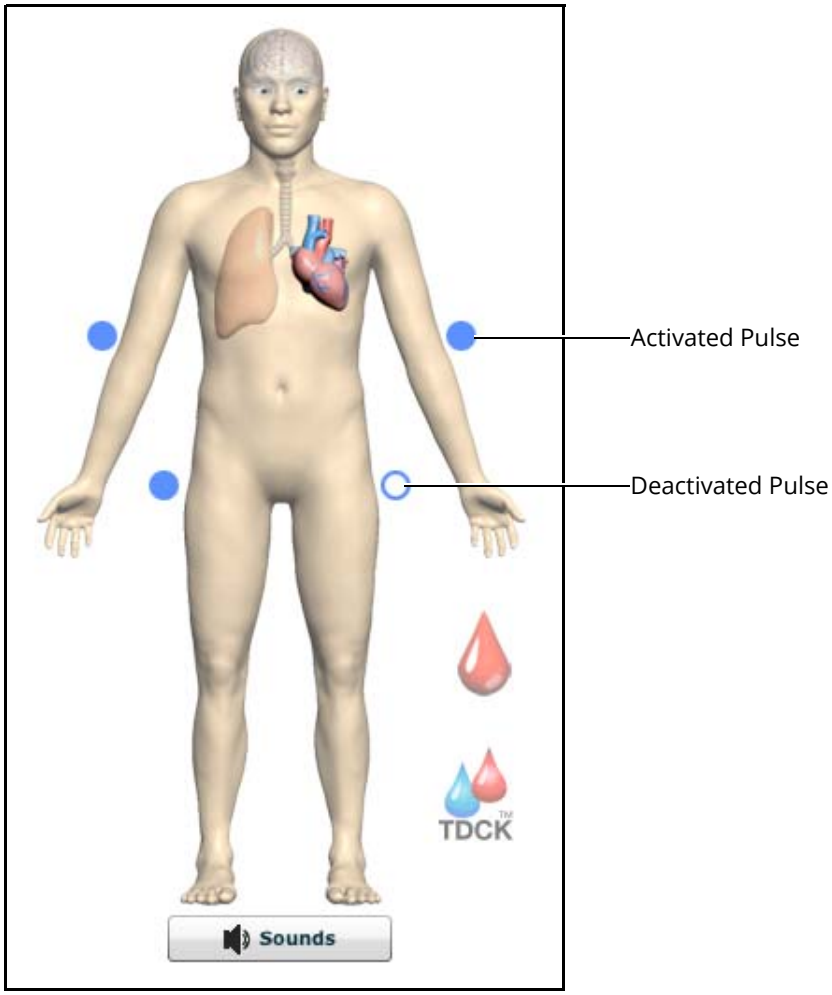
Pulses

The BabySIM has 4 pulse locations.

Brachial (2)

Femoral (2)

Pulses are visible and controlled from any physiological view. All pulses, unless altered by an SCE, are enabled by default. To disable a pulse, click the pulse location on the human form. To enable a pulse, click the pulse location again.



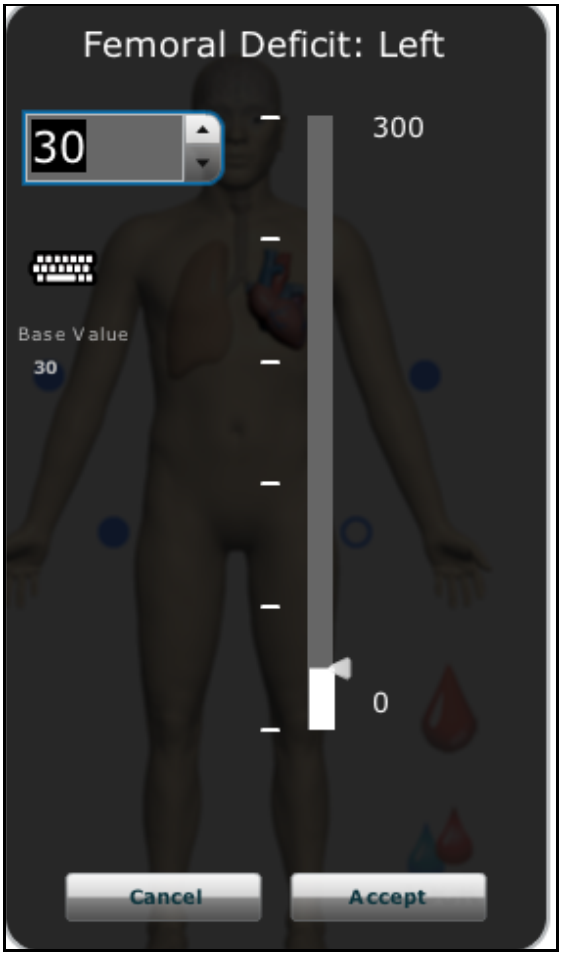
Pulses – Activated and Deactivated

Palpable Pulse Thresholds

A pulse deficit automatically occurs when the systolic arterial blood pressure falls below the following thresholds:

Palpable Pulse Thresholds	
Location	**Systolic Pressure Threshold**
Brachial	**30 mmHg**
Femoral	**30 mmHg**

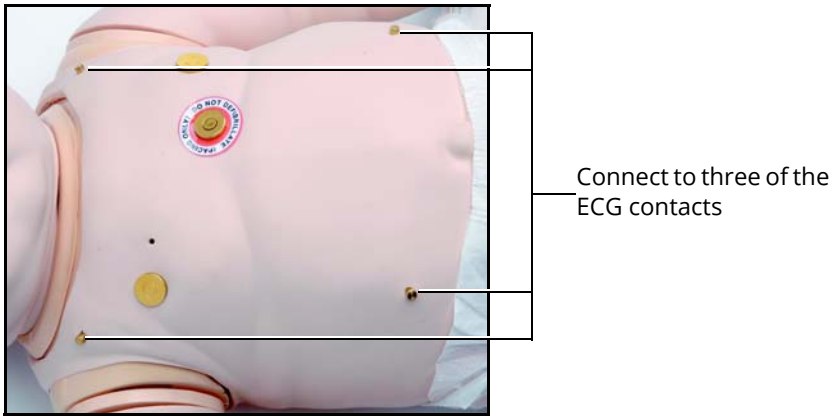
Click and hold a pulse location to adjust the pulse deficit. The pulse deficit parameter appears.



Pulse Deficit Parameter

ECG Signals

To produce ECG signals on a monitor, connect a 3-lead unit to three of the four contacts (or snaps) located on the manikin. The fourth contact may be used as a ground.



ECG Contacts

Manual Blood Pressure

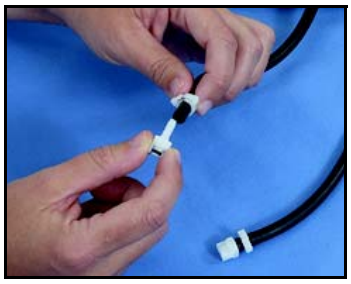
To use noninvasive blood pressure monitoring techniques (i.e., a blood pressure cuff), configure a standard infant cuff with the supplied T-fitting and adapters:

Blood Pressure Cuff Splice Kit

1. Cut the hose that connects to the pressure gauge on the cuff

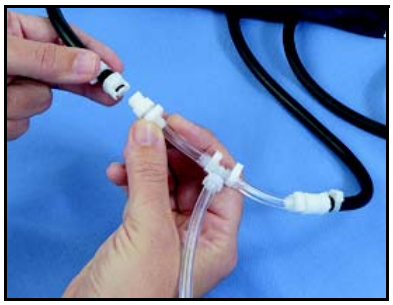
Cutting the Hose

2. Insert one of the supplied adapter fittings into each of the open ends of the tube, using a female fitting on one end and a male fitting on the remaining end



Inserting the Adapter Fitting

3. Attach the adapter cuff around the tubing to hold the adapter fitting into place
4. Insert the T-fitting into the hose adapters, noting the male and female connections



Inserting the T-fitting into the Hose Adapters

5. Connect the remaining portion of the T-fitting to the hose located on the manikin's shoulder just behind the left arm

Connecting the Remaining Portion of the T-fitting into the Hose

6. Attach the cuff to the upper left arm and take the noninvasive blood pressure reading using the return-to-flow technique

An Adapted Blood Pressure Cuff

Store the modified blood pressure cuff with the BabySIM system for future reuse.

Korotkoff Usage

To use this feature:

1. Have the learner palpate the left brachial pulse to identify its presence or absence
2. As the learner places the stethoscope in his ears, disable the left brachial pulse on the Cardiovascular view
3. Allow the learner to auscultate the blood pressure, hearing the beginning of sounds at the systolic pressure and the absence of sounds indicating the diastolic pressure
4. Next, enable the left brachial pulse

Chest Compression

The patient manikin supports normal finger placement and standard compression techniques. Set the manikin on a safe and sturdy work surface when administering chest compressions.

Defibrillation

The BabySIM is designed to safely absorb the energy discharged from manual defibrillators. However, use of a defibrillator for training purposes represents an operational hazard equivalent to use of a defibrillator on a real patient. Consequently, all safety precautions for use of defibrillators must be followed as if the manikin were a patient. Consult the defibrillator's User Manual for further information.

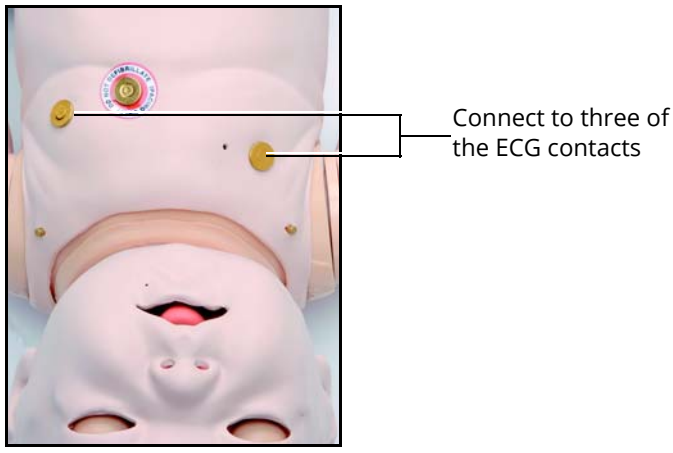
The following cautions should be observed:

- Defibrillation should be performed on the defibrillation electrodes only. If defibrillation is performed over any ECG or pacing electrode, high voltage may be present on the remaining connectors during the shock. This may also damage ECG and pacing circuitry.
- To prevent overheating, do NOT provide more than three (3) defibrillator discharges (maximum 32 Joules) in a sequence. Do NOT exceed an average of two (2) defibrillator discharges per minute during the training session.
- Do NOT let the manikin come in contact with electrically conductive surfaces or objects during defibrillation. A flame-supporting atmosphere, for example, with a high content of oxygen, should be avoided during defibrillation.
- Keep the manikin chest dry. Special attention should be taken when using the urinary system or the chest tube feature
- To prevent pitting of the chest skin electrode, do NOT apply conductive gel or conductive defibrillation pads intended for patient use
- Do NOT use cables or connectors having visible damage
- Do NOT spill fluids over any component inside the manikin torso. This could damage the system and may also present a possible hazard for the operator.

When using a manual defibrillator, the ECG can be monitored via the defibrillator paddles. Coarse ventricular fibrillation and high-rate ventricular tachycardia cardiac rhythms are automatically recognized as "shockable" rhythms.

With each defibrillation, the BabySIM automatically records the amount of energy discharged and the time defibrillation was performed. The simulated patient response to defibrillation is determined by the scenario script or instructor intervention. Thus, cardioversion is not automatically determined by the physiological models.

For paddle placement on the chest, the manikin has two defibrillation disks, which can be unscrewed, leaving threaded connections if required.



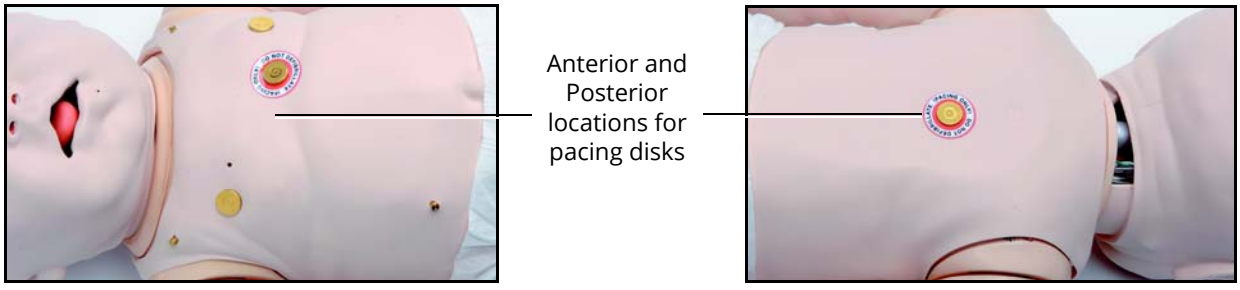
Defibrillation Disks

The BabySIM is compatible with a wide variety of manual defibrillators [1.77 inch (4.5 cm) rated for infants up to one year]. Defibrillators employing a monophasic waveform (as used by Physio-Control® equipment) and some biphasic defibrillators, such as those made by Zoll®, automatically report the energy discharge.

Do NOT allow defibrillator paddles to come in contact with pacing disks or ECG nodes. Defibrillating an ECG or pacing location will damage circuitry within the manikin.

Pacing

Disks on the front and back of the manikin are used for cardiac pacing. To use this feature, make sure the metal pacing disks are attached to the manikin. Next, attach the pacing pads from a standard transthoracic cardiac pacer to the manikin at the site of the pacing disks, the negative lead on the anterior location and the positive lead on the posterior location of the heart.



Pacing Disks

The software automatically detects and responds to pacing signals.

Metabolic System

The BabySIM patient manikin delivers metabolic features that are physiologically modeled within the software so that the results are made available on the Instructor Workstation or the optional Wireless Remote Control. The ABG data displayed corresponds accurately and dynamically to the alveolar concentration of CO_2 and O_2. Metabolic acidosis and alkalosis are simulated with a few simple adjustments to the ABG pH level made by the instructor. For example, simple calibrations can accurately simulate a patient response to metabolic acidosis.

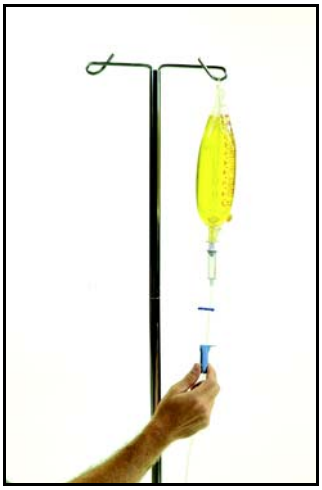
Genitourinary System

The manikin may be configured with either male or female genitalia, either of which allows for the insertion of a urinary catheter. The genitourinary system also provides for the excretion of urine.

Utilizing the Genitourinary Features

To use the Genitourinary features:

1. Insert the genitalia desired for the exercise
2. Set the assembled IV pole near the PCU
3. Fill an IV bag and attach it to the supplied IV solution set to yield a clinically appropriate colored liquid (e.g., for simulated urine, add 1 to 2 mL of yellow food coloring per liter of distilled water and mix to achieve the desired color). Be careful not to make the mixture too thick, as this can clog the system.
4. Verify that the dark blue slide clamp and the light blue roller clamp are in the closed position to close off the flow before filling and hanging the bag



GU Source Bag

5. Hang the bag on the IV pole
6. Connect to the manikin by attaching the end of the IV solution set to the orange hose in the Umbilical Assembly
7. Open the clamp and allow fluid to flow into the manikin. There is a reservoir inside the manikin that serves as a bladder and fills up with the fluid.
8. When the fluid begins to flow from the manikin, adjust the clamp to control the flow

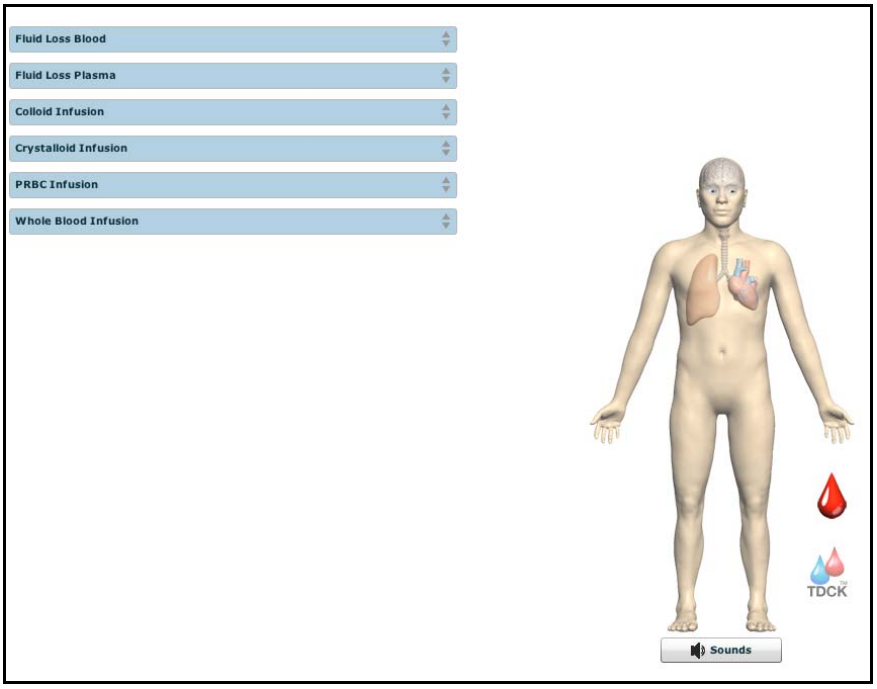
Measurement of urinary output can be made by weighing the simulated patient's diaper.

Note: Cleanup is very important when using simulated fluids.

Pharmacology System and Fluids

The BabySIM supports pharmacological interventions through pre-programmed pharmacokinetic and pharmacodynamic parameters that are established for six intravenous medications. A permanent access catheter is located in the left femoral vein.

Medications and fluids are administered through the permanent access catheter located at the left femoral vein. Before using the access catheter, attach an empty bag to the blue hose (labeled IV drain) to collect those fluids introduced through the catheter.



The Fluids View

Fluids Anatomy, Physiology and Clinical Signal Signs	Patient Monitoring and Scenarios	Software Control	Manual Control
IV Fluid Administration	IV fluids can be administered in the permanent access catheter located at the left femoral vein.	Administered IV fluids must be set by the instructor. View: Fluids PARAMETER: Infusion (Colloids, Crystalloids, Packed Red Blood Cells or Whole Blood)	All administered IV fluids are collected in the bag attached to the blue (IV Drain) hose.
IV Medication Administration	Bolus injections are administered utilizing standard syringes, while continuous IV infusions can be administered using infusion devices. All physiological responses to medications are automatically calculated and exhibited on the patient manikin.	Administered IV medications must be set by the instructor.	All administered IV medications are collected in the bag attached to the blue (IV Drain) hose.
Intraosseous Site	Passive injection (with no drainage) can be made into the anterior tibia of the right leg.	None required.	See *Intraosseous Site.*

Intraosseous Site

The intraosseous site is located on the anterior tibia of the right leg.

The Intraosseous Site

After multiple injections into the site, the plug should be removed and replaced.

Currently, there are six fluids that can be controlled using the **Fluids** view.

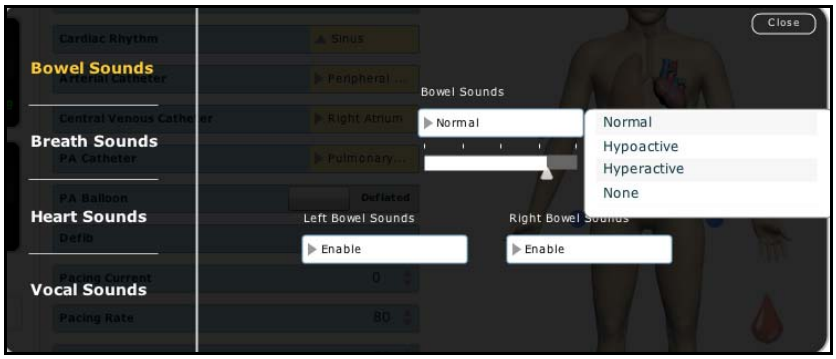
Fluid Parameters	
Fluid Event	**Use/Effect**
Fluid Loss Volume (Blood)	**Reflects a decrease in total blood volume. "Blood Loss" proportionally decreases both the red blood cell volume and the plasma volume according to the current hematocrit.**
Fluid Loss Volume (Plasma)	**Reflects a decrease in plasma volume. "Fluid Loss" decreases the plasma volume without changing the red blood cell volume. It refers collectively and generically to all fluid losses, including evaporative, transcellular (e.g., ascites, pleural effusion), bowel and third space fluid losses.**
Infusion (Colloids)	**Reflects an addition to the plasma volume without changing the red blood cell volume. Colloids include modified fluid gelatin starch solutions (pentastartch and hetastarch), dextran and human albumin.**
Infusion (Crystalloids)	**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: for example, normal saline, dextrose in water and Ringer's lactate.**
Infusion (Packed Red Blood Cells)	**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.**
Infusion (Whole Blood)	**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.**

Sounds

A variety of simulated sounds are available to enhance realism. Click the **Sounds** button on the Run screen to access the Sounds controls.

Bowel Sounds

Learners can auscultate bowel sounds over two intestinal regions: Left Bowel Sounds and Right Bowel Sounds. The sounds can be set to **Normal**, **Hypoactive**, **Hyperactive** or **None** (bowel sounds are absent).



The Bowel Sounds Menu

Bowel sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Bowel Sounds**.

Click any one of the **Bowel Sounds** drop-down menus that controls one or both of the intestinal regions to change the type of sound.

Click and drag the Bowel Sounds slider to adjust the volume.

Normal bowel sounds are present by default.

Note: A patient must be running on the BabySIM simulator for any sounds to be available.

Breath Sounds

Breath sounds are independently synchronized with ventilation of the left and right lungs. Speakers in the anterior regions provide breath sounds that can be auscultated.

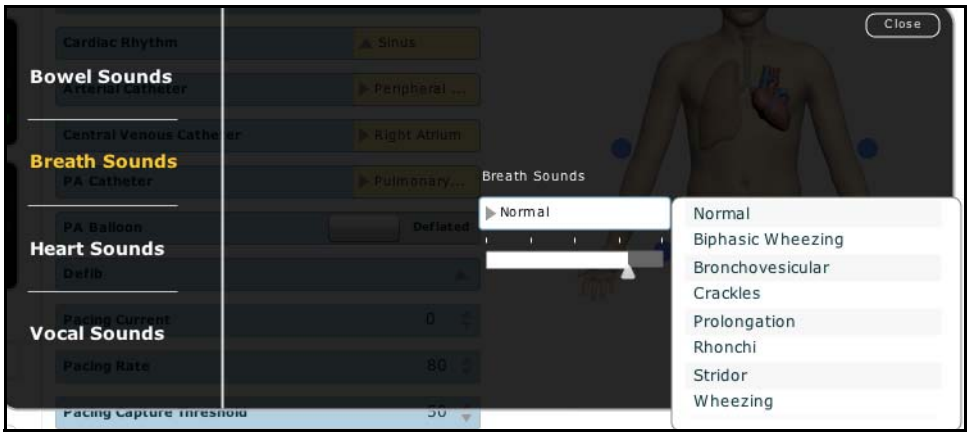
Breath sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Breath Sounds**.

Breath Sounds
Normal
Biphasic Wheeze
Bronchovescular
Crackles
Prolongation
Rhonchi
Stridor
Wheezing

Click any one of the Breath Sounds in the drop-down menu to select a Breath sound. Click and drag the slider to adjust the volume.

Note: A patient must be running on the BabySIM simulator for any sounds to be available.

By default, **Normal** breath sounds are heard.



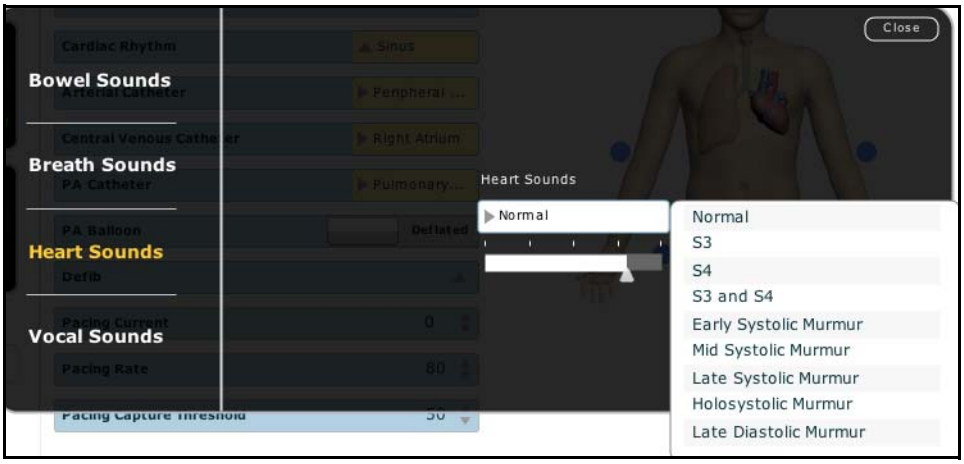
The Breath Sounds Menu

Heart Sounds

Heart sounds emanate from speakers and are synchronized with the cardiac cycle. Normal and abnormal heart sounds are selected using this parameter. By default, heart sounds are set to **Normal**. The following sounds are available:

Heart Sounds
Normal
S3
S4
S3 and S4
Early Systolic Murmur
Mid Systolic Murmur
Late Systolic Murmur
Holosystolic Murmur
Late Diastolic Murmur

Heart sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Heart Sounds**.



The Heart Sounds Menu

Click the **Heart Sounds** drop-down menu to change the type of sound. Click and drag the slider to adjust the volume.

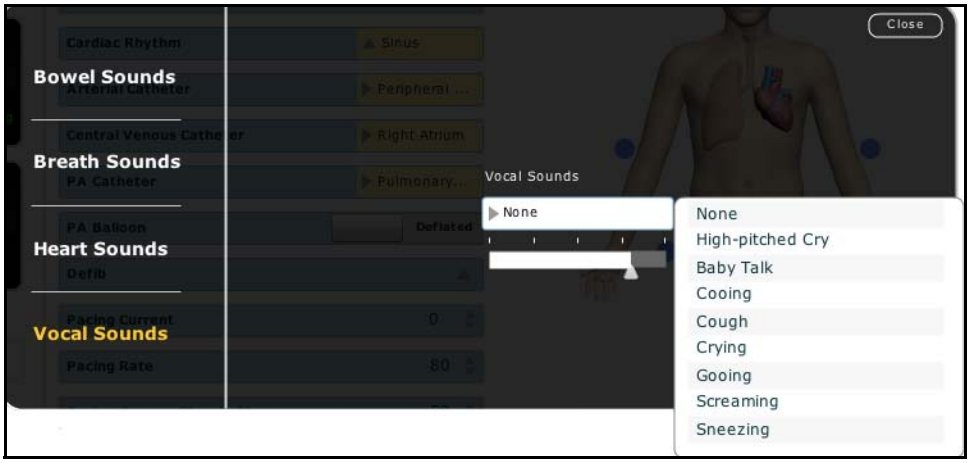
Note: A patient must be running on the BabySIM simulator for any sounds to be available.

Vocal Sounds

A variety of programmable vocal sounds are available. Vocal sounds are androgynous.

Vocal Sounds
None
High-pitched Cry
Baby Talk
Cooing
Cough
Crying
Gooing
Screaming
Sneezing

To select a sound from the Vocal Sounds drop-down menu, click the **Sounds** button on the Run screen. The Sounds panel appears. Click **Vocal Sounds** and select the type of sound desired from the **Vocal Sounds** drop-down menu.



Vocal Sounds Menu

Vocal Sounds are emitted immediately and play continuously when selected from the **Vocal Sounds** drop-down menu. To stop playing a selected vocal sound, select **None** from the list.

Wireless Voice Capability

A wireless microphone is available to provide phonation or a voice from the patient. To use the wireless microphone, attach the transmitter to a belt or pocket and snap the microphone to a lapel or shirt pocket.

Wireless Microphone

Verify that the two antennas located on the front of the wireless receiver on the PCU are extended and that the transmitter has been set to the same channel as the receiver on the PCU (the default setting).

Switch the receiver and the microphone to the **ON** position.

There are two ways to adjust the Wireless Microphone volume. Adjust the volume using the volume setting on the receiver (on the PCU) or with the **Vocal Sounds** volume on the software.

The receiver and transmitter are factory-configured to the same channel. However, if they need to be reset (e.g., when multiple simulators are in use), adjust the frequencies using the Group and Channel settings on the microphone and receiver with a small screwdriver. These settings must be identical. Detailed instructions are shipped with the microphone.

The wireless microphone transmits over user-selectable frequencies of between 790 and 806 MHz at 10 mW, a range legally appropriate for the United States and most international sites.

Recommended Clinical Supply Sizes

The following clinical supply sizes are recommended for use with the simulator. Other sizes may cause damage and should not be used.\

Clinical Supply	Recommended Size
Urinary Catheter	8 Fr
Nasogastric Tube	8 Fr**
ETT	3.5 mm uncuffed
LMA Unique	#1.5
Oropharyngeal Airway	43 mm
Nasal-Pharyngeal Airway	20 Fr 5 mm
IV Cannula	20 to 22 gauge
Chest Tube	12 Fr
Needle Decompression	14 gauge 6 cm

**Insertion only

BabySIM Care and Maintenance

Maintaining the BabySIM requires careful treatment of the electronic and mechanical components. Each time the BabySIM system is assembled or disassembled, make sure all components are properly handled and either removed from or placed into storage correctly.

BabySIM Warranty Programs

General Information

CAE patient simulator products come with a one-year Basic Service Warranty at no additional charge. All warranties begin at date of shipment or CAE installation. You may upgrade your first year Basic Service Warranty to an Enhanced Warranty and receive remedial and preventative maintenance. To prevent equipment downtime and delays after your warranty expires, we encourage you to contract for extended maintenance services for all subsequent years.

Units Out of Agreement

For units no longer under warranty requiring repairs, the Time and Materials service plan will apply (see **Time and Materials** section below).

To place an out-of-warranty unit under a warranty contract, CAE reserves the right to have the patient simulator inspected by a CAE-approved technician at the customer's expense. If necessary, the unit would have to be repaired at the customer's expense prior to issuance of a warranty contract.

The repairs required as the result of the examination will be quoted on a time and material basis.

How to Contact Customer Service

CAE Customer Service Headquarters - United States and Latin America
Monday - Friday from 7:00 a.m. to 6:00 p.m. ET
Toll Free +1 (866) 462-7920
24-hour Hotline +1 (941) 342-5605
Fax +1 (941) 342-5600
Email Address: customerservice@caehealthcare.com
Web URL: www.caehealthcare.com

CAE Customer Service - Canada
Monday - Friday from 8:00 a.m. to 5:00 p.m. ET
Toll Free +1 (877) 223-6273
Email Address: can.service@caehealthcare.com

CAE Customer Service - Europe, Middle East and Africa (EMEA)
Monday - Friday from 8:00 a.m. to 5:00 p.m. CET
Phone +49 (0) 6131 4950354
Fax +49 (0) 6131 4950351
Email Address: international.service@caehealthcare.com

CAE Customer Service - UK and Ireland
Monday - Friday from 9:00 a.m. to 5:00 p.m. GMT
Phone +44 (0)800-917-1851
Email Address: uk.service@caehealthcare.com

Principal hours of operation exclude holiday and non-business days.

Contract Period

Warranty contracts are not ordinarily offered for periods of less than one year. However, multiple-year warranty contracts may be arranged for up to an additional three years. Discounts are available for purchase of multiple year contracts.

Limitations of Agreement

Your exclusive remedy for any defective patient simulator is limited to the repair or replacement of the defective patient simulator.

CAE may elect which remedy or combination of remedies to provide at its sole discretion. CAE shall have a reasonable time after determining that a defective product exists to repair or replace defective product. CAE's replacement product will be manufactured from new and/or serviceable parts. CAE's agreement applies to repaired or replaced products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced product, whichever is longer.

CAE shall not be liable under this warranty for incidental or consequential damages, or in the event of any unauthorized repairs or modifications have been made or attempted, or when the product, or any part thereof, has been damaged by accident, misuse or abuse. This warranty does not cover normal wear and tear, staining, discoloration or other cosmetic irregularities that do not impede or degrade product performance. Any damage or malfunction as a result of the installation of software or hardware, not authorized by CAE, will be repaired under the Time and Materials service plan

CAE's warranty does not cover products that have been received improperly packaged, altered or physically damaged. Products will be inspected upon receipt.

Some states in the USA do not allow the exclusion or limitations of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

Return Materials Authorization (RMA)

No product may be returned directly to CAE without first contacting CAE for an RMA number. If it is determined that the product may be defective, you will be given an RMA number and instructions for product return. An unauthorized return, i.e., one for which an RMA number has not been issued, will be returned at your expense. Authorized shipments are to be shipped prepaid to the address on the RMA. Your original box and packaging materials should be kept for storing or shipping your product. To request an RMA, please contact Customer Service.

Basic Warranty Service Program

The CAE patient simulator comes with a one-year Basic Warranty Service Program. The Basic Warranty Service Program provides return-to-factory hardware and software maintenance. Basic service provides corrective maintenance support for the timely repair or replacement of CAE products. CAE may either repair or replace failed components. The Basic Warranty Service option includes:

- Labor and materials for the repair of products at a CAE facility
- Timely replacement of faulty modules/sub-modules
- Software upgrade services (see **System Software Upgrades Support** section)
- Basic application support
- Customer Service Hotline (telephone, fax and e-mail)
- On-site repair provided at CAE discretion. Freight costs to the CAE center are not covered. However, CAE bears the return freight costs utilizing a standard delivery service selected by CAE.
- CAE assumes the responsibility for loss or damage of goods in CAE's Sarasota Facility during maintenance or service

Enhanced Warranty Service Program

The Enhanced Warranty Service Program provides the same features as the Basic Warranty Service Program with the addition of Preventative Maintenance (PM) of CAE products. PM takes place at CAE's facility and is performed once per year. Freight costs to and from the customer site, shipped by standard ground transportation, will be paid by CAE. Preventative Maintenance consists of evaluation and performance testing of the following:

- Physical inspection and cleaning
- Functional check of equipment
- Lung calibration
- Calibration of CAE-produced equipment
- Pneumatic adjustments as necessary
- Electrical checks and adjustments as applicable
- Mechanical inspection and adjustments
- Repairs / alignments as necessary

System Software Upgrade Support

Customers with current warranty contracts are entitled to receive upgrades to applications software previously purchased. Installation of the system software is the user's responsibility.

The System Software Upgrades Support includes software upgrades for base software and purchased optional software modules.

This does not apply for major upgrades or technological enhancements.*

Pricing Structure

Time and Materials

For those institutions not under agreement, service will be provided as required on a Time and Material basis:

Description	In-House	On-Site
Technical Support	**As quoted at time of repair**	**CAE's prevailing labor rate with a minimum of four hours of labor**
Material	**As quoted at time of repair**	**As quoted at time of repair**
Travel	**N/A**	**Priced at CAE's fully burdened cost plus fee**

Principal period of on-site support (customer's local time) is:

- Monday through Friday, 8:00 AM to 5:00 PM (customer's time zone)
- Holiday and non-business days excluded
- Support outside the principle period is billed at the premium rate (hourly rate x 1.5)

A minimum of 48 hours notice is required for scheduling an on-site support call. Urgent on-site support with less that 48 hours notice will be charged at the premium hourly rate.

On-site time is described as the time period commencing from arrival at customer site through departure from customer site.

Breakdown

After each use, the BabySIM should be properly disassembled, cleaned and stored in a secure place. To ensure that the BabySIM remains in good working condition, follow the prescribed CAE breakdown procedures below. These procedures are estimated to take less than 30 minutes.

The table below outlines the steps required for disassembling, cleaning and storing the BabySIM system.

Breakdown Steps	
1	Stop All Running SCEs
2	Clean Systems
2a	Flush the Genitourinary (GU) System
2b	Flush the IV System
2c	Flush the Chest Tube System
2d	Decompress the Chest
2e	Wipe Off the Manikin
3	Turn the Air and Gas Supplies Off
4	Shut Down the Software
5	Disconnect the Computer Components
6	Shut Down the PCU
7	Disconnect the Hoses and Cables from the PCU
8	Ready the PCU for Storage
9	Disconnect the Umbilical from the Manikin
10	Store the Manikin

Further details for each of these steps are included in the pages that follow.

Step 1: Stop All Running SCEs

Stop any running SCEs using the **Stop** button in the upper right corner of the Müse software for each SCE.

Step 2: Clean Systems

To maintain the BabySIM in top condition, thoroughly clean the outside and flush those systems that were used during the session.

A. Flush the Genitourinary (GU) System

To flush the GU system:

1. Replace the GU source IV bag with a 1 liter IV bag of distilled water
2. Prime the bulb of the IV stake and ensure that flow has started
3. Run the IV supply of distilled water until the bag is empty
4. Close the clamp on the GU source IV bag
5. Remove the IV bag from the stake set and disconnect the stake set from the GU fitting on the Umbilical Assembly
6. Drain the Umbilical Assembly and the stake set
7. Connect a large (e.g., 60 mL) syringe filled with air to the orange hose (the GU fitting) of the Umbilical Assembly
8. Using the syringe, force the air through the system until no water remains in the system
9. Disconnect and drain the urine collection bag

After the flushing procedure is completed, make sure the manikin's skin is clean and dry.

To prevent mold, mildew and fungus from fouling the GU, occasionally flush the GU system with a 1 liter IV bag of distilled water mixed with 20 mL of bleach. Follow the procedure outlined above for flushing the system first using the beach solution. Repeat the procedure using distilled water only. The system should be cleaned in this way about once every two months (or as appropriate).

B. Flush the IV System

To flush the left femoral IV site:

1. Remove the IV source bag from the red hose in the Umbilical Assembly
2. Fill a 60 mL syringe with air and insert the tip into the end of the red hose
3. Force air through the hose until no moisture exists
4. IF COLORED WATER WAS USED, Fill a 60 mL syringe with fresh distilled water
5. Insert the tip of the syringe into the red hose
6. Inject all the water from the syringe into the hose and let it collect in the drain bag attached to the blue hose
7. Continue to inject water until the water flowing into the bag is clear
8. Refill the syringe with air and force the air through the hose until no moisture exists

C. Flush the Chest Tube System

To flush the Chest Tube system:

1. Disconnect the Trauma source bag from the white hose in the Umbilical Assembly
2. Lubricate the priming tube with silicone spray
3. Push the priming tube into the insertion site on the right side (if not already present) far enough to engage the valve and allow the water to drain out
4. IF COLORED WATER WAS USED, fill a 60 mL syringe with fresh distilled water
5. Insert the tip of the syringe into the end of the white hose
6. Inject all the water from the syringe into the hose and let it drain out through the tube
7. Repeat this process until the water draining through the tube is clear
8. Fill the syringe with air and, inserting the syringe into the white hose, force the air through the system until no water drains from the tube
9. Remove the tube

D. Decompress the Chest

Always decompress the chest when using the Pneumothorax Needle Decompression feature before completing the shutdown procedures. Do not store the manikin until decompression has been performed.

Step 3: Turn the Air and Gas Supplies Off

Turn off Air Supply

If air was used:

- Shut off the air supply (i.e., the central air supply resource)

  or

- Turn off the OPTIONAL Air Compressor, drain any condensation and store the Compressor. The Quiet In-Room Air Compressor is drained using a small plug at the one end. Remove the plug and tip the unit toward the opening to drain. Replace the plug after the procedure has been completed.

Turn off Gas Supply

If CO_2 was used:

- Close the CO_2 supply using the supplied wrench to tighten the valve, and properly store the tank

Once the air and gas supplies have been turned off, remove the Regulator Assembly from the CO_2 source, coil the assembly and set it aside for storage.

Step 4: Shut Down the Software

Shut down any optional TouchPro computers, optional Wireless Remote Controls and Müse software.

To shut down the Müse software on the Instructor Workstation:

a. In the Müse software, click the **Disconnect** icon on the Run screen
b. Stop any running SCEs. The Stop Simulation dialog box appears.
c. Click the **Stop Simulation** button. The Simulation stops and returns to the Home page.
d. Click the Account Name in the lower, right-hand corner of the screen. The Logout dialog box appears.
e. Click **Logout** to exit the software
f. Disconnect the Instructor Workstation from the PCU

To shut down the TouchPro software (optional):

a. Click the **Settings** button in the bottom, right-hand corner of the TouchPro screen
b. From the Settings menu, click **Shutdown**. A warning box appears asking if you want to exit.
c. Click **Shutdown**

If using a Wireless Remote Control, quit the Müse application using the same steps described above for the Instructor Workstation.

If using the battery to power the Instructor Workstation or if using the Wireless Remote Control, recharge the battery using the power cable and a surge-protected power source. The Instructor Workstation and Wireless Remote Control power cables both have a green light that indicates a fully charged unit, when lit.

Step 5: Disconnect the Computer Components

To disconnect and store the computer components:

a. If using the optional TouchPro computer, shut down the computer
b. Power off the Instructor Workstation
c. Unplug the Instructor Workstation and the optional TouchPro computer power cables from the outlet
d. Disconnect the Ethernet cable from the Instructor Workstation
e. Disconnect the power supply cable from the Instructor Workstation
f. Coil the cords and store them along with the Instructor Workstation

Note: If using the battery to power the Instructor Workstation or if using the Wireless Remote Control, recharge the battery using the power cable and a surge-protected power source.

Step 6: Shut Down the PCU

With the air and gas supplies turned off (from Step 1):

a. Power off the PCU by pressing the POWER SWITCH on the Interface Panel into the OFF position
b. Unplug the power cord from the power outlet. If you are using the OPTIONAL Auxiliary Power Supply, disconnect the cable from the Auxiliary Power Supply.
c. Remove the power cord from the PCU port labeled AC IN. If you are using the OPTIONAL Auxiliary Power Supply, remove the cable from the port labeled **AUX POWER IN 12VDC**.
d. Coil and set aside the power cord

If using the Auxiliary Power Supply, recharge the internal battery by plugging the component into an AC power outlet when one becomes available.

Step 7: Disconnect the Hoses and Cables from the PCU

To disconnect the PCU's hoses and cables:

a. Disconnect the EXPIRED CO_2 hose connected to the PCU
b. Disconnect the MAIN SUPPLY GAS AIR-OR-CO_2 hose
c. Disconnect the Fluidic/Pneumatic Coupler from the lower **UMBILICAL** port
d. Disconnect the Electrical cable from the upper **UMBILICAL** port
e. Disconnect the Ethernet cable from the **INSTRUCTOR WORK STATION** port
f. Coil the hoses and cables and set them aside to be stored

Step 8: Ready the PCU for Storage

Once all of the hoses and cables are disconnected from the PCU Interface Panel, fold the Wireless Receiver antennas back into position and close the PCU door. Lock the clamps on all three sides of the PCU into place to ensure the safety of the equipment.

Step 9: Disconnect the Umbilical from the Manikin

To disconnect the Umbilical Assembly from the manikin:

a. Unlock the fluid/pneumatic hose system by pressing the red lever
b. Disconnect the electrical cable by twisting the outer fitting
c. Wind the umbilical carefully and set it aside to prepare it for storage

Step 10: Store the Manikin

Place the manikin in the hard manikin case for storage, using the foam inserts to hold it in place. Use any remaining room in the case for clinical supplies and other teaching tools used in the next session.

Before storing the wireless microphone, be sure the transmitter has been turned off to maintain battery power for the next session.

Maintenance Advice

Simple care and maintenance helps to ensure that the BabySIM system stays in good working condition. Many problems are caused by inadequate or improper maintenance. Perform a thorough check of the various components each time the simulator is used.

General Manikin Care

- Avoid the use of writing instruments and sharp objects near the patient manikin to prevent unattractive markings on or tears in the skin
- A mild detergent and warm water will remove most marks and stains. Gently rub the soiled area with a soft cloth. Do NOT use ABRASIVE soaps or pads.
- If more stubborn markings appear on the manikin, CAE suggests a specialty cleaning product, ,such as Goof Off® or Orange-Sol®, available at home improvement or hardware stores. Following the manufacturer's practices and warnings when using these types of cleaners should allow for gentle and easy removal of the marks and stains.
- Prior to using moulage of any kind, CAE suggests the application of a very light coating of petroleum jelly, followed by a light dusting of baby powder to the manikin's skin. This application makes cleaning the skin easier. For cleanup, use alcohol and gauze or a gentle cleaning solvent, such as Goof Off or Orange-Sol.
- If any of the trauma, genitourinary or IV features of the BabySIM have been used, flush out the manikin as described in the previous pages. Failure to flush the systems may cause problems for the system during attempts at future use.
- Store the manikin in the hard case provided for storage and transport
- Do NOT stack items on top of the manikin case

Airway Inspection

The BabySIM is equipped with an anatomically accurate airway which supports the practice of difficult airway management techniques. In the process of performing these techniques improperly or aggressively, the upper airway can be damaged. While such damage may be readily apparent (manifested as a leak in the breathing circuit) during mechanical ventilation, it may not be obvious during spontaneous or bag and mask ventilation.

Because damage can occur, occasional visual inspection of the airway is recommended. Using the light of a laryngoscope blade or a flashlight, visually examine both the upper and lower airway. While tears in the upper airway resulting from intubation may be obvious, needle holes in the lower bronchus resulting from techniques such as transtracheal jet ventilation may not be readily apparent.

If damage to the airway is found, small cuts or tears may be reparable. However, for permanent repair of damaged manikins contact CAE Customer Service.

Care of Electronic Equipment

- Do NOT use any of the computer components associated with this system for any other use
- Do NOT connect the computer components to any network of any kind
- Install any CAE software updates as soon as they become available
- NEVER stack other equipment on computer components or the PCU

Condition Guidelines for Programming BabySIM with Müse

This card is intended to help you select Müse 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 Müse 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	SpO_2 Value
Reset	98%
High 90s	96-97%
Mid 90s	94-95%
Low 90s	90-93%
High 80s	87-89%
Mid 80s	84-86%
Low 80s	80-83%
High 70s	77-79%
Mid 70s	74-76%
Low 70s	70-73%
Less than 70	<69%

Cardiovascular: Blood Pressure

Hypertension		Hypotension	
Reset	80s/50s	Reset	80s/50s
Increased	90s/50s	Decreased	70s/50s
Pre-Borderline	100s/50	Borderline	60s/40s
Borderline	110s/60s	Mild	50s/40s
Mild	120s/60s	Severe	40s/30s
Severe	130s/70s		

Cardiovascular: Heart Rate

Tachycardia		Bradycardia	
Reset	120s	Reset	120s
Increased	130s	Decreased	110s
Elevated	140s	Pre-Borderline	100s
Pre-Borderline	150s	Borderline	90s
Borderline	160s	Mild	80s
Mild	170s	Moderate	70s
Moderate	180s	Severe	60s
Severe	190s	Profound	50s
Profound	200s		

Respiratory: Respiratory Rate

Tachypnea		Bradypnea	
Reset	24	Reset	24
Increased	26	Decreased	21
Pre-Borderline	28	Pre-Borderline	18
Borderline	30	Borderline	16
Mild	33	Mild	14
Moderate	36	Moderate	12
Severe	40	Severe	10
Profound	45	Profound	8
Extreme	>50	Extreme	5

Appendix A – Müse Parameter Descriptions

The Müse software has a number of parameters that control the physiological features of the BabySIM. The parameters are grouped by category: Neurological, Respiratory, Cardiovascular, Fluids and Sounds. Each screen lists the Basic parameters by default. However, when the **Basic/Additional** switch is activated, additional parameters become available.

Click the **Basic** switch to see **Additional** parameters.

Click the **Additional** switch to return to the ***Basic*** parameters.

The Basic/Additional Switch

The following is a brief description of each parameter. Each parameter description lists the default settings for the Ryan Summers and Rose Jackson patients as well as the ranges, if available, for all patients.

Neurological

The BabySIM can simulate a variety of neurological clinical indicators, such as secretions and reactive eyes.

Neurological Parameters
Eyes: Blink Speed
ICP
NMB
Temperature: Body
Temperature: Blood
Fontanel

Eyes: Blink Speed

In **Auto** mode, the eyelids are normally blinking under the following conditions: Minute Ventilation is greater than 1500 mL, SpO_2 is greater than 70% and neuromuscular blockade (NMB) is less than 30%.

The **Blinking** and **Closed** settings allow the user to have one or both eyes either blinking or closed and override the automatic response.

Default: Auto

The **Slow**, **Normal** and **Fast** parameters control the eyelid blinking frequency. Presently, blinking frequency is not linked to the physiological models. However, the response can be done “on the fly” or scripted using the Scenario Designer.

Default: Normal

Intracranial Pressure (ICP)

The ICP parameter is used to set the ICP displayed as a numeric value on the TouchPro monitor. The base value is set at 8 mmHg. This parameter is uninfluenced by physiological models.

Default: 8 mmHg

Range: 0.0 mmHg - 50.0 mmHg

Neuromuscular Blockade (NMB)

The degree of NMB is automatically determined by pharmacokinetic and pharmacodynamic models, which are based on the neuromuscular blocking agents administered and the time course of their injection. For some educational applications, however, the instructor may wish to set a fixed degree of neuromuscular blockade that remains stable for an indefinite period. This can be accomplished using the **NMB** parameter. The default value instructs the pharmacologic models to determine the degree of neuromuscular blockade based on the drugs injected and their pharmacologic properties.

When a positive numeric any other positive value is assigned to this parameter, the degree of NMB is set to that level. For example, 80% NMB causes the simulator to set the degree of NMB to 80%, regardless of the presence (or absence) of neuromuscular blocking drugs. Clinically, the spontaneous tidal volume is markedly reduced.

Default: Modeled

Range: 0% - 100%

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. Note that changes in arterial temperature may alter the shape of the standard oxyhemoglobin dissociation curve. As temperature increases or pH decreases, more oxygen is released from hemoglobin and thus the patient’s saturation decreases. The inverse is also true.

Default: 37° C

Range: 32.0° C - 42.0° C

Fontanel

The anterior fontanel is a fibrous, membrane-covered gap in the bony cranium located at the juncture of the two parietal and two frontal bones. The fontanel should feel flat. When the infant is calm, a bulging fontanel can indicate increased intracranial pressure. When **Bulging** is selected, the anterior fontanel on the manikin expands to simulate conditions such as increased intracranial pressure in an infant.

Default: Normal

Respiratory – Basic Parameters

Respiratory Parameters – Basic
Laryngospasm
Needle Decompression
Seesaw Breathing
Bronchial Occlusion (Left and Right)
Respiratory Rate
Respiratory Rate Factor
$EtCO_2$
Shunt Fraction
SpO_2
NMB
Tidal Volume
Intrapleural Volume: Left
Intrapleural Volume: Right
Fraction of Inspired O_2

Laryngospasm

Use the Laryngospasm parameter to simulate a laryngospasm. A laryngospasm actuator closes the patient's vocal cords and prevents both ventilation and intubation. When activated with the Airway Occluder parameter, a "cannot ventilate, cannot intubate" crisis scenario is achieved.

Default: Off

Needle Decompression

The **Needle Decompression** parameter is used to activate the **Needle Decompression** hardware in the simulator to relieve a pneumothorax in the simulator. This causes a rush of air to be heard on successful decompression. The amount of decompression is automatically subtracted from the **Intrapleural Volume** set.

Default: Off

Note: The Chest Tube and Needle Decompression features cannot be enabled simultaneously.

Seesaw Breathing

During normal spontaneous infant breathing, the chest rises and the abdomen follows with only a brief lag. In seesaw or “paradoxical respiration,” the abdominal wall moves inward during inspiration and rises during expiration. It is observed as a sign of upper airway obstruction or, less frequently, can be a sign of decreased compliance (pneumonia) or elevated resistance (asthma). When **On** is selected, the manikin exhibits a seesaw pattern of respiration (chest retraction with abdominal distension) such as seen with respiratory distress and impending respiratory failure in the infant.

Default: Off

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). 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. Once set, arterial oxygen and carbon dioxide values have no effect on the resulting respiratory rate, but continue to influence other components of the physiological models. 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. In such situations, the patient can only respond to arterial oxygen or carbon dioxide levels by adjusting the **Tidal Volume** parameter.

Default: Modeled

Range: 0 breaths per minute - 80 breaths per minute

Respiratory Rate Factor

The **Respiratory Rate Factor** parameter (along with the **Tidal Volume Factor** parameter) is used to change the baseline respiratory rate (before the control-of-breathing and drug influences are taken into account.) A value of 2 doubles the baseline respiratory rate. A value of 0.5 decreases the baseline respiratory rate by 50%.

Default: 1

Range: 0.01 - 6.00

TIP: *First decrease the respiratory gain factor to reduce the influence of the respiratory control mechanism on the respiratory rate and tidal volume.*

EtCO2

The EtCO2 parameter is used to set the end-tidal CO2 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 CO2 value. Setting the EtCO2 has no effect on the arterial carbon dioxide values (PaCO2), respiratory rate or tidal volume.

For example, when the EtCO2 is set to 50 mmHg, the numeric end-tidal CO2 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.

Default: Modeled
Range: 0 mmHg – 100 mmHg

Shunt Fraction

The **Shunt Fraction** parameter is frequently used to assist in desaturating a patient. This parameter creates a physiologic “bypass” of the normal pulmonary circulation, resulting in changes in O_2, CO_2 and anesthetic gases at the alveolar level. Typically, values of 0.1 to 0.4 are needed to create large alveolar-arterial oxygen gradients sufficient to cause arterial hypoxemia.

Default: 0.03

Range: 0.00 - 0.50

TIP: *If the parameter is set high (0.5), the patient desaturates rapidly and responds to the administration of supplemental O_2.*

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. Resetting to Modeled returns control of the underlying SpO_2 to the physiological models.

Default: Modeled

Range: 0% - 100%

Neuromuscular Blockade (NMB)

The pharmacokinetic and pharmacodynamic models based on the neuromuscular blocking agents administered and the time course of their injection automatically determine the degree of NMB. For some educational applications, however, the instructor may wish to set a fixed degree of neuromuscular blockade that remains stable for an indefinite period. This can be accomplished using the **NMB** parameter. The default setting instructs the pharmacologic models to determine the degree of neuromuscular blockade based upon the drugs injected and their pharmacologic properties.

When a positive numeric value is assigned to this parameter, the degree of NMB is set to that level. For example, 80% NMB causes the simulator to set the degree of NMB to 80%, regardless of the presence (or absence) of neuromuscular blocking drugs. Clinically, the spontaneous tidal volume is markedly reduced.

Default: Modeled

Range: 0% - 100%

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, but continue to influence other components of the physiological models.

For example, with the tidal volume set to 600 mL in the adult simulator, the tidal volume remains a constant (set) 600 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 when the respiratory rate is adjusted.

Default: Modeled

Range: 0 mL- 400 mL

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. Values more than 1500 mL reduce the corresponding lung volume significantly. The breath sounds are automatically diminished on the appropriate side due to decreased ventilation of the affected lung.

Default: 0

Range: 0 mL - 100 mL

Fraction of Inspired O_2 (FiO_2)

This parameter is used to simulate changes in the **FiO_2**, such as would occur with the administration of supplemental oxygen. Use this parameter to simulate supplemental oxygen.

Default: 21%

Range: 0% - 100%

Respiratory – Additional Parameters

Respiratory Parameters – Additional
Respiratory Rate
Tidal Volume
Tidal Volume Factor
pH Shift
PEEP
O_2 Consumption
CO_2 Production Factor
$PaCO_2$ Set-point
I to E Ratio (1:X)
$PetCO_2$-$PaCO_2$ Factor
Respiratory Gain Factor
Respiratory Quotient
Volume/Rate Control Factor
Chest Wall Compliance Factor
Functional Residual Capacity
Lung Compliance Factor: Left
Lung Compliance Factor: Right
Venous CO_2 Shift
Bronchial Resistance Factor: Left
Bronchial Resistance Factor: Right

Respiratory Rate

The **Respiratory Rate** parameter is used to set the respiratory rate to a given number of breaths per minute. Once set, arterial oxygen and carbon dioxide values have no effect on the resulting respiratory rate, but continue to influence other components of the physiological models. 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. In such situations, the patient can only respond to arterial oxygen or carbon dioxide levels by adjusting the **Tidal Volume** parameter.

Default: Modeled

Range: 0 breaths per minute - 80 breaths per minute

Respiratory Rate Factor

The **Respiratory Rate Factor** parameter (along with the **Tidal Volume Factor** parameter) is used to change the baseline respiratory rate (before the control-of-breathing and drug influences are taken into account.) A value of 2 doubles the baseline respiratory rate. A value of 0.5 decreases the baseline respiratory rate by 50%.

Default: 1

Range: 0.01 - 6.00

TIP: *First decrease the respiratory gain factor to reduce the influence of the respiratory control mechanism on the respiratory rate and tidal volume.*

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, but continue to influence other components of the physiological models.

For example, with the tidal volume set to 600 mL in the adult simulator, the tidal volume remains a constant (set) 600 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 when the respiratory rate is adjusted.

Default: Modeled

Range: 0 mL- 400 mL

Tidal Volume Factor

The **Tidal Volume Factor** (along with the **Respiratory Rate Factor**) parameter is used to change the baseline tidal volume (before the control-of-breathing and drug influences are taken into account). A value of 2 doubles the baseline tidal volume. A value of 0.5 decreases the baseline tidal volume by 50%.

Default: 1

Range: 0.10 - 4.00

TIP: *First decrease the respiratory gain factor to reduce the influence of the respiratory control mechanism on the respiratory rate and tidal volume.*

pH Shift

The **pH Shift** parameter is used to create a metabolic acidosis or metabolic alkalosis under script control.

The default pH value displayed on the Patient Status Display or TouchPro software is dependent on respiratory arterial CO_2 values. Under default conditions ($PaCO_2$ = 40 mmHg), the pH is approximately 7.4. Rising arterial CO_2 produces a subsequent drop in pH, while falling arterial CO_2 levels result in rising pH values.

To simulate pH changes with metabolic changes (acidosis or alkalosis), the **pH Shift** value is a mathematical addition to (or subtraction from) the displayed pH value to that which is desired.

Default: 0

Range: -(0.50) - 0.50

Positive End Expiratory Pressure (PEEP)

The PEEP parameter specifies the amount of positive end expiratory pressure applied during mechanical ventilation. Setting this parameter results in clinically appropriate intrathoracic pressures and hemodynamic responses. PEEP must be set both in the software and on the ventilator.

Default: 0 cmH_2O

Range: 0.0 cmH_2O - 25.0 cmH_2O

O_2 Consumption

The **O_2 Consumption** parameter is used to change the rate of consumption of oxygen and production of carbon dioxide.When **O_2 Consumption** is increased and used with increased **Shunt Fraction**, profound levels of hypoxia can be achieved.

Default: 64 mL per minute

Range: 0 mL per minute - 300 mL per minute

CO_2 Production Factor

The **CO_2 Production Factor** parameter allows for the manipulation of metabolic CO_2 production to simulate a variety of pathophysiological conditions. CO_2 production is determined by the **O_2 Consumption** and **Respiratory Quotient** settings. A CO_2 Production Factor value of 2 doubles the CO_2 production, while a value of 0.5 decreases the CO_2 production by 50%.

Default: 1

Range: 0.50 - 4.00

$PaCO_2$ Set-point

The **$PaCO_2$ Set-point** parameter is a set point for $PaCO_2$. The control-of-breathing model adjusts tidal volume and respiratory rate in order to bring the $PaCO_2$ toward this set point. Factors that influence the success of this control effort include baseline tidal volume, baseline respiratory rate, respiratory gain, O_2 consumption, respiratory quotient, lung compliances, chest wall compliance, bronchial resistances, the presence of artificial airways in the simulator and the inspired gas mixture.

When the $PaCO_2$ Set-Point is set to a new value, the physiological controls adjust the simulator's respiratory pattern in an attempt to attain the desired set point. For example, when the set point is raised from 40 to 50 mmHg, there is a transitory decrease in respiratory rate and tidal volume, as the physiological controls attempt to drive the $PaCO_2$ toward 50 mmHg. When the $PaCO_2$ reaches the new set point, the simulator's respiratory rate and tidal volume should return to normal values.

Default: 40 mmHg

Range: 20.0 mmHg - 70.0 mmHg

PaO_2 Set-point

The **PaO_2 Set-point** parameter is a set point for PaO_2. When PaO_2 is below the set point value, progressive stimulation of spontaneous minute ventilation occurs. Both tidal volume and respiratory rate rise, which under appropriate conditions results in PaO_2 moving closer to the set point. Factors that influence this control effort include baseline tidal volume, baseline respiratory rate, respiratory gain, O_2 consumption, respiratory quotient, lung compliances, chest wall compliance, bronchial resistances, the presence of artificial airways in the simulator and the inspired gas mixture. Minute ventilation is not affected for PaO_2 above the set point.

For example, if **PaO_2 Set-point** is set to 100 mmHg and PaO_2 drops to 90 mmHg, ventilatory stimulation occurs. When the PaO_2 reaches the new set point, the simulator's respiratory rate and tidal volume are again controlled to maintain $PaCO_2$ at the $PaCO_2$ set point (*see **$PaCO_2$ Set-point***).

Default: 100.00 mmHg

Range: 20.0 mmHg - 100.0 mmHg

I to E Ratio (1:X)

The **I to E Ratio (1:X)** parameter sets the inspiratory-expiratory (I:E) ratio for spontaneous ventilation. At the default setting, the time for exhalation is twice that of inhalation.

Default: 2

Range: 0.0 - 7.0

$PetCO_2$- $PaCO_2$ Factor

The **$PetCO_2$-$PaCO_2$ Factor** adjusts the end-tidal CO_2 relative to the $PaCO_2$. At the default value of 1, $PetCO_2$ very closely approximates $PaCO_2$. When **$PetCO_2$- $PaCO_2$ Factor** is set at a value of 2, $PetCO_2$ is approximately one half of $PaCO_2$. $PetCO_2$ depends on CO_2 production and alveolar ventilation. Because the alveolar dead space is not modeled physically in the hardware, the responses to changes in mechanical ventilation settings may not be exact. The use of the Onset feature (e.g., onset over 1 minute) is recommended for this parameter.

Default: 1

Range: 0.9 -10.0

Respiratory Gain Factor

The **Respiratory Gain Factor** determines how strong an influence arterial CO_2 levels have on the simulated patient's tidal volume and respiratory rate. Under default conditions (value = 1), when arterial CO_2 levels rise, the patient's respiratory rate and tidal volume show a transitory increase in an attempt to return the patient to the physiological control CO_2 set-point. If the **Respiratory Gain Factor** is increased to more than 1, the patient has a more pronounced response, while values less than 1 correspond to a blunted response.

Default: 1

Range: 0.00 - 10.00

Respiratory Quotient

Respiratory Quotient is the rate of carbon dioxide production divided by the rate of oxygen consumption. Changes to the **Respiratory Quotient** parameter alter the rate of carbon dioxide production relative to the rate of oxygen consumption.

Default: 0.8

Range: 0.70 - 1.20

Volume/Rate Control Factor

Ventilatory responses to increased arterial carbon dioxide or decreased arterial oxygen may take the form of increased tidal volume, increased respiratory rate, or both. The volume/rate control factor determines these relative changes. At a value of 1, increased and decreased ventilatory drive affect tidal volume and respiratory rate equally. When volume/rate control is greater than 1, increased or decreased minute ventilation is predominantly achieved by changes in tidal volume. When the volume/rate control factor is less than 1, ventilatory changes are affected primarily by changes in respiratory rate.

For example, set the volume/rate control factor to 0.1 and increase the shunt fraction to 0.4 to decrease the arterial O_2. The patient responds to falling arterial oxygen levels with increased minute ventilation. Increasing the respiratory rate with minimal increase in tidal volume produces this.

Default: 1 mL

Range: 0.1 mL - 10.0 mL

Chest Wall Compliance Factor

This **Chest Wall Compliance Factor** parameter describes the interaction of the chest wall with the lungs. The **Chest Wall Compliance Factor** parameter defines the volume-pressure relationship in the normal operating lung volumes. Once distended, however, the chest wall rapidly becomes much less compliant (i.e., much “stiffer”) and resistant to further inflation.

Default: 1

Range: 0.15 - 10.00

Functional Residual Capacity

The **Functional Residual Capacity** parameter sets the combined left and right lung volume remaining at the end of a normal, spontaneous exhalation.

Default: 200 mL

Range: 50 mL- 300 mL

Lung Compliance Factor: (Left and Right)

These two parameters independently set the left and right lung compliance. Lung compliance factor determines how easily the lungs inflate. Low compliance factors (less than 1) create “stiff” lungs requiring more pressure for expansion. High compliance factors (greater than 1) create “loose” lungs that easily inflate with less pressure.

Default: 1

Range: 0.15 - 10.00

Venous CO_2 Shift

The **Venous CO_2 Shift** parameter affects the partial pressure of CO_2 in the venous blood. Changing this parameter allows large and rapid shifts in total body CO_2 concentration. Increases in alveolar and arterial CO_2 follow rapidly in a physiologically correct magnitude and time course.

This parameter is useful for giving a “bolus” of CO_2 to the venous system. The alveolar and arterial CO_2 levels rise rapidly in response to the added carbon dioxide but soon return to “pre-bolus” levels as increased ventilation efforts work to eliminate the added CO_2. Therefore, the rise in CO_2 levels is only transitory.

Default: 0 mmHg

Range: 0.0 mmHg - 60.0 mmHg

Bronchial Resistance Factor (Left and Right)

When using the Bronchial Occlusion parameter, the rate of resistance can be set using the Left or Right Bronchial Resistance Factor parameters. The rate of resistance can also be set to occur over time.

Default: 1 cmH_2O

Range: 0.3 cmH_2O - 1000.0 cmH_2O

Cardiovascular – Basic Parameters

Cardiovascular Parameters – Basic
Blood Pressure
CVP
PAP
PCWP (Pulmonary Capillary Wedge Pressure)
Heart Rate
Heart Rate Factor
Cardiac Output
Cardiac Rhythm
PEA (Pulseless Electrical Activity)
Arterial Catheter
Central Venous Catheter
PA Catheter
PA Balloon
Defib
Pacing Current
Pacing Rate
Pacing Capture Threshold

Blood Pressure

The Blood Pressure parameter is used to override the physiological modeling for blood pressure. 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.

Default: Modeled

Range: Systolic 20 mmHg - 200 mmHg

Diastolic 10 mmHg - 200 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.

Default: Modeled
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 override the physiological modeling for pulmonary artery pressure. 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.

Default: Modeled
Range: Systolic 0 mmHg - 50 mmHg
Diastolic 0 mmHg - 50 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.

Default: Modeled
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, but continue to influence other components of the physiological models. Use this parameter to “fix” or set the heart rate to a specific number.

Default: Modeled

Range: 30 beats per minute - 275 beats per minute

Heart Rate Factor

The **Heart Rate Factor** parameter is used to change the baseline heart rate before physiological controls are taken into account. A value of 2 doubles the baseline heart rate, while a value of 0.5 decreases the heart rate by 50%. Use this parameter to raise or lower the heart rate.

Default: 1

Range: 0.30 - 3.00

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.

Default: Modeled

Range: 0 L/min - 30 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
- **Options:**

  Modeled

  Asystole

  Atrial Enlargement, Left
  Atrial Enlargement, Right

  Atrial Fibrillation
  Atrial Fibrillation: HR 120
  Atrial Fibrillation: HR 80

  Atrial Flutter
  Atrial Flutter: HR 150
  Atrial Flutter with 2:1 AV Conduction

  Atrial Tachycardia
  AV Block, First-Degree
  AV Block, Second-Degree, Mobitz I
  AV Block, Second-Degree, Mobitz II
  AV Block, Third-Degree

  Bundle Branch Block, Incomplete Right
  Bundle Branch Block, Left
  Bundle Branch Block, Left with PVCs 25%
  Bundle Branch Block, Left with PVCs
  Bundle Branch Block, Right

  Hypercalcemia

  Hyperkalemia

Hypertrophy, Biventricular
Hypertrophy, Left Ventricular
Hypertrophy, Right Ventricular Hypocalcemia

Hypokalemia

Hypothermia

Junctional
Junctional: HR 50

Long QT Syndrome

Mobitz Type I: Wenckebach
Mobitz Type II

Modeled

STEMI Anterior
STEMI Anterolateral
STEMI Inferior
STEMI Lateral
STEMI Posterior
STEMI Septal
STEMI LBB

Myocardial Ischemia, Mild
Myocardial Ischemia, Moderate
Myocardial Ischemia, Moderate with PVCs 10%
Myocardial Ischemia, Moderate with PVCs 25%
Myocardial Ischemia, Moderate with PVCs
Myocardial Ischemia, Severe

Normal Junctional
Normal Junctional: HR 50

NSTEMI
NSTEMI with PVCs 10%

NSTEMI with PVCs 25%

Paroxysmal Junctional Tachycardia
Paroxysmal Junctional Tachycardia: HR 130

PEA: Pulseless Electrical Activity

Pericarditis

Premature Atrial Contraction
Premature Ventricular Contraction 10%
Premature Ventricular Contraction 25%

Pulseless Electrical Activity

Sinus
Sinus Bradycardia
Sinus Bradycardia: HR 40
Sinus Tachycardia
Sinus Tachycardia: HR 120
Sinus with PAC
Sinus with PVCs: 10%
Sinus with PVCs: 25%

ST Elevation with Chest Pain

Third Degree AV Block

Torsade de Pointes

Trifascicular Block
Ventricular Fibrillation, Coarse
Ventricular Fibrillation, Fine
Ventricular Tachycardia
Ventricular Tachycardia: HR 151
Ventricular Tachycardia, Pulseless
Ventricular Tachycardia, Pulseless: HR 151

Wellen's Syndrome

WPW Syndrome, Left Lateral Pathway

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

Arterial Catheter

The arterial pressure displayed on the Patient Status Display or TouchPro software is set using this parameter. A non-pulsatile, "zero" pressure signal is emitted when the **Atmosphere** position is selected and can be used to simulate zeroing a pressure transducer. This may also be used to remove the arterial pressure waveform, if desired. The **Left Ventricle** position is useful for simulating cardiac catheterization procedures, or for demonstrating left ventricular end-diastolic pressure and its relationship to pulmonary artery occlusion ("wedge") and central venous pressure.

Default: Peripheral Artery

Options: Atmosphere

Peripheral Artery

Left Ventricle

Central Venous Catheter

The venous pressure displayed on the Patient Status Display or TouchPro software is set using this parameter. A non-pulsatile, "zero" pressure signal is emitted when the **Atmosphere** position is selected and can be used to simulate zeroing a pressure transducer. This may also be used to remove the central venous pressure waveform, if desired (i.e., beginning of an SCE with an "unmonitored" patient).

Default: Right Atrium

Options: Atmosphere

Extrathoracic Vein

Intrathoracic Vein

Right Atrium

Pulmonary Artery (PA) Catheter

The pulmonary artery pressure displayed on the Patient Status Display or TouchPro software is set using this parameter. A non-pulsatile, “zero” pressure signal is emitted when the **Atmosphere** position is selected and can be used to simulate zeroing a pressure transducer. This may also be used to remove the pulmonary artery pressure waveform, if desired (i.e., beginning of an SCE with an “unmonitored” patient). The pulmonary artery catheter can be “floated” into position by sequencing through the right heart positions. This may also be scripted into a scenario using the Scenario Designer.

Default: Pulmonary Artery

Options: Atmosphere

Intrathoracic Vein

Right Atrium

Right Ventricle

Pulmonary Artery

PA Balloon

Inflation of the pulmonary artery catheter balloon is simulated by switching to the **Inflated** option of the **PA Balloon** parameter. The appropriate pulmonary artery occlusion or “wedge” waveform is then displayed on the Patient Status Display or TouchPro software.

Default: Deflated

Options: Deflated

Inflated

Defibrillation (Defib)

The Defib parameter is used to simulate a specified amount of energy discharged via an external cardiac defibrillator. Setting this parameter results in the characteristic spike in the ECG, followed by a return to the pre-defibrillation rhythm. Defib has no direct effect on the electrical conduction system of the heart. Thus, synchronized cardioversion may be done “on the fly” or scripted using the Scenario Designer.

Default: 0 Joules

Range: 0 Joules- 60 Joules

Pacing Current

The **Pacing Current** parameter is used to simulate a specified amount of current discharged via an external cardiac pacer. Setting this parameter results in the characteristic pacing signal on the ECG waveform when the pacing current is at or above the capture threshold. Also, see **Pacing Capture Threshold**.

Default: 0 mA

Range: 0 mA- 200 mA

Pacing Rate

The **Pacing Rate** parameter determines the cardiac rate (in beats/minute) when the pacing current is at or above the pacing capture threshold. Also, see **Pacing Current** and **Pacing Capture Threshold**.

Default: 80 beats per minute

Range: 0 beats per minute - 119 beats per minute

Pacing Capture Threshold

The **Pacing Capture Threshold** parameter determines the minimum pacing current necessary to pace the heart via an external cardiac pacer. Also see **Pacing Current**. Pacing current values below the pacing capture threshold have no effect on the patient's heart rate.

Default: 50 mA

Range: 0 mA - 119 mA

Cardiovascular – Additional Parameters

Cardiovascular Parameters – Additional
Baroreceptor Maximum Pressure
Baroreceptor Minimum Pressure
Left Ventricle Contractillity Factor
Right Ventricle Contractility Factor
Systemic Vascular Resistance Factor
Venous Capacity Factor
Systemic Arteries Compliance Factor
Pulmonary Arteries Compliance Factor
Pulmonary Vasculature Resistance Factor
Venous Return Resistance Factor
Baroreceptor Gain (Overall) Factor
Baroreceptor Gain (Cardiac) Factor
Baroreceptor Gain (Peripheral) Factor
Chest Compression Efficacy
Aortic Valve Resistance Factor
Mitral Valve Resistance Factor
Pulmonic Valve Resistance Factor

Baroreceptor Maximum Pressure

Baroreceptor maximum pressure defines the mean arterial pressure (MAP) at which the baroreceptor inhibitory activity on the heart is maximal. When a simulated patient's MAP increases above baseline pressure, the baroreceptor response exerts greater inhibitory controls on the MAP (e.g., reduction in heart rate) in an attempt to return the MAP to the patient's baseline pressure. However, these controls have an upper limit, and this "maximum pressure" is defined as the baroreceptor maximum pressure.

In other words, as the MAP increases, the physiological controls (i.e., baroreceptor response) work to bring the pressure back toward baseline, primarily by reducing the heart rate. For every 5 mmHg increase in MAP, the heart rate may decrease by 2 beats per minute in an attempt to keep the MAP in check. However, there is an upper limit ("maximum pressure"), after which these controls are no longer effective. Once the MAP reaches the baroreceptor maximum pressure, there is no additional reduction in heart rate if the pressure continues to rise. For example, should the pressure continue to rise, the heart rate would not show a corresponding slowing.

Default: 91 mmHg

Range: 40 mmHg - 220 mmHg

Note: It is important to set both the baroreceptor maximum pressure and the baroreceptor minimum pressure at the same time for the software to recognize the baroreceptor reset.

Baroreceptor Minimum Pressure

Baroreceptor minimum pressure defines the mean arterial pressure (MAP) at which the baroreceptor inhibitory activity on the heart is minimal. When a simulated patient's MAP decreases below baseline pressure, the baroreceptor response exerts inhibitory controls on the MAP (e.g., increase in heart rate) in an attempt to return the MAP to the patient's baseline pressure. However, these controls have a lower limit, and this "minimum pressure" is defined as the baroreceptor minimum pressure.

In other words, as the MAP decreases, the physiological controls (i.e., baroreceptor response) work to bring the pressure back toward baseline, primarily by increasing the heart rate. For every 5 mmHg decrease in MAP, the heart rate may increase by 2 beats per minute in an attempt to keep the MAP in check. However, there is a lower limit ("minimum pressure"), after which these controls are no longer effective. Once the MAP reaches the baroreceptor minimum pressure, there is no additional increase in heart rate if the pressure continues to fall. For example, should the pressure continue to fall, the heart rate would not show a corresponding increase.

Default: 51 mmHg

Range: 20 mmHg - 160 mmHg

Note: It is important to set both the baroreceptor maximum pressure and the baroreceptor minimum pressure at the same time for the software to recognize the baroreceptor reset.

Left Ventricle Contractility Factor

The **Left Ventricle Contractillity Factor** parameter adjusts the contractility of the left ventricle and has a direct effect on cardiac output and blood pressure. Use this parameter to raise or lower the cardiac output.

Default: 1

Range: 0 - 5.00

Right Ventricle Contractility Factor

The **Right Ventricle Contractility Factor** parameter adjusts the contractility of the right ventricle and has a direct effect on pulmonary artery pressure and an inverse effect on central venous pressure. Use this parameter to raise or lower pulmonary artery pressure (PAP) or to change the central venous pressure (CVP).

Default: 1

Range: 0 - 5.00

Systemic Vascular Resistance Factor

The **Systemic Vascular Resistance Factor** parameter adjusts the baseline systemic vascular resistance. Raising the value increases the systemic vascular resistance, while lowering the value decreases the vascular resistance.

Raising the parameter value is analogous to increasing the resistance to blood flow through the systemic vasculature. Under such conditions, the arterial blood pressure (ABP) increases, and the heart rate may decrease due to feedback from the physiological control mechanisms.

Default: 1

Range: 0.10 - 10.00

Venous Capacity Factor

The **Venous Capacity Factor** parameter adjusts the volume of blood contained in the unstretched venous system without an increase in venous pressure. Raising the value decreases the venous capacitance (vasodilatation and decreased vascular tone), while lowering the value increases the venous capacitance (vasoconstriction and increased vascular tone).

The volume of blood in the venous system has an inverse relationship to the blood pressure. Lowering the value is analogous to a “shift” in blood from the venous system to the arterial system, and this shift, when coordinated with increased systemic vascular resistance, results in an increase in blood pressure [arterial blood pressure (ABP), pulmonary artery pressure (PAP) and central venous pressure (CVP)].

Default: 1

Range: 0.10 - 100.00

Systemic Arteries Compliance Factor

The **Systemic Arteries Compliance Factor** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient’s systemic blood pressure. Increases in the compliance factor result in a decreased (narrower) pulse pressure, while smaller values increase the pulse pressure. Additionally, when the pulse pressure increases as a result of a reduced compliance factor, both systolic and diastolic pressures increase. Conversely, with a narrower pulse pressure (higher compliance factor), both the systolic and diastolic blood pressures also drop.

Default: 1

Range: 0.50 - 5.00

Pulmonary Arteries Compliance Factor

The **Pulmonary Arteries Compliance Factor** parameter adjusts the pulse pressure (difference between systolic and diastolic pressures) of the simulated patient's pulmonary blood pressure. Increases in the compliance factor decrease (narrow) the pulse pressure, while smaller values increase the pulse pressure. Additionally, when the pulse pressure increases as a result of a reduced compliance factor, both systolic and diastolic pulmonary pressures increase. Conversely, with a narrower pulse pressure (higher compliance factor) both the systolic and diastolic pulmonary pressures also drop.

Default: 1

Range: 0.20 - 5.00

Pulmonary Vasculature Resistance Factor

The **Pulmonary Vasculature Resistance Factor** parameter adjusts the baseline pulmonary vascular resistance. Raising the value increases the pulmonary vascular resistance, while lowering the value decreases the vascular resistance.

Raising the parameter value is analogous to increasing the resistance to blood flow through the pulmonary vasculature. Under such conditions, the pulmonary artery pressure (PAP) and central venous pressure (CVP) increase due to back-pressure through the right side of the heart.

Default: 1

Range: 0.10 - 10.00

Venous Return Resistance Factor

The **Venous Return Resistance Factor** parameter adjusts the resistance between the extrathoracic and intrathoracic venous compartments. Raising the value increases the resistance, while lowering the value decreases the resistance.

With less blood returning to the heart, there is a reduced volume entering the ventricles prior to ventricular contraction. This results in a drop in the cardiac output and decrease in arterial blood pressures. The heart rate increases due to feedback from the physiological control mechanisms in an attempt to maintain adequate blood pressures.

Default: 1

Range: 0.10 - 100.00

Baroreceptor Gain (Overall) Factor

The **Baroreceptor Gain (Overall) Factor** parameter adjusts the influence of mean arterial pressure (MAP) on heart rate, contractility, systemic vascular resistance and venous capacity. Use this parameter to adjust how vigorously the heart and vasculature respond to blood pressure changes. The degree of increase in heart rate or vascular response is influenced by the baroreceptor gain (overall) factor.

For example, when blood pressure falls, the heart rate increases, the arteries increase their vascular tone (resistance) and there is less pooling of the blood in the venous system, all in an attempt to maintain adequate blood pressure. A barorecptor gain (overall) factor value of less than 1 corresponds to baroreceptor depression. A barorecptor gain (overall) factor value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 0.00 - 100.00

Baroreceptor Gain (Cardiac) Factor

The **Baroreceptor Gain (Cardiac) Factor** parameter selectively adjusts the influence of mean arterial pressure (MAP) on the heart rate and contractility, influencing how much the heart rate increases or decreases with changes in blood pressure. Use this parameter to adjust how vigorously the heart responds to blood pressure changes.

A baroreceptor gain (cardiac) factor of less than 1 corresponds to baroreflex depression (e.g., less heart rate response to MAP changes). A value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 0.00 - 10.00

Baroreceptor Gain (Peripheral) Factor

The **Baroreceptor Gain (Peripheral) Factor** parameter adjusts the influence of mean arterial pressure (MAP) on systemic vascular resistance and venous capacity influencing how much the vasculature responds to changes in blood pressure.

For example, when blood pressure falls, the arteries increase their vascular tone (resistance), and there is less pooling of the blood in the venous system, in an attempt to maintain adequate blood pressure. A factor of less than 1 corresponds to baroreflex depression (e.g., less systemic vascular resistance response to MAP changes). A value greater than 1 leads to a stronger response to MAP changes.

Default: 1

Range: 0.00 - 10.00

Chest Compression Efficacy

The **Chest Compression Efficacy** parameter is used to determine the effectiveness of the chest compression administered by the caregiver. The 100% setting indicates that chest compressions are completely effective, while the 0% setting prevents them from having any effect on intrathoracic pressure.

Default: 100%

Options: 100%

0%

Aortic Valve Resistance Factor

The **Aortic Valve Resistance Factor** parameter is used to adjust the resistance to blood flow across the aortic valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the aortic valve.

Default: 1

Range: 1 - 1000

Mitral Valve Resistance Factor

The **Mitral Valve Resistance Factor** parameter is used to adjust the resistance to blood flow across the mitral valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the mitral valve.

Default: 1

Range: 1 - 1000

Pulmonic Valve Resistance Factor

The **Pulmonic Valve Resistance Factor** parameter is used to adjust the resistance to blood flow across the pulmonic valve. Increasing the value to greater than 1 corresponds to increased resistance to blood flow through the pulmonic valve.

Default: 1

Range: 1 - 1000

Pulses

The table below shows the defaults and ranges for the pulses and pulse deficits for the BabySIM.

Pulse	Default	Range
Left Brachial	On	N/A
Right Brachial	On	N/A
Brachial Deficit	30	0 - 300
Left Femoral	On	N/A
Right Femoral	On	N/A
Femoral Deficit	30	0 - 300

All pulses, unless altered by an SCE, are enabled by default. To disable a pulse, click the pulse location on the human form. To enable a pulse, click the pulse location again. Click and hold a pulse location to adjust the pulse deficit.

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.

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

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.

Range: 0 mL - 100 mL

Packed Red Blood Cells (PRBC) Infusion

PRBCs 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.

Range: 0 mL - 100 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.

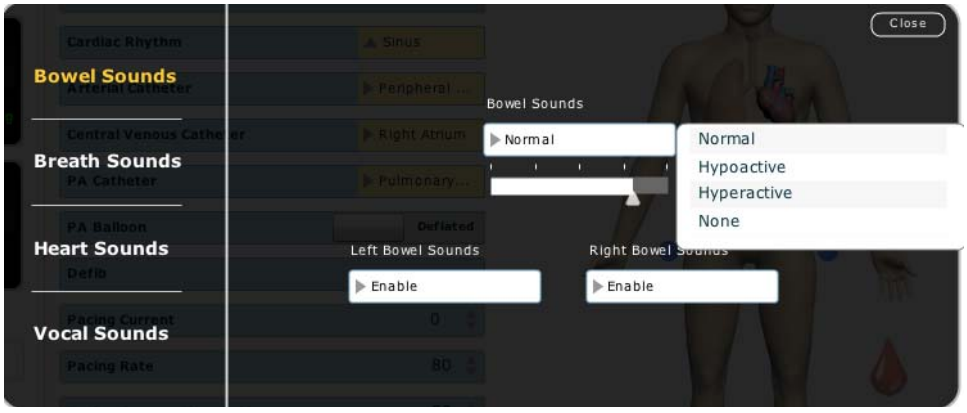
Range: 0 mL - 100 mL

Sounds

A variety of simulated sounds are available to enhance realism. Click the **Sounds** button on the Run screen to access the Sounds controls.

Bowel Sounds

Learners can auscultate bowel sounds over two intestinal regions: Left Bowel Sounds and Right Bowel Sounds. The sounds can be set to **Normal**, **Hypoactive**, **Hyperactive** or **None** (bowel sounds are absent).



The Bowel Sounds Menu

Bowel sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Bowel Sounds**.

Click any one of the **Bowel Sounds** drop-down menus that controls one or both of the intestinal regions to change the type of sound.

Click and drag the Bowel Sounds slider to adjust the volume.

Normal bowel sounds are present by default.

Note: A patient must be running on the BabySIM simulator for any sounds to be available.

Breath Sounds

Breath sounds are independently synchronized with ventilation of the left and right lungs. Speakers in the anterior regions provide breath sounds that can be auscultated.

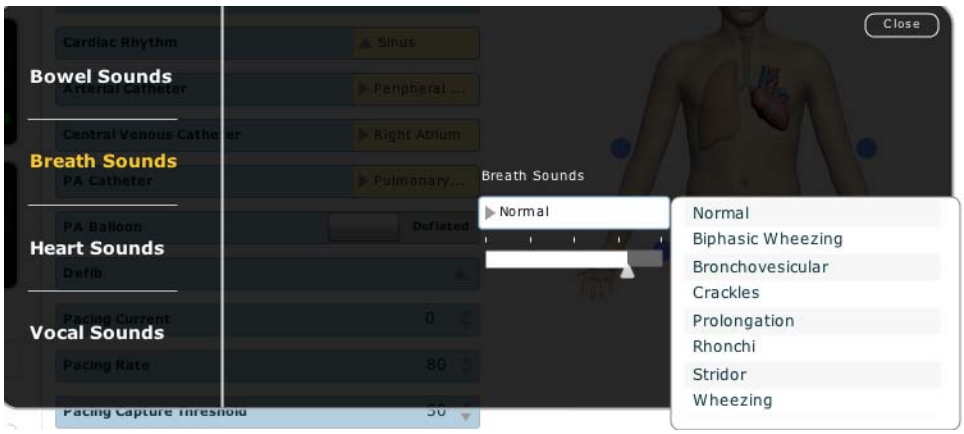
Breath sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Breath Sounds**.

Breath Sounds
Normal
Biphasic Wheeze
Bronchovescular
Crackles
Prolongation
Rhonchi
Stridor
Wheezing

Click any one of the Breath Sounds in the drop-down menu to select a Breath sound. Click and drag the slider to adjust the volume.

Note: A patient must be running on the BabySIM simulator for any sounds to be available.

By default, **Normal** breath sounds are heard.



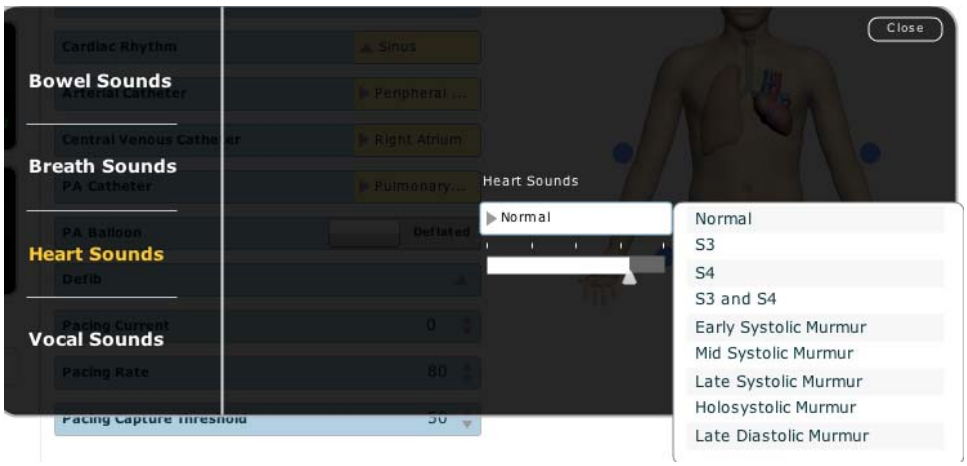
The Breath Sounds Menu

Heart Sounds

Heart sounds emanate from speakers and are synchronized with the cardiac cycle. Normal and abnormal heart sounds are selected using this parameter. By default, heart sounds are set to Normal. The following sounds are available:

Heart Sounds
Normal
S3
S4
S3 and S4
Early Systolic Murmur
Mid Systolic Murmur
Late Systolic Murmur
Holosystolic Murmur
Late Diastolic Murmur

Heart sounds can be adjusted by clicking the **Sounds** button on the Run screen. When the Sounds panel appears, select **Heart Sounds**.



The Heart Sounds Menu

Click the **Heart Sounds** drop-down menu to change the type of sound. Click and drag the slider to adjust the volume.

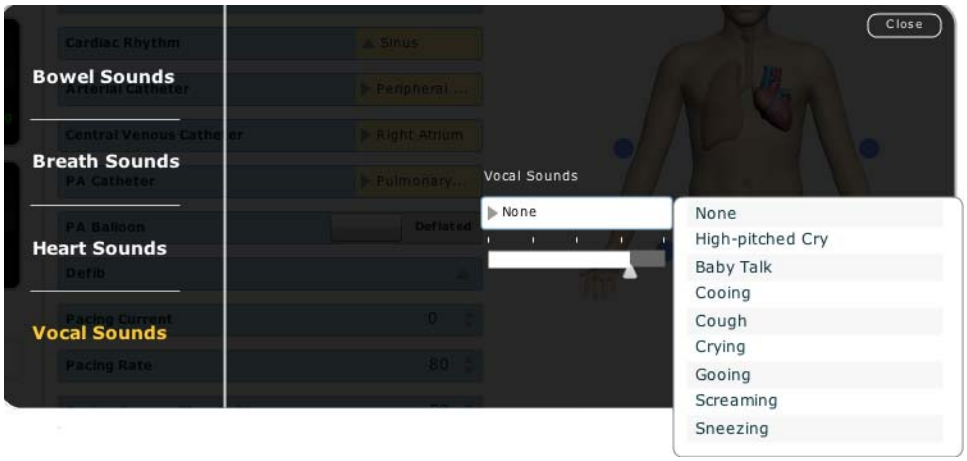
Note: A patient must be running on the BabySIM simulator for any sounds to be available.

Vocal Sounds

A variety of programmable vocal sounds are available. Vocal sounds are androgynous.

Vocal Sounds
None
High-pitched Cry
Baby Talk
Cooing
Cough
Crying
Gooing
Screaming
Sneezing

To select a sound from the Vocal Sounds drop-down menu, click the **Sounds** button on the Run screen. The Sounds panel appears. Click **Vocal Sounds** and select the type of sound desired from the **Vocal Sounds** drop-down menu.



The Vocal Sounds Menu

Vocal Sounds are emitted immediately and play continuously when selected from the **Vocal Sounds** drop-down menu. To stop playing a selected vocal sound, select **None** from the list.

Instructor Workstation Configuration For WiFi (Wireless) Connection.

Some Simulator PCU's allow for a WiFi connection with the laptop Instructor Workstation. The WiFi connection is a three-part process: configuring the laptop settings, connecting to the simulator WiFi network, and configuring a web browser to run Müse.

IMPORTANT: The simulator PCU must have the WiFi router installed in order to connect to WiFi. An antennae, similar to the picture below, will be visible if the PCU has the WiFi router.

In environments where there may be WiFi interference, such as limited access or multiple simulators in use, DO NOT use the WiFi connection with the Instructor Workstation. Instead, ensure the WiFi is turned OFF and use the Ethernet cable.

For proper connection, use either the Ethernet cable or WiFi.
DO NOT use both connections at the same time.

The PCU

Follow these instructions to configure the Instructor Workstation for WiFi connection.

IMPORTANT: For best performance, Müse should not be running during WiFi configuration. If Müse is running, be sure to "Disconnect" the simulator in Müse before configuring the WiFi connection.

A) Mac Laptop Configuration

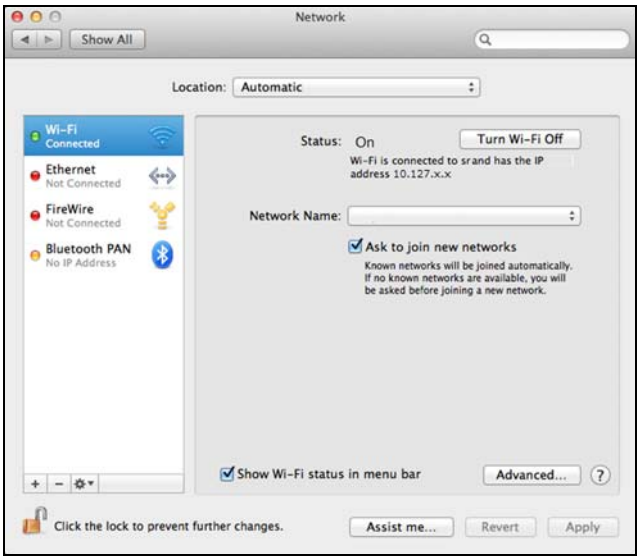
Ensure the Ethernet cable is **NOT** connected to the laptop or tablet Instructor Workstation, or PCU.

Ensure the simulator PCU is powered on (allow three minutes to fully power on and establish a connection).

TIP: *To make changes, you may need to be logged in as administrator for the computer.*

To configure a Mac laptop:

1. From the apple menu (icon), click **System Preferences**
2. In the System Preferences window, click **Network**
3. Ensure the lock icon is unlocked (click to unlock)



The Network Settings Window

WiFi Network Adapter Configuration

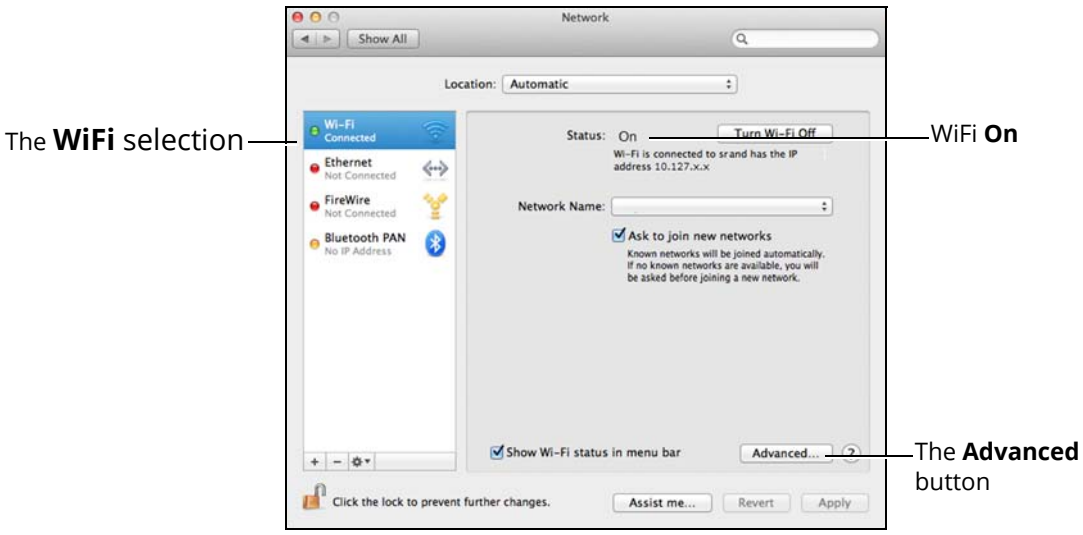
1. Click **Wi-Fi** in the left column.

   TIP: *Some previous versions of Mac refer to WiFi as* ***Airport***

2. Ensure the WiFi is **ON**

   TIP: *It is helpful to check (select)* ***Show Wi-Fi status in menu bar****.*

3. Click the **Advanced** button

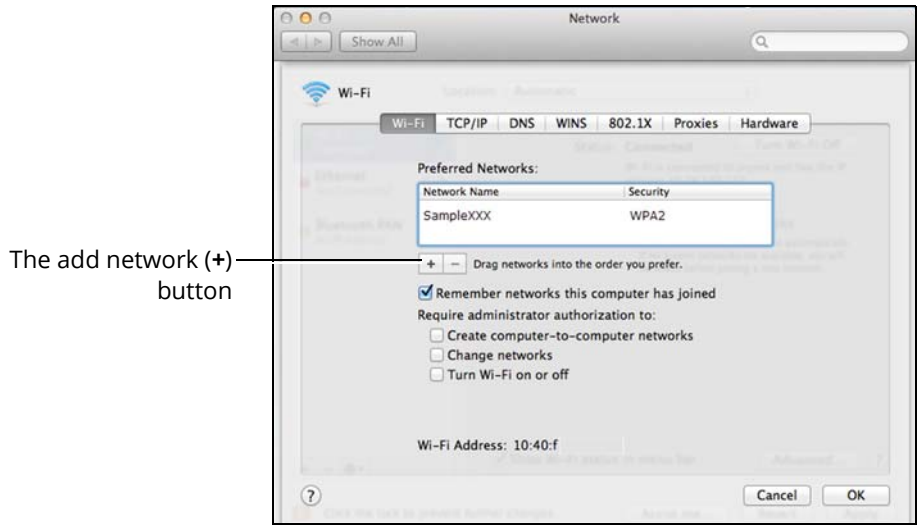


The WiFi Settings Window

4. If your simulator is shown in the **Preferred Networks** list, ensure it is highlighted and ***proceed directly to step 9***

   TIP: *It is helpful to check (select)* ***Remember networks this computer has joined.***

5. If your simulator is not shown in the **Preferred Networks** list, click the plus sign (**+**) to add the network



The WiFi Advanced Settings Window

6. Click the **Choose a Network** button to list available networks

TIP: *Some previous versions of Mac have a* ***Show Networks*** *button.*

The Add WiFi Network Window

7. Click to select your simulator's wireless network (for example, BABYXXXX, where XXXX is the serial number for the unit). If necessary, enter password.

   The case-sensitive password is **BABY** followed by the serial number, and has eight characters and may include zeros preceding the serial number.

   For example, eight character passwords:

   Enter **BABYXXXX**, where XXXX is the 4-digit serial number.

   Enter **BABY0XXX**, where XXX is the 3-digit serial number.

   Enter **BABY00XX**, where XX is the 2-digit serial number.

The WiFi Network Selection Window

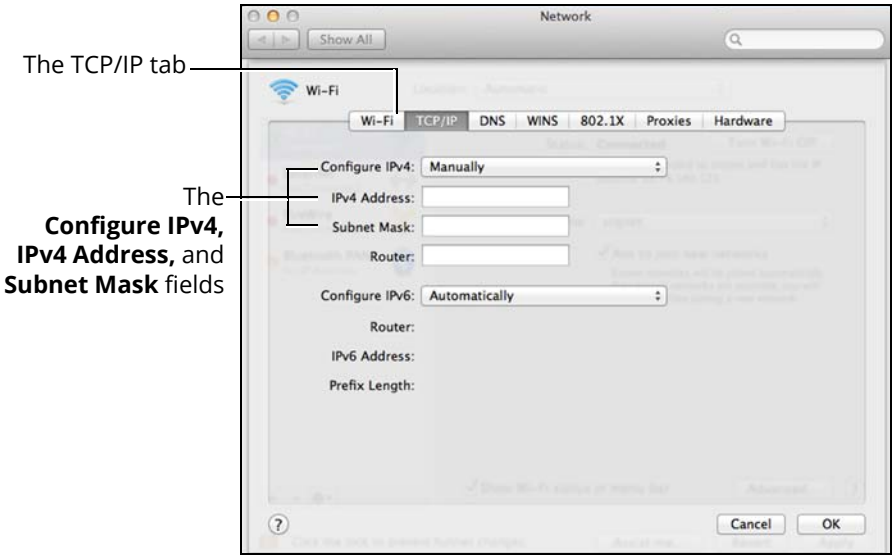
8. Click **OK** to return to the WiFi window

   TIP: *Some previous versions of Mac have an* ***Add*** *button, instead of OK*

9. Ensure BABYXXXX is highlighted and click to select the **TCP/IP** tab.
10. In the **Configure IPv4** field, ensure **Manually** is selected
11. In the **IPv4 Address** field, enter the numbers specified on the *Simulator Data Sheet* for the **Instructor Workstation - IP Address**, but replace the last digit with a unique number, one increment higher.
    For example: If the IP Address is 10.127.83.238, enter the number *10.127.83.23****9***.

    IMPORTANT: When entering numbers, include the dots (**.**) exactly as specified.
12. In the **Subnet Mask** field, enter the numbers **255.0.0.0**

Leave all other fields blank.



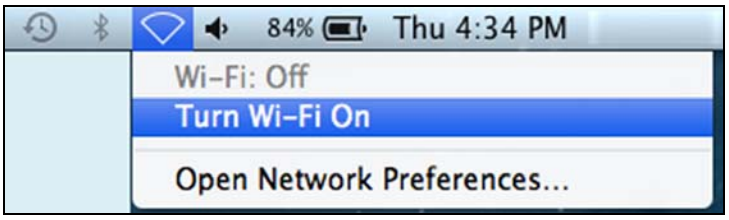
The TCP/IP Settings Window

13. Click **OK**, then click **Apply** to accept the changes
14. Click the lock icon to lock settings
15. Close (quit) the **System Preferences** window

Connect to the simulator network (WiFi)

1. Ensure the simulator PCU is powered on (allow three minutes to fully power on and establish a connection)
2. Click the **WiFi** icon in the top toolbar. If necessary, turn WiFi on

   TIP: *Some previous versions of Mac refer to WiFi as* ***Airport****.*



The WiFi Icon

3. Select your simulator's wireless network (for example, BABYXXXX, where XXXX is the serial number for the unit).

The Simulator WiFi Connection

If necessary, enter password.

The case-sensitive password is **BABY** followed by the serial number, and has eight characters and may include zeros preceding the serial number.

For example, eight character passwords:

Enter **BABYXXXX**, where XXXX is the 4-digit serial number.

Enter **BABY0XXX**, where XXX is the 3-digit serial number.

Enter **BABY00XX**, where XX is the 2-digit serial number.

TIP: *After the initial setup, if "Remember network" or "Connect automatically" was checked, subsequent connections can be made by ensuring the WiFi is ON and connected to the simulator network.*

IMPORTANT: *Refer to the section Configure Web Browser To Run Müse to complete the Instructor Workstation configuration for WiFi.*

B)Windows Laptop Configuration

Ensure the Ethernet cable is **NOT** connected to the laptop or tablet Instructor Workstation, or PCU.

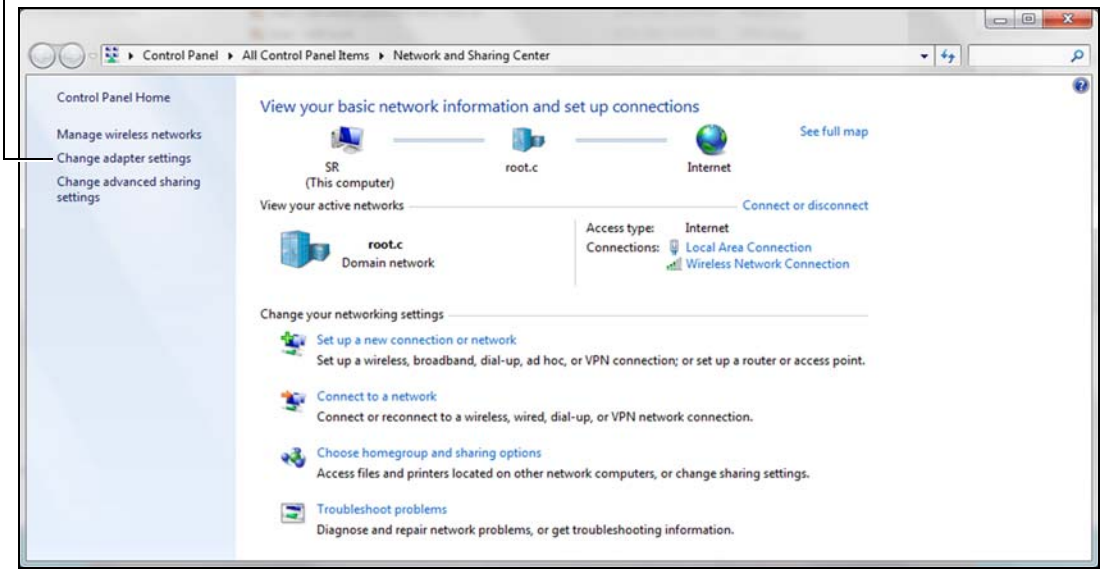
Ensure the simulator PCU is powered on (allow three minutes to fully power on and establish a connection).

TIP: *To make changes, you may need to be logged in as administrator for the computer.*

To configure a Windows laptop:

1. From the **Start** menu (button), open the **Control Panel**
2. Click **Network and Internet** (If using icon view, click **Network and Sharing Center**)
3. Ensure **Network and Sharing Center** is selected
4. Click **Change adapter settings** (in the left column)

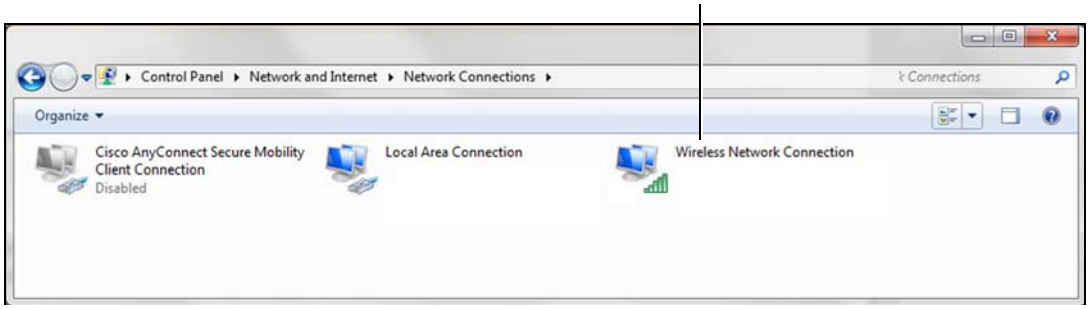
The **Change adapter settings** selection



The Network and Sharing Center Window

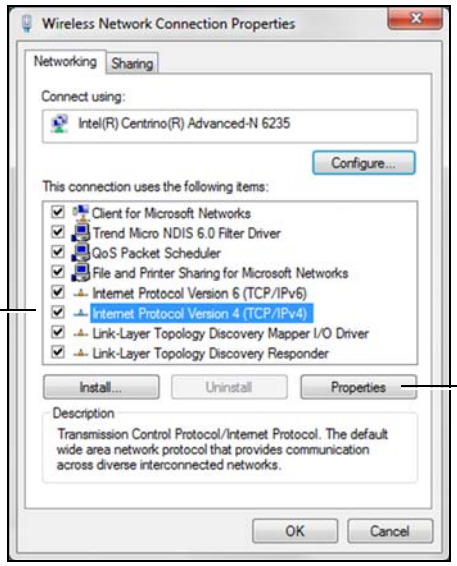
5. Double-click **Wireless Network Connection**, then click **Properties** (or right-click **Wireless Network Connection** to get to the properties window)

The **Wireless Network**



The Change Adapter Settings Window

6. Click to highlight **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties** (or double-click **Internet Protocol Version 4 (TCP/IPv4)** to get to the properties window)

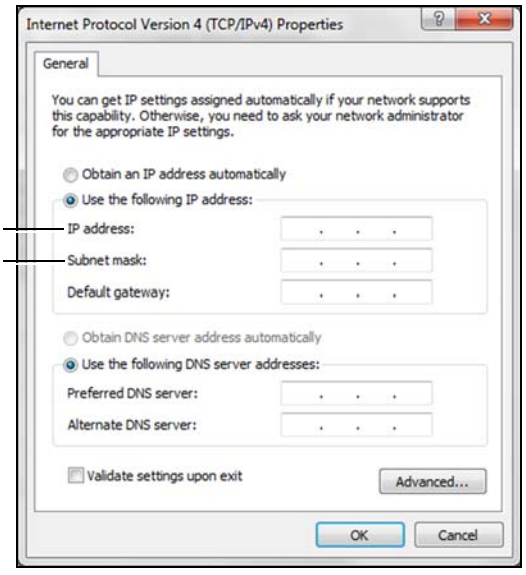


The **Internet Protocol Version 4 (TCP/IPv4)** selection

The **Properties** button

The Wireless Connection Properties Window

7. Click to highlight **Use the following IP address**
8. In the **IP Address** field, enter the numbers specified on the *Simulator Data Sheet* for the **Instructor Workstation - IP Address**, but replace the last digit with a unique number, one increment higher.
   For example: If the IP Address is 10.127.83.238, enter the number *10.127.83.23**9***.
9. In the **Subnet Mask** field, enter the numbers **255.0.0.0**
   Leave all other fields blank.



The **IP Address**

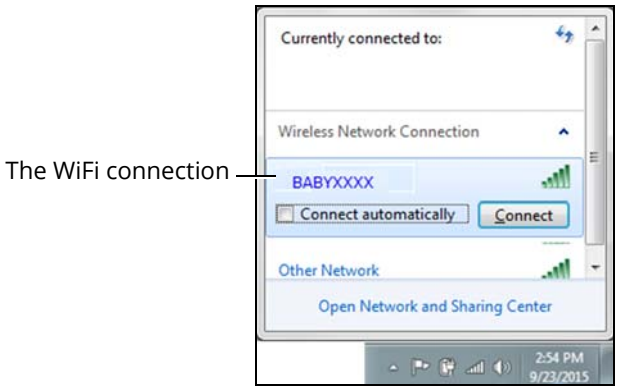
The **Subnet mask**

The IP Address and Subnet Mask Entry Window

10. Click **OK** to accept all the changes and close all windows

Connect to the simulator network (WiFi)

1. Ensure the simulator PCU is powered on (allow three minutes to fully power on and establish a connection)
2. Click the **Wireless Network** icon in the bottom Windows toolbar
3. Click to select your simulator's wireless network (for example, BABYXXXX, where XXXX is the serial number for the unit)
4. Click **Connect**



The Simulator WiFi Connection

If necessary, enter password.

The case-sensitive password is **BABY** followed by the serial number, and has eight characters and may include zeros preceding the serial number.

For example, eight character passwords:

Enter **BABYXXXX**, where XXXX is the 4-digit serial number.

Enter **BABY0XXX**, where XXX is the 3-digit serial number.

Enter **BABY00XX**, where XX is the 2-digit serial number.

The wireless connection is established.

TIP: *After the initial setup, if "Remember network" or "Connect automatically" was checked, subsequent connections can be made by ensuring the WiFi is ON and connected to the simulator network.*

IMPORTANT: Refer to the section *Configure Web Browser To Run Müse* to complete the Instructor Workstation configuration for WiFi.

Configure Web Browser To Run Müse

Müse can be run from the Instructor Workstation laptop using the Firefox or Internet Explorer web browser. Before running Müse, ensure the simulator is powered on and your laptop WiFi is connected to the simulator.

To run Müse from Firefox or Internet Explorer:

1. Open the Firefox or Internet Explorer browser
2. Enter the unique IP number that was created for the **IPv4 Address** field, including the dots, into the browser address bar

   For example: If the IP number is 10.127.83.238, type *10.127.83.238* as the address.

   After you enter the correct address, Müse will launch to the start screen.

Tip: *Add the Müse address (IP number) as a bookmark or favorite, for easier access.*

Tip: *Set the Müse address (IP number) as the browser home page, for easier access.*

IMPORTANT: When reconnecting to the PCU with the Ethernet cable, follow these steps:

1. Close and exit Muse
2. Power off the PCU
3. Turn the WiFi **OFF** on the laptop or tablet Instructor Workstation. Then power OFF the laptop or tablet Instructor Workstation.
4. Refer to the section *Getting Started*, **Step 6: Establish the Ethernet Cable Connection** to complete the setup

   Note: The WiFi **MUST** remain OFF when the Ethernet cable is connected.