Pediatric HAL® S3004-S3005 Instruction Manual

Contains documentation for Pediatric HAL® S3004/S3005 and GaumardUI
(the **Gaumard U**ser **I**nterface software).

Gaumard®
Simulators for Health Care Education

Leadership Through Innovation

**Pediatric HAL® is an interactive educational system developed to assist a certified instructor.
It is not a substitute for a comprehensive understanding of the subject matter
and not intended for clinical decision making.**

Manual Version OP.11.2.1
for GaumardUI (HAL®) v1.20.8.0

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Contents

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I. Getting Started

A. Overview

- Completely self-contained and mobile
- Pediatric HAL® is fully responsive and functional even when carried
- RF communications up to 150 feet (50 meters)
- Powerful yet intuitive user interface software

Airway

- Oral and nasal intubation
- Use an ET tube or LMA
- Sensors detect depth of intubation
- Unilateral chest rise with right main stem intubation
- Multiple upper airway sounds synchronized with breathing

Appearance

- Color responds to hypoxic events and interventions (healthy, mild cyanosis, severe cyanosis)
- Eye blinking (eyes open, close and blink at given rates)
- Pupil Dilation (responsive to low ambient light and high intensity light)

Breathing

- Control rate and depth of respiration and observe chest rise
- Ventilation is measured and logged
- Gastric distension with excess BVM ventilation
- Select independent left and right lung sounds
- Chest rise and lung sounds are synchronized with selectable breathing patterns
- Accommodates assisted ventilation, including BVM and mechanical support
- Unilateral chest rise

Circulation

- Conductive skin regions allow for ECG monitoring with real equipment
- Conductive skin regions for electrical therapy (defibrillation, cardioversion, pacing)
- Multiple heart rhythms, rates and complications
- Heart sounds include a normal heart as well as atrial and ventricular septal defects
- Chest compressions are measured and logged
- Blood pressure can be taken on the left arm using a cuff, palpation, or auscultation

- Blood pressure sounds audible between systolic and diastolic pressures
- Pulse strengths vary with blood pressure and pulses are synchronized with ECG.

Simulator

- Physical size is 50th percentile of 5 year old (S3005) / 1 year old (S3004)
- Interchangeable genitalia
- Internal rechargeable NiMH battery

Venous access

- IV training arm (right only)

Control

- Wireless tablet PC with stylus control
- Communication modules are FCC and CE! Compliant
- Communications module can be used simultaneously with the tablet computer's integrated wireless (IEEE 802.11b) networking device
- Bluetooth(R) technology in the tablet computer allows wireless printing to compatible printer and quick connections to other devices

Accessories

- 100-240 VAC charger
- Blood pressure cuff
- Instructions
- Carrying case

Other

- One year limited warranty, extended warranty to three years
- Installation and training services available

B. Terminology

It is wise to spend a moment familiarizing yourself with some of the terminology that will be used to discuss simulation with the Pediatric HAL® system.

Automatic Mode - In this mode, vital signs respond automatically to caregiver participation, instructor specifications, and pharmacologic intervention. The model used in this operating mode was developed based on physiologic principles. Features unique to this mode include: a comprehensive list of drugs for easy administration, a drug profile editor for adding new drugs or editing existing ones, among other things.

Facilitator - the person conducting the simulation; an instructor or lab staff member.

GUI - the Gaumard User Interface - is the software application, used to control the manikin and evaluate care providers.

Palette - a collection of Palette Items. Each profile has its own palette.

Palette Item - any full or partial set of physiological parameters that have been grouped and saved together under a single name.

Profile - a unique Premie HAL® software configuration, including custom Palette, Scenarios, and options. Each Profile acts as a separate program, in that changes made to one profile have no effect on the others.

Provider - a person participating in the simulation as a healthcare provider.

Scenario - a saved sequence of physiological states, like a "playlist." Scenarios provide a level of automation that unburdens the facilitator and allows standardized presentation of symptoms.

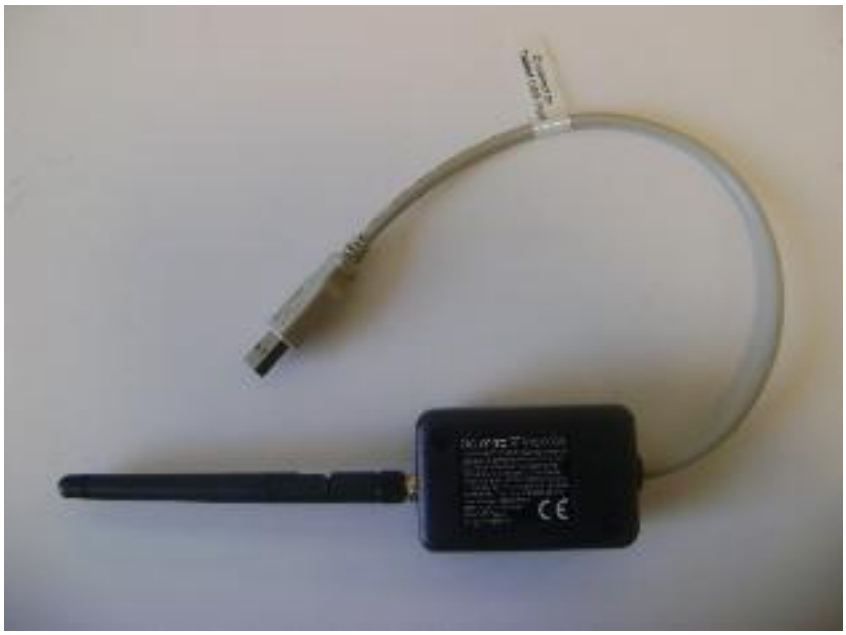
Scenario Item - a Palette Item that is part of a scenario. Scenario Items may also represent a fixed delay period ("Wait") or a pause ("Wait Indefinitely").

Stylus - a special pointing device for the tablet computer. The stylus is the fastest and easiest means of controlling the Premie HAL® software. See the Equipment Set-up section of this guide for more information on working with the stylus.

C. Equipment Set-up

1. Connecting the Communication Module

The communications module is a USB device, and a short USB cable is included.



The module's USB cable can be connected whether the computer is on or off. The affixed patches of Velcro can be used to physically secure the module to the back of the computer. When the computer is on, the green indicator light on the communications module confirms that it has been correctly installed.

When the manikin establishes communication with the tablet computer, the communication indicator in the status viewer in the GUI will blink green.

For more information about the communication indicator, refer to Section III.B.1.b.

Warning: Never disconnect the communications module while the Pediatric HAL® software is running. Doing so can seriously damage the module.

2. Configure Tablet Computer

You should familiarize yourself with the tablet computer instruction manual. The following issues are of special importance:

Using the stylus

The stylus operates very much like a mouse. You will notice that the pointer moves when the stylus is held near but without touching the screen. Tapping the screen with the stylus tip is like clicking the primary (usually left) mouse button. Holding the stylus button while tapping the screen is like clicking the secondary (usually right) mouse button.

Calibrating the stylus

For working with the Pediatric HAL® software and many other applications, the stylus input is far superior to a mouse in both speed and comfort. An additional advantage is it can be easily calibrated for your personal comfort. On the desktop is a shortcut to the Pen Calibration program, which can also be found in the Windows Control Panel. The calibration program will present the user with crosshair targets at each of the four corners of the screen. Position yourself and the tablet as if you are working, and carefully touch the exact center of each of the targets. After calibration, the pointer should be displayed directly beneath the stylus tip. Significant changes to viewing angle should be followed by calibration for best performance.

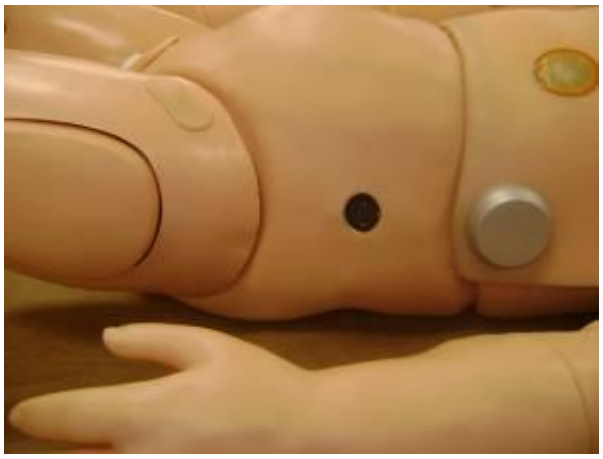
Rotating the display

One of the buttons along the right edge of the screen rotates the display. The display orientation is set at the factory for optimal comfort while using Newborn HAL®. If you accidentally rotate the screen, press the  button repeatedly until the original orientation is restored.

3. Charge the Battery

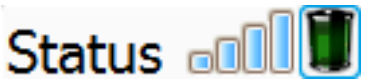
Upon receiving the manikin, connect the charger to the battery port. Please charge for 2-3 hours (or until the charger displays a green light).

S3004 Pediatric HAL® One Year old:




S3005 Pediatric HAL® Five Year old:


Use the battery indicator in the status panel to check the battery life.



For more information about the battery indicator, refer to Section III.B.1.(c).

NOTE: Battery charge time is approximately 2-4 hours. The charger indicator light will show red if the manikin is being charged.

Warning: Avoid using the simulator while the charger is connected. If the manikin is being used and the charger is connected, the charger slows down the discharge. In other words, it extends the battery life by making it longer to discharge. However, it will **not** charge the battery. To charge the battery you must:

1) If connected, unplug the charger from the manikin.
2) Turn off the simulator by turning off the GaumardUI.
3) Connect the charger to the battery port.
4) Leave the battery charging for 2-3 hours.

Power Supply

For the S3004 One Year Old ***only***, starting with serial number **O1010084**, Pediatric HAL® is being shipped with a power supply and the modification enabling it, which can sustain operations after the battery is fully charged. Earlier serial numbers may have the option of sending HAL® in for a power supply upgrade.

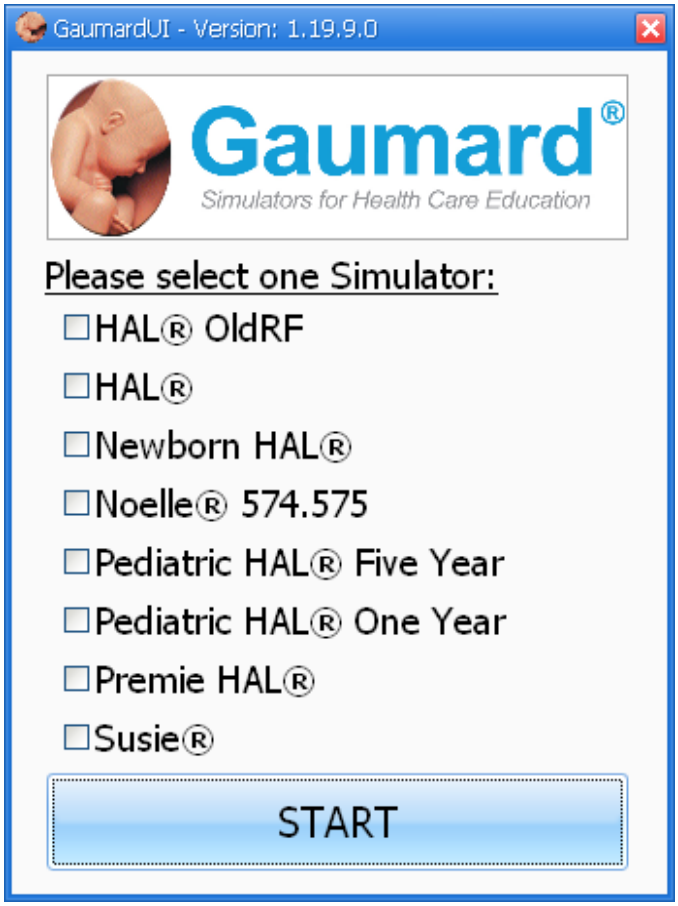
Power adapter with exchangeable plugs
for various international power systems

4. Start the System

Pediatric HAL® is ready to go. After reading the Care and Cautions section of this guide, you can begin working with the simulator.

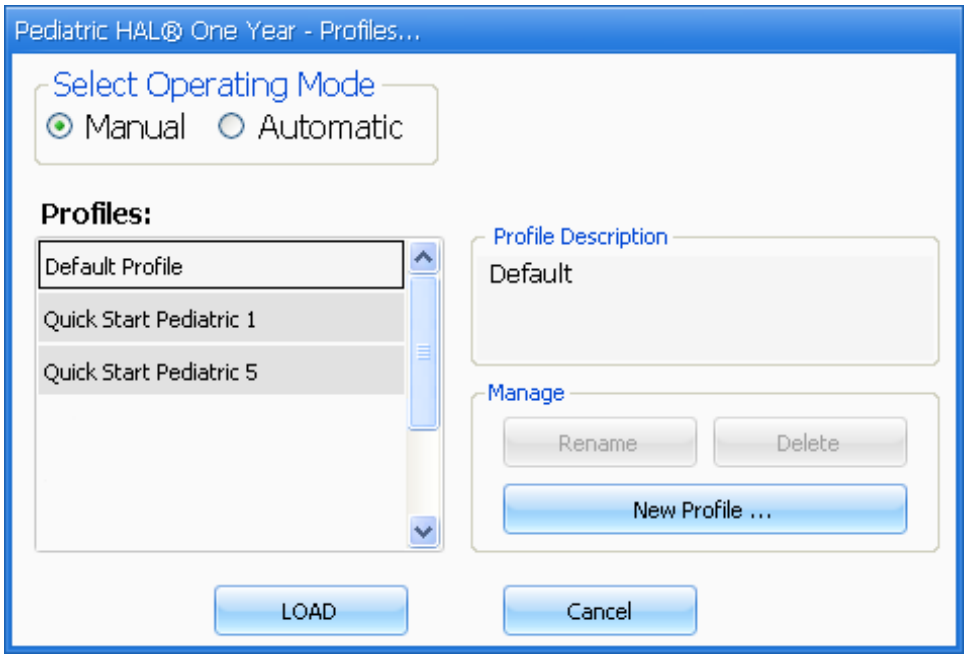
To start the simulator, click on the GaumardUI icon on the desktop of your tablet computer.

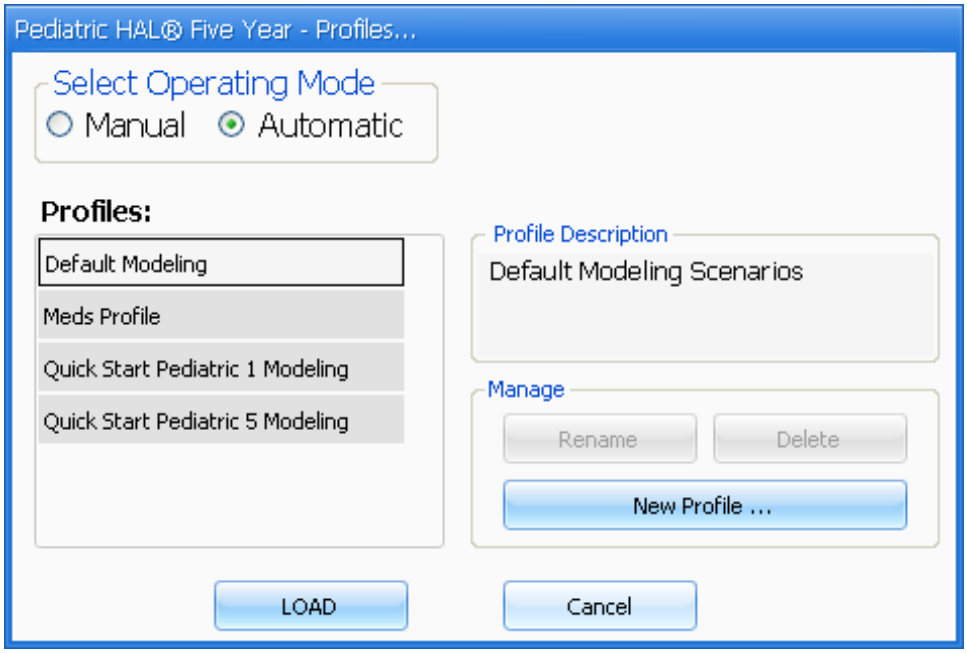
A dialog box is then displayed which prompts you to select the active manikin. If you have the S3004 Pediatric HAL® One Year Old, Select Pediatric HAL® One Year and click "Start".



If you have the S3005 Pediatric HAL® Five Year Old, select Pediatric HAL® Five Year and click "Start".

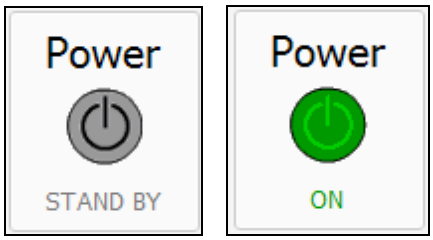
Now select the profile of your preference and click load. For more information about profiles, go to Section III.A (Working with the GaumardUI, Profiles).





You are now ready to use the Gaumard User Interface. For more information about the software, refer to Section III of this manual.

It is important to note that Pediatric HAL® uses what is called "soft power," which means that the manikin is activated from the software. It is very important to understand the behavior of the soft power feature, described below.



When the battery is connected, Pediatric HAL® is always in **SLEEP** mode. Pediatric HAL® will automatically wake up in the **ON** mode less than 1 minute after starting the software. The communication indicator on the Status panel should blink green, confirming that the wireless RF link between the controller and model has been established.

To extend battery lifetime, click the power button in the lower right corner of the program window to put the system in **STAND-BY** mode. Battery will last approximately 3 hours depending on factors like breathing rate, cyanosis, etc.

II. Manikin Features

Disclaimer: The section below describes all possible features in the Pediatric HAL® simulator series. Please use the table below to identify which features are standard and which ones are optional in your HAL® model before you complete reading Section II, "Manikin Features".

Legend: Y = Yes N = No O = Optional

	Manikin Feature	5YO S3005	1YO S3004	Comments
Airway	Nasal Intubation	Y	Y	
	Oral Intubation	Y	Y	
	Tongue Edema	Y	Y	
	Tracheostomy	Y	Y	
	Breathing/Airway Sounds	Y	Y	
Breathing	R/L Chest Rise*	Y	Y	
	Lung Sounds Locations	Y	Y	Right and left
Cardiac	Heart Sounds	Y	Y	
	Defibrillate, cardiovert/pace	Y	Y	
	ECG generated in real time	Y	Y	4 patches
Cephalic	Active Eyes	Y	Y	
	Cyanosis	Y	Y	
	Seizures	Y	Y	
Circulation	Right arm IV	Y	Y	
	Left arm virtual BP	Y	Y	
	Pulses	Y	Y	Carotid, brachial, radial, femoral
	Disable Pulses	Y	Y	Radial
Systemic	Bowel Sounds	Y	N	Starting with SN: P0904113
	Male/Female Catheterization	Y	Y	
Other	Streaming Audio	O	O	150 feet
	Physiologic Model	O	O	
	Instructor control/data change	O	O	300 feet

The content of this table is subject to change without prior notice. Please contact Gaumard Scientific for the most current information.

A. Airway

Intubation

HAL®'s airway can be intubated both nasally and orally using LMA or endotracheal tubes, as shown in the figures below.

NOTE: Always lubricate tubing , airway and nasal opening prior to performing any nasal or oral exercises.

Procedure	Recommended Device Size 5 year old	Recommended Device Size 1 year old
Intubation (Blade size)	Miller 2 or MAC 3	Miller 1
LMA	Size 2/2.5	Size 1.5/2
Nasal Intubation	12 Fr catheter	10 Fr catheter
Oral Intubation	ETT 5.0 or 5.5 no cuff; 10 Fr suction catheter	ETT 3.5 no cuff; 8 Fr suction catheter
Nasogastric Tube	12 Fr catheter	10 Fr catheter

Intubation can be made more difficult by turning on tongue edema.

Once intubated, sensors detect the depth of the intubation tube. Should the tube be inserted too deeply, the left lung is automatically disabled, realistically demonstrating right mainstem intubation. Correcting the tube position enables the left lung.

Tracheostomy

Users can perform tracheostomy.

Airway Sounds

HAL® has multiple upper airway sounds synchronized with his breathing: normal, stridor inspiratory, stridor expiratory, and stridor biphasic.

B. Breathing

Breathing Pattern

Users can easily control rate and depth of respiration; and choose independent left, right, upper and lower lung sounds, which are synchronized with selectable breathing patterns: Kussmaul's, Cheyne-Stokes, Biot's, Apneustic, apnea, and normal.

Lung Sounds

Multiple lung sounds are available: normal, wheezing, inspiratory squeaks, crackles and rales.

Bilateral Chest Rise

Right or left lung can be disabled individually.

Pulmonary Ventilation

HAL® can be ventilated with a BVM or mechanical ventilator.

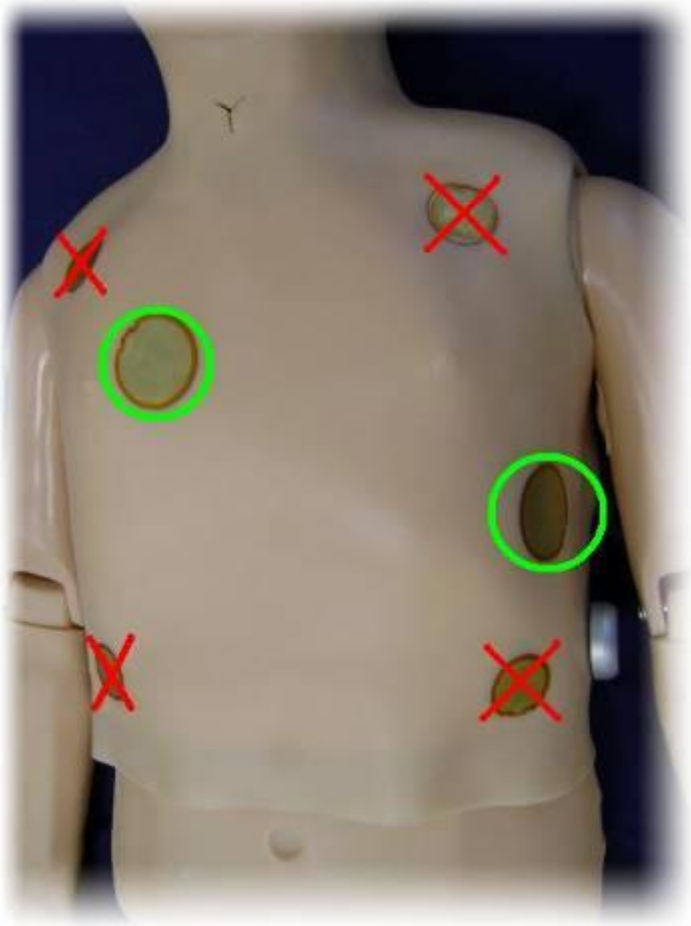
C. Cardiac

Heart Sounds

HAL® is equipped with several realistic heart sounds (normal, distant, systolic murmur, S3 and S4) which are tied to a user-defined heart rate and selectable rhythms.

ECG Monitoring and Electrical Therapy

HAL®'s conductive skin sites allow the attachment of real electrodes and defibrillator pads. This feature permits the user to track cardiac rhythms and events with their own equipment just like with a human patient.



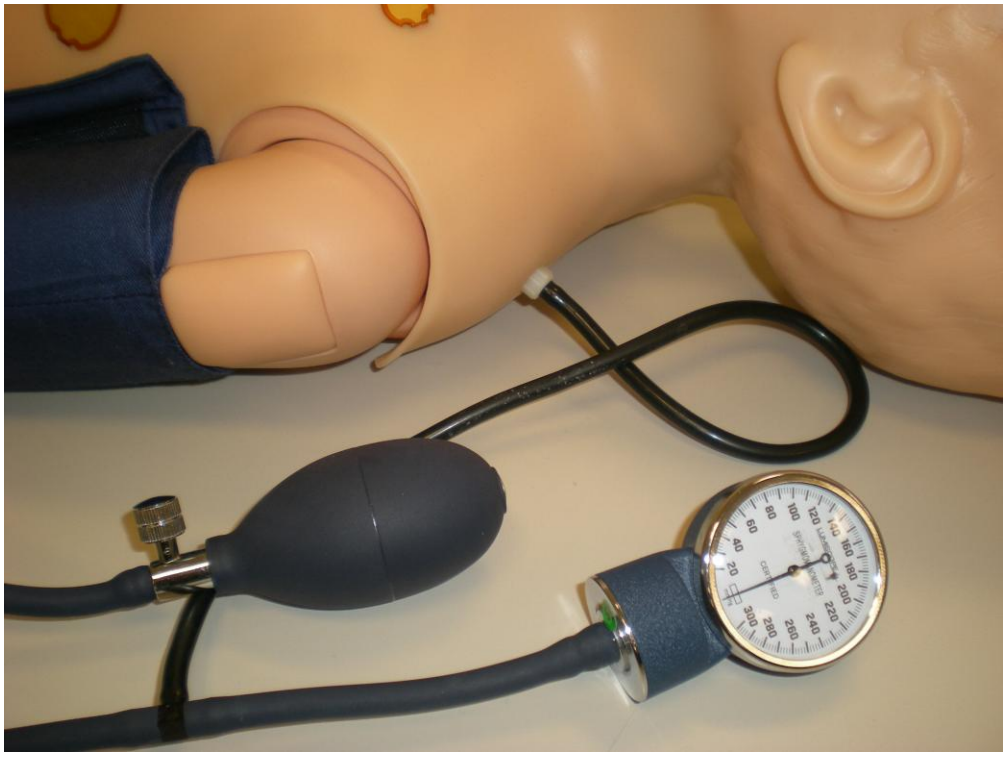
D. Circulation

Bilateral Pulses

HAL®'s palpable pulses (carotid, brachial, radial, femoral and pedal) are dependent on blood pressure. Users can also disable distal pulses to simulate severe hypotension.

Programmable Blood Pressure

Programmable blood pressure can be read using a sphygmomanometer and users can auscultate the Korotkoff sounds



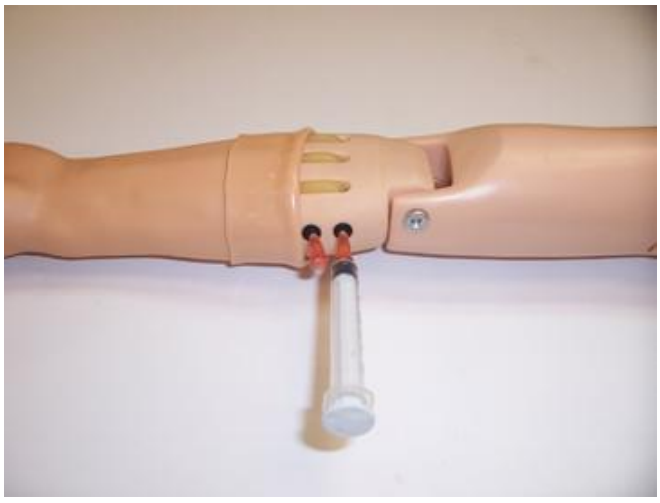
When care providers use the blood pressure cuff to take a measurement by auscultation, a modified cuff must be used with an extra branch in the tubing. The Luer-lok fitting on the end of the extra branch must be connected to the Luer-lok fitting on Pediatric HAL®'s left shoulder. Some facilitators prefer to make this connection before commencing a simulation session.

IV Arm

HAL® has IV training functionality in his right arm only; it can be used for bolus or intravenous infusions as well as for drawing fluids.

Locate the fill syringe and fill it with the desired fluid – water or simulated blood. Insert the fill syringe and drain connector as shown, and push the fluid into the IV circuit until it starts to come out the drain connector.

Warning: Use only Gaumard's provided simulated blood. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.



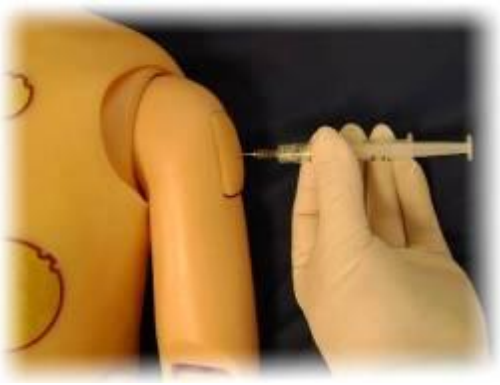
After the circuit is full, just remove the fill syringe and drain connector and the self-sealing ports will keep the fluid inside the veins.

For simulation of high volume infusions, it is necessary to leave the drain tube attached and run it to a suitable outlet or container.

Warning: Do not attempt to fill IV systems without the drain connector in place as it can seriously damage the system.

Intramuscular Injection Sites

IM sites on both deltoids and quadriceps are also available.



Intraosseous Access

Intraosseous access used for the infusion of fluids, blood and/or drugs directly into the bone marrow of the tibia or other large bone. It is a quick way to find venous access when alternate peripheral veins are not visible or palpable. Setting up an intraosseous access line is an invasive procedure that can be simulated with Pediatric HAL®.

E. Cephalic

Reactive Eyes

Pediatric HAL® has blinking eyes with photosensitive pupils. The dilatation state of the pupils, the blinking rate and light reactivity are easily manipulated from the tablet PC giving the user total control.

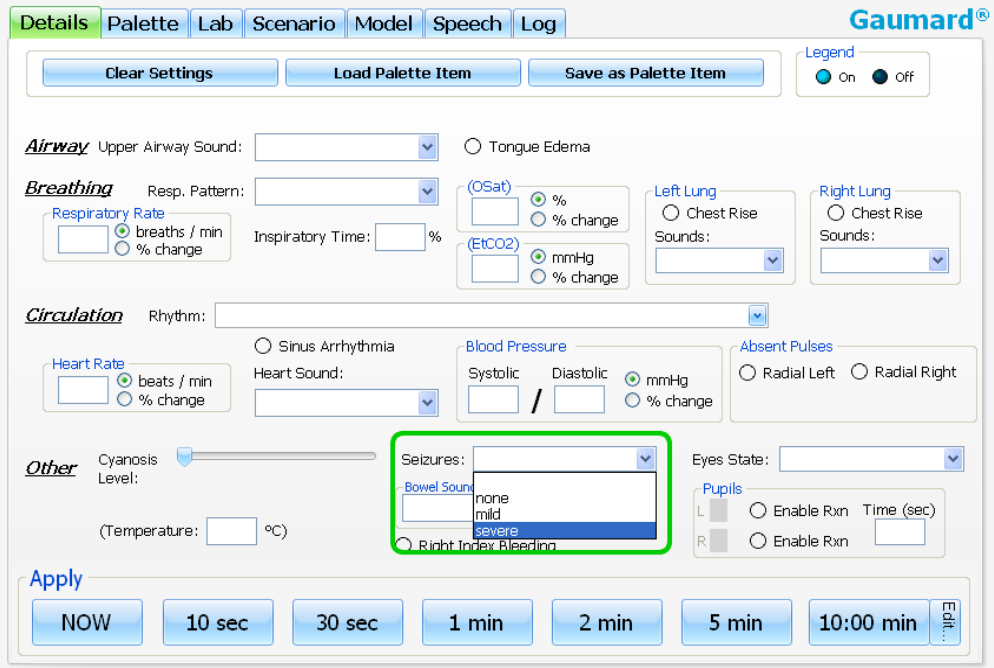
Central Cyanosis

User may choose from various intensities – healthy, mild, severe – and use the physiological modeling to trend improvement or degradation of condition. For more information about how to use this feature, go to Section III.A.6.

Seizures

The seizures mechanism can be used in conjunction with scenarios, and can also be set up and saved as a custom Palette Item. Choose between mild and severe seizures.

This control will only appear and enable when the tablet is correctly connected to the manikin.



F. Systemic

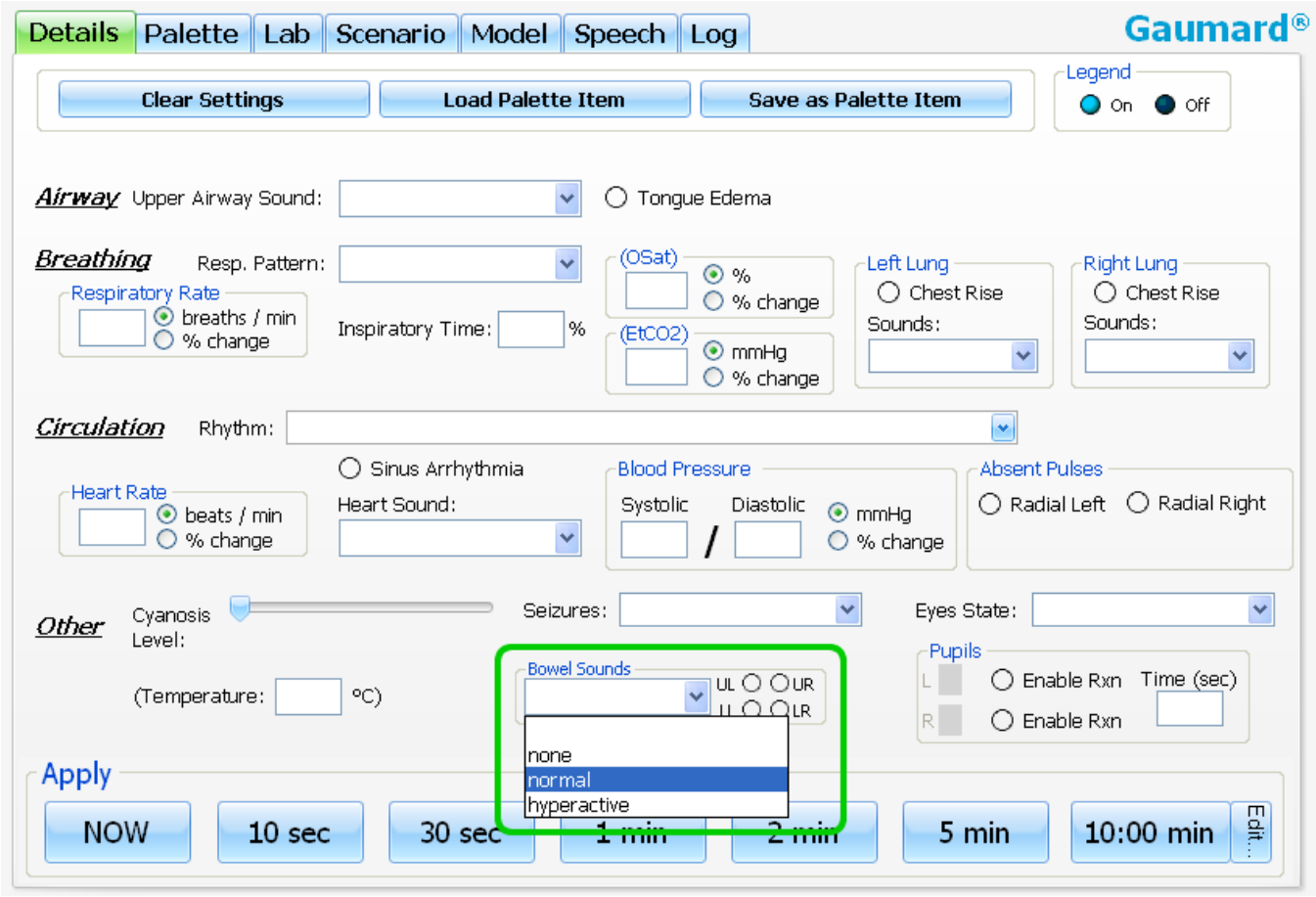
Urinary Catheterization

HAL® can be catheterized via exchangeable male and female genitalia.

To fill the urinary reservoir with liquid, use the white urinary port located in his bottom rear (shown below).

Simulator Model	Maximum Infusion Volume Urinary Reservoir (mL)
S3004 Pediatric 1 year old	48
S3005 Pediatric 5 year old	90

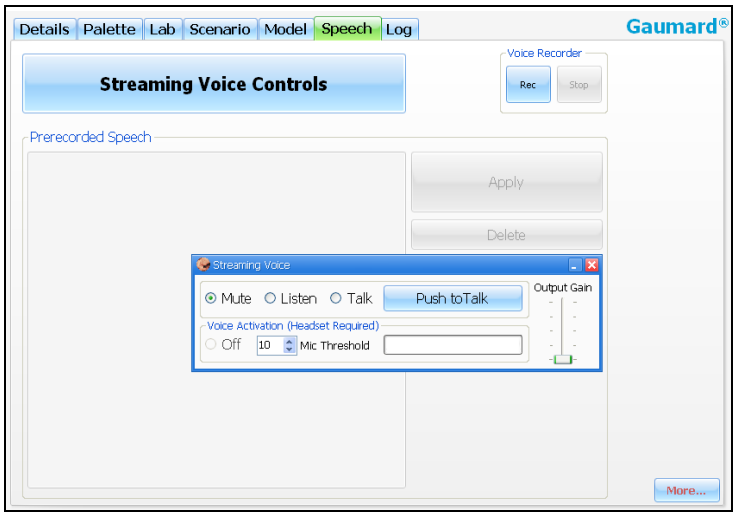
Bowel Sounds



The Five-Year-Old HAL® has four speakers to produce bowel sounds; each can be adjusted for volume or disabled entirely as desired. The One-Year-Old HAL® does not have this feature.

G. Other

Streaming Audio (optional)



This feature allows you to be the voice of the simulator, listen with headsets to any discussions occurring near the simulator, and record your own voice commands in any language. For information about how to use this feature, go to Section III.B.7.

Vital Signs Monitor

The Vital Signs Monitor simulates a vital signs monitor attached to the simulated patient. The vital signs are synchronized through a wireless network between the facilitator's tablet and the computer running the monitor. Each trace can be customized independently of each other; users can set alarms, time scales, boundaries and grid options.

For information on how to setup Gaumard Monitors with GUI, please refer to the Appendix, Section V.C.4.

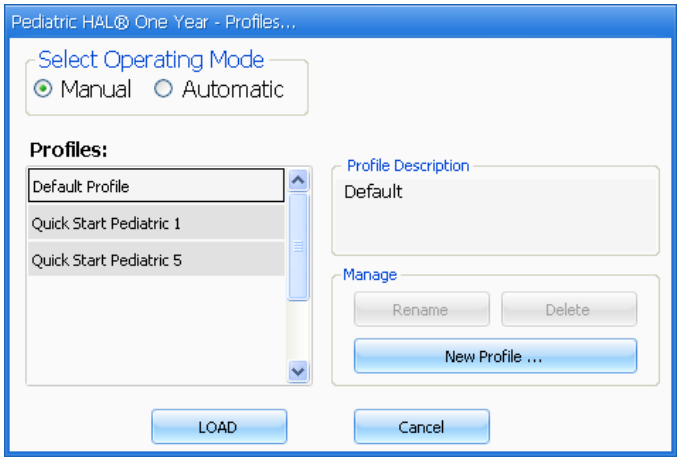
III. Working with the GaumardUI

A. Profiles

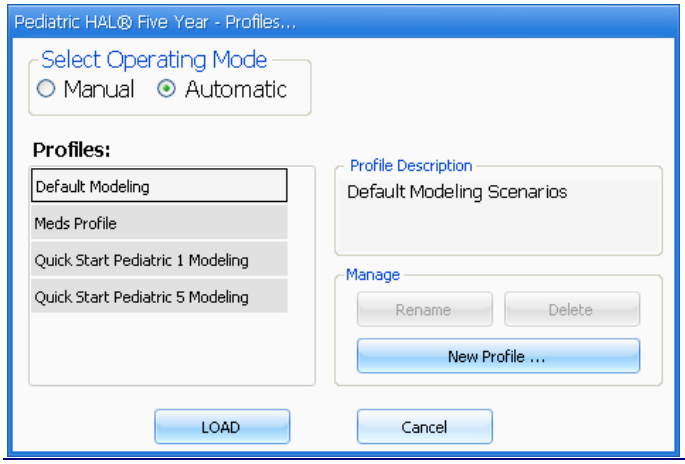
A profile is a unique configuration of customized Palettes, Scenarios, and options. Each Profile acts as a separate program, in that changes made to one profile have no effect on the others.

When starting the GaumardUI, you are prompted to select an operating mode, and then a profile.

Manual Mode: In this mode, vital signs and other responses are changed according to the specifications given by the instructor



Automatic Mode: In this mode, vital signs respond automatically to caregiver participation, instructor specifications, and pharmacologic intervention. The model used in this operating mode was developed based on physiologic principles. Features unique to this mode include: a comprehensive list of drugs for easy administration, a drug profile editor for adding new drugs or editing existing ones, among other things.



The profiles available for the **Automatic** operating mode are:

- *Default Modeling*–When creating a new profile, it is often useful to include the Default profile contents and begin customization from that foundation.

- *Meds Profile* – This profile contains over a dozen pre-programmed drugs to be used on simulations.

Profiles are used to organize and protect software settings. As you begin to customize Pediatric HAL®, it will become clear how profiles can best serve your needs. For example:

- It may be appropriate to assign one profile to each user of your HAL® system.

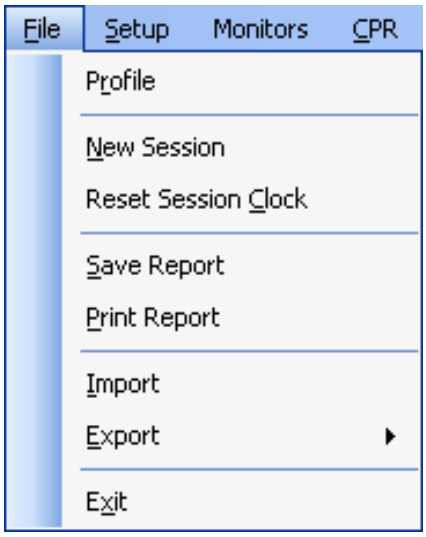
- Others may choose to create a profile dedicated to a specific academic course, which might be taught by multiple instructors.

- For the most detailed exercises, it is sometimes useful to devote an entire profile to one particular subject area, or even one particular scenario.

Profiles are used to organize and protect software settings. As you begin to customize Pediatric HAL®, it will become clear how profiles can best serve your needs. For example:

- ✓ It may be appropriate to assign one profile to each user of your HAL® system.
- ✓ Others may choose to create a profile dedicated to a specific academic course, which might be taught by multiple instructors.
- ✓ For the most detailed exercises, it is sometimes useful to devote an entire profile to one particular subject area, or even one particular scenario.

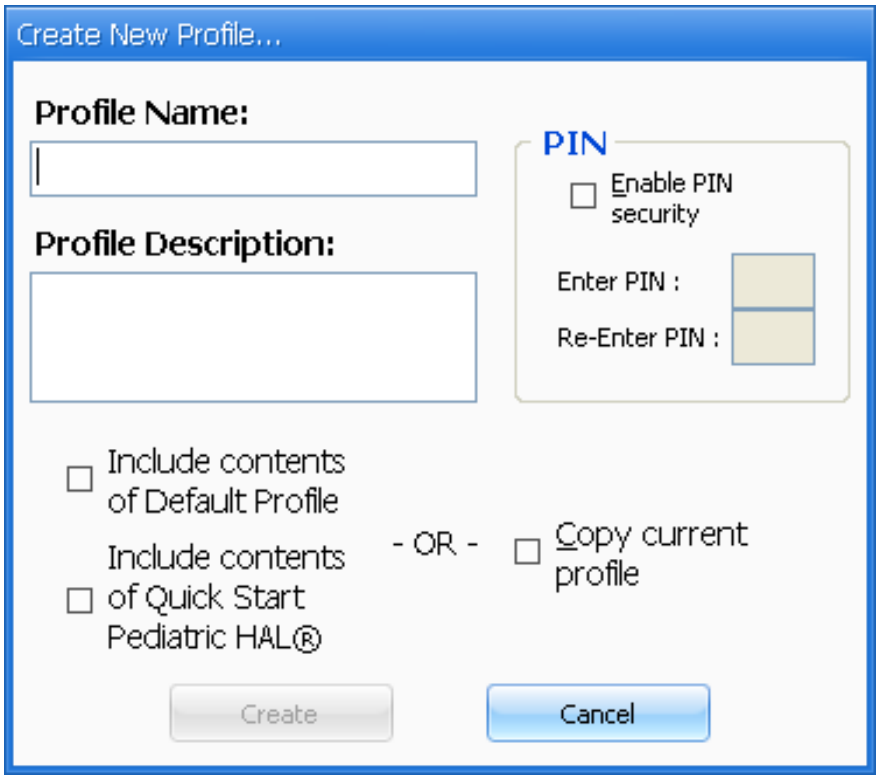
To access the Profiles dialog box at any time, select “Profiles” from the File pull-down menu.



When starting out with Pediatric HAL® , it is recommended that you use the *Quick Start Scenarios* profile, which was created in conjunction with experienced healthcare instructors and working medical professionals. Quick Start Scenarios instantly turn you into a simulation expert.

One can also choose the Default profile, which has a generally applicable palette that is useful for simulating common medical emergencies. For many applications, the Default profile is a convenient starting point that can be customized to fit your particular simulation objectives.

Notice that there are a number of options when creating a new profile. You may choose to include the contents of the "Default" or "Quick Start Scenarios" profiles or to copy the contents of an existing profile. For security, you can enable PIN protection, which will require the user to enter a four-digit key before loading that profile. For more detail on manually manipulating profiles with Windows Explorer, advanced users should refer to the File Structure appendix at the end of this guide.



For more detail on manually manipulating profiles with Windows Explorer, advanced users should refer to the File Structure appendix at the end of this guide.

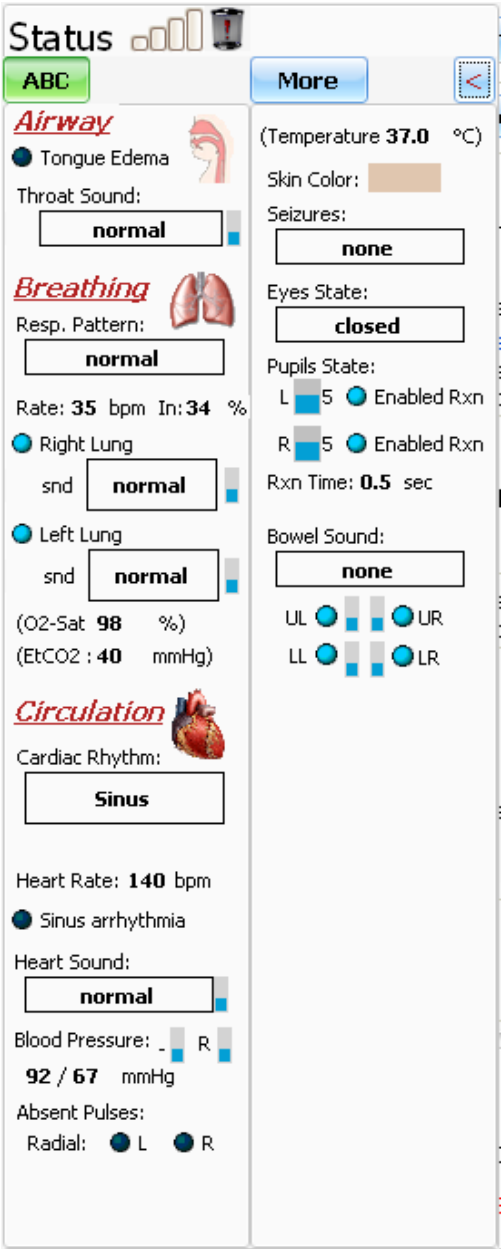
B. The Environment

1. Status

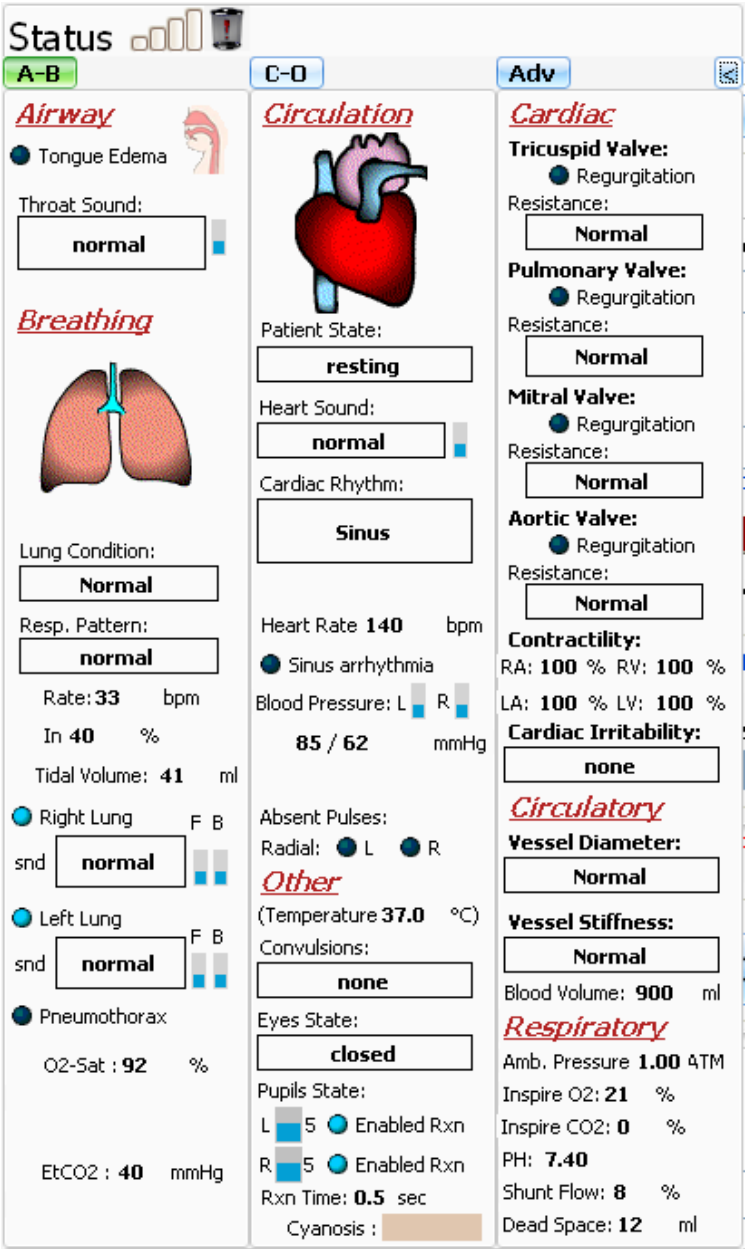
a. The Status Panel

S3004 Pediatric HAL® One Year Old

Manual Mode:

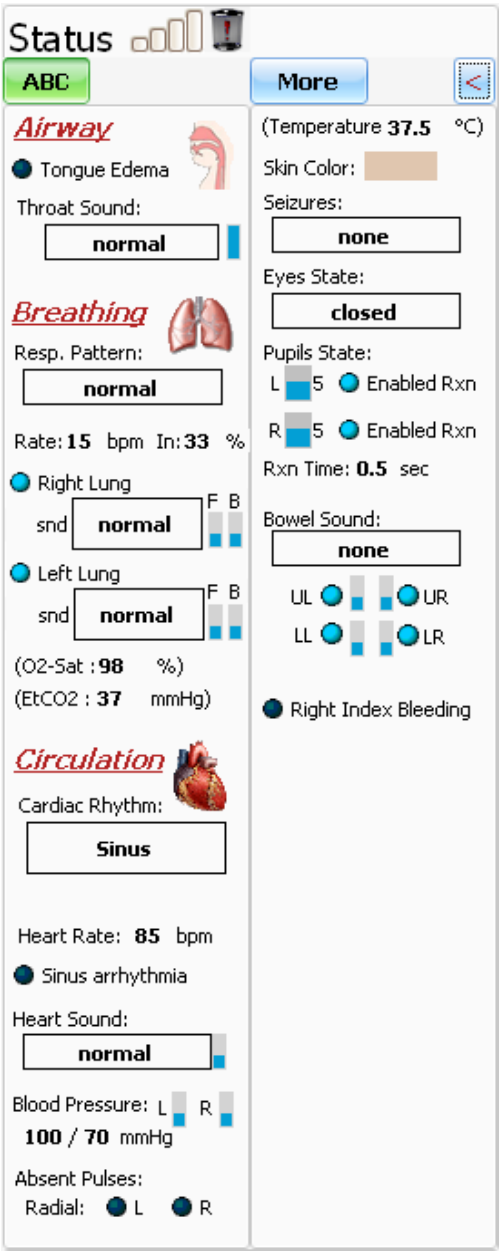


Automatic Mode:

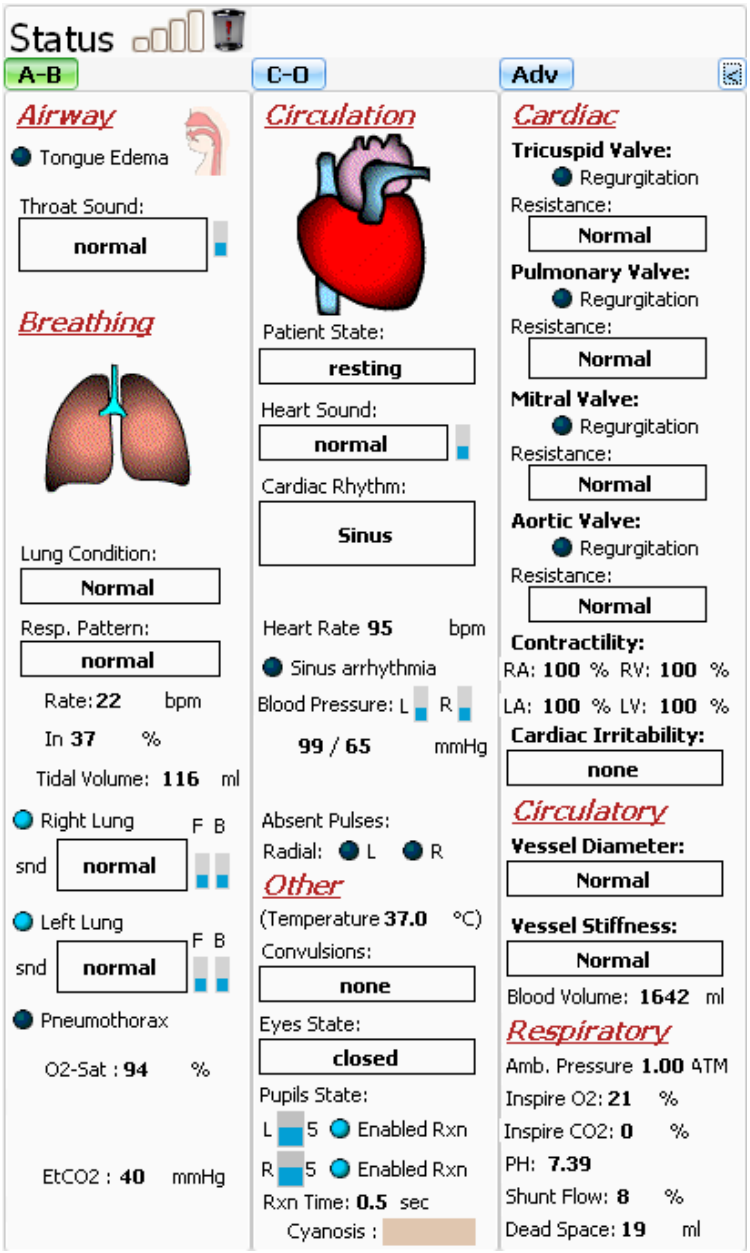


S3005 Pediatric HAL® Five Year Old:

Manual Mode:



Automatic Mode:



At all times, the *Status* panel will be visible along the left edge of the Pediatric HAL® software window. The vital signs and other details of the simulated patient are shown here. Most important are the battery and communication indicators at the top, which are described in more details in the following sections.

The label of the active page is highlighted blue and specific controls undergoing changes will be highlighted in yellow.

Clicking on the arrow button expands the status viewer so that both tabs are visible at the same time.

Airway

The Airway section displays the current through sound and airway condition.

Breathing

The Breathing section shows detailed information related to respiration. Those parameters in parentheses are only a "virtual" vital signs that cannot be evaluated on the manikin. They can only be assessed by a provider using Gaumard's Vital Signs Monitor (available separately).

Circulation

The Circulation section displays Pediatric HAL® cardiac parameters.

b. Communication Indicator

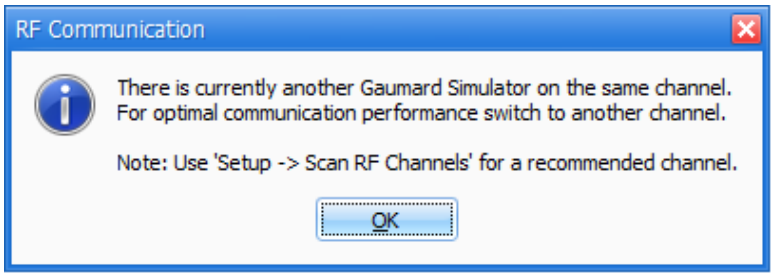
Communication

The communication indicator shows the status of the radio link between the computer and the manikin.

The bars are unfilled with blue when there is no attempt to communicate, for example when the module is not connected to the computer or the system is in STAND-BY mode.

The number of blue bars filled indicates the strength of the signal.

The warning icon indicates a signal conflict with another manikin. Clicking the icon produces the following message:

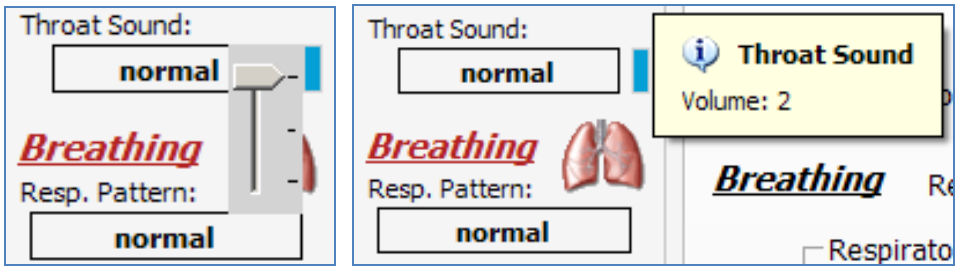


c. Battery Indicator

The battery status indicator progresses as the battery in the manikin is used.

The exclamation mark indicator is shown when there is no communication with the manikin and the program cannot get the battery information.

d. Sound Volumes



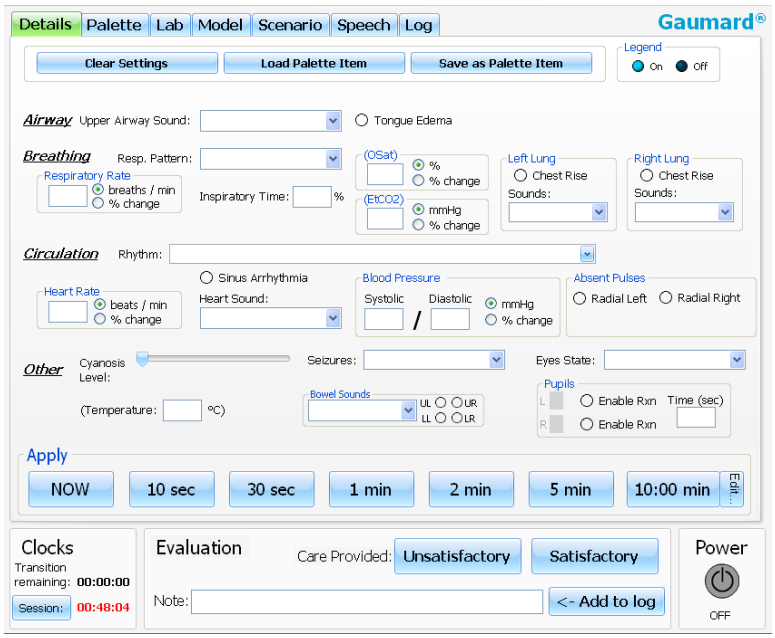
The volume of each of Pediatric HAL® sounds can be adjusted from the Status Panel. Click on the volume level indicator next to each sound and a volume control will pop up. Select the volume level desired and the sound will be adjusted instantly on the manikin (i.e. there is no need to click “Apply”).

2. Details

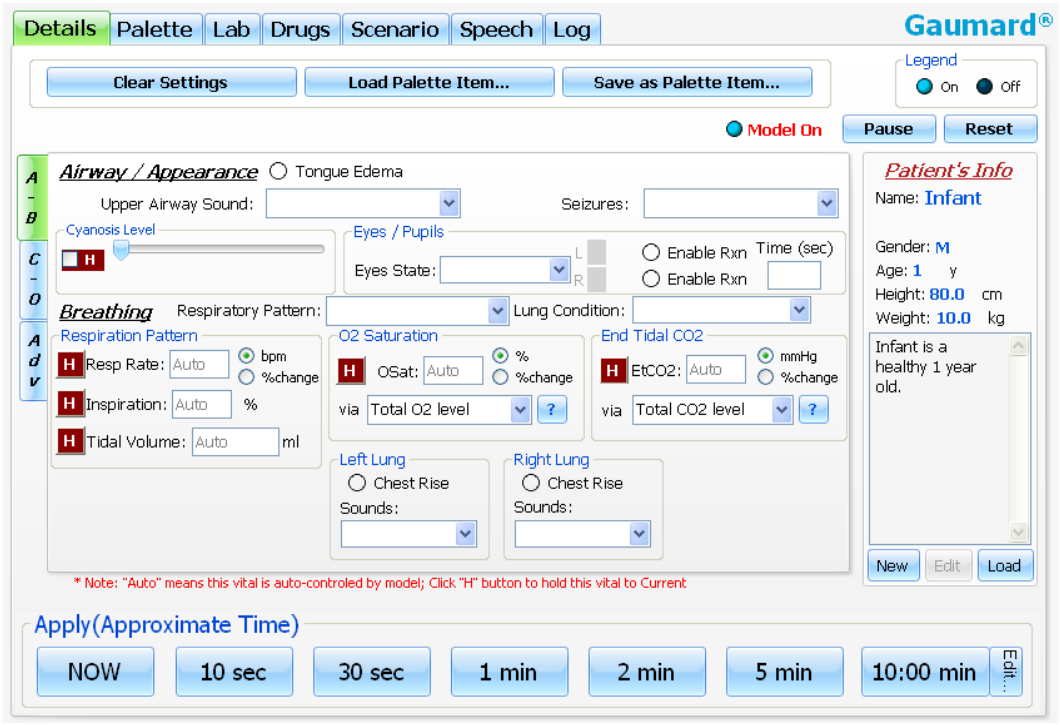
It is best to think of controlling the Pediatric HAL® simulator in terms of three levels of complexity: first Details, then Palette, and finally Scenarios. The Details page is the first of the tab-pages found in the main area of the software window. This is the simplest form of control available to the facilitator. Note that for each item in the Status panel, there is a corresponding field or control on the Details page.

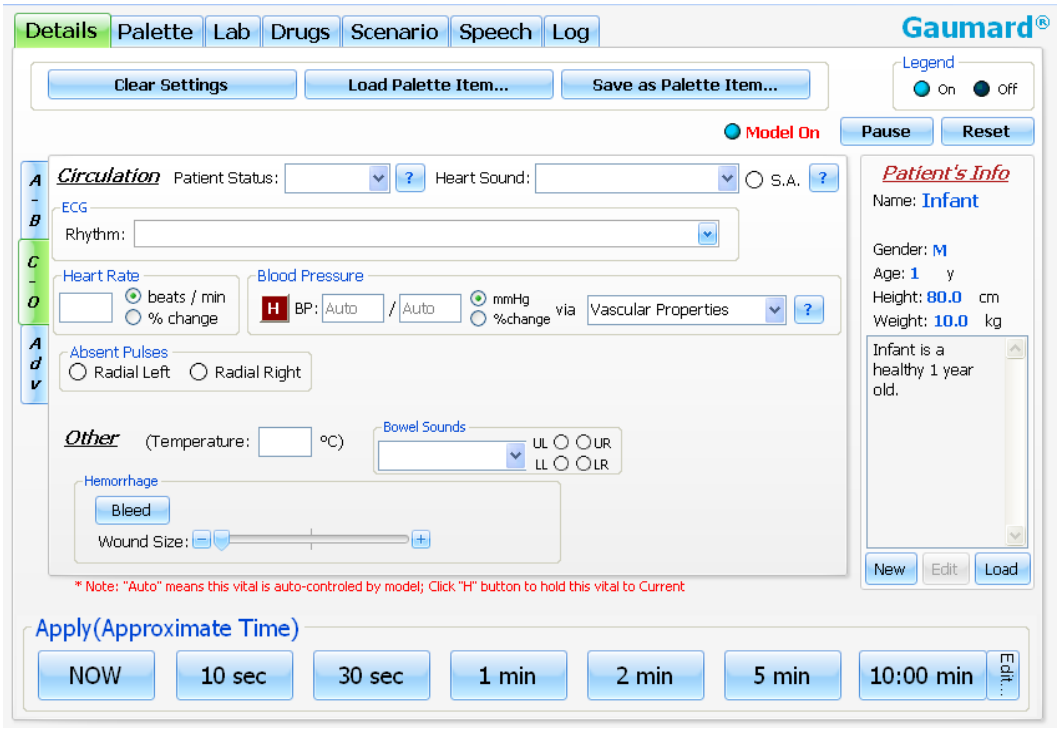
S3004 Pediatric HAL® One Year Old

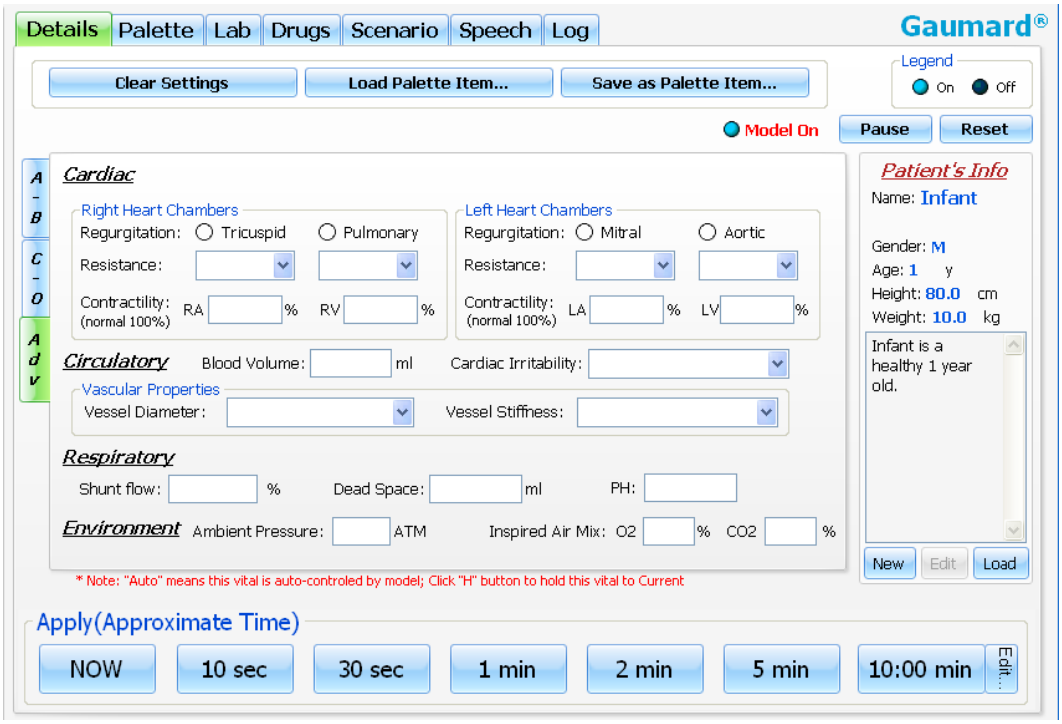
Manual Mode:



Automatic Mode:

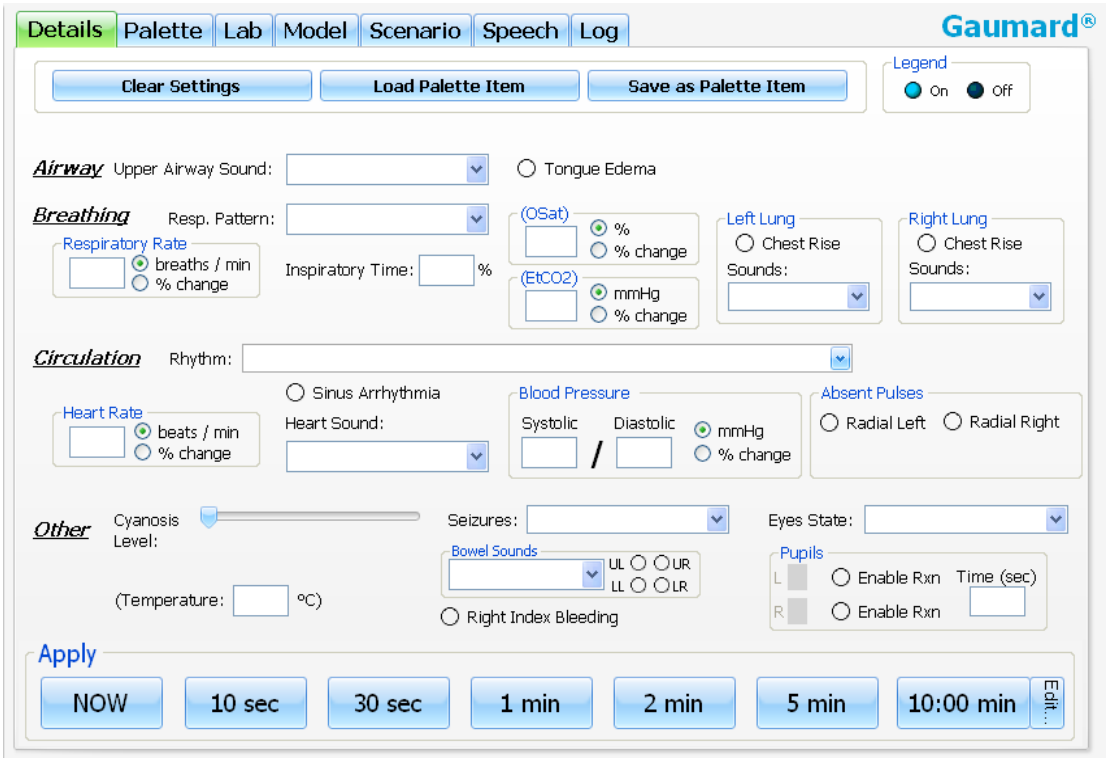




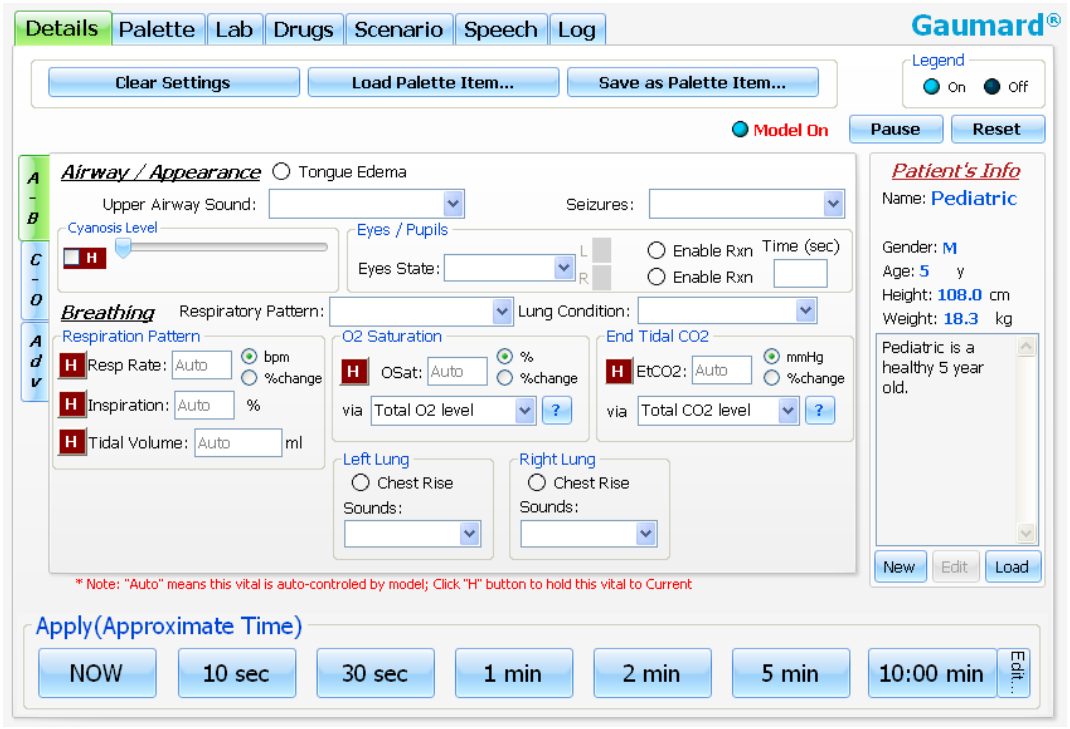


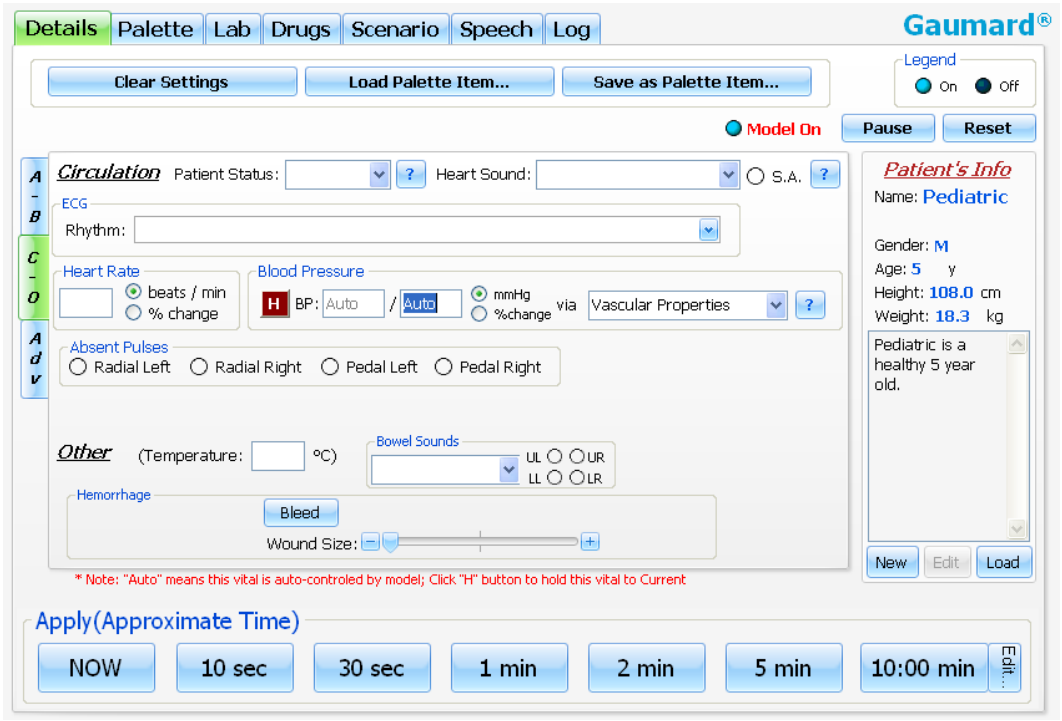
S3005 Pediatric HAL® Five Year Old

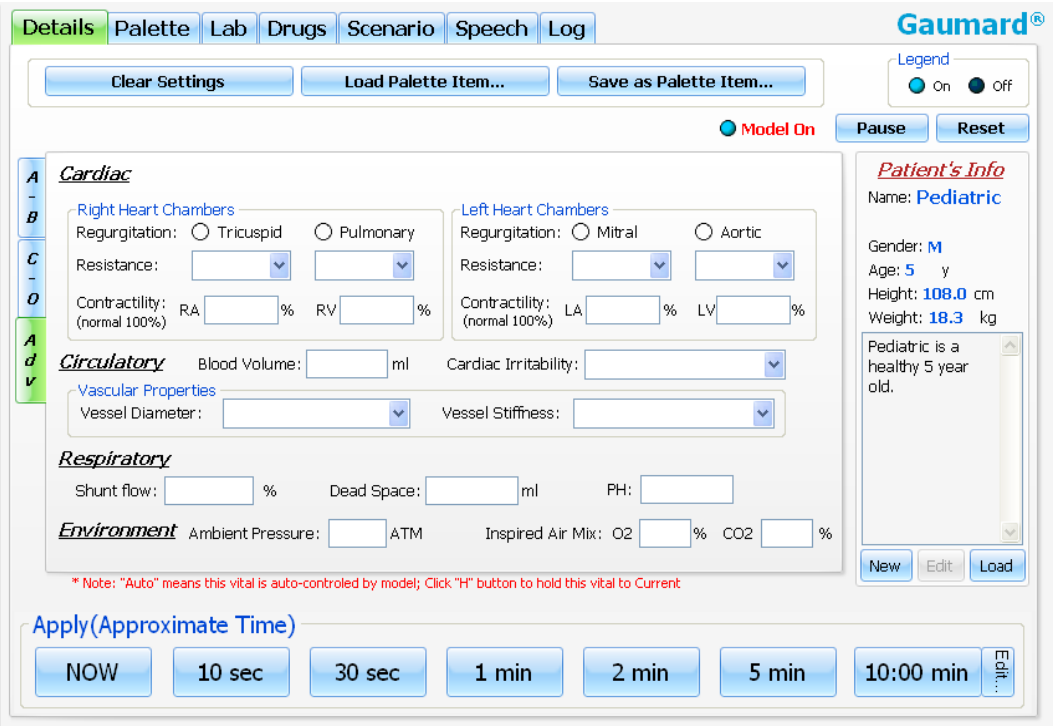
Manual Mode:



Automatic Mode:







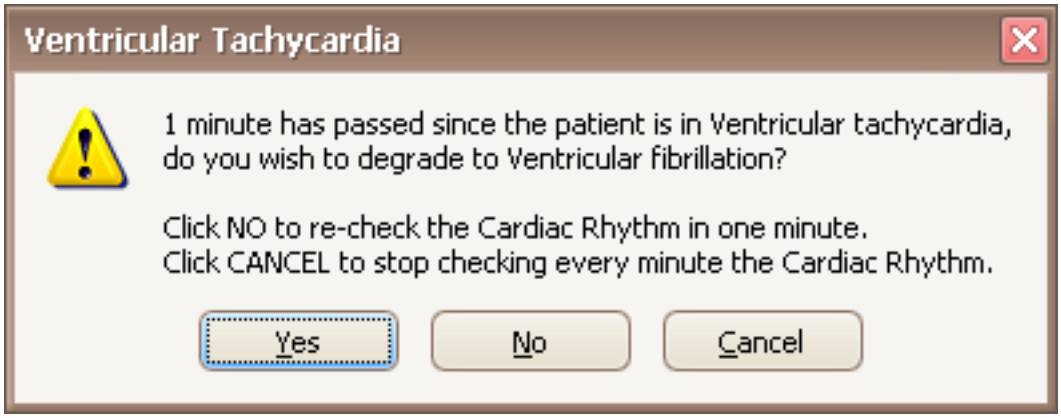
Choose the settings you wish to change from the available fields and click one of the "Apply" buttons below. New settings will be applied over the time period indicated by the button's label. Click the "NOW" button to change Pediatric HAL® condition instantly, or click one of the other "Apply" buttons to create a trend.

Some settings always get applied immediately, such as cardiac rhythm and breathing pattern, while numerical settings such as heart rate and respiratory rate, can be easily made to transition gradually (linearly) from their current values to any target you specify. The right-most button can be customized to any transition time you require by clicking the part of the button labeled "Edit".

As transitions are applied, the time remaining in the transition is displayed in the Clocks panel at the bottom of the program window. It is very important to note that those settings that you do not specify will **remain unchanged**. If there is already an ongoing transition at the moment you click an Apply button, it will stop, and a new transition will begin from the current physiological state.

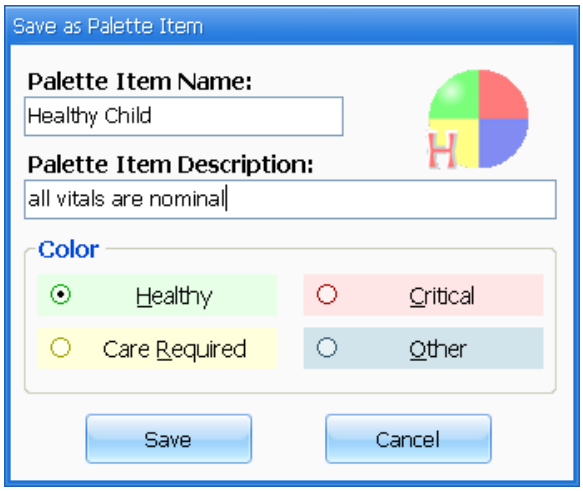
Ventricular Tachycardia Warning:

If the cardiac rhythm is maintained at Ventricular Tachycardia for one minute, the following prompt window will be displayed:



Clicking "Yes" degrades the cardiac rhythm to ventricular fibrillation. Clicking "No" does not degrade the cardiac rhythm but re-checks the rhythm after a minute. Clicking "Cancel" stops the software from checking the cardiac rhythm every minute.

The Details page is also used to create Palette Items. A Palette Item is any full or partial set of physiological parameters that have been grouped and saved together under a single name. To create a Palette Item, choose the desired parameters on the Details page and click the *Save as Palette Item...* button near the top of the page. You will be prompted to name and describe the item and to assign it one of four color-codings for easier identification.



The collection of all Palette Items *in this profile* are displayed on the Palette page, the next section of this guide.

The Details page tabs are explained below:

a. Airway/Breathing

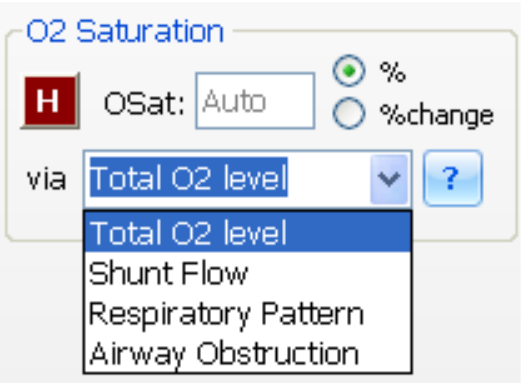
The first Details side-tab (see: One Year Old – Five Year Old) contains controls related to **a**irway, **a**ppearance and **b**reathing.

Note that:

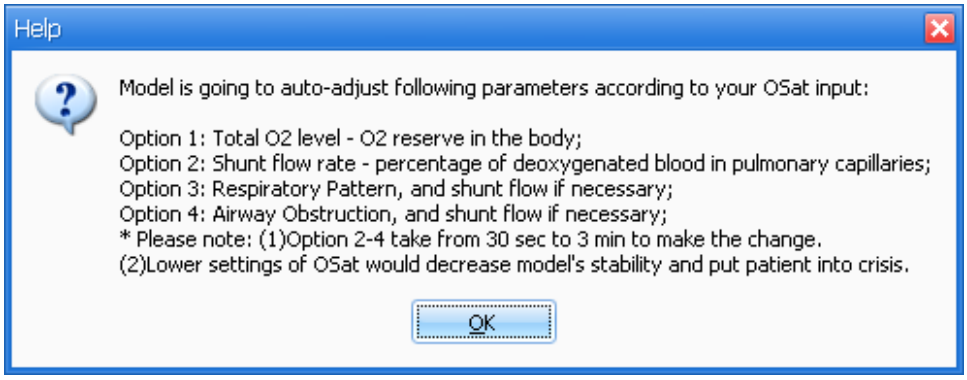
- Some changes are gradual and even if one applies a new value now, there is a small delay. The delay results from using a closed loop model that adjusts to the target values over time, rather than displaying a unique value that is unrelated to other parameters.

- Mild cyanosis is activated when the oxygen saturation is less than 92% and/or the temperature is less than 35° C. **Values under these thresholds will cause the cyanosis to get progressively worse.**

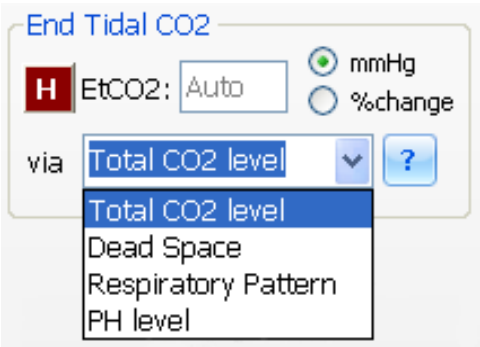
- Oxygen saturation can be changed by adjusting one of the following four parameters:
  - Total O_2 level: oxygen reserve in the body.
  - Shunt flow: the percentage of deoxygenated blood in pulmonary capillaries.
  - Respiratory pattern
  - Airway construction



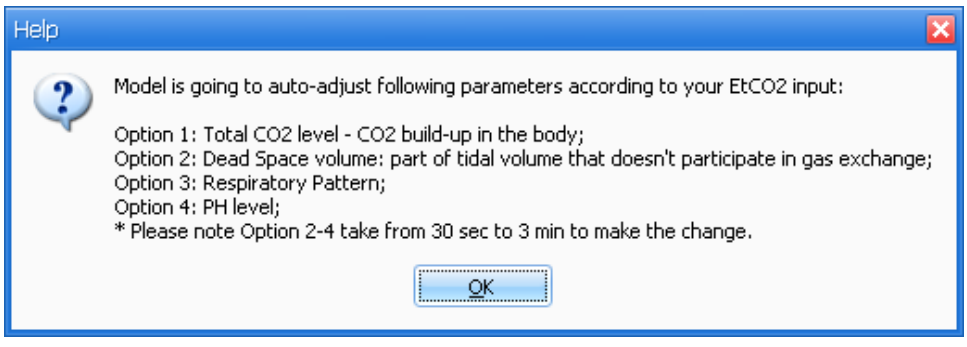
Click on the question mark button to view a brief description of the four options. Doing so brings up the following dialog box:



- Similarly, EtCO2 can be changed by adjusting one of four parameters:
  - Total CO_2 level: CO_2 build-up in the body;
  - Dead Space: part of tidal volume that doesn't participate in gas exchange
  - Respiratory Pattern
  - Ph level

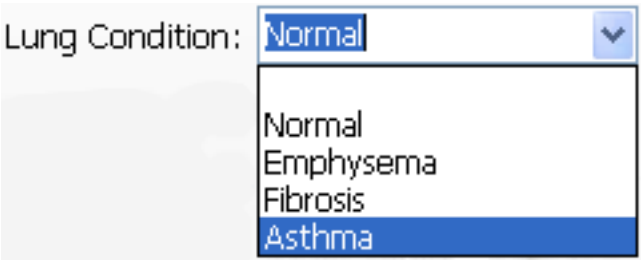


Click on the question mark button to display a brief summary of these options. Doing so displays the following dialog box:



There are two controls on this page that are **unique** to the automatic mode:

1. **Lung Condition**. This control allows you to change shunt flow, dead space, airway resistance and respiratory pattern indirectly. You can choose one of four options as shown in the figure below.



2. **Tidal Volume**. Tidal volume is the amount of air breathed in or out during normal respiration. Tidal volume for a normal adult is 500 mL; for a pediatric patient it would be between 10-20 mL (between 6-8 mL/Kg).

If the respiratory rate goes to zero, the model does not restore it automatically. Always remember to specify a new respiratory rate.

b. Circulation and Other

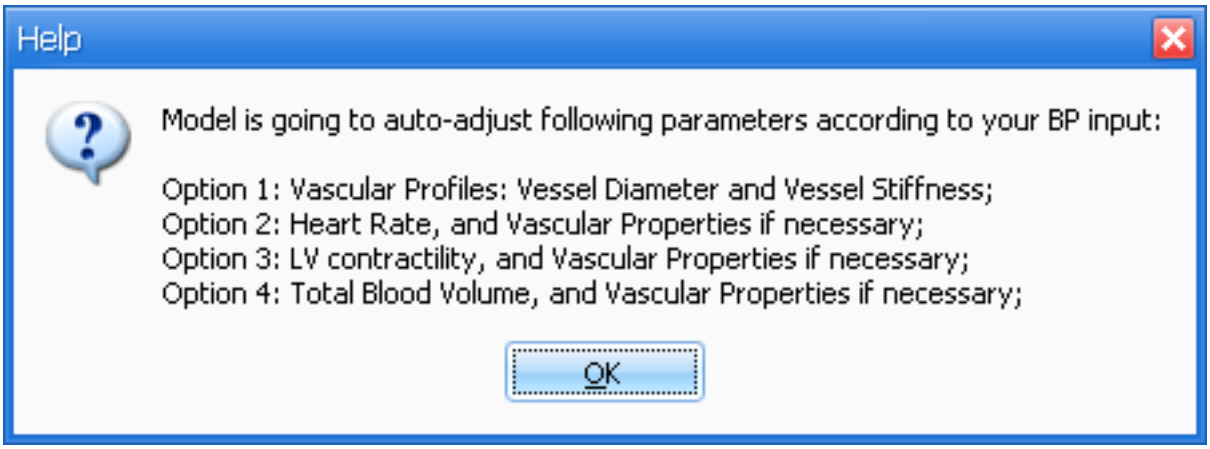
The Details side-tab "C/O" (see: One Year Old – Five Year Old) includes **c**irculation and **o**ther controls.

Note that:

- Each cardiac rhythm has a specific effect on the blood pressure wave forms. The pressure wave forms include ABP, CVP, PAWP and Pulse.

- Similar to OSat and $EtCO_2$, blood pressure can be changed indirectly when using the modeling mode. You can do so by selecting one of four options:
  - Arterial properties: vascular diameter and stiffness.
  - Heart Rate
  - LV Contractility
  - Total Blood Volume

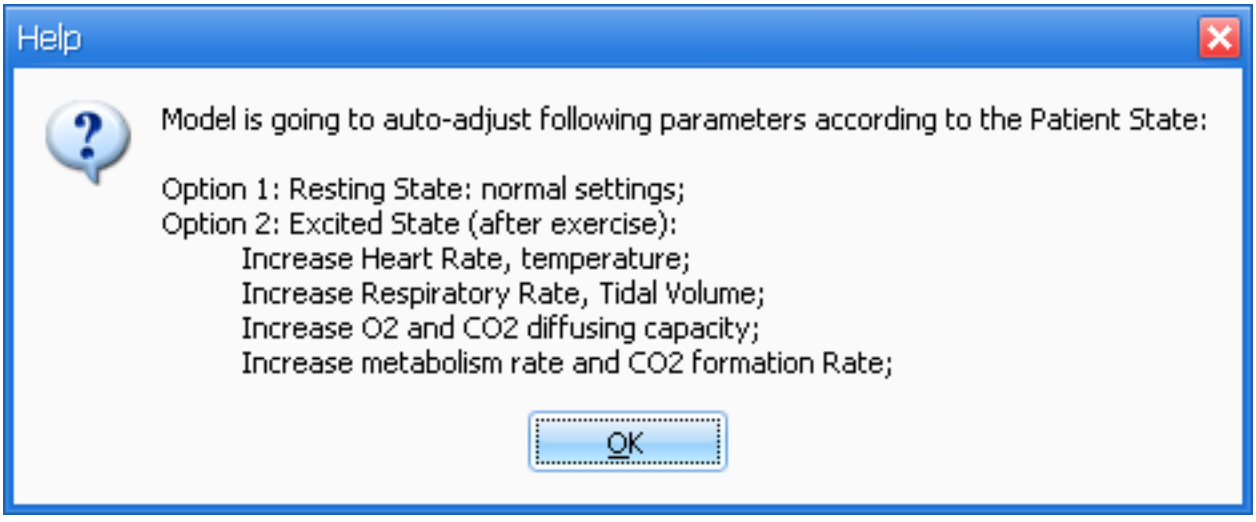
Click on the question mark to view a summary of these options:



There is a control on this page that is **unique** to the modeling mode:

Patient status. Selecting one of the two available options affects heart rate, temperature, respiratory rate, tidal volume, metabolism rate and carbon dioxide formation rate indirectly.

Click on the question mark button to view a summary of the parameters that will be affected by selecting one of those two options.



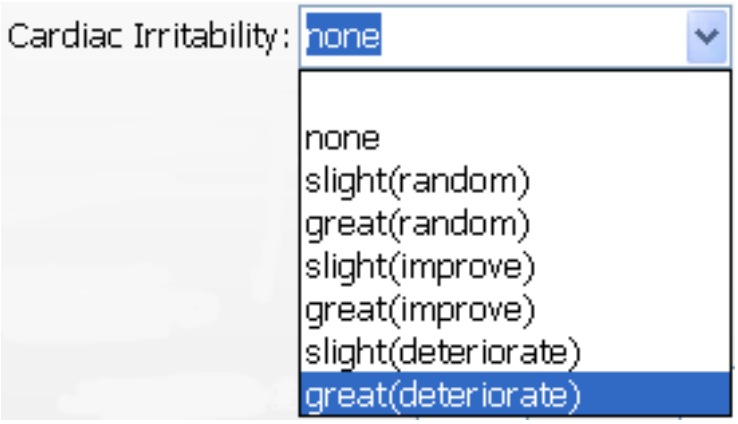
c. Advanced

The last Details sidetab is the **adv**anced tab (see: One Year Old – Five Year Old). It includes cardiac, circulatory and respiratory advanced controls.

This page gives you more control over the model by allowing you to edit additional parameters that have an effect on the cardiovascular and respiratory systems. Use this page if you want to add complexity to a scenario or if you need to superimpose special conditions.

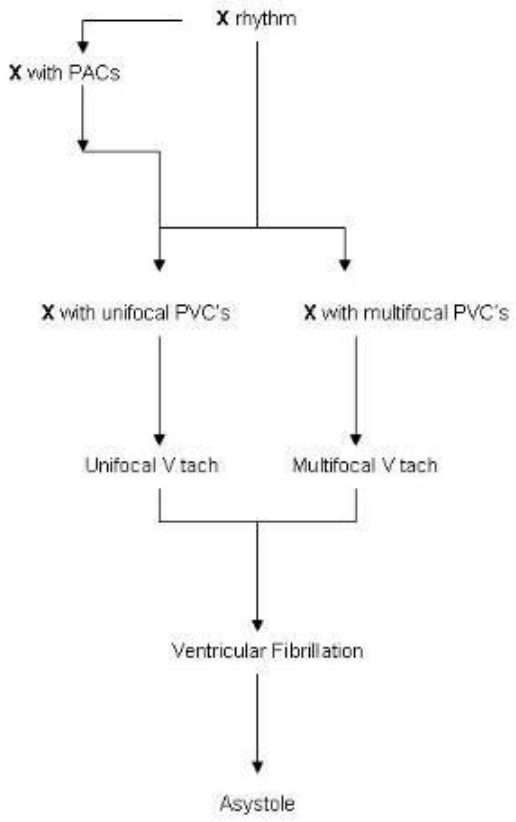
Note that:

- All the controls in this page are **unique** to the modeling mode.
- Cardiac irritability can be used to modify cardiac rhythms indirectly. You can improve (move towards normal sinus rhythm), or deteriorate (move towards ventricular fibrillation and asystole) any of the rhythms.



The progression of rhythms generally follows the pattern displayed in the figure to the right, where "X" represents:

- normal sinus rhythm
- multifocal atrial tachycardia
- atrial flutter
- atrial fibrillation
- junctional rhythm
- left or right bundle branch block
- or atrio-ventricular block



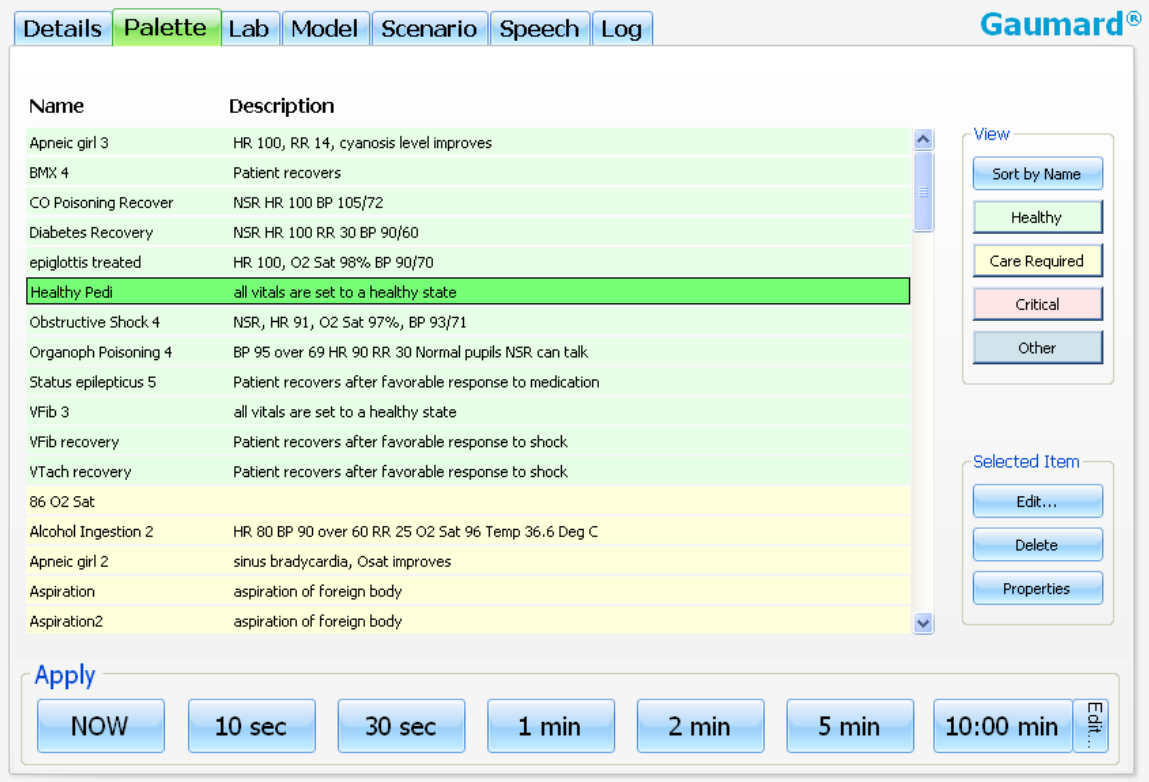
The "Hold" (H) and "Auto" buttons on the Details page are **unique** to the automatic mode. These controls add a new level of regulation that allows higher physiologic accuracy. Amongst the vitals that can be placed on hold or auto are: respiratory rate, inspiration time, tidal volume, oxygen saturation, and end tidal CO_2—from the A/B tab, and blood pressure—from the C/O tab. These two controls are defined below:

- **Hold**  : allows you to keep a value constant. Recall, that in the manual mode, if you want to keep a value constant, you simply have to leave that control blank. In this mode, leaving a control blank allows the automatic model to auto-adjust it. Therefore, by clicking this button you can lock the vital at the specific value.

- **Auto**: allows the model to auto-adjust a value. Note that blank controls default to auto.

3. Palette

The second level of control is the Palette tab-page. Each item on the Palette represents a complete or partial physiological state. The **Palette** page displays all of the Palette Items in the active profile. Each profile has its own separately customizable Palette. Create Palette Items with the Details page, as described previously.



Apply Palette Items using the buttons at the bottom of the page, exactly as changes to Pediatric HAL® condition are applied on the Details page. Change Pediatric HAL® vital signs and symptoms instantly by clicking to select a Palette Item and clicking the “NOW” button. Or, create a gradual transition in physiological state with one of the other “Apply” buttons.

Palette Items can be sorted with the “View” buttons found on the right side of the page.

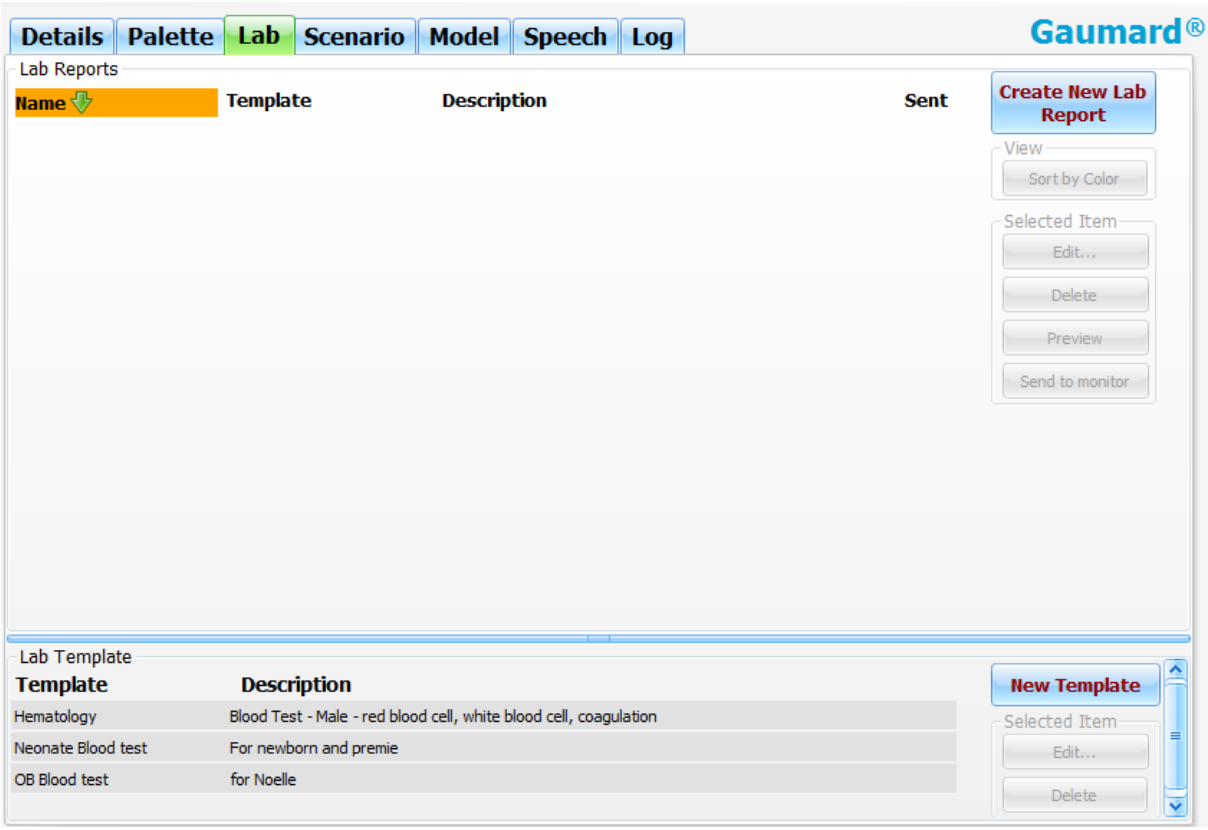
Editing existing Palette Items is as simple as selecting the item you wish to modify and clicking the Edit button. You will be automatically be taken to the Details page, and the settings that comprise the selected Palette Item will be displayed. Change them as desired, and click the “Save as Palette Item” button.

Many of the functions related to Palette Items are also available by clicking the second mouse button (usually the right button) while the pointer is positioned over an Item. Note, when using the tablet computer, this is best done by holding the stylus button while tapping the screen.

For more information on customizing the Palette, see the Tips on Palette Item and Scenario Creation section of the Appendix at the end of this guide.

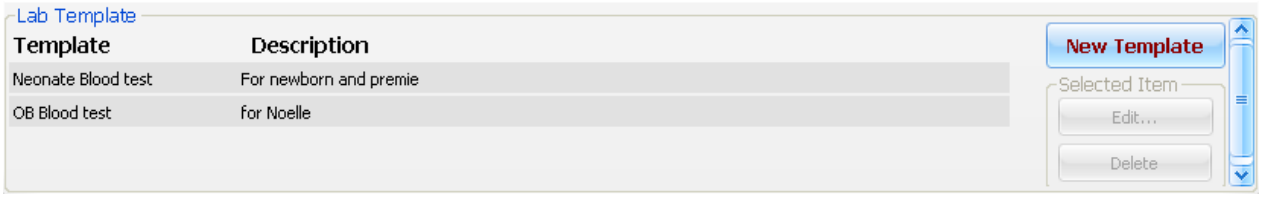
4. Lab

Laboratory tests are helpful tools for evaluating the health of a patient. To simulate this process, the Lab Tab allows the facilitator to create laboratory tests and results. Any number of custom templates can be created for use in scenarios. In addition, the facilitator is in control of the results of each test. This gives the facilitator the ability to create reports where results are above or below normal ranges. Once a laboratory test is prepared, the facilitator can display the results on the Virtual Monitors window for the provider to utilize.

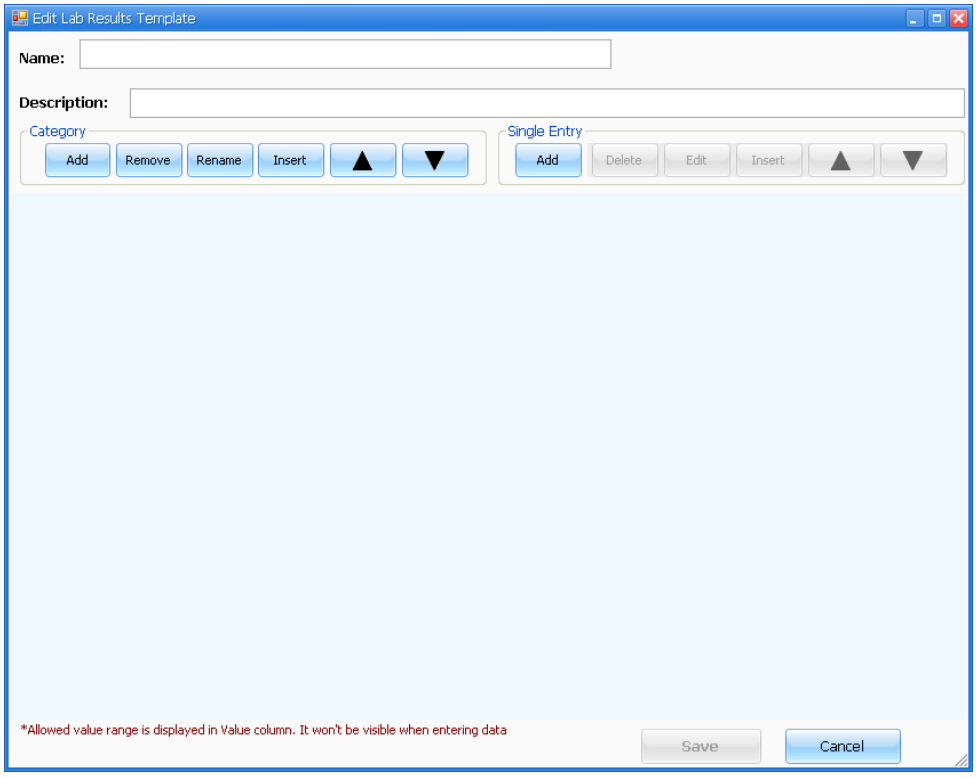


a. Creating a Lab Template

To begin, navigate to the bottom of the tab and click on the **New Template** button on the right.

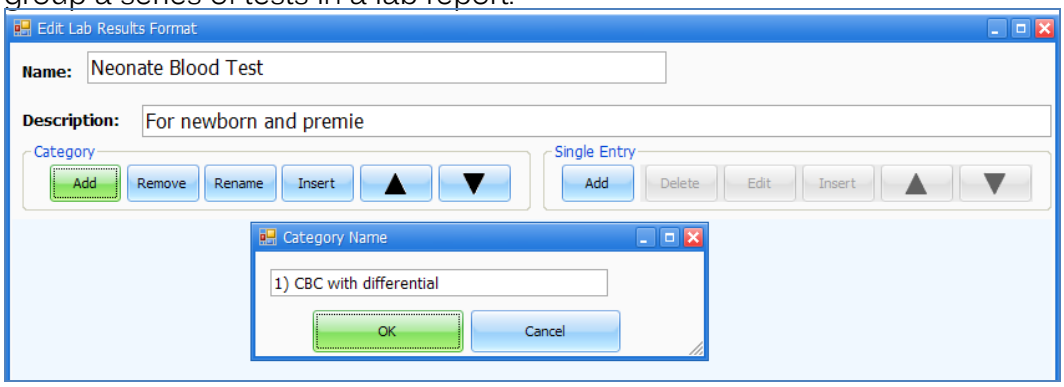


The **Edit Lab Results Template** window opens to create and edit templates that will be later used to create lab reports.

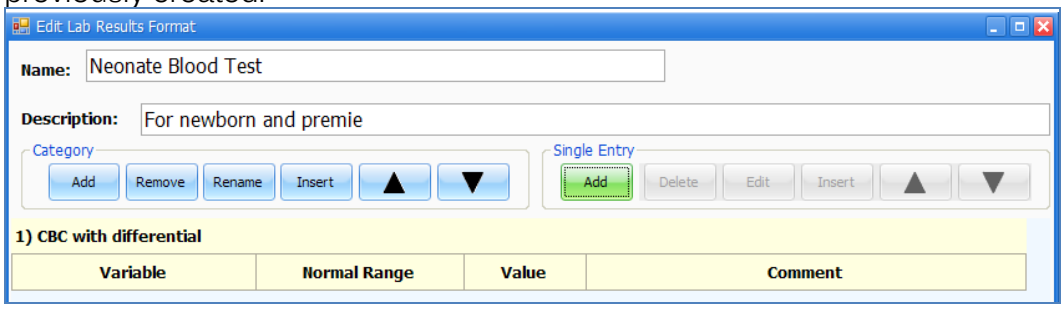


Enter a **name** for the lab template followed by a **description**.

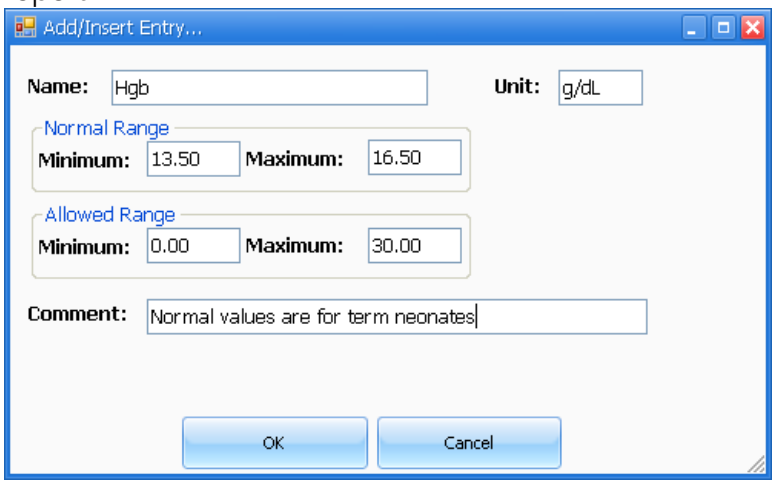
From the category box, click **Add** to name and create a new category. Categories will be used to group a series of tests in a lab report.



Click **OK** to save the new category. Use the Single Entry menu to add a test under the category previously created.

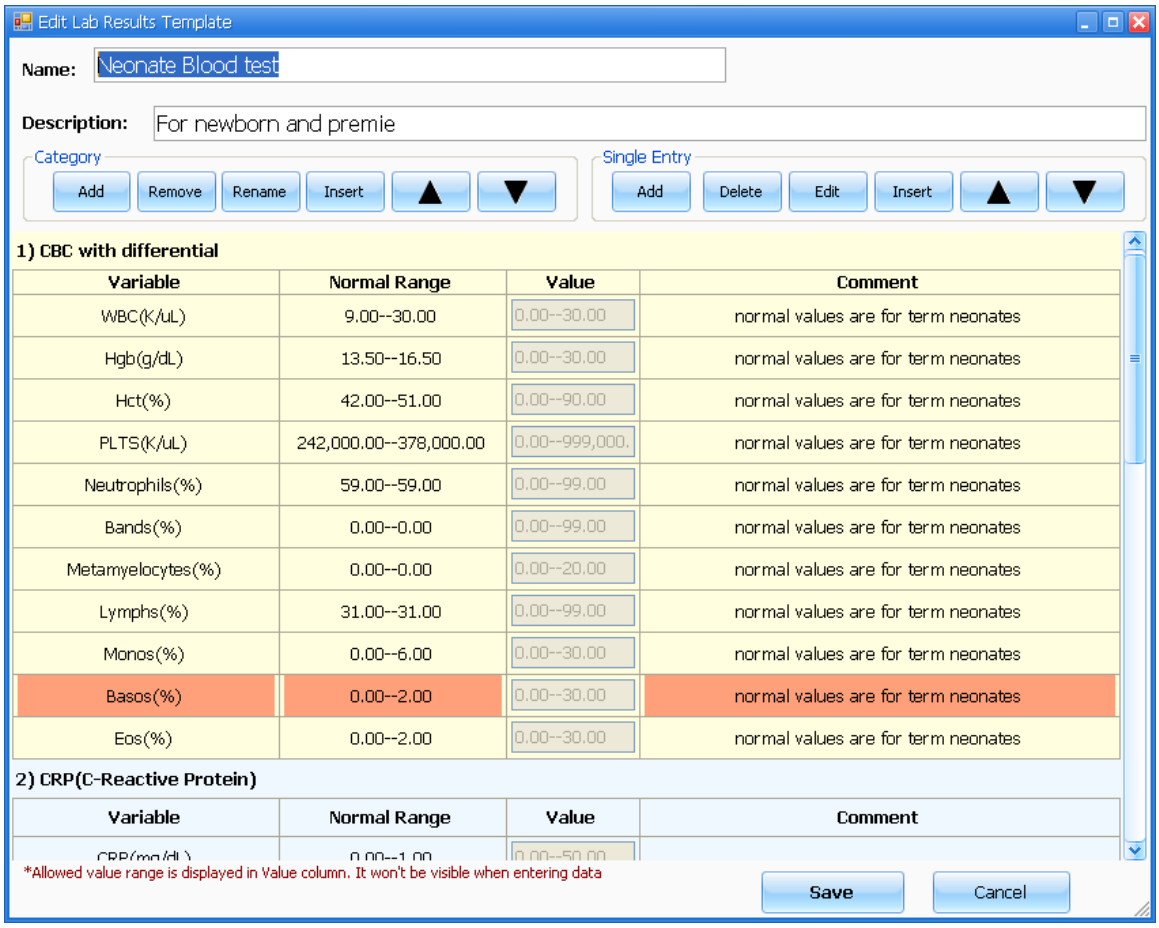


The **Add/Insert Entry** menu is used to customize the different parameters on a specific test. Begin by providing the name of the test and the unit used. The **normal range** will be displayed on the lab report for the provider to use as guide while reading the results. Meanwhile, the **allowed range** restricts the minimum and maximum value a facilitator can input as a test result. Use the **comment** field for any notes regarding this test. The comments will appear on the final report.



Once the test entry is configured, click **OK** to add the new test.

Repeat the process to add more tests and categories using the Category and Single Entry menu. Please note that individual items can be moved, deleted or modified after they are created.



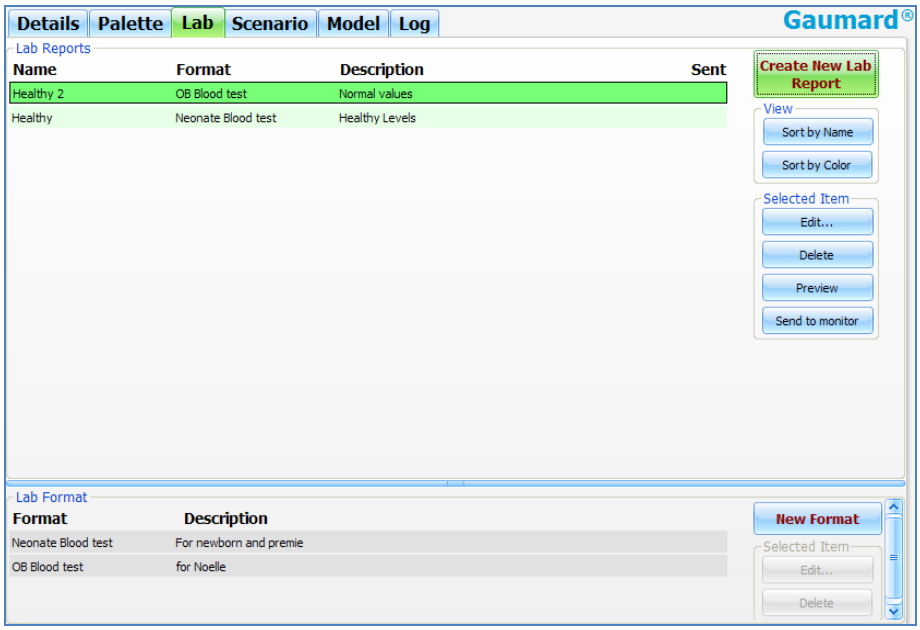
Navigate to the bottom of the page to save the new category.

Once a new template is created, it will be listed on the Lab Template section at the bottom of the Lab tab.

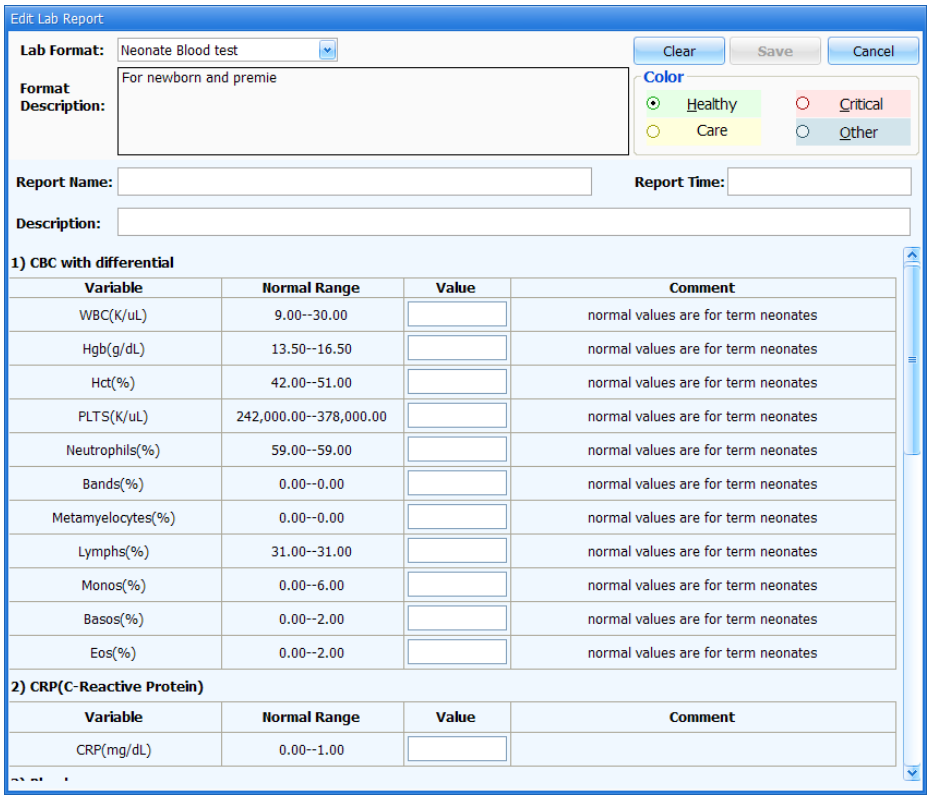
Use the buttons on the left panel to edit or delete lab formats.

b. Creating a Lab Report

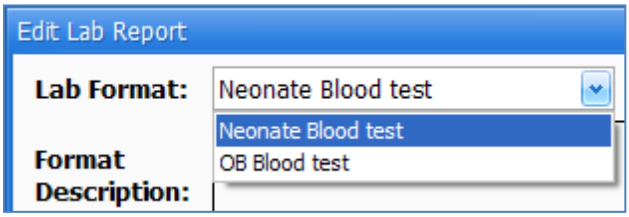
To begin, click on **Create a New Lab Report** from the right panel.



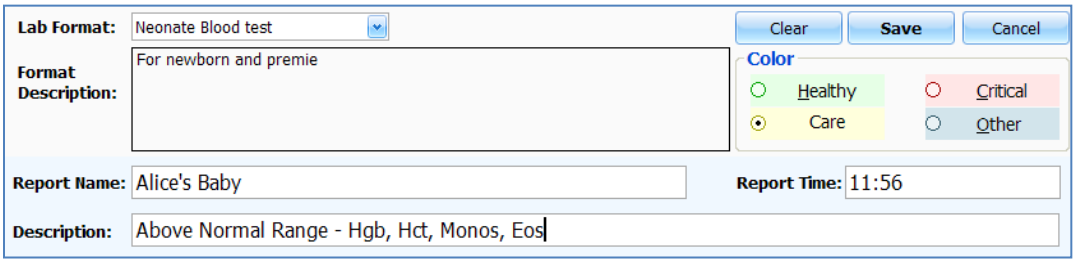
Use the **Edit Lab Report** window to select a laboratory test template and create a lab report.



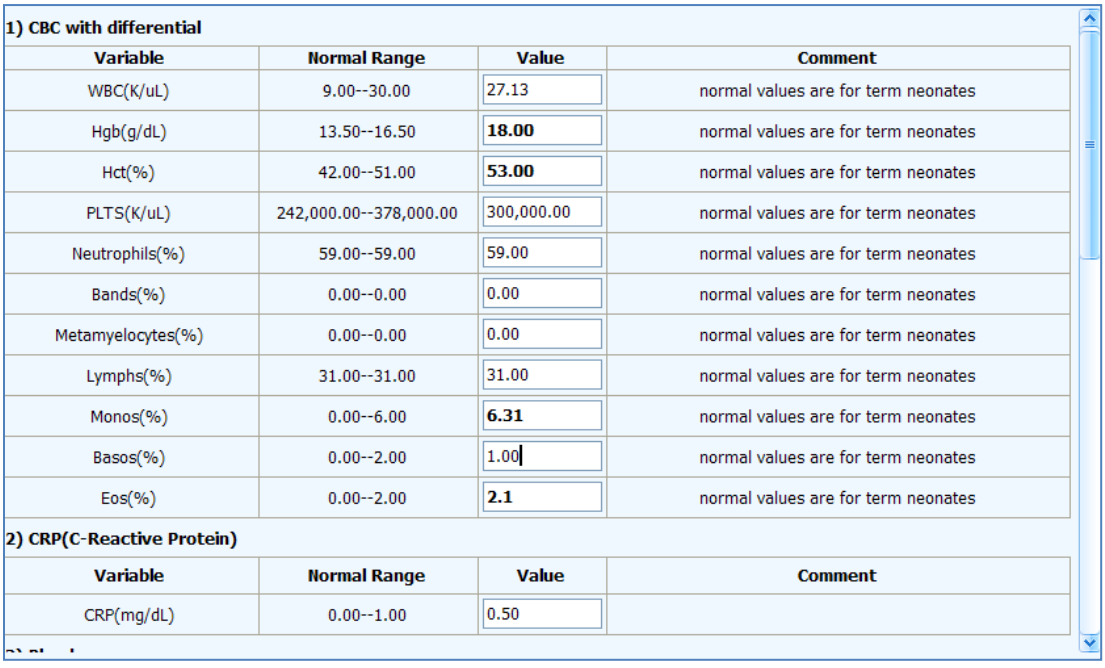
First, select a **Lab Template** from the drop down menu.



Provide a **Report Name**, **Report Time** and **Description**. In addition, select a condition color tag for the lab report on the right panel. Color tags aid the sorting of lab reports on the report list window.



Input the results of the tests on the **Value** column. Values above the normal range specified will be displayed in bold. Include any comments associated with the test performed.



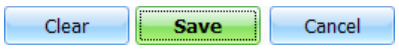
1) CBC with differential

Variable	Normal Range	Value	Comment
WBC(K/uL)	9.00--30.00	27.13	normal values are for term neonates
Hgb(g/dL)	13.50--16.50	**18.00**	normal values are for term neonates
Hct(%)	42.00--51.00	**53.00**	normal values are for term neonates
PLTS(K/uL)	242,000.00--378,000.00	300,000.00	normal values are for term neonates
Neutrophils(%)	59.00--59.00	59.00	normal values are for term neonates
Bands(%)	0.00--0.00	0.00	normal values are for term neonates
Metamyelocytes(%)	0.00--0.00	0.00	normal values are for term neonates
Lymphs(%)	31.00--31.00	31.00	normal values are for term neonates
Monos(%)	0.00--6.00	**6.31**	normal values are for term neonates
Basos(%)	0.00--2.00	1.00	normal values are for term neonates
Eos(%)	0.00--2.00	**2.1**	normal values are for term neonates

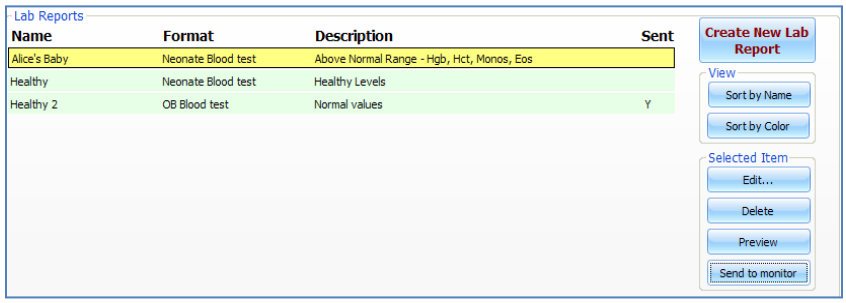
2) CRP(C-Reactive Protein)

Variable	Normal Range	Value	Comment
CRP(mg/dL)	0.00--1.00	0.50	

Finally, click **Save** from the top right menu to create the lab report.

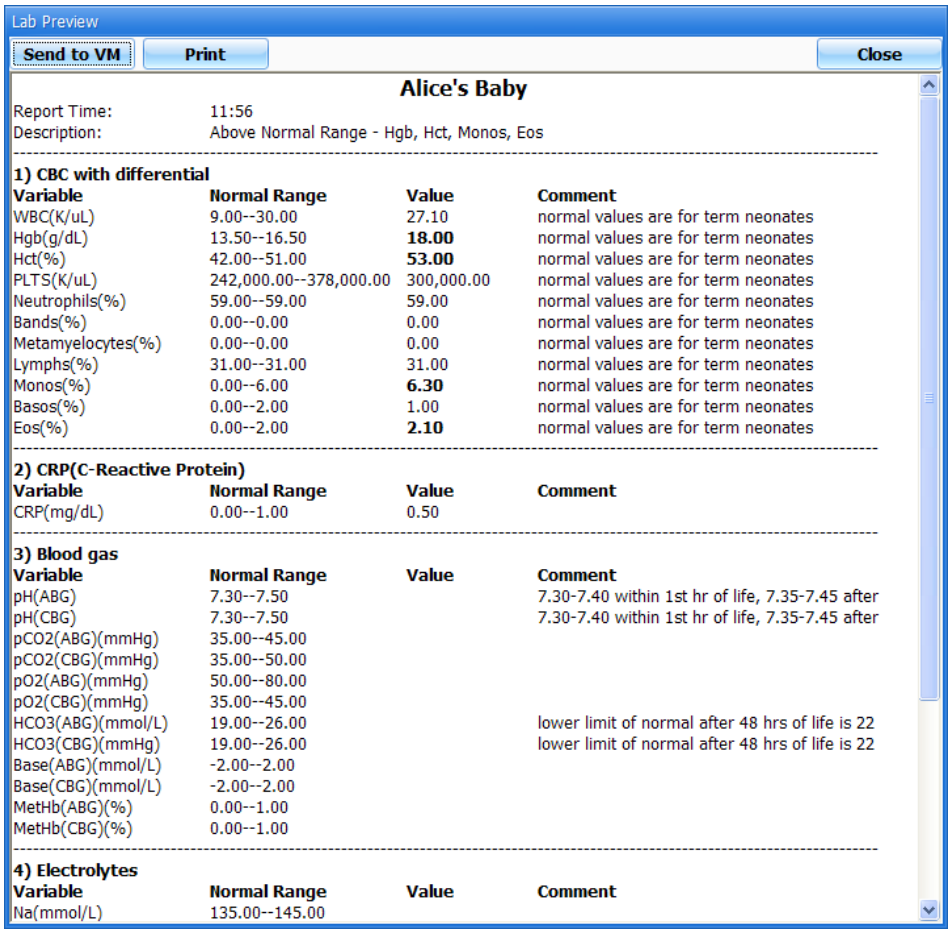


The newly created lab report will be listed on the Lab Reports list.



Lab reports can be sorted by name, template, description, sent or color.

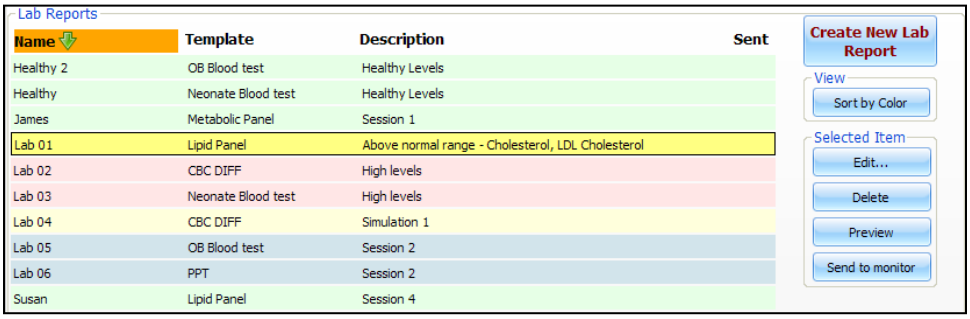
On the right panel, the **Preview** button will display the final lab report on the facilitator's screen. Click on the **Preview** button to view the lab report.



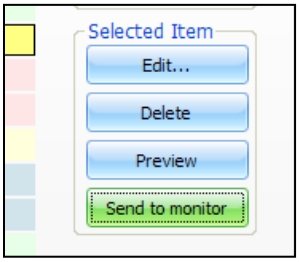
The preview window also allows the printing of results for distribution and archiving. To make changes, click **Close** and then **edit**.

c. Send to Monitor

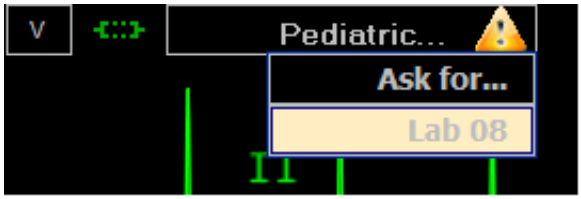
Begin by selecting the report from the lab reports list.



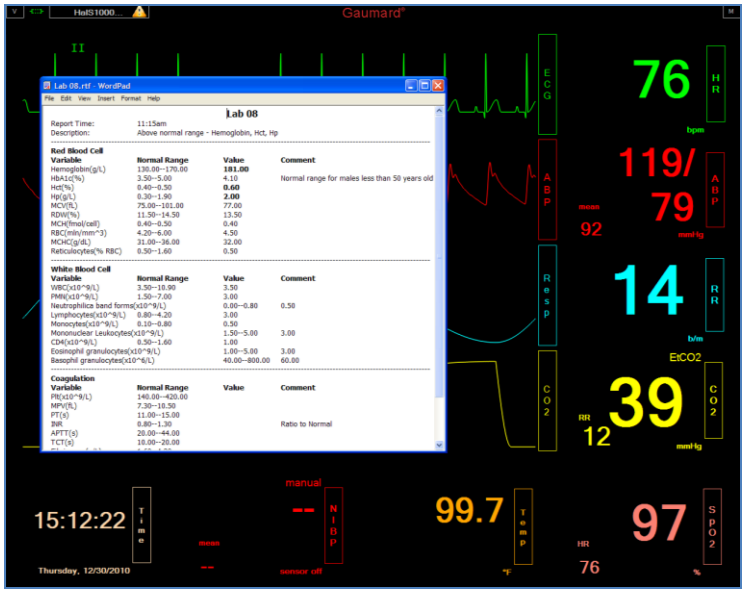
Click the **Send to Monitor** button to transfer the lab report to the Virtual Monitors.



On the Virtual Monitor's window, an exclamation icon notifies the provider a file is ready for access. Click the HAL® drop down menu to select the available lab report.



The lab report will open using the system's default application.



Once the report is sent, the letter Y will be present on the Sent column.

Name	Template	Description	Sent
Lab 01	Hematology	High Glucose	Y
Lab 02	Cardiac	High range	
Lab 03	Hematology	Normal range	Y
Lab 04	Cardiac	Normal range	
Lab 05	Hematology	Low white blood cell count	
Lab 06	Blood Gases	Below normal range - pH	
Lab 07	Blood Gases	Below normal range - PCO2	
Lab 08	Hematology	Above normal range - Hemoglobin, Hct, Hp	Y

An editable copy of the lab report is also copied onto the Gaumard_UI folder on the tablet's home screen.

For information on how to access other files from the Gaumard Monitor screen, navigate to Section III.C.4.b.

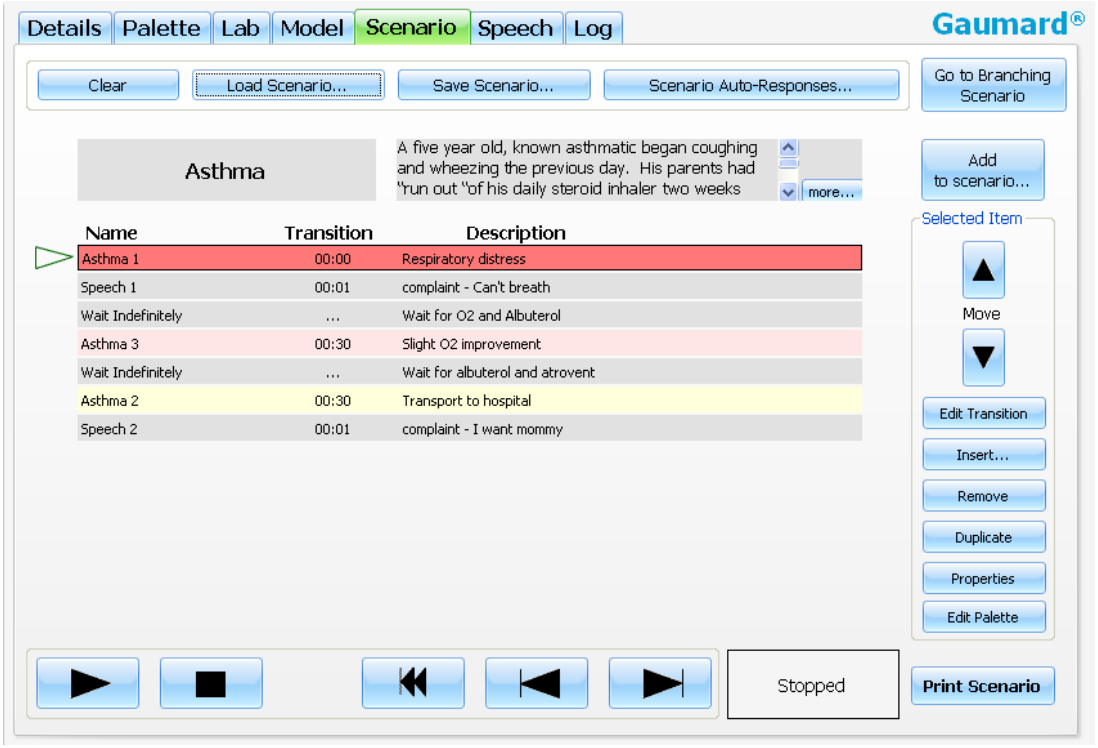
5. Scenarios

The most advanced method of controlling the Pediatric HAL® system is to build a scenario, a sequence of Palette Items and delay periods. This is done on the third tab-page in the main area of the software window. The best way to think of a scenario is like a "playlist" of palette items. Consistent with this analogy, scenario controls at the bottom of the page look and behave just like traditional and software-based media players.

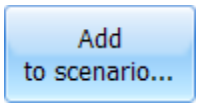
Scenarios let the facilitator automate most of the changes to Pediatric HAL®'s condition, so that their attention can remain on the providers' actions. The scenario system can also provide standardization of the patient's presentation of symptoms. For fair assessment of providers and any research application, such standardization is key.

a. Linear Scenarios

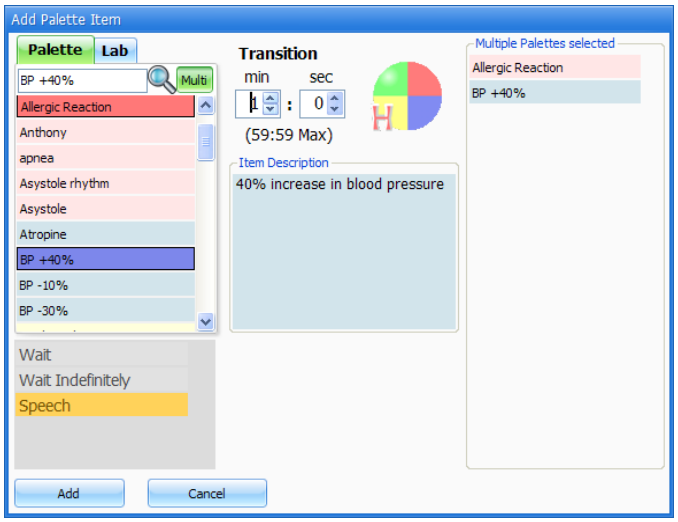
Linear scenarios consist of palette items added in sequence with specific transition times as shown in the figure below.



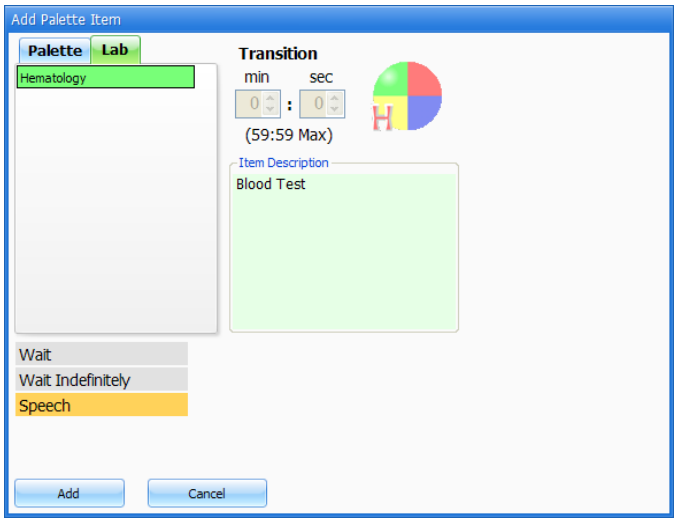
To add palettes to the Scenario, click on the “Add to scenario” button.



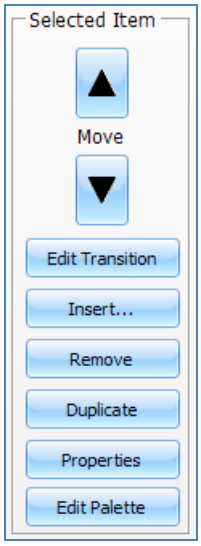
Use the add palette item window to add Palettes and Labs



Choose the desired palette and specify a transition time. If the list of palettes is long, you may search a desired palette using the search bar next to the search icon. To select multiple palettes at one time, enable the Multi control button. The palettes selected will be shown on the right panel.

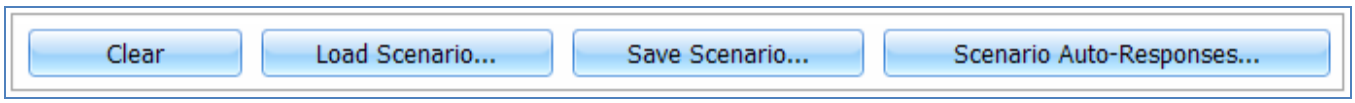


The Lab tab will allow the facilitator to include previously lab reports previously created in the User Interface.

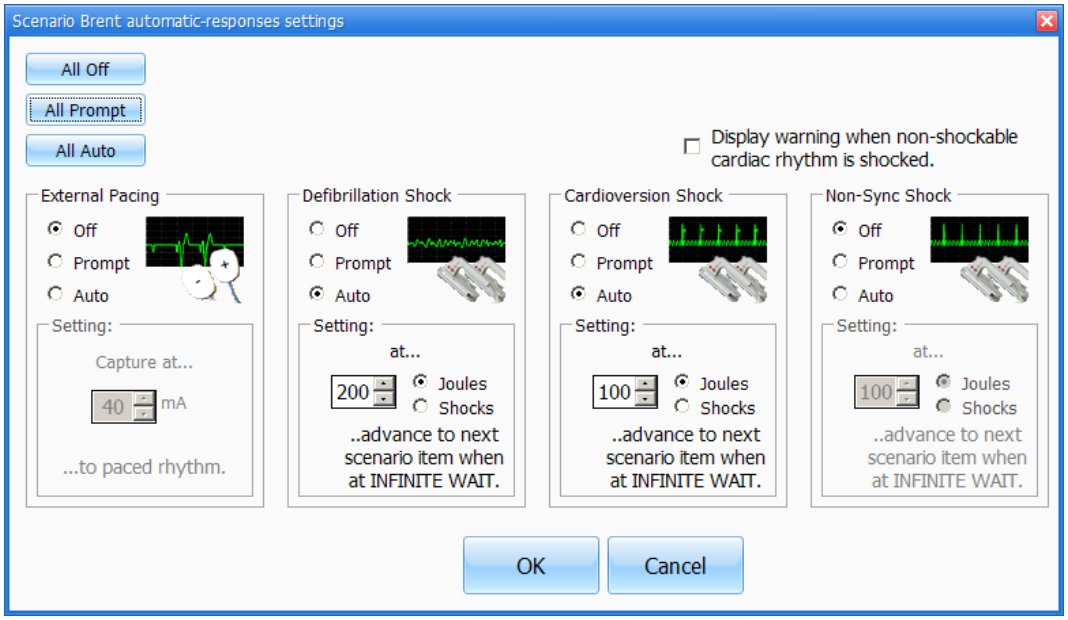


After a palette is added, you may select it to move it up and down from the list using the arrows. You may also edit the transition time, insert a new palette, remove or duplicate the palette, or check the properties using the buttons on the "Select Item" panel shown in the figure.

The buttons found on the top panel can be used to clear any palettes listed on the scenario page, load or save a scenario, program settings for electrical therapy, and switch from linear to branching scenarios.



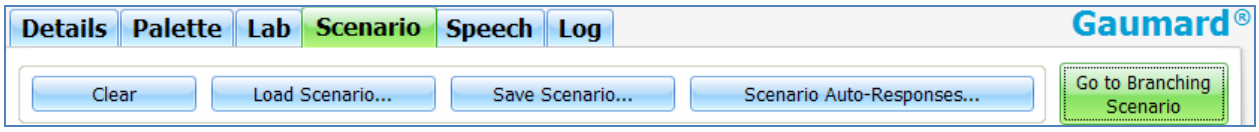
Note: Unlike the Non-Scenario Auto Responses dialog box described in Section III.C.2.c, setting shock therapy to "Auto" does not convert the vital signs to a pre-selected palette, rather, it advances the scenario to the next palette item. Please note that it will **only** advance to the next palette if the shock is applied while a "wait indefinitely" palette is being played.



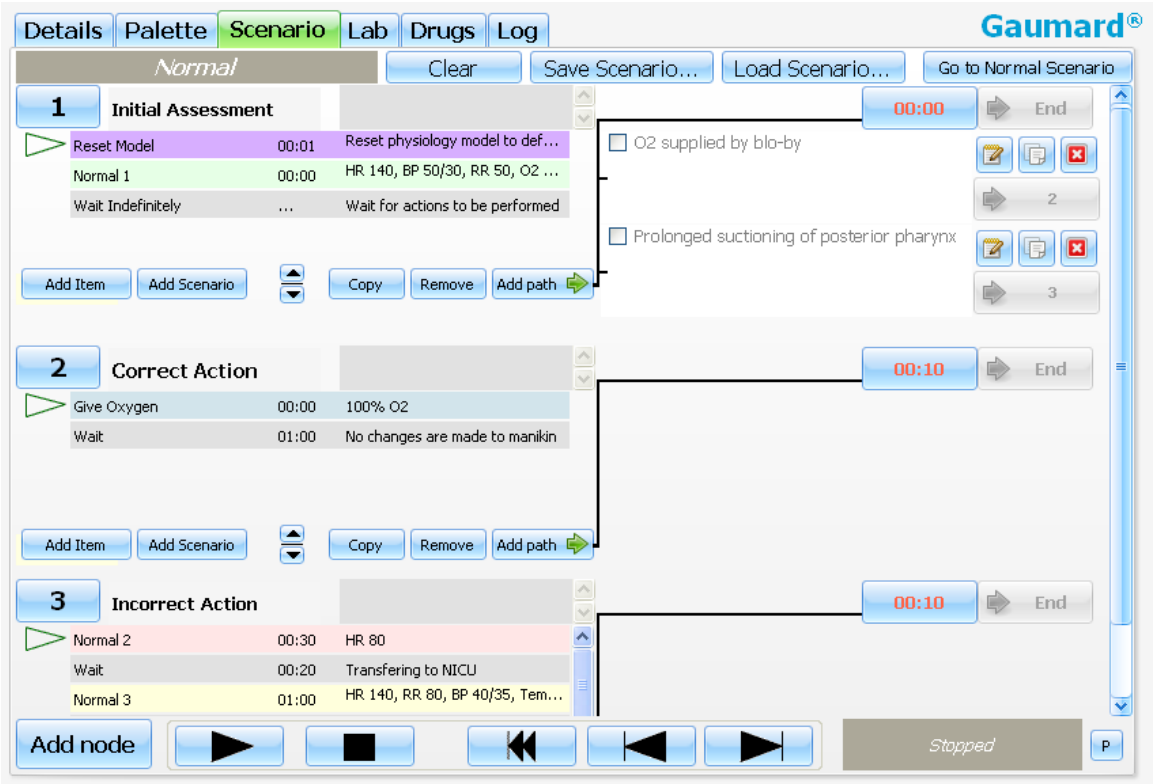
b. Branching Scenarios

The branching scenario is an advanced linear scenario editor. It allows the user to branch towards different scenarios/palettes depending on specific "Key Events" activated by the instructor.

To access the Branching window, click on the **Go to Branching Scenario** button on the Scenario tab. Similar to the linear scenario page, the buttons on the top panel can be used to clear, load and save a scenario, or to switch from branching to linear scenarios.



Branching Scenario screen

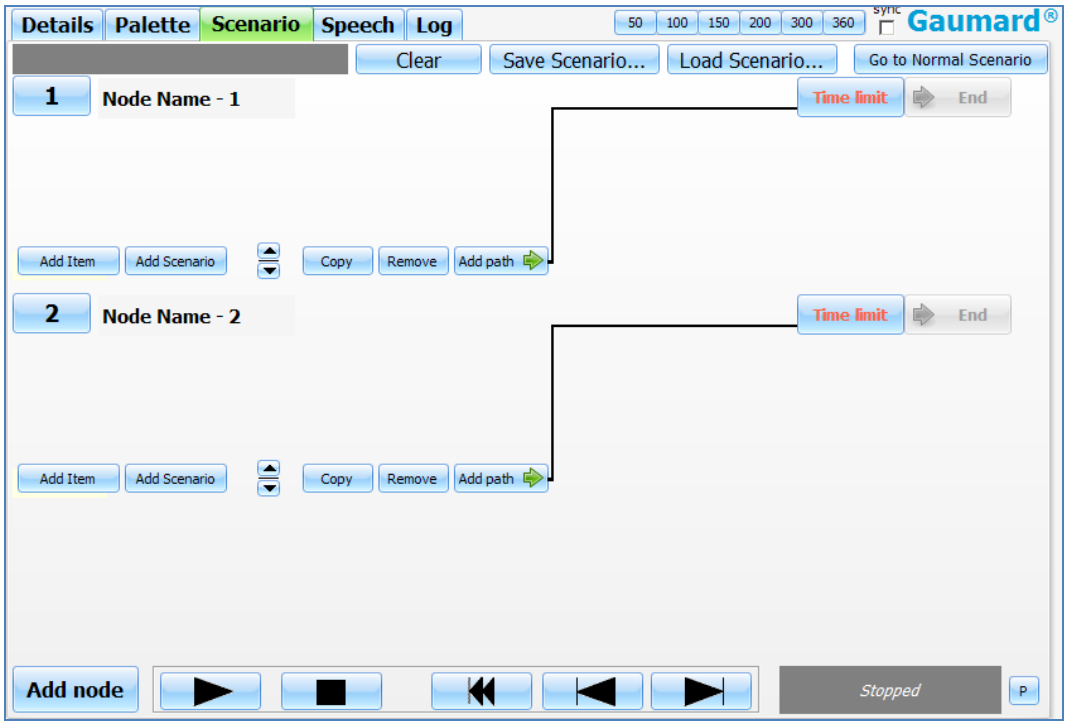


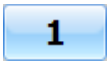
Go to the linear scenario page by clicking on the "Go to Normal Scenario" button.

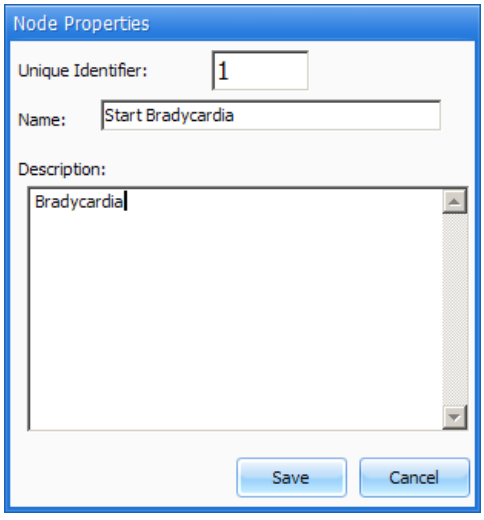
Adding Nodes

A branching scenario will consist of several "Nodes" added by the facilitator. Each node is preconfigured to run a normal scenario or a series of palettes. The facilitator will then activate key events that will alter the trajectory of the nodes.

To add a node, click **Add node** near the bottom of the page.

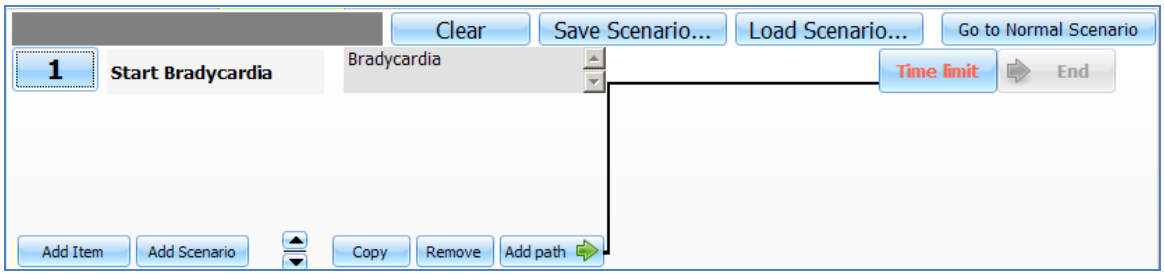


To edit the node name and description, click the node's Unique Identifier number 

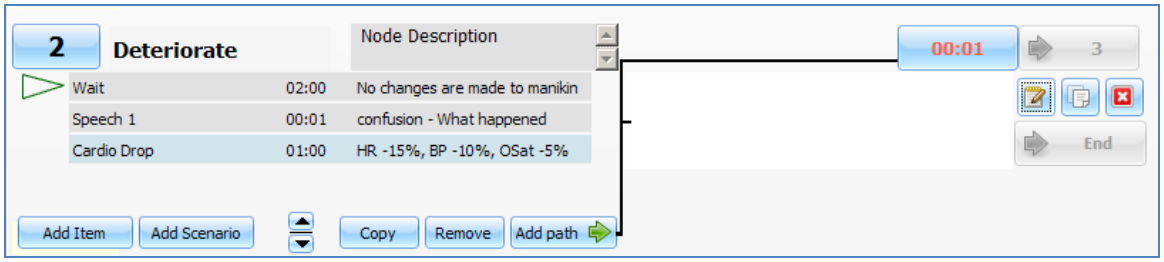


Click **Save** to apply changes

Adding Palettes or Scenarios



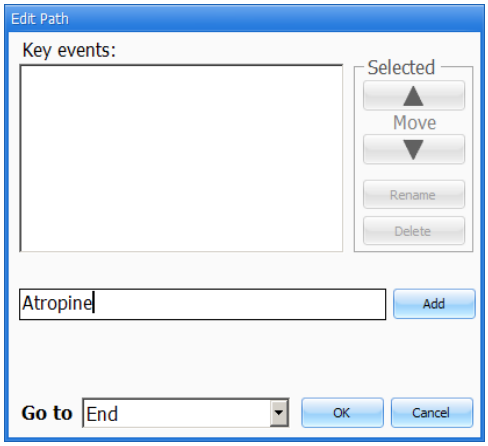
Click **Add Item** to add specific palette items or **Add Scenario** to add full scenarios to this node.



In this example, the following nodes will be created: [1] Start Bradycardia, [2] Deteriorate, [3] Interventions, [4] Atropine, [5] Epinephrine, [6] Dopamine and [8] Pace. Each node has been programmed with specific palettes.

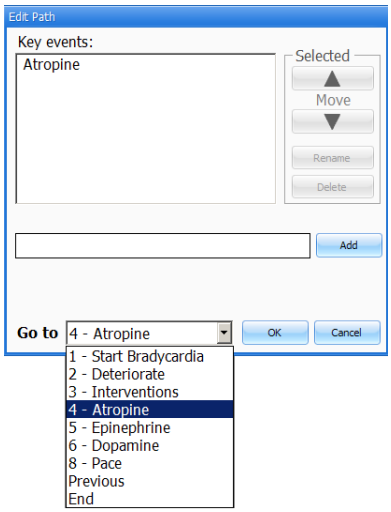
Adding Paths

After all the nodes are created, it is necessary to create paths or branches. To add a *path* to a node, click the **Add path** button. Use the **Edit Path** window to name, rename, sort and create your **key events**. In this example, the facilitator will administer atropine.

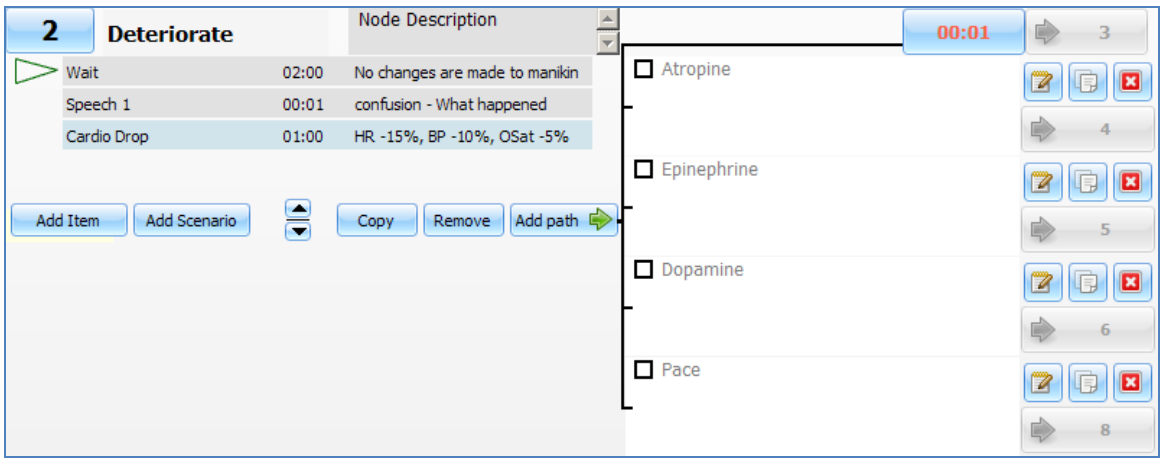


Name the *key event* then click Add.

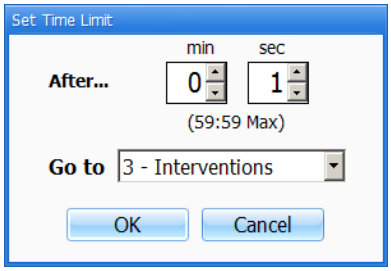
After adding the *key event*, use the **Go to** drop-down menu to designate the corresponding node.



The facilitator added a total of four paths to **Node 2 Deteriorate**: Atropine, Epinephrine, Dopamine and Pace. The paths are activated by the key events previously programmed.



If no key event is selected by the time the last palette expires, the scenario will move on to the palette indicated by the timer and arrow.



The facilitator can edit the time limit and the **Go to** node by clicking the timer.

Path Controls

Once a path is opened for any node, you can edit, copy or delete the path using the buttons below:

Edit

This button allows you to add, remove, or change the order of actions in a specific path. Clicking on this button also enables you to select where the scenario should go after the path is finished playing.

Copy

This button allows the user to copy the entire path. You can paste it to a different node, or paste it in the same node to duplicate it.

Delete

This button allows the user to delete any undesired path.

c. Scenario Controls

Scenarios are controlled from the buttons at the bottom of the Scenario page. The same way a music player plays songs, the Scenario plays palette items. Intuitively, the facilitator can play, stop, pause, skip, or repeat items as appropriate. The Scenario Position Indicator points to the current item and shows the current status of the scenario. The following paragraphs describe in detail the behavior of each button and indicator.

The Scenario Position Indicator

An unfilled triangle means that the scenario is stopped. When the Play button is clicked, the item pointed by the indicator is be played.

A rapidly blinking triangle means that the scenario is playing the item to which the indicator is pointing.

A slowly blinking triangle means that the scenario is paused at the item to which the indicator is pointing.

The Scenario Buttons

Plays the item to which the scenario position indicator is pointing. This button has to states: play or pause.

Pauses the scenario. This state of the play button is only active when the scenario is playing. It is disabled when a 'Wait indefinitely' item is playing because in such case the scenario is already paused.

The Stop button has 2 behaviors depending on when it is clicked. When clicked once, the Stop button halts the scenario at the end of the currently playing item. When clicked a second time, the scenario is stopped immediately. For example, if the currently playing item has a transition of 1:00 minute and the Stop button is pressed when it has 0:10 seconds left, the scenario will be halted at the end the transition (i.e., in 10 seconds). If the Stop button is clicked again within those remaining 10 seconds, the scenario stops immediately.

The Next button advances the indicator to the next item on the scenario regardless if the scenario is playing, paused, or stopped. It can also be used to move the indicator to select an item before playing it.

Similar to the Next button, the Previous button returns the indicator to the previous item in the scenario.

The Reset button stops the scenario immediately and returns the indicator to the first item in the scenario.

d. Factory Preset Scenarios

i. Manual Mode

These scenarios in the manual mode are found in the Quick Start Pediatric 5 profile. Six of these scenarios are linear and fourteen are branching. All shown are for a five-year-old patient.

Scenario Name	Scenario Type	Scenario Description
Linear		
Asthma	Respiratory	A five year old, known asthmatic began coughing and wheezing the previous day. His parents had "run out "of his daily steroid inhaler two weeks ago. He received two nebulized Albuterol the day before and slept through the night. He had one treatment this morning but by mid-morning he was in respiratory distress with audible wheezing and visible retractions. He cannot speak in full sentences.
Cardiac Tamponade	Cardiac	A five year old boy has a gunshot wound to his chest. The family has called 911 but has not begun CPR. You are the first responder with your emergency team. The boy is unresponsive with an entry wound near his heart. The family said he was crying a few minutes ago.
Fire Victim	Systemic	A five-year old boy is rescued by his father from a house fire. He was found in his bedroom asleep. The room was engulfed with flames and smoke. His pajamas are charred and his face is burned and covered with soot. His pajamas are removed to reveal his arm and torso are burned.
Foreign Aspiration	Respiratory	A five year old boy was visiting his grandmother who had a bowl full of peanuts on the table. He and his older brother were throwing the peanuts in each other's mouths and laughing. The five year old began choking and gasping for air. He could still say a few words between coughing, but then he collapsed to the floor. His grand-mother ran into the room and his older brother explained he had choked on a peanut. His grandmother saw he was turning "blue". She told her grandson to call 911.
Girl w VTach	Cardiac	5 year old female with heart condition is poorly responsive, has a weak pulse and diminished perfusion.

Scenario Name	Scenario Type	Scenario Description
Septic Shock	Systemic	A five year old boy with Sickle Cell Anemia is brought to the ED with what the mother thought were infected mosquito bites. She treated them with antibiotic ointment. Most of them improved except for one large area on his abdomen that now measures 3X4 cm. with a localized abscess formation. He developed fever yesterday of 104 degrees F. Today he has developed chills and his temperature is still 104 despite fever reducers. He takes folic acid and penicillin daily. His immunizations are up to date.
		Branching
Alcohol Ingestion	Trauma	A five year old boy wakes up early and is thirsty. His parents had a party the night before and left glasses half-full of mixed alcoholic drinks around the living room. When the parents get up two hours later they find him asleep on the floor and smelling of alcohol. They cannot wake him up so they call 911.
Cardiac Arrest	Cardiac	While watching a baseball game a five-year-old boy was hit by a high velocity “foul ball” in the chest. He immediately falls to the ground and cries “I’m hurt”. As you approach he becomes unresponsive. You access the ABC’s and find him to be pulseless and not breathing. You call for an EMT and report a cardiac arrest.
Cardiac Ischemia	Cardiac	During the ride home from a family camping trip a five year old boy falls asleep in the back of his parents truck camper. The night was cold so the heater in the cab was turned on. When they returned home he seemed confused, couldn't walk and complained of a headache and vomited. His parents bring him to the ED and are worried about meningitis.
Chest Injury	Trauma	A five-year-old boy was racing his BMX bike over a dirt hill in his back yard. He had his helmet on but not his chest protector. His mother was watching and said he became airborne and the handle bar of the bike landed on his chest when he hit the ground. He is crying, “my chest hurts” and "I can’t breathe". He was not unconscious and his extremities and abdomen appear normal. You suspect fractured ribs, a lung contusion or a tension pneumothorax.

Scenario Name	Scenario Type	Scenario Description
Diabetic Ketoacidosis	Systemic	A five-year old boy presents to the ED with a history of vomiting for one day. His mother says he has vomited at least ten times since the night before and he can't keep anything down. He has a low-grade fever and has not had diarrhea but he has been wetting the bed. He appears pale with sunken eyes and breathing very rapidly.
Epiglottitis	Respiratory	A five year old girl was recently adopted from another country. Her immunization status is in question and her parents had planned to have her immunized soon. Two weeks after her arrival in the United States she developed a high fever of 40 Deg C and has difficulty in swallowing. Her voice became weak and she had coarse stridor with every breath. Her parents tried treating her for croup with some cool mist as they had their other children but she showed no improvement. Her parents then brought her to the E.D.
Gram Negative Sepsis	Systemic	A five year old boy with cerebral palsy is carried in to the ED by his foster father. He is one of five foster children, all with special needs. He wears braces to walk and has speech and language delays. He has been vomiting for three days and has been refusing to eat. He has also been crying a lot. He has no medications. His foster father says he has to leave because his wife needs the car to go to work.
Hypothermia	Trauma	A five year old boy wandered away from his parent's farm house in freezing temperatures. He was found by a passing motorist curled in a snow drift. He was dressed only in pajamas and his exposure time was at least four hours. The motorist wrapped him up and drove him to the hospital.
OP Poisoning	Trauma	A five year old immigrant boy wandered in a field that was recently sprayed with pesticides (Organophosphate). His parents took off his clothes and washed him off with water but a few minutes later he began vomiting and became "limp". They drove him to the ED that was thirty minutes away.
Renal Failure	Trauma	A five year old boy presents to the ED with some tiny red dots on his arms and legs and his mother says he hasn't "peed" since yesterday. Last week he had some bloody diarrhea and has been vomiting for two days but they were on vacation so they didn't see a doctor.

Scenario Name	Scenario Type	Scenario Description
Soccer Boy with SVT	Cardiac	A previously healthy boy is brought to the ED because his mother says he has been acting tired and passed out while playing soccer today. He said his chest hurts and his heart jumps.
Status epilepticus	Systemic	Mom calls 911 because as her son was falling asleep she noticed seizure activity of his arms and legs. He had had short seizures with high fever when he was one and two. This time he had no fever and was well the entire day. There has been no history of trauma. He has been seizing for at least fifteen minutes when you arrive. You correctly assess he may develop status epilepticus.
Supra-ventricular Tach	Cardiac	A previously healthy boy is brought to the ED. According to his dad he has been acting tired and passed out today. He said he feels dizzy and his heart jumps.
Toy Balloon 5yr	Respiratory	You are at a birthday party where you see a five year old trying to blow up a balloon. Instead of blowing out he sucks the balloon in and begins gasping for breath. He is turning cyanotic and cannot cry. You assess his airway is obstructed and the obstruction must be removed. You try simple measures as back blows and chest thrusts and activate EMS.

These scenarios in the manual mode are found in the Quick Start Pediatric 1 profile. Five of these scenarios are linear and seven are branching. All shown are for a one-year-old patient.

Scenario Name	Scenario Type	Scenario Description
		(b) Linear
Croup	Respiratory	You are called to a home at two a.m. because a one-year old boy "can't breathe". His parents said he was fine when they put him to bed. He has had no illness before and there is no history of asthma. He woke up with a "barking cough" and then began to struggle for each breath. They called their advice line that said to put him in some steam from the bathroom shower. He did not improve, so they called 911.
Drowning Boy	Trauma	A one year old boy falls into the pool and is found floating a couple of minutes later. When the paramedics arrive the child is not breathing, has severe cyanosis and he is in asystole.
Hypovole-mic Shock	Systemic	A one year old boy presents to the ED with a three day history of vomiting and watery diarrhea with out blood or mucous. He attends daycare and a note was sent home about two other children with rotavirus diarrhea. He was given Pedialyte the first day and his vomiting and diarrhea decreased on the second day. Today, however his diarrhea is constant and he has refused to drink. His urine output is unclear because of the diarrhea in the diapers. During your assessment he has a thirty second period of tremors.
Pneumonia	Respiratory	You are called to a home where a one-year old child is gasping for breath. His mother says he has had wheezing before and is being treated for "baby asthma". He saw his doctor last week and has been receiving nebulized Albuterol three times a day for one week. Over the past few days his fever has increased to 39.1 Deg C, his nose has become more filled with yellow mucous and he has had little to drink. He is not taking any antibiotics.
Pneumonia and Septic	Respiratory	You are called to a home where a one-year-old child is gasping for breath. His mother says he has had wheezing before and is being treated for "baby asthma". He saw his doctor last week and has been receiving nebulized Albuterol three times a day for one week. Over the past few days his fever has increased to 39 Deg C, his nose has become more filled with yellow mucous and he has had little to drink. He is not taking any antibiotics.

Scenario Name	Scenario Type	Scenario Description
		(c) Branching
Bee sting	Trauma	You are called to a home where a one year old boy was bitten multiple times by angry “Yellow Jackets" thirty minutes ago. When you arrive you see areas of hives around the bites, his lips and eyes are swollen and he has audible stridor.
Bronchiolitis	Respiratory	A one year old child is brought to your ER with a one day history of a clear runny nose, low grade temperature and a wet cough. His mother states today that he is refusing to drink and appears to be breathing fast. She claims his immunizations are up to date and he has been in good health.
Cong Heart Failure	Cardiac	A one year old boy is transferred to your facility with a history of weakness and seizures despite therapeutic levels of anticonvulsants. Normal CT Scan, spinal fluid, and electrolytes.
Second Degree Block	Trauma	A one year old child was visiting his grandmother and was found playing in her purse. She noticed her long acting propranolol bottle was opened and he may have ingested at least four pills about one hour ago. She contacted poison control who told her to bring him to the hospital.
Shaken Baby Syndrome	Trauma	A young mother returned from her night shift to find her one year would not wake up when she went to check on him. Her boyfriend said he was probably just sleepy because he had cried a lot the night before. She knows something is wrong and takes him to the ED.
Sinus Tachycardia	Cardiac	A young mother brings her baby to the ED. She says her baby was crawling on the floor and put something in his mouth and swallowed it about an hour ago. You notice the mother is thin, jittery with open sores on her face and arms. You consider the ingestion may be a stimulate.
Toy Aspiration	Respiratory	You are at a birthday party where you see a one year old trying to blow up a balloon. Instead of blowing out he sucks the balloon in and begins gasping for breath. He is turning cyanotic and cannot cry. You assess his airway is obstructed and the obstruction must be removed. You try simple measures as back blows and chest thrusts and activate EMS.

ii. Automatic Mode

These scenarios in the automatic mode are found in the Pediatric 5's Meds profile. There are three linear scenarios and no branching scenarios. All shown are for a five-year-old patient.

Scenario Name	Scenario Description
Linear	
Adenosine-OD	Asystole -> severe AVB, asthma, exited
Adenosine-SD	Asystole -> Sinus
Adenosine-UD	Asystole -> previous rhythm

These scenarios in the automatic mode are found in the Pediatric 1's Meds profile. There are three linear scenarios and no branching scenarios. All shown are for a one-year-old (infant) patient.

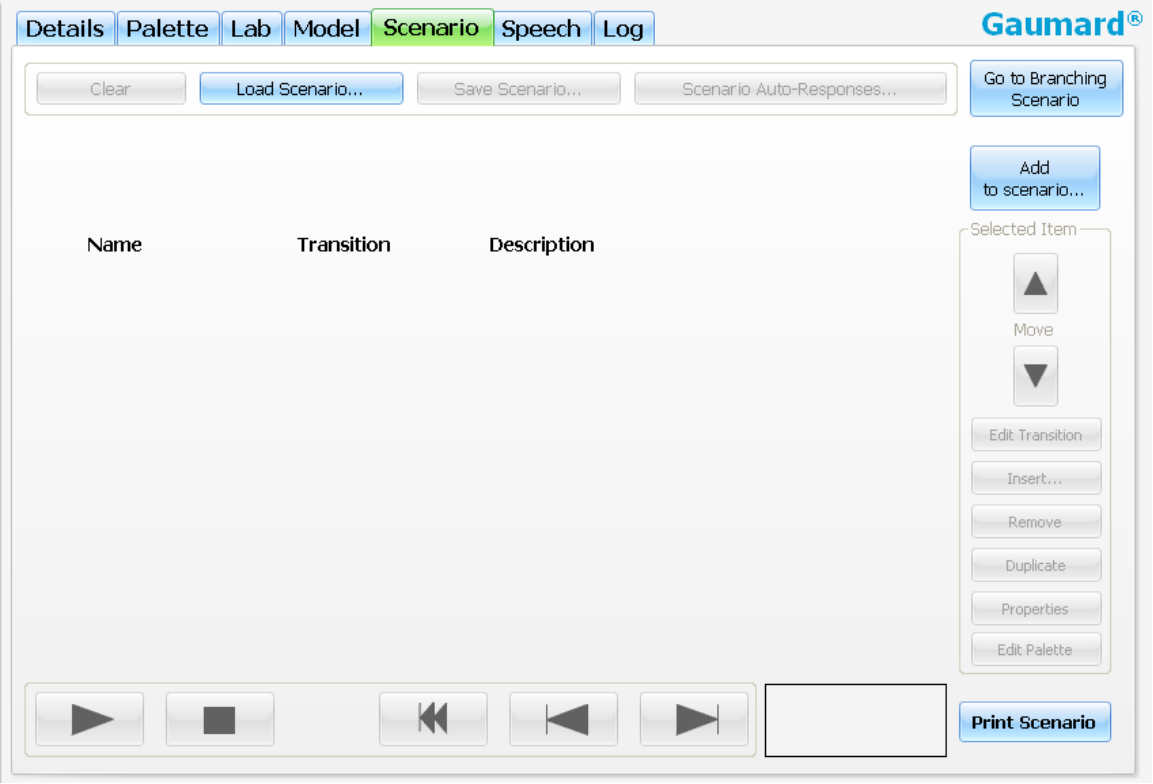
Scenario Name	Scenario Description
Linear	
Adenosine-OD	Asystole -> severe AVB, asthma, exited
Adenosine-SD	Asystole -> Sinus
Adenosine-UD	Asystole -> previous rhythm

Flowcharts for these scenarios can be found in Section V.A of this manual.

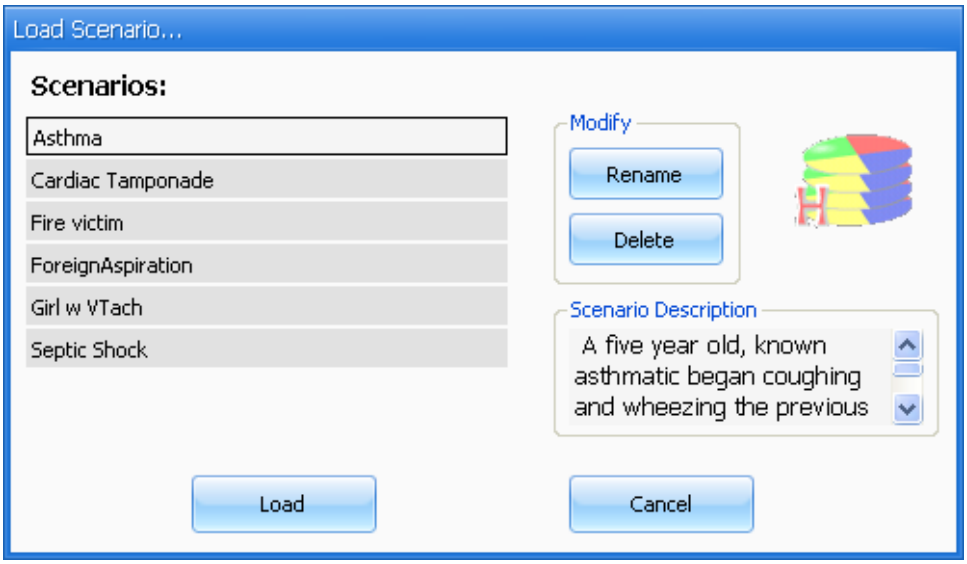
e. Using Factory Preset Scenarios

A powerful way to teach Emergency Care is to use the factory preset scenarios. To locate and load any of them, follow these three easy steps:

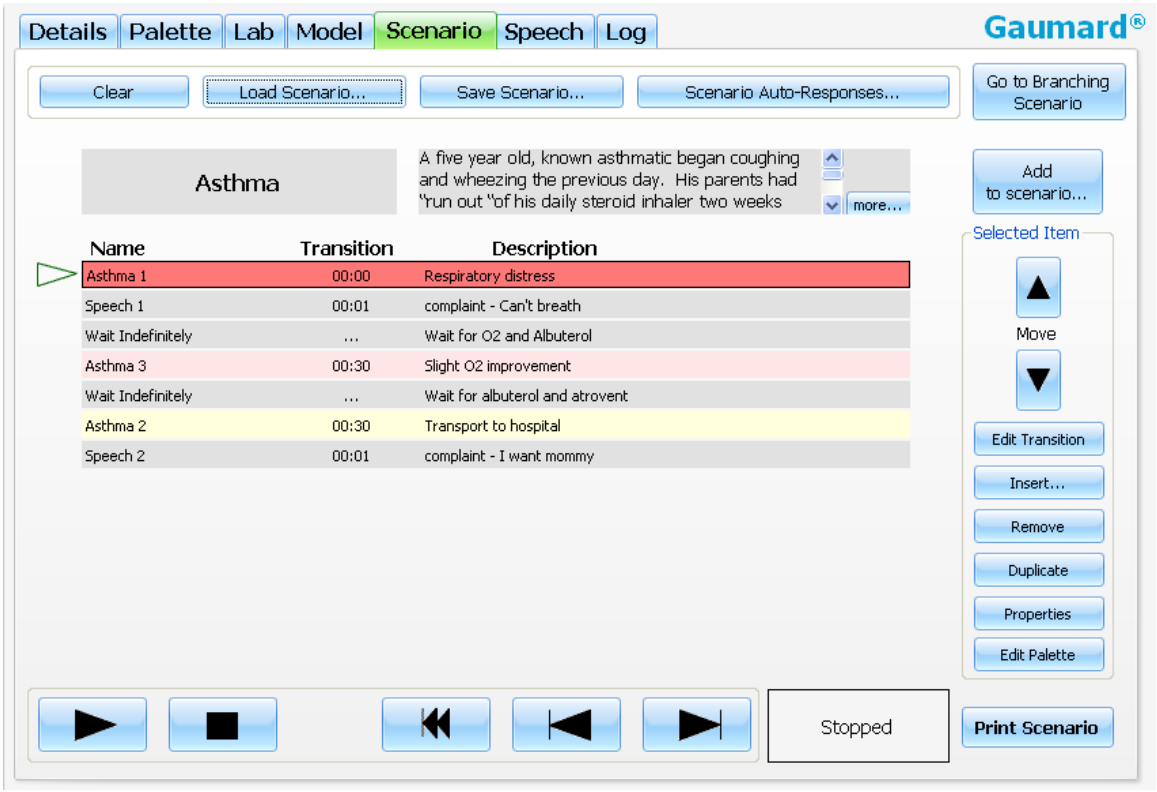
1. Go to the Scenario page.



2. Click on Load Scenario. The Load Scenario dialog box appears.



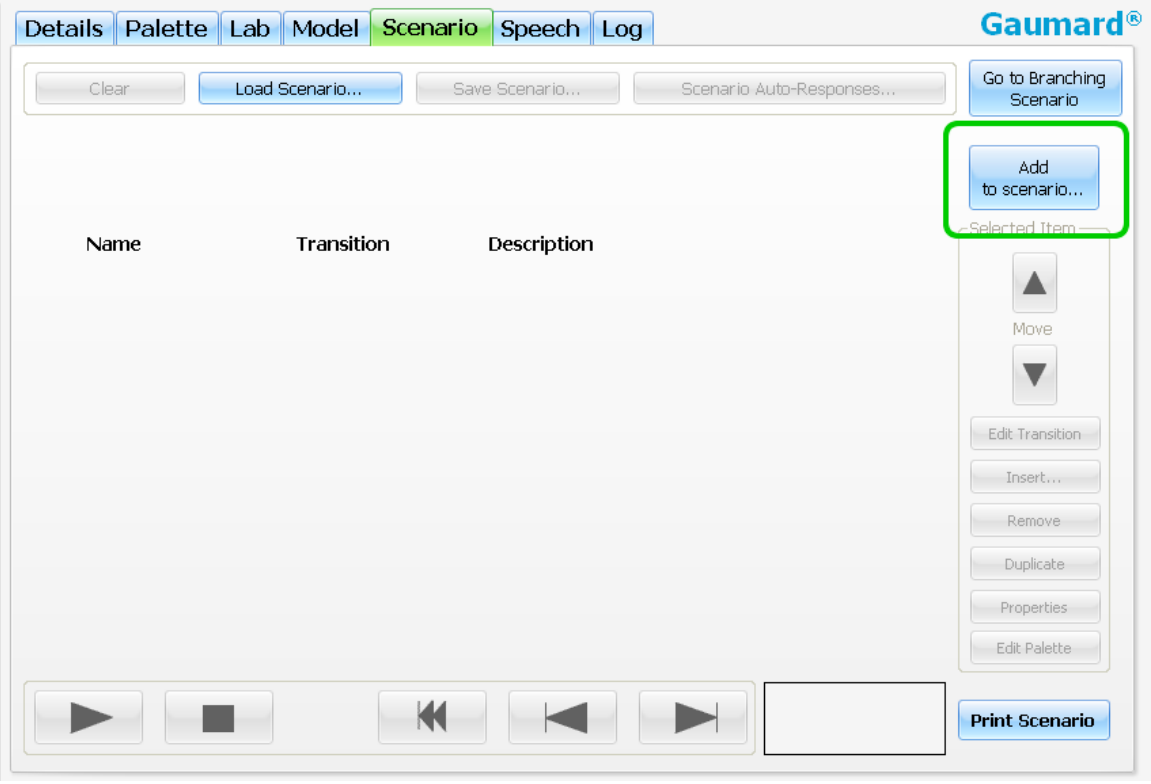
3. Select the desired scenario and click on load.



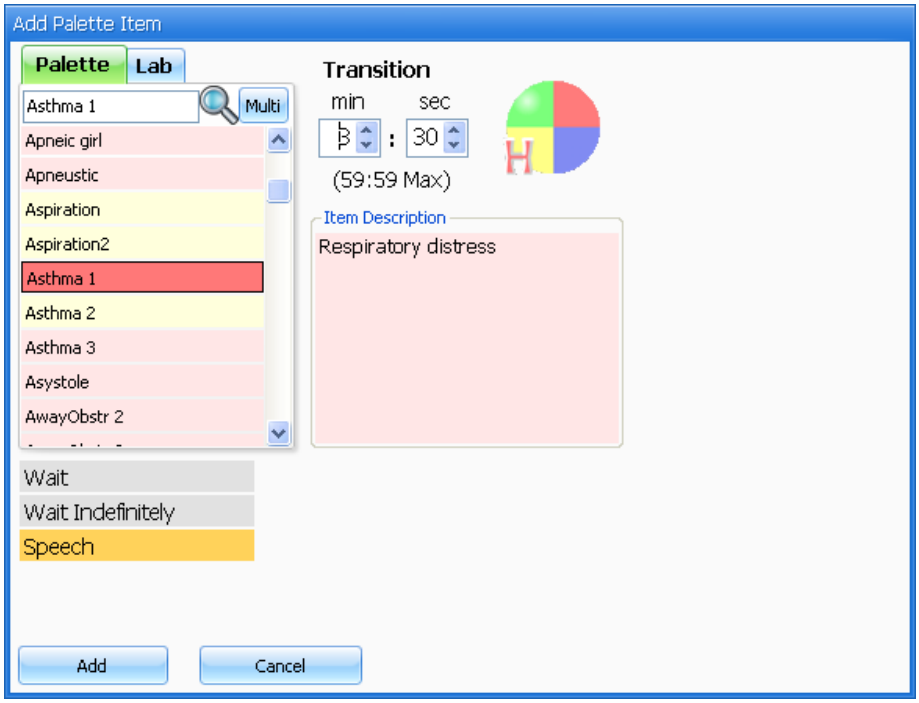
After loading the desired scenario, click on play and watch the vital signs adjust according to the specifications of each palette.

f. Creating Your Own Scenarios

Building a scenario is very simple. Click the "Add to Scenario…" button on the right side of the page.



You will be presented with a list of all the Palette Items in the active Profile and a field for setting the transition time. When running a scenario, this transition time functions just as the time on the "Apply" buttons on the Details and Palette pages.



From the “Add Item” dialog box, you may also choose the "Wait" item, which causes a delay of a specified duration, or a "Wait Indefinitely" item, which causes the scenario to pause at that point until the facilitator manually advances to the next item.

One can manipulate the scenario items with the “Selected Item” group of buttons on the right side of the page. Most of these functions are also available by right-clicking on scenario items. (When using the stylus, hold the stylus button and tap the screen to do a right-click).

Palette Items may also be created by editing the settings on the Details tab and choosing “Save as Palette Item...”. As long as it was either created in or exported to the current profile, it will appear on the “Add Palette Item” list. Not every field has to be populated in order for a Palette Item to save.

When all the palettes have been selected and ordered, click “Save Scenario...”. The scenario may be run immediately - click on the “Play” button. Watch the vital signs adjust according to the specifications of each palette item.

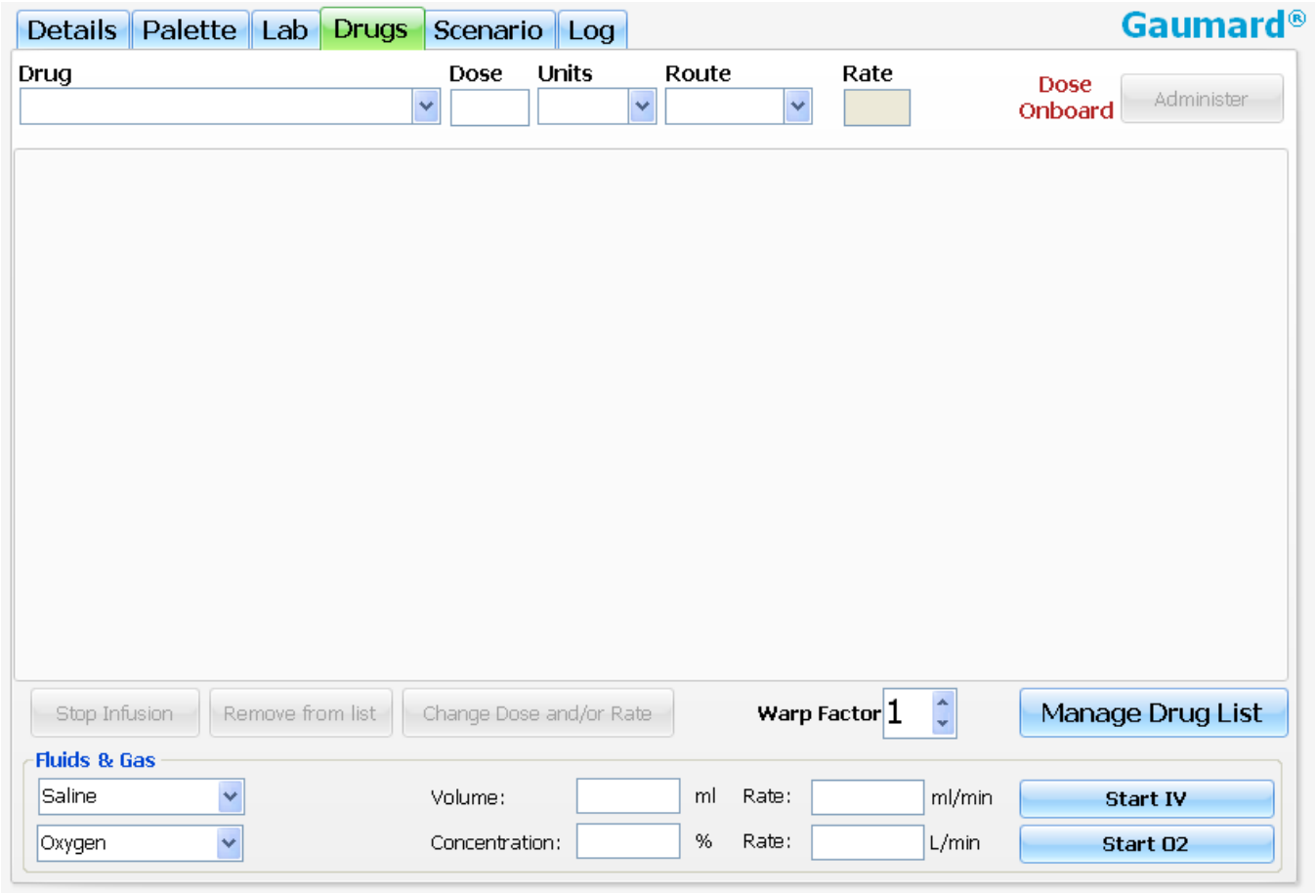
Note: There are a few important things to remember when creating your own scenario in the automatic mode:

- If you select an inconsistent combination of vitals, the model does not adjust to the specified values. The model is based on accurate physiologic principles, and therefore, choosing a combination of vitals that is inconstant with these principles, will not deliver the appointed results.

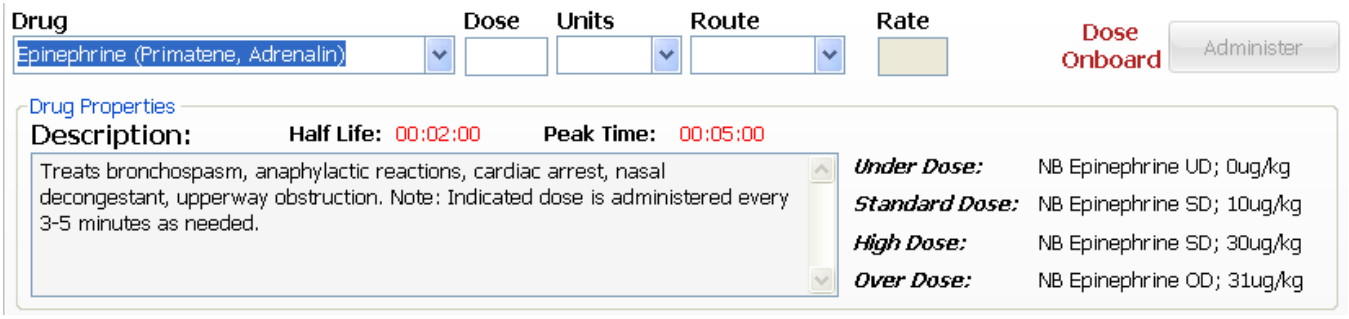
- To observe pneumothorax, make sure that one or both of the lungs is disabled for chest rise. If both lungs are inflating, then the pneumothorax function is not activated. Recall that the model is based on accurate physiologic principles and by definition, pneumothorax occurs only when one or both of the lungs collapse.

6. Drugs (Automatic Mode only)

The "Drugs" page is unique to the automatic mode. This operating mode contains numerous drugs that are frequently used during cardiovascular care. All of these drugs are found in the 2008 *Handbook of Emergency Cardiovascular Care* published by the American Heart Association. To get started, select a desired drug from the list.

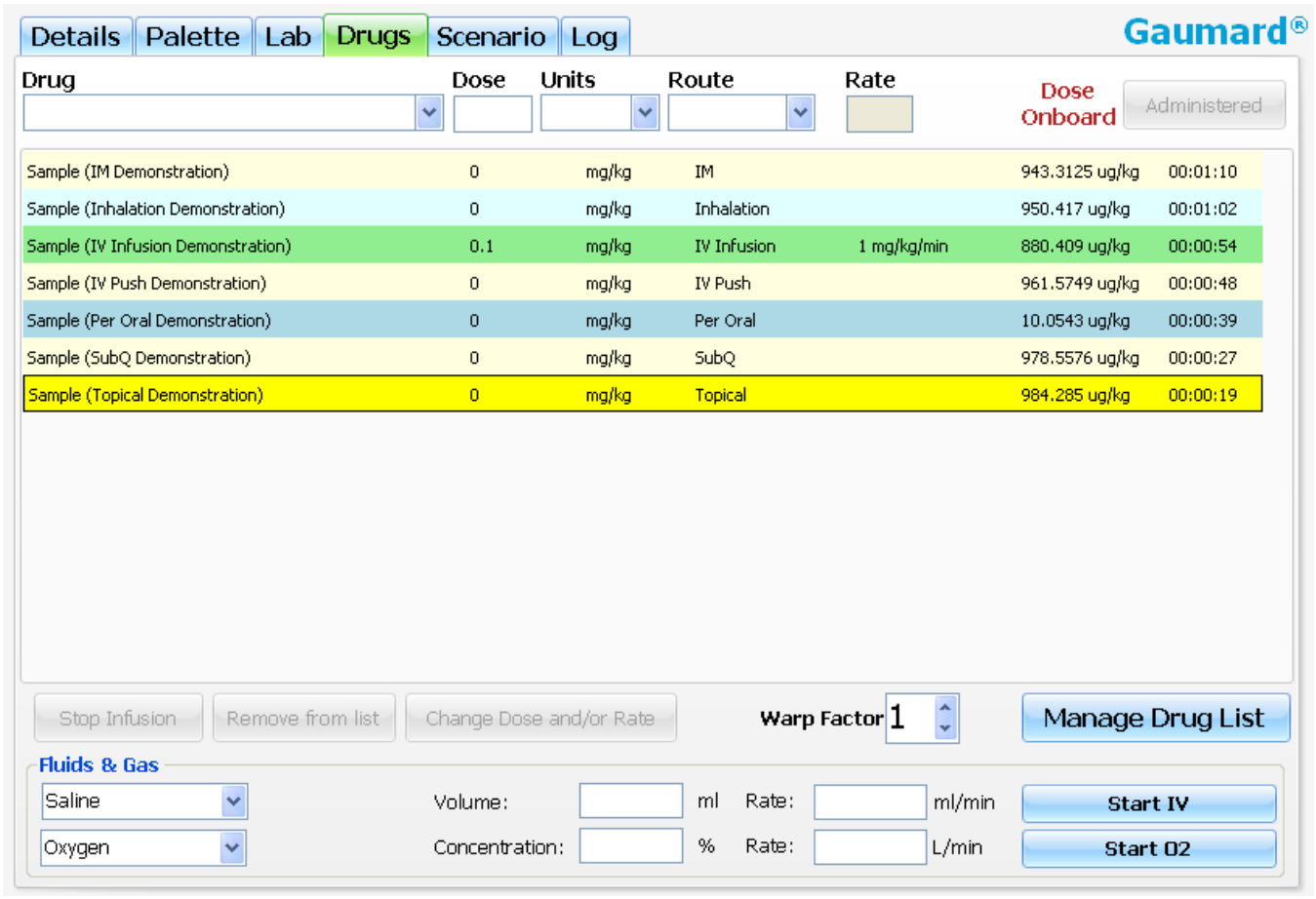


After making your selection, a brief description is displayed at the top of the window. The HALf life and peak time are also indicated, as well as the under, standard, high and over dose effects (see figure below).



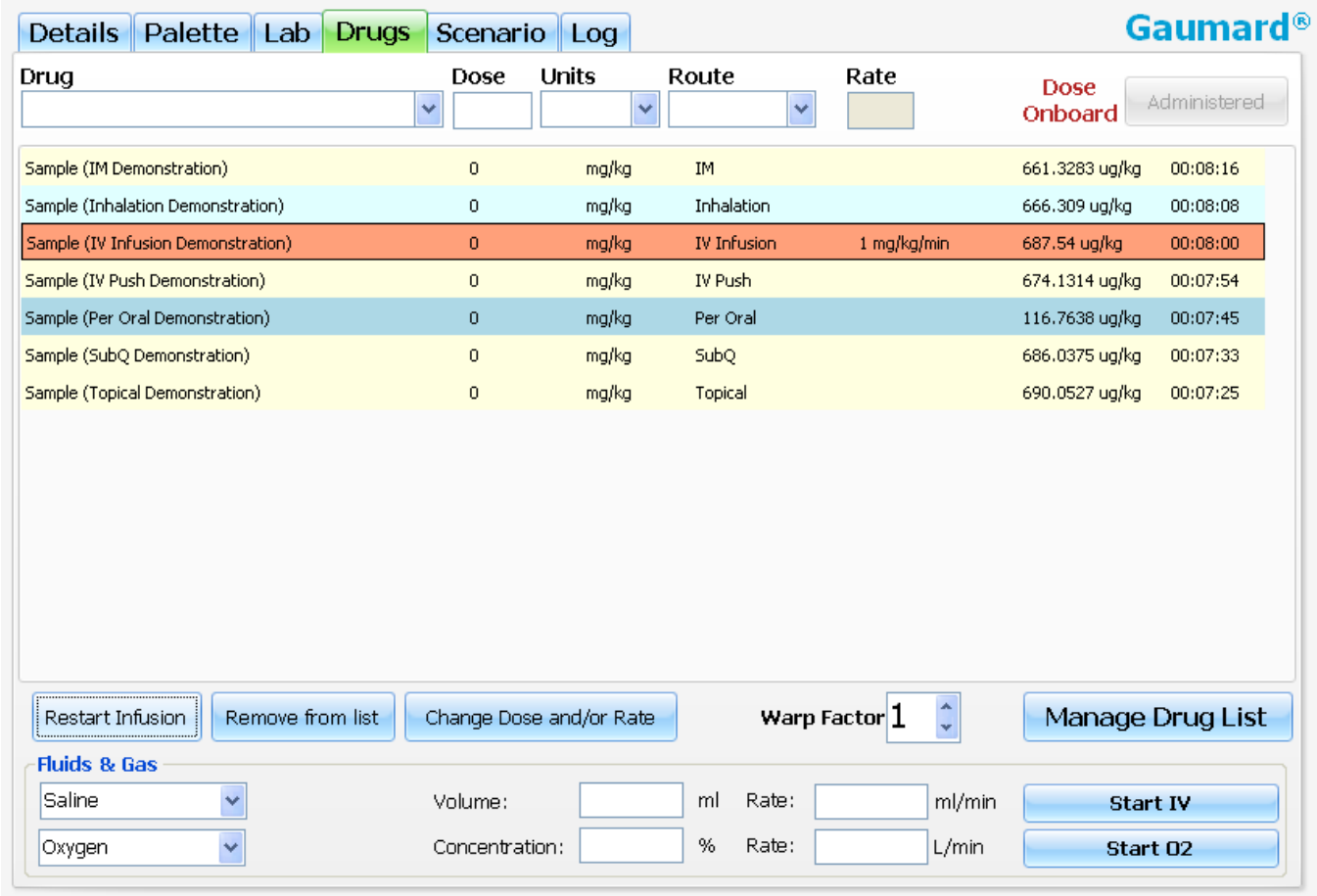
Specify the dose, units, route and rate (if applicable), and click on the "Administered" button.-

When a drug is administered, it appears below the drop down menu. Under "Dose Onboard" you will see how much drug is left in the body. The picture below displays a list of sample configurations of drugs. Remove any drug that has been completely delivered to the patient by highlighting it and clicking "Remove".

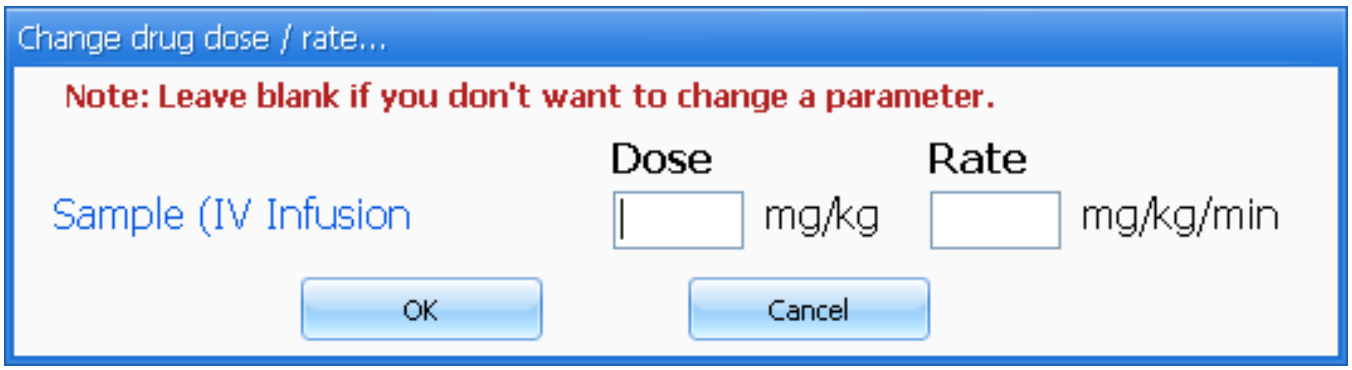


You can also stop the administration of any drug being applied via IV Infusion.

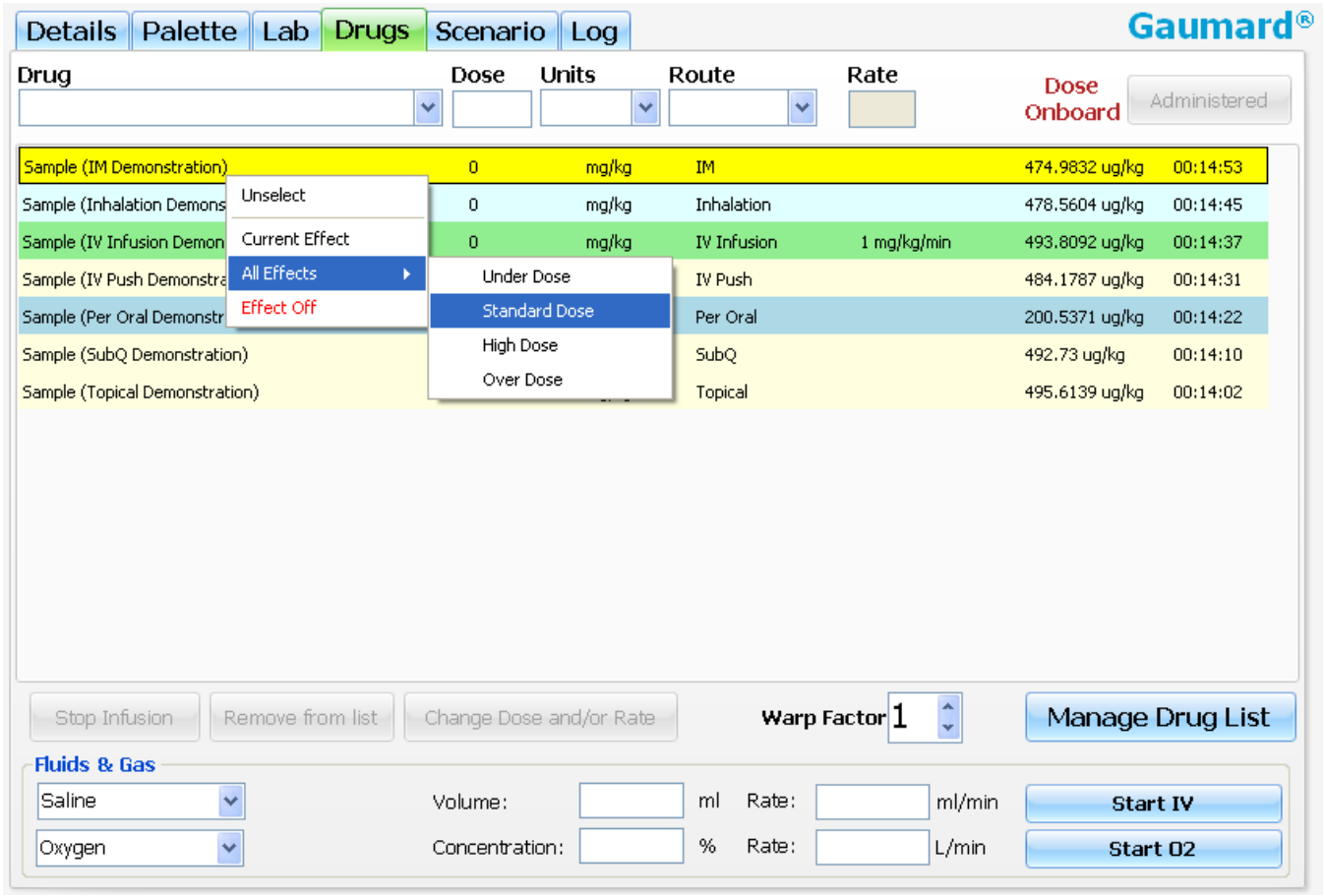
After highlighting the desired drug that is being applied via IV infusion, click on “Stop”. A stopped drug is highlighted red, as shown in the figure below:



You can restart the infusion of a stopped drug at any time. You can also change the dose and rate of drugs that are applied via IV infusion.



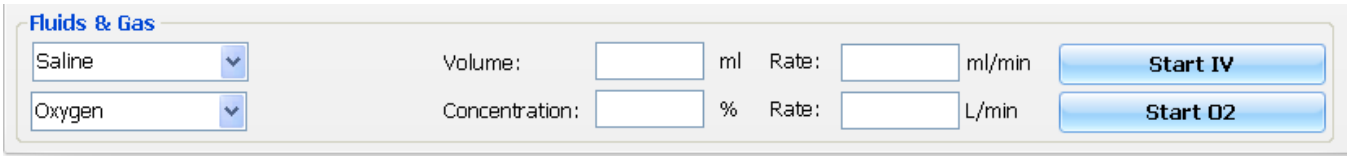
Right-clicking on a drug that is being administered displays the following drop down menu:



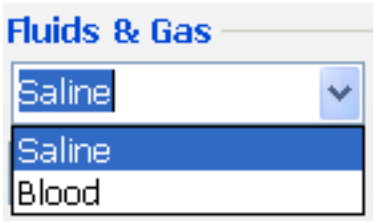
Use this menu to:

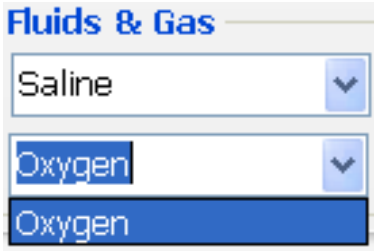
- Unselect a highlighted drug
- View the effect the drug is currently having on the vitals of the patient
- View any of the dose effects for that drug.
- Turn the drug effect off

At the bottom of the Drugs page, controls for fluids and gas administration are found:

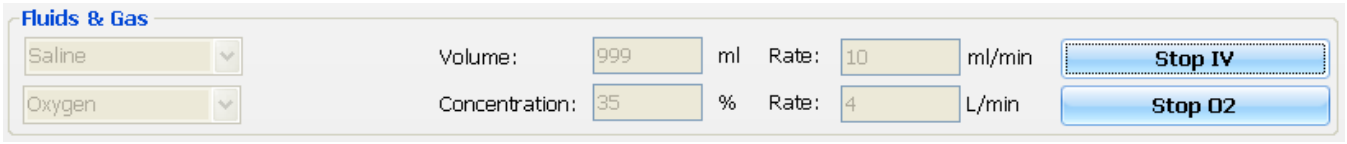


Two fluids can be administered, saline or blood.





To apply any of these options, including oxygen, select the desired choice and specify the volume or concentration and the rate, then click on “Start IV” or “Start O2”. You can stop the administration at any time by clicking “Stop”.

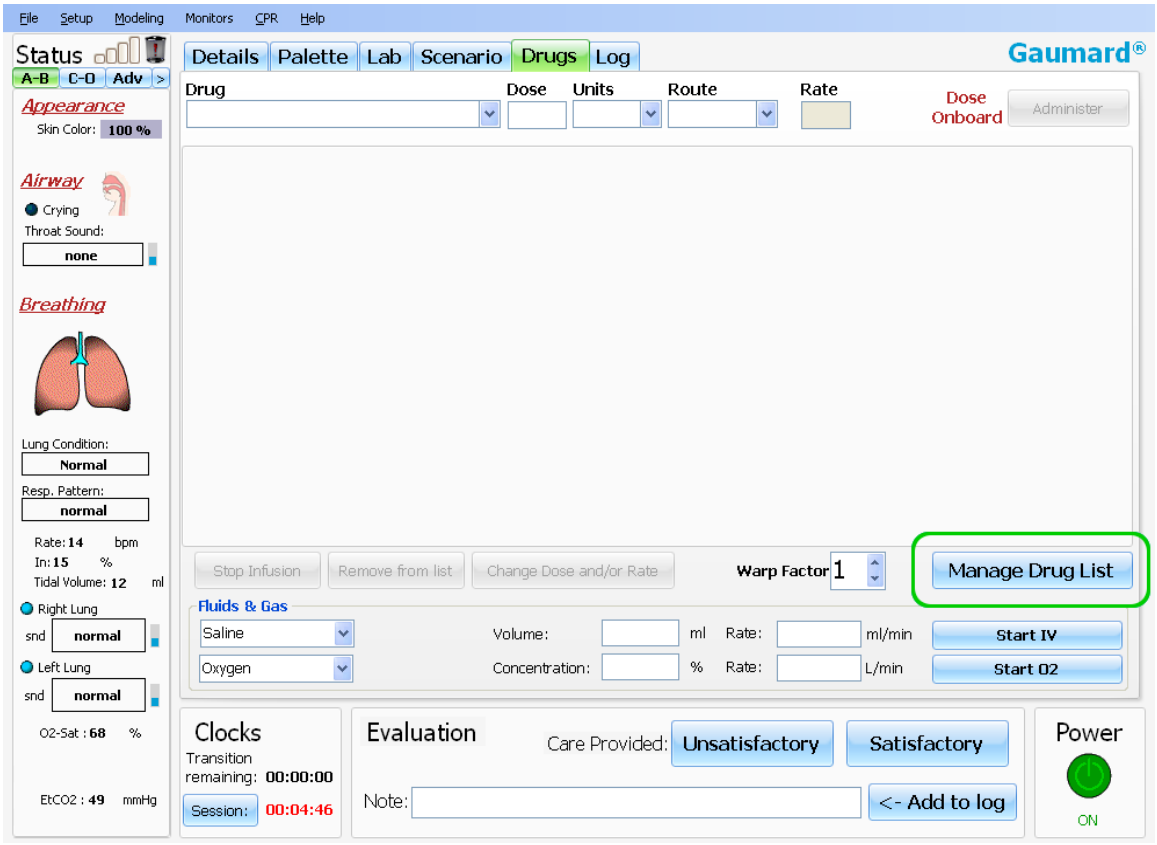


Adding New Drugs

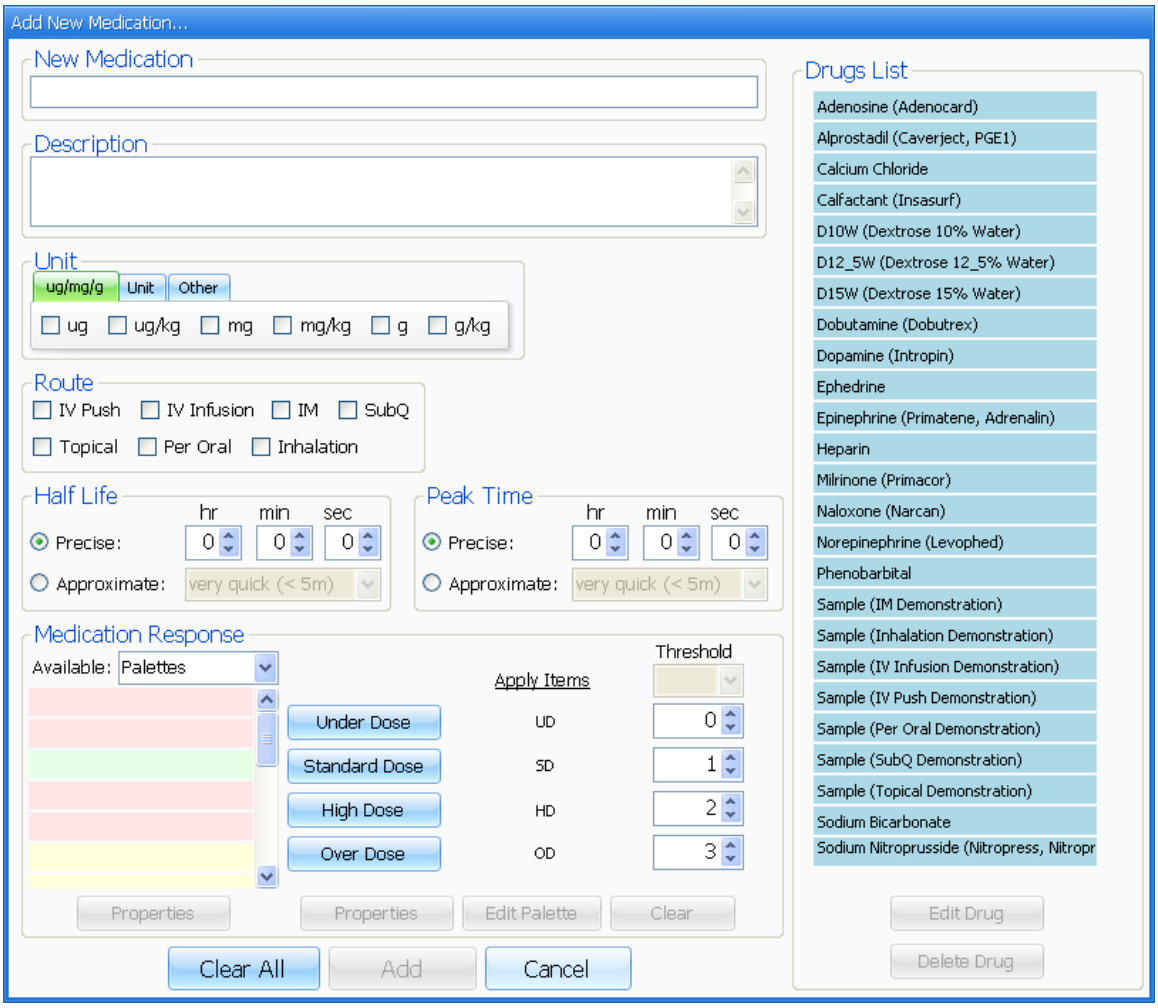
In the event that a desired drug is not found in the list provided, as many drugs as might be desire to complete scenarios can be added. To do so, follow the simple procedure described below:

1. First, create a palette that illustrates the effect of that drug. You should create four different dose effect pallets per drug: an under dose, standard dose, high dose and an overdose palette.

2. After completing the dose effect palettes, create a drug profile. To do so, go to the Drugs page and click on the button labeled "Manage Drug List.”

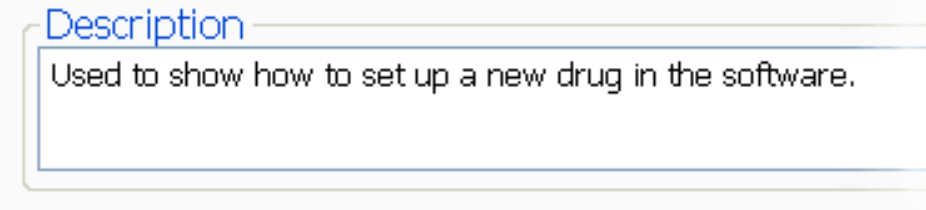


The Add New Medication window appears.

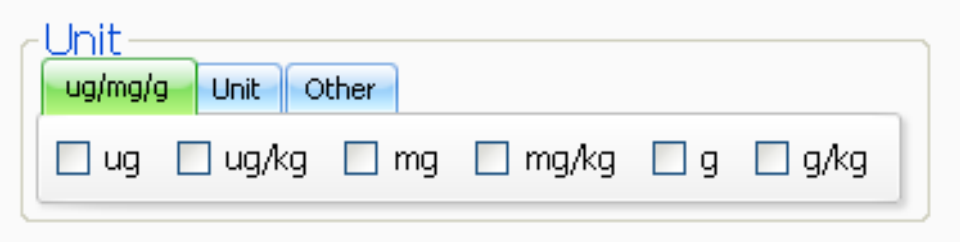


3. Type the name of the drug under New Medication following this pattern: Generic Name (Brand Name).

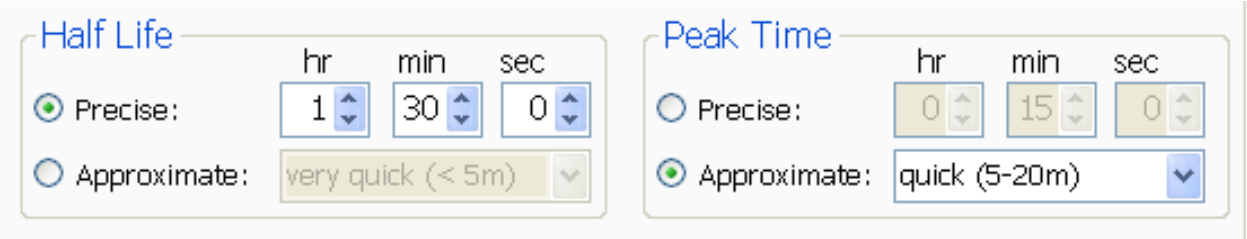
4. Under the Description field, type the condition this medication treats. You can add a Note at the end of your description stating specific explanations about the dosage.



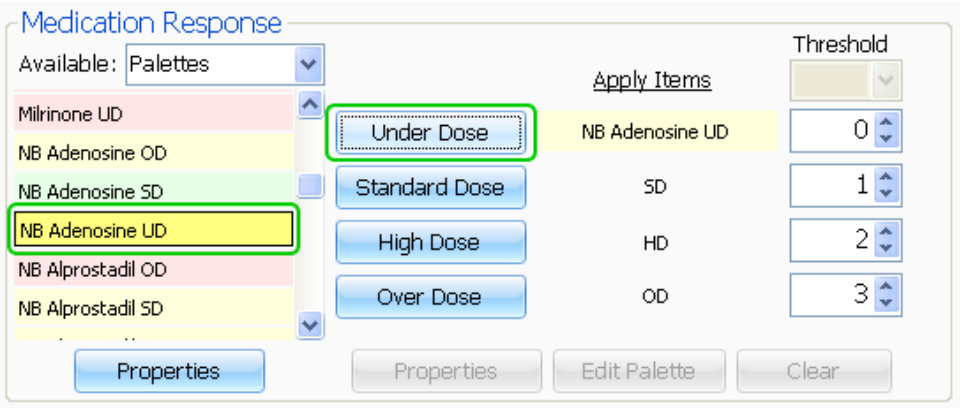
5. Select the units and the administration route.



6. Specify the HALf Life and Peak time. If these numbers are unknown, use the approximate option to estimate these times. It is required that a HALf life and peak time are specified for each drug.

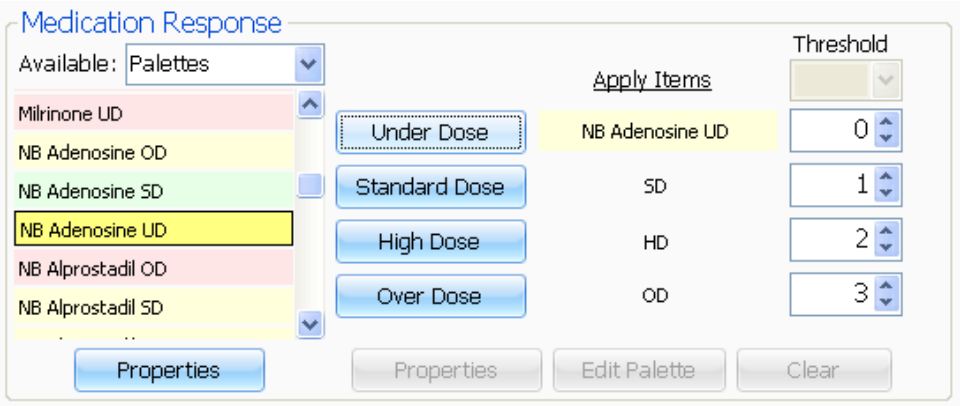


7. Find a list of the available palettes in the bottom left side of the page. To add the palettes you created to the drug profile, highlight the desired palette and click on the matching button.



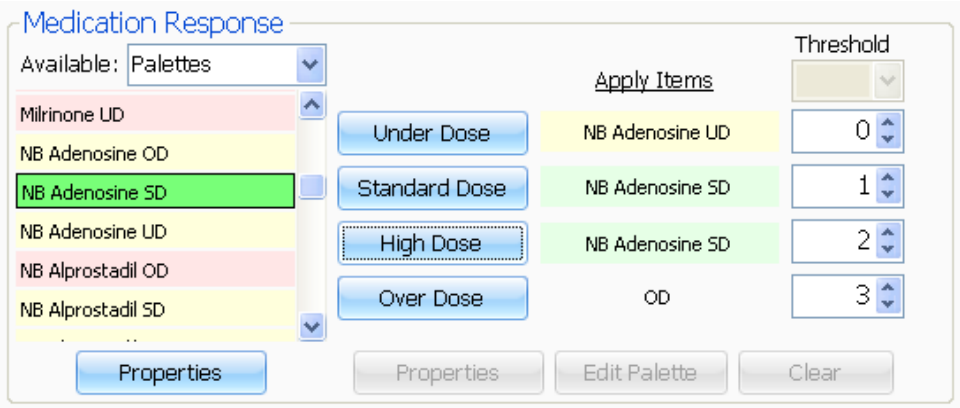
In the example above, select “NB Adenosine UD” and click on the Under Dose button that is indicated by the pointer. Once added, its name will appear between the dose buttons and the

threshold numbers.

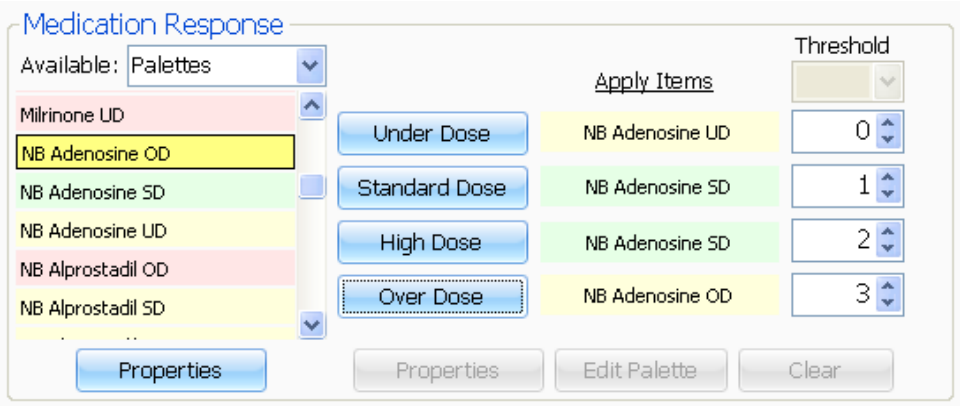


Do the same for the other three palettes and enter the threshold value for each.

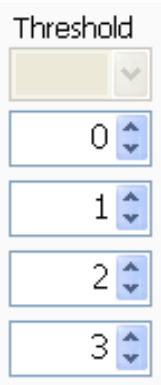
You may use the same palette for more than one dose. Such is the case for Adenosine, for example:



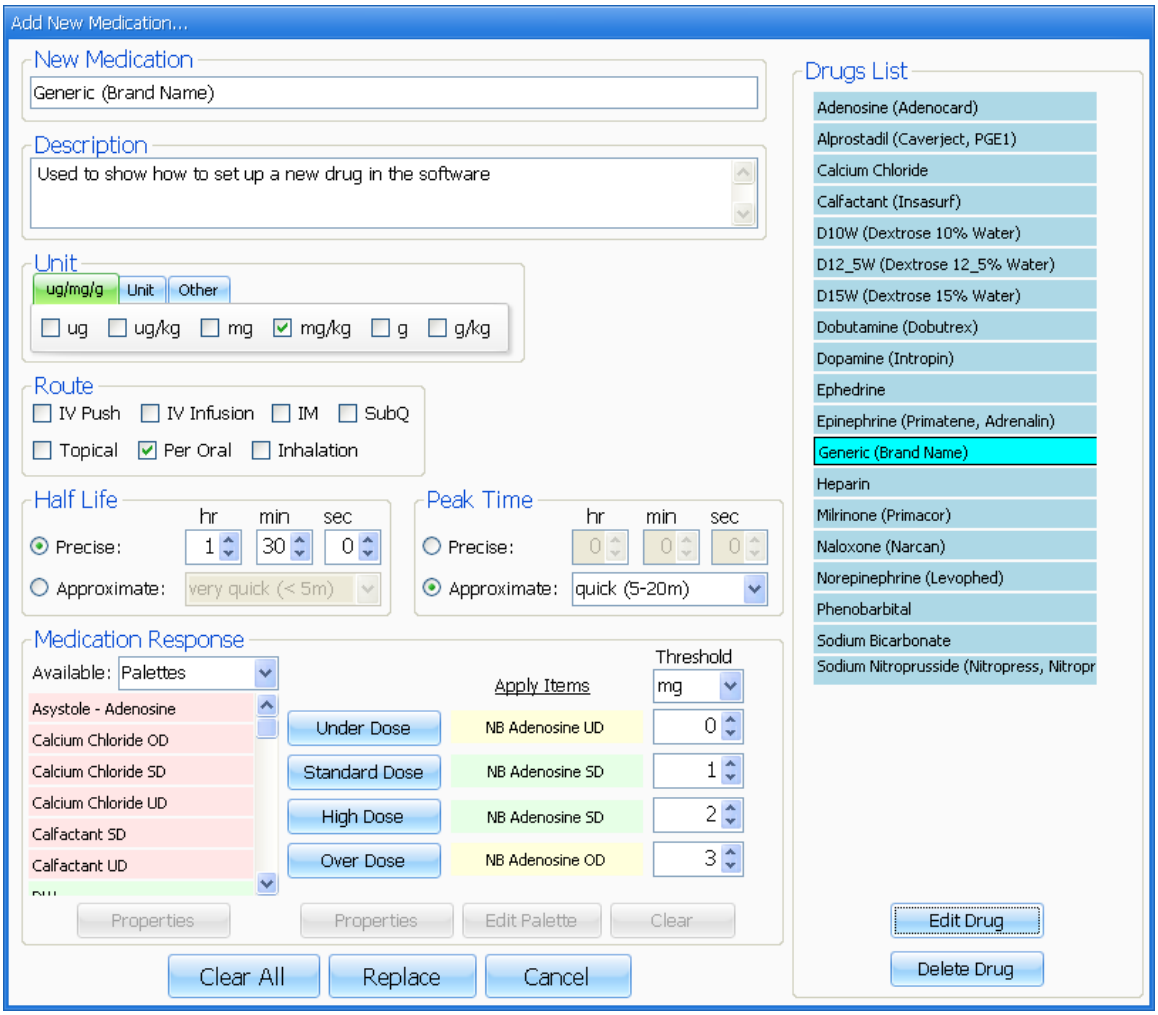
Notice that in the case of Adenosine, there are only three pallets: NB Adenosine UD, NB Adenosine SD and NB Adenosine OD. The standard dose is used in this drug profile twice, once each for the standard and high dosages.



8. Specify the units for the threshold and type the threshold quantity for each dose effect.

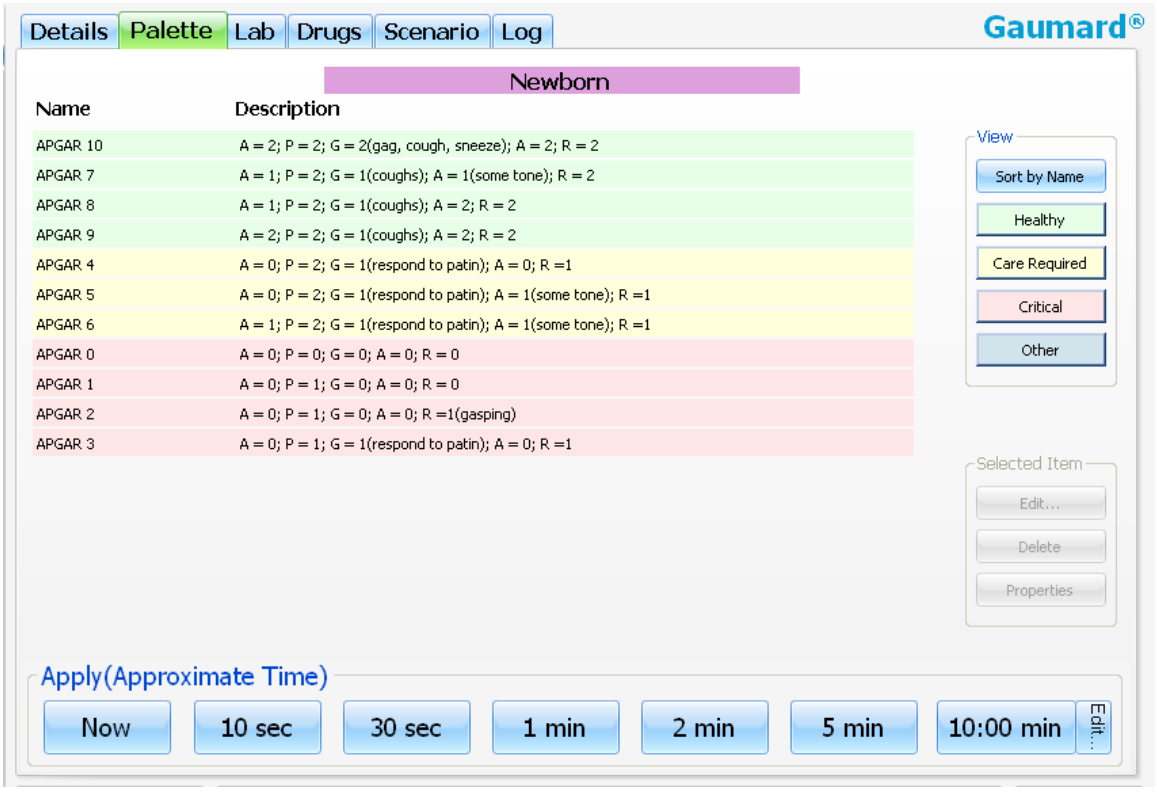


9. After completing the drug profile, click “Add”.



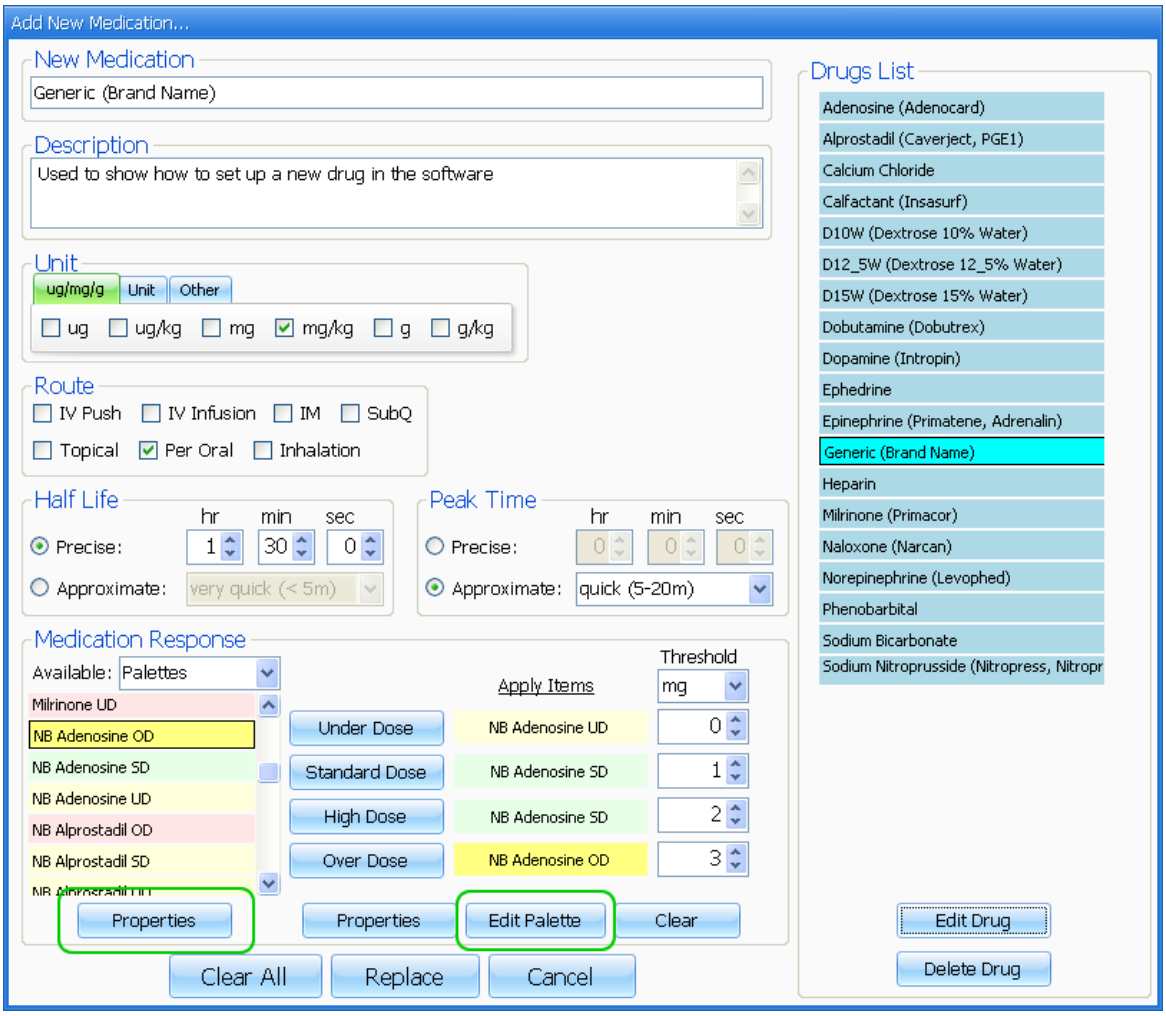
Note:

- You can edit the drug profile of any of the drugs. To do so, click on the button labeled “Manage Drug List.” Select the drug you will to edit and click on “Edit Drug.” Make the desired changes, and click on the “Replace” button to save them.
- You can view a list of all palettes by clicking on the Palette tab. From this page, you can also view the properties you selected for each item. To do so, highlight the desired palette and click on properties on the left side column under Selected Item.

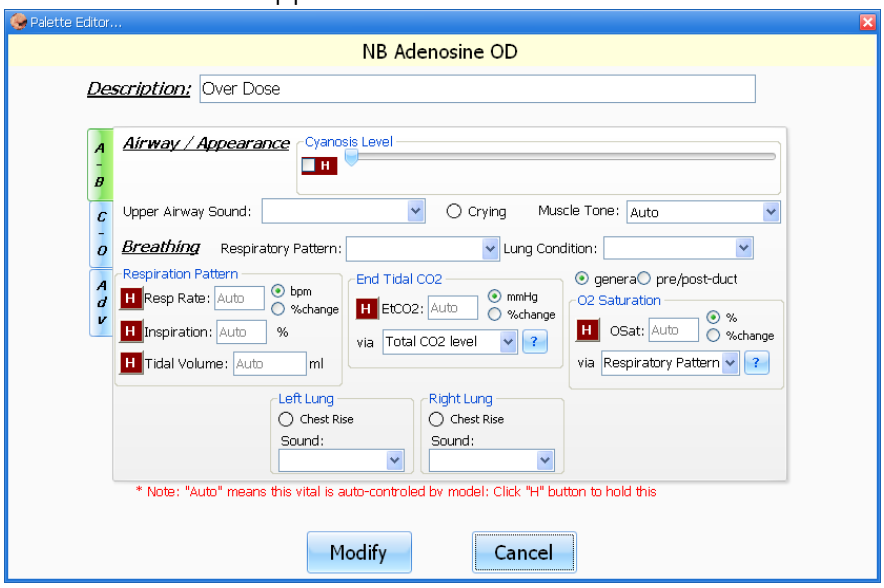


If any changes are made to any of the palettes (UD, SD, HD, or OD) from the Drugs page, a prompt to decide if you want those changes to apply to the original palette item as well will display. Click OK to make those changes take place.

Compare the properties of the original palette versus the properties of the palettes selected for each drug. To do that, click on the buttons labeled properties shown in the figure below:

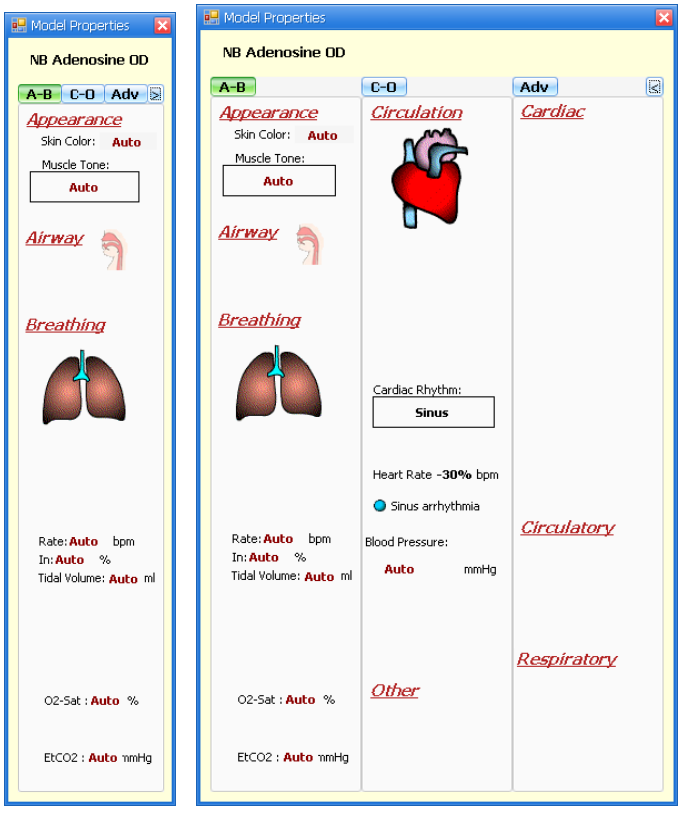


The Palette Editor appears when the Edit Palette button is clicked:



The Properties windows, using Adenosine as the example, will look as follows:

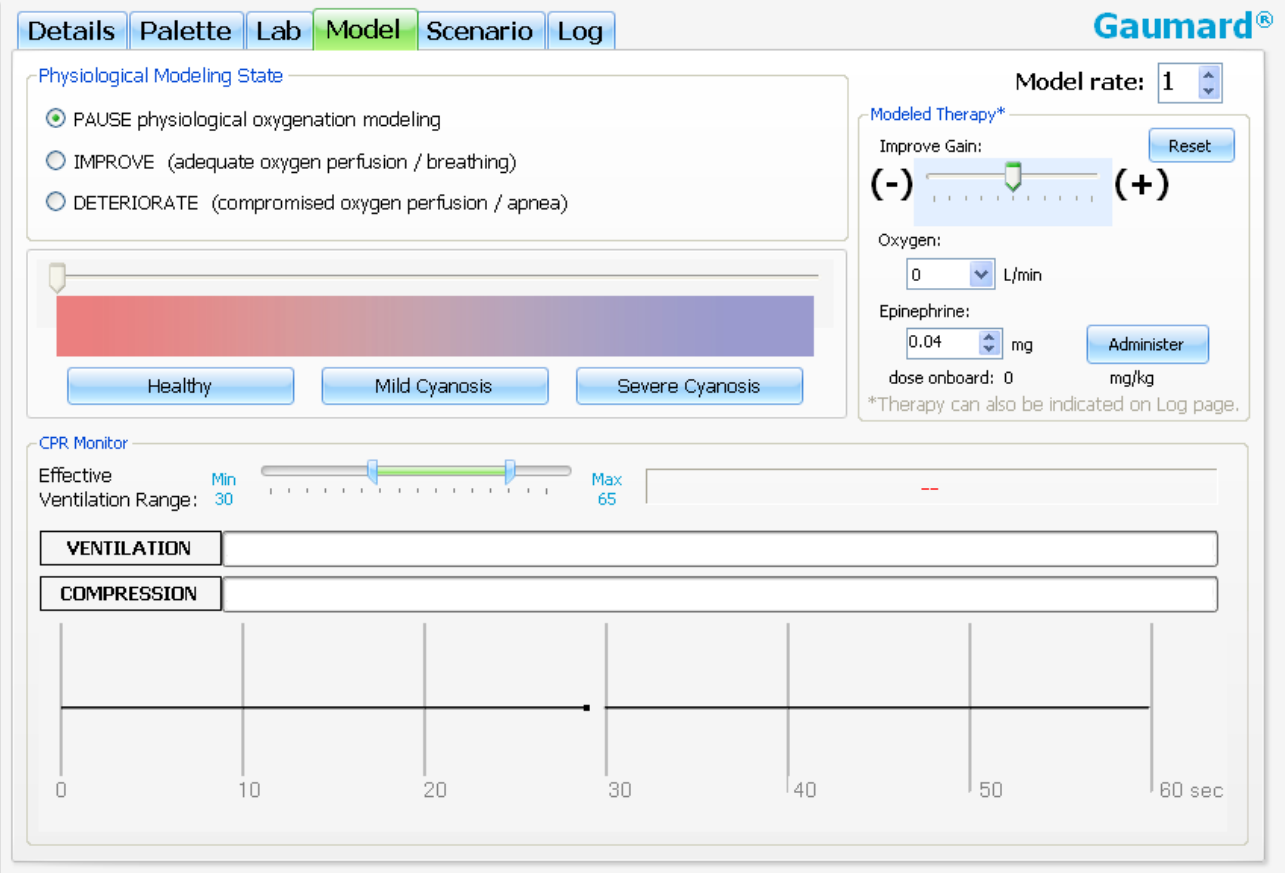
Single view *Expanded*



Notice that the same three tabs from the details page are present (A/B, C/O, Adv). When you click on any one of those, only the options that were selected under each section are displayed

7. Model

Cyanosis modeling is one of the most exciting features of Pediatric HAL®. The physiological model controls all vital signs and skin color and, depending on effectiveness of provider intervention, it will improve or deteriorate the state of Pediatric HAL®. The model speed can be controlled through the Model warp-factor, which goes from 1 to 5 (1 representing real-time).



Physiological Modeling State

Pause: Model will pause at the current state.
Improve: Model trend to a healthy state. Once the model reaches the complete Healthy state, the model will go to *Pause* mode.
Deteriorate: Model will trend to a severe cyanotic state. If ventilations given to the neonate are of correct depth and between 40 and 60 per minute, the vital signs will improve. Otherwise, they will continue to deteriorate.

Cyanosis Levels

The facilitator can quickly jump to any of the 3 points in the state of the model.

Healthy: Pedi is pink with adequate oxygenation.
Mild Cyanosis: Pedi is bluish and vital signs are starting to deteriorate.
Severe Cyanosis: Pedi is blue, apneic and vital signs are rapidly worsening.

Modeled Therapy

Improve Gain: Moving this slider will help increase or decrease the cyanotic response to ventilations.
Oxygen: By selecting an oxygen rate, the baby will improve faster with proper ventilation. "Flow On" must be selected to activate the oxygen response.
Epinephrine: Select the desired epinephrine dose and then select "Administer". Immediately the heart rate of the Pediatric HAL® should rise and the dose on board should start diminishing over time. The dose should be enough to increase the heart rate a small percentage in order to help the oxygen delivery in the system, therefore helping improve the neonate with proper ventilation.
Reset: By selecting "Reset" the oxygen flow and the epinephrine dose onboard will be eliminated.

CPR Monitor

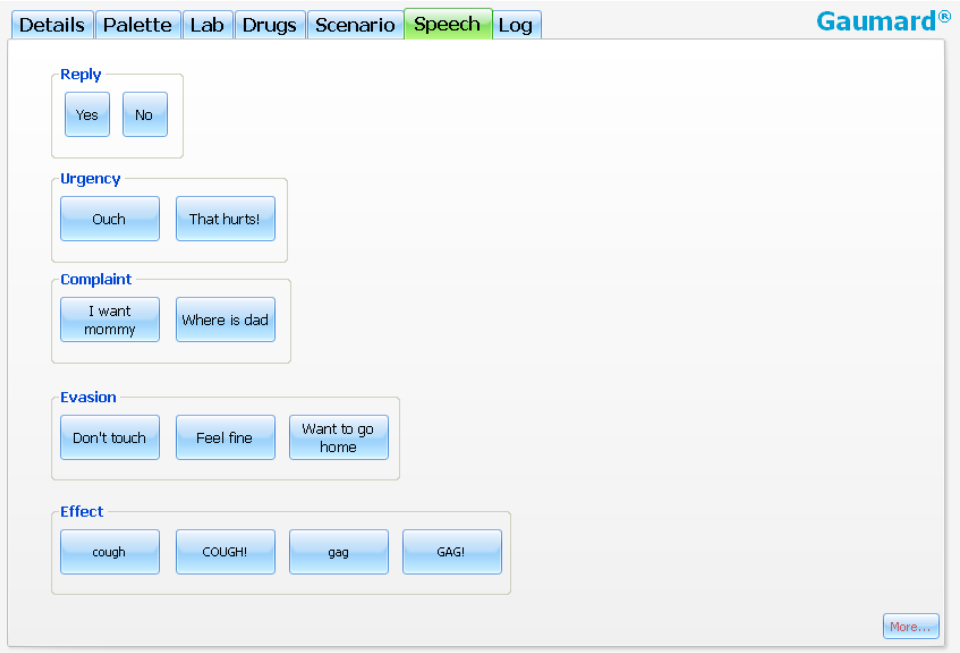
The CPR monitor has two bar graphs and a real time display that gives the user feedback on the CPR given to Pediatric HAL®. Both bar graphs have a label on the left that change color representing low (yellow), correct (green) and high (red) levels of treatment. At the same time the real time graphs also show each compression and ventilation.

8. Speech

a. Prerecorded Sounds

Pediatric HAL® has many pre-recorded expressions that can be initiated with a single click on the Speech page. The collection of speech and other sounds was chosen to cover a wide range of simulated emergencies.

S3004 Pediatric HAL® One Year Old:



S3005 Pediatric HAL® Five Year Old:

One benefit of prerecorded sounds are that they are consistent, so that providers' interpretation of Pediatric HAL®'s speech is not colored by the variable quality of an actor's performance. Further, the facilitator need not spend time and resources casting and directing said actor.

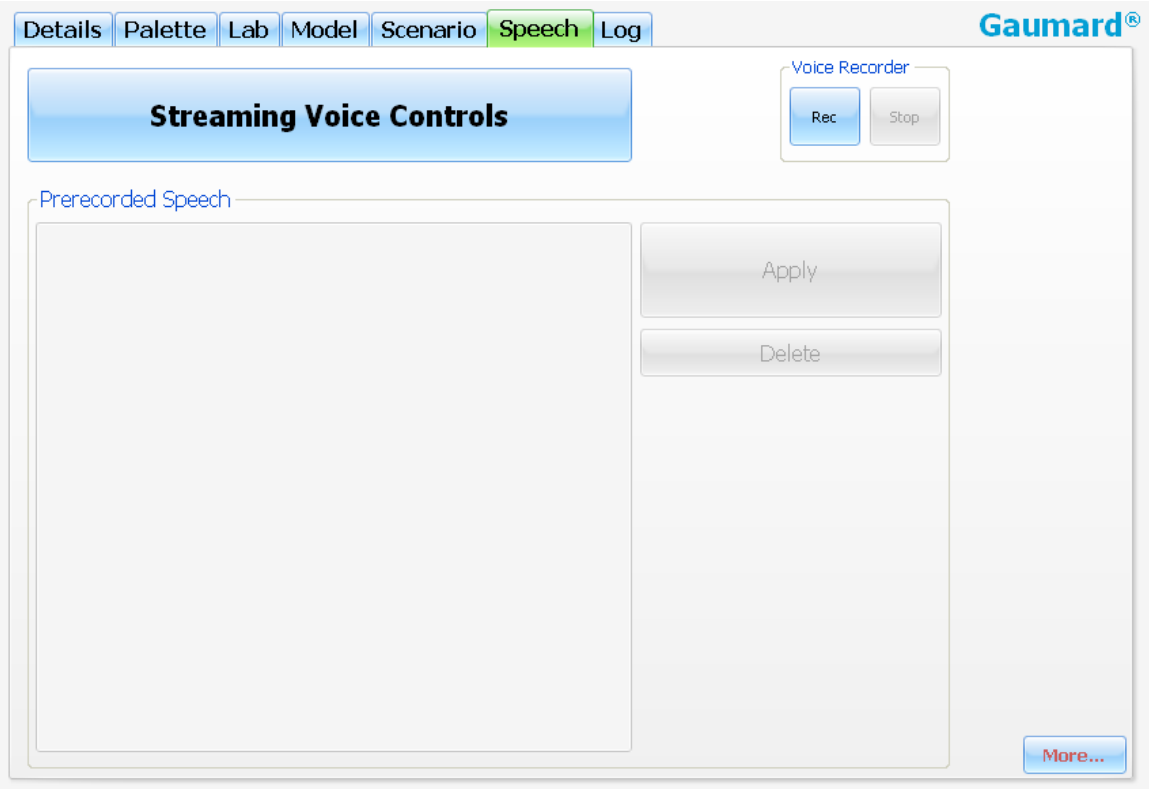
For ease of use, Pediatric HAL®'s expressions are divided into natural categories and laid out on a single page, all visible at once.

b. Streaming Audio (if factory installed)

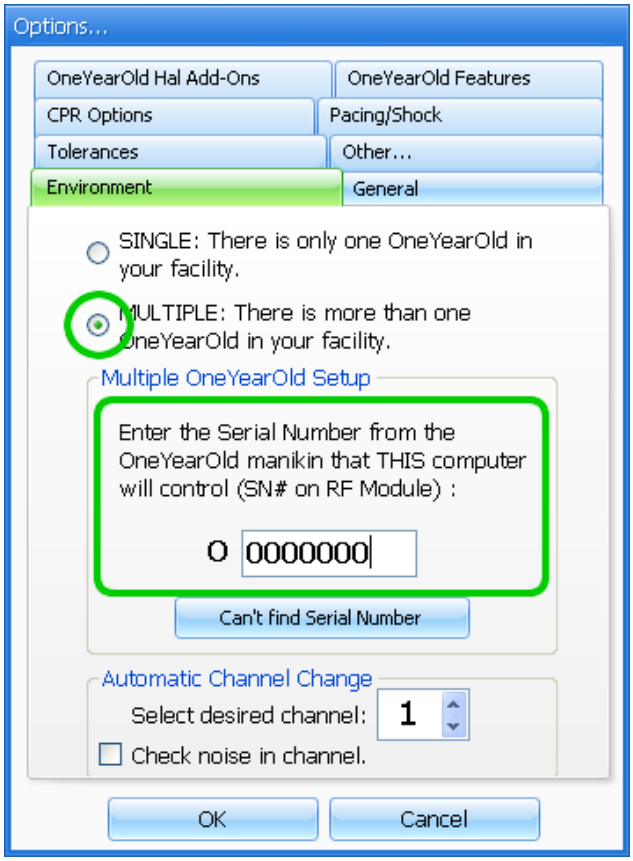
Streaming audio makes your simulation even more realistic. It allows the instructor to hear everything the providers around the simulator are discussing.

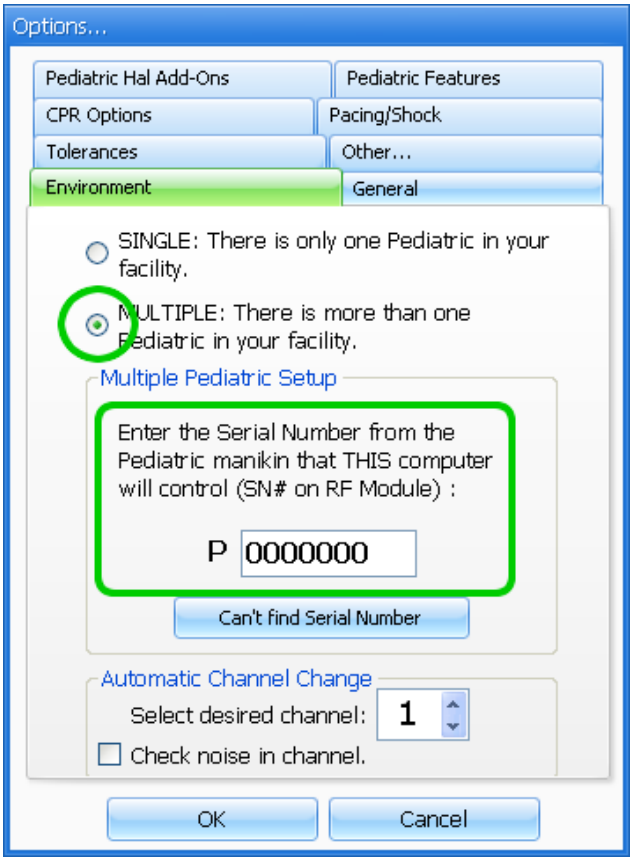
At the same time, the instructor and provider can interact as if the instructor were the patient. The instructor will also be able to record his or her own speech phrases that can be used at any given time or within a scenario.

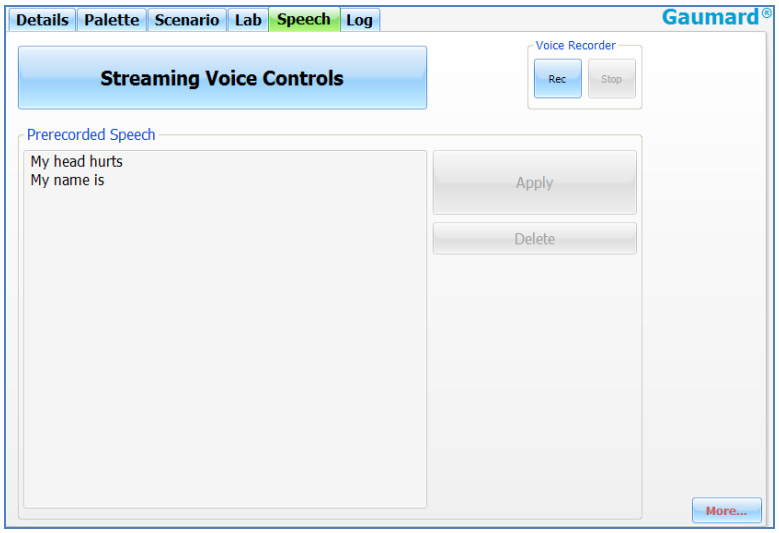
The streaming audio is located on the “Speech Tab” of the GUI.



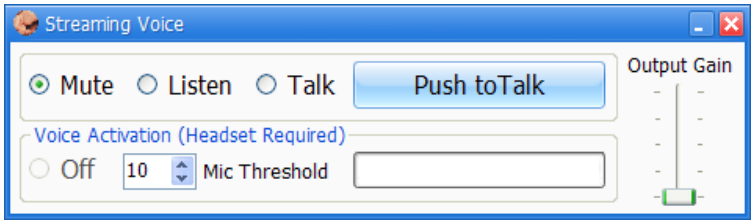
Warning: You **must** have the GUI environment set on **multiple** manikins with your simulator's **serial number specified**. To do so, go to Setup, Options and click on the environment tab.

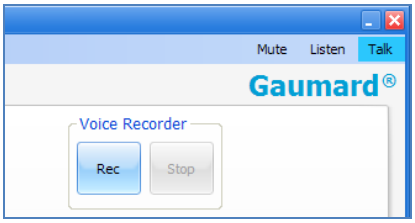






Streaming Voice Controls: This button opens a new dialog box that is available to the user at all times. Selections on that dialog box include "Mute," "Listen," and "Talk". Select "Mute" to stop the communication; "Listen" to hear what providers are saying, or "Talk" to speak to the providers as the manikin's voice. Mute, Listen and Talk controls are always available on the top right corner of the user interface.





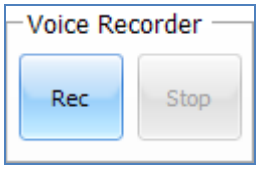
It is recommended that the instructor uses a headset to improve sound quality. The headset also allows the user to use the "Voice Activation" so that at any time the instructor wishes to speak, it is sent directly to the manikin without user intervention.

The voice activation threshold can be adjusted. The "Mic Threshold" is used to adjust how sensitive the microphone is to the user's voice. The higher the threshold, the less sensitive the microphone is; and vice versa. For instance, if the threshold is set to high, users must speak loudly for the microphone to detect the audio.

Voice Clarity

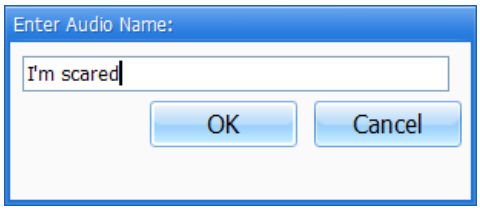
To achieve better clarity:

- Verify that the physical MIC control on the headset is set to high.
- Enable "Microphone boost" from the Windows setting
- Use the "Output Gain" to increase the microphone volume as a last resource. To raise the output gain in increments, tap and hold the control, then slide to the desired level.



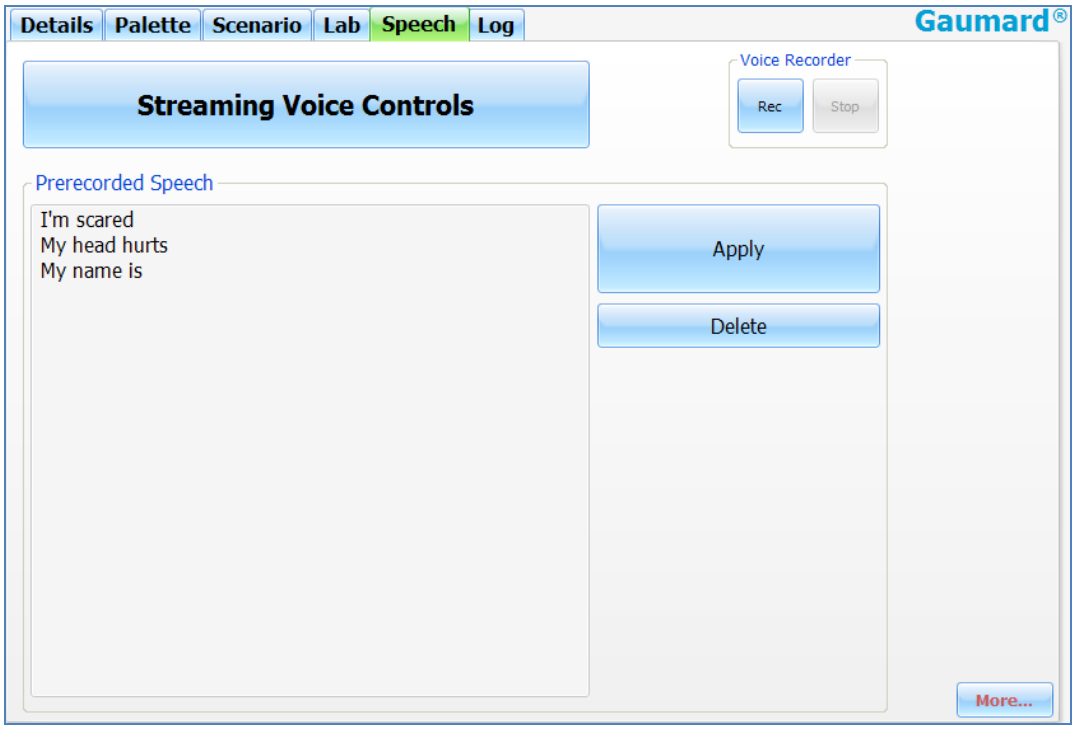
Voice Recorder: The instructor is able to record his/her own speech phrases at any time. Once the instructor clicks on the "Rec" button the software automatically starts capturing everything that is said into the microphone.

Press “Stop” to finish recording. Use the Enter Audio Name window to name the speech phrase.



Enter a name and click “OK.” The phrase will now be accessible under the “Prerecorded Speech” menu.

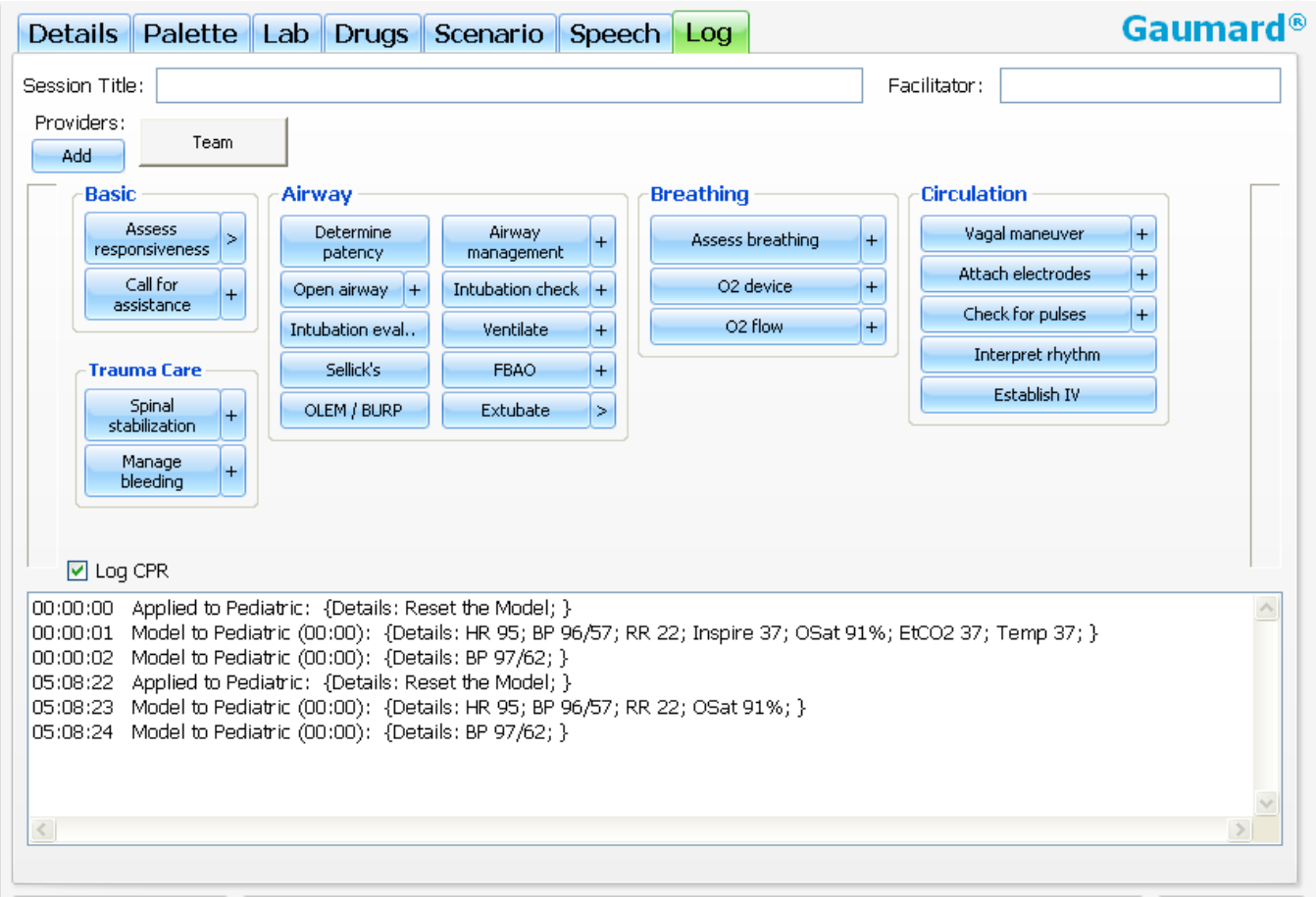
Prerecorded Speech: On this section the instructor is able to play any of the custom phrases by either typing on the text box or clicking on the menu option. Once a phrase is selected, it can be played as the manikin’s voice or deleted.



More...: If the instructor wishes to play any of the Simulator’s prerecorded speech phrases, he or she will need to click on the “More...” button located on the bottom right corner of the Speech page.

9. Log

The Log page allows the facilitator to keep track of every event during a session. It automatically creates an entry whenever a detected event occurs as well as every time there is a change in the patient's condition. In addition, the facilitator can log observed provider actions with a simple click.



The Log page consists of four different areas (from bottom to top): the text log, provider action buttons, team logging buttons, and session info.

a. Text Log

This is the large panel at the bottom of the Log Page, containing all the time-stamped text entries. Every event in a session is recorded as an entry in the Text Log. The different types of entries are: Actions, Applied Changes, Detected Events, Evaluations, Model, and Notes.

Actions

Actions refer to those performed by one of the providers in the session. The facilitator can quickly log actions from the Provider Actions section and make the entry more specific using the Team Logging feature. The following is an example of an Action entry:

"00:07:24 Action (Assess responsiveness)"

Applied Changes

An "Applied" log entry occurs automatically every time there is a change to the physiological condition of the manikin. In other words, every time changes are made from the Details page, Palette page, or from a Scenario a log entry like the following is created:

"00:04:01 Applied (00:30): Details: Rhythm Sinus; Cardiac event 0; HR 140;"

Detected Events

Every time one of the various sensors in the manikin detects a provider action, it is automatically logged as a "Detected" entry. These actions include intubation, BP cuff placement, artificial ventilations, and chest compressions. The following example shows an entry after a provider performs BVM ventilation:

"00:03:26 Detected (ventilation): correct"

Evaluations

Evaluations are added by the facilitator by clicking on the "Satisfactory" or "Unsatisfactory" buttons on the Evaluation panel. Team Logging allows the facilitator to evaluate individual providers with a single click. For example, if provider Charles Parker did a correct procedure, the Evaluation entry would be:

"00:00:28 [Charles Parker] Evaluation (Care Provided): SATISFACTORY"

Model

When the facilitator changes the state of the cyanosis model from the Model page, an entry in the text log is automatically generated:

"00:18:10 Action (Hypoxia Model): deteriorating

Notes

Notes can be entered directly from the Evaluation panel or by right-clicking on the text log and adding a note. The following is an example of a Note entry:

"00:10:10 Note: provider took too long to assess patient."

b. Provider actions

The Provider Actions section refers to the collection of buttons in the middle of the page. It allows the facilitator to accurately keep track of provider actions. The buttons are grouped into 6 groups: Basic, Trauma Care, Airway, Breathing, Circulation, and Medication. Anytime the facilitator clicks one of the buttons, a time-stamped log entry is generated with that particular action. For example, if the "Assess responsiveness" button is clicked when the session clock reads 00:07:24, the following entry is automatically generated:

"00:07:24 Action (Assess Responsiveness)"

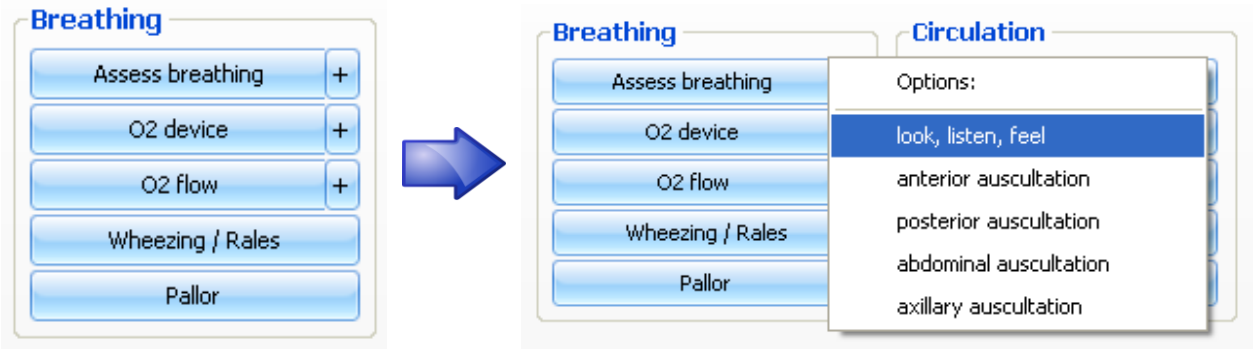
Special Buttons

Some provider-action buttons are accompanied by a special option button.

The first special button, " **+** ", lets the facilitator log actions in more detail. For example, if the button "Assess breathing" is clicked, the following entry is created:

"00:01:28 Action (Assess breathing)"

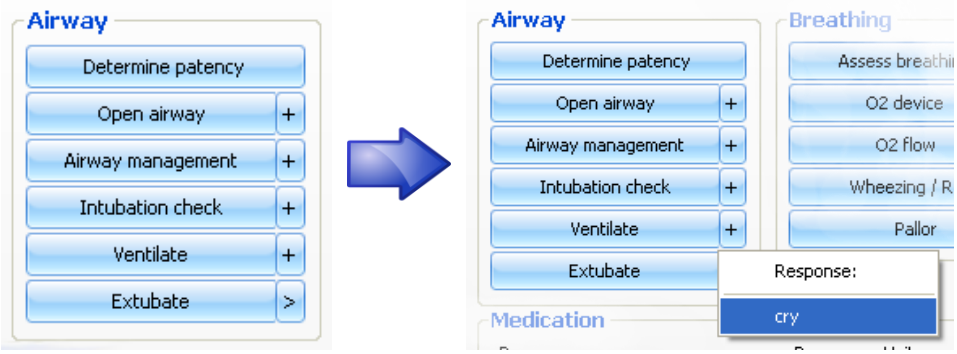
On the other hand, if the " **+** " button next to "Ventilate" is clicked, a list of additional options appears. The facilitator can be more specific and choose, for example, "look, listen, feel"...



...and the following entry is added:

"00:01:28 Action (Ventilate): look, listen, feel"

The second special button, " **>** ", allows pre-programming common responses to specific actions. For example, the facilitator can pre-program normal respiratory sounds and re-enable the lungs when the provider performs a needle decompression.



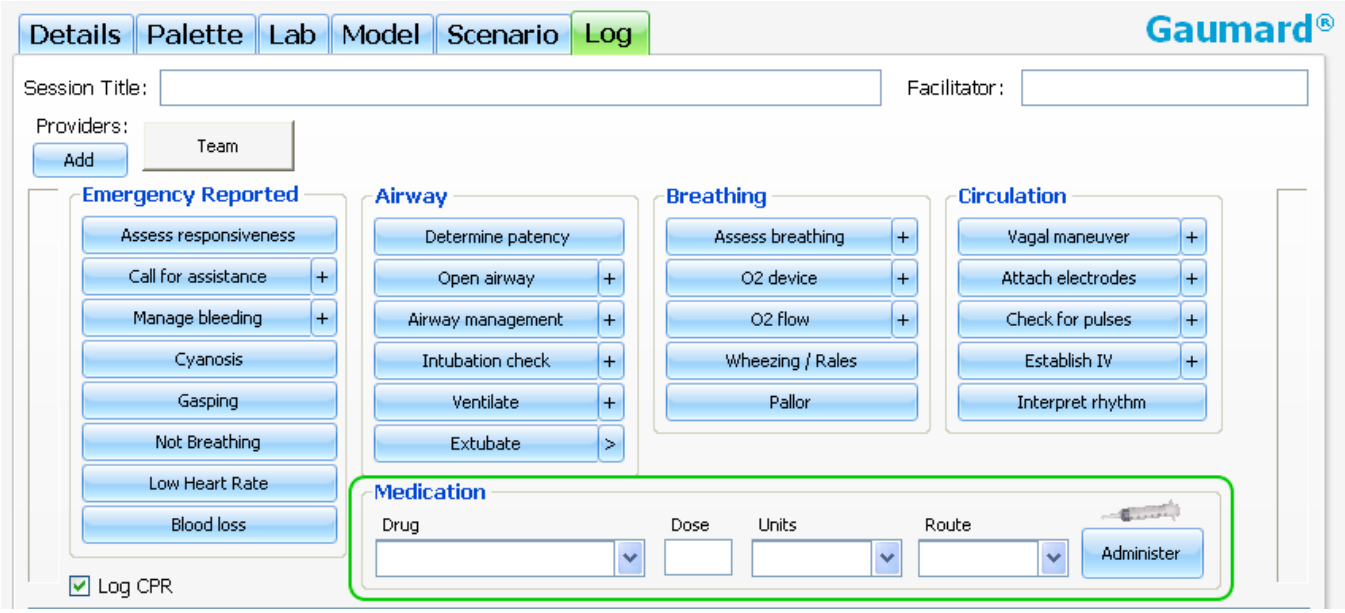
When the "extubate" button is clicked the following entry is created:

"00:01:28 Action (Extubate): cough"

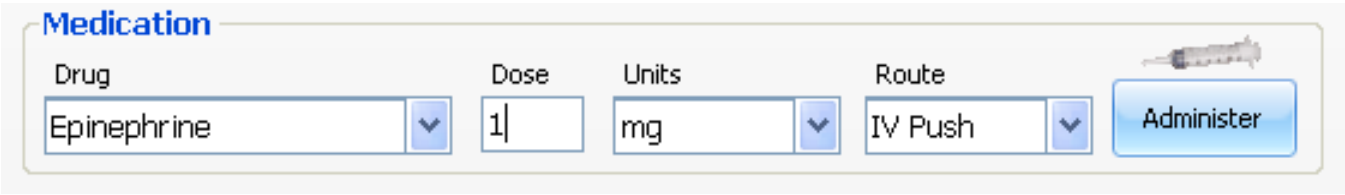
Medications (Manual Mode Only)

The Medications section allows for easy and fast logging of drugs administration, including dose and route. The software comes preloaded with a set of commonly used drugs. Each of these

drugs has a default dose unit and a default route for administration (which can be overwritten by just typing over). For example, for Epinephrine the default dose unit is "ml/kg" and the default route is "IVP" (intravenous push). In order to enter, for example, that a provider administered .1 ml/kg of epinephrine via IVP, the facilitator just has to enter the text "e"; the software automatically searches the drug list and displays the best match (if any).



After a drug has been selected, just clicking on the “dose” text field automatically fills the units and route fields with the default values for that particular drug.



The facilitator then enters the dose and clicks on the “Administered” button and a log entry is created (let's say the dose entered was “.1”):

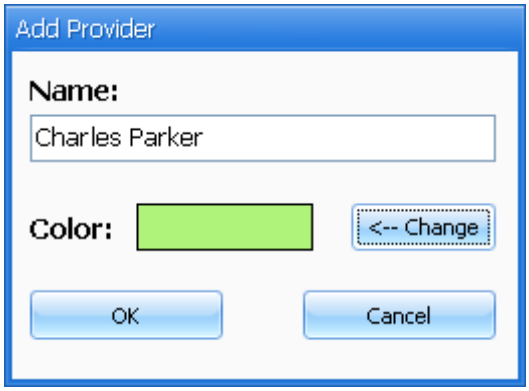
"00:05:43 Action (Medication Administered): Epinephrine, .1ml/kg, IVB/IVP"

c. Team Logging

The Team Logging feature allows the facilitator to designate which member of the team

performed a particular action. The Team Logging section is right above the Provider Actions section on the Log page.

First, the facilitator should add all providers in the team, one by one, by clicking on the "Add" button and filling the "Add Provider" dialog box.



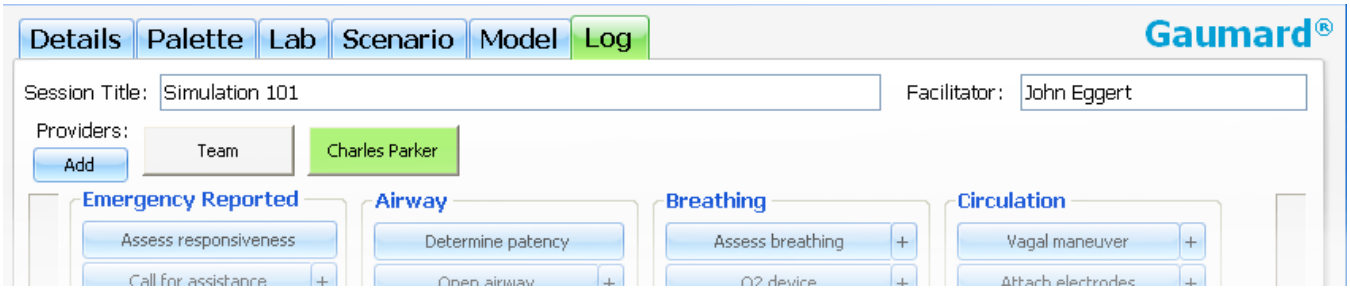
As shown in the Log Page image (at the beginning of this page), a colored button is inserted on the Team Logging region for the provider just added. There can be up to six different providers, each with a corresponding button. Every time one of the provider buttons is clicked, that person becomes the active provider. To indicate the active provider, the vertical bars on each side of the Log page will match the color chosen for that person. On the Log Page image, for example, the provider "Charles Parker" is the active provider, so the vertical bars are teal colored. While there is an active provider, every time a Provider Action or Evaluation log entry is created it will have the name of the provider added to it as follows:

"00:07:41 [Charles Parker] Action (Check for pulses): brachial"

To deactivate deselect the active provider and return to general logging, click the "Team" button and the vertical bars will return to neutral color. All provider buttons can be edited or deleted by right-clicking them and selecting an option from the menu.

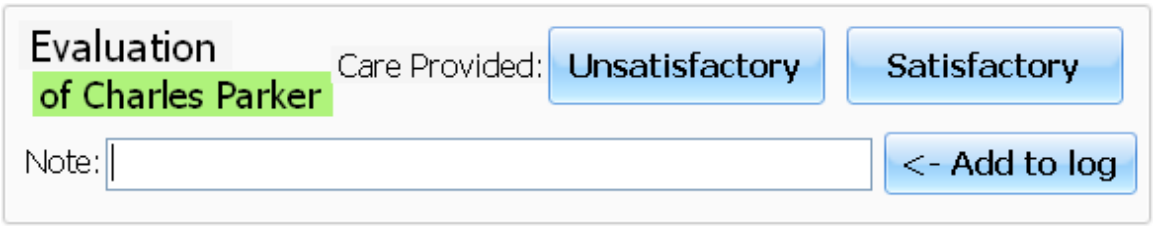
d. Session info

The session info area contains the "Session Title" and "Facilitator" fields at the top of the page. These fields are included when a report is saved or printed.

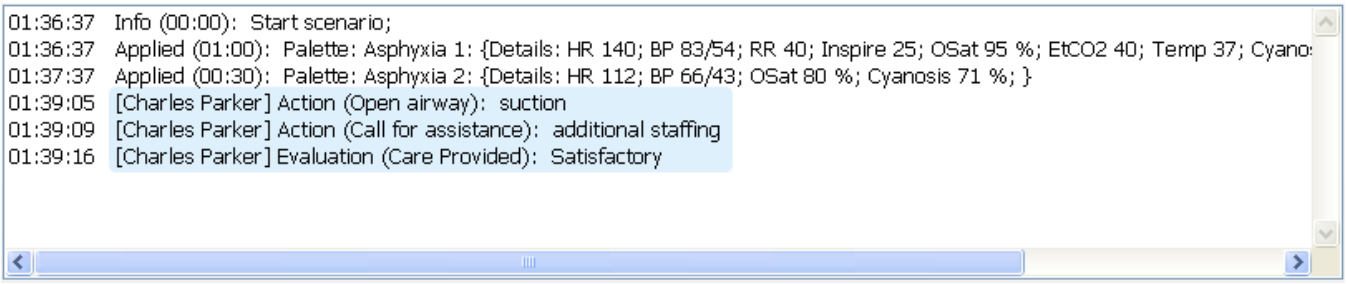


9. Evaluation

The Evaluation panel, always visible at the bottom of the software window, allows the facilitator to insert standard evaluations or arbitrary notes into the log. The stylus device and hand-writing recognition technology makes annotating in real-time very fast and convenient.

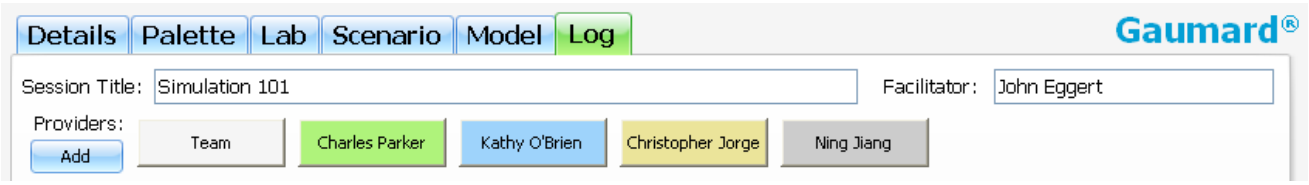


Standard evaluations are given context by their position in the log relative to detected and observed provider actions. The following example illustrates this idea.



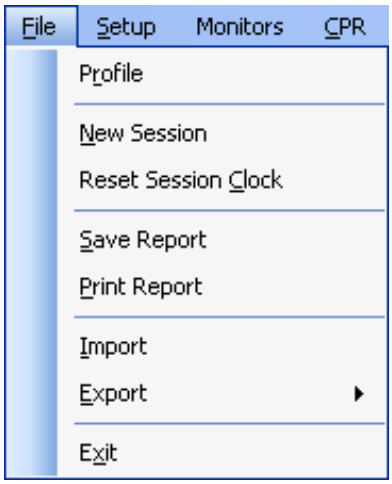
Note in the highlighted lines above that the provider "Charles Parker" cleared the patient's airway, called for help and was then evaluated on those actions.

The evaluation panel is part of the team-logging system, described previously. When a particular provider is selected, log entries generated via the Evaluation panel will be prepended with the provider's name. For more information on Team Logging, see the previous section of this guide on Logging.

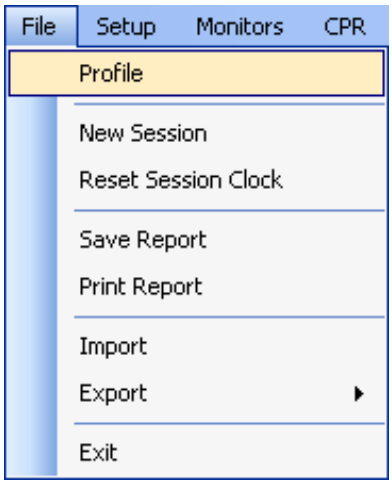


C. Menus

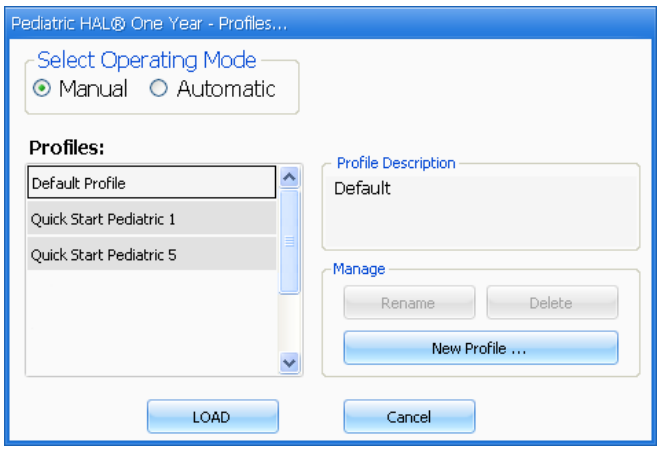
1. File

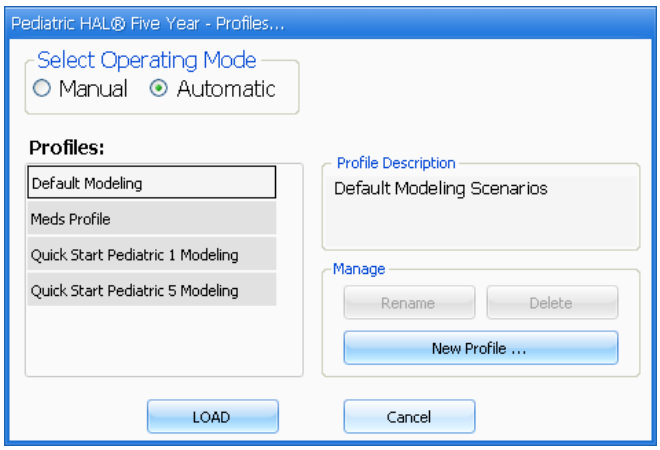


a. Profile



This option allows you to change your current profile. The profile window is displayed:

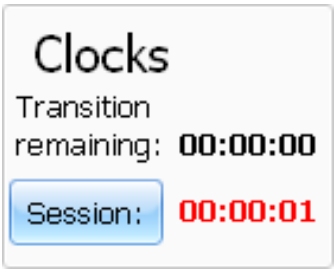




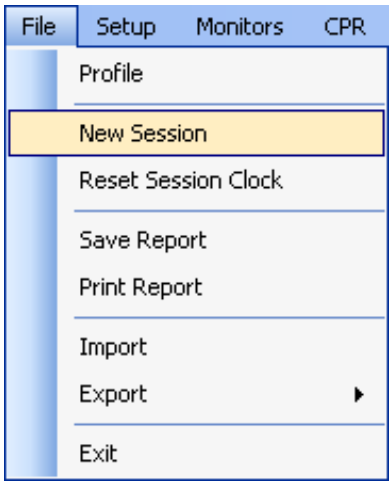
b. New Session

Clicking New Session in the file menu will:

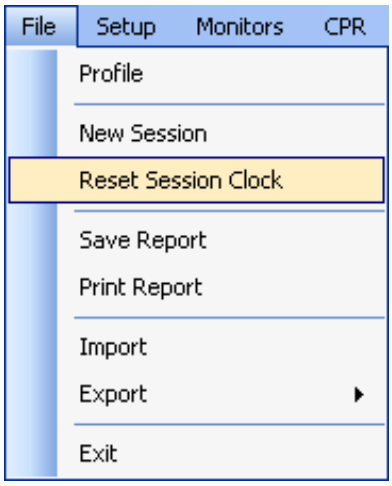
- ✓ Clear any loaded/playing scenario
- ✓ Clear any loaded/playing palette
- ✓ Resets vital signs to normal values
- ✓ Clears out log page
- ▪ Restarts the session clock. The session clock is located at the bottom of the window.



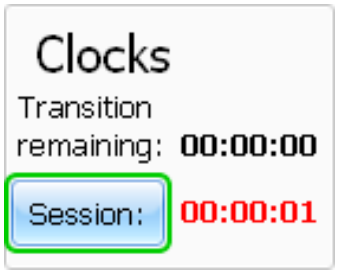
The shortcut key for staring a new session is **Ctrl + N**.



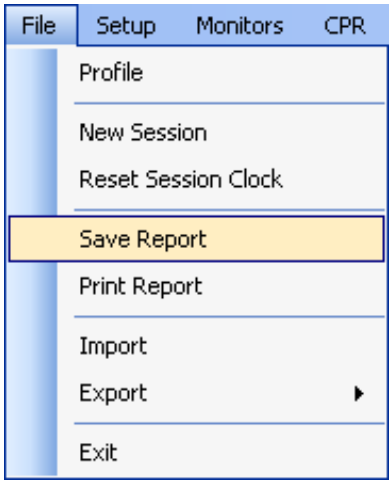
c. Reset session clock



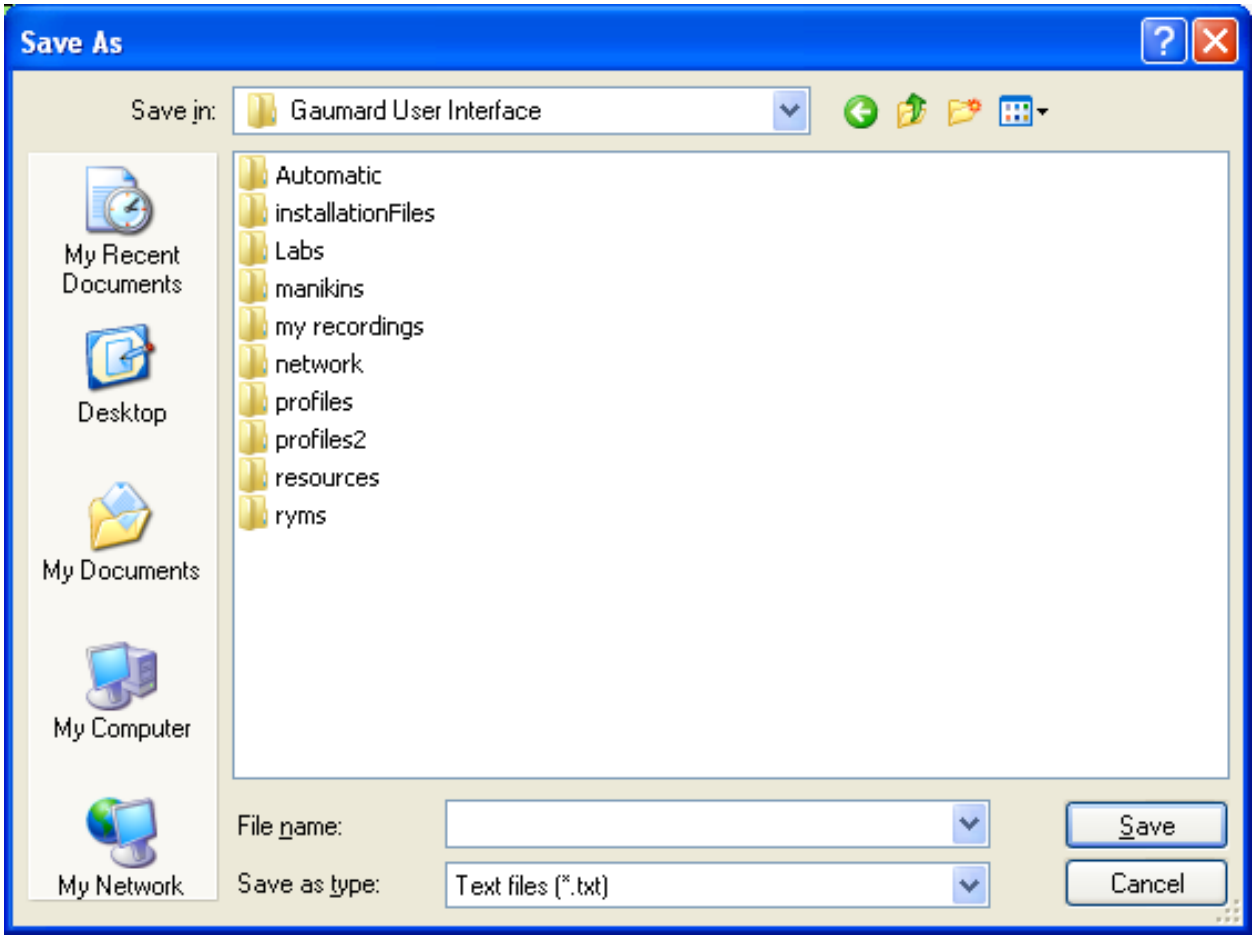
Clicking on Reset Session Clock resets the clock back to zero. It does not have any effect on the transition time remaining on a scenario; it does not reset the vital signs, or clear out loaded scenarios. The session clock may also be reset by clicking on the Session button next to the session time.



d. Save Report

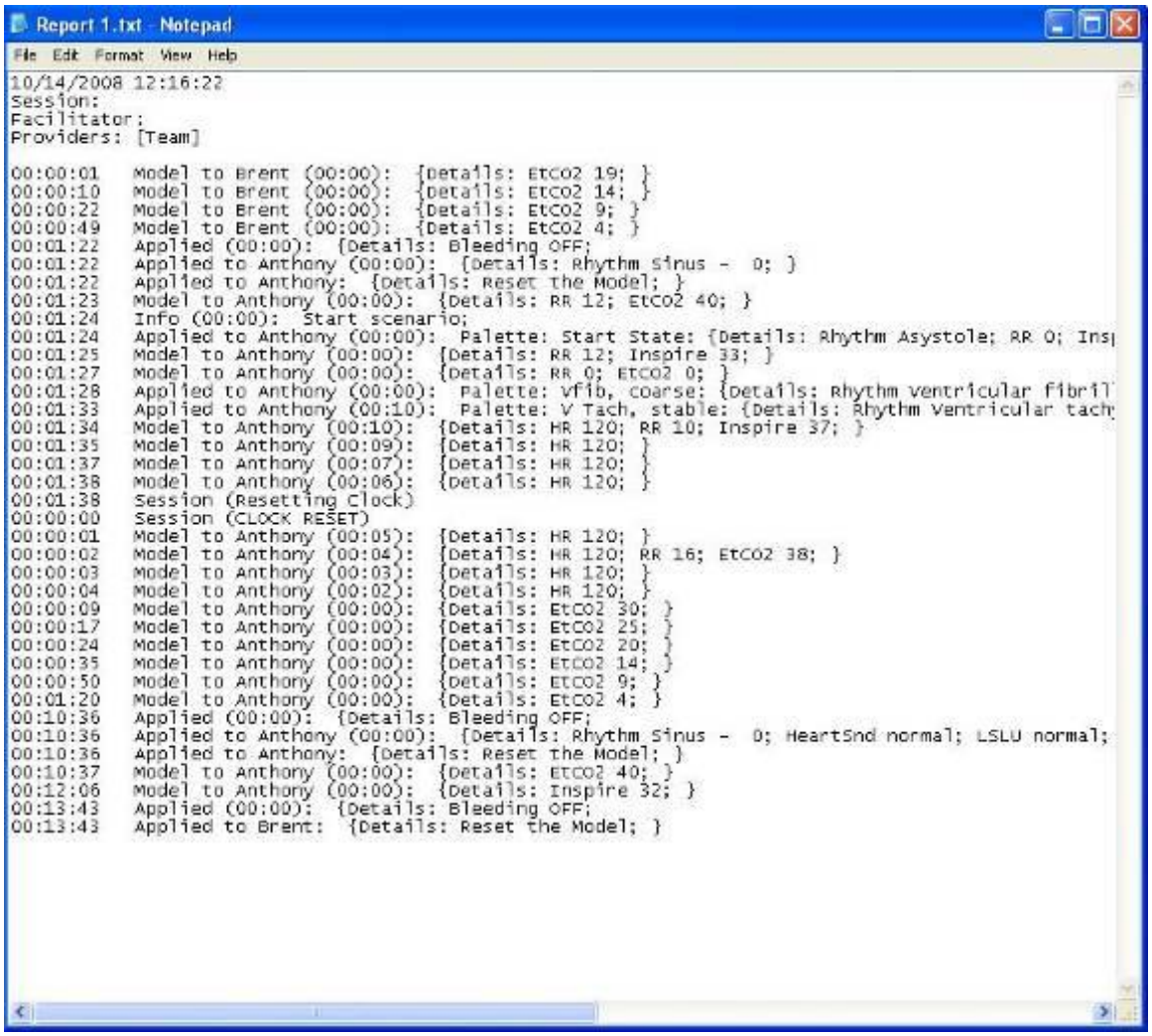


This option allows all the information recorded in the log page to be saved as a text file. Clicking on it brings up the "Save As" dialog box:

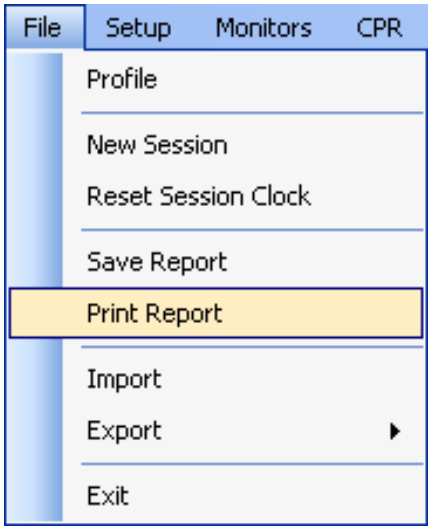


Select the desired name and path, and click "Save".

The shortcut key for saving a report is Ctrl + S. For a sample report, look at the figure below:



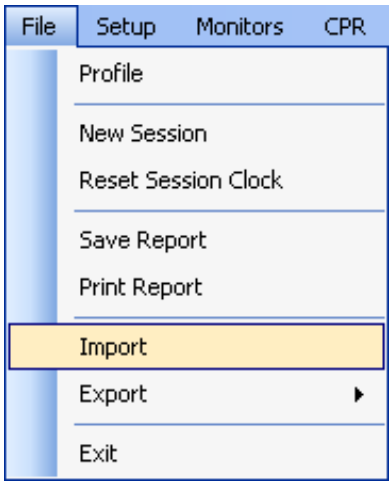
e. Print Report



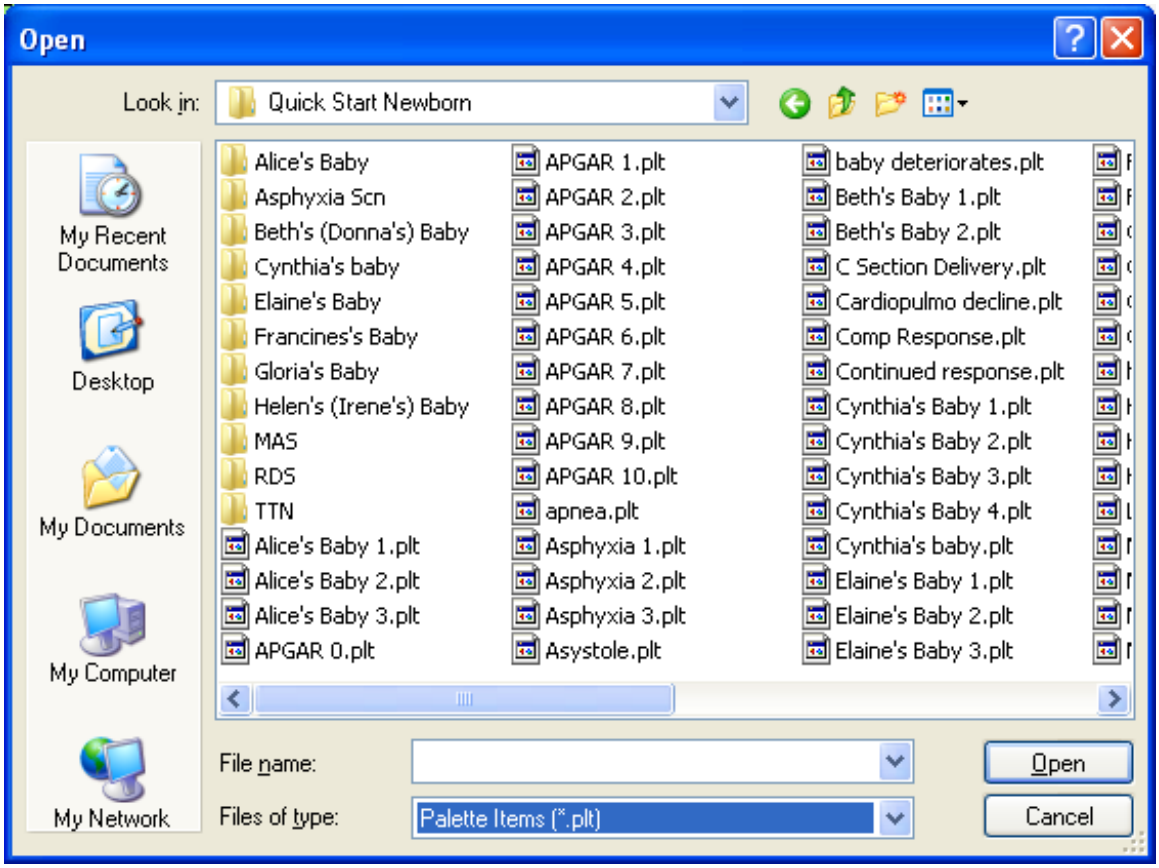
This option allows printing of a text file containing all the information in the log for the latest session. Clicking on Print Report brings up the Print window.

The shortcut key for this option is **Ctrl + P**.

f. Import

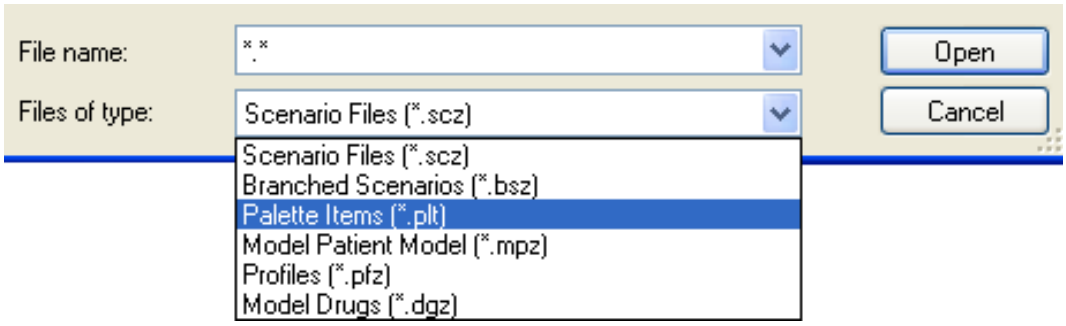


This tool allows the import of palettes, scenarios or modeling patients that may have been created in another tablet PC. When Import is clicked, the "Open" dialog box displays:

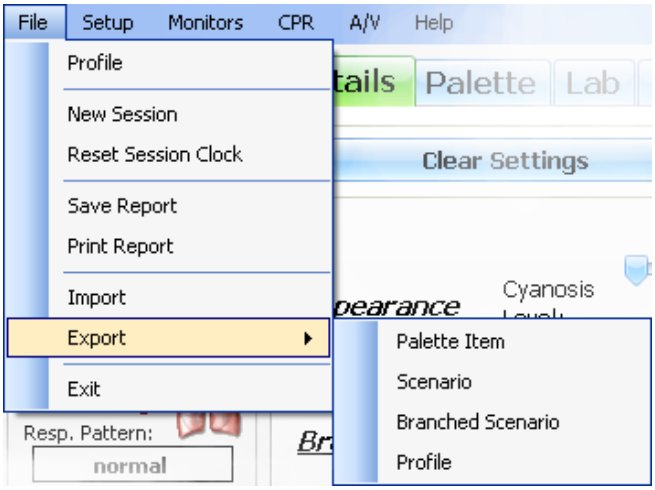


Browse to the location where the documents are saved and open it. They are automatically brought into the GaumardUI.

Make sure the correct file type is selected.

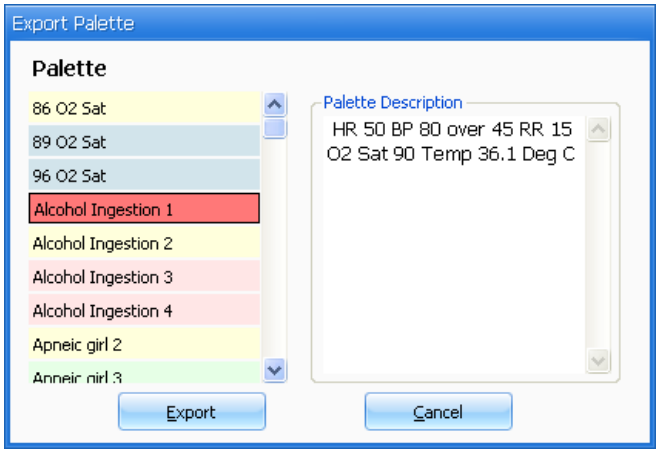


g. Export

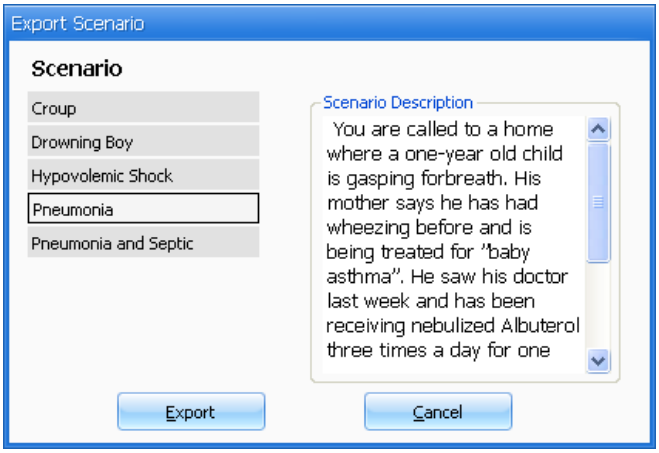


Palettes, scenarios (branched or linear), and model patients may be exported. After selecting the kind of file to export, the following dialog box is displayed appropriate to the file-type:

Export Palette

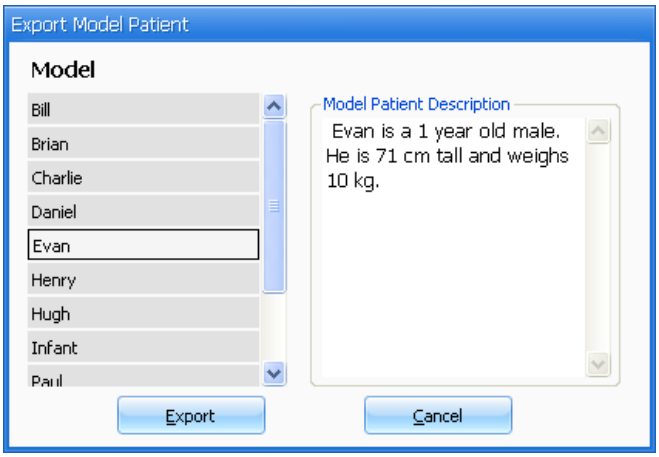


Export Scenario

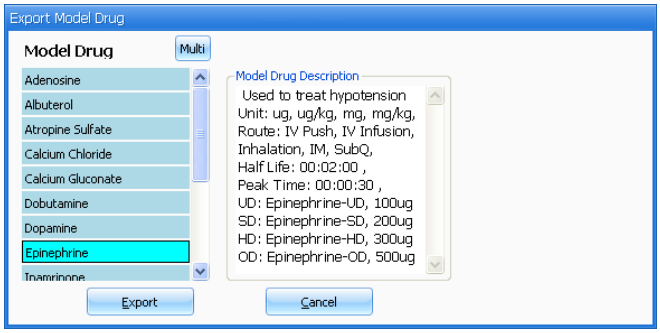


Export Branching Scenario

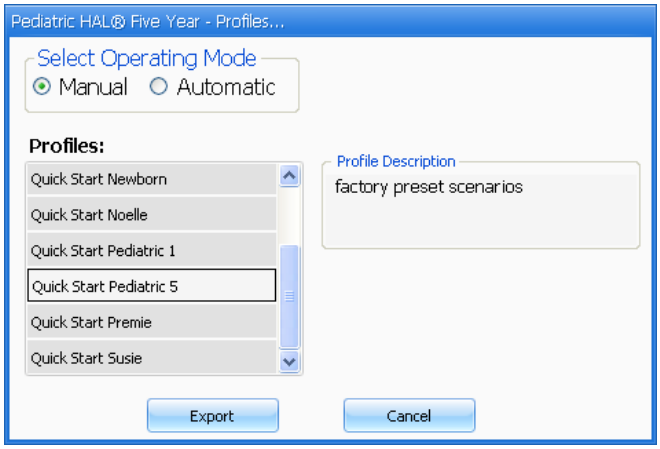
Export Model Patient (automatic mode only)



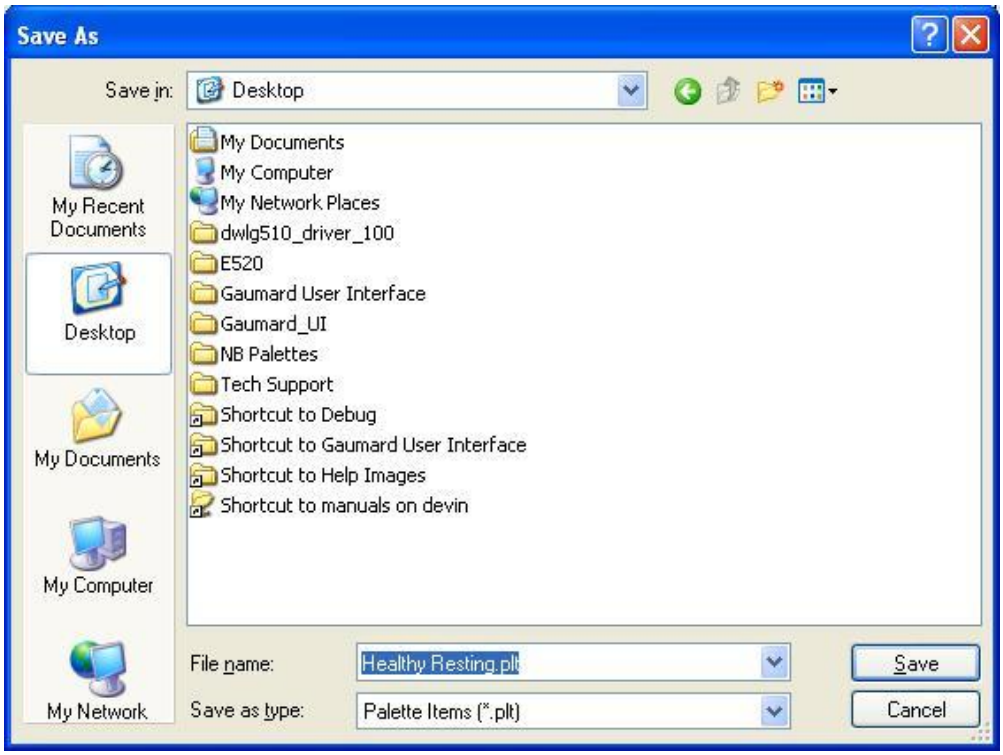
Export Model Drug (automatic mode only)



Export Profile

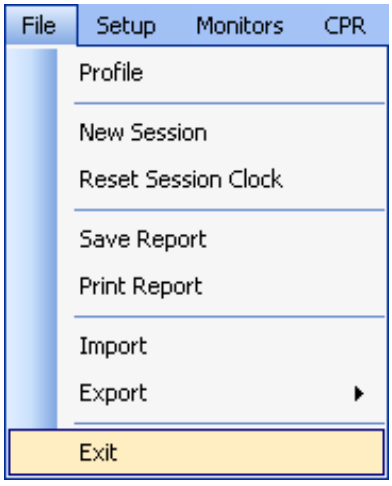


Make a selection and click “Export”. The “Save As” dialog box is then displayed:



Specify a path and click “Save”. Note that only one item may be exported at a time.

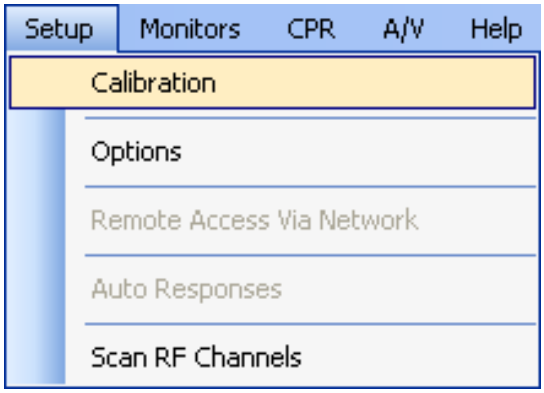
h. Exit



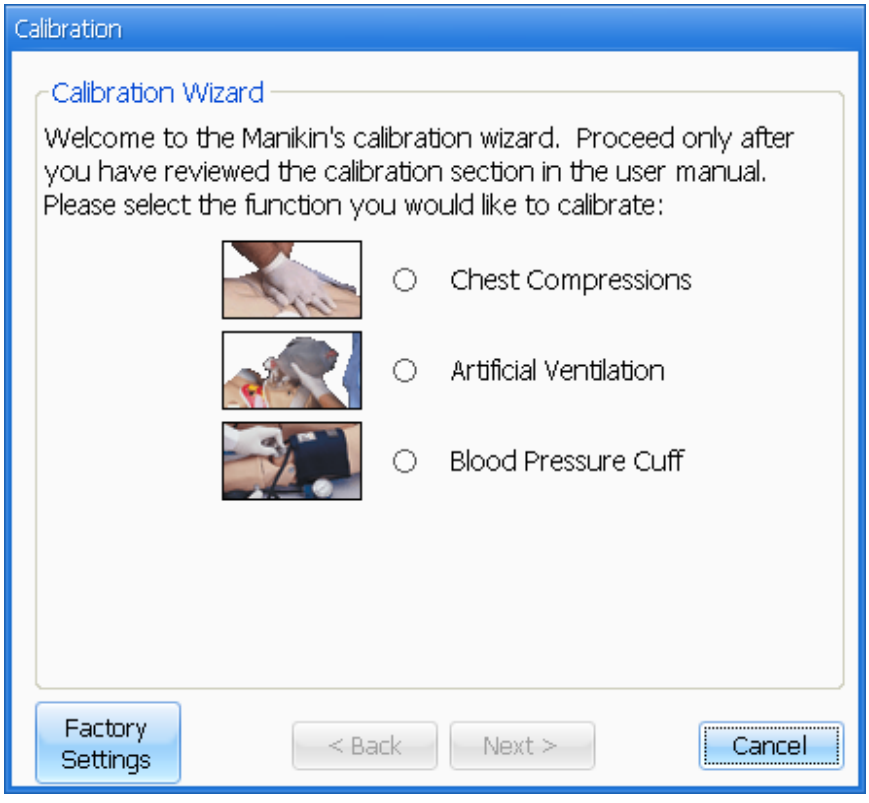
Exit the software at any time by going to File, Exit. The software can also be closed by using the shortcut key **Alt + F4**. Also exit by clicking on the “x” button at the top right corner of the user interface.

2. Set-up

a. Calibration



This tool allows easy calibration of the sensors inside the manikin. First choose which function to calibrate: Chest compressions, artificial ventilations, or blood pressure cuff.



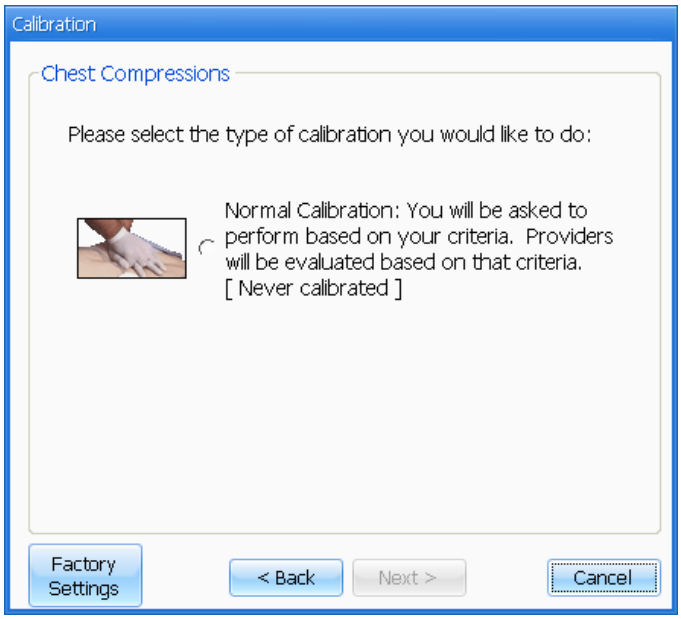
The procedures for each specific calibration are described in the sections below.

i. Chest Compressions/Artificial Ventilations

This tool helps calibrate the chest compressions and the artificial ventilations to specific criteria. That is, the calibrator will be telling the system what a correct chest compression is and/or what a correct artificial ventilation is. Providers will be evaluated by the system based on this criteria.

The chest compressions and ventilations are calibrated the same way. After making a selection, this window is displayed:

The software will now ask for a number of "correct" chest compressions or artificial ventilations to be performed, depending on which being calibrating.



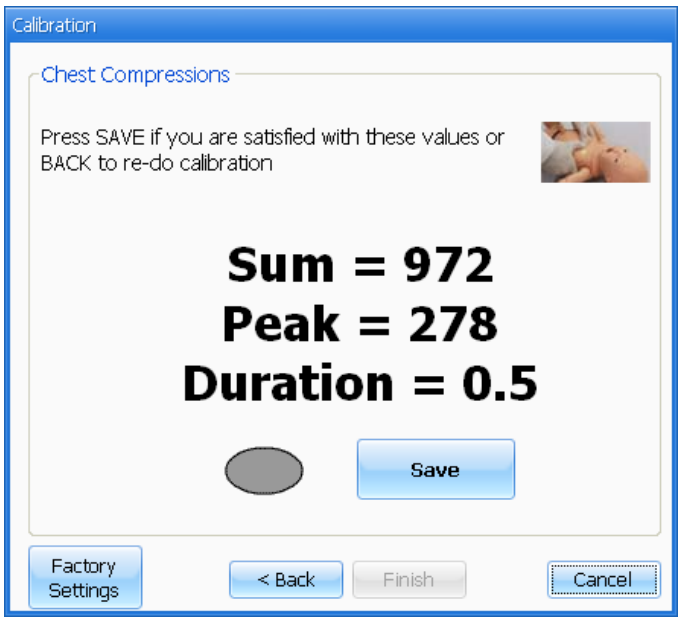
The facilitator should follow the text cue on the screen to perform just ONE compression or ventilation at a time, until prompted for the next one.
For example, if calibrating chest compressions:

- The wizard prompts you with a "#1".

  - Perform one correct chest compression.
  - A green filled oval indicates that the chest compression was successfully recorded.
  - The wizard prompts you with a "#2".

- Perform a second correct chest compression.
- A green filled oval indicates that the chest compression was successfully recorded.
- ...and so on.

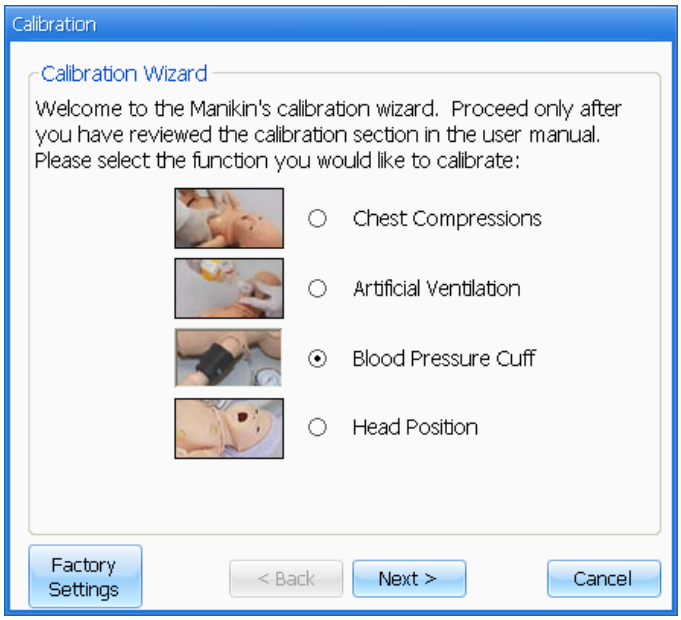
- At the end of the calibrating session, the wizard shows the average peak, depth, and duration values for the procedure. If the procedures have been performed correctly, click the "Save" button. Otherwise, press the "Back" button to repeat the calibration.



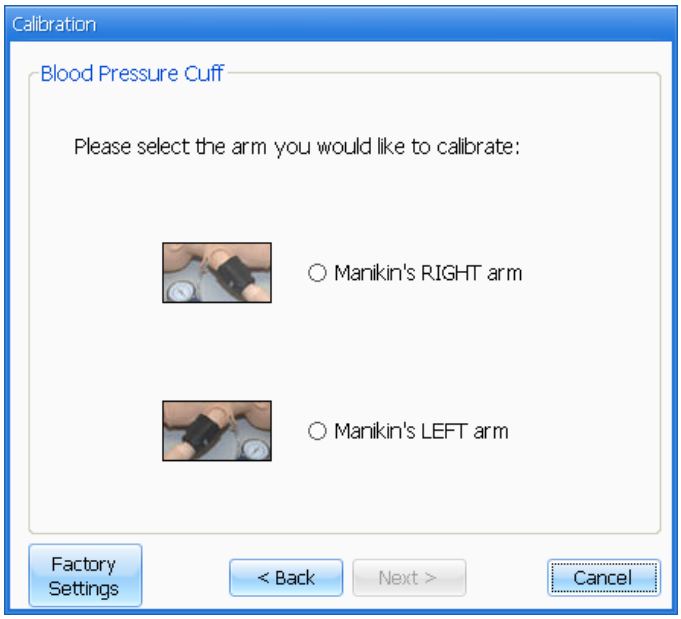
Notice that the user can go back a step, abort or cancel at any time during the procedure.

ii. Blood Pressure Cuff

Blood pressure cuff calibration should be performed only when the Korotkoff sounds do not match the systolic and diastolic values set from the computer.



To calibrate, place the blood pressure cuff on the manikin's left arm. Remember to connect the cuff's luer-lock connector to the manikin's shoulder. (The blood-pressure-enabled arm will display when the software checks the manikin's settings.)



The software will prompt for setting the BP cuff to a certain pressure, hold that pressure constant, and press the “OK” button. Follow the text cue on the screen and repeat the procedure for each pressure level until "Done" is displayed.

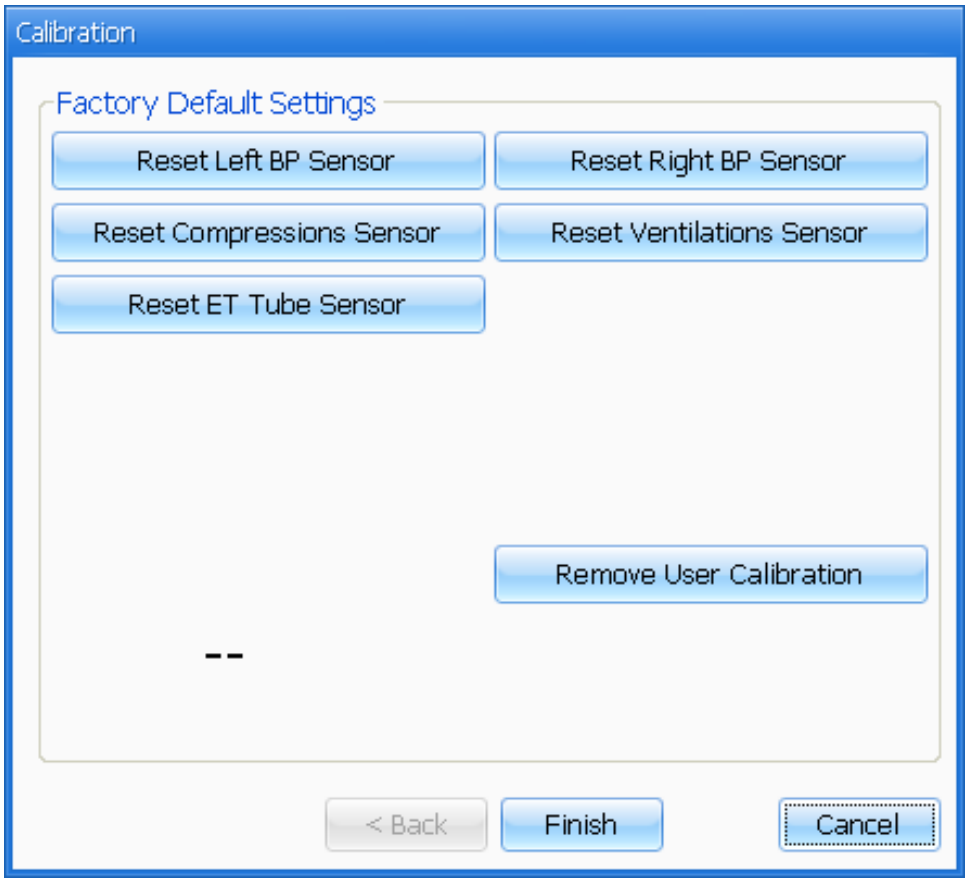
For example:

- The wizard prompts with "0 mmHg."
- Set the pressure on the BP cuff to 0 (i.e. cuff valve open).
- Click the “OK” button.
- A green filled oval indicates that the value was successfully set.
- The wizard then prompts with "20 mmHg".
- Set the pressure on the BP cuff to 20 mmHg.
- Click the “OK” button.
- A green filled oval indicates the value was successfully set.
- ...and so on.

Once the prompt reads “Done”, go back and calibrate another function or click the “Finish” button to close the calibration wizard.

iii. Factory Settings

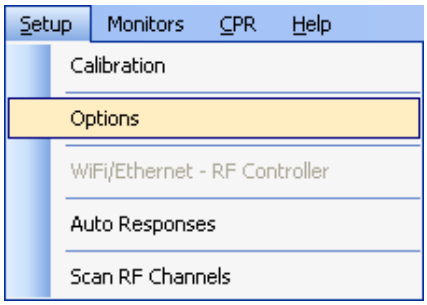
Factory Settings is a very useful tool to consider when recalibrating. It restores the sensors to factory settings over-riding any calibrations performed by users. Make sure that when you are restoring the sensors to the factory settings that no one is practicing chest compressions, ventilations, intubation or reading a blood pressure. Any of these actions may interfere with the reset. Each time that one of these sensors is clicked a message will appear at the bottom left of the screen notifying the user of the status of the reset (OK, or TRY AGAIN). Should the sensor not respond, please refer to the troubleshooting guide or contact Customer Support.



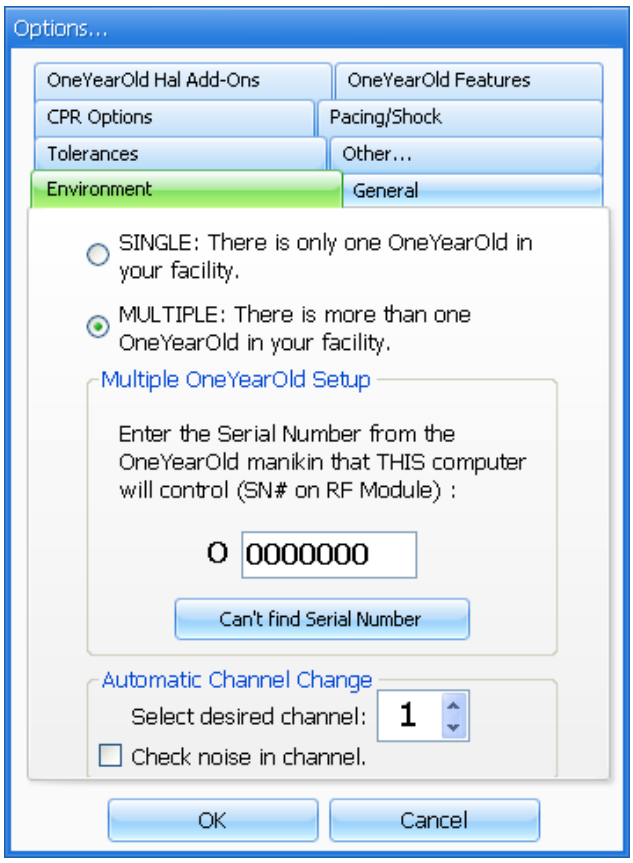
At the end of calibrating a function, the Calibration Wizard resets the manikin for the changes to take effect and displays the message "Done". If the wizard displays the message "Can't reset", it means that the new calibration values will take effect next time you start the software. If the changes need to take immediate effect, close the GaumardUI software, wait about one minute (for the manikin to turn off), then start the GaumardUI software again.

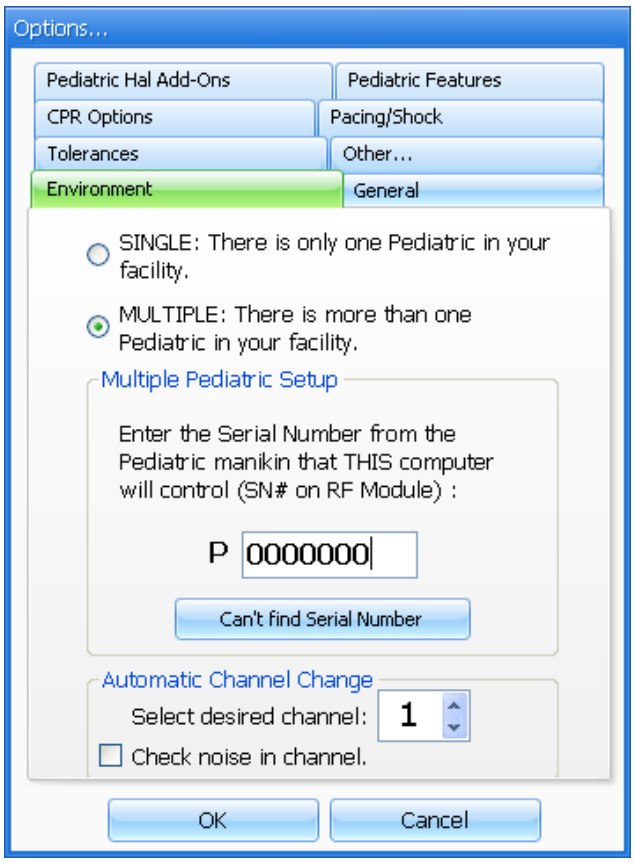
b. Options

The GaumardUI has several options that can be preset by the instructor.



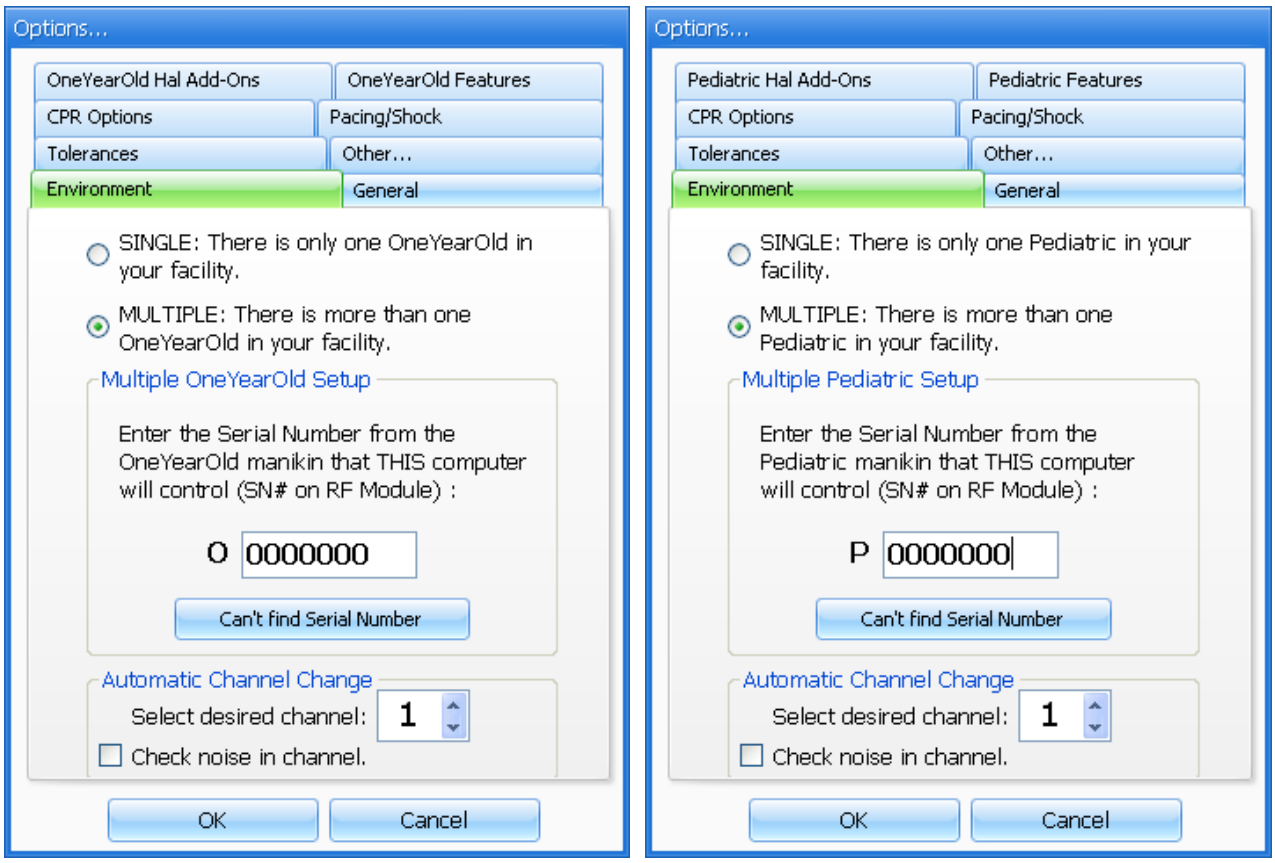
The "Options..." dialog box contains eight tabs: Environment, Tolerances, Pediatric HAL® add-ons, General, Pediatric Features, Pacing, CPR Options, and Other.





Each of these sections is further explained below.

i. Environment

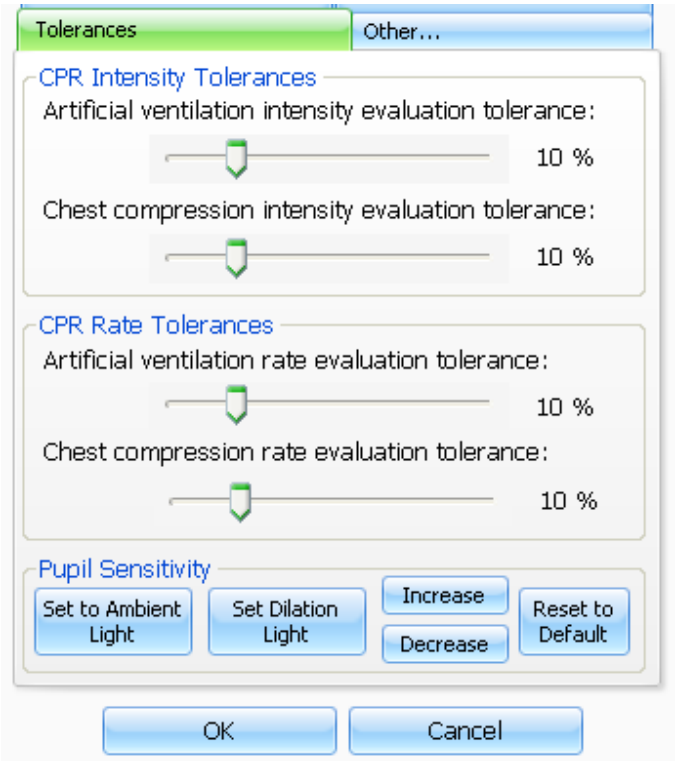


This tab allows you to choose how many HAL®s in the facility. Notice that if the "MULTIPLE" button is selected, the correct manikin's serial number in the text box must be entered. If the serial number cannot be found, try connecting to the HAL® using "SINGLE", press on the button that says "Can't find Serial Number" and follow the instructions.

At the bottom of this tab, the channel that the RF module will use to communicate with the manikin may be selected. It is recommended that the Auto Channel Change is active because it makes sure the initialization channel is always clear for other manikins to use on start-up.

To ensure the manikin always uses the cleanest channel possible, select the "Check noise in channel" button.

ii. Tolerances

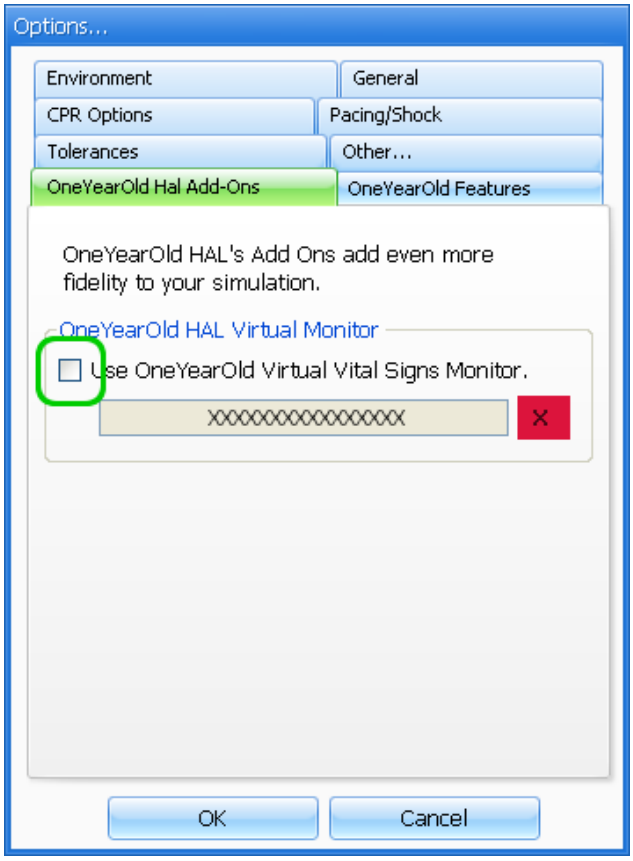


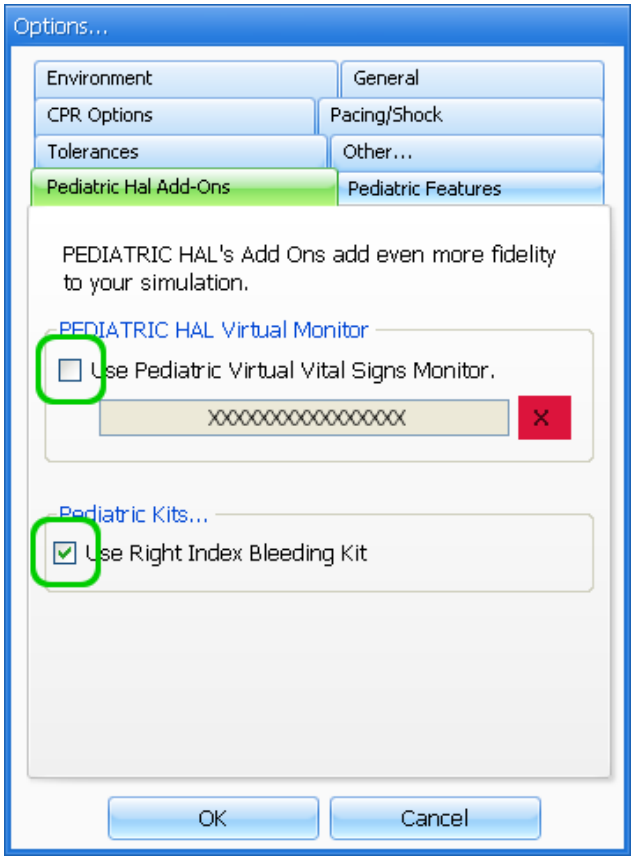
This tab is used to select the tolerance and intensity of both chest compressions and ventilations. At the bottom of the tab you can find controls related to pupil sensitivity.

If the Blinking Eyes kit is installed, you can recalibrate the pupil sensitivity using these controls. The five buttons are described below:

- Set to Ambient Light: If the pupils are constantly closing with the current ambient light, you can disable the pupil reactivity and open the pupils to the desired diameter. Then use the "Set to Ambient Light" button to recalibrate the sensitivity to the current environment, and then enable the reactivity on each pupil.
- Set Dilation Light: The pupils should react to low ambient light by increasing their diameter. To set pupils to react to proper low ambient light intensity, cover both eyes blocking MOST, not ALL incoming light, then click "Set Dilation Light" button.
- Increase-Decrease: use these controls to increase or decrease the sensitivity to light.
- Reset to Default: Use this button to reset the pupil's sensitivity to the factory settings.

iii. Pediatric HAL® Add-Ons





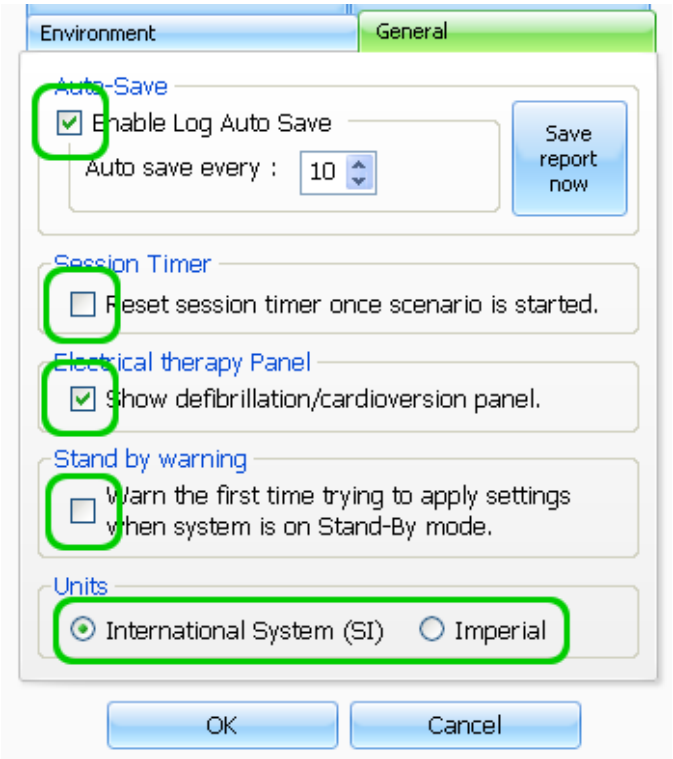
This tab allows you to select any of the additional packages that you may have installed in your manikin. Make sure you select **only** the Add-Ons that are currently being used on your manikin, otherwise the software might not control the manikin properly.

The Vital Signs Monitor simulates a vital signs monitor attached to the patient. The vital signs are synchronized through a wireless network between the facilitator's tablet and the computer running the monitor. Vital Signs Monitor allows the user to customize each trace independently of each other; users can set alarms, time scales, boundaries and grid options.

The HAL® Virtual Monitor checkbox allows you to enable or disable the “Monitors” menu option in the upper left corner of the user interface.

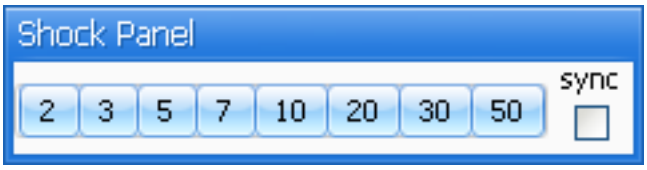
Once the Vital Signs Monitor option is enabled the menu will appear.

iv. General



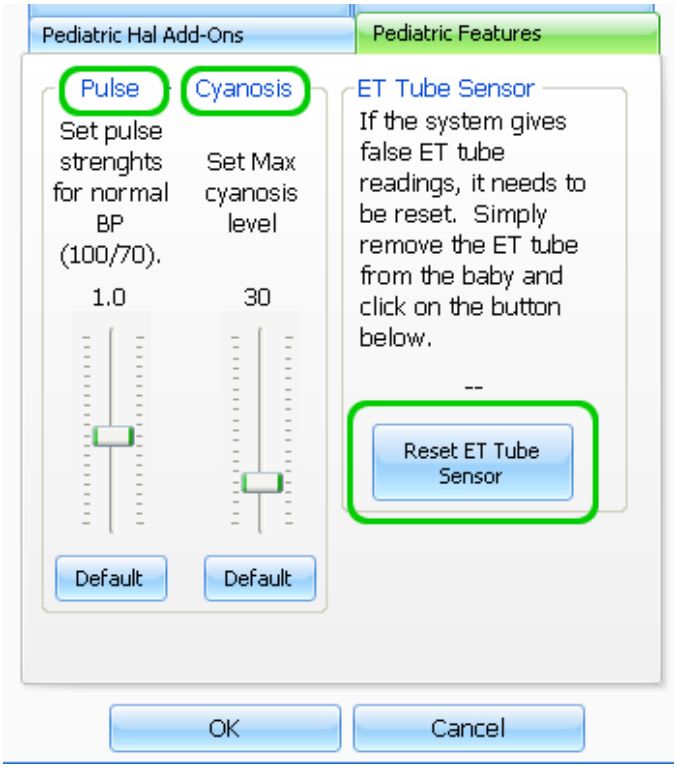
This tab allows you to:

- Enable auto saving of the log.
- Save your current log report.
- An automatic timer reset option
- Enable message box that will warn you if you are trying to apply changes while the manikin is in stand by.
- Display shock panel for electrical therapy. The shock panel is displayed in the upper right corner of the interface.



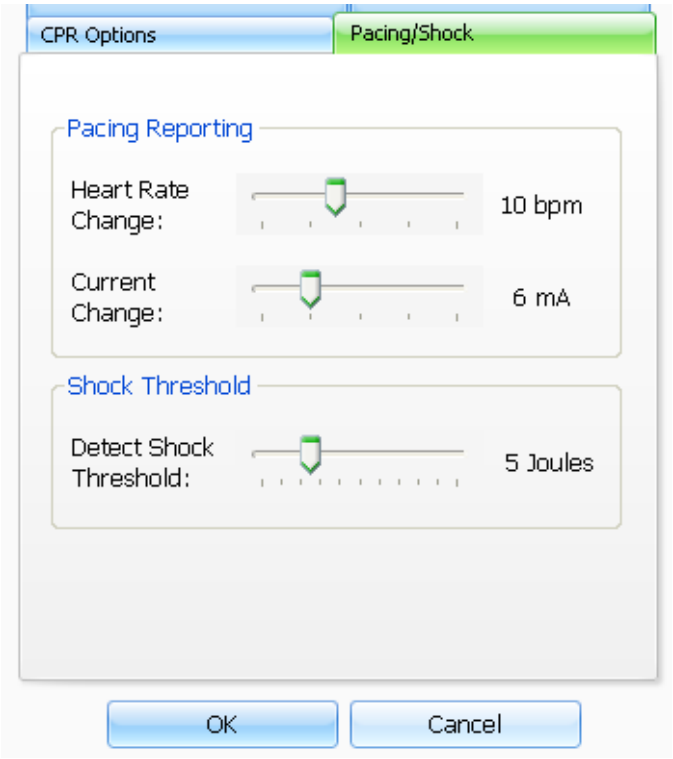
- Select units (SI or English).

v. Pediatric Features
(labeled as “OneYearOldFeatures” on the S3004)



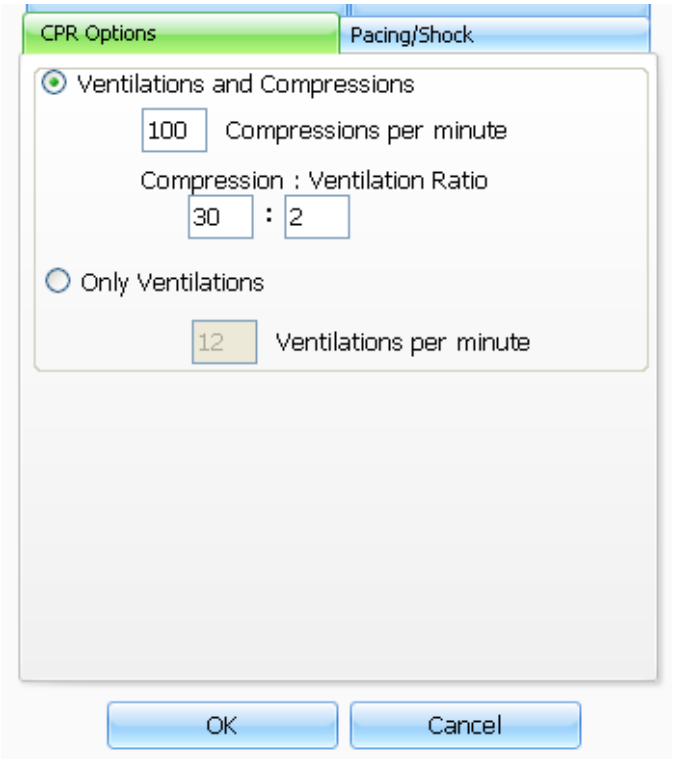
- Fine tune the pulse intensity.
- Fine tune the Maximum cyanosis intensity.
- In case the ET Sensor is not responding properly to the intubation, remove everything from the airway and click on the "Reset ET Tube Sensor" button.

vi. Pacing



When HAL® is being paced, the pacers oscillate by a minimum fraction both on the heart rate and the current. This oscillation can make the software fire an event each time these small changes are captured. In this tab you can set a threshold for each parameter so that only changes greater than these settings will be taken into account by the software.

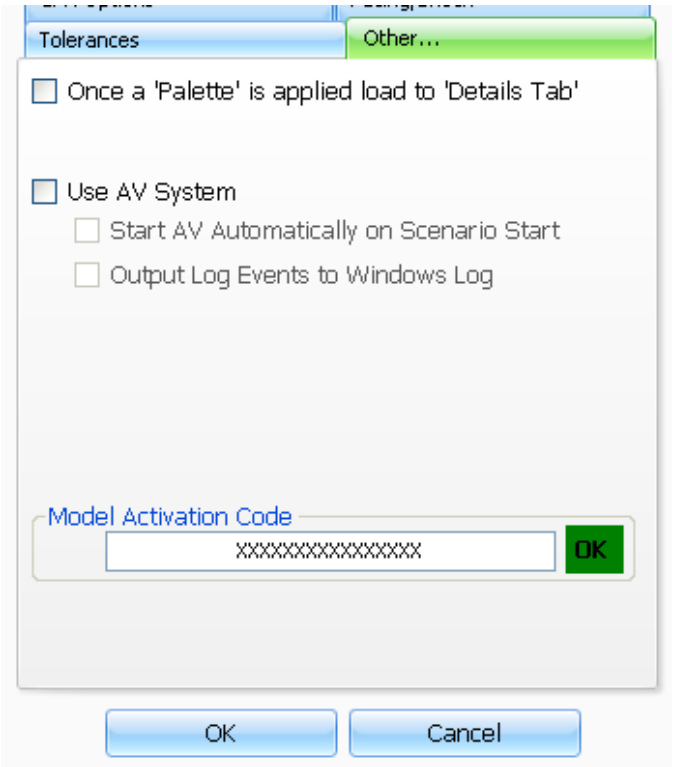
vii. CPR Options



In this tab you can:

- Select the number of desired compressions per minute.
- Specify the compression/ventilation ratio
- Select number of ventilations per minute (if the “Only Ventilations” button is selected).

viii. Other

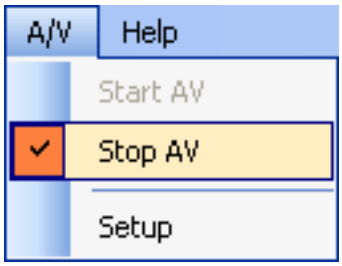


This tab gives you additional control over the simulation. The first option "Once a 'Palette' is applied load to 'Details Tab'" is useful for people that want to keep track of the latest parameter that were updated using the Details Tab. The second option, "Use AV System" is used to enable the A/V Link.

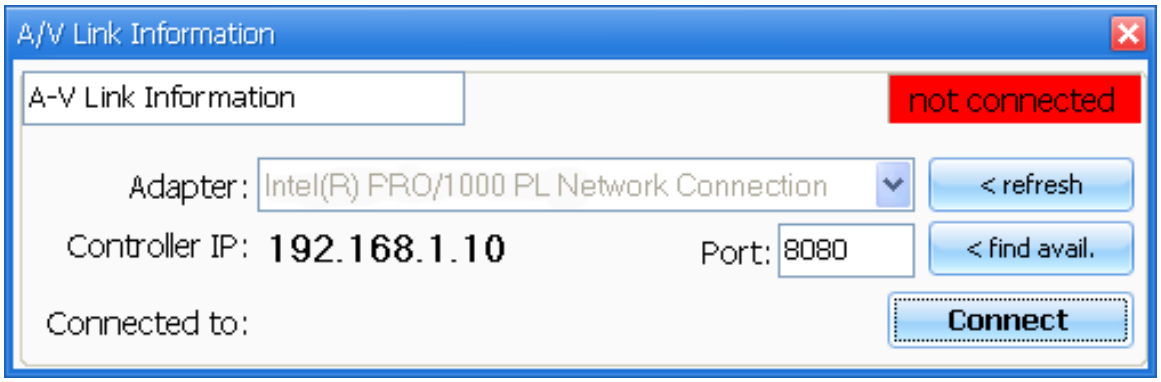
NOTE: Please consult with your A/V System's manufacturer for compatibility with Gaumard's Simulators prior to setting up the A/V Link Interface.

GaumardUI is capable of interfacing with a number of third party A/V recording systems that enable the capture of Audio and Video interlaced with the events recorded in the software log.

Enabling the AV Link displays the following A/V menu:



Clicking on A/V, Setup displays the following dialog box:

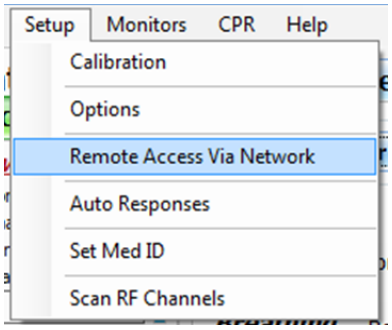


This menu permits sending Start and Stop messages to the recorder, as well as displaying the connection status. In order to set up the connection on the A/V System side, please consult your A/V System's documentation.

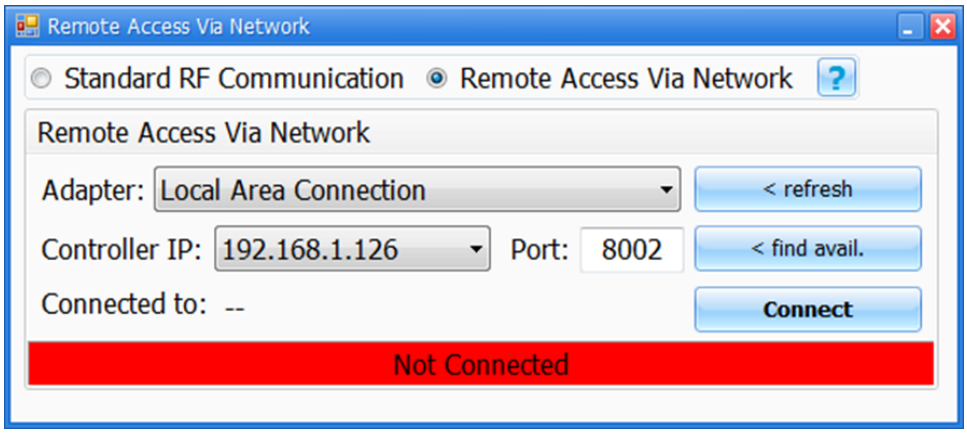
GaumardUI also permits automatic sending of a "Start Record" message to the A/V Unit.

NOTE: Because it is possible to extend a simulation session beyond the last step in a scenario, the "Stop Recording" message does not have an "automatically stop" option.

c. Remote Access Via Network

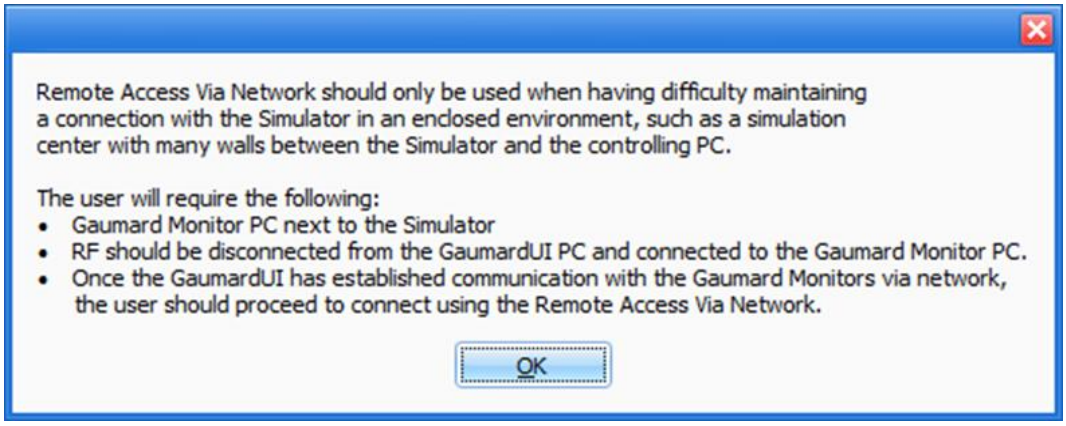


The Remote Access Via Network should only be used when having difficulty maintaining a connection with the Simulator in an enclosed environment, such as a simulation center with many walls between the Simulator and the controlling PC.



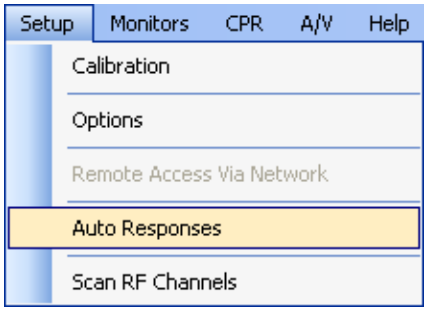
The user will require the following:

- Gaumard Monitor PC next to the Simulator
- RF should be disconnected from the GaumardUI PC and connected to the Gaumard Monitor PC.
- Once the GaumardUI has established communication with the Gaumard Monitors using WiFi or Ethernet connection, the user should proceed to connect the Remote Access Via Network.

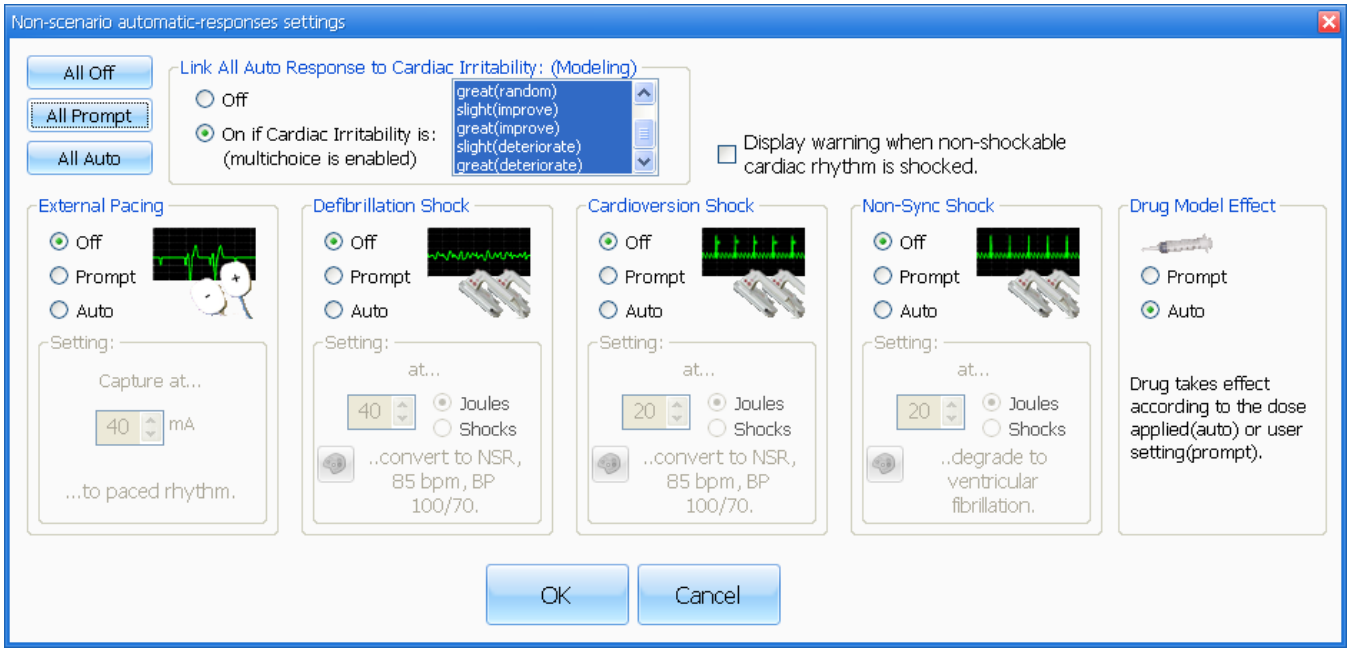


Settings must also be adjusted on the Gaumard Monitors to complete the connection correctly. See Section V.C.3.b for the Virtual Monitor menus and settings.

d. Auto Responses

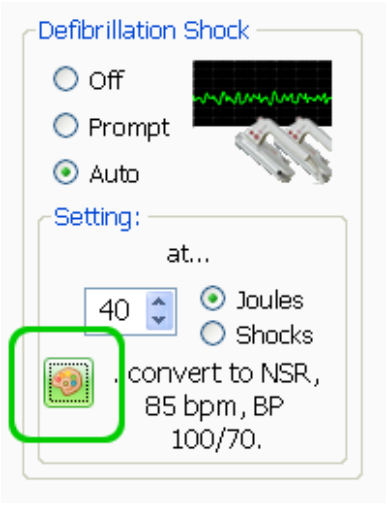


Auto-responses is used to program electrical therapy to auto, prompt or off.

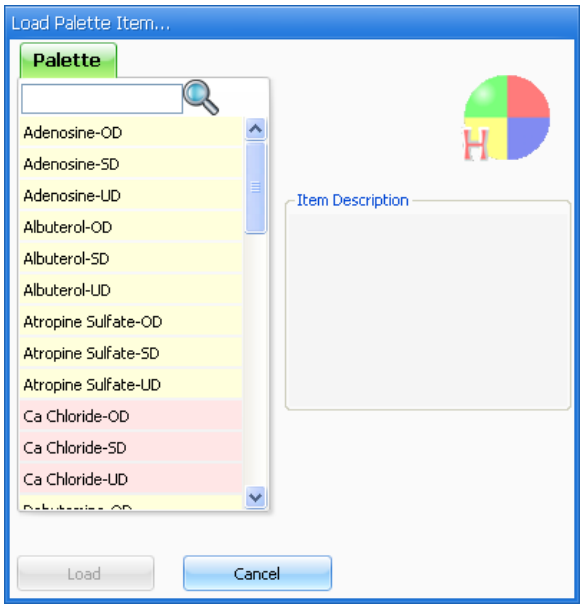


These three states are defined below:

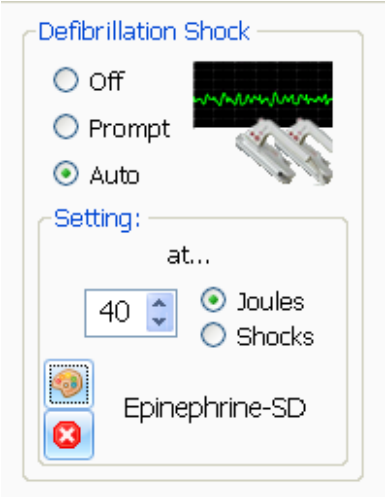
- Off - The software **does not** respond to the electric therapy.
- Prompt - The software detects the electrical therapy and prompts the user if they would want to change the manikin's vitals to some preset healthy vitals.
- Auto - The software automatically detects the electrical therapy and compares it to a threshold selected by the provider, and once this threshold is accomplished the vitals automatically change to a healthy vital state.



Click on the palette button to program a specific palette to be applied after the electrical therapy.



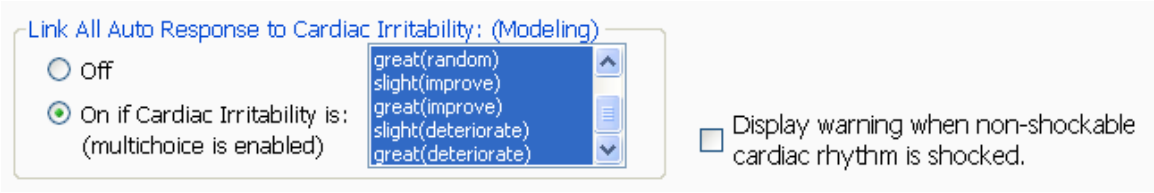
The “Load Palette Item” dialog box is displayed. Highlight the desired palette and click “Load”.



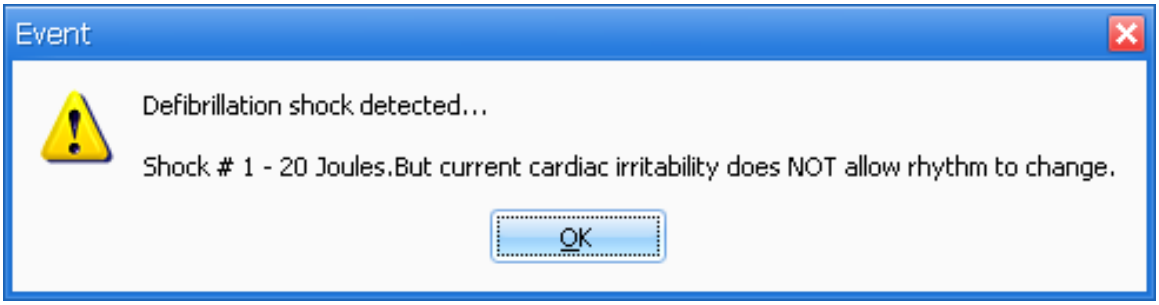
The desired palette is now displayed in the “Setting” section.

You can delete the palette by clicking the “X” button.

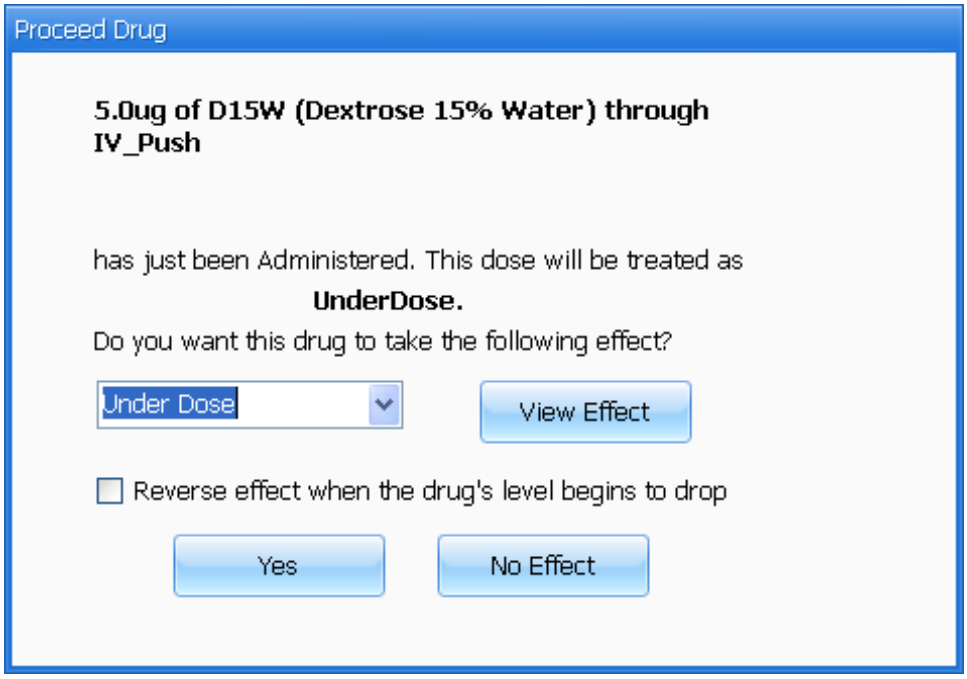
The Non scenario automatic-responses settings dialog box has two additional features in the automatic mode: "Link All Auto Response to Cardiac Irritability" and the "Drug Model Effect" panel.



- Link All Auto Response to Cardiac Irritability- if this feature is turned "on," the auto-responses will work auto or prompt **if and only if** the cardiac irritability option on the details page matches the selection on this dialog box. If the cardiac irritability on the details page does not match the selection on this dialog box, the following error message is displayed when the electrical therapy is detected:

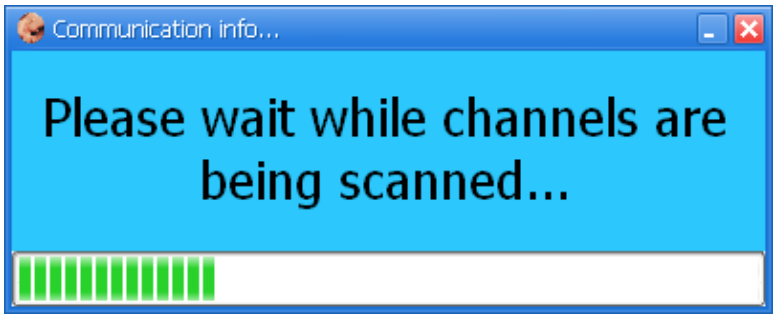


- Drug Model Effect-this feature is used to panel has two options:
  1) Auto: applies drug effect as soon as the drug recognition module detects a drug. Note that the effect applied will be determined by the calculated dosage.
  2) Prompt: This option displays the Proceed Drug every time a drug is detected by the drug recognition module to ask the user if the drug effect should be applied now. This option allows the user to select which drug effect to apply, and whether or not the drug effect should reverse when the drug's level begins to drop.

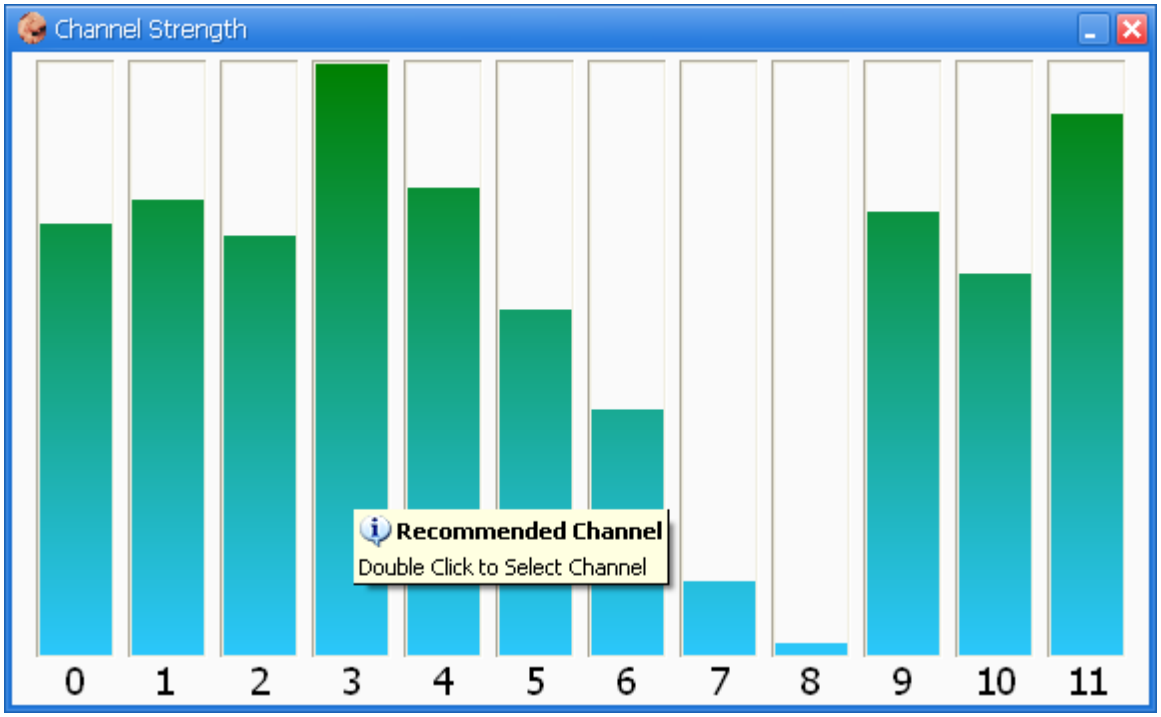


e. Scan RF Channels

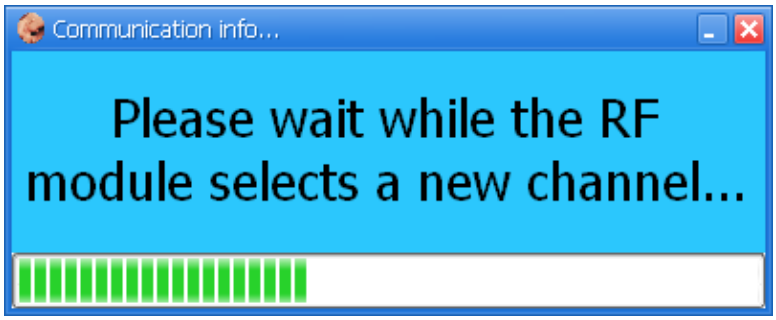
Manually select the best possible RF channel for tablet-manikin communications by selecting "Setup", then "Scan RF channels". The following notice displays while the scan is in progress:



When the scan is complete, a series of bars will display, with the highest bar indicating the best signal. On mouseover, a popup will display "Recommended Channel" over the channel bar with the best measured signal. The other bars will only display a "Double Click to Select Channel" message.



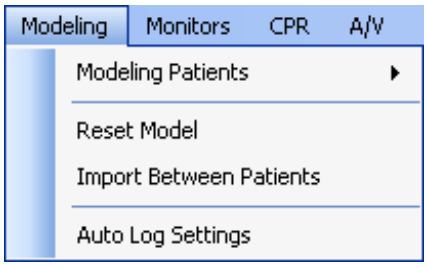
Click on the recommended channel in the graph to select it. The following message will display while the command is processed.



The new channel should subsequently ensure four solid bars display in the communications indicator at the top of the Status bar.

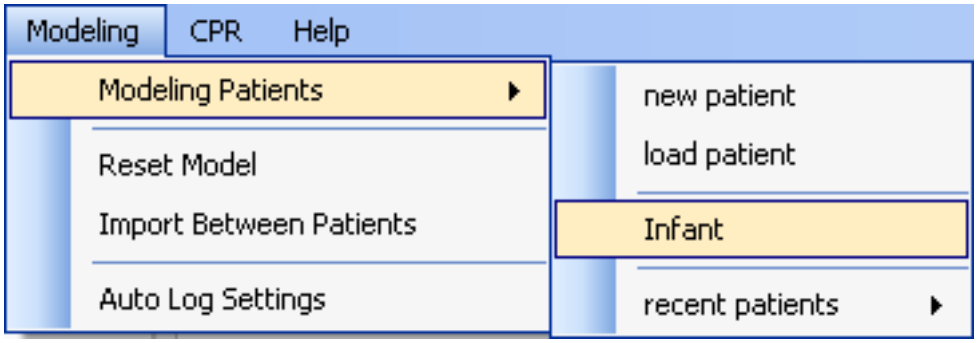
3. Modeling (Automatic Mode Only)

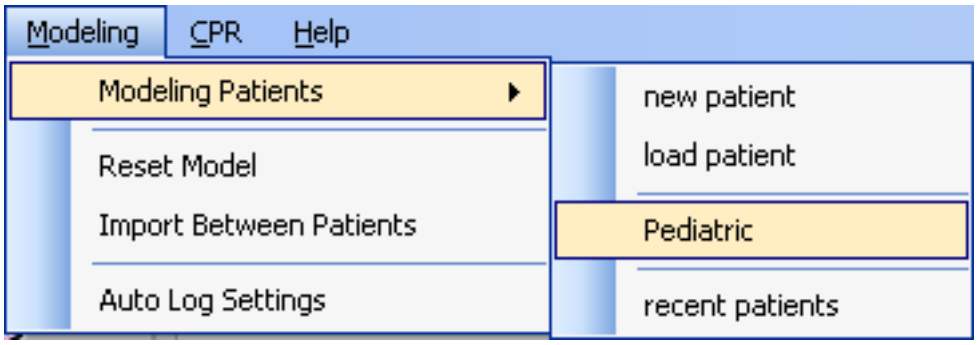
The “Modeling” drop down menu in the top left corner of the GaumardUI contains four options: Modeling Patient, Reset Model, Import Between Patients, and Auto Log Setting.



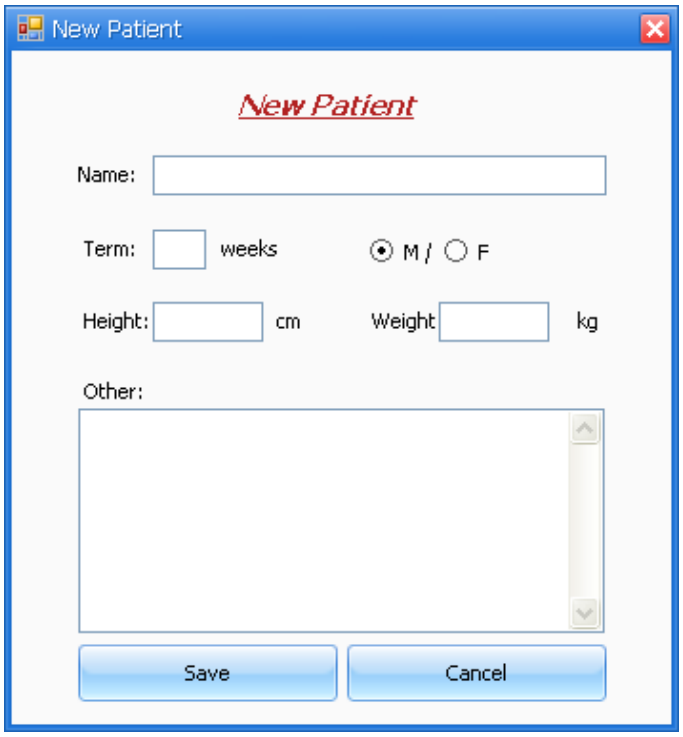
a. Modeling Patient

This option allows you to create a new patient or load an already existing one.



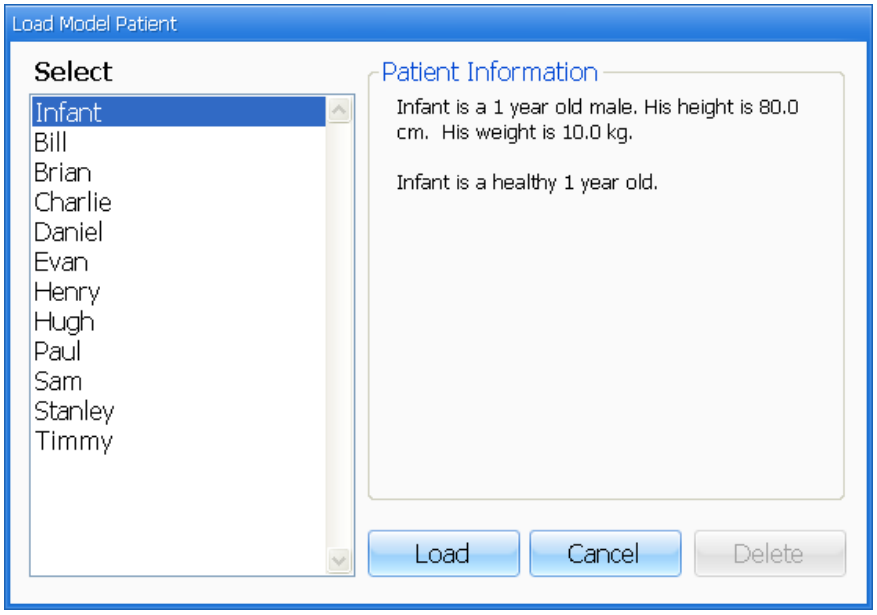


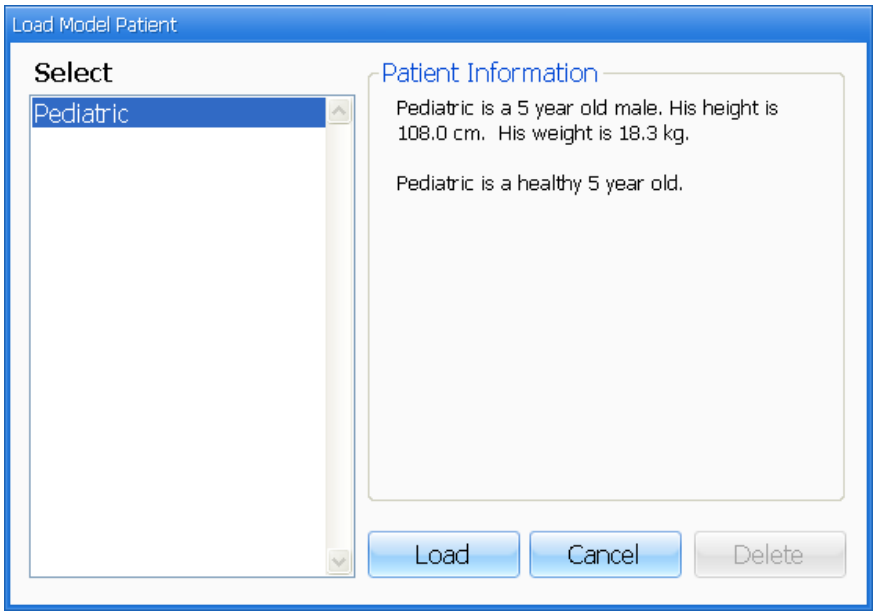
To create a new patient, go to Modeling, Modeling Patient, new patient. The following dialog box is displayed:



Enter the name of the patient, age, gender, height, weight and/or additional notes. Then, click on "Save".

To load an already existing patient, go to Modeling, Modeling Patient, Load Patient.

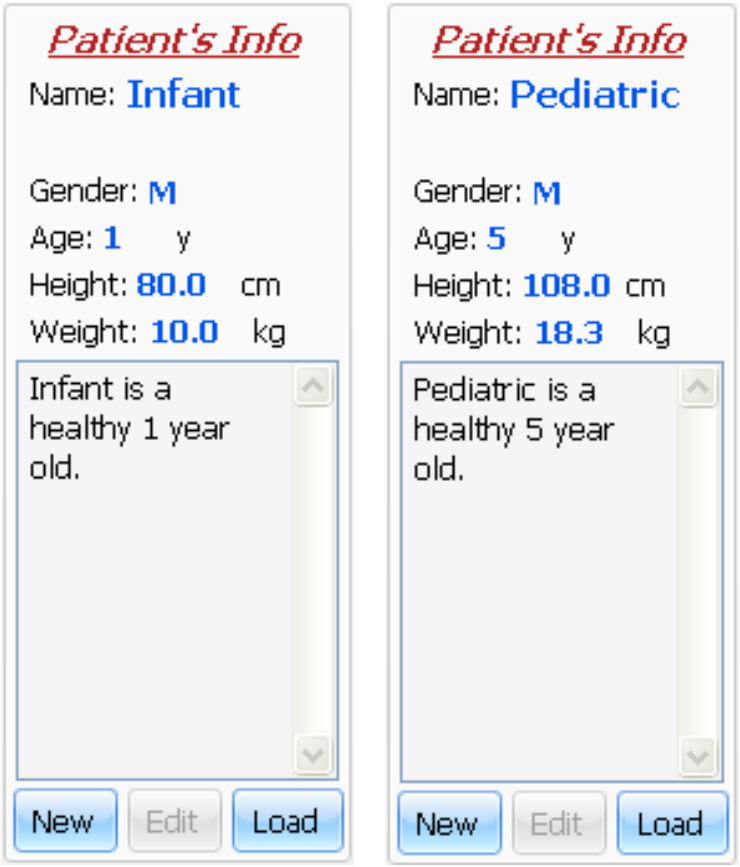




Select the desired patient, and click on Load. Notice that the factory pre-set patient "Infant" or "Pediatric" cannot be deleted, as opposed to any of the patients that you create yourself, which can be deleted.

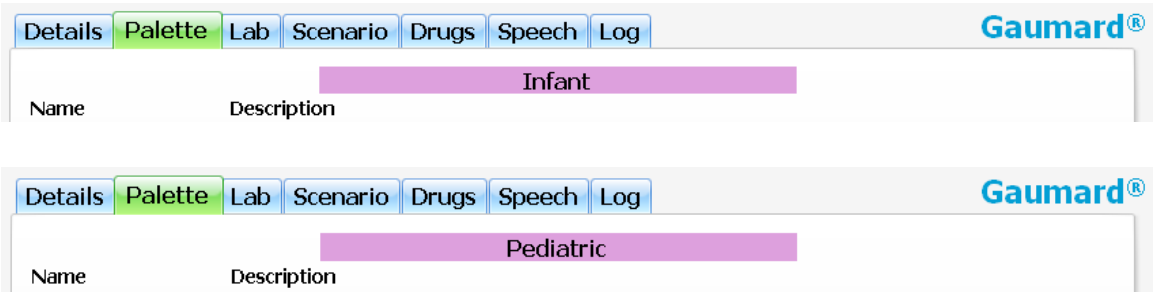
Also notice that after loading a patient, there are two places where you can see the name:

1. Right side of the page under the Details tab.

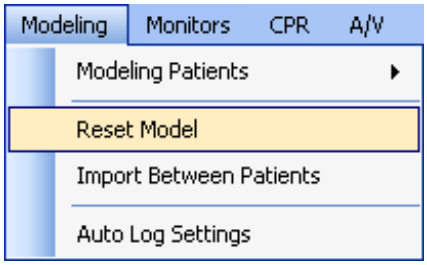


The three buttons at the bottom of this display can also be used to add a new, edit or load patients to the model.

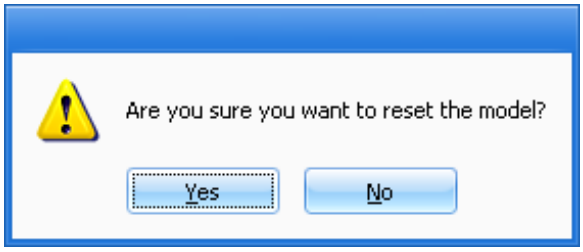
2. Top of the page under the Palette tab.



b. Reset Model

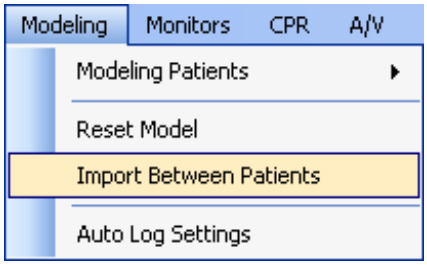


Clicking on Reset Model under the Modeling drop down menu, will restore all vitals and physiologic controls to normal state. For instance, if the ECG rhythm is currently on Ventricular Fibrillation, clicking on reset model changes the ECG rhythm back to sinus. After clicking this menu option, the following dialog box is displayed.



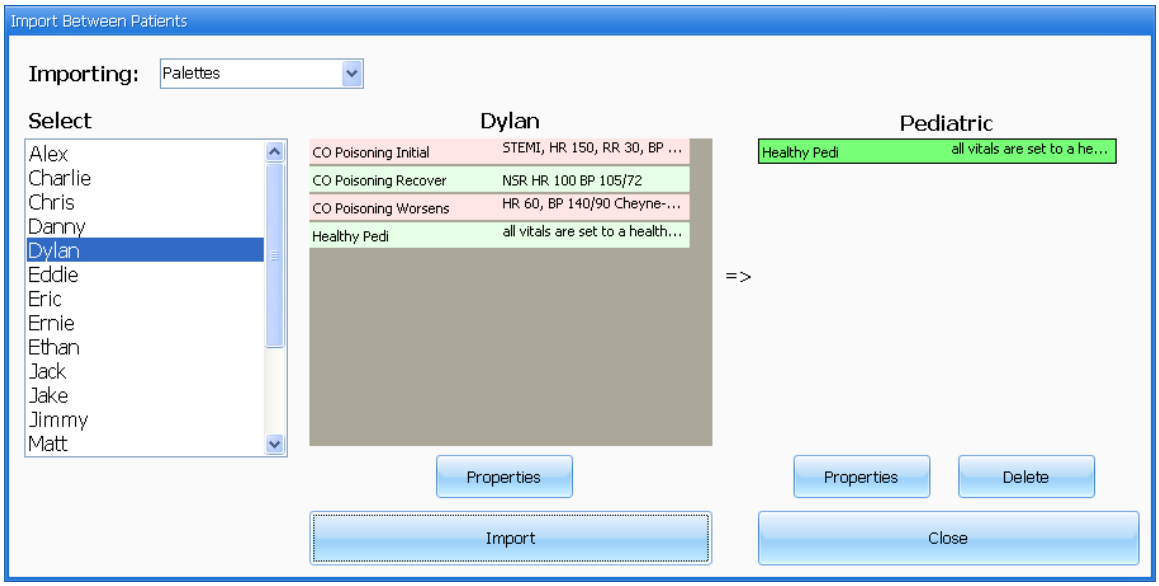
Click "Yes" to proceed with the reset.

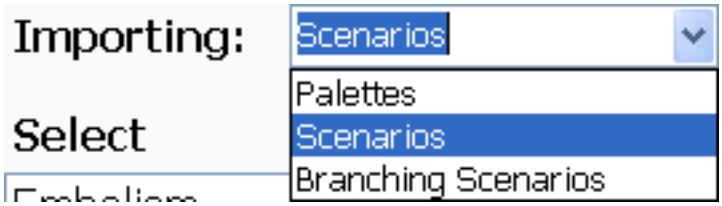
c. Import between Patients



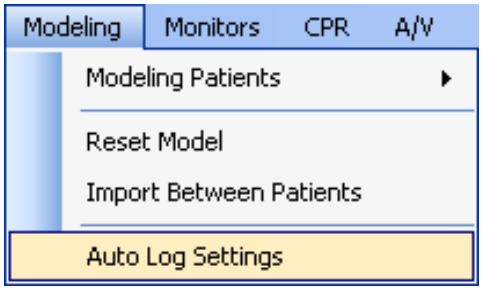
This menu option allows you to import palettes, scenarios and branching scenarios from one patient to another. To do so select what you will like to import, highlight the patient you would like to import items from, and then select the specific item and click on import. After importing an item, it appears under the patient to whom it was imported.

The following figure illustrates how to import palettes from patient Hal to Mark:

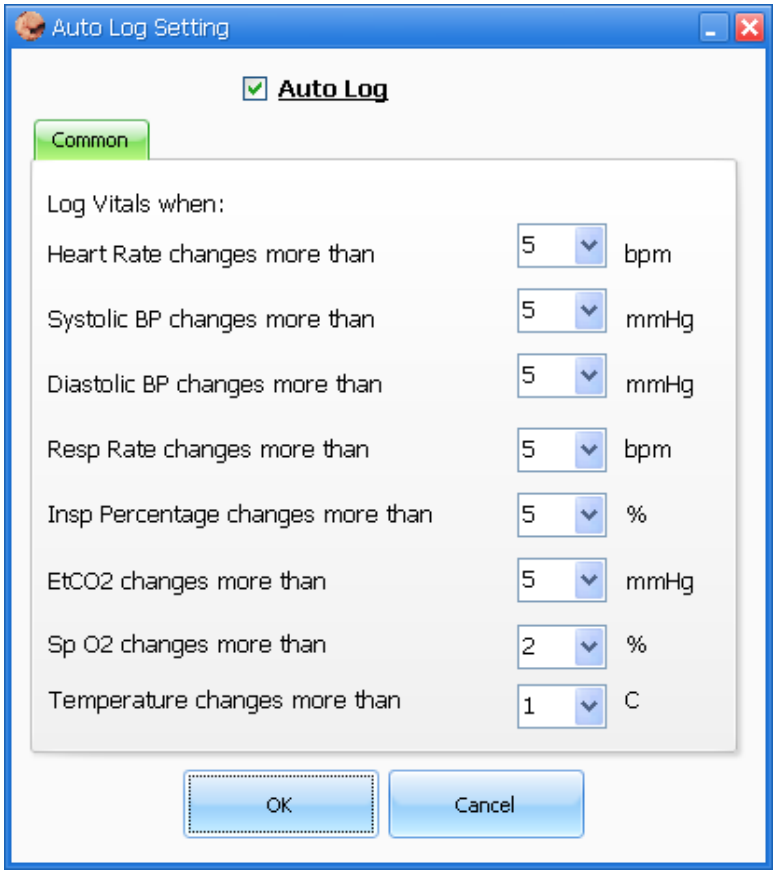




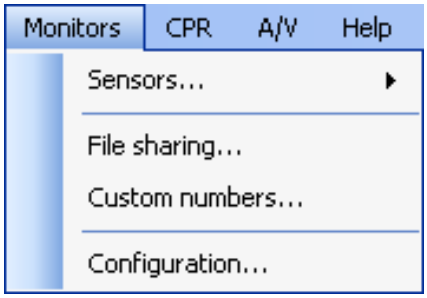
d. Auto Log Setting



This menu option is used to specify various vitals that you would like to be logged automatically after reaching a specific threshold.

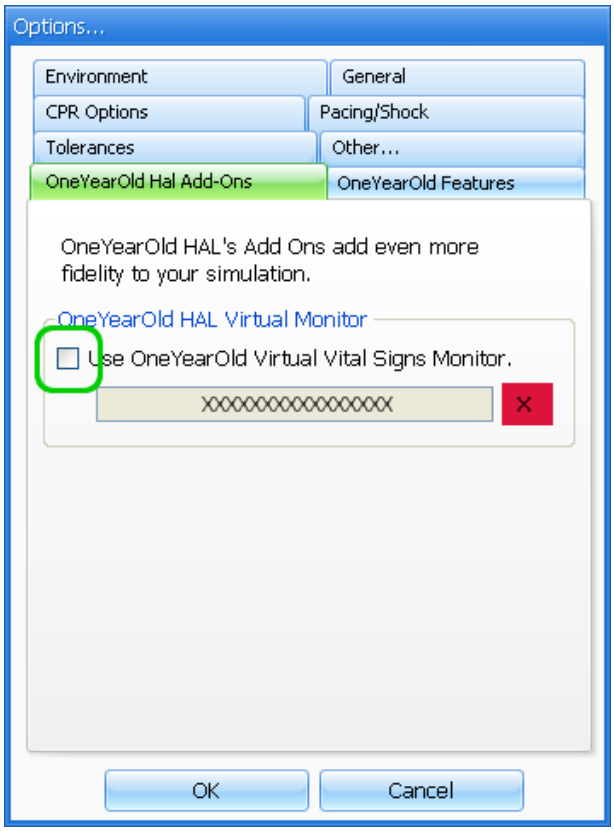


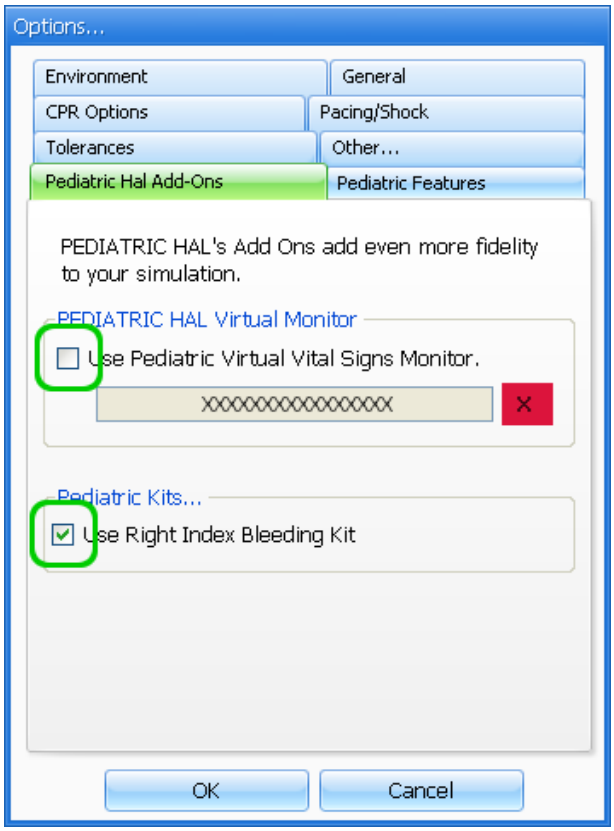
4. Monitors



The Vital Signs Monitor simulates a vital signs monitor attached to the simulated patient. The vital signs are synchronized through a wireless network between the facilitator's tablet and the computer running the monitor. Vital Signs Monitor allows the user to customize each trace independently of each other, users can set alarms, time scales, boundaries and grid options.

Warning: The menu option for Monitors is not visible unless the user has enabled it from the "Options" dialog box and enters the activation code on the field provided. See Section III.C.2.b.iii for more information.

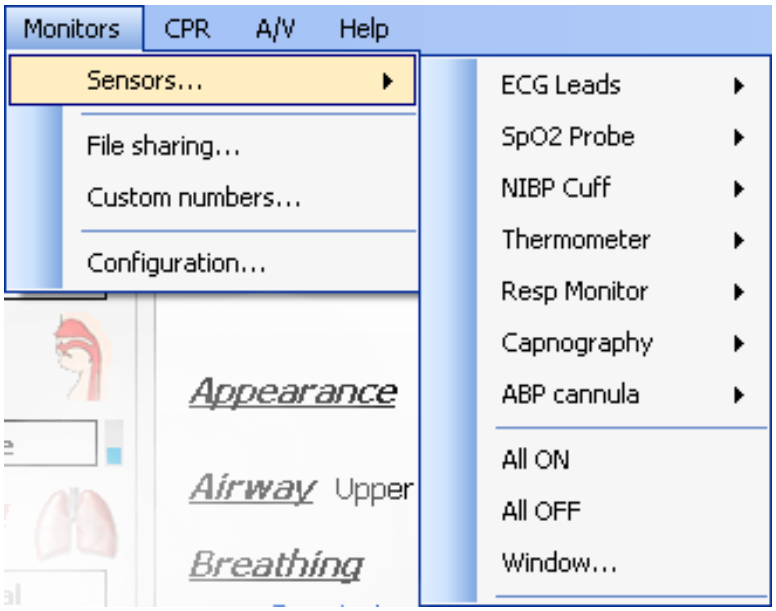




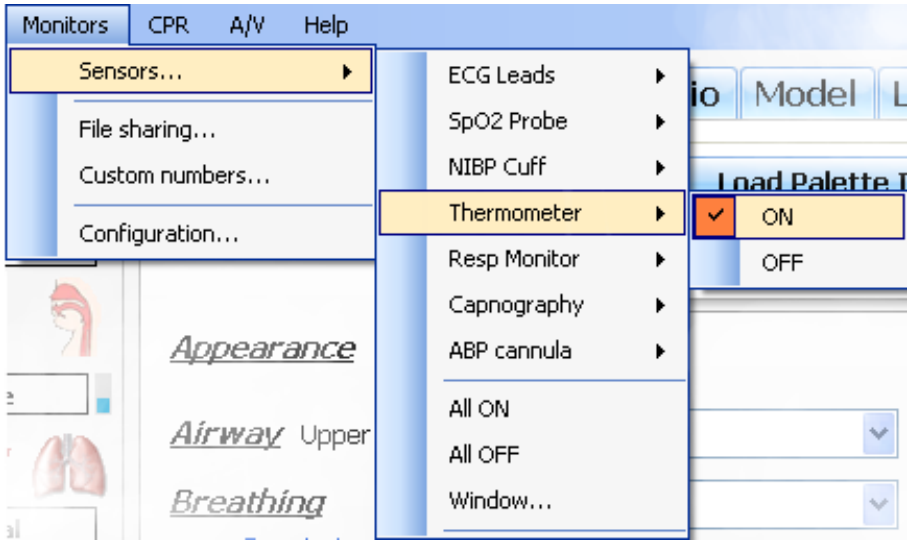
Once the Vital Signs Monitor option is enabled the menu will appear.

a. Sensors

This tool allows you disable any of the waveforms present in the Virtual Signs monitor.



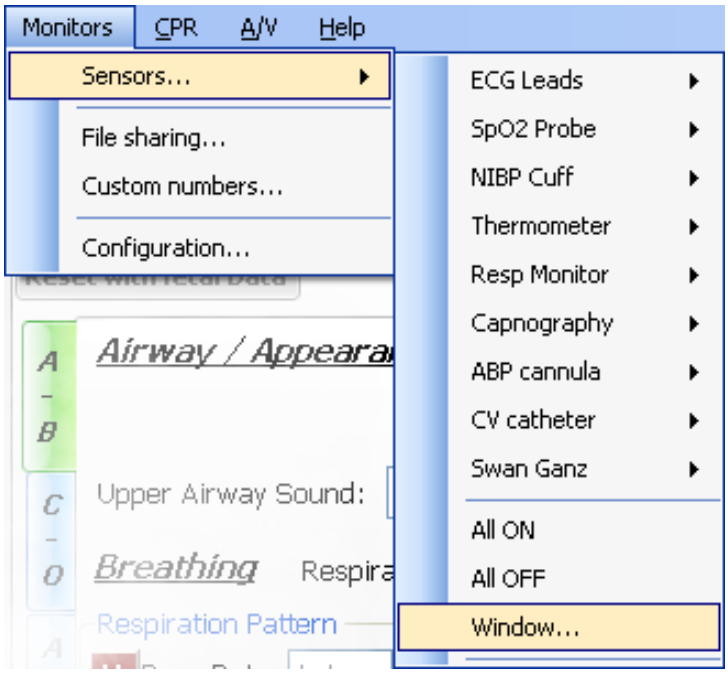
Select any of the waves that you will like to display and click on ON or OFF.



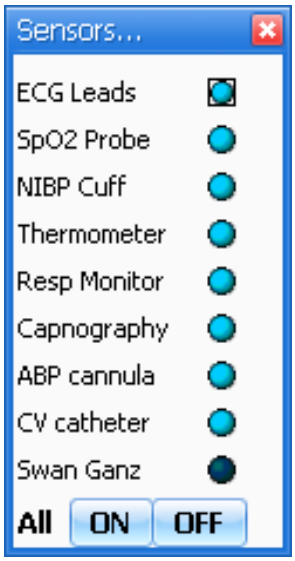
.

The virtual signs monitor defaults to “All On.”

Another way to control the sensors is to go to Monitors → Sensors → Window.



This option brings up a floating dialog box that can be viewed from any of the tabs in GUI. It can also remain opened as the users work in different scenarios. The "Sensors..." dialog box looks like the one below:

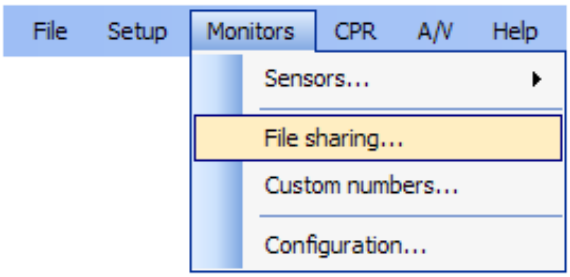


Light blue radio buttons indicate that a particular sensor is turned on and dark blue radio buttons indicate that a sensor is turned off. In the example above, all the sensors are turned on, except the Thermometer and the ABP cannula.

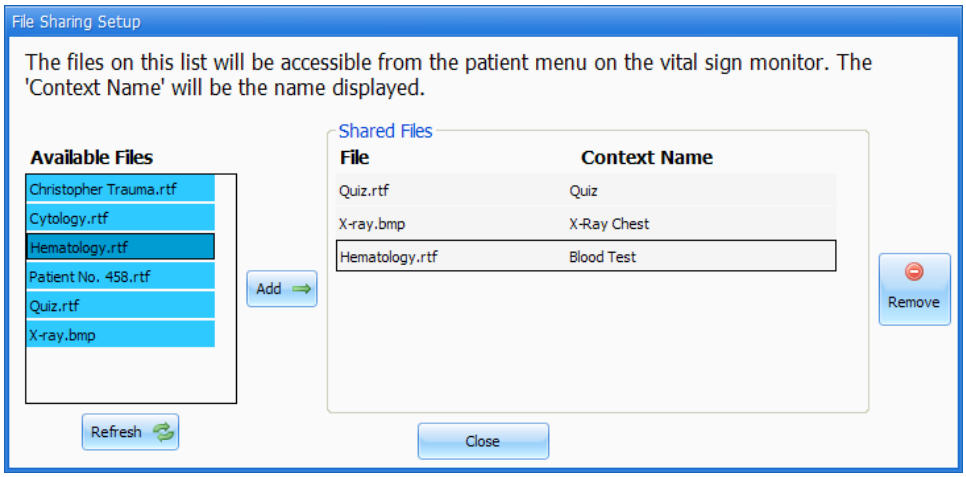
b. File Sharing

File sharing is only available when using the Gaumard Vital Signs monitor. To use this tool you must first locate the "GaumardUI" folder on the desktop (of the tablet). The folder must be shared for access by the monitor software. This can be done by right-clicking over the folder, selecting 'Properties" and then "Enable Sharing". A shared folder will be marked as seen below.

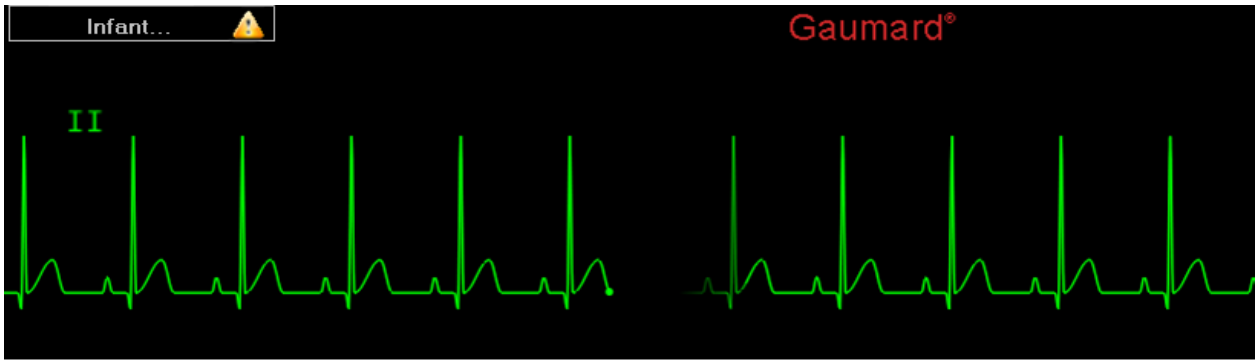
Add to this folder any kind of files that you wish to share with students or providers. Then access the File Sharing Setup window from the GaumardUI Monitors menu.



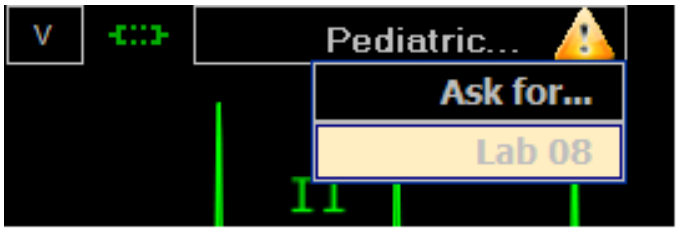
The File Sharing Setup menu is used to manage shared files.



Files in the Gaumard_UI folder will be listed on the **Available Files** panel located on the left. To share a file, click on the **Add** button in the middle of the screen. Enter a context name on the pop-up menu and click OK. The shared file will appear on the right list box. Remove individual files by using the "Remove" button on the right.



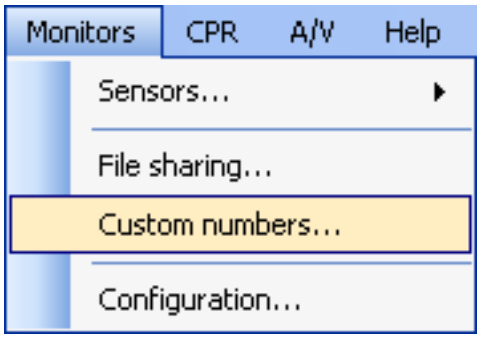
A yellow icon will be shown on the top left of the screen once a file is shared. This will inform the provider that a file is available for viewing.



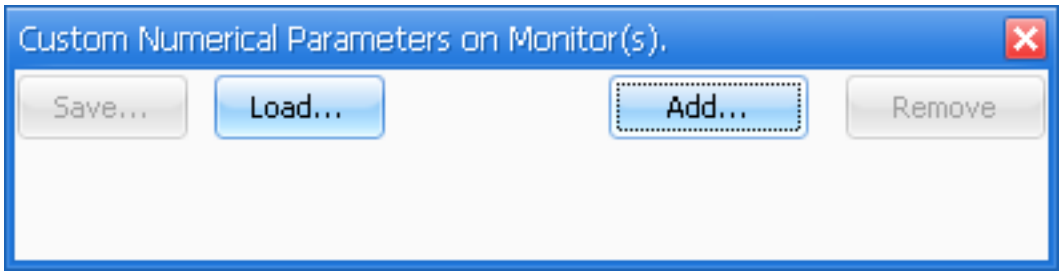
Click on the "Infant" or "Pediatric" buttons to bring down the selection of available files. Once a file is selected, it will automatically open on the Gaumard Monitor screen.

c. Custom Numbers

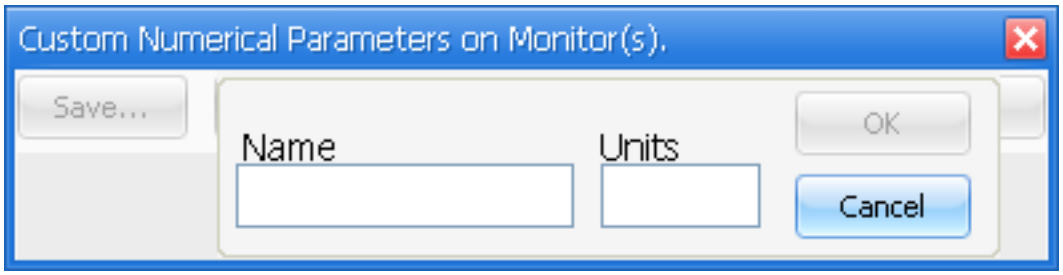
Use the custom numbers tool to add a new parameter, such as glucose level or platelet count, to HAL®'s virtual monitor.



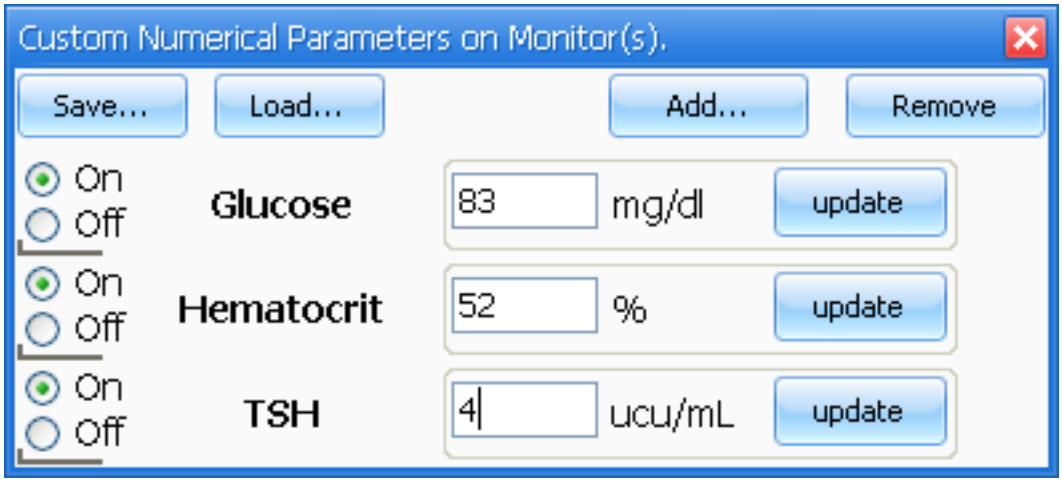
On clicking the "Custom numbers..." option, the following dialog box is displayed:



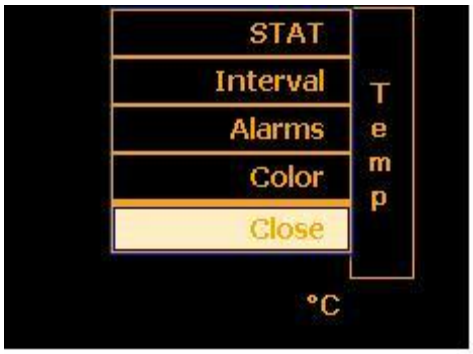
Click "Add" to enter a new parameter for display in the virtual monitor. This dialog box is displayed:



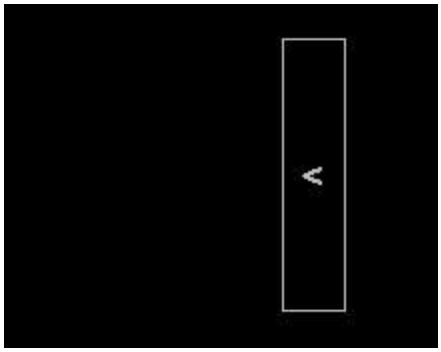
Enter the name and units of the new parameter and click "OK". The new parameter is displayed. Several custom numbers may be entered at a time.



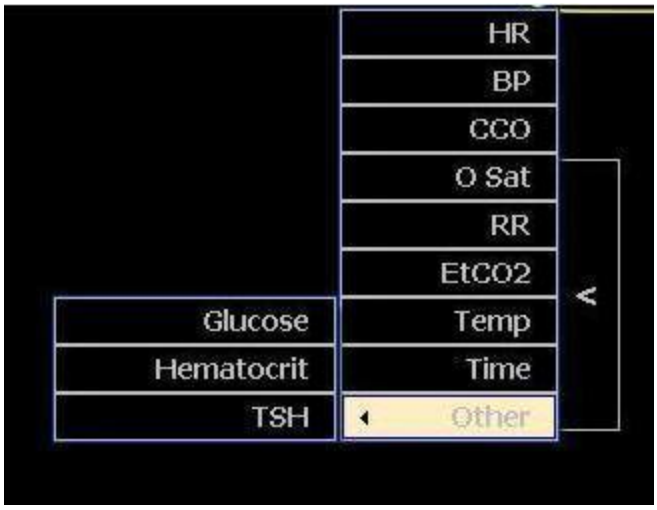
Enter the amount to be displayed in the virtual monitors and click “update”. Have the student or provider close one of the parameters currently displayed by the virtual monitor by clicking on the button of the value to be removed, and selecting “Close”.



Now the new custom number has a display slot.

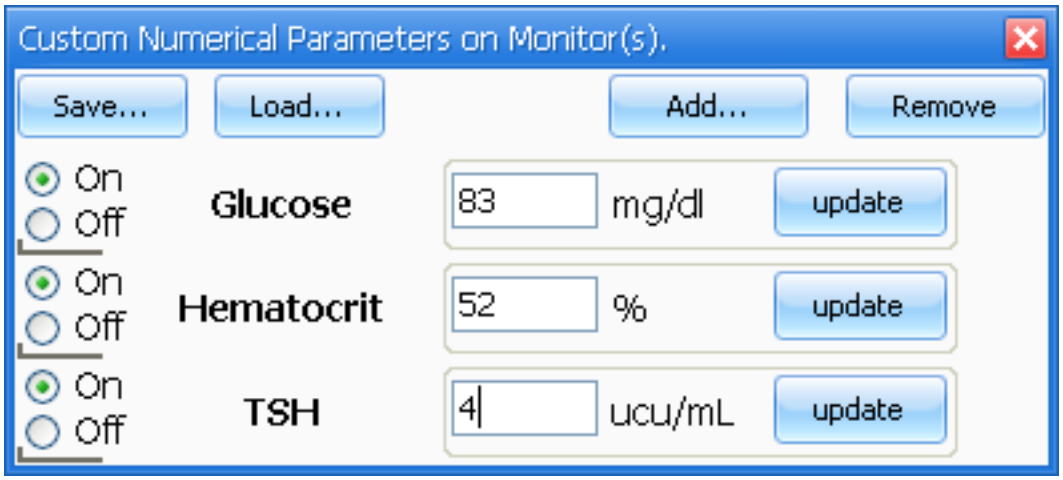


Click on the button and select “Other”. Choose the value to display.

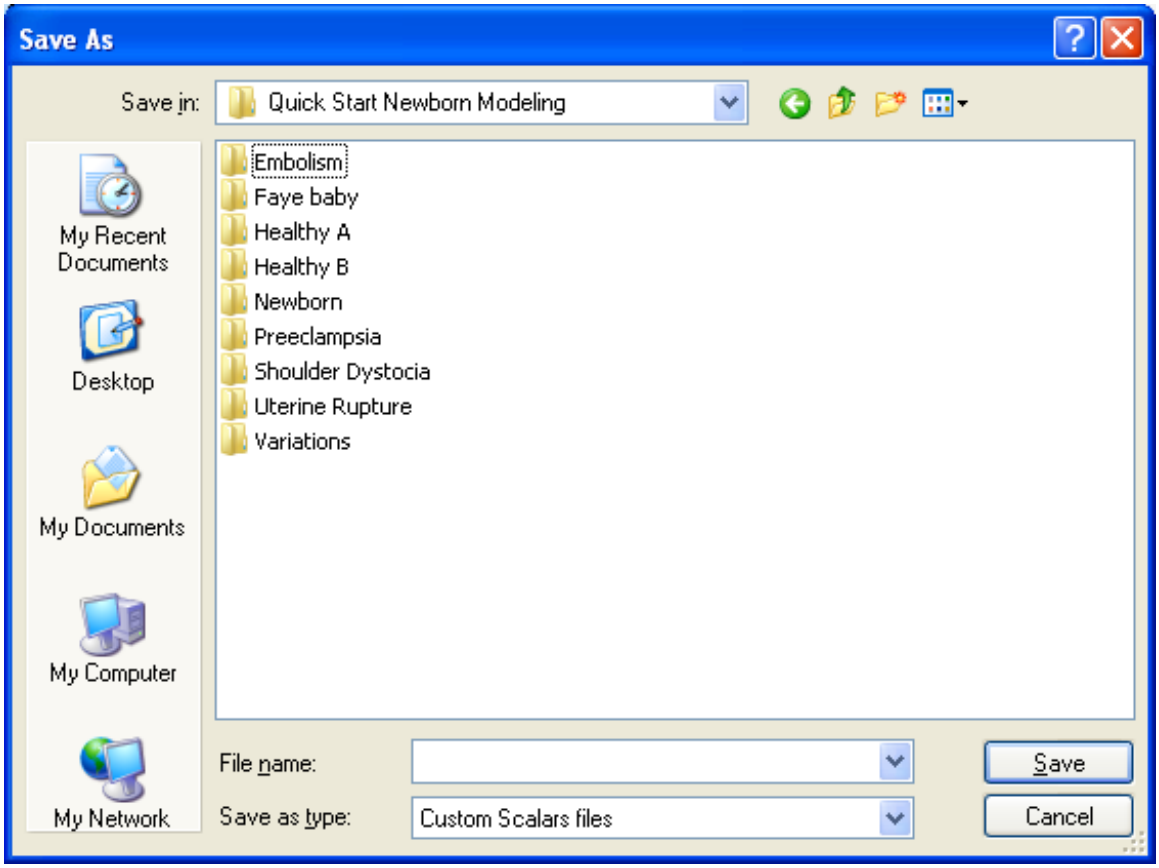


Do the same for as many new values as preferred for display. The figure below shows three new values: Glucose level, hematocrit, and TSH levels along the bottom of the display.

Delete any parameter by clicking “Remove”.

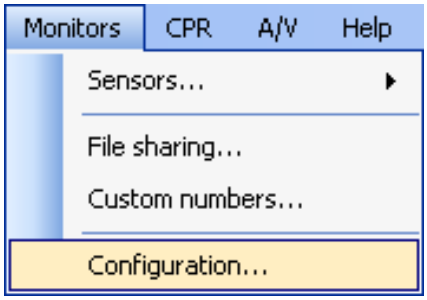


Save any list of added custom numbers by clicking on the “Save...” button. After clicking this button, the “Save As” dialog box is displayed:

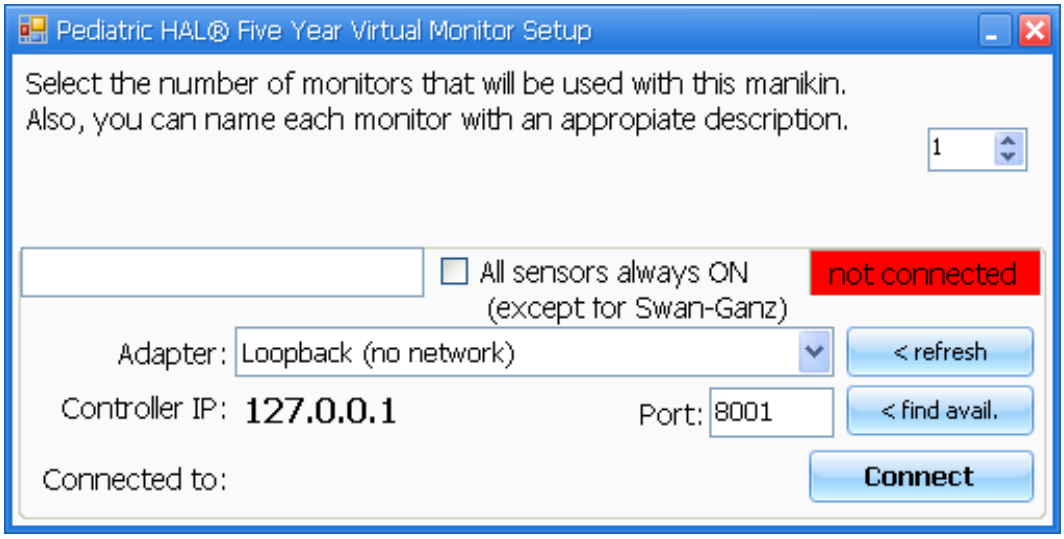


Type a file name and click “Save”. You can load any of the pre-saved combination of custom numbers by clicking on the “Load” button.

d. Configuration



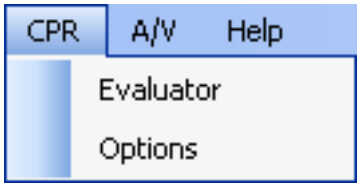
The configuration button is used to properly connect the virtual monitor to the tablet. Clicking on it displays the following window:



When properly configured and connected, the connection status display will turn green and the monitors will show waveforms and readings.

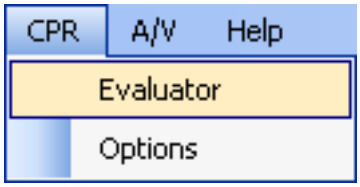
5. CPR

HAL® can also be used as a teaching aid for CPR. There are a couple of features that allow the instructor to get some feedback on how well the providers are doing the CPR. Click on the CPR menu for those options.

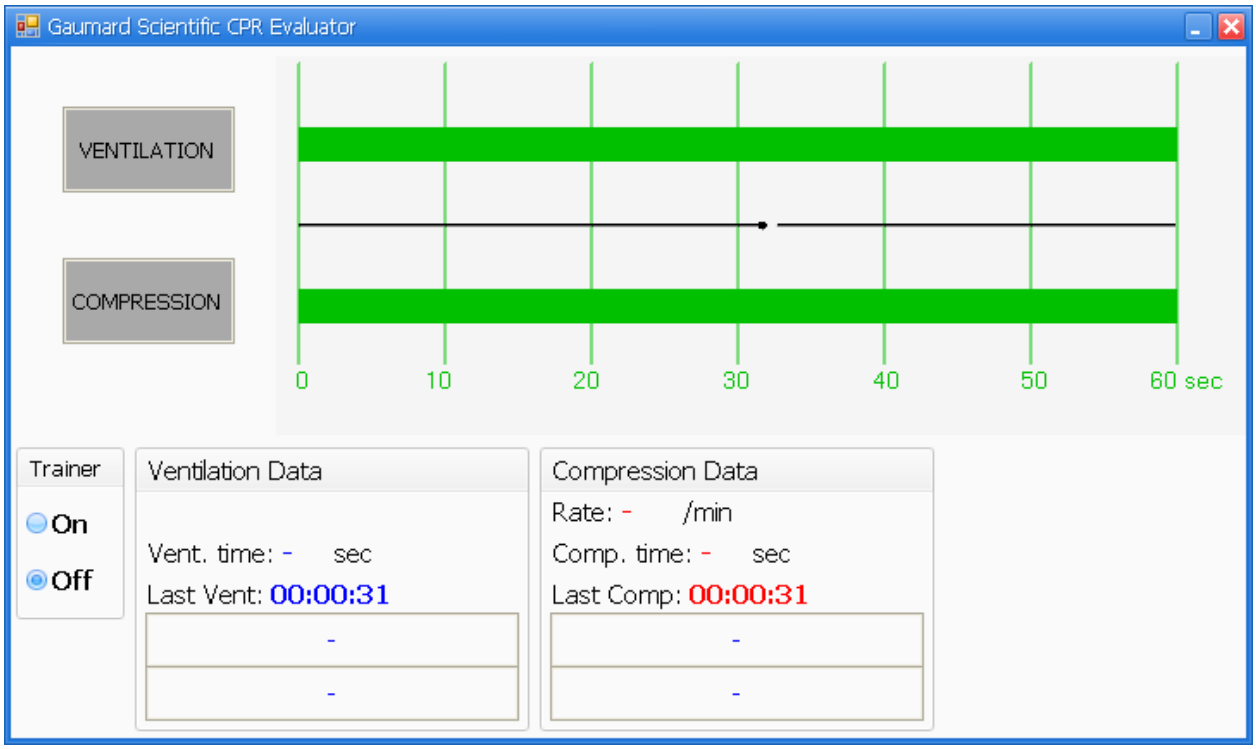


It is important to know that the chest compressions will only give feedback to the instructor if the heart rate is not set to a healthy state, and ventilations will only be reported if the respiration rate is set to **zero**.

a. Evaluator



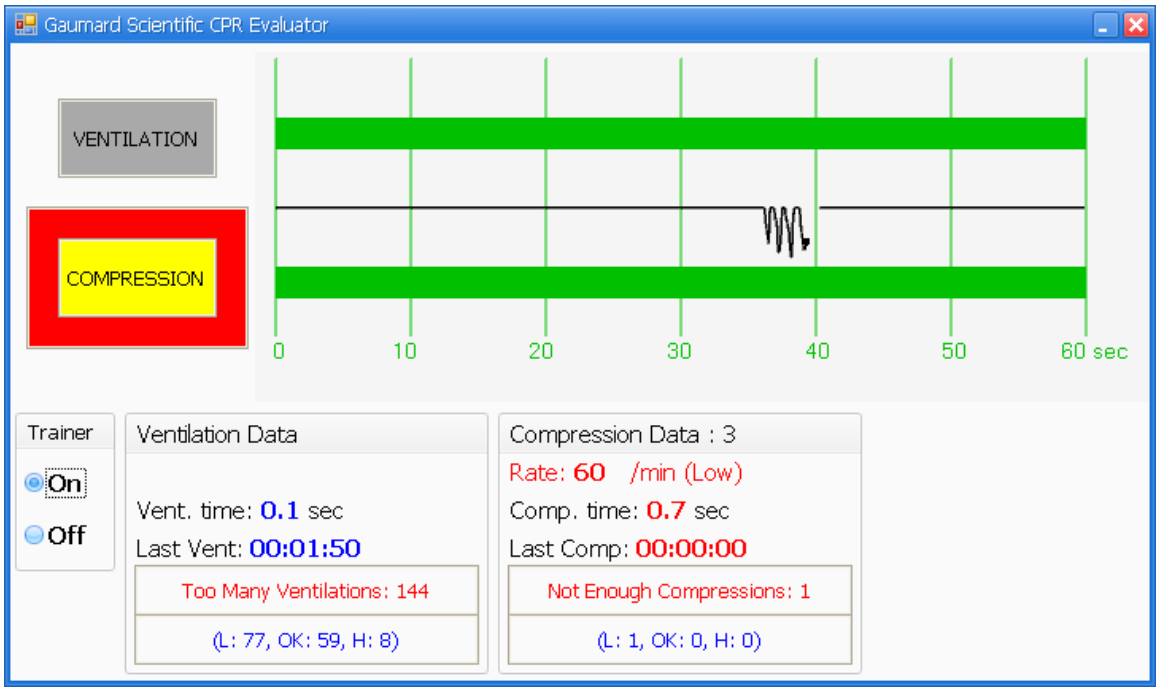
This feature allows the instructor to get real-time feedback on the current compressions and ventilations being done by the providers.

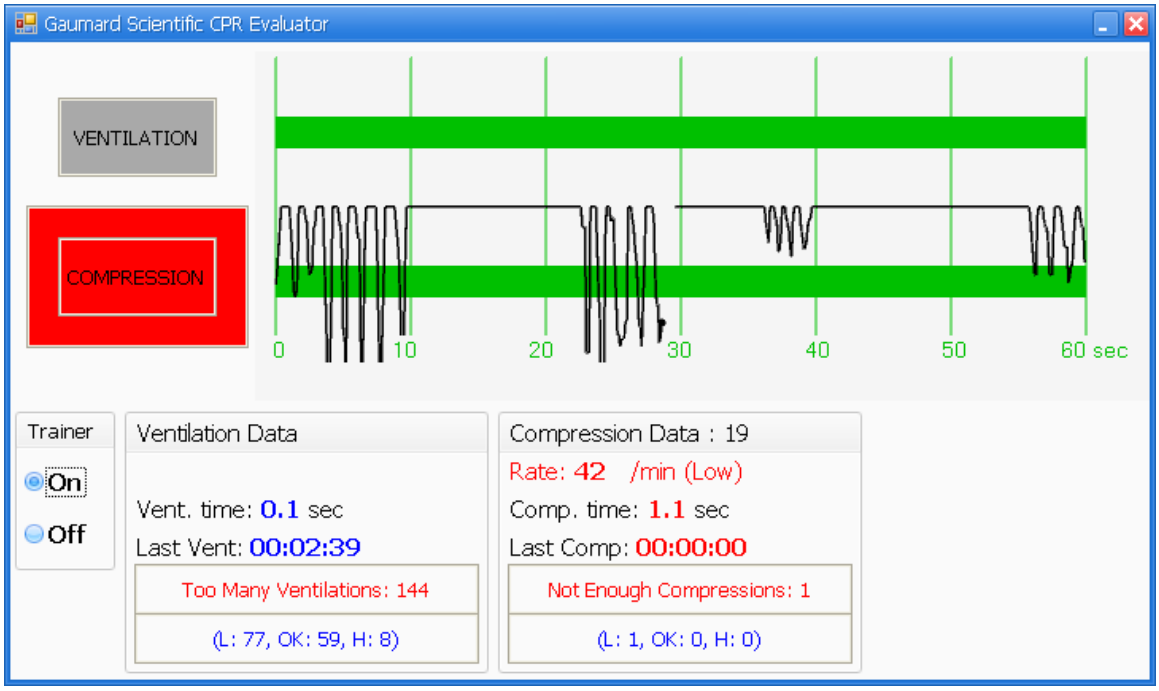


Open this window when your students or providers are ready to start performing compressions and/or ventilations. Click the Trainer to "On" as appropriate.

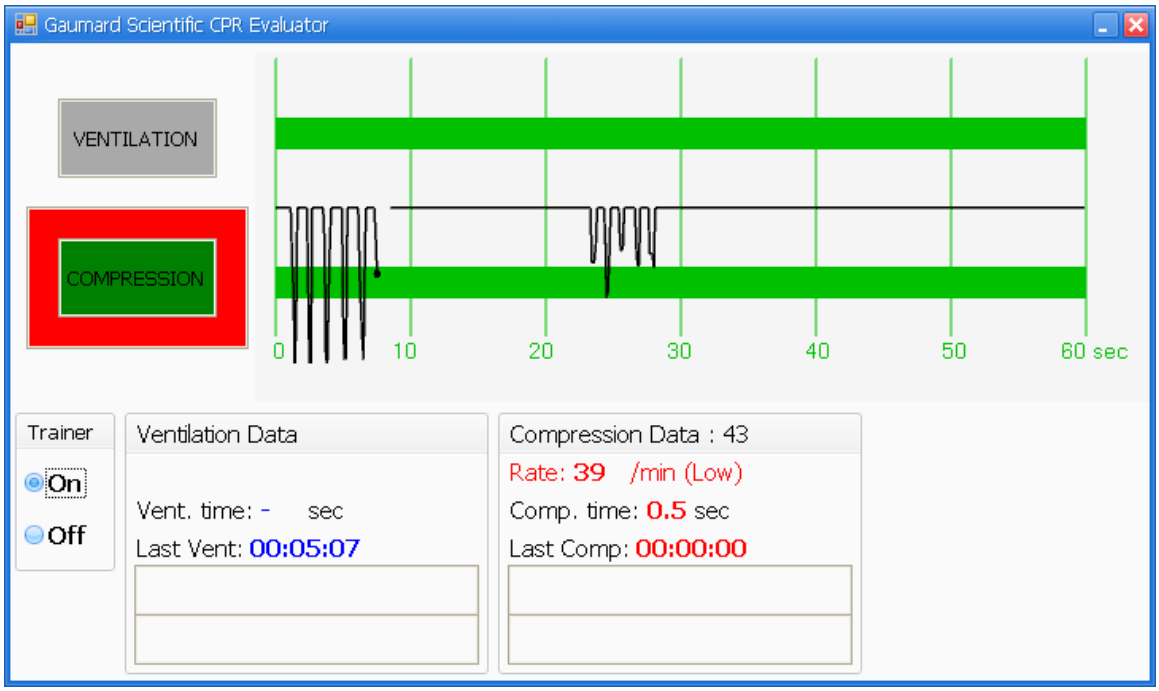
When a ventilation or compression is detected, the label "ventilation" or "compression" will blink one of three colors: green, yellow, or red. Green represents a correctly-performed procedure, yellow means that it was too sHALlow or ineffectual, and red refers to an overly-forceful compression or ventilation.

The examples below show the range of performance with the trainer frame-prompts on:

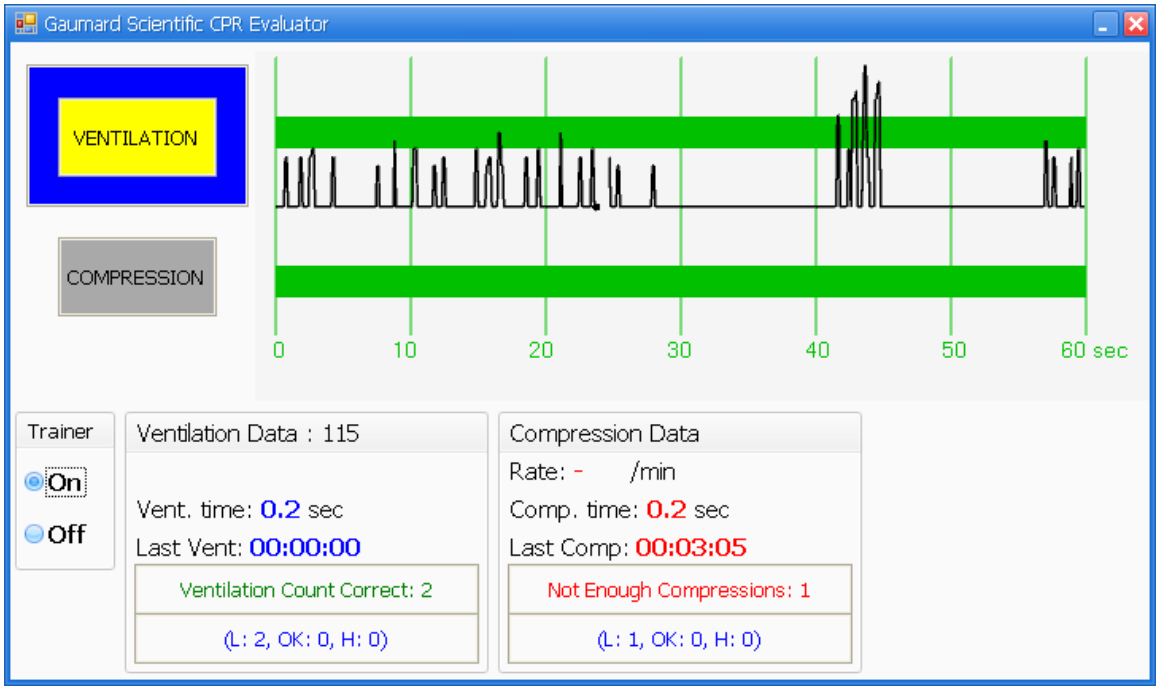


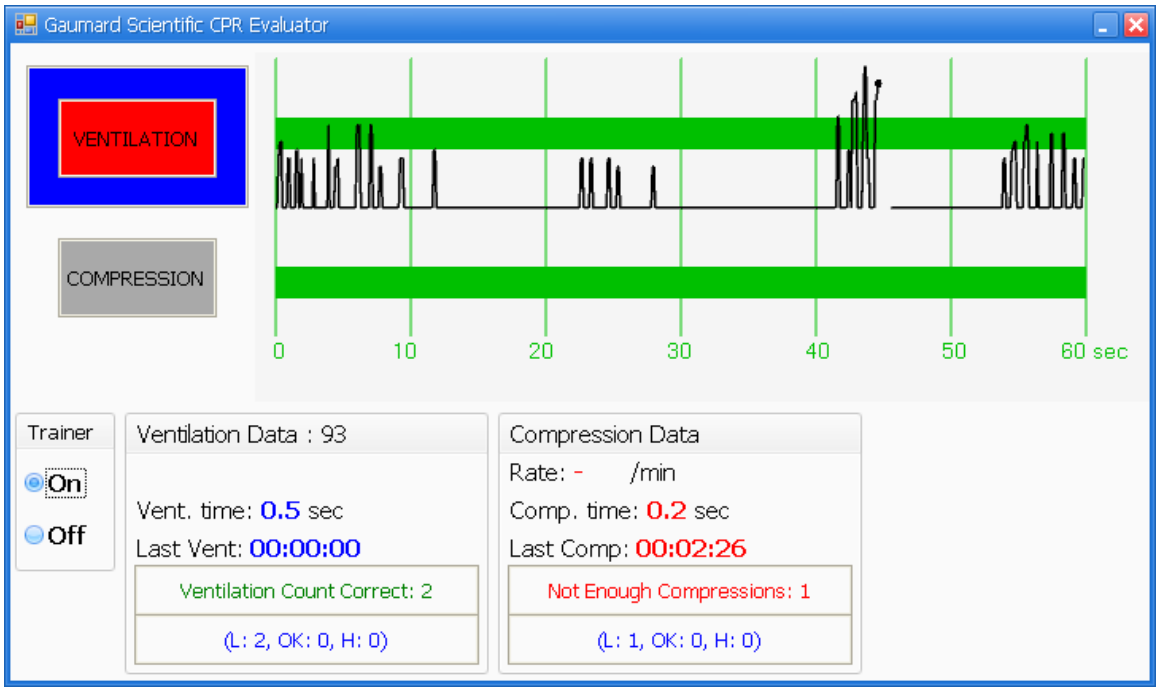


The waveform peaks either do not reach or exceed the green “Good” zone.

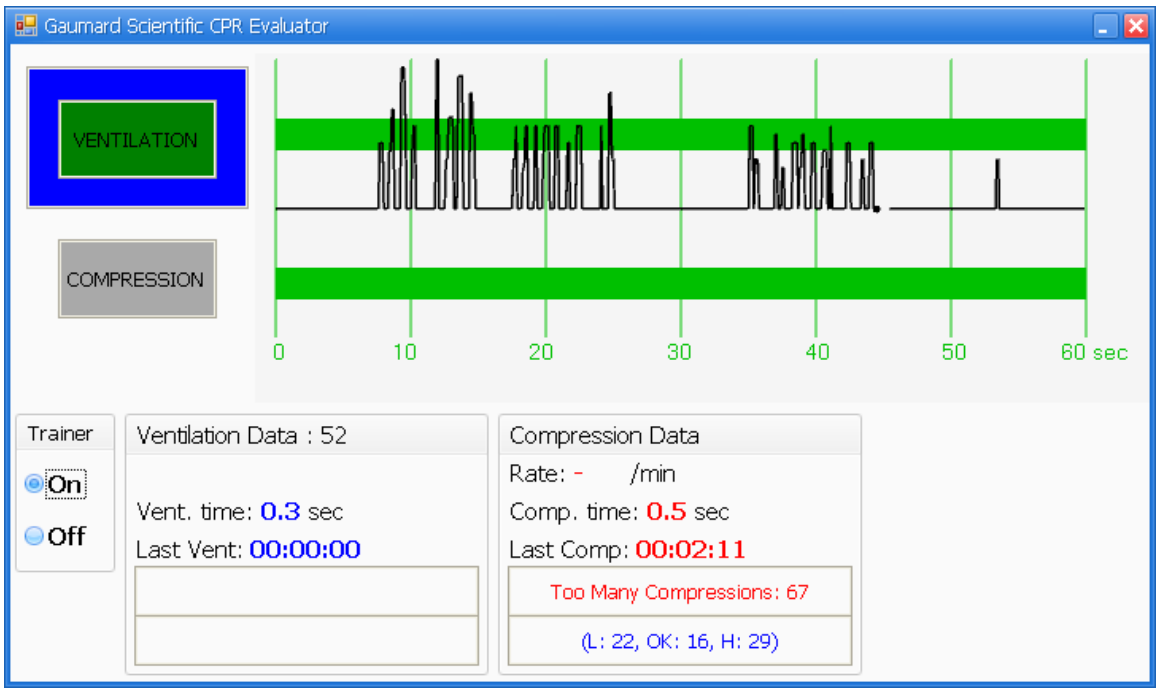


Here the waveform peak is entering the green "Good" zone. If the compression was as forceful as the preceding compressions, the green label will change to red.





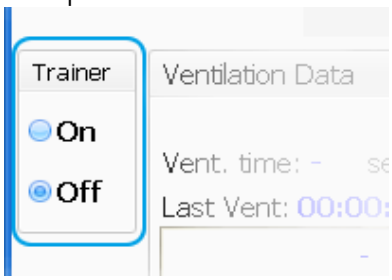
Again, the waveform peaks miss the green “Good” zone for ventilations.



Here, the ventilation peaks reach the green zone fairly consistently.

Trainer

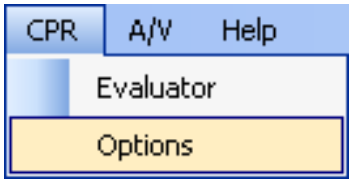
This feature can be used to help the students or providers create the correct rhythm of compressions to ventilation ratio.



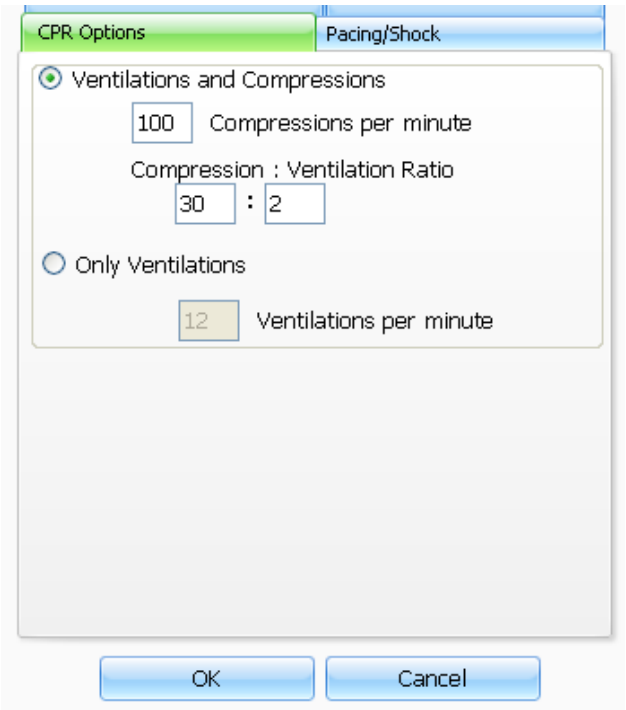
Turning the Trainer on will enable frames to flash around the Compression and Ventilation labels, prompting the provider to administer each procedure when the red or blue frame appears.

The instructor can change the CPR ratio on the trainer by going to CPR, Options.

b. Options

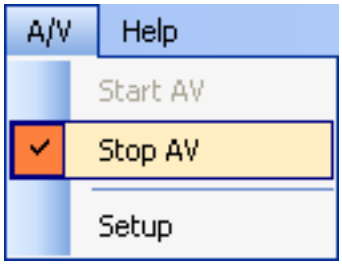


Clicking on Options under the CPR menu, will take to the CPR tab of the “Options…” window.

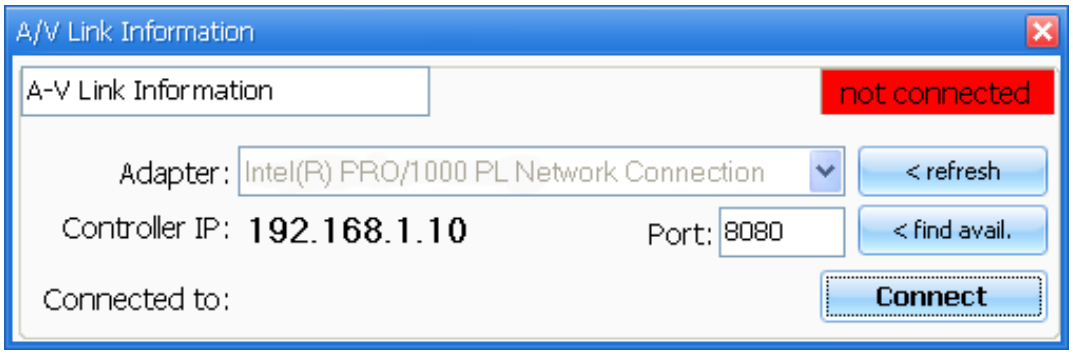


6. A/V

Enabling the AV Link displays the following A/V menu:



Clicking on A/V, Setup displays the following window:



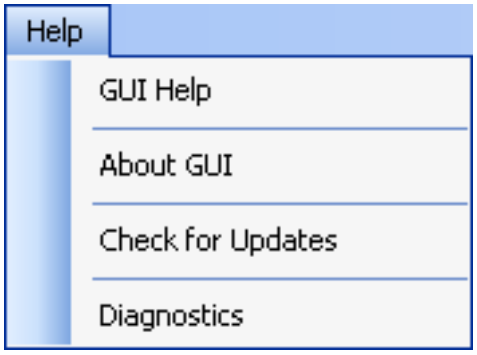
This menu permits sending Start and Stop messages to the recorder, as well as displaying the connection status. In order to set up the connection on the A/V System side, please consult your A/V System's documentation.

GaumardUI also permits automatic sending of a "Start Record" message to the A/V Unit.

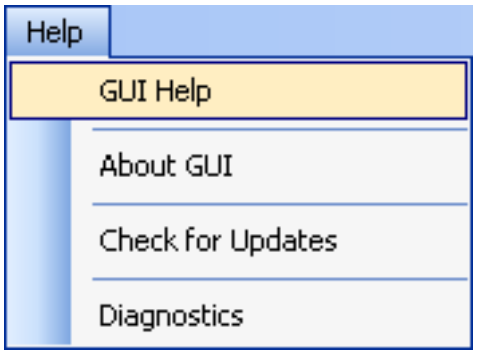
NOTE: Because it is possible to extend a simulation session beyond the last step in a scenario, the "Stop Recording" message does not have an "automatically stop" option.

7. Help

The help menu has four options: GUI Help, About GUI, Check for Updates and Diagnostics.

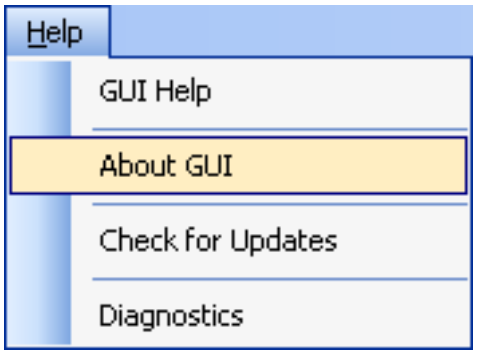


a. GUI Help



GUI Help allows you to view a soft copy of the entire Pediatric HAL® help manual.

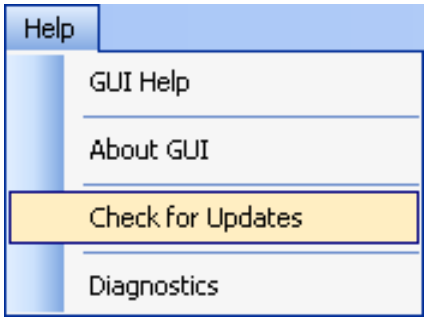
b. About GUI



Clicking on About GUI displays the following dialog box:

This dialog box gives you the version of the software you are currently using.

c. Check for Updates



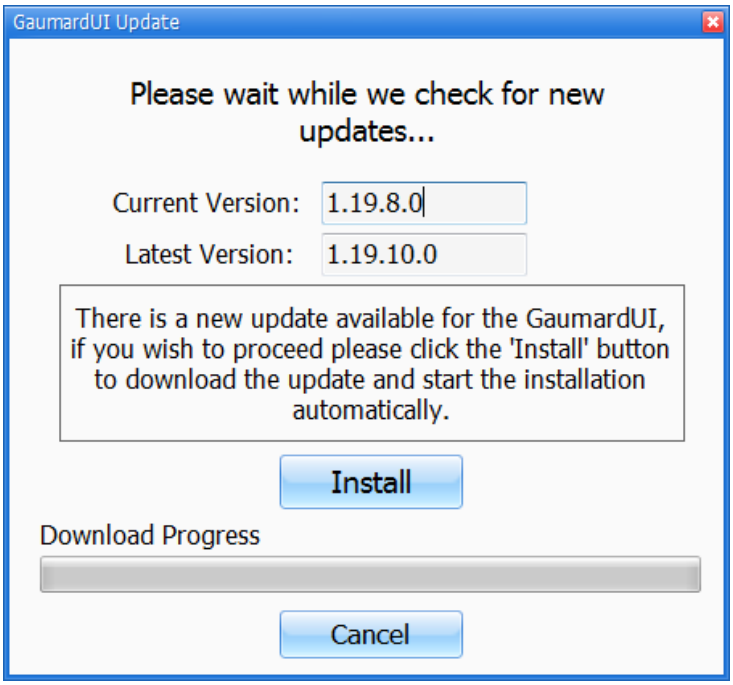
Use this feature to check for software updates. To check and install software upgrades, follow these simple steps:

onnect an Ethernet cable to the tablet PC.

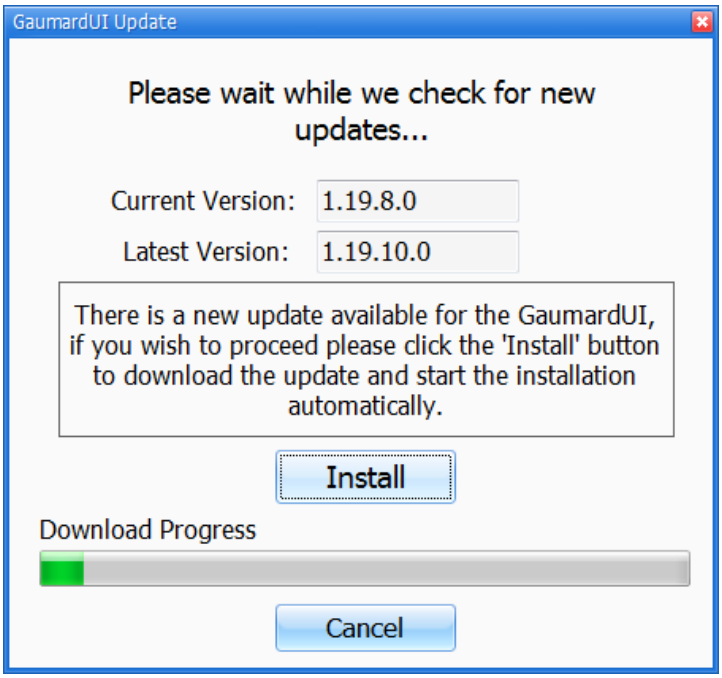
Warning: Do not change the network configurations of the tablet to connect it to your local wireless network. Such changes will interfere with the proper operation between the tablet and your

virtual monitor.

1. Go to the Help menu, and click on Check for Updates. The Gaumard UI automatically starts searching for available updates.
2. If there is an available update, the following dialog box is displayed.



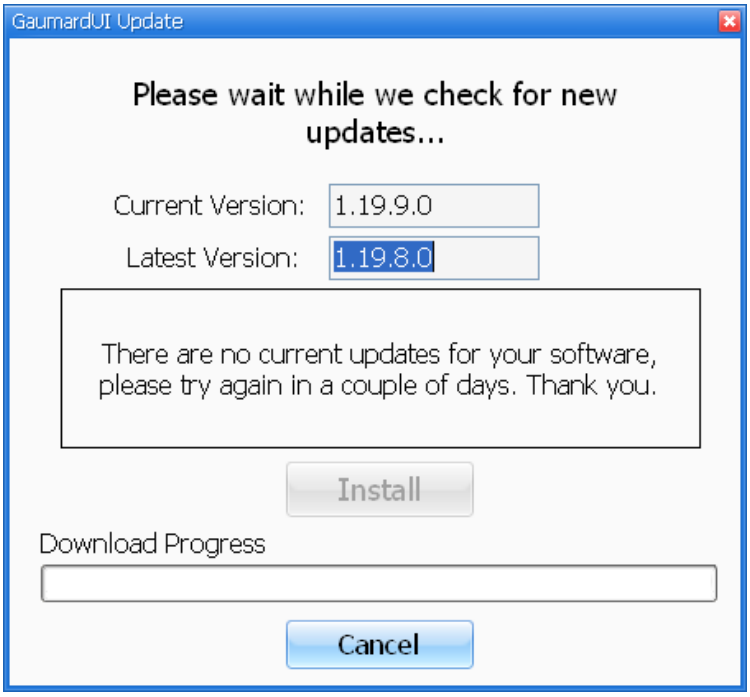
Click “Install” to begin the update. The download progress bar begins to auto-fill as the setup file is downloaded.



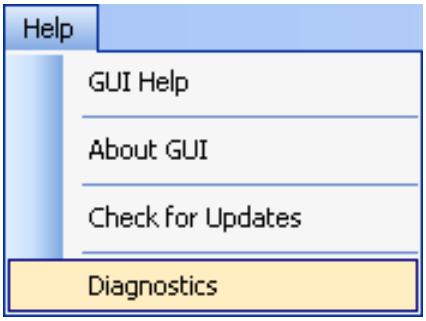
Upon completion, the software automatically launches the setup wizard.

Click Next, and follow the wizard instructions to complete the software download.

3. If updates are not available, the “Install” button is disabled and the following dialog box is displayed.

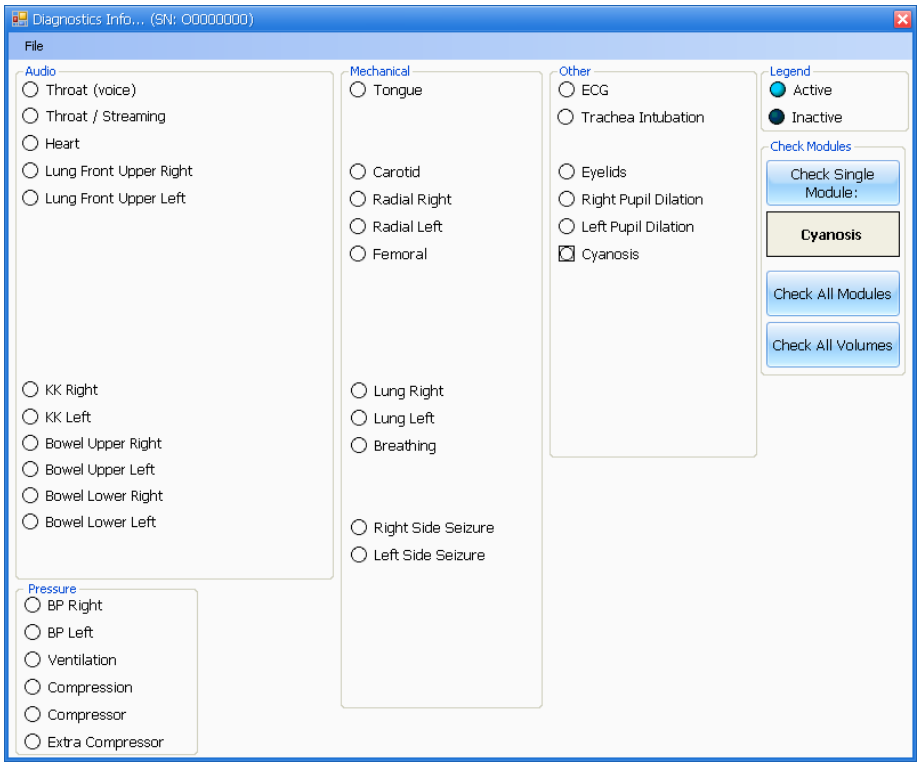


d. Diagnostics

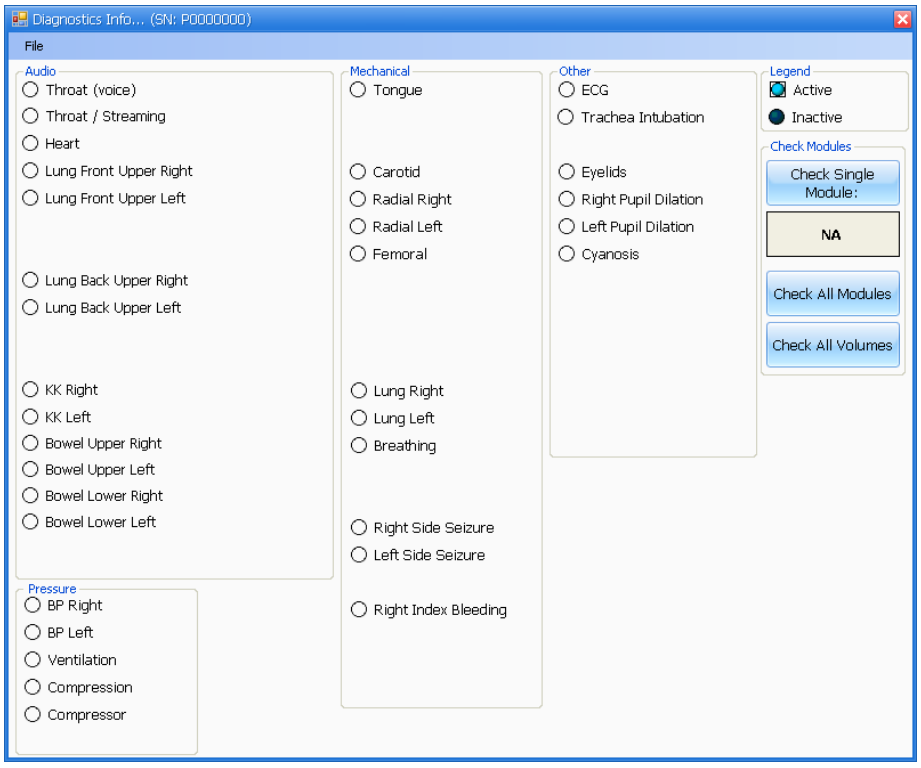


Use this feature as a troubleshooting tool.

S3004



S3005



For more information, go to the Appendix, Section V.C.2.

IV. Care and Cautions

A. Overall Warnings

Remember that damage caused by misuse is not covered by your warranty. It is critical to understand and comply with the following guidelines:

- There are inherent dangers in the use of some medical devices. For simulations that incorporate electrical therapy of any kind, always know your equipment and **follow the device manufacturers' safety guidelines.**

Defibrillation is only allowed on the large sternum and apex sites, marked green below. **NEVER deliver a shock to ECG electrode targets on the shoulders or waist, marked red below.** Doing so will not create a fire hazard, nor is there risk of shock to the provider, but **internal damage in HAL® may result**. This situation is considered improper use and is **NOT** covered by the HAL® warranty. The system will require repair at our facility.

Electrode gel on the skin between any two electrode/paddle targets can become a pathway for electrical current, just as in real life. If this occurs, HAL®'s skin can be burned.

Only deliver electrical therapy when the simulator is intact and fully assembled. NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics. Discontinue use if any wires are found exposed with damaged insulation.

HAL® should be **cleaned** with a cloth dampened with diluted liquid dishwashing soap. If medical adhesives remain on the skin, clean with alcohol wipes. **DO NOT USE "GOO GONE"** as the citric acid in the formula will cause pitting of the various materials comprising your manikin.

When connecting the battery to the manikin, make sure to **match the two color-coded connectors to the corresponding color-coded battery terminals**.

Do not attempt to intubate without lubricating the airway adjunct with silicone oil lubricant (provided). Failure to do so will make intubation very difficult and is likely to result in damage. Always lubricate tubing , airway and nasal opening prior to performing any nasal or oral exercises.

NEVER disconnect the communications module while the HAL®UI software is running. The software will halt, and the module may be damaged.

When simulating drug administration **via endotracheal tube, providers must use an empty syringe**. Passing liquids into the trachea or esophagus may cause internal damage.

The provided baby powder should be used sparingly on top of the lungs and ribs to eliminate any noise caused by rubbing of internal parts during breathing.

Store HAL® in a cool, dry place. Extended storage above 85 degrees Fahrenheit (29 Celsius) will cause the manikin to soften and slowly warp. It is acceptable to *operate* HAL® at an ambient temperature of 95 degrees Fahrenheit (35 Celsius).

HAL® is "splash-proof" but not water-proof. Do not submerge or allow a large volume of fluid to enter the interior of the manikin. Do not expose the tablet computer to water or excessive dust unless it is protected by a rugged case (available separately).

Mouth to mouth resuscitation without a barrier device is not recommended, as it will contaminate the airway. Treat HAL® with the same precautions that would be used with a real patient.

The use of needles larger than 22 gauge will reduce the lifetime of the lower arms' skin and veins.

Replace needle-decompression targets by exposing the ribs and disconnecting the Luer-lok fitting that secures the target. Follow the instructions for closing the chest in the Equipment Set-up section of this guide.

Replacing the battery should only be done while HAL® is in **STAND-BY** mode or when the software is not running. Refer to the Equipment Set-up section of this guide for more details on power modes.

When the arm veins require replacement, contact Gaumard to arrange for a lower arm exchange. For a small fee, we will deliver reconditioned and warrantied lower arm assemblies to your facility. After receiving the replacement arms, use the same box and the enclosed shipping label to return the old arms to Gaumard. For international and express service, additional fees may be charged. Refer to the Consumables and Replacement Parts section of this guide, and contact Customer Service for more information.

B. Electrical Therapy

One of Pediatric HAL®'s most exciting features is the accommodation of real monitoring and electrical therapy devices. In most cases, no special instruction is necessary to use such devices. Electrodes of your choice are applied directly to the flexible, conductive targets on the chest. A few special concerns are described below.

Warnings:

▪ ECG lead II, the monitoring lead, is the only ECG signal produced on the manikin. HAL® has sites on his chest for up to 4 ECG electrodes to accommodate today's most common monitors, marked **red** below. These sites are electrically tied together by an appropriate impedance, preventing "lead off" alarms from the monitor.

And, as stated previously in Care and Cautions:

▪ There are inherent dangers in the use of some medical devices. For simulations that incorporate electrical therapy of any kind, always know your equipment, and **follow the device manufacturers' safety guidelines.**

- **Defibrillation** is only allowed on the large sternum and apex sites, marked **green** below. NEVER deliver a shock to ECG lead targets on the shoulders and waist. Doing so will not create a fire hazard, nor is there risk of shock to the provider, but major internal damage will result. This situation is considered improper use and is NOT covered by the HAL® warranty. The system will require repair at our facility.
- **Electrode gel on the skin** between any two electrode/paddle targets can become a pathway for electrical current, just as in real life. If this occurs, HAL®'s skin can be burned.
- **Only deliver electrical therapy when the simulator is intact and fully assembled.** NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics. Discontinue use if any wires are found exposed with damaged insulation.
- Real medical products, especially electrodes, sometimes use powerful adhesives that can be difficult to remove. HAL® should be cleaned with a cloth dampened with diluted liquid dishwashing soap or with alcohol wipes. **DO NOT USE "GOO GONE"** as the citric acid in the formula will cause pitting of the various materials comprising your manikin.

V. Appendix

A. More About Scenarios

Pediatric HAL® comes with three factory preset profiles, designed in conjunction with healthcare professionals. Two are in Manual Mode; one uses the physiological modeling in Automatic Mode.

The contents of each are described below.

In Manual Mode:

- *Quick Start Scenarios* - a variety of complete scenarios and the palette items they comprise.
- *Default* - only a simple Palette filled with common conditions (no scenarios). When creating a new profile, it is often useful to include the Default profile contents and begin customization from that foundation.

In Automatic Mode:

- *Default Modelling*- only a simple palette filled with common conditions (no scenarios). When creating a new profile, it is often useful to include the Default profile contents and begin customization from that foundation.
- *Meds* – three scenarios demonstrating a sample set of medication reactions

Following the list of scenarios are flowcharts displaying specific Details settings, actions and health status for each step.

1. Quick Start Pediatric 5 (S3005) Factory Preset Scenarios

Category	Scenario
Respiratory	
	1. Asthma
	2. Foreign Body Aspiration
	3. Upper Airway Obstruction (Toy Balloon)
	4. Epiglottitis
Trauma	
	1. Chest Injury
	2. Hypothermia
	3. Alcohol Ingestion
	4. Organophosphate Poisoning
	5. Renal Failure and Hyperkalemia
Cardiac	
	1. Soccer boy with SVT
	2. Cardiac Arrest
	3. Cardiac Ischemia
	4. Cardiac Tamponade
	5. Supraventricular Tachycardia
Systemic	
	1. Gram Negative Sepsis
	2. Status Epilepticus
	3. Fire Victim
	4. Septic Distributive Shock
	5. Diabetic Ketoacidosis
Automatic	
	Adenosine OD
	Adenosine SD
	Adenosine UD

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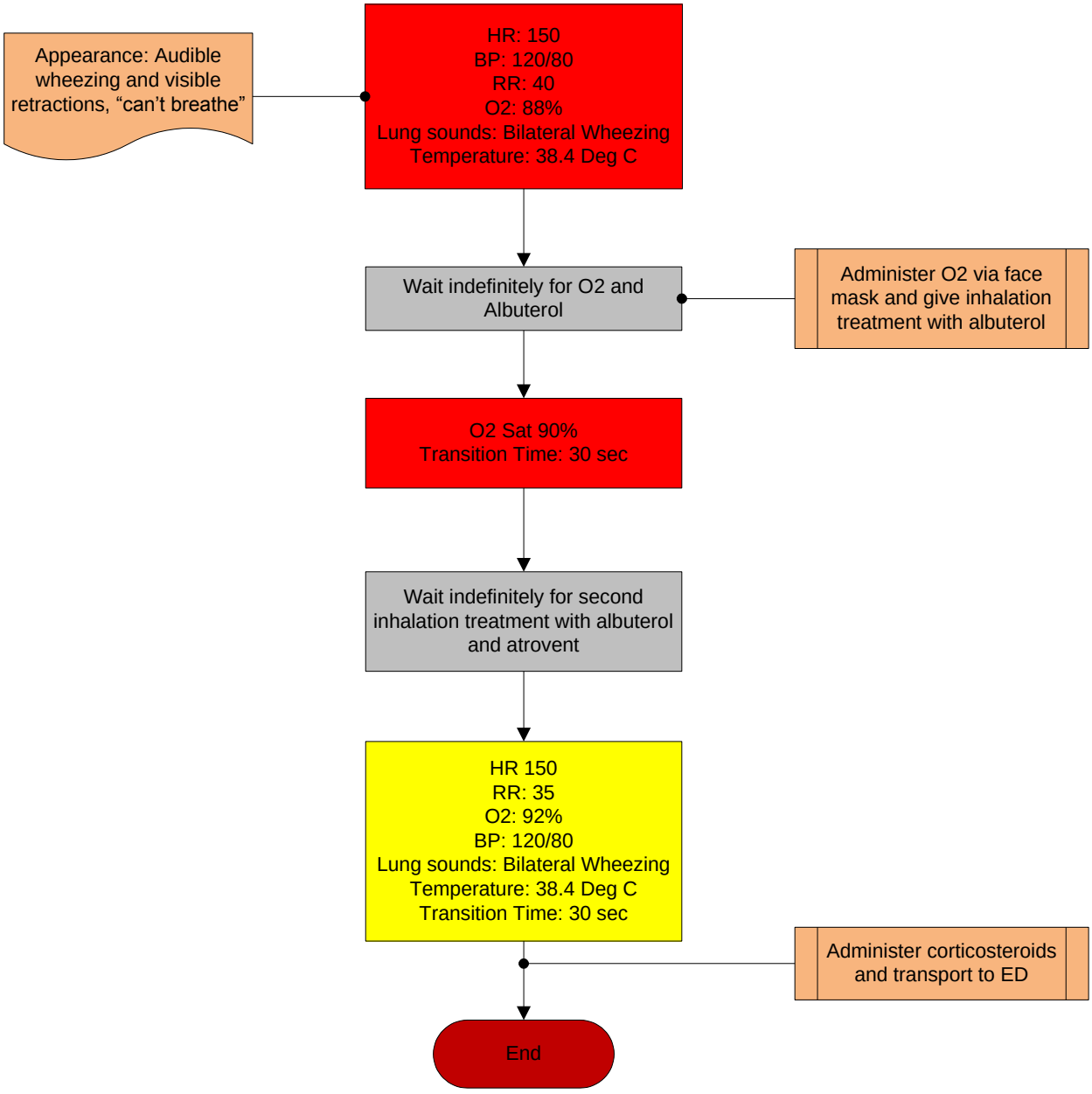
Pediatric HAL® Five Year - Respiratory Scenario

Asthma

A five year old, known asthmatic began coughing and wheezing the previous day. His parents had "run out" of his daily steroid inhaler two weeks ago. He received two nebulized Albuterol the day before and slept through the night. He had one treatment this morning but by mid morning he was in respiratory distress with audible wheezing and visible retractions. He cannot speak in full sentences.



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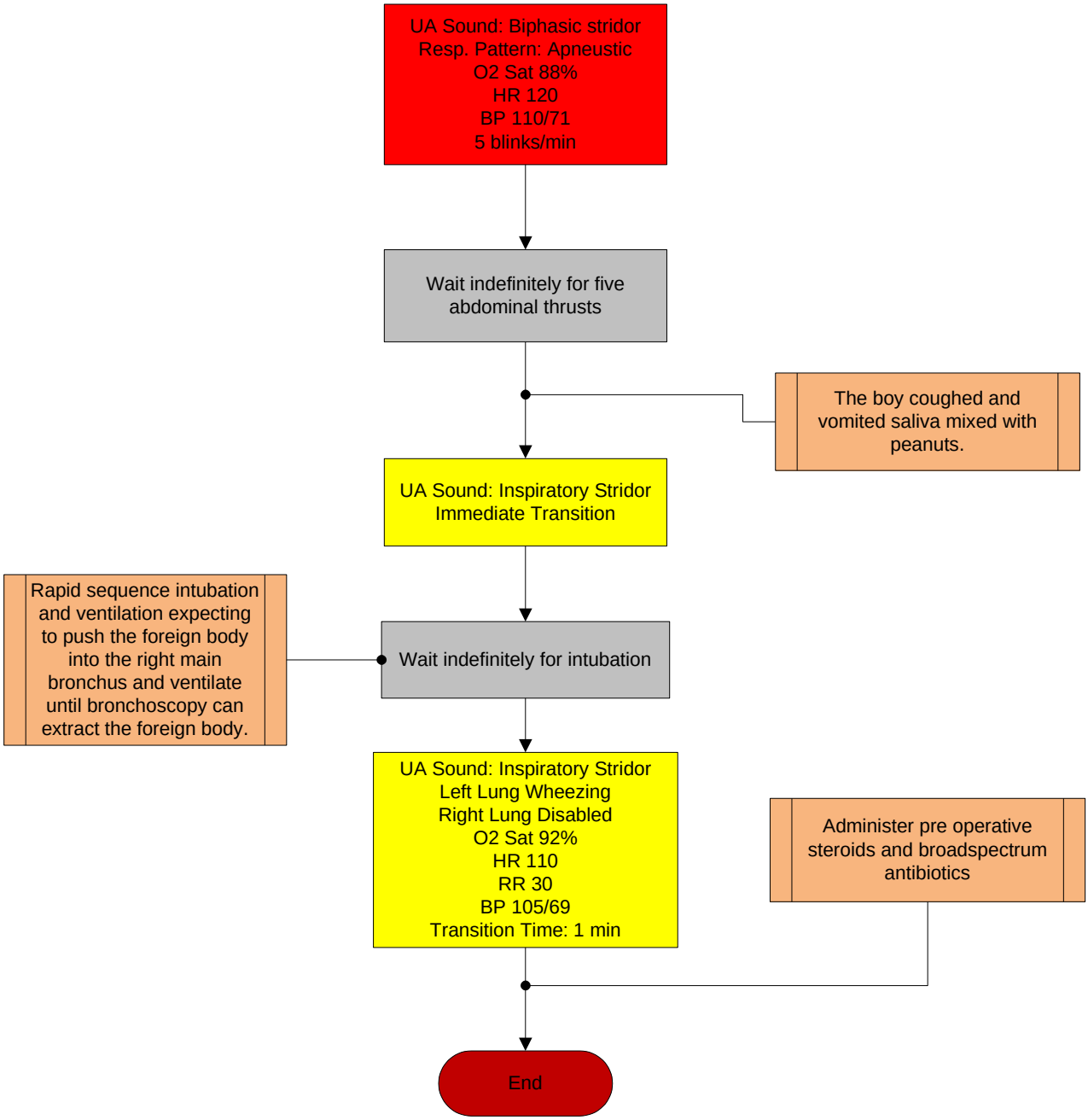
Pediatric HAL® Five Year - Respiratory Scenario

Foreign Body Aspiration

A five year old boy was visiting his grandmother who had a bowl full of peanuts on the table. He and his older brother were throwing the peanuts in each others mouths and laughing. The five year old began choking and gasping for air. He could still say a few words between coughing, but then he collapsed to the floor. His grandmother ran into the room and his older brother explained he had choked on a peanut. His grandmother saw he was turning "blue". She told her grandson to call 911.



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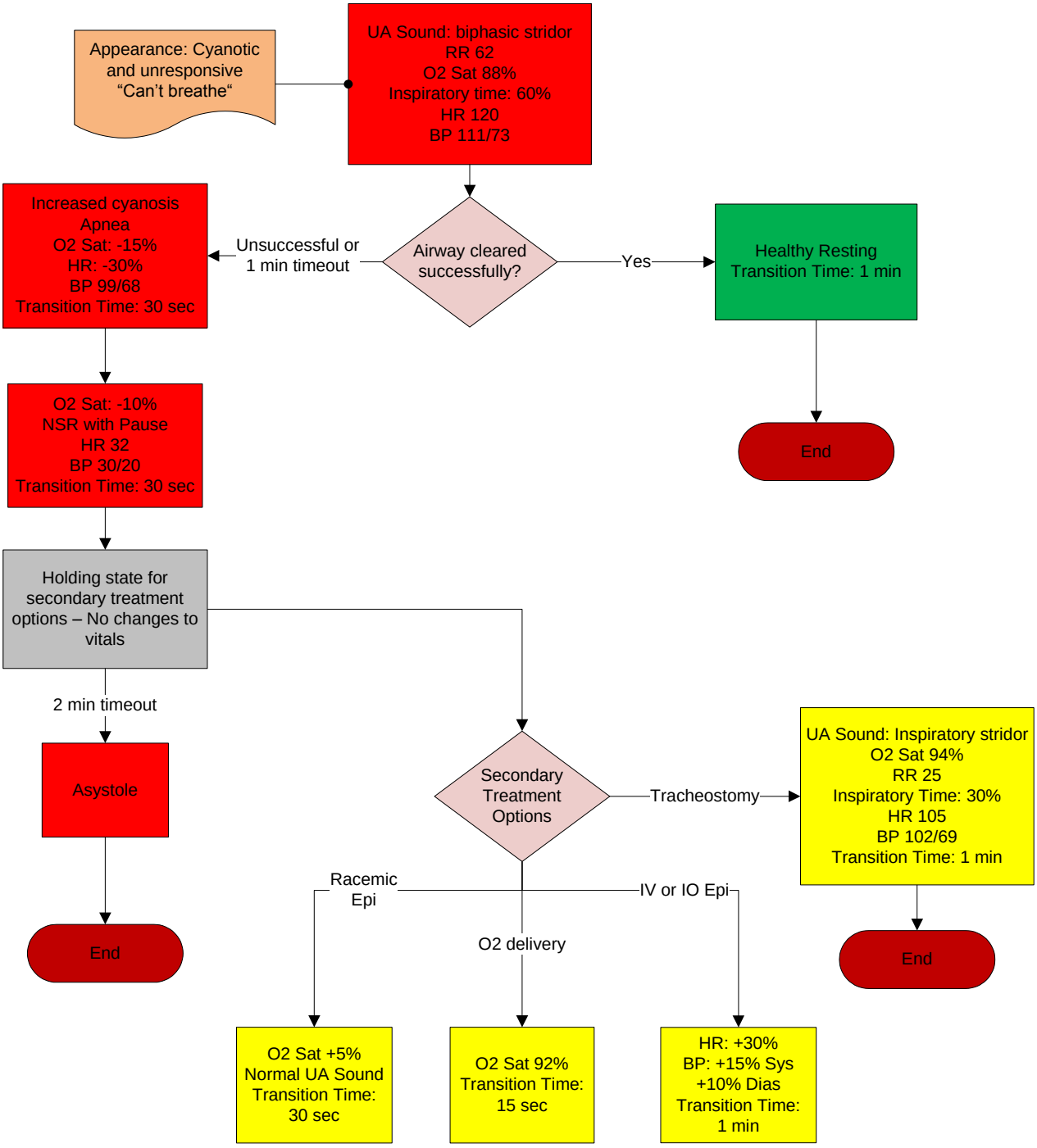
Pediatric HAL® Five Year - Respiratory Scenario

Upper Airway Obstruction

"Toy Balloon 5yr"

You are at a birthday party where you see a five year old trying to blow up a balloon. Instead of blowing out he sucks the balloon in and begins gasping for breath. He is turning cyanotic and cannot cry. You assess his airway is obstructed and the obstruction must be removed. You try simple measures as back blows and chest thrusts and activate EMS.



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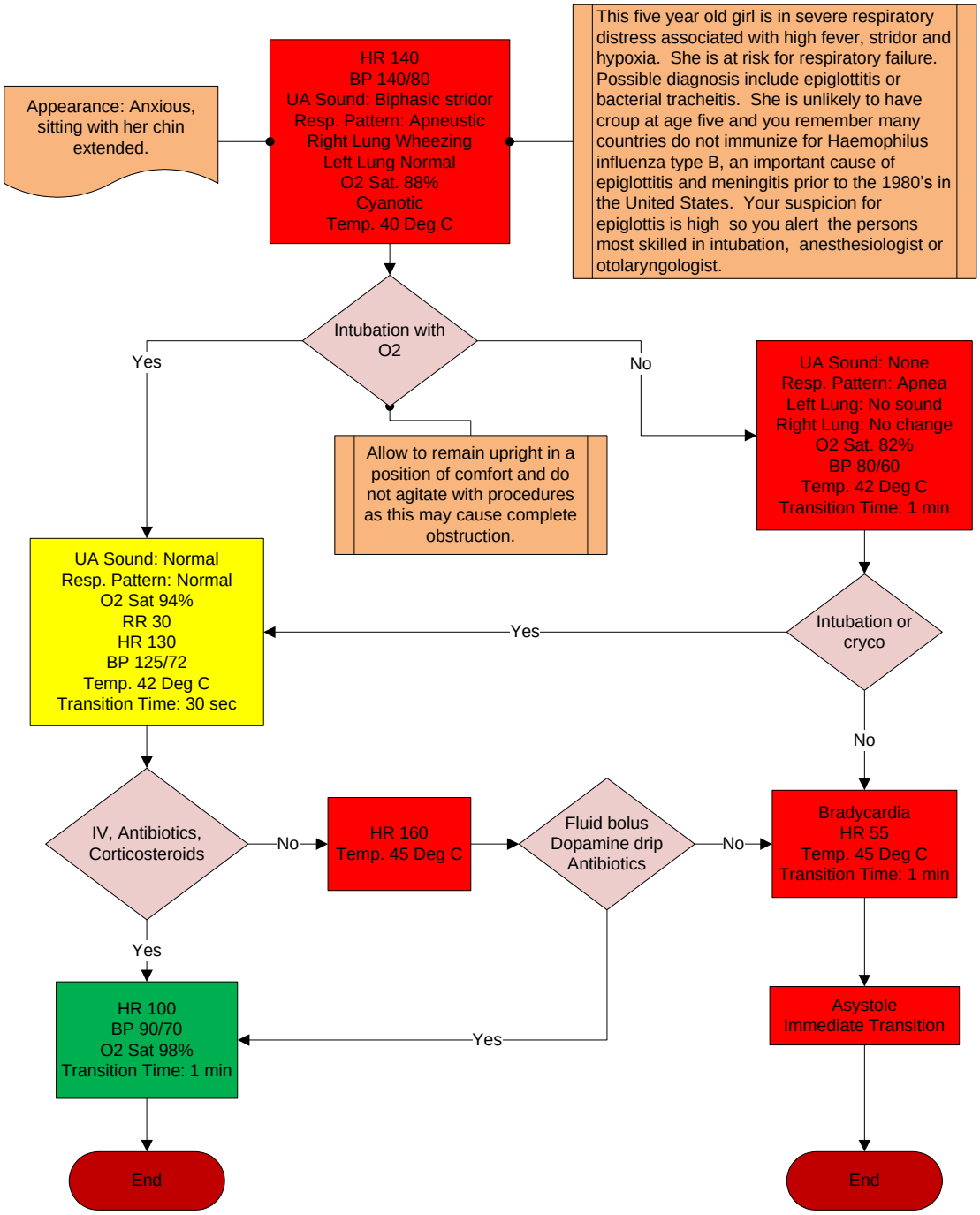
Pediatric HAL® Five Year - Respiratory Scenario

Epiglottitis

A five year old girl was recently adopted from another country. Her immunization status is in question and her parents had planned to have her immunized soon. Two weeks after her arrival in the United States she developed a high fever of 40 Deg C and has difficulty in swallowing. Her voice became weak and she had coarse stridor with every breath. Her parents tried treating her for croup with some cool mist as they had their other children but she showed no improvement. Her parents then brought her to the E.D.



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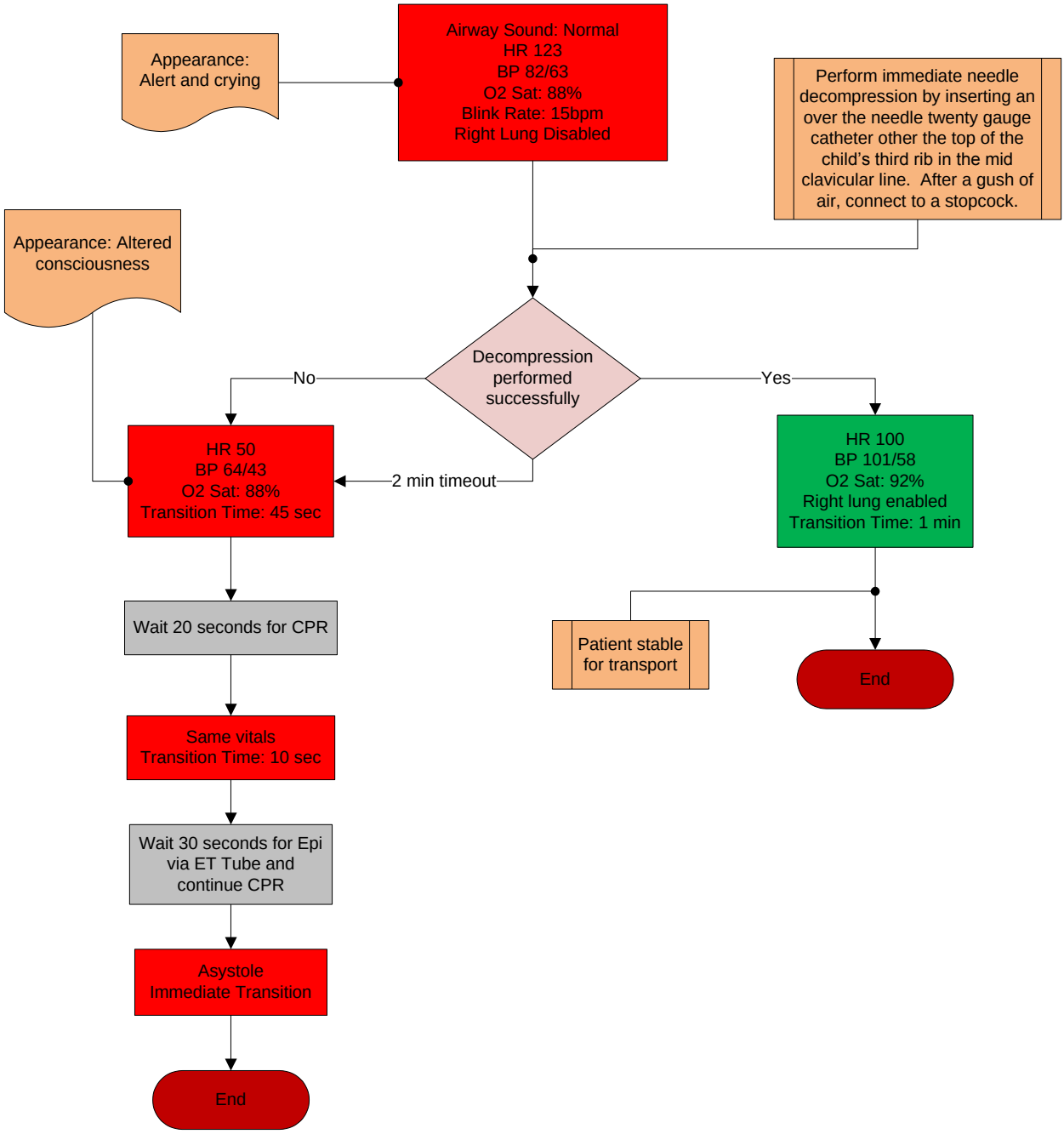
Simulators for Health Care Education

Pediatric HAL® Five Year - Trauma Scenario

Chest Injury

A five-year-old boy was racing his BMX bike over a dirt hill in his back yard. He had his helmet on but not his chest protector. His mother was watching and said he became airborne and the handle bar of the bike landed on his chest when he hit the ground. He is crying, "my chest hurts" and "I can't breathe". He was not unconscious and his extremities and abdomen appear normal. You suspect fractured ribs, a lung contusion or a tension pneumothorax.



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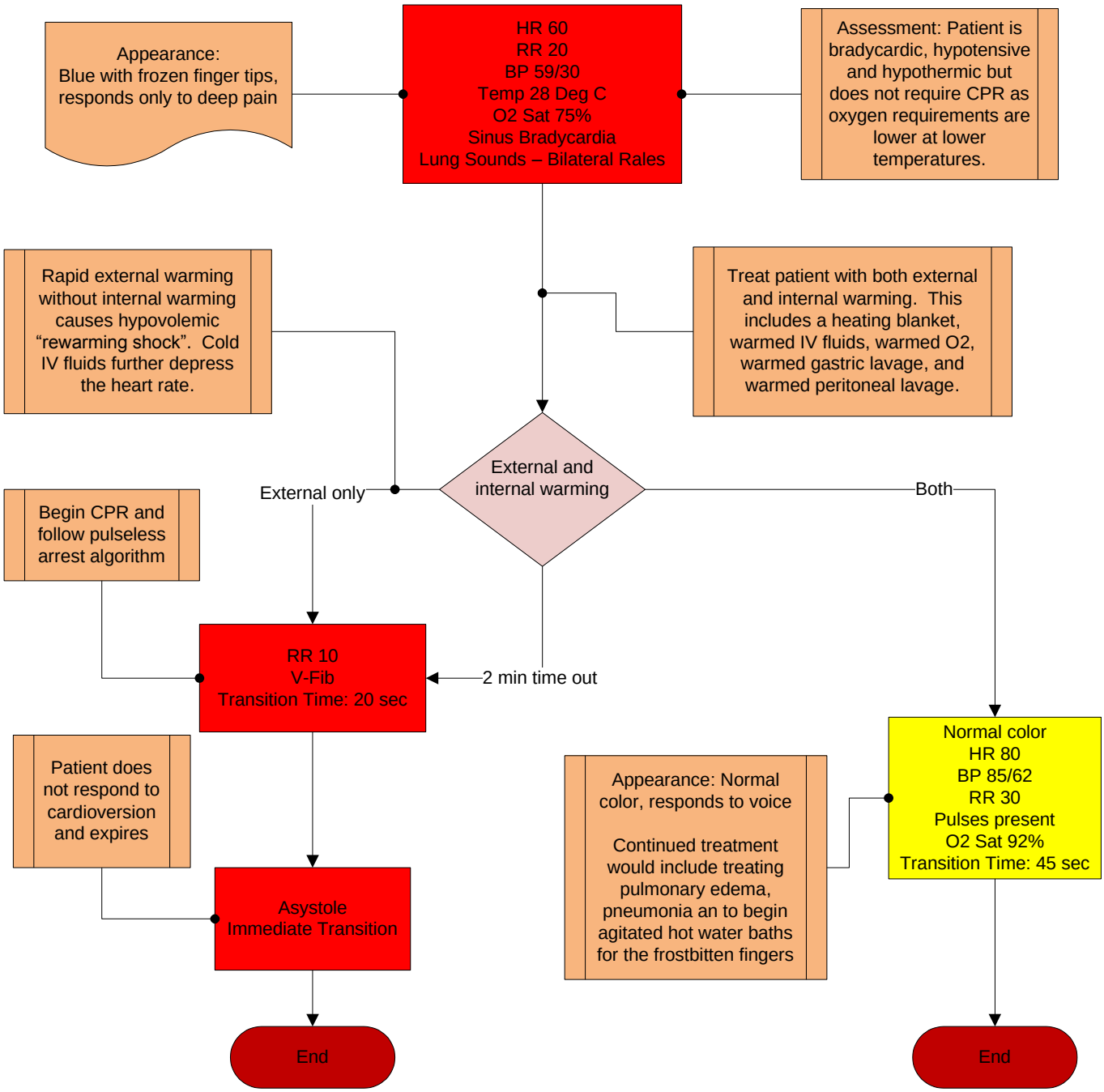
Pediatric HAL® Five Year - Trauma Scenario

Hypothermia

A five year old boy wandered away from his parent's farm house in freezing temperatures. He was found by a passing motorist curled in a snow drift. He was dressed only in pajamas and his exposure time was at least four hours. The motorist wrapped him up and drove him to the hospital.



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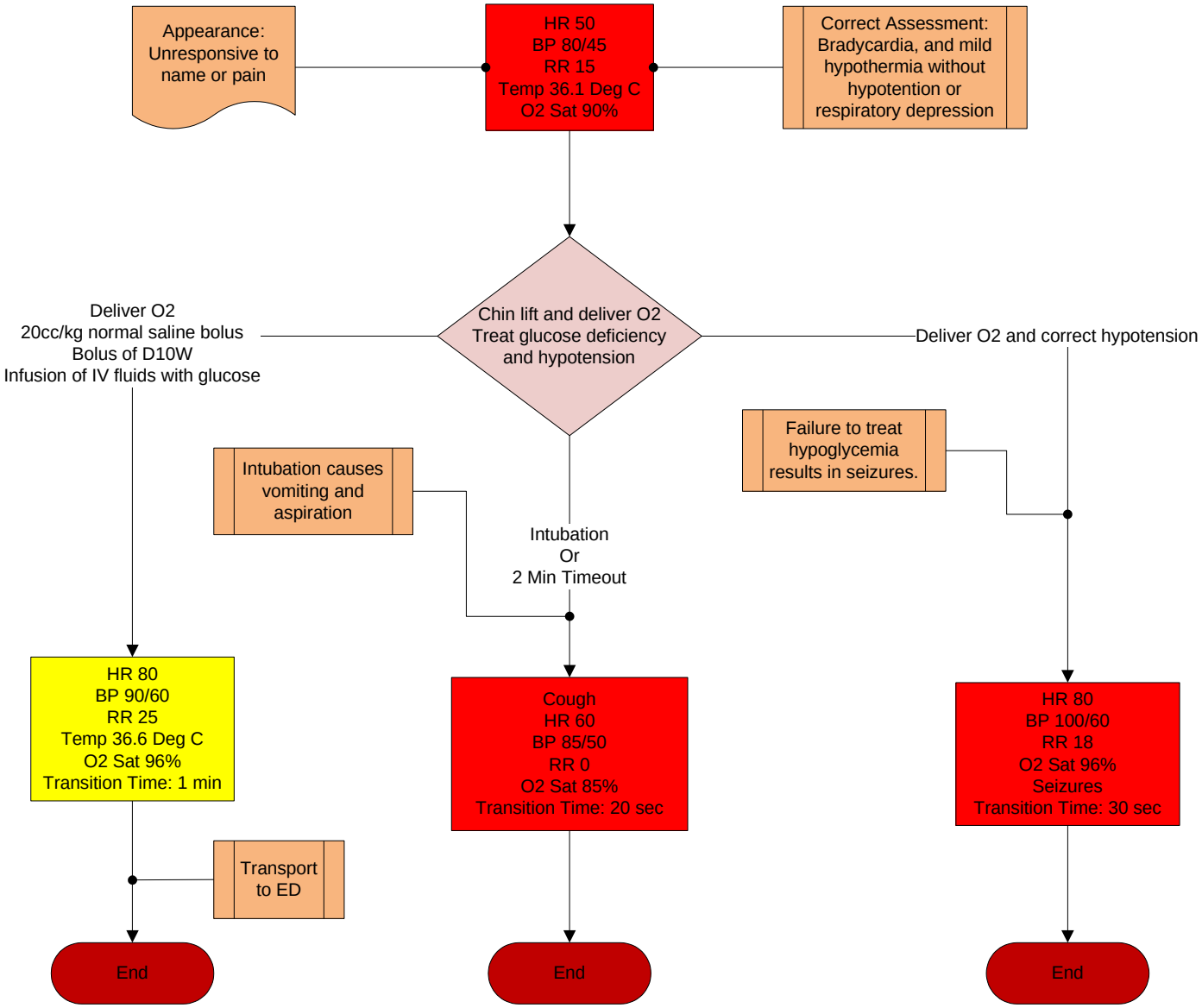
Simulators for Health Care Education

Pediatric HAL® Five Year - Trauma Scenario

Alcohol Ingestion

Bradycardia and Hypoglycemia

A five year old boy wakes up early and is thirsty. His parents had a party the night before and left glasses half full of mixed alcoholic drinks around the living room. When the parents get up two hours later they find him asleep on the floor and smelling of alcohol. They cannot wake him up so they call 911.



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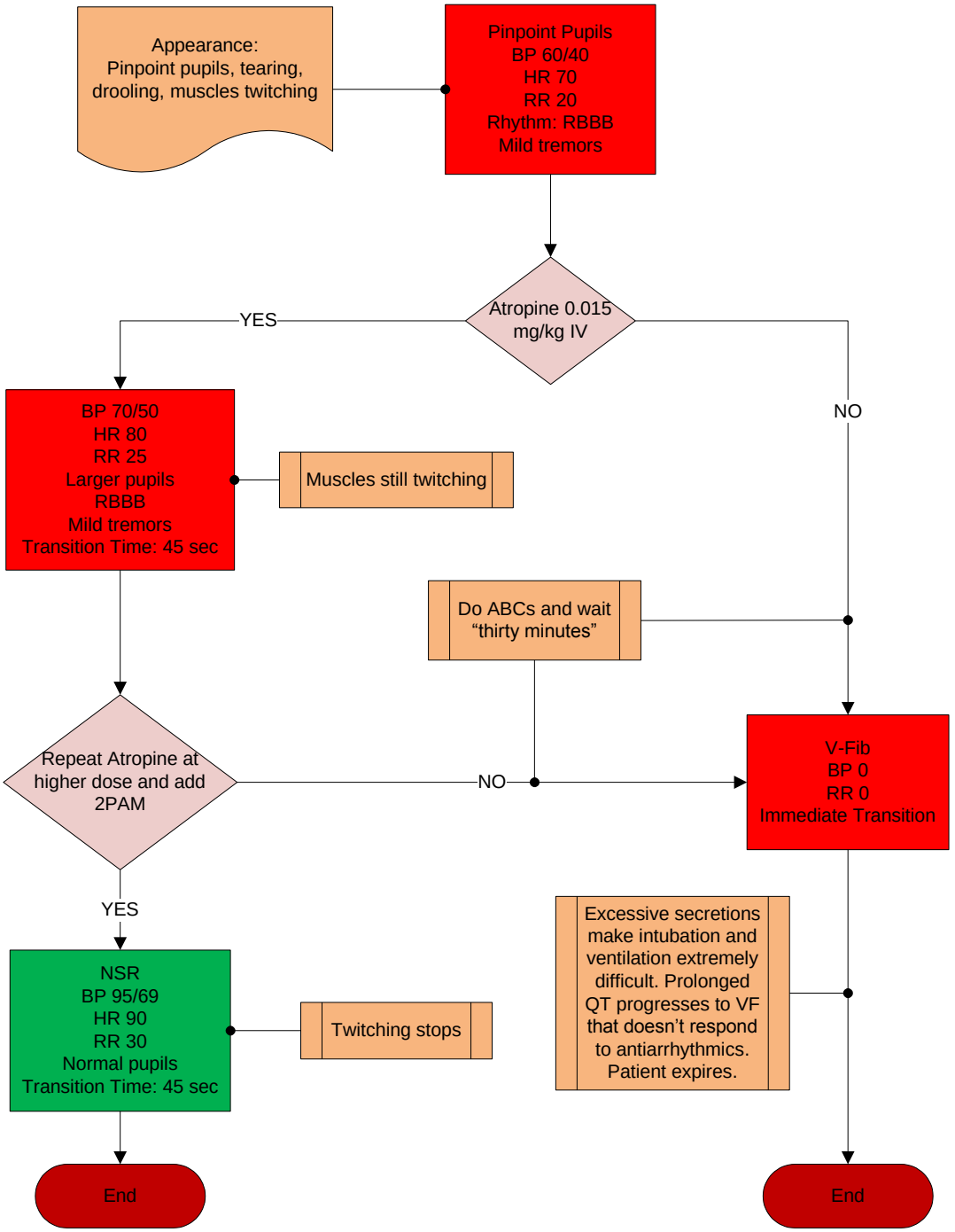
Simulators for Health Care Education

Pediatric HAL® Five Year - Trauma Scenario

Organophosphate Poisoning

"OP Poisoning"

A five year old immigrant boy wandered in a field that was recently sprayed with pesticides (Organophosphate). His parents took off his cloths and washed him off with water but a few minutes later he began vomiting and became "limp". They drove him to the ED that was thirty minutes away.



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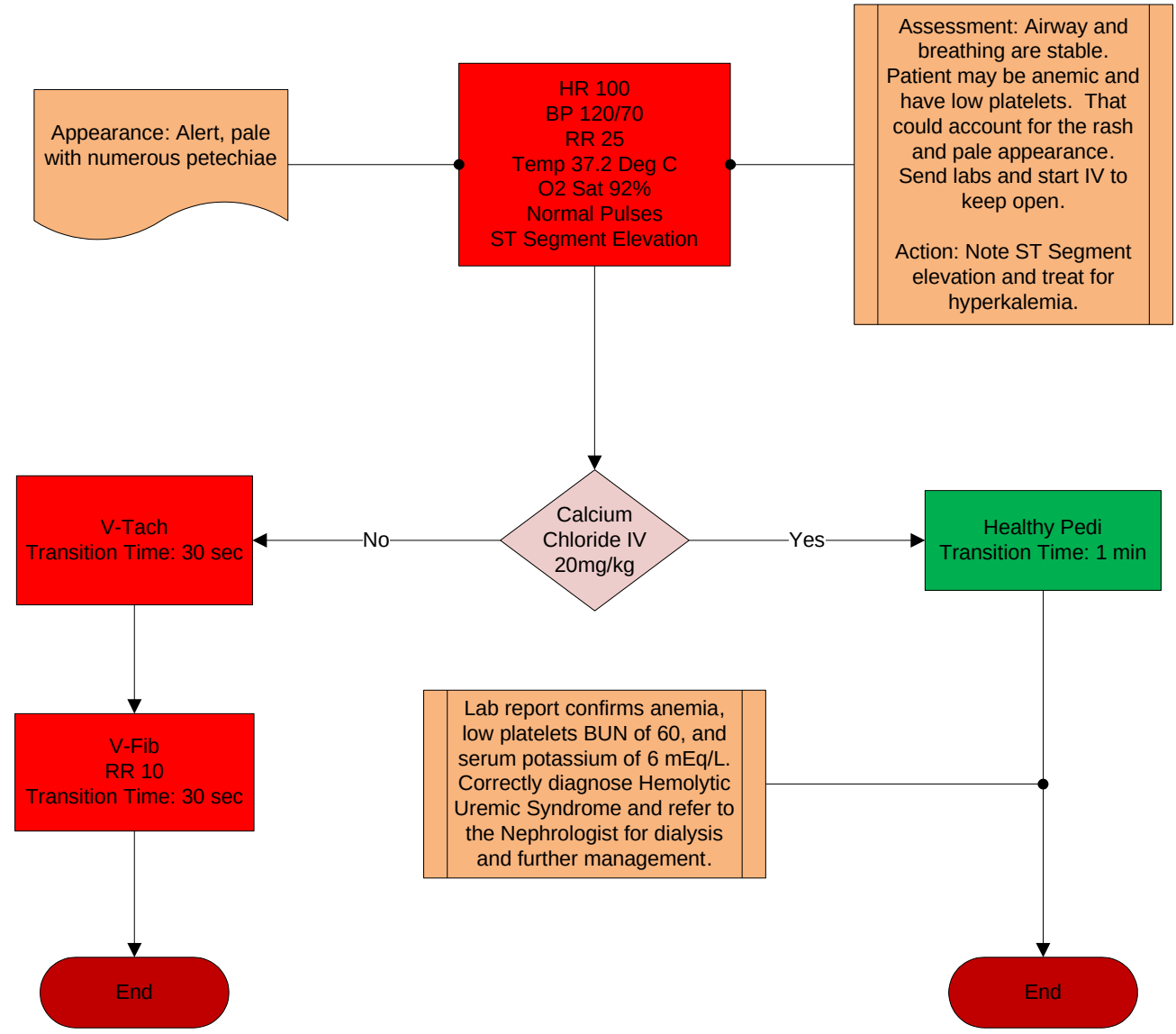
Simulators for Health Care Education

Pediatric HAL® Five Year - Trauma Scenario

Renal Failure and Hyperkalemia

A five year old boy presents to the ED with some tiny red dots on his arms and legs and his mother says he hasn't "peed" since yesterday. Last week he had some bloody diarrhea and has been vomiting for two days but they were on vacation so they didn't see a doctor.

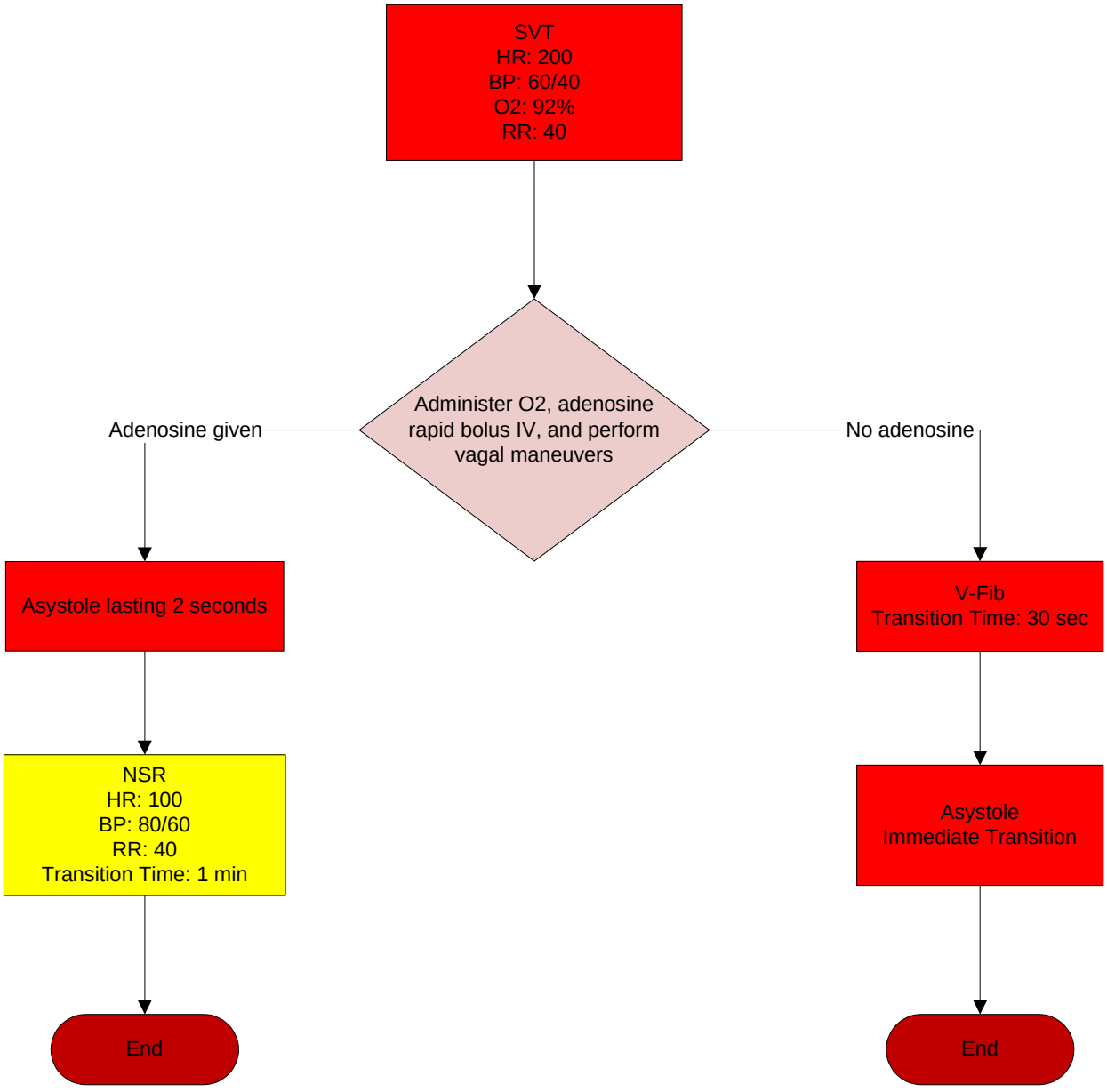


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Cardiac Scenario

Soccer Boy with SVT

A previously healthy boy is brought to the ED because his mother says he has been acting tired and passed out while playing soccer today. He said his chest hurts and his heart jumps.



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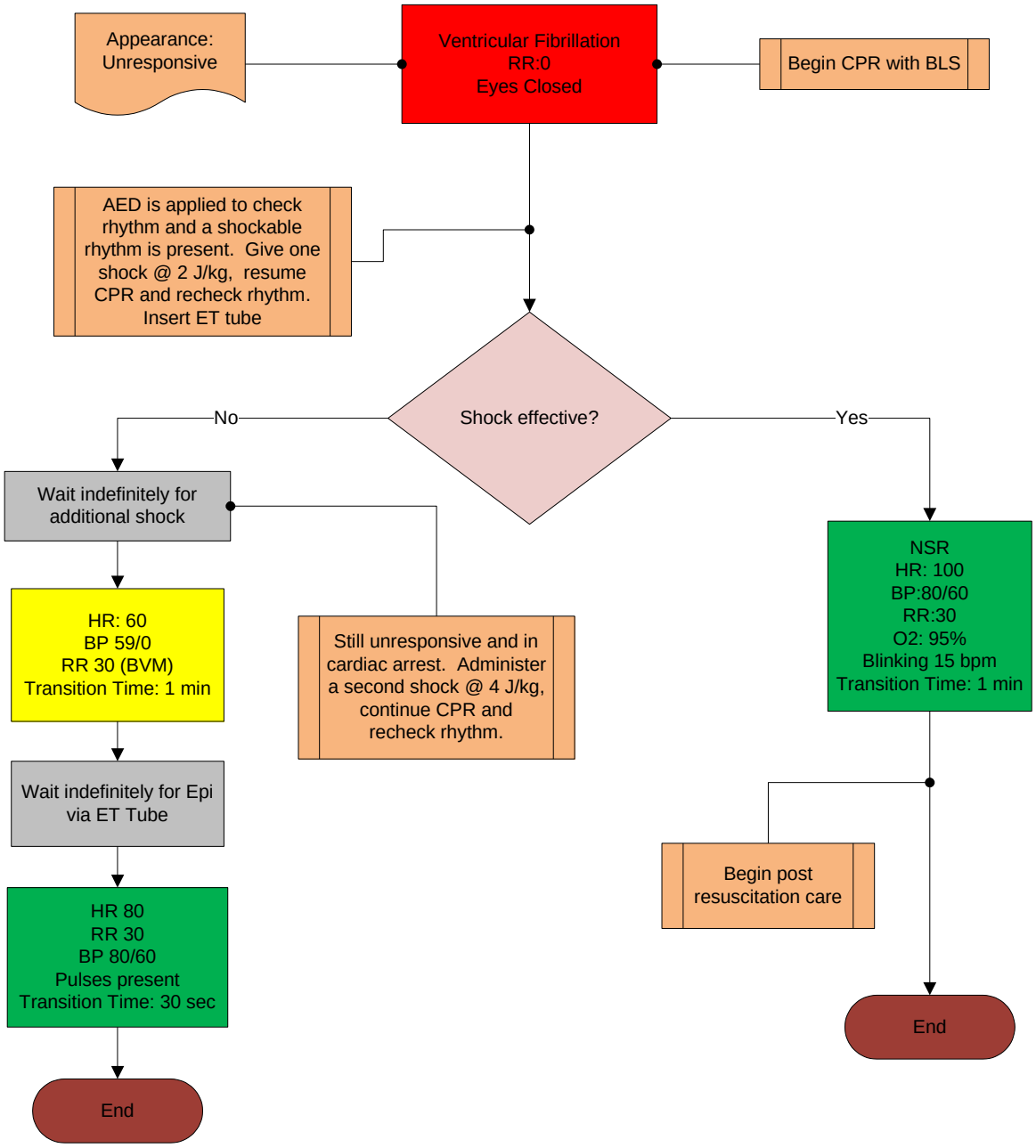
Simulators for Health Care Education

Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Arrest

While watching a baseball game a five-year-old boy was hit by a high velocity "foul ball" in the chest. He immediately falls to the ground and cries "I'm hurt". As you approach he becomes unresponsive. You access the ABC's and find him to be pulse less and not breathing. You call for an EMT and report a cardiac arrest.



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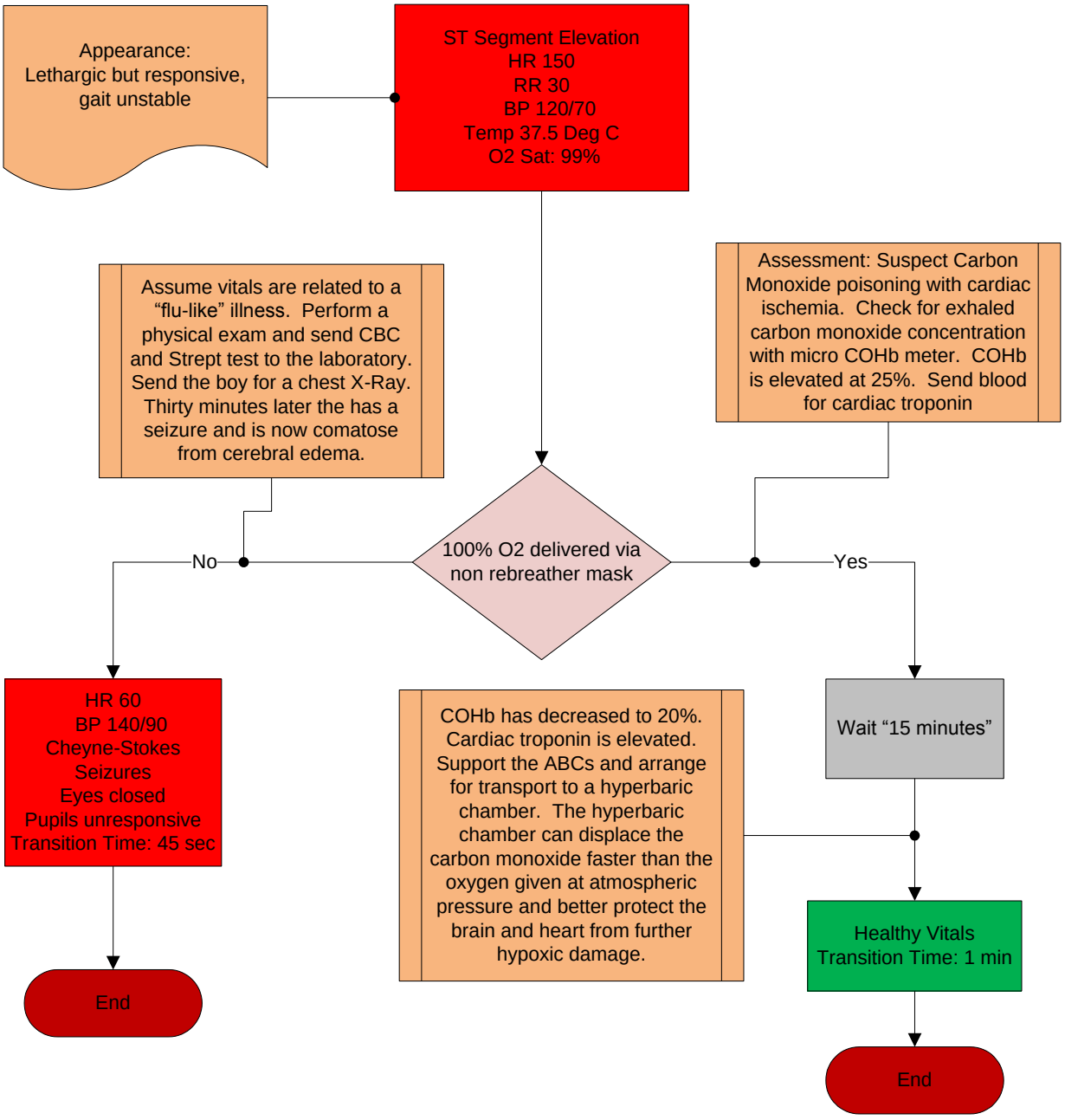
Simulators for Health Care Education

Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Ischemia

Carbon Monoxide Poisoning

During the ride home from a family camping trip a five year old boy falls asleep in the back of his parents truck camper. The night was cold so the heater in the cab was turned on. When they returned home he seemed confused, couldn't walk and complained of a headache and vomited. His parents bring him to the ED and are worried about meningitis.



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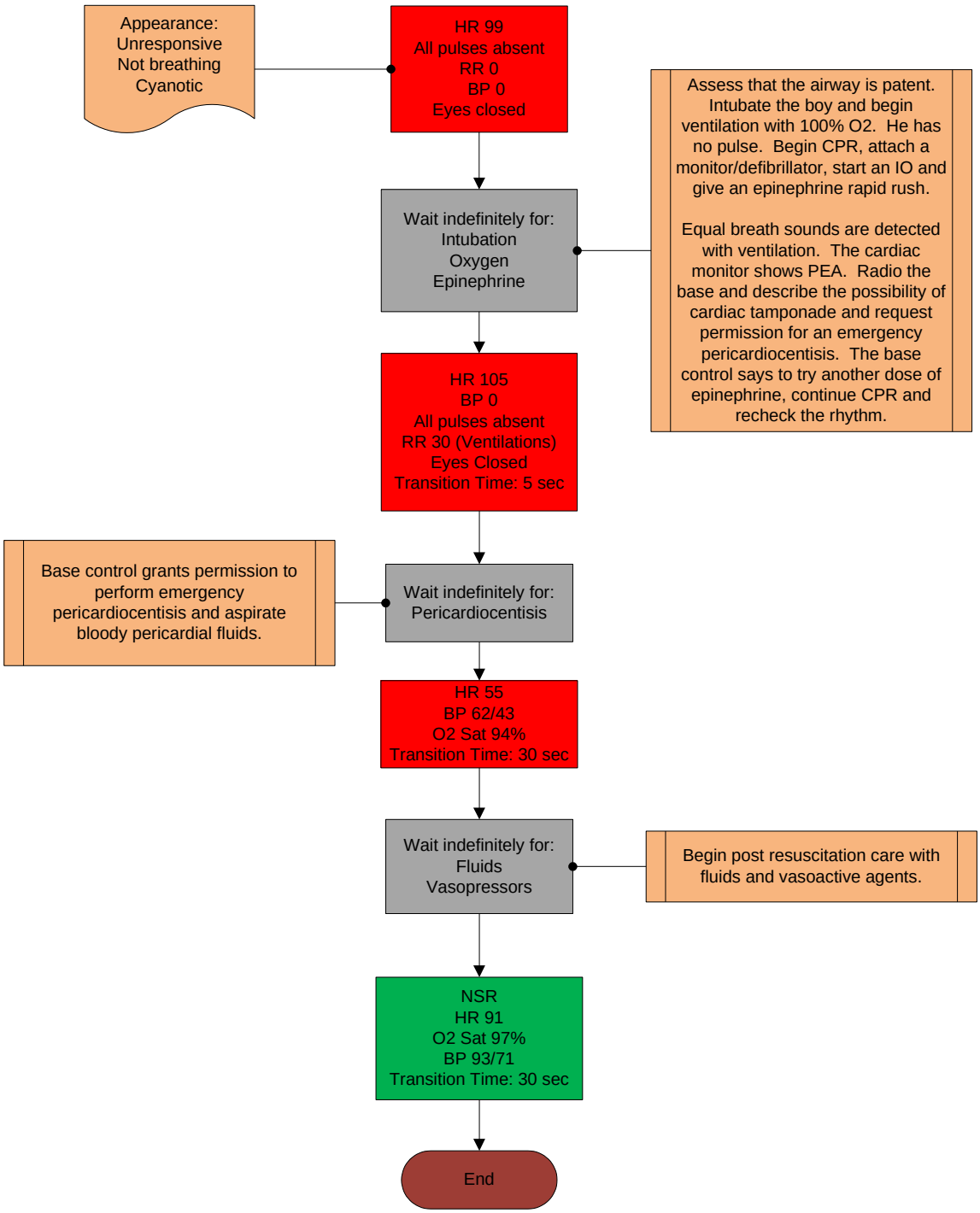
Simulators for Health Care Education

Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Tamponade

Obstructive Shock / Pulseless Arrest

A five year old boy has a gunshot wound to his chest. The family has called 911 but has not begun CPR .You are the first responder with your emergency team. The boy is unresponsive with an entry wound near his heart. The family said he was crying a few minutes ago.

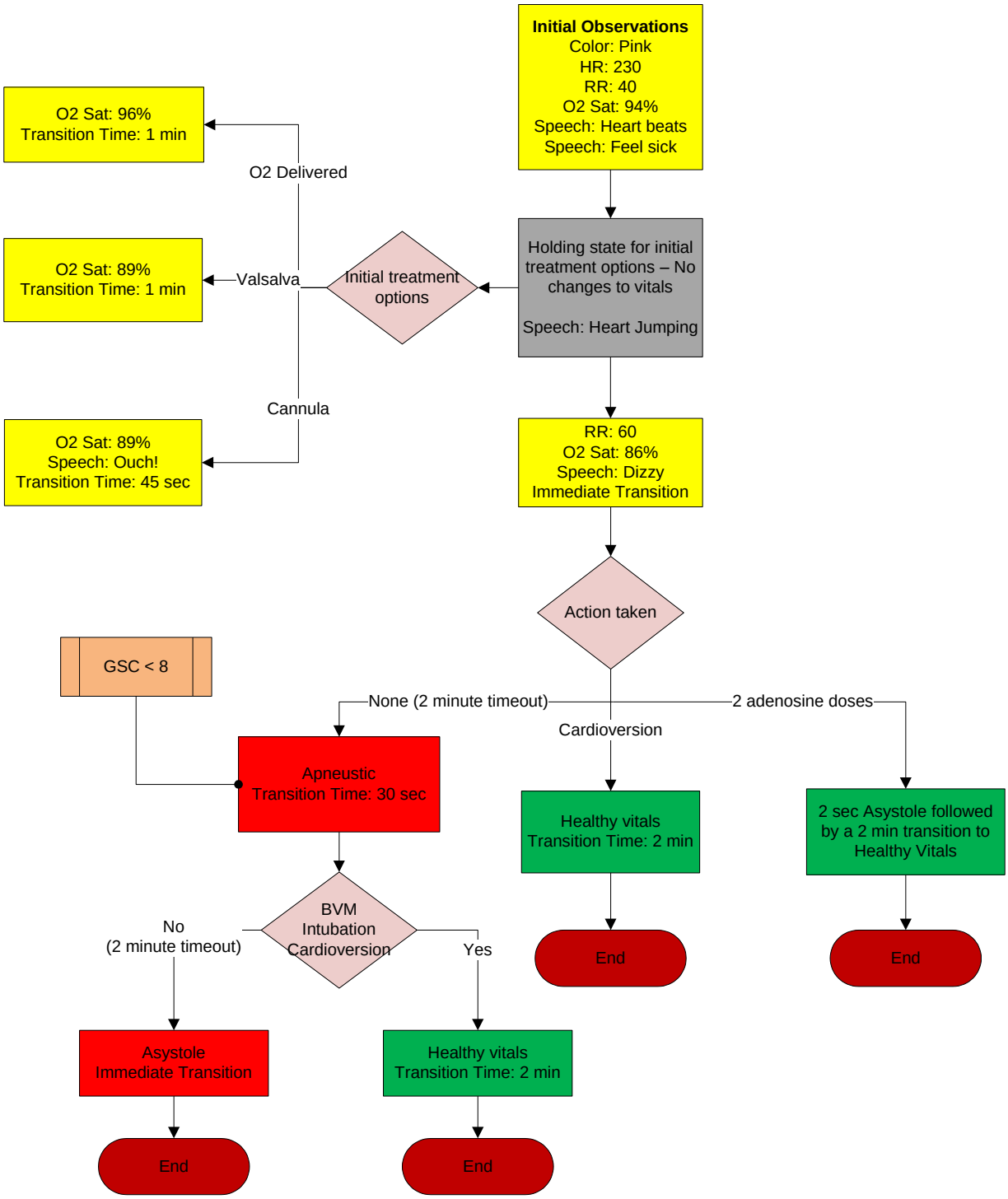


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Cardiac Scenario

Supraventricular Tachycardia

A previously healthy boy is brought to the ED. According to his dad he has been acting tired and passed out today. He said he feels dizzy and his heart jumps.



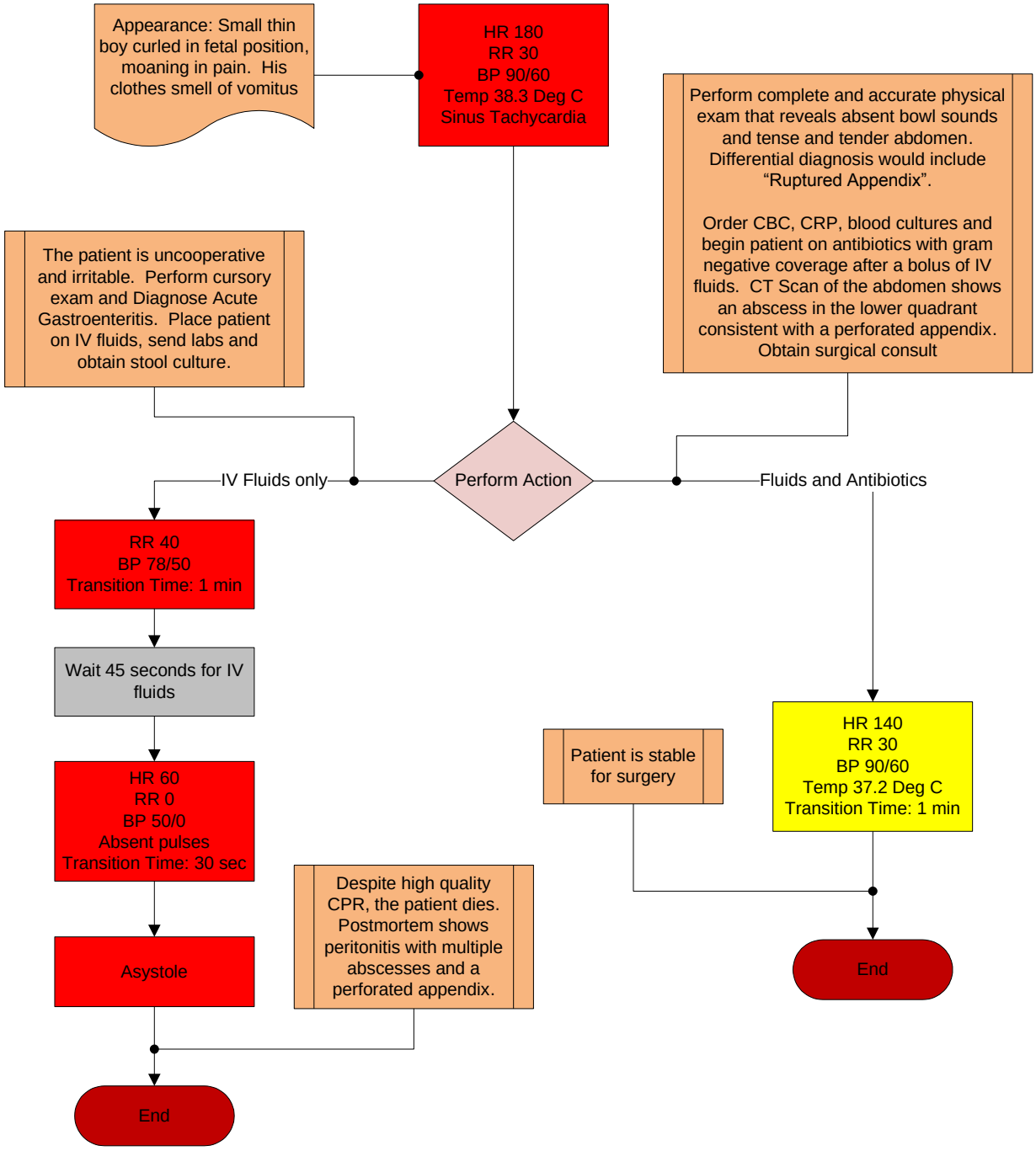
Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Systemic Scenario

Gram Negative Sepsis

Perforated Viscous and Peritonitis

A five year old boy, with cerebral palsy is carried in to the ED by his foster father. He is one of five foster children, all with special needs. He wears braces to walk and has speech and language delays. He has been vomiting for three days and has been refusing to eat. He has also been crying a lot. He has no medications. His foster father says he has to leave because his wife needs the car to go to work.

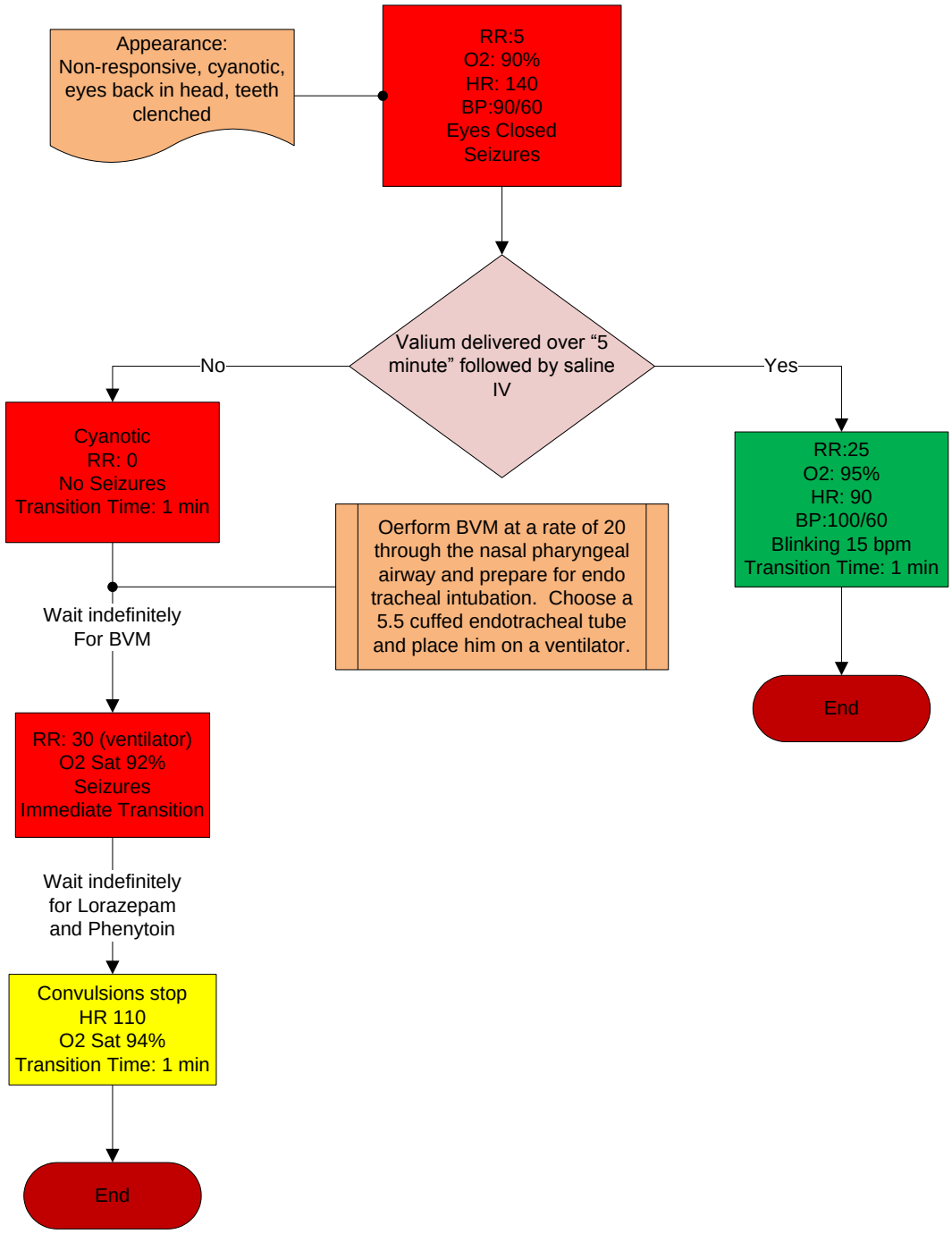


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Systemic Scenario

Status Epilepticus

Mom calls 911 because as her son was falling asleep she noticed seizure activity of his arms and legs. He had had short seizures with high fever when he was one and two. This Time he had no fever and was well the entire day. There has been no history of trauma. He has been seizing for at least fifteen minutes.

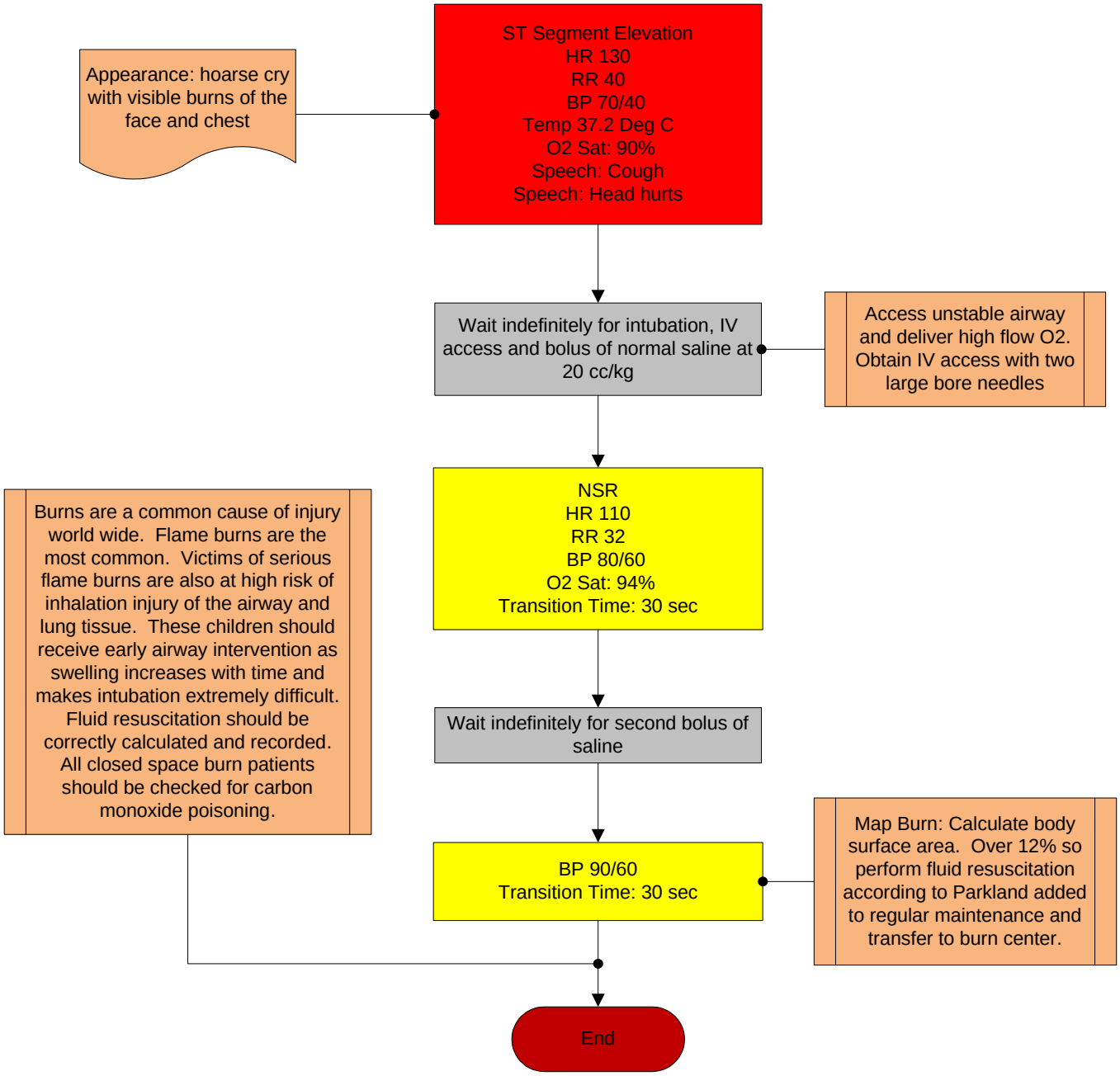


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Systemic Scenario

Fire Victim

A five-year old boy is rescued by his father from a house fire. He was found in his bedroom asleep. The room was engulfed with flames and smoke. His pajamas are charred and his face is burned and covered with soot. His pajamas are removed to reveal his arm and torso are burned. He inhaled a large amount of smoke during the fire.

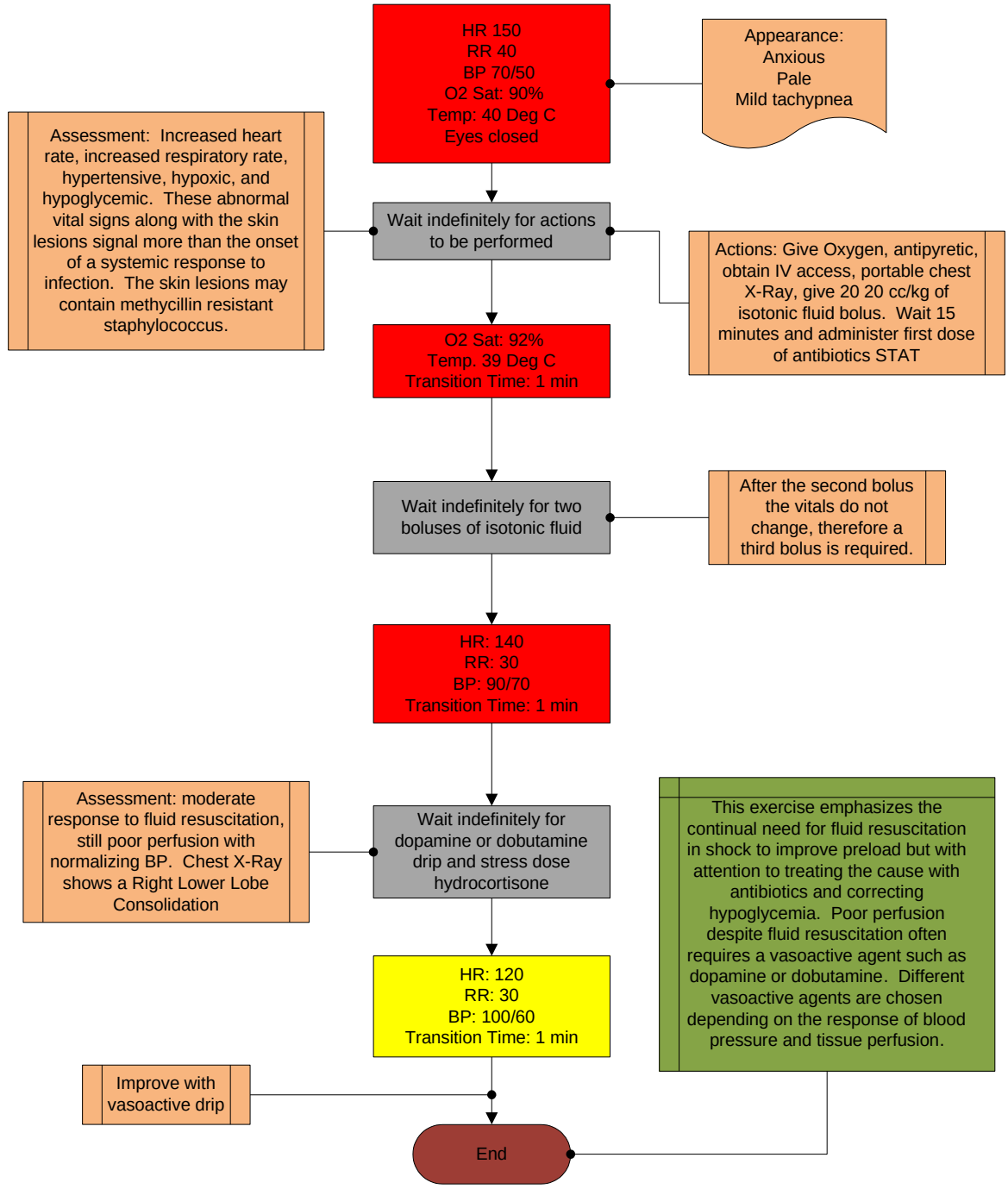


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Systemic Scenario

Septic Distributive Shock

A five year old boy with Sickle Cell Anemia is brought to the ED with what the mother thought were infected mosquito bites. She treated them with antibiotic ointment. Most of them improved except for one large area on his abdomen that now measures 3X4 cm. with a localized abscess formation. He developed fever yesterday of 40 Deg C. Today he has developed chills and his temperature is still 40 Deg C despite fever reducers. He takes folic acid and penicillin daily. His immunizations are up to date.

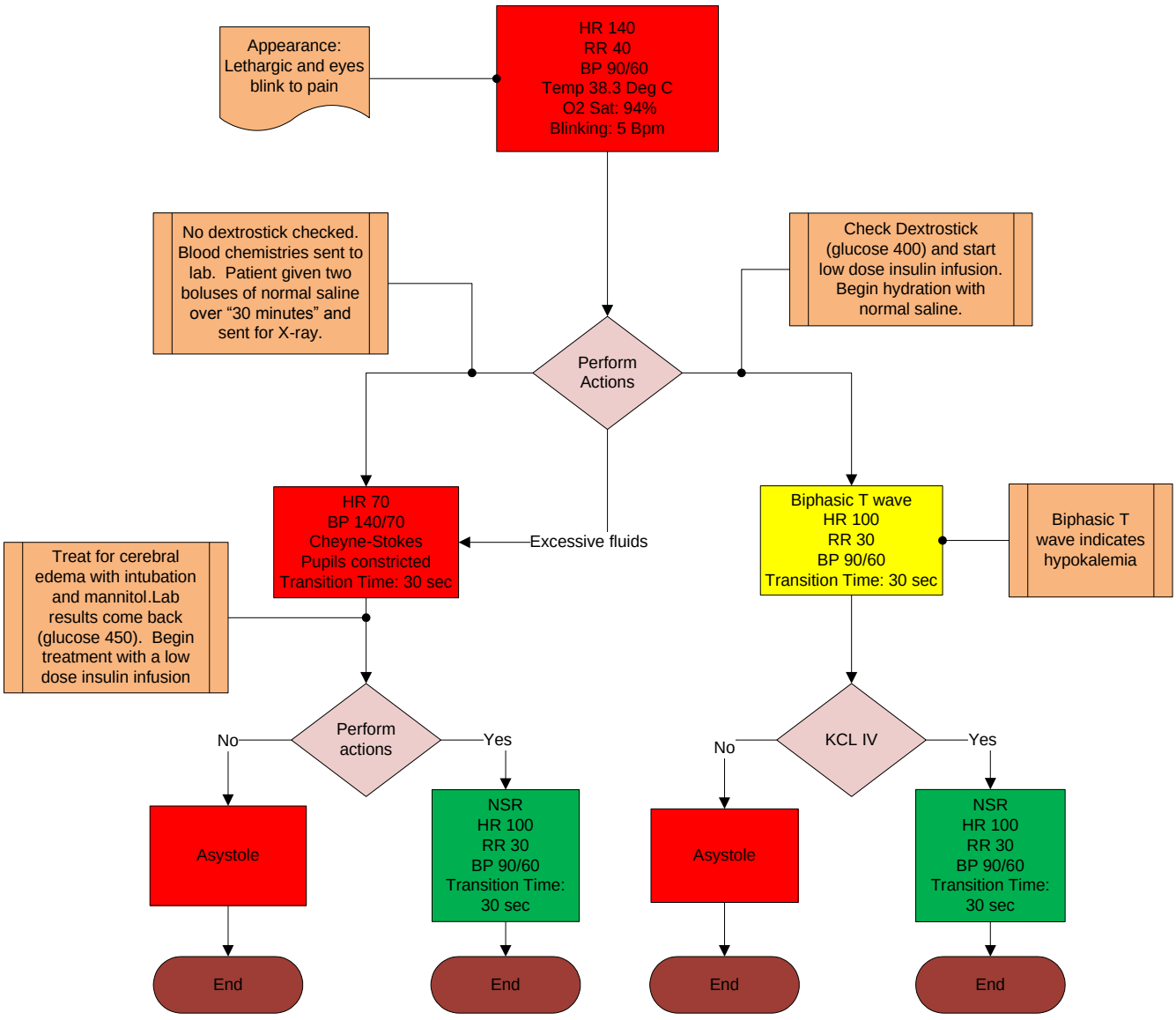


Gaumard®
Simulators for Health Care Education

Pediatric HAL® Five Year - Systemic Scenario

Diabetic Ketoacidosis

A five-year old boy presents to the ED with a history of vomiting for one day. His mother says he has vomited at least ten times since the night before and he can't keep anything down. He has a low-grade fever and has not had diarrhea but he has been wetting the bed. He appears pale with sunken eyes and breathing very rapidly.



2. Quick Start Pediatric 1 (S3004) Factory Preset Scenarios

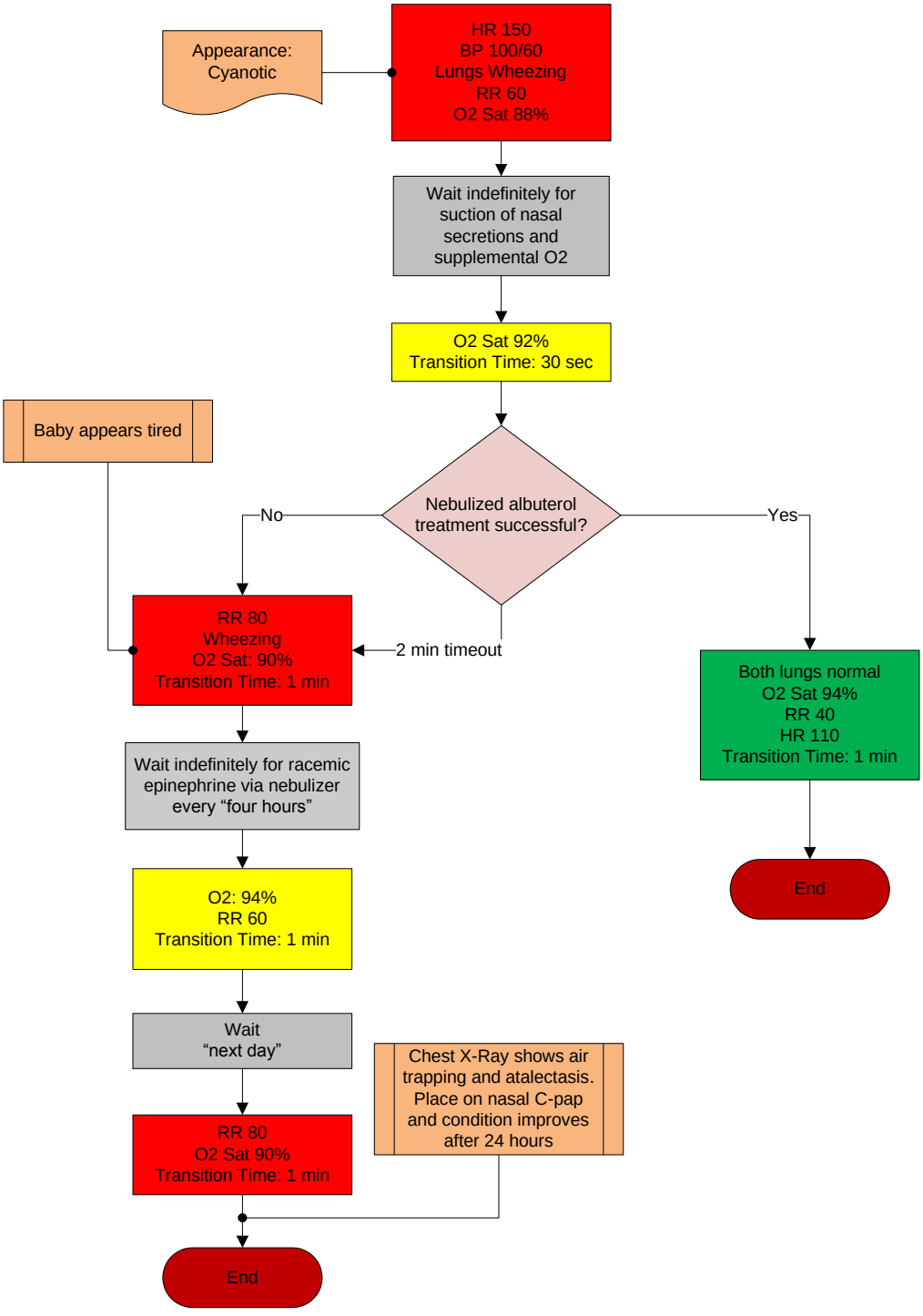
Category	Scenario
Respiratory	
	1. Bronchiolitis
	2. Upper Airway Obstruction (Toy Aspiration)
	3. Croup
	4. Pneumonia
	5. Pneumonia with Septic Shock
Trauma	
	1. Shaken Baby Syndrome
	2. Drowning Boy
Cardiac	
	1. Second Degree Block
	2. Sinus Tachycardia and Hypertension
	3. Congenital Heart Failure
Systemic	
	1. Bee Sting
	2. Hypovolemic Shock
Automatic	
	Adenosine OD
	Adenosine SD
	Adenosine UD

Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Respiratory Scenario

Bronchiolitis

A one year old child is brought to your ER with a one day history of a clear runny nose, low grade temperature and a wet cough. His mother states today that he is refusing to drink and appears to be breathing fast. She claims his immunizations are up to date and he has been in good health.



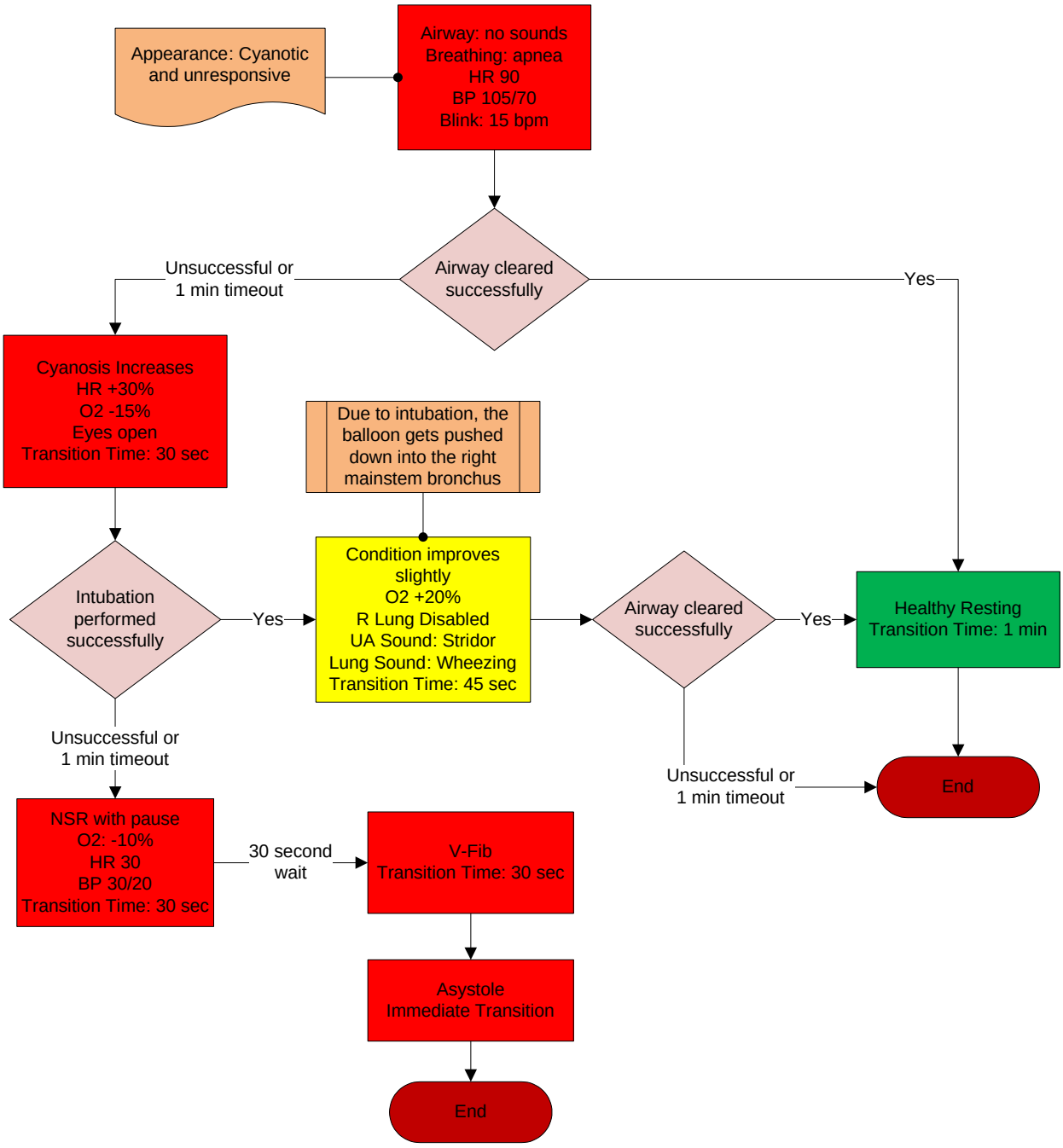
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Respiratory Scenario

Upper Airway Obstruction

"Toy Aspiration"

You are at a birthday party where you see a one year old trying to blow up a balloon. Instead of blowing out he sucks the balloon in and begins gasping for breath. He is turning cyanotic and cannot cry. You assess his airway is obstructed and the obstruction must be removed. You try simple measures as back blows and chest thrusts and activate EMS.

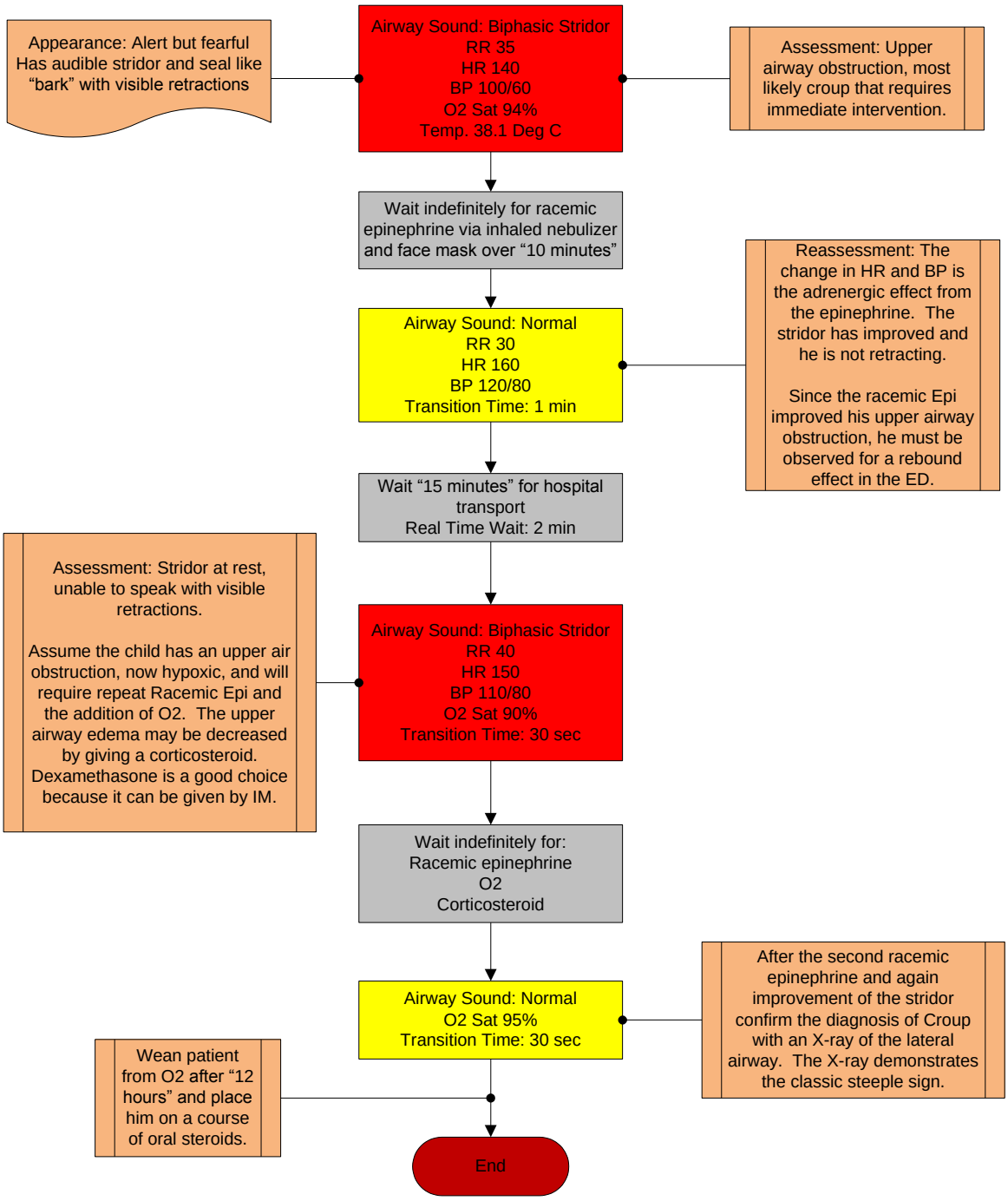


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Respiratory Scenario

Croup

You are called to a home at two a.m. because a one-year old boy "can't breathe". His parents said he was fine when they put him to bed. He has had no illness before and there is no history of asthma. He woke up with a "barking cough" and then began to struggle for each breath. They called their advice line that said to put him in some steam from the bathroom shower. He did not improve, so they called 911.

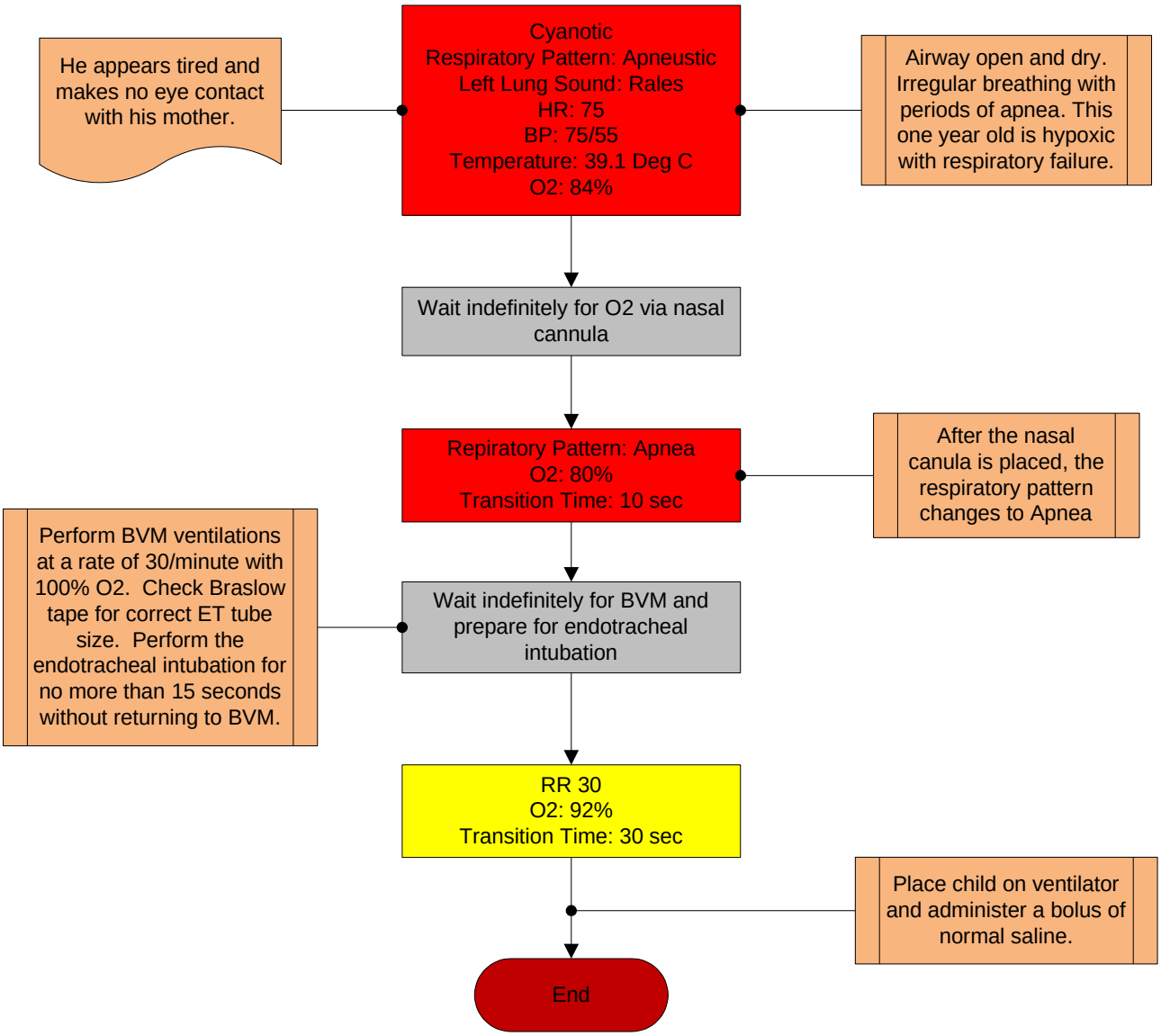


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Respiratory Scenario

Pneumonia

You are called to a home where a one-year old child is gasping forbreath. His mother says he has had wheezing before and is being treated for ”baby asthma”. He saw his doctor last week and has been receiving nebulized Albuterol three times a day for one week. Over the past few days his fever has increased to 39.1 Deg C, his nose has become more filled with yellow mucous and he has had little to drink. He is not taking any antibiotics.

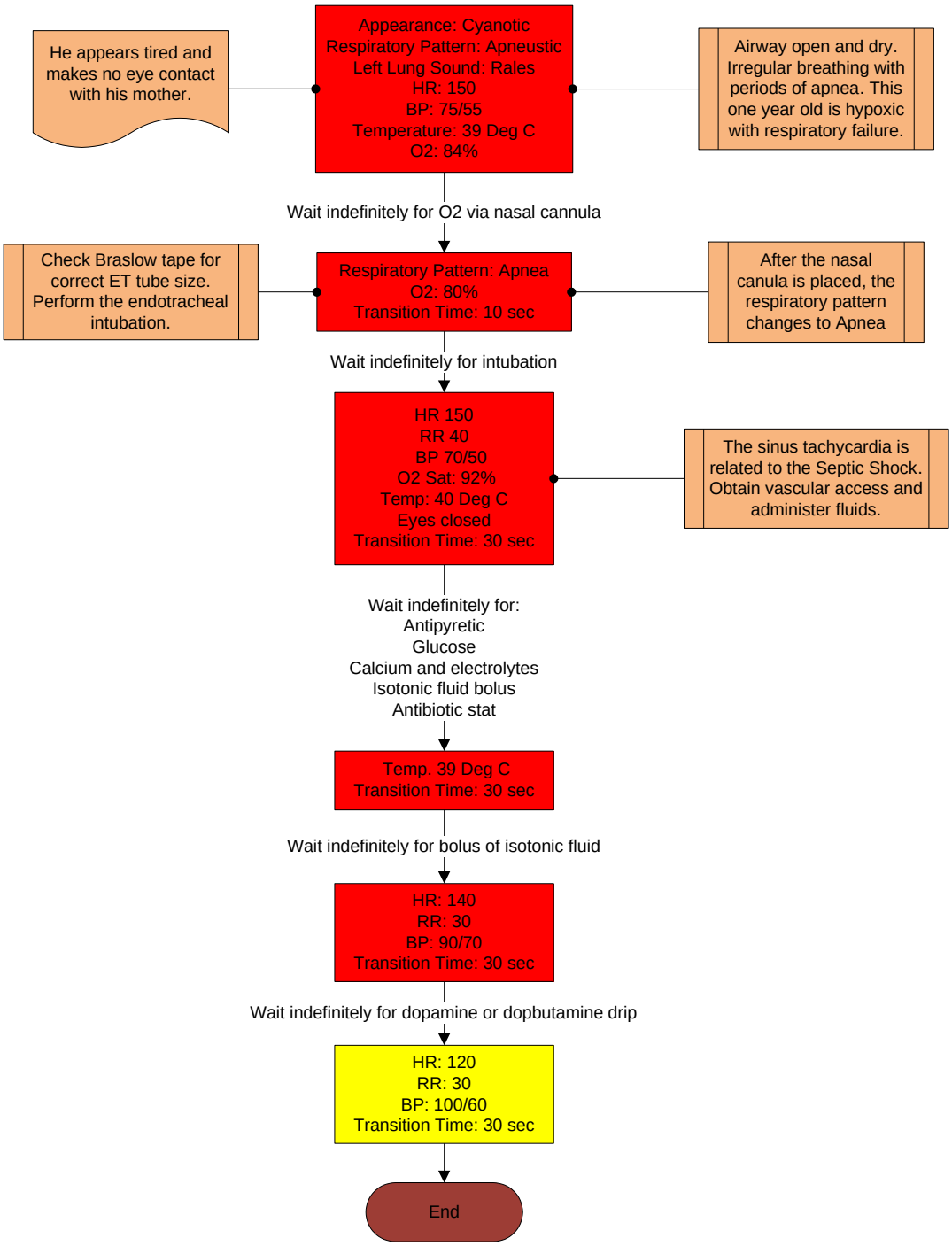


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Respiratory Scenario

Pneumonia with Septic Shock

You are called to a home where a one-year-old child is gasping for breath. His mother says he has had wheezing before and is being treated for "baby asthma". He saw his doctor last week and has been receiving nebulized Albuterol three times a day for one week. Over the past few days his fever has increased to 39 Deg C, his nose has become more filled with yellow mucous and he has had little to drink. He is not taking any antibiotics.

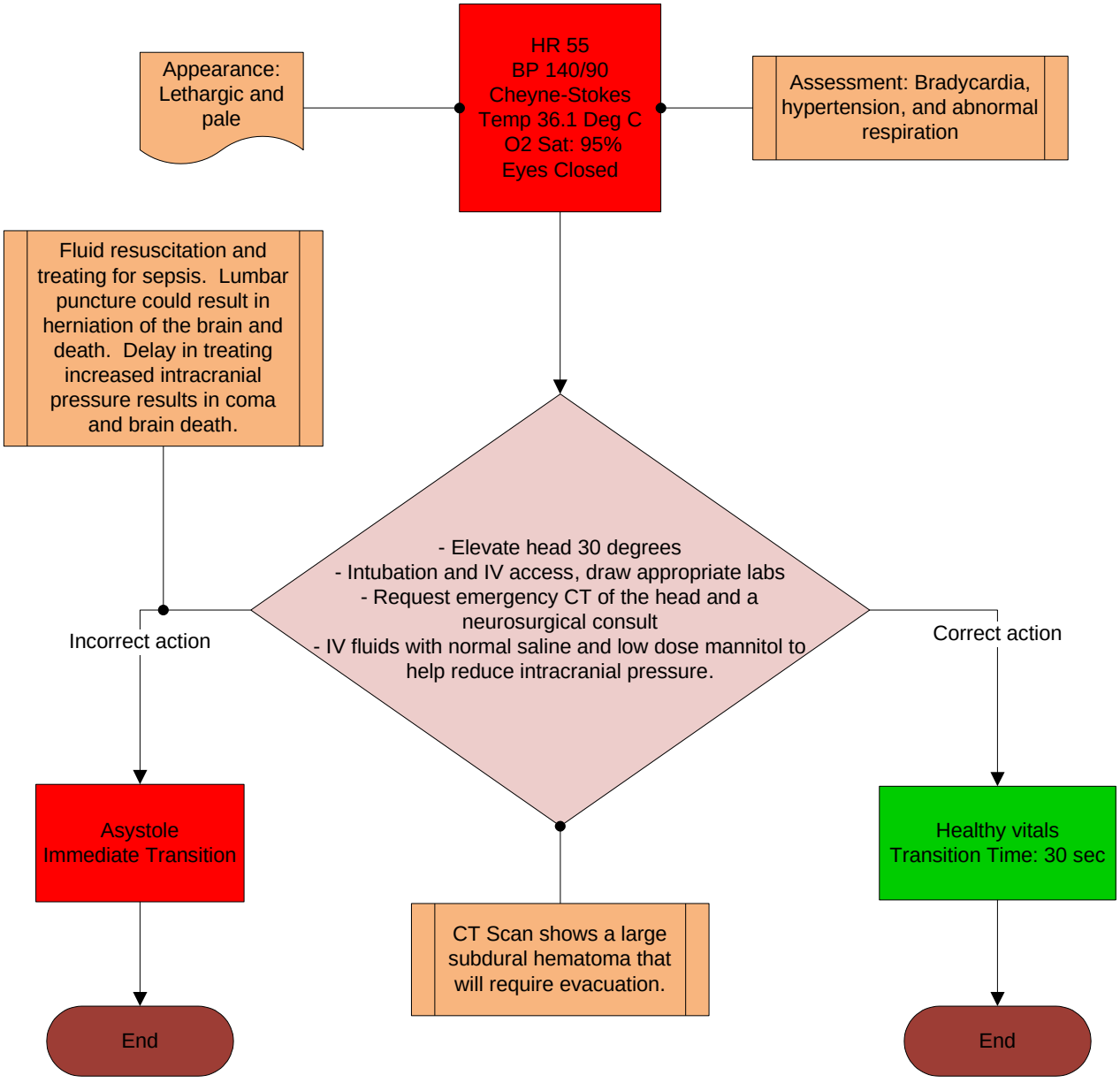


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Trauma Scenario

Shaken Baby Syndrome

A young mother returned from her night shift to find her one year would not wake up when she went to check on him. Her boyfriend said he was probably just sleepy because he had cried a lot the night before. She knows something is wrong and takes him to the ED.

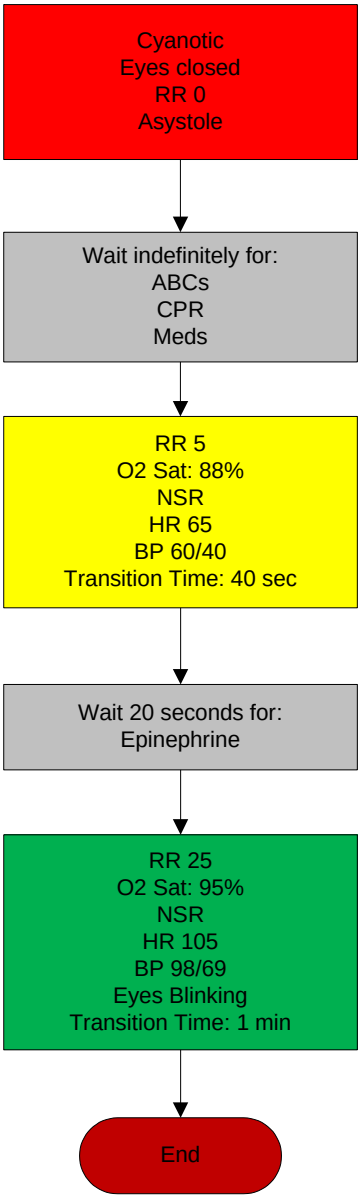


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Trauma Scenario

Drowning Boy

A one year old boy falls into the pool and is found floating a couple of minutes later. When the paramedics arrive the child is not breathing, has severe cyanosis and he is in asystole.



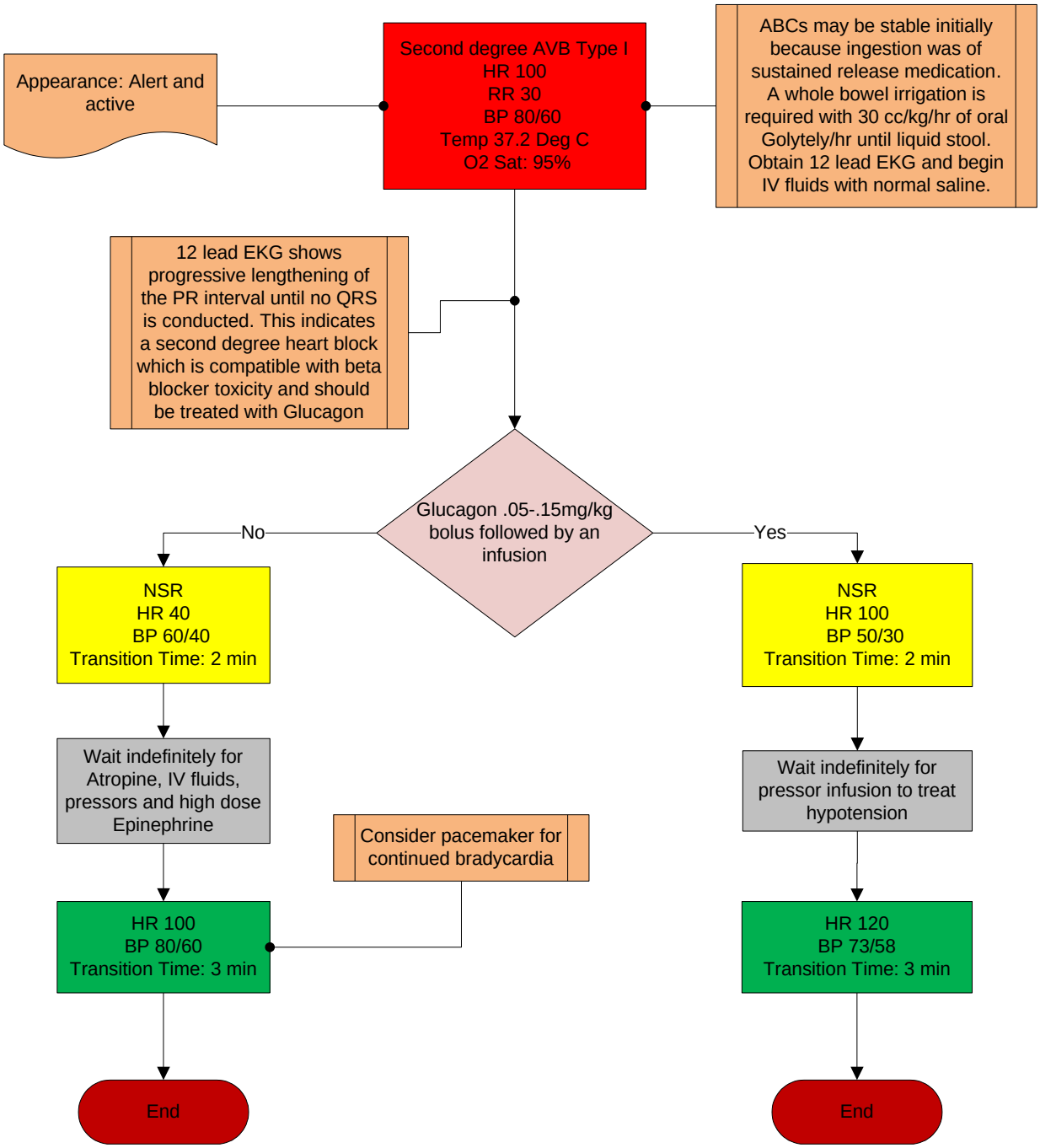
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Second Degree Heart Block

Mobitz Type I (Wenkebach)

A one year old child was visiting his grandmother and was found playing in her purse. She noticed her long acting propranolol bottle was opened and he may have ingested at least four pills about one hour ago. She contacted poison control who told her to bring him to the hospital.



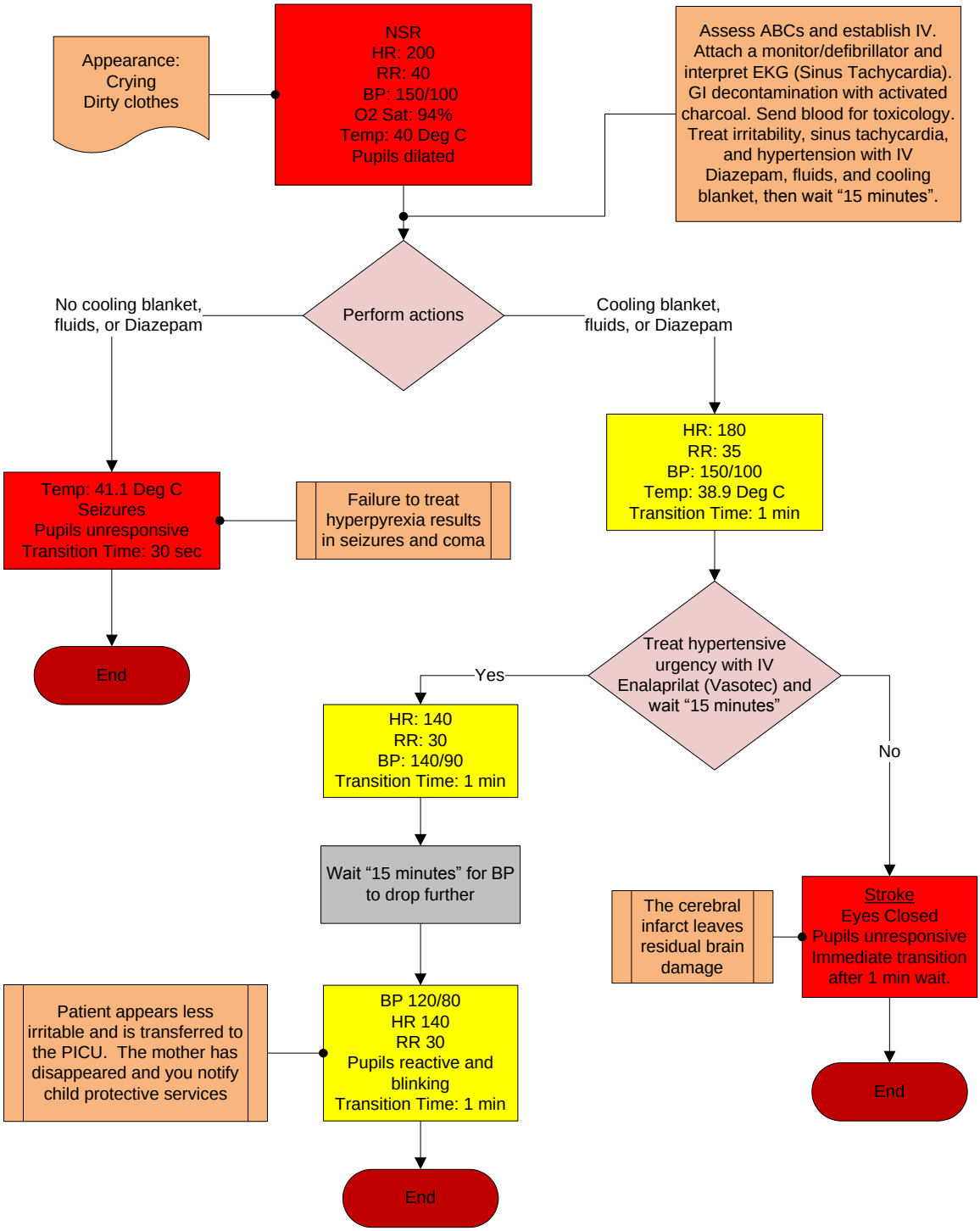
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Sinus Tachycardia and Hypertension

Methamphetamine Ingestion

A young mother brings her baby to the ED. She says her baby was crawling on the floor and put something in his mouth and swallowed it about an hour ago. You notice the mother is thin, jittery with open sores on her face and arms. You consider the ingestion may be a stimulate.

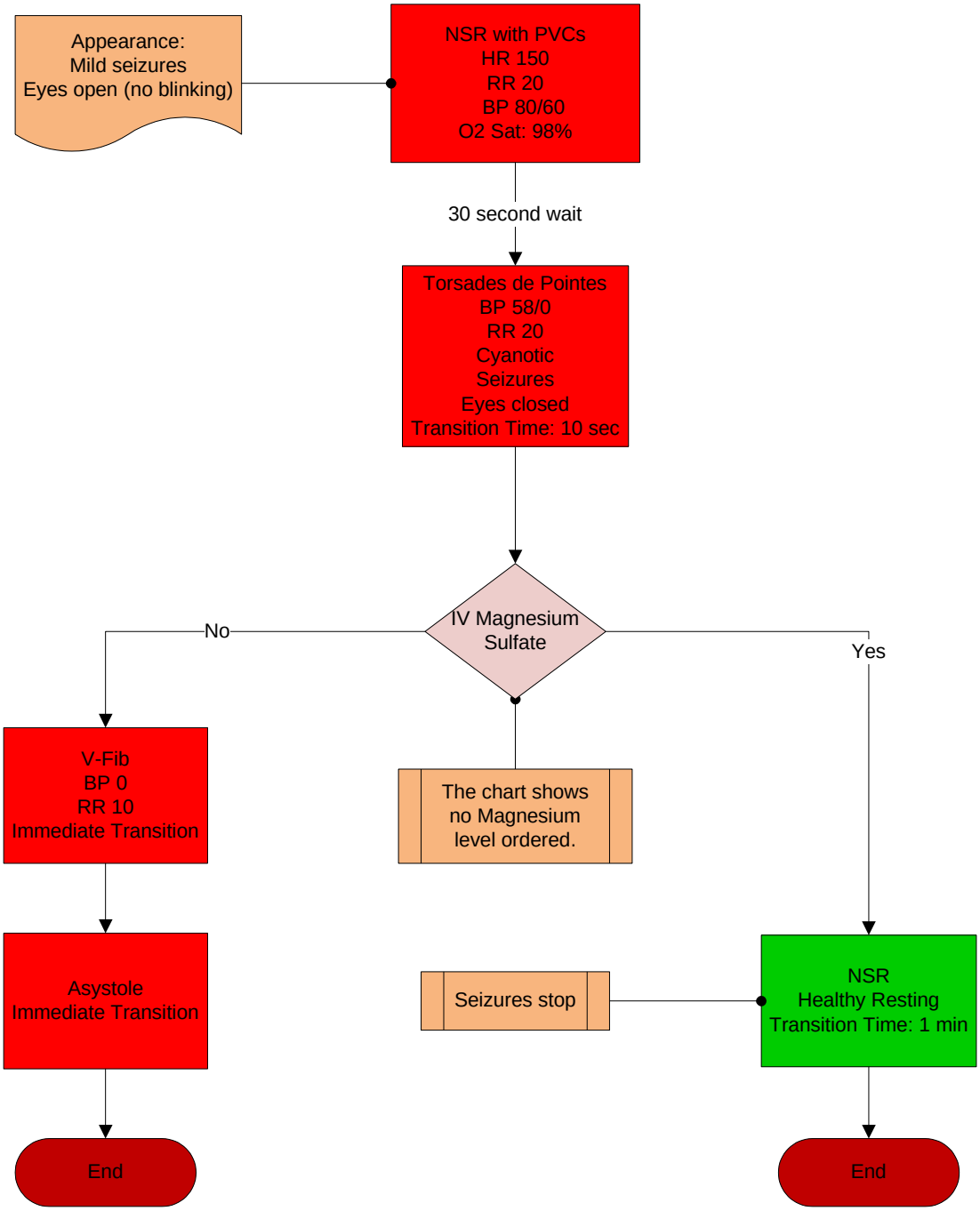


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Congenital Heart Failure

A one year old boy is transferred to your facility with a history of weakness and seizures despite therapeutic levels of anticonvulsants. Normal CT Scan, spinal fluid, and electrolytes.

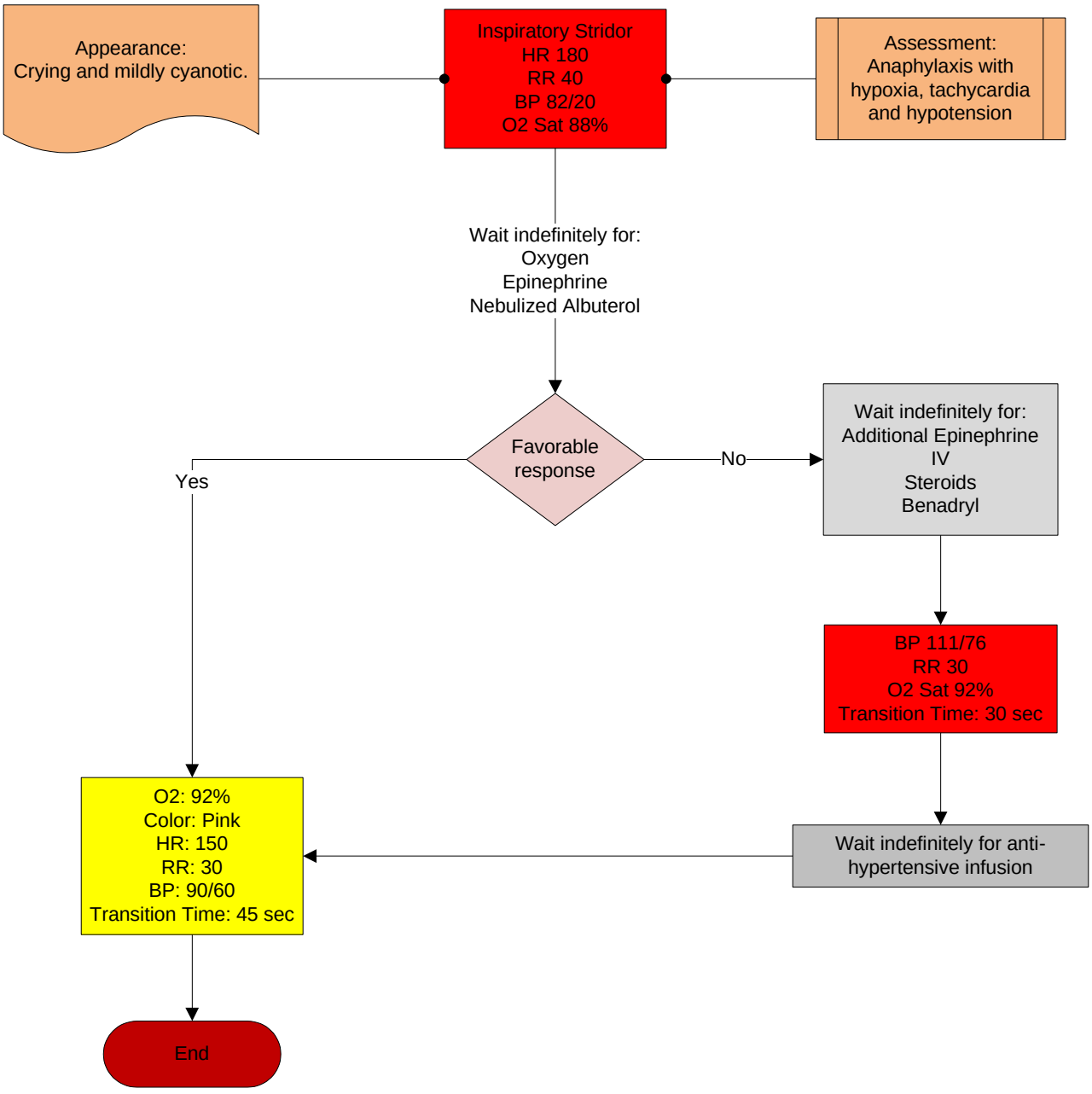


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Systemic Scenario

Bee Sting

You are called to a home where a one year old boy was bitten multiple times by angry "Yellow Jackets" thirty minutes ago. When you arrive you see areas of hives around the bites, his lips and eyes are swollen and he has audible stridor.



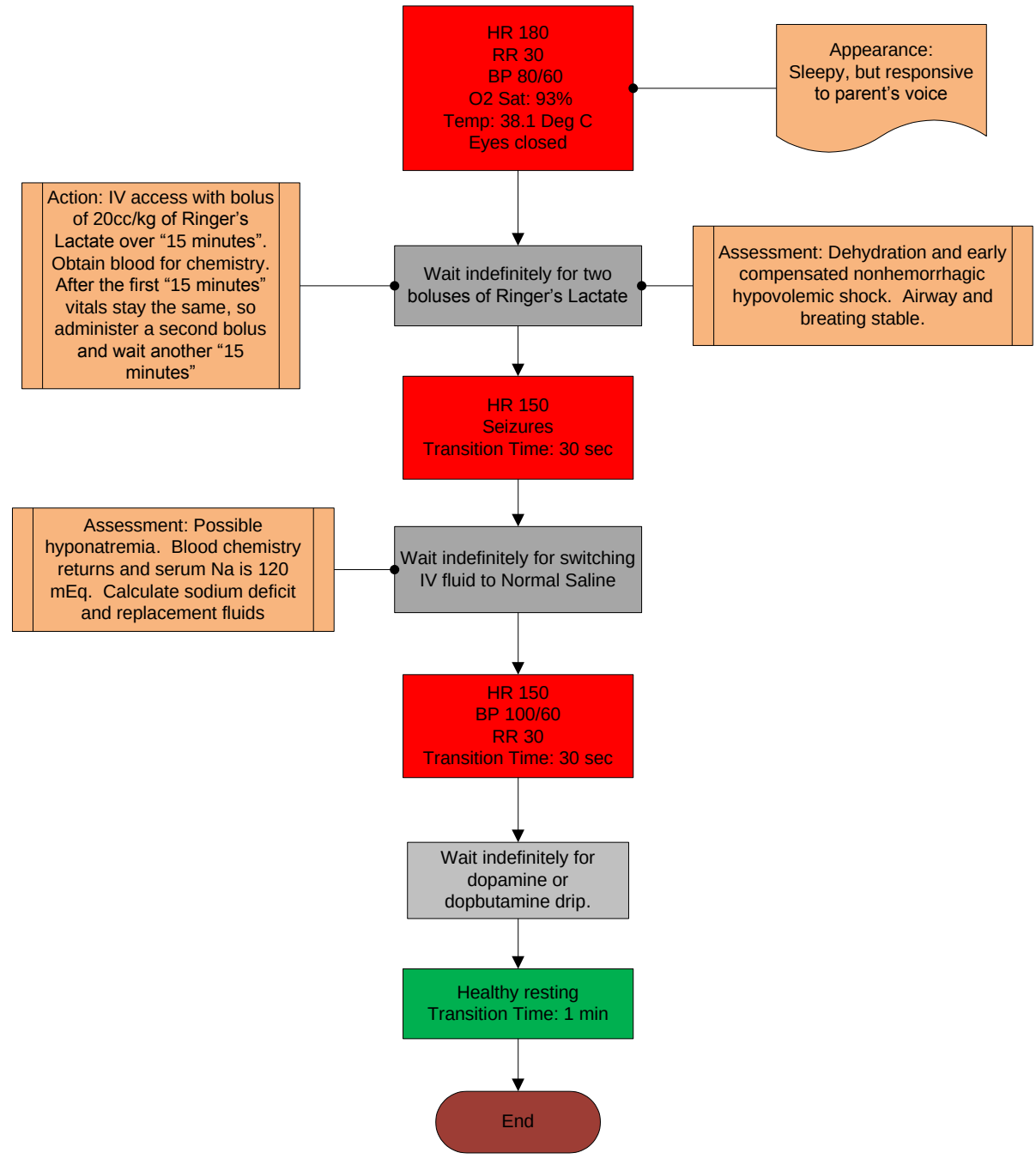
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Systemic Scenario

Hypovolemic Shock

Hyponatremic Seizures

A one year old boy presents to the ED with a three day history of vomiting and watery diarrhea with out blood or mucous. He attends daycare and a note was sent home about two other children with rotovirus diarrhea. He was given Pedialyte the first day and his vomiting and diarrhea decreased on the second day. Today, however his diarrhea is constant and he has refused to drink. His urine output is unclear because of the diarrhea in the diapers. During your assessment he has a thirty second period of tremors.



3. Tips on Creating Scenarios

Thinking in Terms of Palette Items

As described previously, Palette items represent complete or partial groups of settings that have been stored as a single item. We learned how applying partial states will hold constant all settings that are left unspecified.

Not only does it take time to customize the palette, but a very large palette also becomes difficult to navigate. So, it is desirable to minimize the number of Palette Items in each Profile. To accomplish this, an experienced facilitator tries to create items that are as generally applicable as possible and can, thus, be applied to a wide range of scenarios. The key is to only include in your Palette Items the settings that are directly related to the physiological event represented by that Palette Item.

Smart Scenarios

After reading the Details, Palette, and Scenarios sections of this guide, it should be clear how to build a scenario. You may have already tried building your own or modifying some of the factory presets. The following four guidelines will refine your ability to build the best possible scenarios.

1. How will the scenario begin?

The first thing to consider is the initial condition of the patient. Create a Palette Item to describe this condition. Make sure that this first step in the scenario is a complete state. That is, indicate some selection for each and every available setting on the Details page. Remember that only the settings you specify will cause a change in HAL®, and all other settings will remain constant. So, by starting with a complete state, HAL®'s condition will always be the same when the scenario starts, regardless of what he was doing previously.

Likewise, the "transition duration" of the first step in the scenario should be zero, indicating that changes are applied immediately.

There is one point that can cause confusion and warrants further explanation. It is an extension of the above discussion of partial states. The issue is best illustrated through the following example:

Suppose that you are creating a Palette Item to start your scenario. In this case, you have decided that the patient will be apneic. The question is, "How should the lung sounds be set?"

Most people's first inclination is to set the lung sounds to "none." This is incorrect, despite apnea. Obviously, no lung sounds should be heard during apnea, but since you have already set respiratory rate to zero, none will be. (Sounds are synchronized to the breathing cycle.)

What you are really setting here when you choose a lung sound is the condition of the lungs, given respiratory drive. That is, if the patient's respiratory rate were changed from zero, what sound would be heard? Assuming that the lungs themselves are normal in this scenario, you would choose "normal" for the lung sound setting.

Then, as the scenario progresses, if the patient starts breathing, there will be no need to set the lung sound again. It will already be set. The same principle applies to the heart sound and other settings.

2. Include notes to guide the facilitator during the simulation.

It is common for scenario designers, especially those who act as facilitators, to neglect the importance of notes in the scenario. They think that they will remember the learning objectives, patient history, and other details at the time they are ready to conduct the simulation. They usually don't, especially when revisiting a scenario months after creating it.

When you add "Wait" and "Wait Indefinitely" steps to a scenario, you have an opportunity to edit the item description. Use this description field to hold notes to the facilitator. Typically, scenario designers write notes in that space to indicate what the provider(s) or facilitator should be doing at that point.

Further, when saving the scenario, you may edit the scenario description. This is the best place to put patient history and any other longer notes and instructions.

3. Assume that providers will do the right thing.

Usually, you should create a scenario with the assumption that the providers will perform correctly. As long as they do, the scenario can be allowed to continue.

Naturally, you must be prepared for what might happen to HAL® when providers deviate from expectations. The consequences of such deviations can sometimes be included in the scenario, punctuated by "Wait Indefinitely" items. In other cases, the simulation will require more direct control by the facilitator via either the Palette or Details page.

4.Choose auto-response settings based on the scenario content and the objectives.

As you've seen, auto-responses can be used to free the facilitators' attention. They also enhance realism by presenting instant reactions to the care providers. On the other hand, sometimes it is not possible or desirable to determine the responses before the simulation begins. Different environments and applications call for different settings.

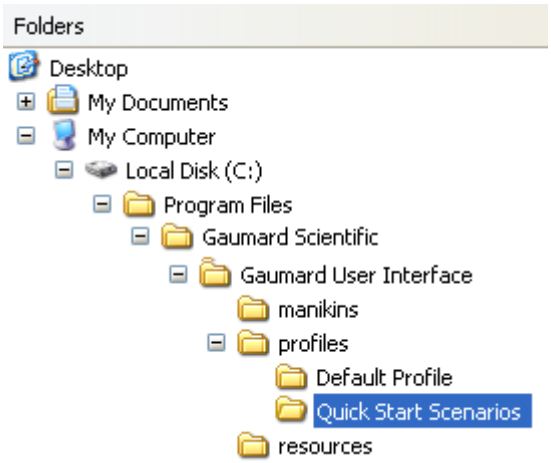
Some teaching practices are best done with the auto-response settings in Prompt mode. Responses must be triggered by a vigilant facilitator. Though it is slower and requires more attention, the benefit of Prompt over other modes is that the simulation can be allowed to go in any direction, and it will be possible to choose the response on a case-by-case basis.

Other learning exercises require a higher degree of automation. For such applications, most facilitators choose *Auto* mode for the auto-response settings. The key issue is standardized timing of symptom presentation. A consistent, repeatable simulation is essential for fair assessment of that care provider in relation to others and for the broader interpretation of results in the context of training validation studies.

When in doubt, it is best to choose *Prompt* mode, in which the facilitator will be given direct control of the responses as events are detected.

B. File Structure

Advanced users may find it helpful to understand the GaumardUI directory structure. With direct file manipulation, one can easily move palette items and scenarios between profiles, as well as move entire profiles from one computer to another.



Profiles

In the GUI program folder is the “profiles” sub-folder (e.g. “C:\Program Files\Gaumard Scientific\Gaumard User Interface\profiles\”). All user information is saved there, and it is the only folder that should be modified manually. In the example shown, notice that there are 2 profiles in this installation, “Default Profile,” and “Quick Start Scenarios.”

Palette Items

Saved as “*.plt” files, palette items in each profile are located at the top-level of each profile folder. To copy palette items from one profile to another, copy the .plt file found in the source profile folder.

Scenarios

Scenarios are stored as sub-folders within profile directories. Scenarios can also be transferred between profiles by copying the scenario folder and its contents.

 NEVER...

- Modify files in the “resources” directory or those at the top-level of the “Gaumard User Interface” directory.
- Manipulate files or folders while the GaumardUI software is running.
- Modify or delete “*.dll,” “*.scn,” or “*.sys” files.

C. Troubleshooting

1. General Troubleshooting Guide

Use the following table to find causes and solutions to a number of possible problems.

Symptom	Possible Cause	Solution
Communication never gets established or is lost (**blinking communication indicator is consistently red**)	Battery connectors in the manikin are reversed	Make sure to connect red wire to red terminal, and black to black
	Battery is discharged	Make sure battery is charged.
	Computer is too far away from simulator	Get simulator closer to computer
	Trying to communicate with a different simulator	Make sure to select the right simulator when opening the software. In a multiple simulator environment, make sure to enter the right Serial Number
	Starting more than one simulator with its own tablet	Select different channels for each of the simulators, and then turn them on one at a time, meaning: Wait until a link has been established between the tablet and the simulator (the yellow window goes away). Only after that, start running the GaumardUI software in the second tablet, and so on for the rest of the simulators. To do so, go to menu Setup → Options → Environment → Select “Auto change to channel: #” (# = number from 1 – 11).

Symptom	Possible Cause	Solution
	All others	Close the GaumardUI software and unplug the RF module for at least 5 seconds, then plug it back in. Disconnect one terminal from the battery and reconnect after 5 seconds. Restart the software and wait for initialization
Simulator doesn't run for the time specified on the manual	Battery not charged properly	Make sure that LED indicator on battery charger goes through the sequence described in its label, usually red or orange after plugging it, and then green when charge is completed. If LED does not go through label's indications, then: ▪ Check plug connection making sure it is all the way in. ▪ Make sure you are using the appropriate charger, labeled with its simulator name
Simulator doesn't respond to any command even that blinking communication indicator is consistently green	The computer is properly communicating with a simulator, but not necessarily the one you intend to control	If you have more than one manikin in your facility, make sure that your computer is properly set-up to control the manikin that you wish to control. Go to Options... on the Setup pull-down menu and check the Environment preferences

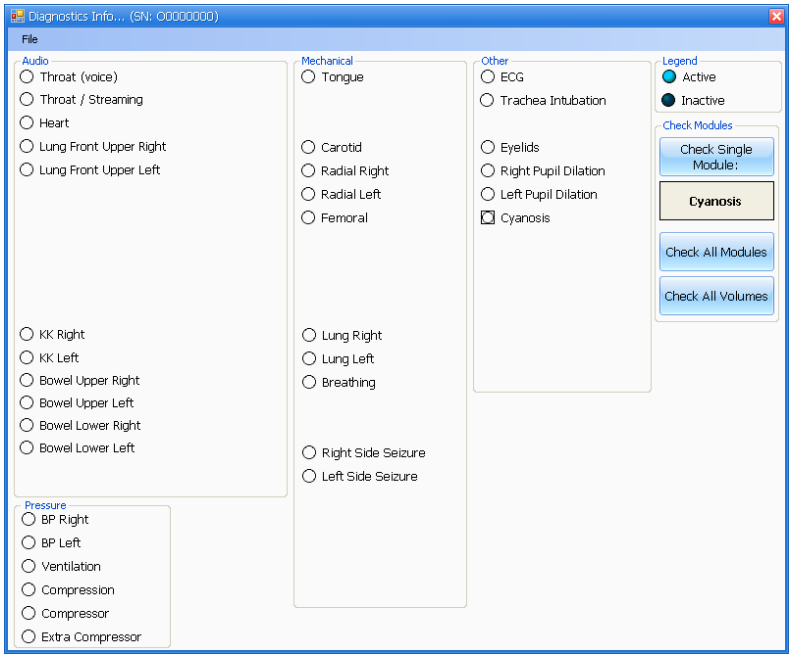
Symptom	Possible Cause	Solution
Commands are taking longer than usual to take effect or simulator is not reporting every action (**blinking communication indicator is consistently yellow**)	Distance between computer and manikin is reaching its limit *or* there are too many obstructions between (walls, etc)	Get simulator closer to computer or move away from obstructions
	There's too much RF interference either from another Gaumard tetherless simulator in the vicinity or an RF radiator.	Try changing the RF channel by going to the menu for Setup → Options → Environment → Select "Auto change to channel: #" (# = number from 1 – 11).
GaumardUI has set the power mode to STAND-BY automatically	The battery on the manikin is depleted	Plug charger for all others including
"RF module not found" message is displayed when GaumardUI is started	RF module not connected	Connect the RF module to any USB port.
	RF module not identified by the computer	Close the software and try disconnecting the RF module for at least five seconds, then plug it back in and restart the software
Chest compressions are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "**blinking communication indicator is consistently yellow**"
	Is the respiratory rate set to "0 / min"? Chest compressions are only detected when the respiratory rate is set to 0 per minute (0 / min). Otherwise they are ignored	Set respiration rate to zero
	All others	See "Calibration Wizard" section inside User's Manual

Symptom	Possible Cause	Solution
Artificial ventilations are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "**blinking communication indicator is consistently yellow"**
	All others	See "Calibration Wizard" section inside User's Manual
Simulator's chest does not rise with artificial ventilation (e.g. BVM)	Simulator not running	In some simulators, the trachea is disconnected from the lungs when they are not on.
	Disable lung/s	Enable the lungs from "Detail" page on the GaumardUI software
Low chest rise (or no chest rise at all) while breathing	Wrong settings or disabled lungs	Make sure lungs are enabled and both respiration rate and inspiration percent are different than "0". Try changing the respiration rate to a different value, and if still nothing happens, try turning the manikin off and restarting everything to make sure the internal air compressor gets its initial settings
Loss of brachial pulse	Brachial pulses disabled	Make sure to enable brachial pulse on "Details" tab page
Pre-built scenarios don't show up		Select "Quick Start Scenarios" when starting the software. Should user forget to do so, there's no need to shut down the software and open it again in order to load the pre-built scenarios. Go to "File/Profile" menu and then select "Modeled Scenarios"
A sound is absent or is not heard at desired volume level	Volume not set to user's criterion.	Every sound has a volume control. Play with the volume control to get it to the desired level.

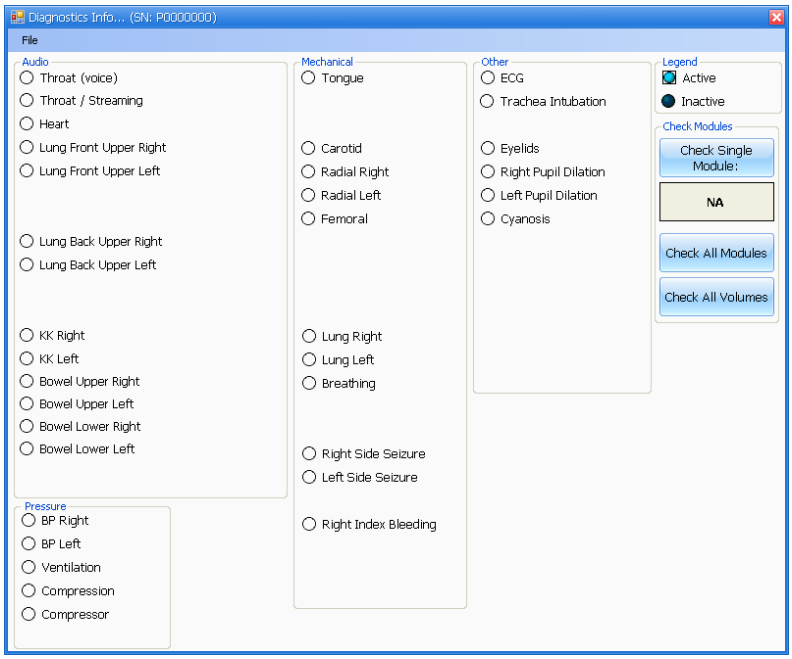
2. Diagnostics

The Diagnostics dialog box can be accessed by going to the Help menu and selecting “Diagnostics”. This dialog box is very useful for troubleshooting because it gives the user feedback on all of the working modules inside the manikin. The user can click on the button that says "Check All Modules" and the software checks which modules are responding.

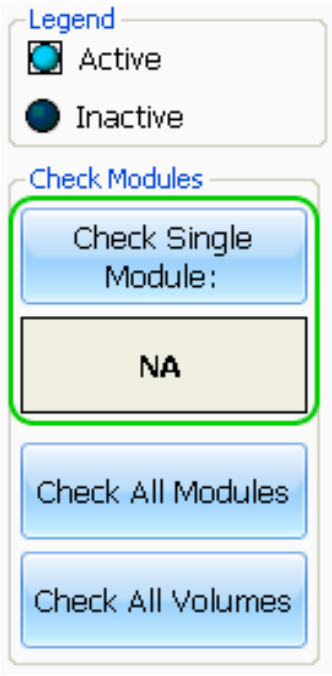
S3004



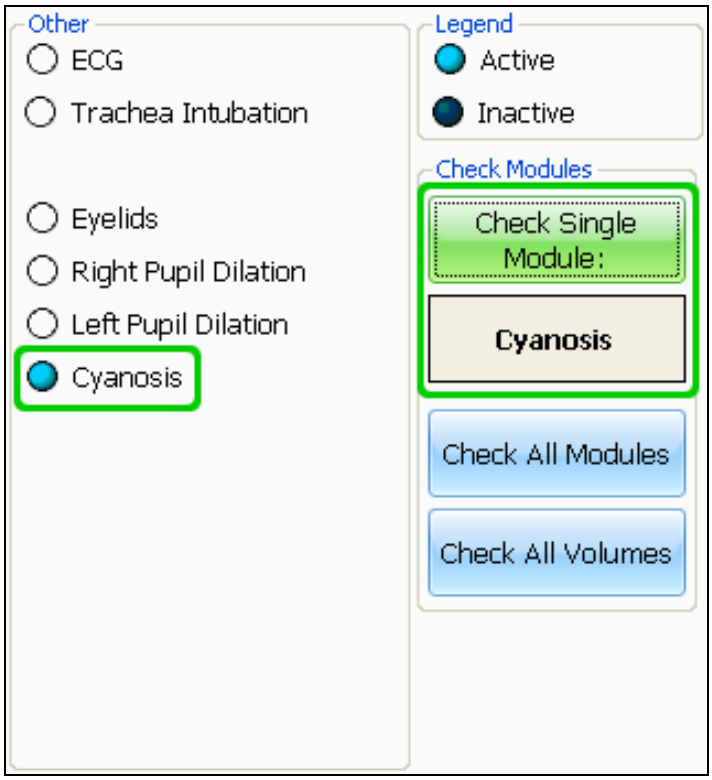
S3005



You can also check individual modules by clicking on the module you will like to check. Notice that the name of the module is displayed on the right column.



Now click on the "Check Single Module" button:



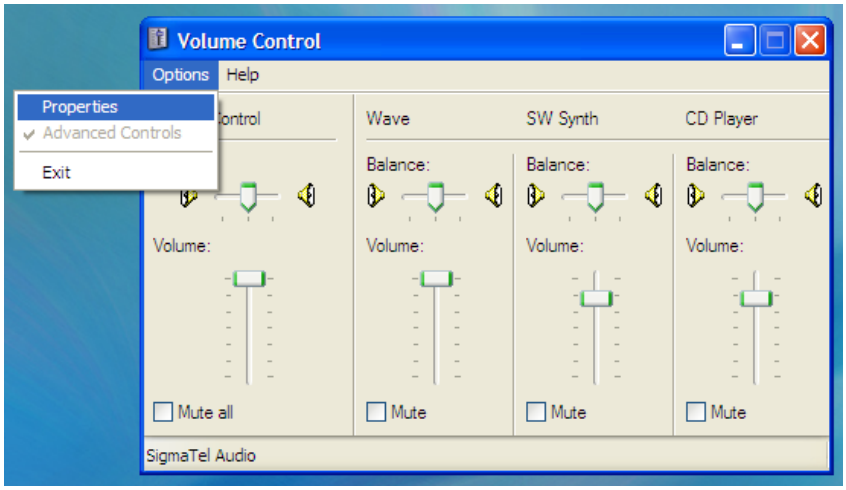
Active modules report light blue, and inactive modules report black. If there is a specific module that fails to respond please contact customer support (make sure that the module that is unresponsive is not specific to an Add-On feature that is not installed on your manikin).

3. Microphone Boost for Streaming Audio

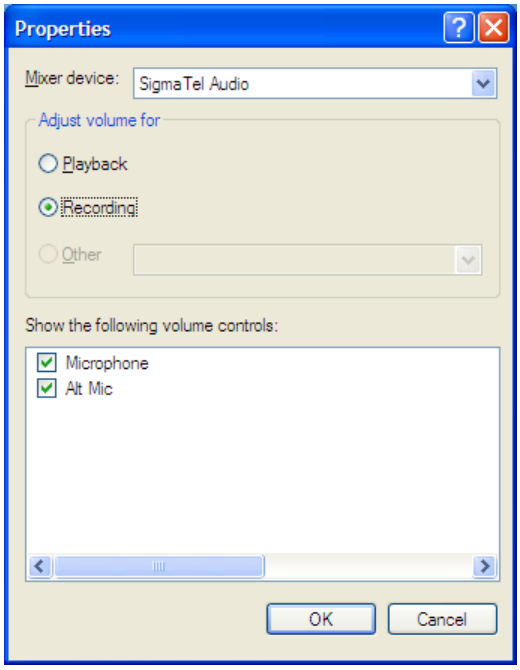
Use the instructions below to increase the streaming audio volume:

Double-click on the speaker icon found in the tablet's task bar in the lower right corner.

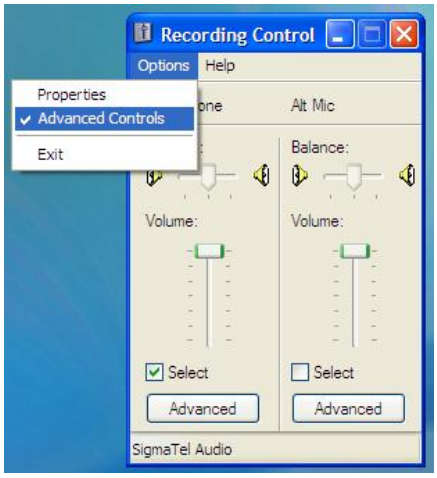
The Volume Control dialog box is displayed. Click on the Option menu, and select Properties.



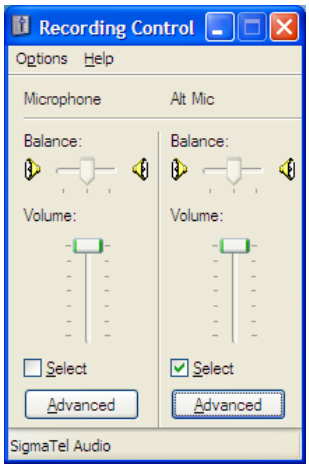
The Properties dialog box is displayed. Under "Adjust volume for", select the Recording option and click OK.



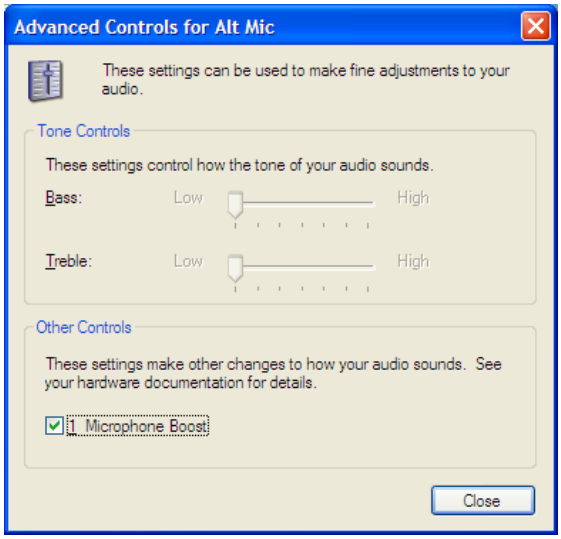
The Recording Control dialog box is now displayed. Make sure that the Advanced Controls option is checked in the Options menu.



Click on the “Advanced” button under the “Alt Mic” volume control.



The Advanced Controls for Alt Mic dialog box is displayed. Select Microphone boost under the Other Controls section. Click Close.



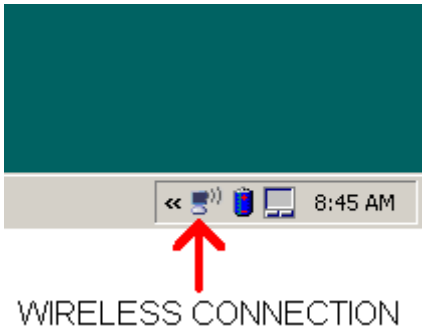
This should improve the volume of the microphone used for streaming audio.

4. Connecting to the Gaumard Monitors

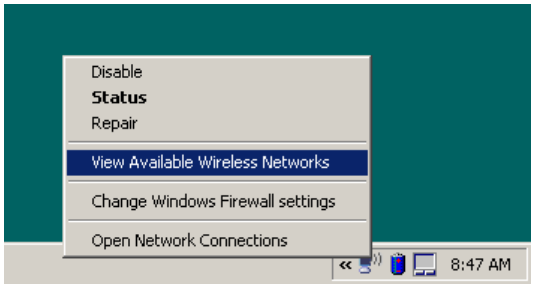
To connect the virtual monitor to the GaumardUI, you must have both computers joined to the same network, and you must properly configure their IP addresses. Make sure that the "Monitors" menu is visible by enabling it from the "Options" dialog box. The section below describes in detail how to do both of these things.

First, create a computer to computer wireless network connection. Note that the wireless connections between the computers are programmed at Gaumard if the simulators are shipped with a virtual monitor. In case a customer decides to buy the virtual monitors at a later date, the wireless network has to be set either by the user or a Gaumard representative onsite. There may also be cases when for various reasons the wireless network needs to be reconfigured. This tutorial is specific for Windows XP.

1. Locate the wireless connection icon on the bottom right corner of your desktop.

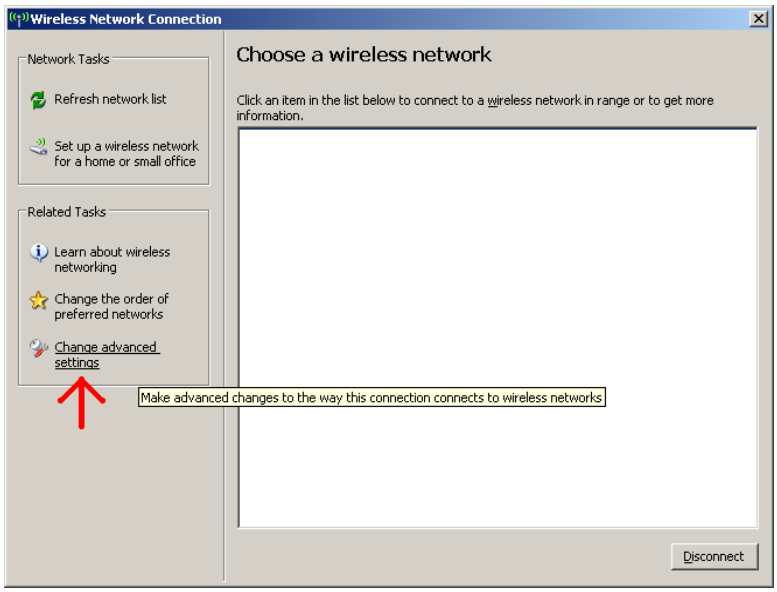


2. Right-click over the icon. A small menu appears. Select "View Available Wireless Networks" from the options on the menu.

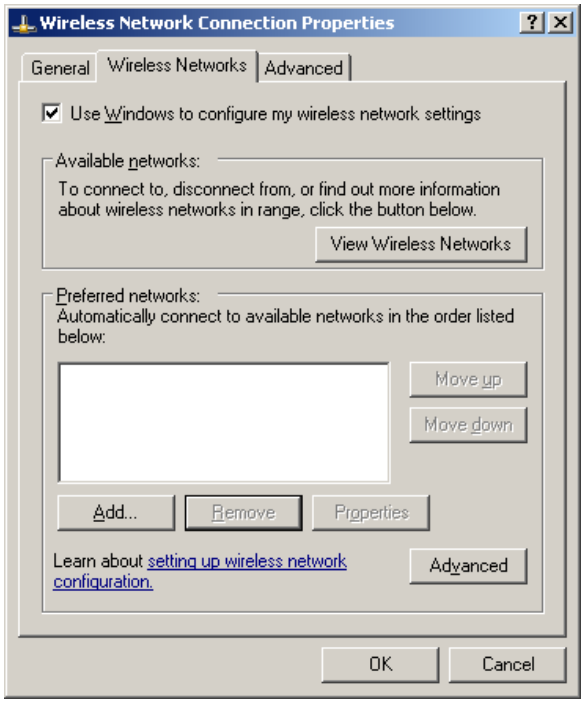


3. The "Wireless Network Connection" dialog box opens. Select the link that says "Change advanced settings" (located on the bottom left of this window). This will open a new

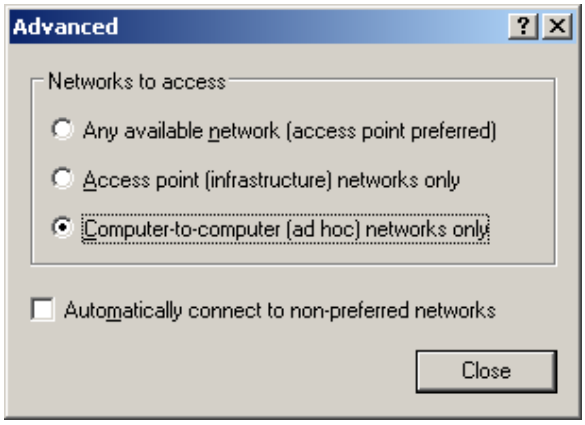
dialog box.



4. When the "Wireless Network Connection Properties" dialog box is displayed, select the "Wireless Networks" tab. Locate the "Advanced" button located on the lower right. Click on it.

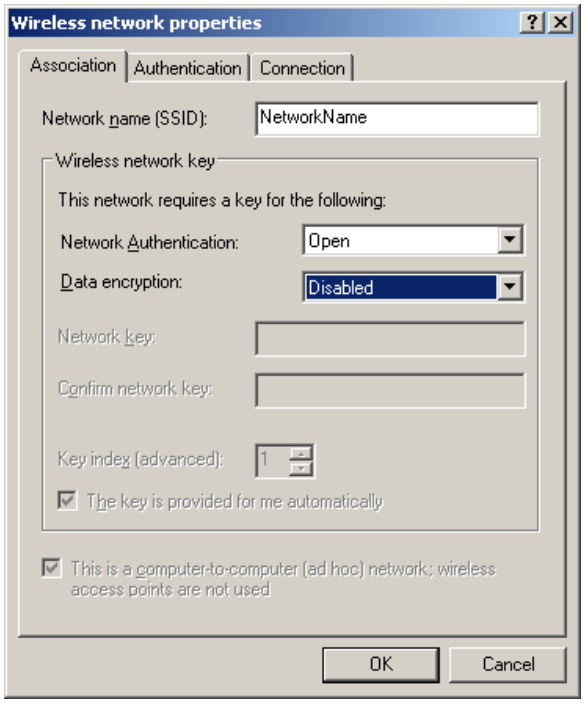


5. In the “Advanced” dialog box, select “Computer-to-computer (ad hoc) networks only.” Make sure the check box on the bottom is NOT selected. By selecting this option, it ensure the computer does not try to connect to and access point within the facility; the computer will only try to connect to registered ad hoc connections. Click “Close”.

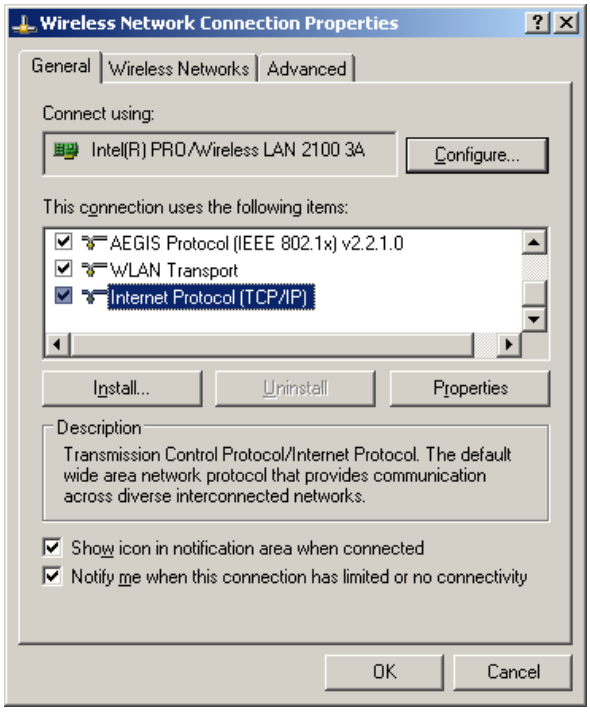


6. Click “Add” on the “Wireless Network Connection Properties” dialog box. The “Wireless network properties” dialog box is displayed. Here is where the wireless network will be created. On the “Network name(SSID):” type the desired network name. Network names are case sensitive, so ensure it is typed exactly the same on any computer to which connection is attempted. Example network names: "HalNet", "NoelleNet", "GaumardNet".

   Ensure the “Network Authentication” is "Open" and the “Data encryption” is "Disabled." Click “OK.”



7. The new network now appears on the “Wireless Network Connection Properties” dialog box under “Preferred networks”. Find the “Internet Protocol(TCP/IP)” inside the selection box labeled “This connection uses the following items.” Highlight it and click the “Properties” button.



8. The “Internet Protocol (TCP/IP) Properties” dialog box is displayed. Set the IP address for this computer. Make sure you select “Use the following IP address” then in the “IP address:” option, input the following:

    Computer 1 - 1.0.0.1
    Computer 2 - 1.0.0.2
    Computer 3 - 1.0.0.3
    And so on...

    Make sure all the IP numbers have the same number for the first three digits and make sure the last one is different.

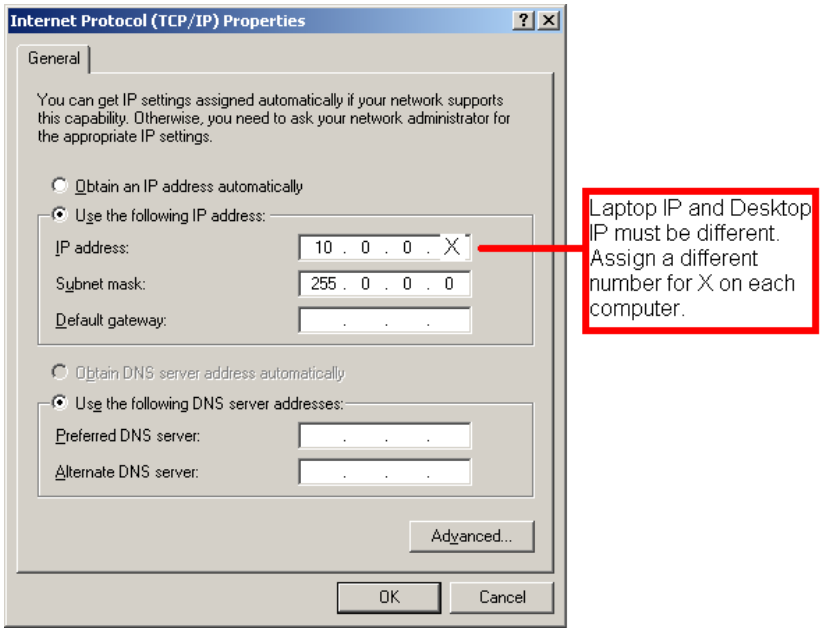
    Example of IP addresses that will NOT communicate with each other:

    Computer 1 - 1.0.10.1..... .....Computer 2 - 1.0.0.2

Computer 1 - 50.0.10.1 .... Computer 2 - 1.0.10.2
Computer 1 - 10.10.10.1..... Computer 2 - 10.10.10.1

To simplify the procedure, have the first three numbers to be 1.0.0.X, and make sure X is different on each computer.

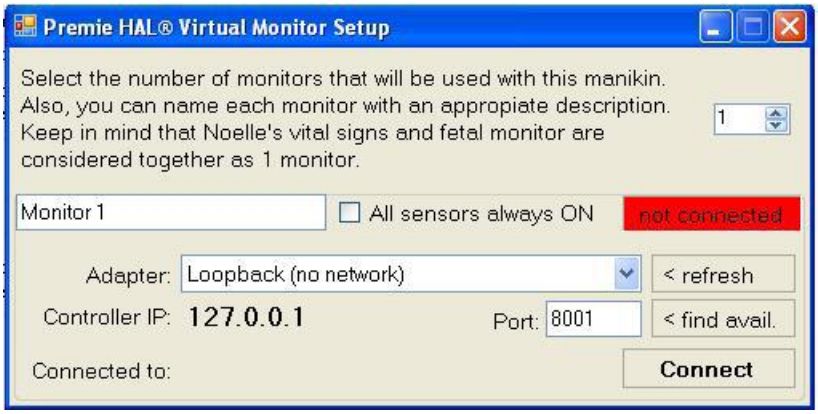
9. Now select “Subnet mask”. It should auto fill itself with 255.0.0.0. Ensure everything else is empty/blank and click “OK”.



This process has to be repeated on the each computer you are trying to connect to the GaumardUI. Remember to name the network exactly the same, but when you setup the IP addresses make sure they are different.

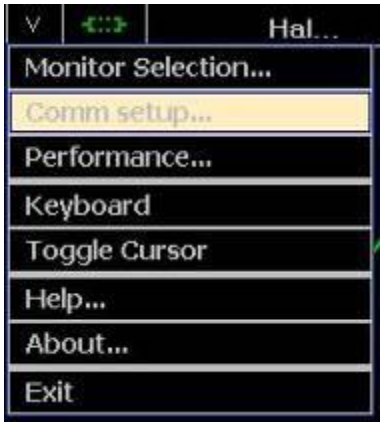
10. Following the IP address configuration, go to the “HAL® Virtual Monitor Set Up” dialog box by clicking on Monitors, Configuration on the GaumardUI.

On this dialog box, select the “Adapter” you will be using (usually the wireless adapter).

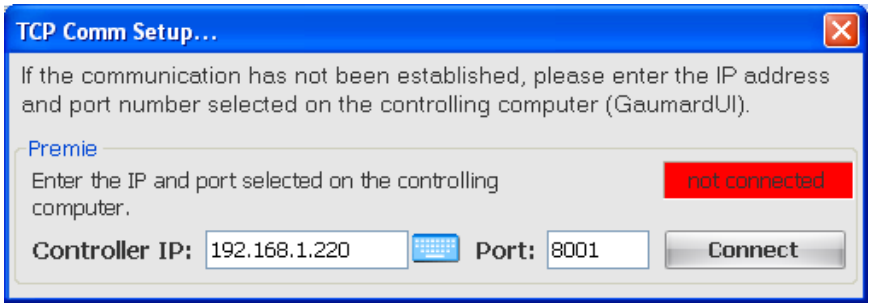


The Vital Signs Monitors should be configured to connect to the Controller IP designated by the selected Adapter. Make sure the port numbers are the same for the tablet and the computer running the Vital Signs Monitor.

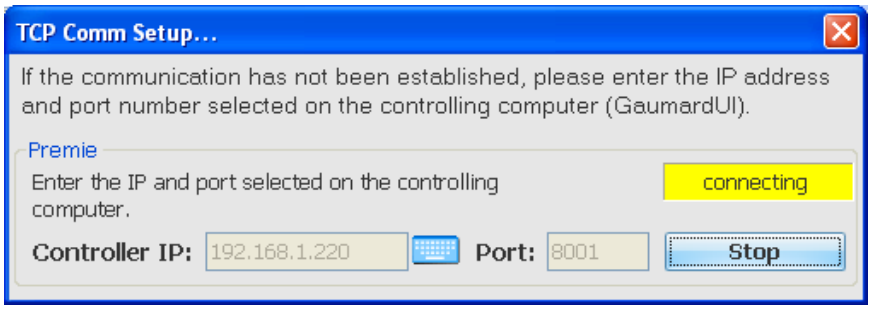
11. On the Monitors go to the menu labeled “v” located on the upper left corner. Click on it and select “Comm Setup…”

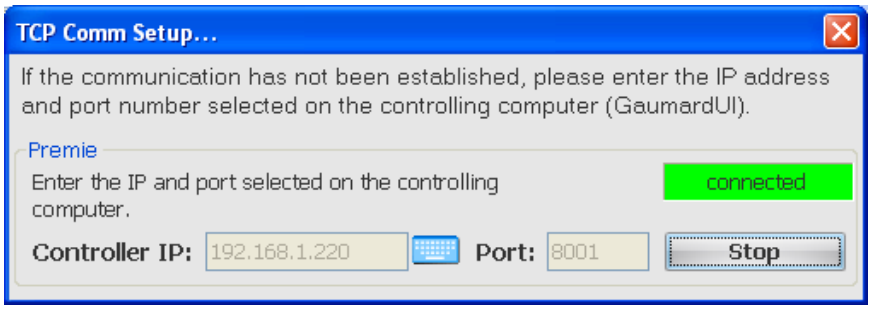


Open the “TCP Comm Setup” window and input the Controller IP address. This is the IP of the computer running the GaumardUI software (i.e., your computer tablet).

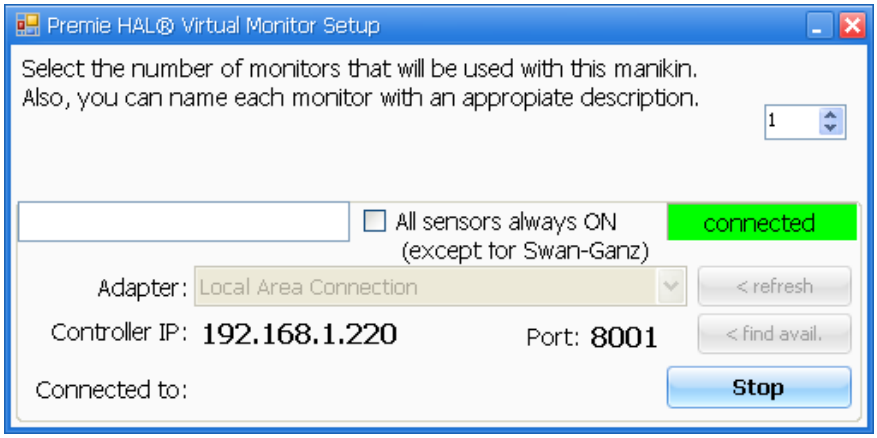


Make sure both computers are using the same port and click “Connect”.





On the GaumardUI, click on Monitors, then Configuration. This option displays the monitor setup dialog box, and also shows that the connection has been established.



The connection configuration will be saved allowing the communication to start automatically next time you start the software.

D. Consumables, Replacements and Optional Parts

Contact Gaumard Scientific for a **complete list** of consumables and replacement parts and their prices.

Item ID	Name	Type	Description
S3005.001	A/C Virtual Monitor	A	A/C Powered 17" Touch Screen monitor and desktop
S3005.002	D/C Virtual Monitor	A	D/C Powered 12" Touch Screen Mobile Monitor with stylus
S3005.010	Battery	C	Rechargeable battery
S3005.011	Battery Charger	R	100-240 V AC battery charger with label
S3005.013	Power cord	R	
S3005.029R.L	I/O Leg Skin Cover	C	Light color skin cover for right leg tibia bone
S3005.031	I/O Tibia bones	C	I/O leg tibia reservoir bones
S3005.053L.D	Upper LEFT Arm	M	Dark color upper left arm assembly with tethered BP with adaptor
S3005.053R.L	Upper RIGHT Arm	M	Light color upper right arm assembly with tethered BP with adaptor
S3005.081	Silicone Oil	C	Oil-based silicone lubricant
S3005.200	Audio & Video Recording System	A	
S3005.206	RF Module	R	Radio Frequency Module with USB connector
S3005.223L.L	Lower Left Arm Reveining	M	Lower left IV arm reveining, light color
S3005.223R.L	Lower Right Arm Reveining	M	Lower right IV arm reveining, light color
S3005.300	Wireless Streaming Audio	A	Wireless streaming audio feature
S3005.300.U	Wireless Streaming Audio Upgrade	U	
S3005.DEMO	Adult PEDIATRIC 5YO Demo Unit		
S3005.EXW	Two Year Extended Warranty	A	Extended warranty for years Two **AND** Three
S3005.INST	In-Service Training	A	Day of in-service training and installation
Item ID	**Name**	**Type**	**Description**
S3004.001	A/C Virtual Monitor	A	A/C Powered 17" Touch Screen monitor and desktop
S3004.002	D/C Virtual Monitor	A	D/C Powered 12" Touch Screen Mobile Monitor with stylus

S3004.010	Battery	C	Rechargeable battery
S3004.011	Battery Charger	R	100-240 V AC battery charger with label
S3004.013	Power cord	R	
S3004.029R.L	I/O Leg Skin Cover	C	Light color skin cover for right leg tibia bone
S3004.031	I/O Tibia bones	C	I/O leg tibia reservoir bones
S3004.053L.D	Upper LEFT Arm	M	Dark color upper left arm assembly with tethered BP with adaptor
S3004.053R.L	Upper RIGHT Arm	M	Light color upper right arm assembly with tethered BP with adaptor
S3004.081	Silicone Oil	C	Oil-based silicone lubricant
S3004.200	Audio & Video Recording System	A	
S3004.206	RF Module	R	Radio Frequency Module with USB connector
S3004.223L.L	Lower Left Arm Reveining	M	Lower left IV arm reveining, light color
S3004.223R.L	Lower Right Arm Reveining	M	Lower right IV arm reveining, light color
S3004.300	Wireless Streaming Audio	A	Wireless streaming audio feature
S3004.300.U	Wireless Streaming Audio Upgrade	U	
S3004.EXW	Two Year Extended Warranty	A	Extended warranty for years Two AND Three
S3004.INST	In-Service Training	A	Day of in-service training and installation

C=Consumables; R=Replacements; A=Accessories; U=Upgrades; M=Replace in Miami Factory ONLY

E. Warranty

EXCLUSIVE ONE-YEAR LIMITED WARRANTY

Gaumard warrants that if the accompanying Gaumard product proves to be defective in material or workmanship within one year from the date on which the product is shipped from Gaumard to the customer, Gaumard will, at Gaumard's option, repair or replace the Gaumard product.

This limited warranty covers all defects in material and workmanship in the Gaumard product, except:

1. Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product;
2. Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to property clean the Gaumard product; and
3. Damage resulting from a repair or attempted repair of the Gaumard product by anyone other than Gaumard or a Gaumard representative.

This one-year limited warranty is the sole and exclusive warranty provided by Gaumard for the accompanying Gaumard product, and Gaumard hereby explicitly disclaims the implied warranties of merchantability, satisfactory quality, and fitness for a particular purpose. Except for the limited obligations specifically set forth in this one-year limited warranty, Gaumard will not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory regardless of whether Gaumard has been advised of the possibilities of such damages. Some jurisdictions do not allow disclaimers of implied warranties or the exclusion or limitation of consequential damages, so the above disclaimers and exclusions may not apply and the first purchaser may have other legal rights.

This limited warranty applies only to the first purchaser of the product and is not transferable. Any subsequent purchasers or users of the product acquire the product "as is" and this limited warranty does not apply.

This limited warranty applies only to the products manufactured and produced by Gaumard. This limited warranty does not apply to any products provided along with the Gaumard product that are manufactured by third parties. For example, third-party products such as computers (desktop, laptop, tablet, or handheld) and monitors (standard or touch-screen) are not covered by this limited warranty. Gaumard does not provide any warranty, express or implied, with

respect to any third-party products. Defects in third-party products are covered exclusively by the warranty, if any, provided by the third-party.

Any waiver or amendment of this warranty must be in writing and signed by an officer of Gaumard.

In the event of a perceived defect in material or workmanship of the Gaumard product, the first purchaser must:

1. Contact Gaumard and request authorization to return the Gaumard product. Do NOT return the Gaumard product to Gaumard without prior authorization.
2. Upon receiving authorization from Gaumard, send the Gaumard product along with copies of (1) the original bill of sale or receipt and (2) this limited warranty document to Gaumard at 14700 SW 136 Street, Miami, FL, 33196-5691 USA.
3. If the necessary repairs to the Gaumard product are covered by this limited warranty, then the first purchaser will pay only the incidental expenses associated with the repair, including any shipping, handling, and related costs for sending the product to Gaumard and for sending the product back to the first purchaser. However, if the repairs are not covered by this limited warranty, then the first purchaser will be liable for all repair costs in addition to costs of shipping and handling.

Extended Warranty

In addition to the standard one year of coverage, the following support plans are available:

- Two-Year Extension (covers second and third years)
  Call for pricing (USA only)

F. Contact Us

If you have read this user's guide and still require assistance, it's easy to reach us.

E-mail Technical Support: support@gaumard.com
E-mail Sales and Customer Service: sales@gaumard.com

Phone:
Toll-free in the USA: (800) 882-6655
Worldwide: 01 (305) 971-3790

Note: Before contacting Tech Support **you must**:

1. Have the manikin's Serial Number (located in the left leg under the IM site)
2. Be next to the simulator if troubleshooting is needed.

Fax: (305) 667-6085

Post:
Gaumard Scientific
14700 SW 136 Street
Miami, FL 33196-5691
USA

Office hours: Monday-Friday, 8:30am - 4:30pm EST (GMT-5, -4 Summer Time)