



Gaumard[®]
Simulators for Health Care Education

HAL[®]

S3201 / S3101 / S3000

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.

User Guide H 13.5.1
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Introduction

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Care, Maintenance, and Warnings

Damage caused by misuse may void the manufacturer's warranty. Failure to comply with the following guidelines could result in injury or damage to the equipment.

SET UP

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

Do not use universal AC adapters. Only use the AC adapter supplied with the simulator.

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

Do not remove the chest skin. Internal components are serviced by Gaumard certified technicians only.

Never connect HAL to Ethernet cards, LAN networks or unauthorized diagnostic equipment. Doing so may cause damage to the system.

Do not connect the RJ45 cable directly to the tablet's Ethernet port. Wired communication can only be established using the RF module wired port.

Turn HAL OFF before replacing the battery. Failure to do so could result in serious damage to the system.

STORAGE

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

Do not store the simulator with a discharged battery. It is good practice to re-charge the battery at the end of every simulation session. In addition, make sure the battery is re-charged at least once every 3 months even if the simulator is not being used; otherwise permanent loss of capacity might occur because of self-discharge.

PROCEDURES

Do not 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.

Do not introduce flammable gases into the airway.

Providers must use an empty syringe when simulating drug administration via endotracheal tube. Passing liquids into the trachea or esophagus may cause internal damage.

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.

Do not turn HAL's head sideways while laryngospasm is on. Doing so may damage the mechanism that closes the larynxes.

Always dispose of system batteries in compliance with local laws and regulations.

Do not perform surgical exercises on the ventilation insert.

Only replace trauma limbs when HAL is powered off or in standby mode.

MECHANICAL VENTILATION

Always follow the mechanical ventilator's guidelines and precautions.

HAL is not designed to test the performance, functionality, and accuracy of a mechanical ventilator.

Do not introduce liquids, humidified gases, flammable gases, or administer aerosol medications into the airway. Moisture in the airway will damage the simulator's internal mechanics.

HAL's operating limitations are consistent with that of a real human. Treating HAL in a manner that would seriously harm a real person is likely to result in damage to HAL's internal mechanics.

Always treat HAL as a real patient.

IV ARM, DRUG RECOGNITION AND NEEDLE DECOMPRESSION

Only use Gaumard's provided simulated blood. Any other simulated blood containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

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

The simulator must be powered on when working with the drug recognition arm. This includes calibration, purging, draining, IV infusion, Set Med Id and injecting fluids. Failure to do so will permanently damage the simulator and void the warranty.

You must always have water in the IV vasculature for the drug recognition module to work.

Do not inject fluids into the intramuscular sites.

Do not add liquids to the hemothorax sites. Doing so will damage the simulator and void the warranty.

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.

Maximum amount of fluid injected without draining should not exceed 40 mL and the maximum injection rate is 9999 mL/hr.

At the end of every simulation session, you must purge the IV system with clean water with the simulator powered on. If the drug recognition arm is not going to be used for long periods of time (a week or more), purge the system with 70% isopropyl alcohol solution. Failure to do so may permanently damage the system.

CONSUMABLES

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.

LATEX WARNING

Vein tubing contains latex, which may cause allergic reactions. Users allergic or sensitive to latex should avoid contact. Discontinue use of this product and seek medical attention if an allergic reaction occurs.

CO₂ CARTRIDGE

Always follow the manufacturer's safety and warning information included with the CO₂ cartridge package.

Never point a CO₂ cartridge at yourself or others

Do not use damaged CO₂ cartridges

Do not puncture the cartridge CO₂ seal manually

Do not expose the CO₂ cartridges to high temperatures as indicated on the product's packaging

Install threaded cartridges only (3/8"-24UNF-2A). Do not attempt to install a cartridge that does not meet the specifications listed in this document.

Do not over tighten the cartridge into the simulator's cartridge harness

Always verify that the CO₂ cartridge is empty using the software diagnostics before removing it. Do not remove the CO₂ cartridge if the simulator is not fully operational.

CLEANING

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 simulator.

HAL[®] is "splash-proof" but not water-proof. Do not submerge or allow a large volume of fluid to enter the interior of the simulator.

Do not expose the control computer to water or excessive dust unless it is protected by a rugged case (available separately).

Electrical therapy

- Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.
- Make sure the defibrillation patches on the simulator are in good condition, including removing any and all gel residue on the defibrillation patches from previous use(s). It is a good practice to remove gel residues after every use. Failure to do so will leave behind a film of electrode gel that hardens causing arcing and pitting.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- Use hard paddles or wet-gel pads preferably. Avoid using solid-gel pads since they present higher risk of burning the simulator's skin.
- Gel pads have a shelf life. Make sure they are not expired to avoid arcing.
- Make sure the simulator is not in contact with any electrically conductive surfaces.
- Use the simulator only in a well-ventilated area, free of all flammable gases.
- **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. A gentle, degreasing cleanser may be needed. Refer to Care and Cautions for more information.
- Electrode gel on the skin between any two electrode targets can become a pathway for electrical current, just as in real life. If this occurs, HAL's skin can be burned.
- Do not allow defibrillation pads to overlap ECG sites. Doing so will may damage the simulator and cause arcing.
- Should dark traces appear on the conductive patches due to gel residue or previous arcing, use a pencil eraser to remove the traces and then clean with alcohol.

DO NOT SCRATCH the conductive patches with abrasive objects; doing so will cause irreversible damage to the conductive sites and subsequently cause arcing

Getting Started

Equipment setup

LEG ASSEMBLY

To install the lower legs:

1. Remove the fixed bolts from the knee joints using the hexagonal wrench included.



2. Connect the red pedal pulse lead and white CO₂ lead to the right lower leg. On the left leg, connect the pedal pulse and secure the trauma power lead for later use.



3. Position the lower legs and insert the knee joint bolt. Tuck any extra wire and the connector into the lower leg.
4. Replace the bolt and use the two provided hexagonal wrenches to secure the knee bolt without over tightening.

BATTERY

HAL is shipped with the internal battery disconnected. Connect the battery lead as part of the first install process.

WARNING: Do not remove the chest skin.

To connect the internal battery leads:

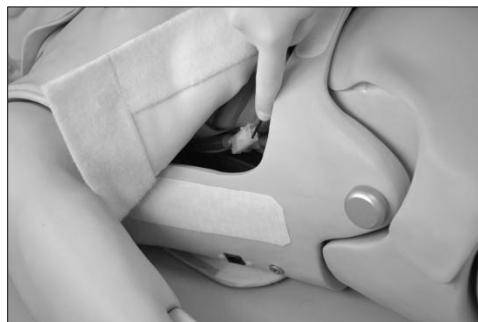
1. Locate the connectors on HAL's right hand side.



2. Gently lift the right corner on the chest skin as shown and connect the battery clip.



3. Slide battery leads inside the cavity.



- Secure the chest skin. Connect the simulator's power charger.



Immediately after connecting the battery leads, HAL is on stand-by mode and ready to be initialized by the GIGA software.

BATTERY LIFE

Battery charge time is approximately **four** hours. The AC adapter's status indicator light displays red when the battery is charging and green when the process is complete.

Feature	Runtime
Internal Battery	5 hours

To display the battery level, the GIGA software must first establish a connection with the HAL. For more information about the battery indicator, refer to page 12.

WARNING: Do not store the simulator with a discharged battery. It is good practice to re-charge the battery at the end of every simulation session. In addition, re-charge the battery at least once every 3 months even if the simulator is not being used, otherwise permanent loss of capacity might occur because of self-discharge.

Control Tablet PC

The tablet PC is preloaded with the GIGA control software used by the facilitator to initialize the simulator and control the vital signs.

Before turning on the computer for the first time, please review the documentation included with the product for important care and warning information.

USING THE STYLUS

The tablet's stylus is a pen-shaped input used to interact with files and programs.

- Left click - tap the screen with the pointer. Tap twice rapidly to double-click.
- Right click - tap and hold a highlighted item or hold the button near the pointer and tap the item or text.

CALIBRATING THE STYLUS

As part of the initial setup process, calibrate the stylus using the Tablet and Pen calibration tool in the Windows® control panel. Complete the calibration process while holding the pen in a natural writing position for greater accuracy during normal use.

WIRELESS COMMUNICATION USB MODULE

The controlling computer transmits the startup and control commands to simulator through the USB RF communication module.

Connect the RF communication module to an available USB port on the tablet.



Secure the RF communication module to the tablet or PRO+ computer using the Velcro patch. The tablet is now ready to communicate with the simulator wirelessly. For information about the signal strength indicator, go to page 20.

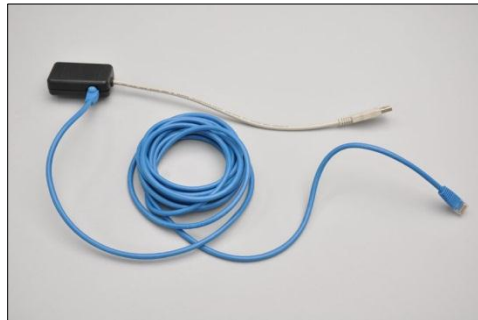
USB COMMUNICATION MODULE WIRED

The USB communication module is also equipped with a wired communication port for transmitting the startup and control commands to the simulator. The alternate wired configuration should be used in environments that do not allow wireless communications.

Do not connect the simulator to Ethernet cards, LAN networks, or unauthorized diagnostic equipment. Doing so may cause damage to the system.

To connect the simulator to the Tablet PC using the wired option:

1. Connect the RJ45 cable to the USB communication module



2. Connect the RJ45 cable to the communication port on the simulator's right side
3. Connect the communication module to an available USB port on the tablet PC



The tablet is now ready to communicate with simulator.

STREAMING AUDIO HEADSET

The computer system includes a headset that allows the facilitator to speak as HAL's voice and listen to the participants reply.

Connect the headset MIC and Speaker connectors to the designated ports on the side of the tablet PC. Go to page 56 for more information about the streaming voice feature.



Always connect the streaming audio headset before starting the GIGA software.

Virtual Monitor

The Gaumard Monitors software displays HAL's simulated vital signs in real time. The interactive monitoring software is preloaded in to the virtual monitors PC.

The virtual monitor PC also allows the facilitator to play back the session recordings stored in the PRO+ PC for debriefing.



VIRTUAL MONITOR PC SETUP

Refer to the manufacturer's documentation included with the virtual monitor system components for important safety, installation, and start-up information before turning on the PC for the first time.

To setup the virtual monitor PC:

1. Place the all-in-one PC within line of sight of the controlling computer
2. Connect the power supply to the PC and to the wall outlet
3. Connect the USB keyboard and mouse receiver to the PC
4. Turn on the computer

VIRTUAL MONITOR WIRELESS CONNECTIVITY

The control PC and the all-in-one virtual monitor PC establish a wireless link at startup automatically. The wireless connection allows the Gaumard control software to transmit the vital signs information to the Gaumard Monitors software.

To verify the wireless link between the two computers, click the wireless icon located on the task tray. The wireless network name is configured at the factory and may differ from the one seen below. To troubleshoot connection issues between the virtual monitor computer and the controlling tablet, please go to page 102.

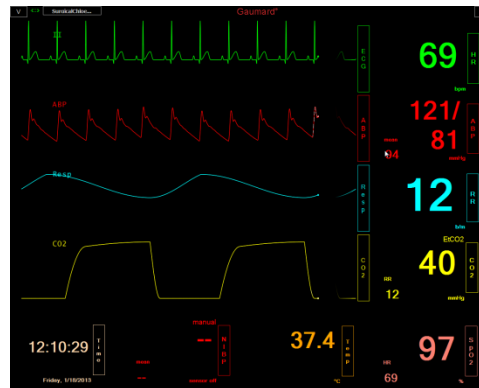


GAUMARD MONITORS

After the wireless connection is established, double click or tap the Gaumard Monitors icon to start the vital signs software.



The Gaumard Monitors software is now ready to receive the vital signs information generated by the GIGA control software.



For more information about the Gaumard Monitors software, please refer to the Gaumard Monitors user guide.

Working with GIGA

Initializing the Simulator

After reading the manufacturer's care and caution information, press the power button to turn on the Tablet PC.



The GIGA software initializes the simulator. Double click the GIGA icon on the tablet's home screen to start.



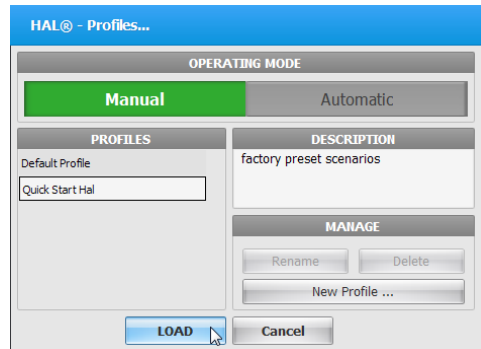
The simulator selection menu is shown. Select HAL and click "Start".



The wireless link between GIGA and the simulator is established within 1 minute.

PROFILES AND OPERATING MODES

After the startup screen, the profile and operating mode selection menu is displayed.

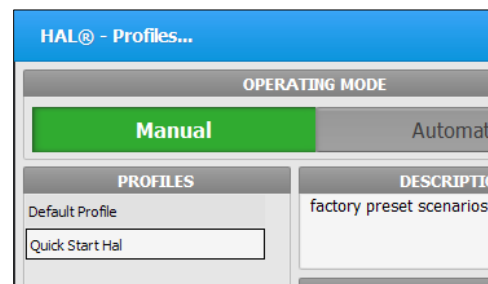


The GIGA control software has two modes of operation: Manual and Automatic. Each mode includes a Quick Start profile with preprogrammed scenarios exercises created in conjunction with experienced healthcare instructors and working medical professionals. Continue to the next section to learn more about the each operating mode and the profiles included.

After selecting an operating mode and profile, click "Load" to continue.

MANUAL MODE

In the "Manual" operating mode, the facilitator fully controls the vital signs and physiologic responses.



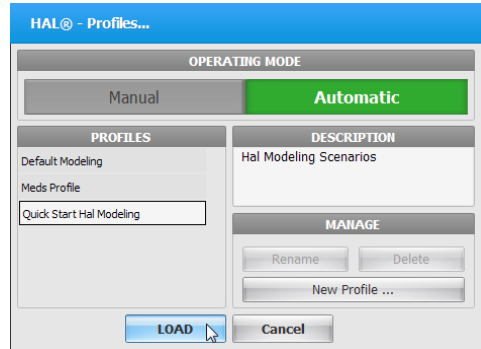
The Manual mode includes the following profiles:

Default Profile – includes one palette with healthy vital signs.

Quick Start HAL – contains ten scenarios

AUTOMATIC MODE

The Automatic mode assists the facilitator by automatically adjusting vital signs in response to caregiver participation, pharmacologic intervention, and manual input. For example, when facilitator increases the heart rate, the Auto mode will calculate the response and adjust the blood pressure automatically. To activate the operating mode as an upgrade option, go to page 98.



The Automatic mode includes the following built-in profiles:

Default Modeling– includes one palette with healthy vital signs.

Meds Profile – This profile contains fifty-two pre-programmed drugs to be used on simulations.

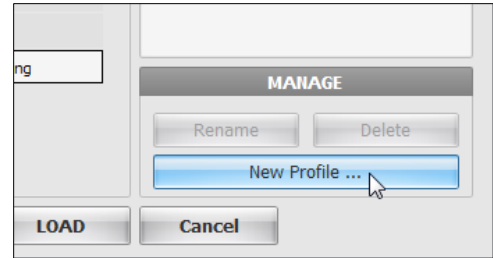
Quick Start Hal Modeling – includes eight scenarios configured for the Automatic operating mode

CREATING A NEW PROFILE

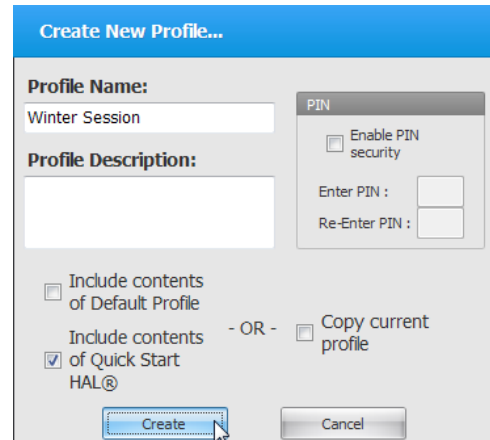
Profiles store palette, scenario, and option settings independently; changes made to one profile have no effect on the others. Below are some examples on how profiles are used.

- Assign one profile to each user of your Gaumard simulator system
- Use profiles to organize and protect palettes and scenarios
- Create a profile dedicated to a specific academic course taught by multiple instructors
- Devote an entire profile to one particular subject area, or even one particular scenario

To create a new profile, click “New Profile”.



Enter a name for the new profile followed by a description.



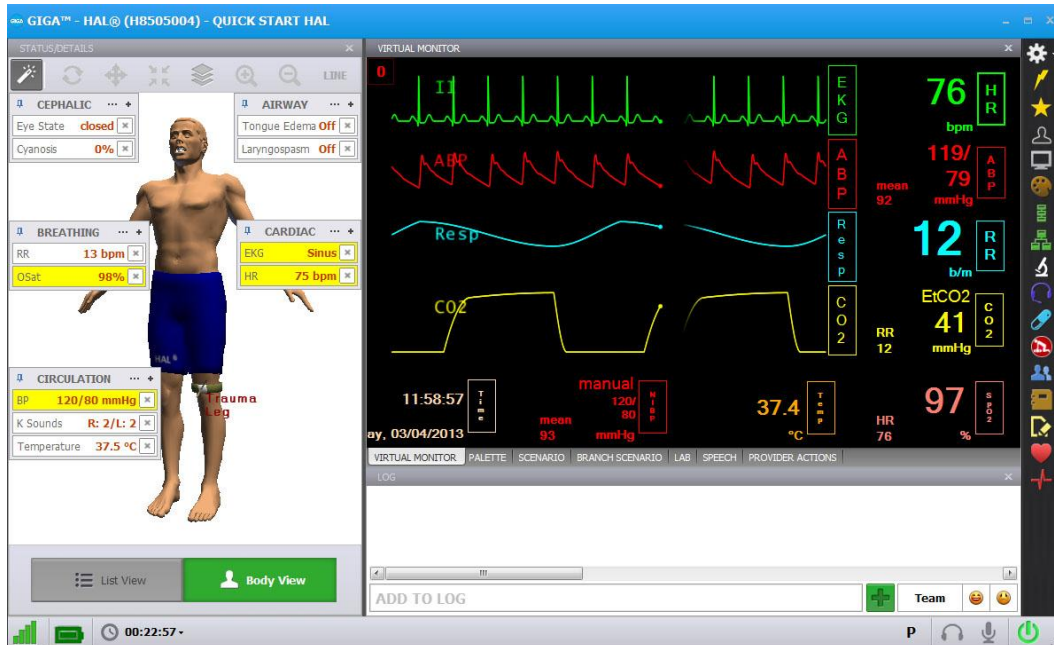
Enable the PIN protection to prevent unauthorized users from accessing or making changes to this profile.

Lastly, click “Create” to save the new profile

GIGA Interface

The GIGA software is used to control the simulator, monitor the vital signs, and evaluate the provider's performance. The simulation technician or instructor carrying out the simulation operates the GIGA software.

The GIGA control elements and scenario programming procedures are consistent throughout the Gaumard family of high-fidelity simulators. Some software controls and features covered in this guide may be hidden depending on the simulator's hardware configuration and optional upgrades.



Connection status

The communication indicator displays the status of the radio link between the tablet's USB RF module and the simulator. Full bars indicate excellent communication (i.e., normal operation).



Battery indicator

The battery indicator displays the battery charge information. An exclamation sign is shown when there is no communication with the simulator and battery information cannot be retrieved.

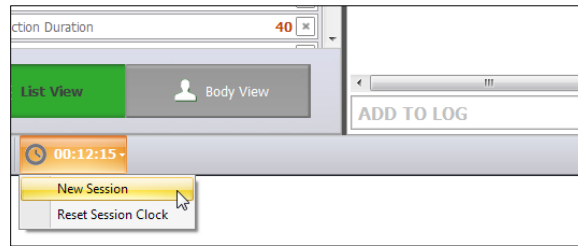


When the battery is depleted, the simulator is set to STAND-BY mode automatically. The simulator will not initialize until the power adapter is reconnected.

Feature	Runtime
Internal Battery	Approx. 5 hours

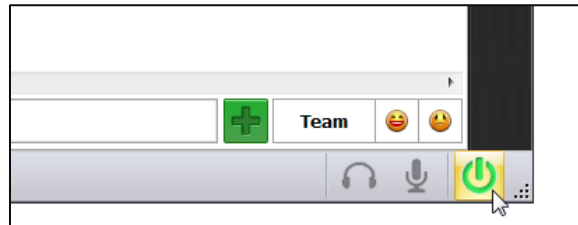
Session clock

The session timer displays the duration of the current session. Click the timer to reset the clock or to start a new session. Event entries in the text log are synchronized with the session timer.



Power/Stand-by

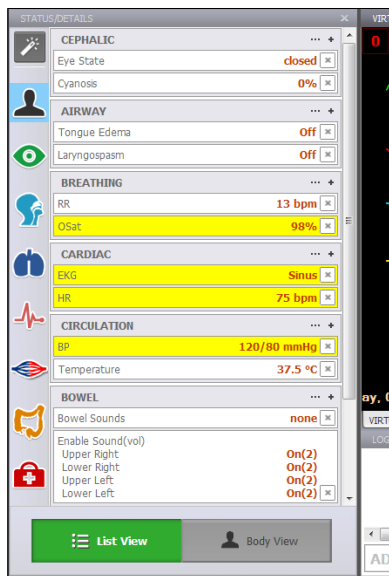
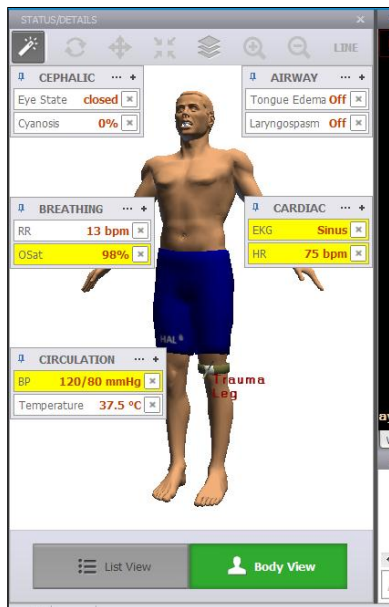
The power button is located at the bottom right corner of the GIGA software. Toggle the power button to set the simulator to stand-by mode and then again to resume.



Status / Details Controls

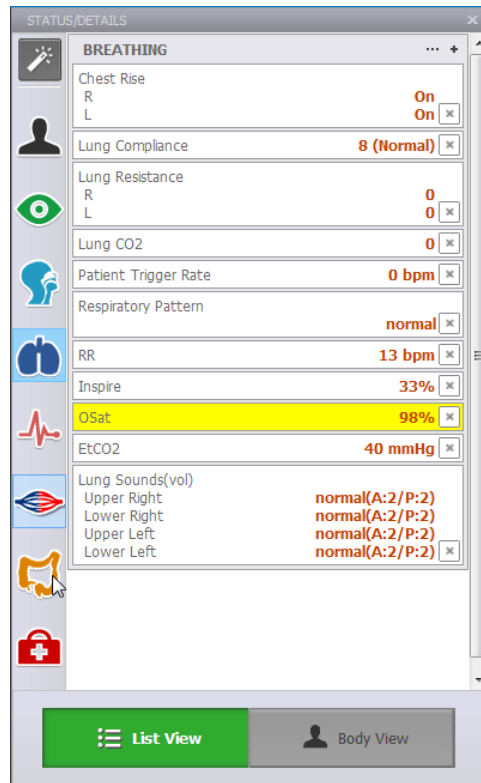
The Status/Details panel is used to monitor and control the simulator's vital signs. The individual parameter controls displayed on the details tab provide the simplest method for controlling the simulator's vital signs, sounds, and features.

There are two viewing modes. The "List view" displays the vital signs controls in a list format, while the Body view displays the interactive patient model with floating control boxes. Toggle the view buttons to switch between the two modes.

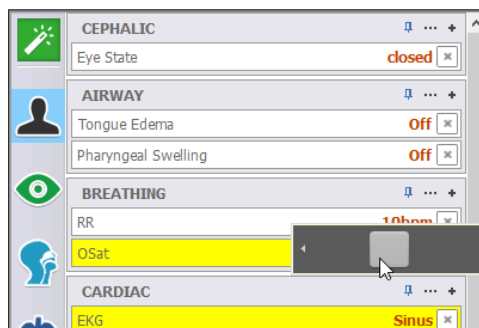


SYSTEMS LIST VIEW

In the List View, the vital signs controls are divided into separate categories. Click through the categories to view the controls available for the current simulator configuration.

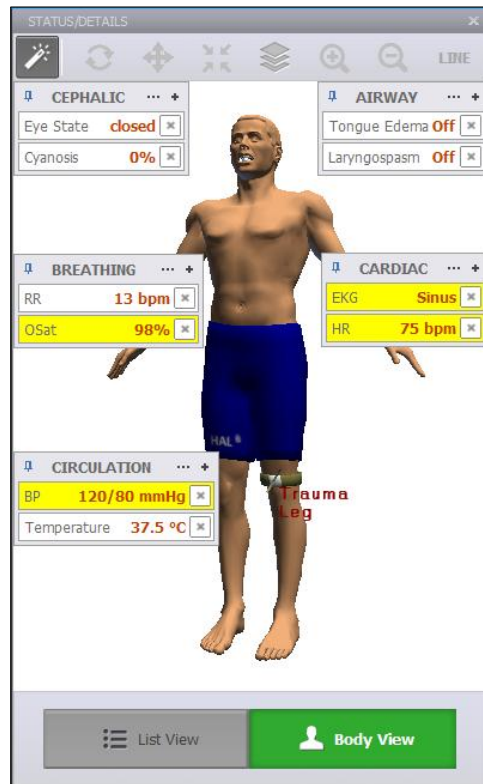


Enable the "instant apply" option and click the control to change the vital sign to a new value. Vital signs undergoing change blink yellow.

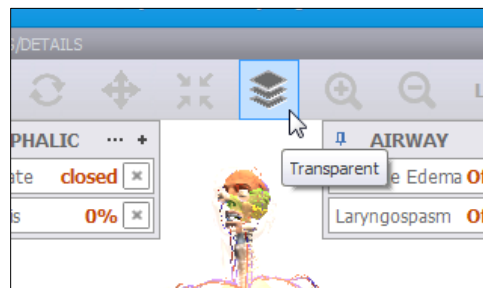


THE BODY VIEW

The “Body View” mode displays an interactive model of the simulator. The model is a representation of the simulator and its internal organs. The floating control boxes are used to monitor and change the vital signs just like in the “List View” mode.

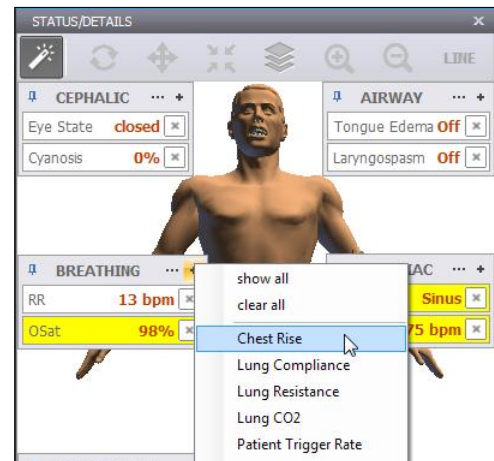


Use the Body View controls to rotate, zoom, and re-center the model. Click the transparency button to view the model's internal organs.

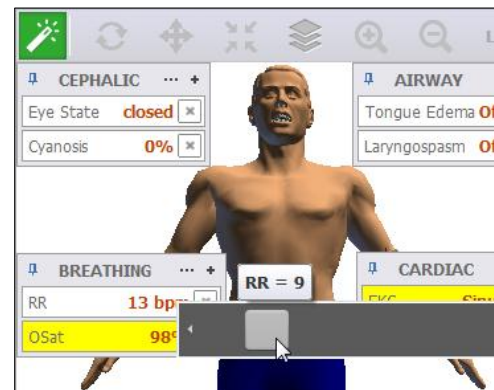


FLOATING CONTROLS

The floating controls are used to monitor and change the vital signs. The default layout displays commonly used vital signs controls. Click the + button to add controls to the floating window.

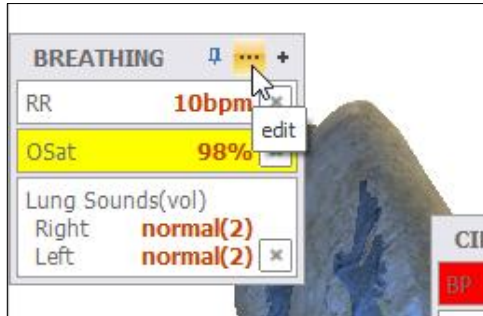


Enable the “instant apply” option and click the control to change the vital sign to a new value. Vital signs undergoing change blink yellow.

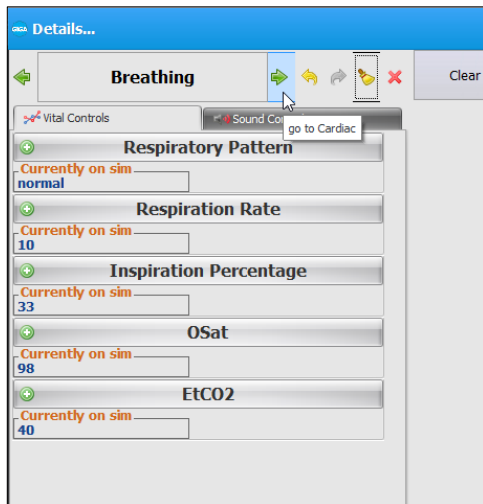


EXPANDED CONTROLS

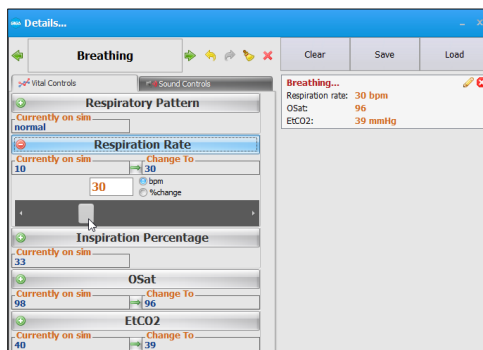
The expanded details view is used to tabulate a list of vital sign changes before applying them all at once. In addition, the Details list is used for creating palette items; a set of vital signs parameters stored in a single loadable item. Click the edit button to open the expanded Details list.



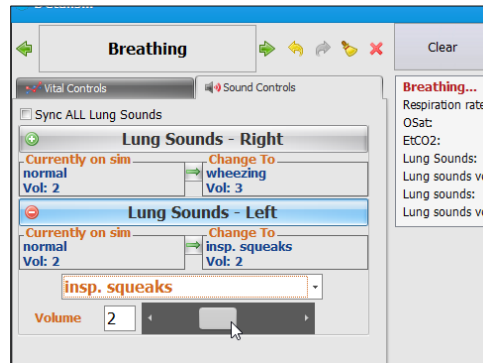
The vital signs controls are divided into categories. Click through the categories to view the controls available for the current simulator configuration.



Change vital sign value or state to add it to the Details list.

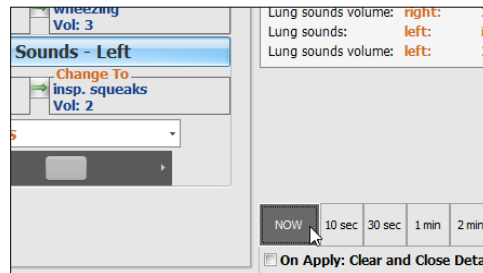


Click the sound controls tab to change the sound types for audible features (e.g. heart rate) and volume level.



APPLYING CHANGES

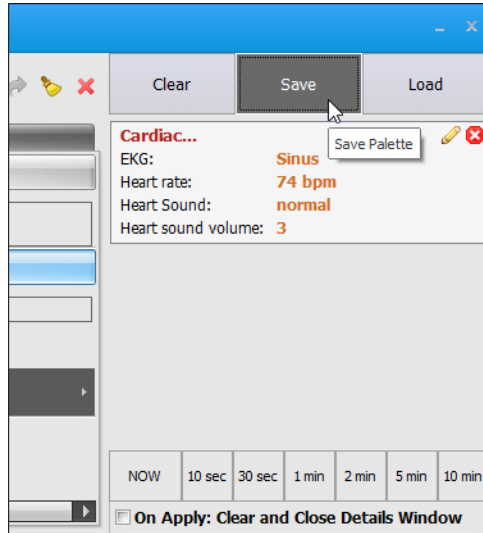
After the list of changes is created, click "NOW" to update the vital signs instantly. Alternatively, click a trending timer to update numerical vital sign parameters (e.g. heart rate, blood pressure) gradually.



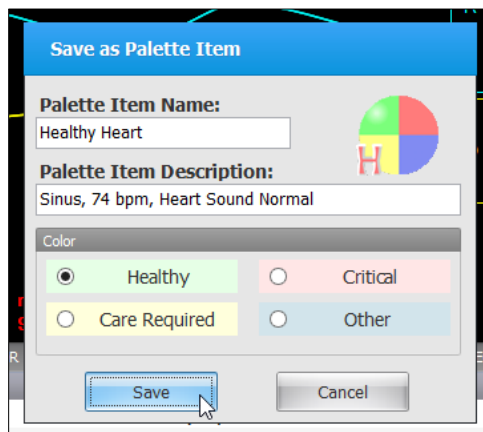
CREATING PALETTE ITEMS

A palette item stores one or more vital sign settings into a single loadable object. Use a palette item to update a set of vital signs quickly. For example, one palette item can be created to update all the cardiac parameters to a healthy state.

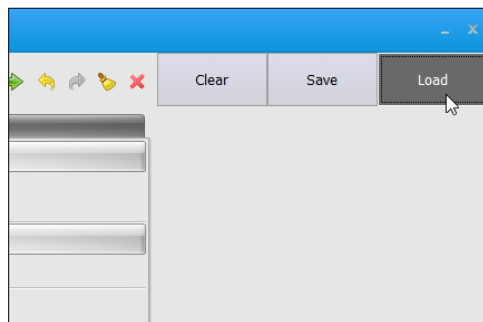
To create a new palette item, set the values for the desired vital signs parameters and click "Save".



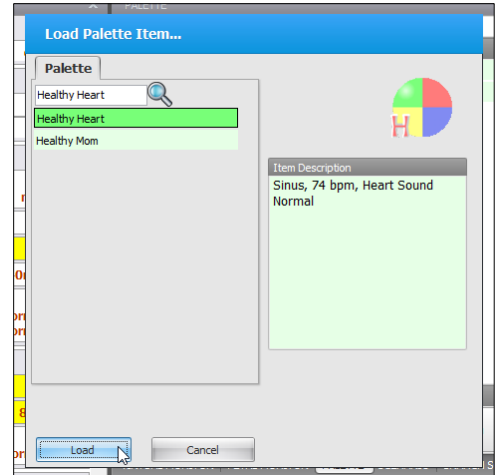
Enter a name for the palette, a description, and choose color code. Click “Save” to create the new palette Item. Palette items are stored in the active profile.



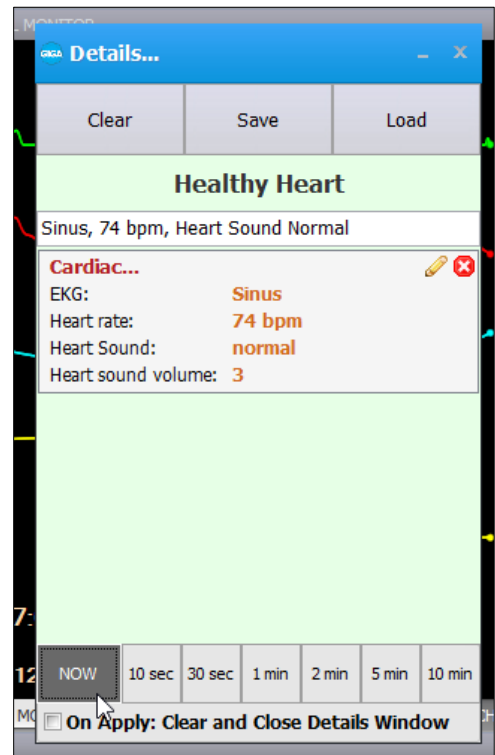
When the palette is needed, click the Load button to select the palette from the library.



Select the palette item from the “Load Palette Item” menu and click “Load”



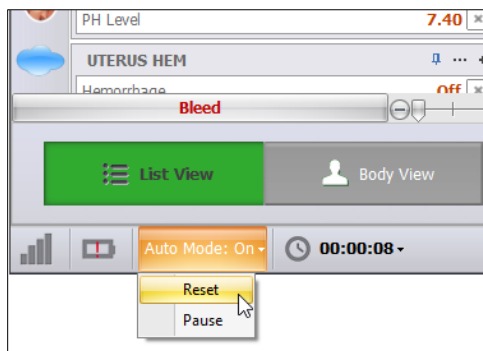
Click the apply option to submit the changes.



AUTOMATIC MODE CONTROLS

While operating in the Automatic Mode, GIGA adjusts the patient's vital signs automatically in response to caregiver participation, instructor input, and pharmacologic intervention. For example, if the heart rate is increased, GIGA will calculate a realistic response to the event and adjust the blood pressure values automatically. To enable the Automatic Mode as an option in the profiles menu, go to page 98.

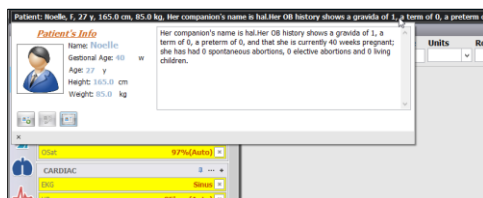
Click "Auto Mode" to pause the automatic changes. To return the patient to the initial state, click "Reset".



PATIENT PROFILE

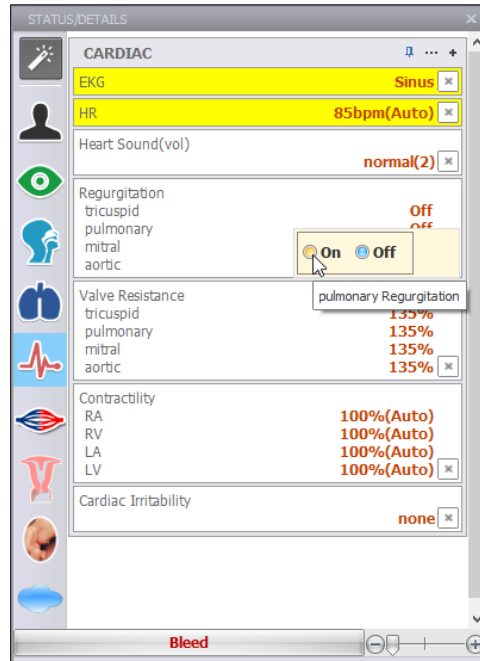
Patient files store general information such as weight, height, and age. The automatic mode factors the patient's weight as it adjusts related physiological parameters. GIGA includes several preprogrammed patients in the Quick Start Modeling profile. For more information on the each patient profile, go to page 140.

HAL is the default patient loaded when the Quick Start Modeling Profile is selected and it is an ideal candidate for most simulations. Click the patient information bar to view the patient's profile.



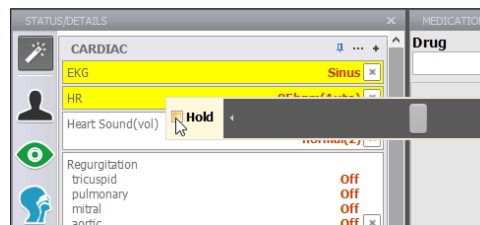
AUTOMATIC MODE CONTROLS

In the automatic mode, the Details panel includes additional vital sign parameters and control options not available in the Manual mode.



The "Hold" and "Auto" options are unique to the automatic mode. The "Auto Mode" adjusts vital sign controls with an (auto) suffix automatically.

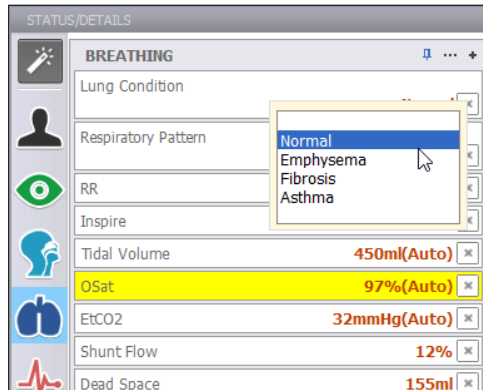
Checkmark "Hold" to prevent the Auto Mode from adjusting the value. Then change the vital sign to the new static value. The automatic mode will not change values set to hold. The "Auto Mode" will adjust all other controls set to "auto".



Some changes are gradual and even if submitted for immediate change. 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.

LUNG CONDITION

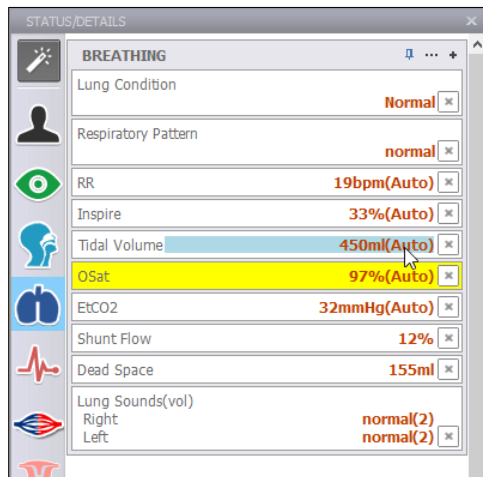
The lung condition parameter adjusts the shunt flow, dead space, airway resistance, and respiratory pattern automatically.



TIDAL VOLUME

In the automatic mode, a tidal volume of 450 m/L to 500 m/L is considered the normal level for an adult of average build.

The “auto mode” does not restore the respiratory rate if it is set to zero. Always remember to specify a new respiratory rate.



CIRCULATION

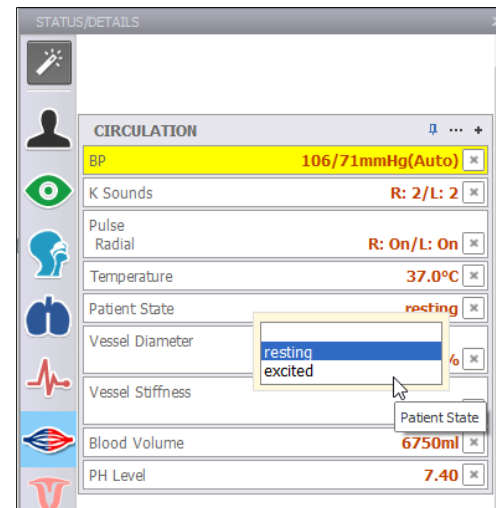
Each cardiac rhythm has a specific effect on the blood pressure waveforms. The pressure waveforms include ABP, CVP, PAWP, and Pulse. The blood pressure values are affected when any of the following parameters are changed:

- Vascular profiles: vessel diameter and vessel stiffness

- Heart Rate
- LV Contractility
- Total Blood Volume

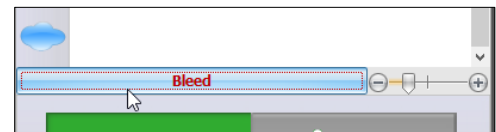
PATIENT STATUS

Set the patient status to “Excited” (after exercise) to increase heart rate, temperature, respiratory rate, tidal volume, O₂, CO₂ diffusion capacity, metabolic rate, and CO₂ formation rate. Set the status to “resting” for a normal state.

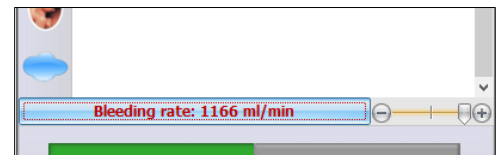


BLEED AND WOUND SIZE

The Bleed and Wound size options simulate blood loss virtually. To start the virtual bleeding click the “Bleed” button, and then adjust the bleeding rate using the “Wound Size” control.

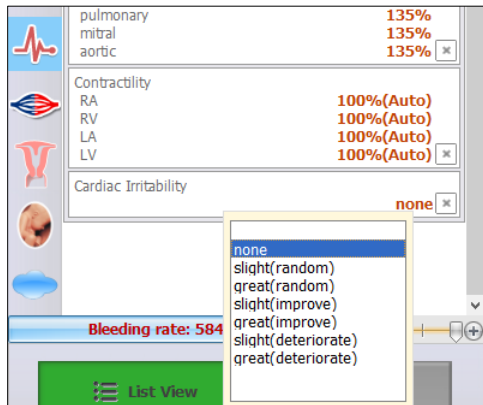


Once the bleeding function is activated, the Auto Mode will adjust the vital signs in response to the blood loss. If the provider does not intervene, the vital signs will deteriorate and myocardial ischemia will occur. For information on how to infuse blood to the model virtually, go to page 92.

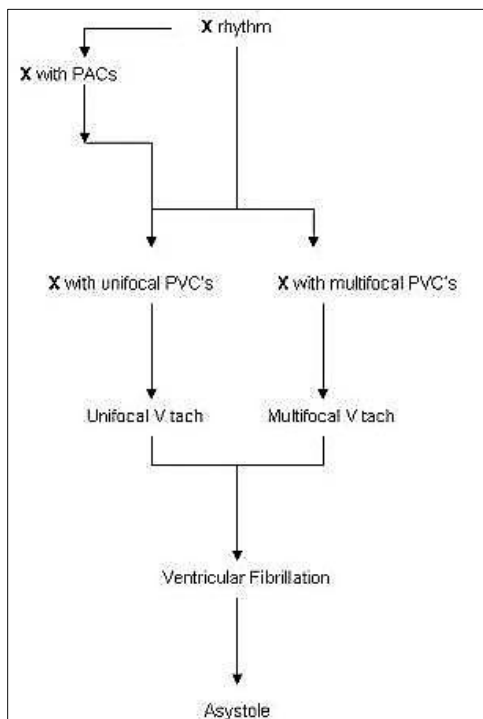


CARDIAC

The Cardiac irritability control adjusts the cardiac rhythms indirectly. Set the Cardiac Irritability to “improve” to move the current heart rhythm to normal sinus gradually. Alternatively, set the cardiac irritability to “deteriorate” to move the heart rhythm to ventricular fibrillation and eventually asystole.

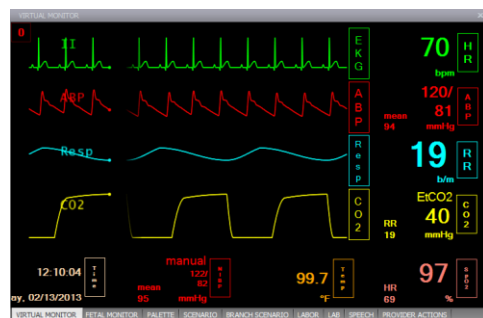


The progression of rhythms generally follows the pattern displayed in the figure below, where “X” represents normal sinus rhythm, multifocal atrial tachycardia, atrial flutter, atrial fibrillation, junctional rhythm, left or right bundle branch block, or atrio-ventricular block:



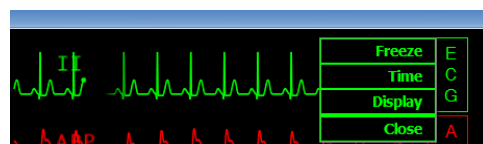
Virtual Monitor

The interactive virtual monitor tab (VM) displays the patient's vital signs information. The waveform and numerical parameters are interactive and the layout is fully customizable.



WAVEFORM MENU

Click the waveform name to access the waveform options.



- Freeze - Pause the waveform reading. To unfreeze the selection, click the waveform menu and select "Go".
- Time - Set length of the ECG waveform. The options available are 5 seconds, 10 seconds, 15 seconds, and 20 seconds.
- Display - Open the waveform properties menu. Edit the waveform color, amplitude, intensity and scroll direction.

CHANGING THE WAVEFORM TYPE

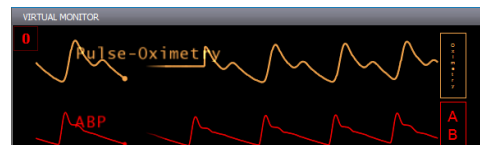
To change the type of waveform displayed, click the waveform menu and select "close".



Click the empty waveform menu and select the new waveform type. While operating on the Automatic mode, the ECG option displays a sub menu for 12 individual leads.



The new waveform type is now displayed

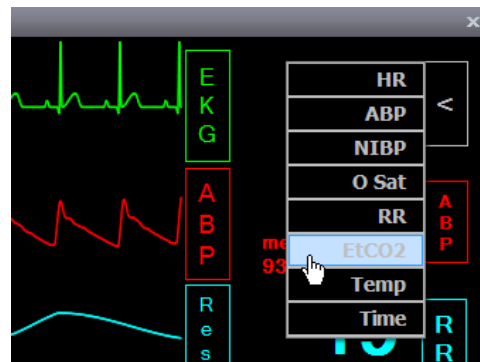


NUMERIC MENU

Click the numeric menu to access the numerical parameter options. To change the type of numerical parameter displayed, click the numeric menu and select "close".

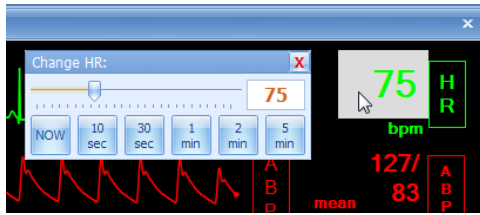


Click the empty numerical menu and select the new parameter type.



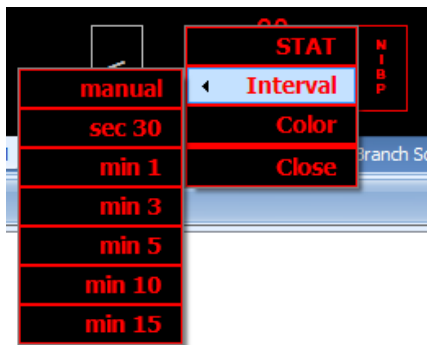
CHANGING VITAL SIGNS

Numerical parameters can be adjusted directly from the virtual monitor tab. Double-click the numerical parameter to open the floating control window. Adjust the parameter to the new value and submit the changes using the Apply NOW or trending options.



NONINVASIVE BLOOD PRESSURE

By default, the NIBP parameter does not update automatically. Click the NIBP menu and select “Stat” to refresh the reading. Alternatively, set a refresh interval to automate the stat process periodically.



Palettes

Use the Palette tab to sort, manage, and edit the palette items in the current profile. Each profile stores an independent library of palette items.

To modify the vital sign parameters programmed into a palette, select a palette and click the Edit button. After the changes are made using the Details tab, click the “Save as Palette” Item button. See the Tips on Palette Item and Scenario Creation section of the appendix for more information on customizing palettes.

Select a palette item from the list and click an “Apply” button to update the vital signs to the values stored in the palette item.

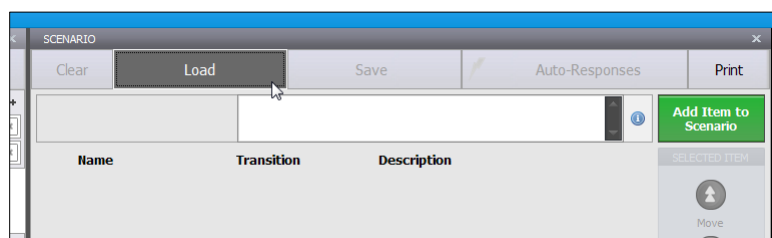


Scenarios

LINEAR SCENARIOS

GIGA includes several preprogrammed scenarios to simulate a variety of complications. All preprogrammed scenarios are included in the “Quick Start Profile”. Click File>Profile to switch to switch to a different profile without exiting the software.

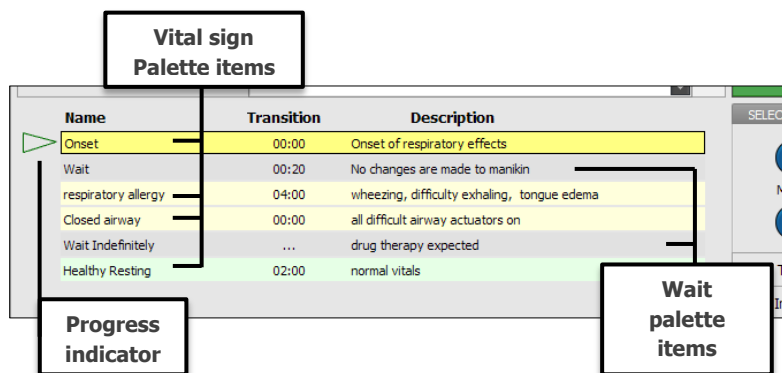
To use a preprogrammed scenario go to the Scenario tab and click “Load Scenario”.



The Load Scenario dialog box appears. Select a scenario and click on Load.

LINEAR SCENARIOS OVERVIEW

Scenarios automate changes to the patient’s condition to simulate an entire exercise without the need for manual input. A linear scenario is simply a playlist of vital signs palette items and wait palette items played back in succession.



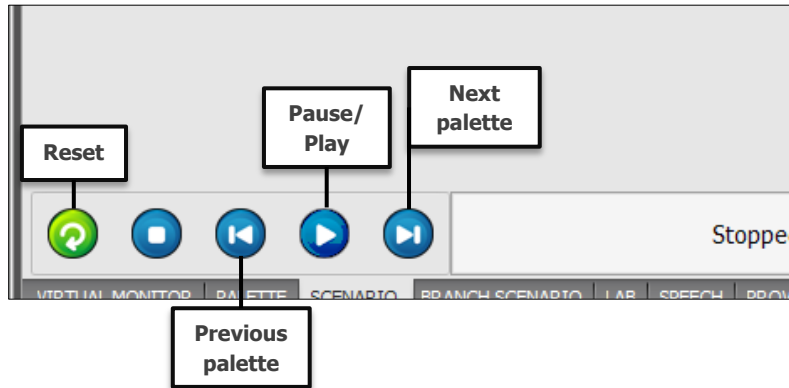
During the scenario, each vital signs palette updates the patient’s vital signs. The palette’s transition time trends the increase or decrease of numerical parameters (e.g. Heart rate, blood pressure) over seconds or minutes. In the figure below for example, the vital signs palette “Healthy Resting” is programmed with a transition time of 2 minutes. When the scenario reaches “Healthy Resting”, it will take 2 minutes for the vital signs to trend from the previous state to the values programmed within the palette.

Name	Transition	Description
Onset	00:00	Onset of respiratory effects
Wait	00:20	No changes are made to manikin
respiratory allergy	04:00	wheezing, difficulty exhaling, tongue edema
Closed airway	00:00	all difficult airway actuators on
Wait Indefinitely	...	drug therapy expected
Healthy Resting	02:00	normal vitals

Wait palettes do not update or change vital signs. Instead, wait palettes give the participant time to perform an action; this may be treatment in response to a complication or performing a standard assessment.

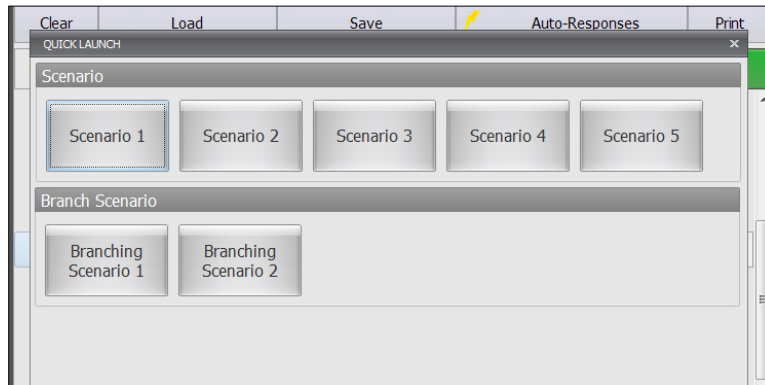
SCENARIO CONTROLS

Scenarios are controlled using the playback buttons at the bottom of the tab. Intuitively, the click play, stop, pause, or next as necessary during the scenario. Click next to proceed to the next palette from a “wait indefinitely” palette.



SCENARIO QUICK LAUNCH

Use the scenario Quick Launch tab to start a scenario with a single click. The Quick Launch tab displays all the scenarios saved in the active profile.



CREATING A NEW LINEAR SCENARIO

Build new scenarios to expand the number of exercises available in a training program. The general process of creating a new linear scenario is the following:

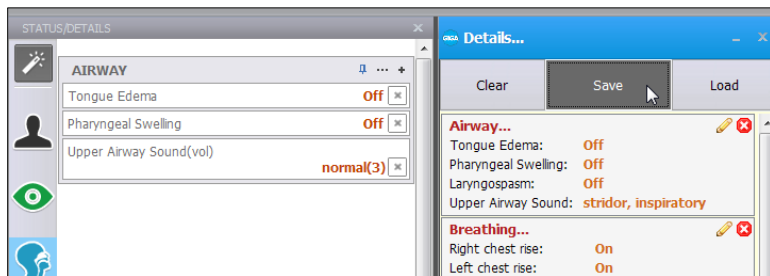
- Create a vital sign palette item for each state in the scenario
- Add the vital signs palettes and wait times to the scenario
- Play the scenario
- Modify and edit palettes
- Save the scenario

CREATING PALETTE ITEMS

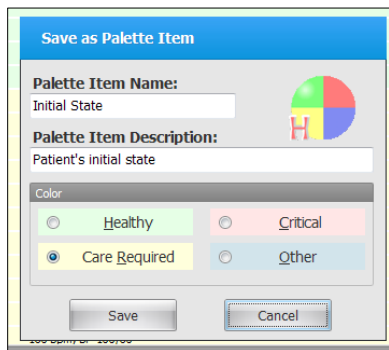
The first step is to create several vital sign palette items using the Details tab. Each palette item represents a physiological state during the scenario.

Program the first palette item to be used as the scenario's starting point. Set values for all the physiological parameters, sound types, and volumes. This ensures that when the scenario begins no vital signs from a previous state will inadvertently carry into the scenario exercise.

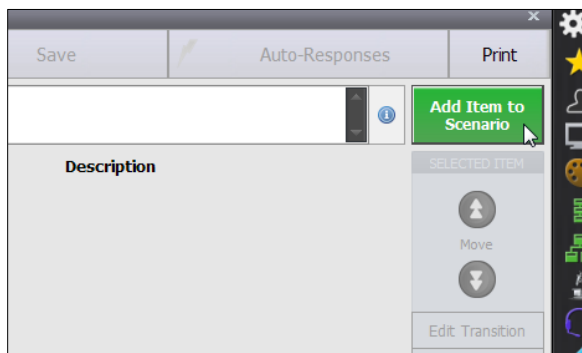
Using the list view controls, select the vital signs parameters for the starting physiological state in the scenario. Click the “Save as Palette Item” button to create the new palette.



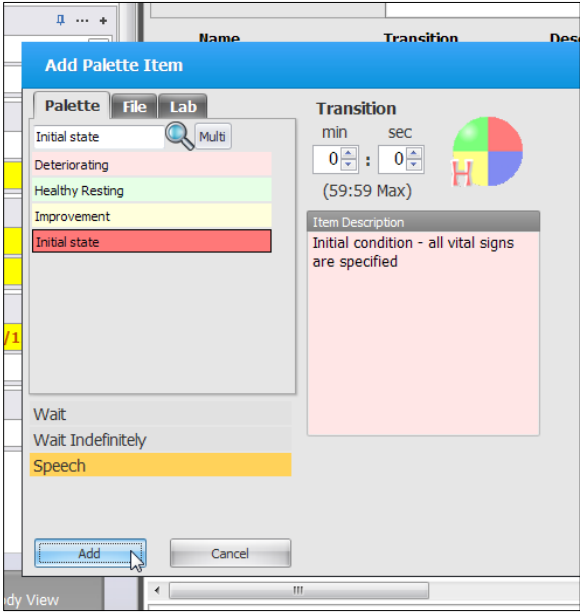
The “Save as Palette Item” dialog box is displayed. Type in the palette item name and a brief description; assign a color tag and click “Save”.



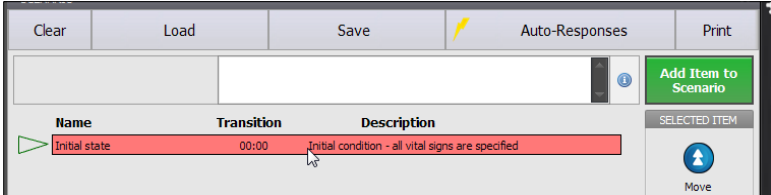
Create the next palette item with only those vital sign parameters that are relevant to the second stage in the patient’s condition. Repeat this process to create palettes for the third and final stage in the scenario. Remember to program only the values that require change. After all the individual vital sign palettes are created, go to the “Scenario” tab and click “Add to Scenario”.



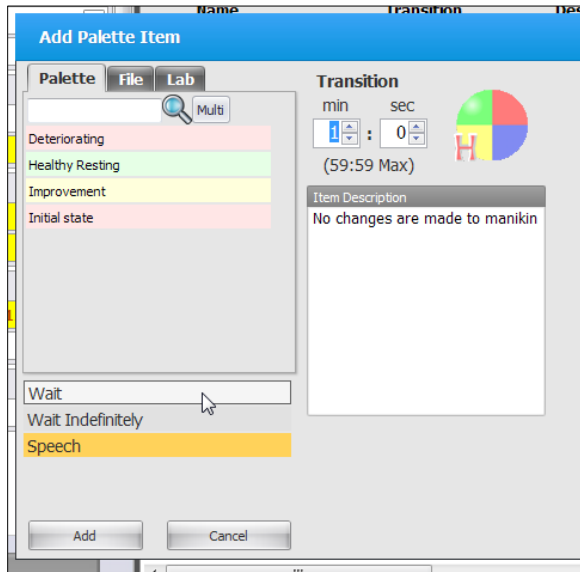
The Add Palette item menu displayed. Select the vital sign palette programmed to be first state in the scenario. Enter 0 min 0 sec for the transition time, so the initial vital signs are applied immediately. Click “Add” to add the palette to the scenario.



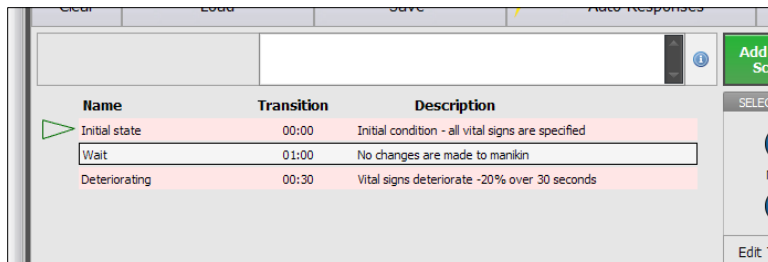
The first palette is now added. Click “Add Palette to Scenario” button again to add more vital sign palettes and wait palette items.



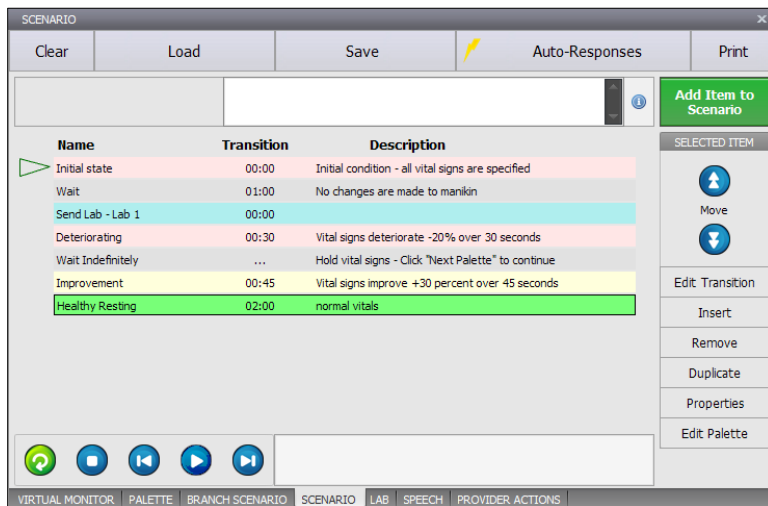
A “Wait” item maintains vital signs values steady for the transition time allotted. Insert a “wait” item to give the provider time to perform an action or an assessment. For example, auscultating blood pressure or gathering general information about the patient. Alternatively, add “Wait Indefinitely” to hold the vital signs until the “next item” button is clicked from the playback controls.



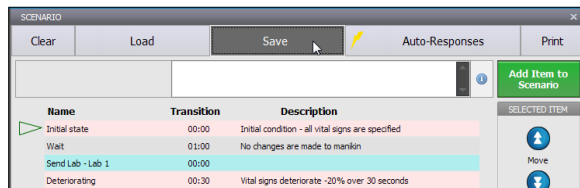
The wait palette item is now added.



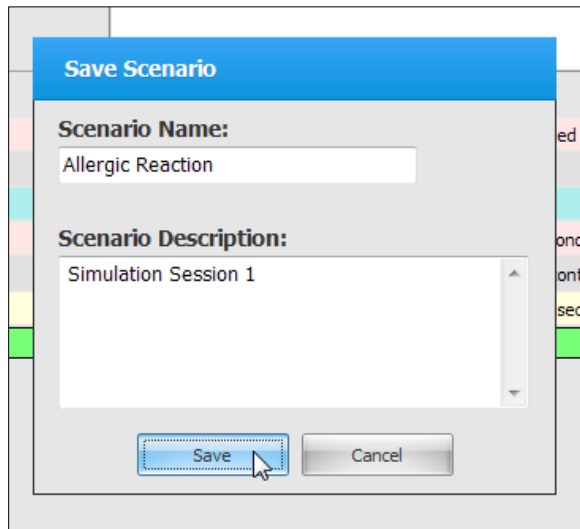
Add more palette items and then use the “Selected Item” menu to make any changes.



Click “Save Scenario” to store the scenario in the current profile for later use.



Type in a name and a description for the new scenario and click Save.



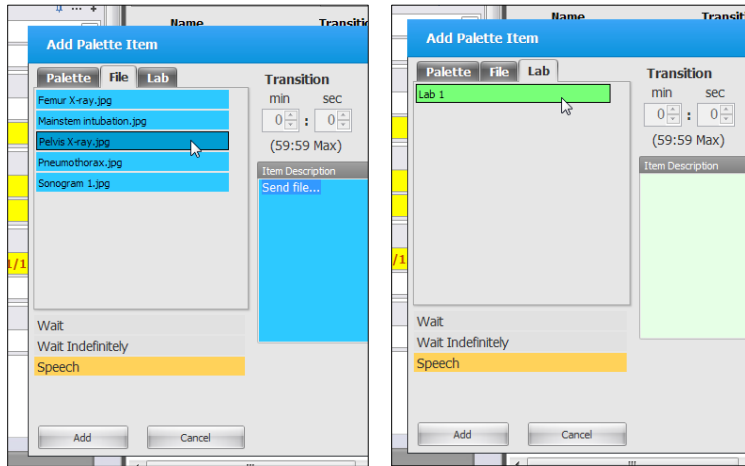
ADDITIONAL SCENARIO FEATURES

Incorporate the following features into a scenario for added realism.

- Auto responses –move onto the next palette item automatically when virtual electric therapy is detected
- File sharing and lab reports – Send lab reports to the virtual monitor computer
- Speech – add phrases or custom speech

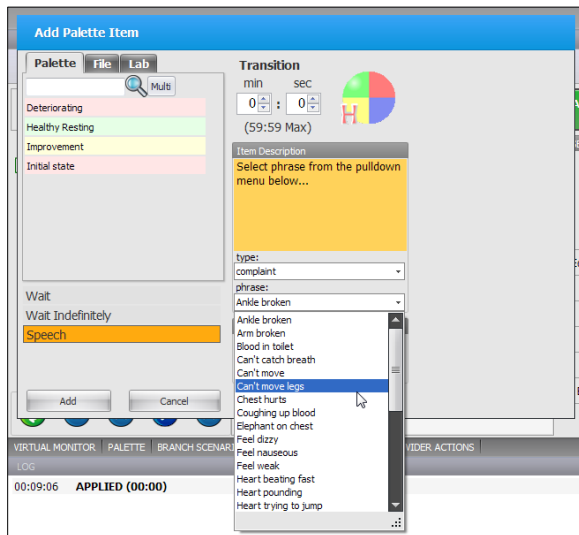
FILE SHARING AND LAB REPORTS

The scenario can also automate the distribution of shared files and labs. Click “Add to scenario”, and then use the “File” and “Lab” tabs to select from available documents. For more information making files available for file sharing, go to page 102. To create a new lab report, go to page 48.



SPEECH

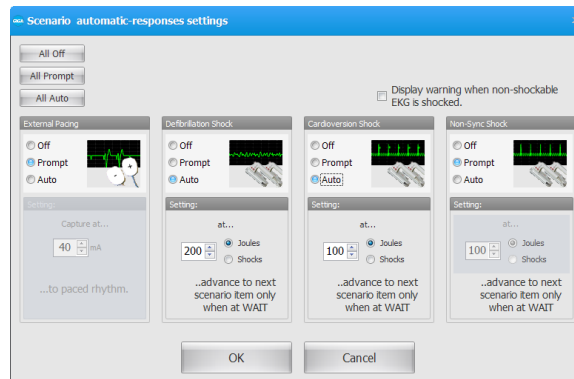
Add realism to a scenario by integrating automated speech phrases. Click the Add to scenario button and select Speech. Then, select the type of speech and phrase using the drop down menus.



AUTO RESPONSES

The scenario auto-response settings move the scenario to the next palette when electrical therapy is detected. Electrical therapy can be applied by the facilitator via Virtual Shock panel or by the care provider using real medical equipment if the simulator supports it.

Auto-responses advance to the next palette if the virtual shock is applied while a “wait indefinitely” palette is playing and the heart rhythm is “shockable”.

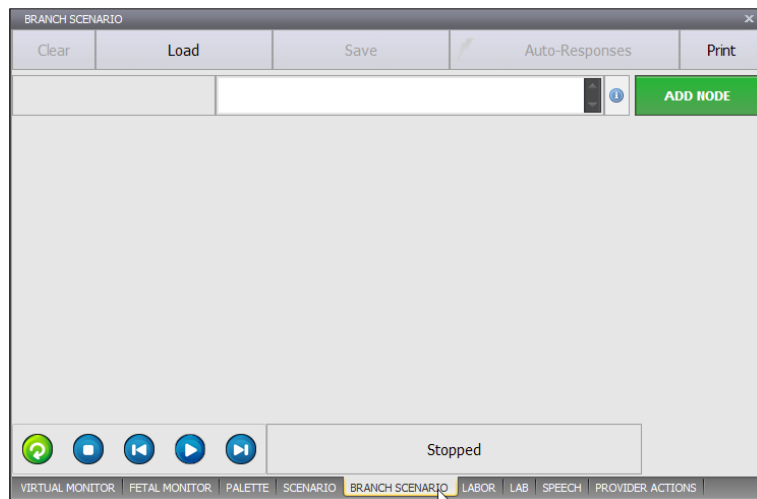


The three response options are defined below:

- Off - The scenario does not respond to the electric therapy.
- Prompt - The software detects the electrical therapy and prompts the user for approval before advancing to the next palette.
- Auto – Advances to the next palette automatically only if the electrical therapy meets the threshold specified

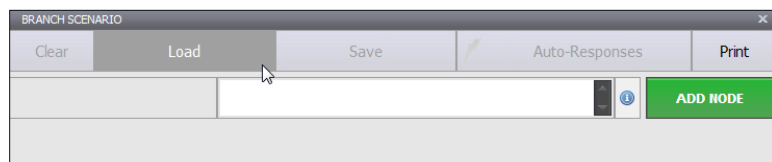
Branching Scenarios

Unlike linear scenarios, which move from one palette to the next, the trajectory of a branching scenario can change in response to the participant's actions. Click the "Branching scenario" tab to access the branching scenario window.



BRANCHING SCENARIO SCREEN

Use the panel buttons to clear, load, and save new scenarios, or to switch from branching to linear scenarios. Click "Load Scenario" to access the preprogrammed branched scenarios in the current profile.



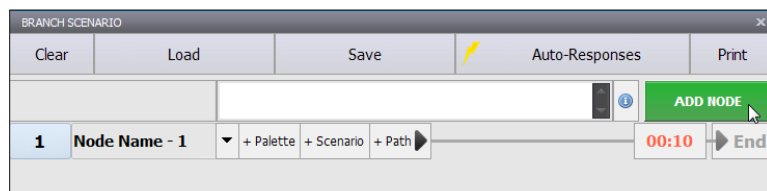
CREATING A NEW BRANCHING SCENARIO

The process of creating a new branching scenario is the following:

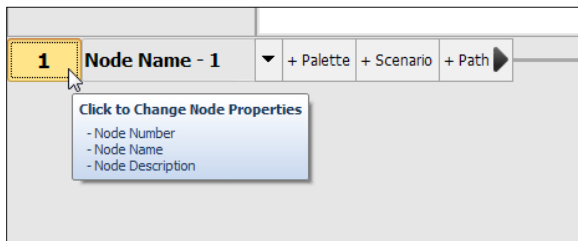
- Add nodes
- Add palettes or scenarios to each node
- Add paths to nodes that require provider action
- Create key events to alter the progress and trajectory of the nodes within the scenario

ADDING NODES

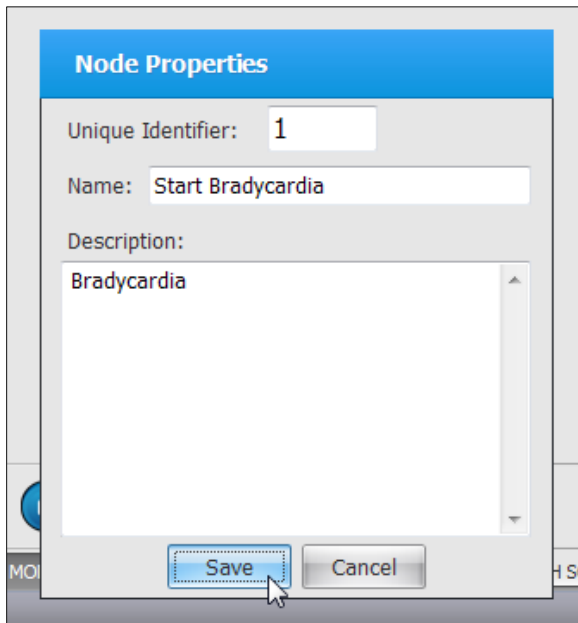
A branching scenario consists of several "Nodes". Each node is preconfigured to run a normal scenario or a series of palettes simulating a specific condition or effect. Click the "Add node" button to create a new node for the first set of vital signs.



Click the node's identifier number to edit the node properties.

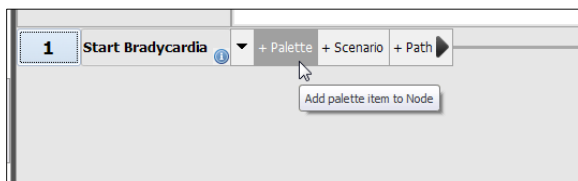


Enter a name for the node and description and then click **Save**.



ADDING PALETTES OR SCENARIOS TO A NODE

Click "Add Item" to add palette items or "Add Scenario" to add full scenarios to the node.



Add more nodes each with palette items to simulate every stage in the scenario. In this example, several nodes simulate the effects of medications that maybe administered to the patient by the provider. The first two nodes simulate the complication [1] Start Bradycardia, [2] Deteriorate. The following nodes: [3] Interventions, [4] Atropine, [5] Epinephrine, [6] Dopamine and [7] Pace are activated only when the provider administers the applicable medication or electrical therapy. Each node is programmed with palettes that simulate the effect described.

The screenshot shows a software interface for a medical scenario titled "Bradycardia". The interface includes a menu bar with "Clear", "Load", "Save", and "Auto-Response". Below the menu bar, there is a title bar "Bradycardia" and a note: "Note: for this scenario to function as intended the". A green "ADD NODE" button is visible in the top right corner. The main area displays a sequence of nodes, each with a time limit and a "Go To" button. The nodes are:

- 1 Start Bradycardia** (00:01): Includes palette items "Bradycardia" (00:00, RR 10, HR 45, 2nd deg. AVB (Type II)) and "Speech1" (00:01, complaint - Feel dizzy).
- 2 Deteriorate** (00:01): Includes palette items "Wait" (02:00, No changes are made to manikin), "Speech1" (00:01, confusion - What happened), and "Cardio Drop" (01:00, HR -15%, BP -10%, OSat -5%).
- 3 Interventions** (00:10): Includes palette item "Wait Indefinitely" (Wait for intervention).
- 4 Atropine** (00:01): Includes palette item "Atropine" (01:00, HR +10%, BP +7%).
- 5 Epinephrine** (00:01): Includes palette item "Epi infusion" (01:00, HR +5%, BP +8%).

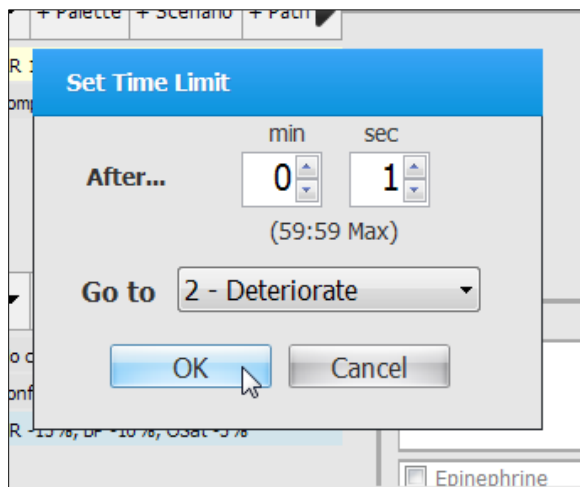
The "Go To" button for node 3 is highlighted with a red box.

ADDING PATHS

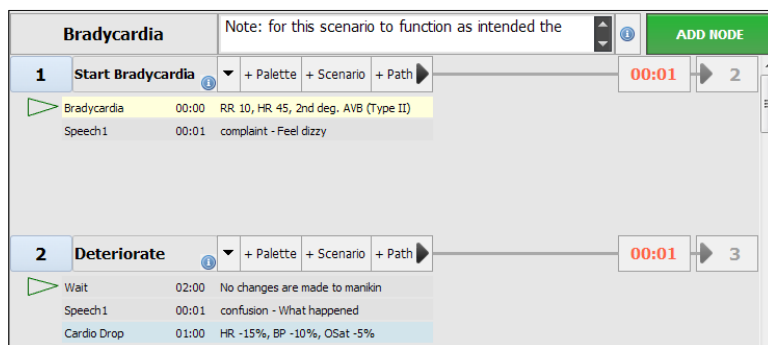
A path refers to the trajectory from one node to another after the last palette in the node expires. The scenario will move on to the node indicated by the arrow. Click on the "Time Limit" icon to modify the "Go To" point for the default path.

The close-up screenshot shows a node's "Go To" button. The button is labeled "00:10" and "End". A mouse cursor is hovering over the "00:10" time limit, and a tooltip is visible. The tooltip contains the text "00:10" and "End".

In this example, the first node must move to “Node 2 - Deteriorate” after the time limit expires. Click “OK” to save the changes.

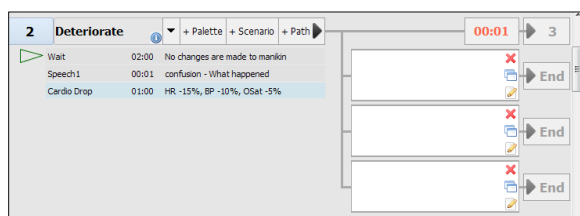


Node 1 is now configured to proceed to Node 2 as indicated by the arrow.

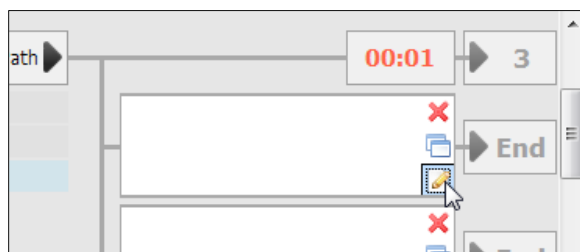


KEY EVENTS

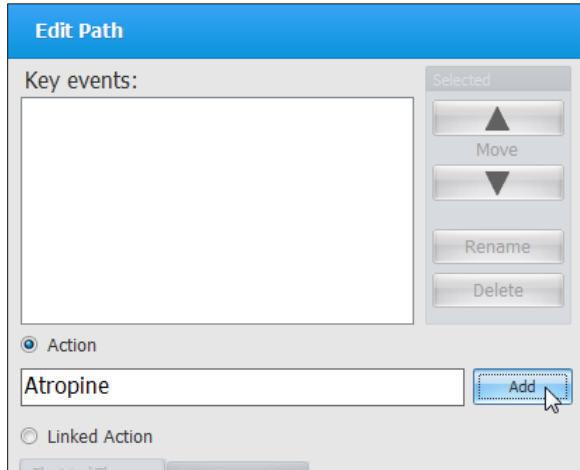
Key events activate alternate paths in a node. The alternate paths are used to change the trajectory of the scenario depending the participant’s actions. To add a key event to a node, first add the additional paths.



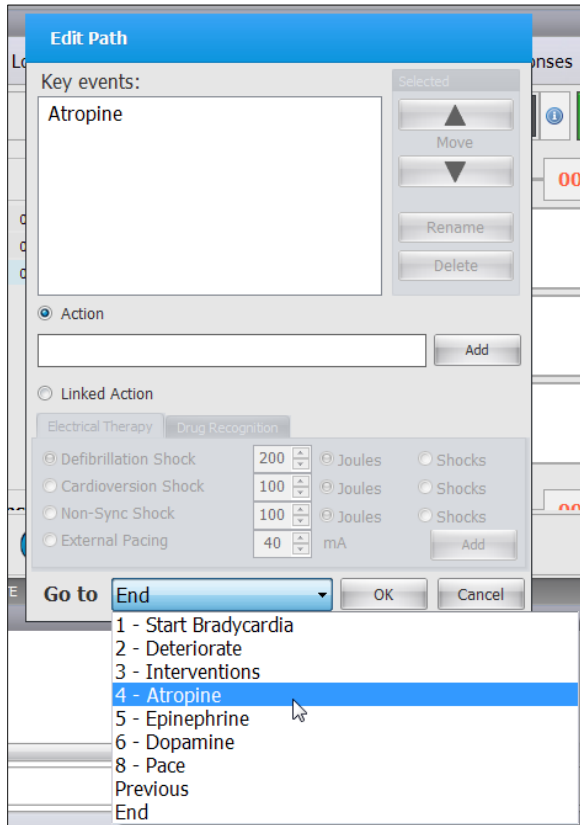
Click the “Edit path” icon to program key events for the node.



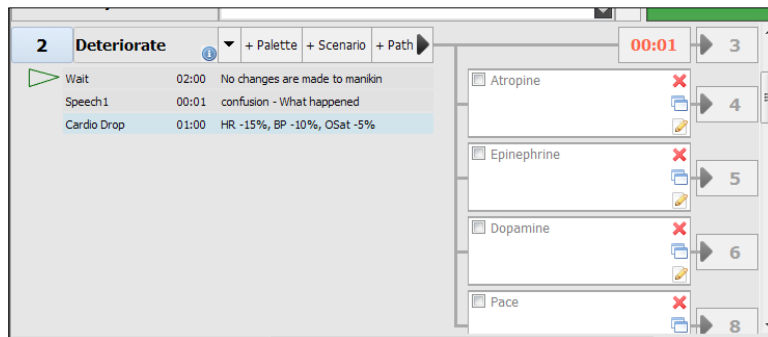
A key event is the action expected by the participant. Type a name for the action and then click “Add”.



After the action is added to the Key Events list, assign the node that this action will move the scenario to using the “Go to” menu. Click “OK” to save changes.



In the figure below, node 2 is configured with four alternate paths. Once the provider performs any one of the actions listed as key events, checkmark the key event to activate the alternate path.

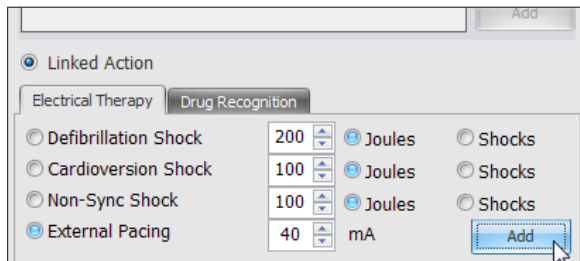


SAMPLE BRANCH SCENARIO DIAGRAM

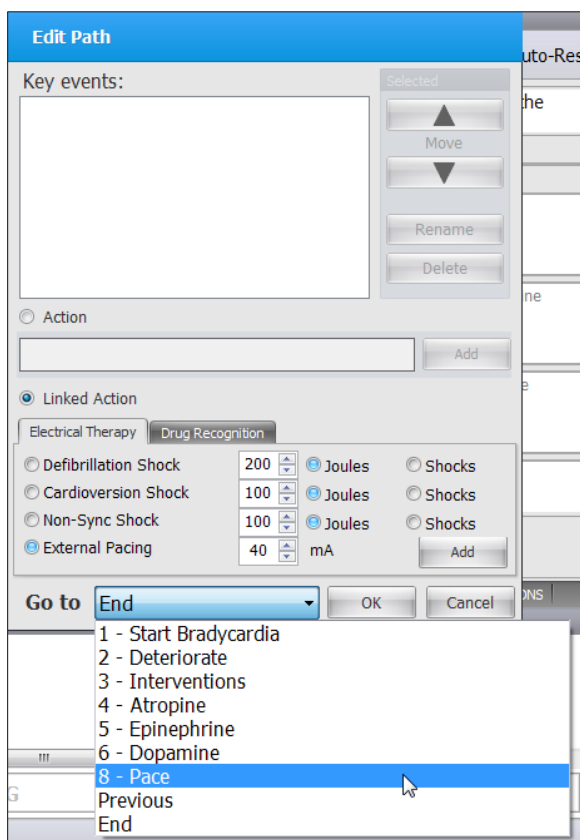
Node	Node Name	Description		
1	Start bradycardia	Node vital signs palettes simulate bradycardia. Go to node 2.		
2	Deteriorate	Vital signs palettes deteriorate the patient's condition by -15%. Care provider has 4 options. Each option (key event) moves the scenario to the node specified. If no action is taken, the scenario will move to node 3 at the end of the time limit.		
		Key event		
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">Atropine Node 4</td> <td style="width: 25%; text-align: center;">Epinephrine Node 5</td> <td style="width: 25%; text-align: center;">Dopamine Node 6</td> <td style="width: 25%; text-align: center;">Pace Node 7</td> </tr> </table>	Atropine Node 4	Epinephrine Node 5
Atropine Node 4	Epinephrine Node 5	Dopamine Node 6	Pace Node 7	
3	Intervention	Wait indefinitely, vital signs are on hold. Provider is to intervene again.		
		Key event		
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">Atropine Node 4</td> <td style="width: 25%; text-align: center;">Epinephrine Node 5</td> <td style="width: 25%; text-align: center;">Dopamine Node 6</td> <td style="width: 25%; text-align: center;">Pace Node 7</td> </tr> </table>	Atropine Node 4	Epinephrine Node 5
Atropine Node 4	Epinephrine Node 5	Dopamine Node 6	Pace Node 7	
4	Atropine	Node vital signs palettes simulate the response to atropine. Time limit: Go to node 3 after 1 minute.		
5	Epinephrine	Node vital signs palettes simulate the response to epinephrine. Time limit: Go to node 3 after 1 minute.		
6	Dopamine	Node vital signs palettes simulate the response to dopamine. Time limit: Go to node 3 after 1 minute.		
7	Pace	Vital signs simulate the effect of pacing. Scenario ends.		

LINKED ACTIONS

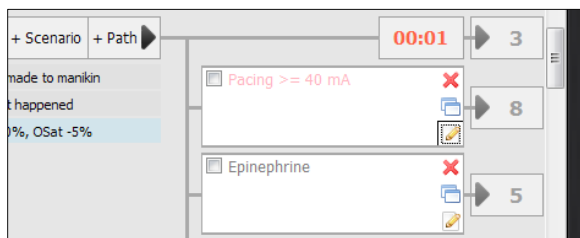
A “Linked Action - key event” triggers an alternate path when electrical therapy is detected. Click the Linked Action radio button and select the available actions. Then, set the electrical therapy thresholds or number of shocks require to trigger the key event. Click “add” to create the key event.



Set the “Go to node” from the drop down and click OK to save the changes.



The key event is now programmed to move the scenario to node 8 if pacing is detected.



The “Linked Action” model medication tab is exclusive to the automatic mode. Program the medication linked action to trigger an alternate path when the system detects that the specific medication has been administered to the simulator.

Linked Action

Electrical Therapy Drug Recognition

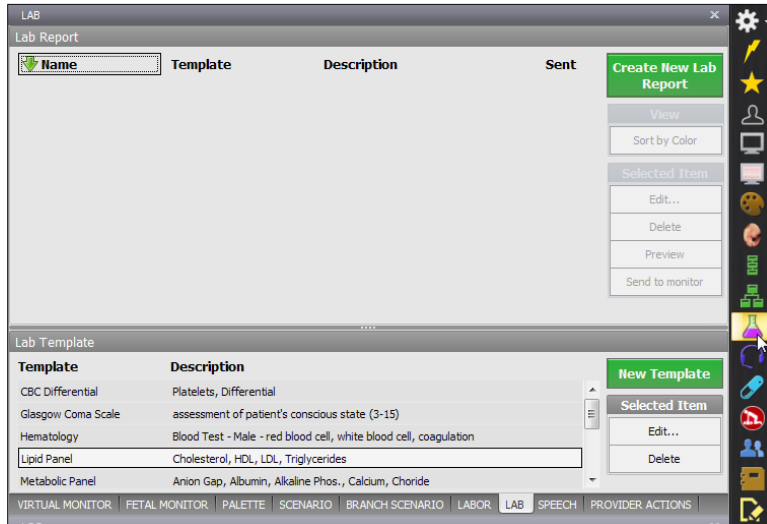
Medication: Atropine Dose threshold (mg) 4

Add

Go to 4 - Atropine OK Cancel

Labs

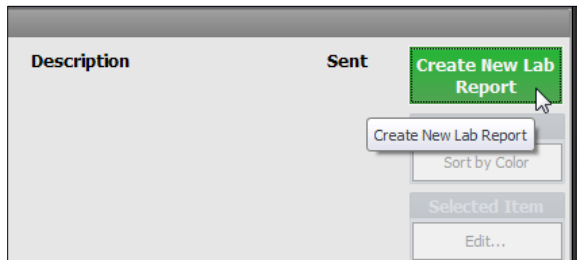
Use the Lab tab to create mock laboratory tests results to aid the participants during simulation. In addition, create new laboratory templates to supplement different types of scenarios. Once a laboratory report is created, send the file to the virtual monitor screen for the provider access during the exercise.



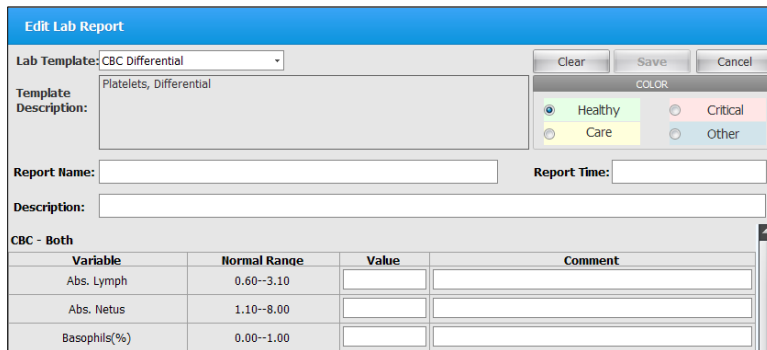
PREPARING A LAB REPORT

To create a new lab report with mock test results:

1. Click "Create a New Lab Report" on the right panel.



The "Edit Lab Report" window is displayed.



- Select a "Lab Template" from the drop down menu.

The screenshot shows the 'Edit Lab Report' window. The 'Lab Template' dropdown menu is open, displaying a list of templates: CBC Differential, Glasgow Coma Scale, Hematology, Lipid Panel (highlighted), Metabolic Panel, Neonate Blood test, and OB Blood test. The 'Report Name' and 'Description' fields are visible but empty.

- Enter a report name, a report time, and a description. In addition, select a color tag for the lab report on the right panel. Color tags aid the sorting of lab reports on the report list window.

The screenshot shows the 'Edit Lab Report' window with 'Lipid Panel' selected in the dropdown. The 'Template Description' field contains 'Cholesterol, HDL, LDL, Triglycerides'. The 'Report Name' field contains 'Lab 01' and the 'Description' field contains 'Above normal range - Cholesterol, LDL Cholesterol'. Below the form is a table for 'Lipid Panel - Female'.

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	35.00--85.00	85	
Cholesterol/HDL(Ratio)	0.00--4.40	5.1	Care required

- Enter the test results in the "Value" column. Include any comments associated with the test performed.

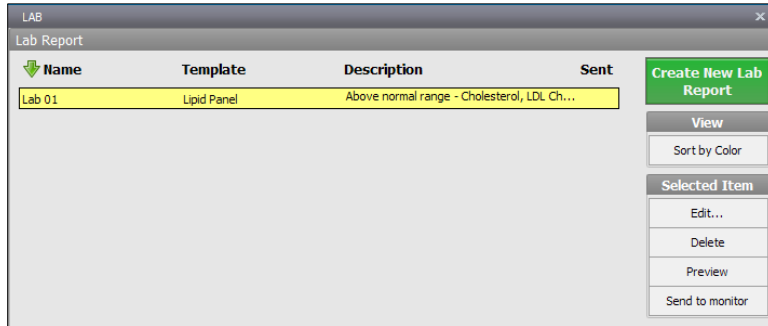
The screenshot shows the 'Lipid Panel - Female' table with test results entered. The 'Value' column contains '85' for HDL Cholesterol and '5.1' for Cholesterol/HDL Ratio, with a comment 'Care required' in the 'Comment' column.

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	35.00--85.00	85	
Cholesterol/HDL(Ratio)	0.00--4.40	5.1	Care required

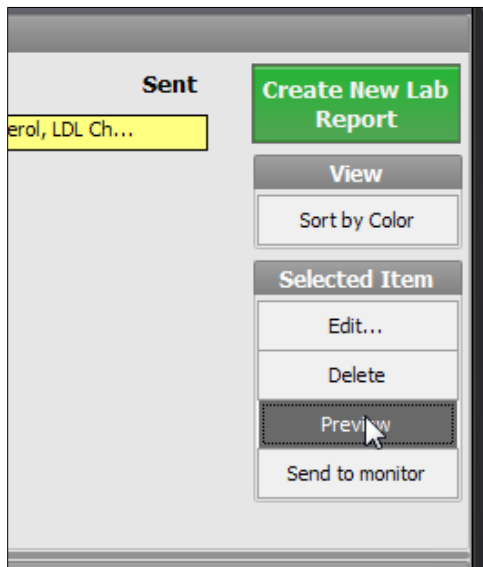
- Click "Save" to create the lab report.

The screenshot shows the 'Save' button highlighted with a mouse cursor. Below it is a 'COLOR' selection area with four radio buttons: 'Healthy' (green), 'Care' (yellow, selected), 'Critical' (red), and 'Other' (blue). Below the color selection is a 'Report Time:' field.

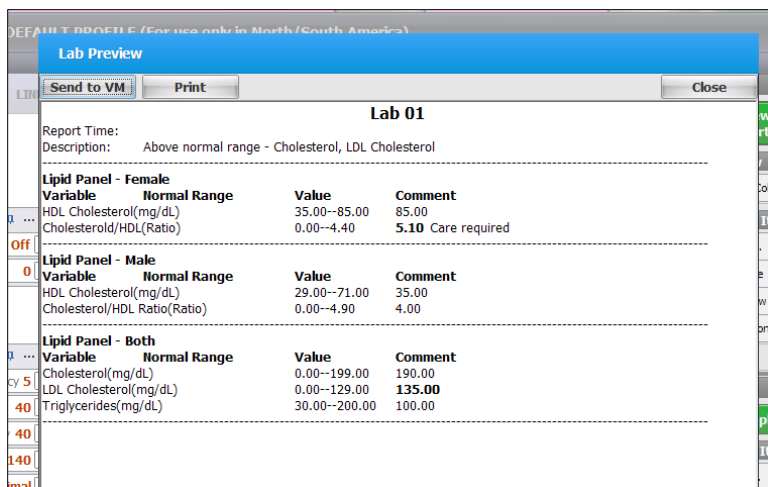
The newly created lab report is now listed in the “Lab Reports” section. Sort lab reports by name, template, description, or color tag.



6. Click “Preview” to review the final lab report.



The preview window displays the test results how the provider will see them on the virtual monitor screen. If the computer is connected to a printer, click PRINT to create a hard copy.

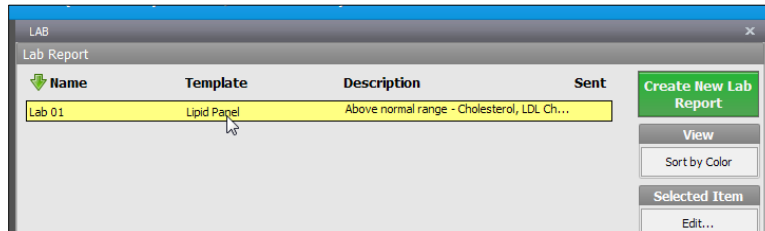


SEND TO MONITOR

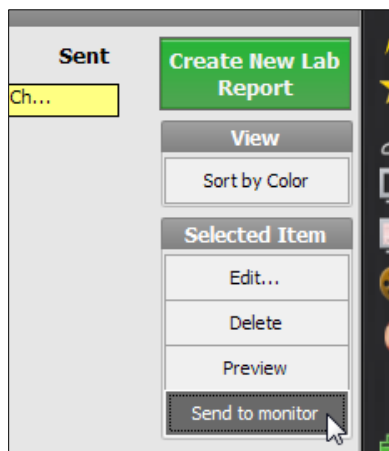
Send the completed lab report to the virtual monitor screen to assist the care provider.

To transfer the lab report to the virtual monitor screen:

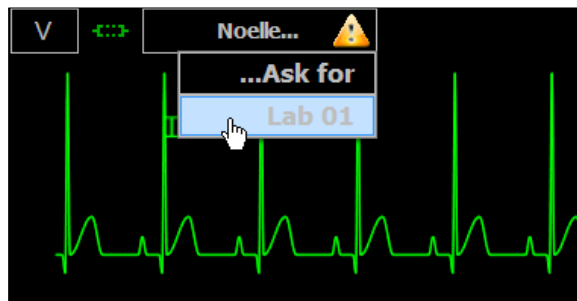
1. First, select the report from the lab reports list.



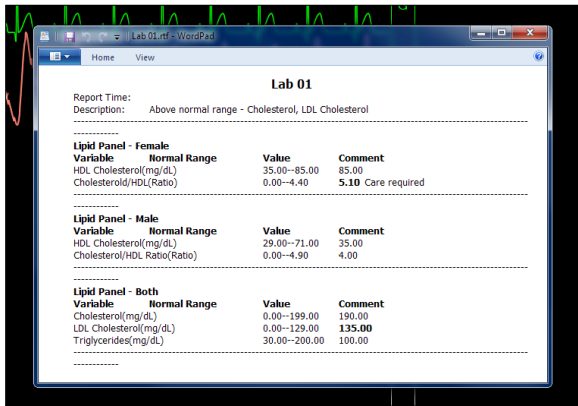
2. Click "Send to Monitor" button to transfer the lab report to the virtual monitor.



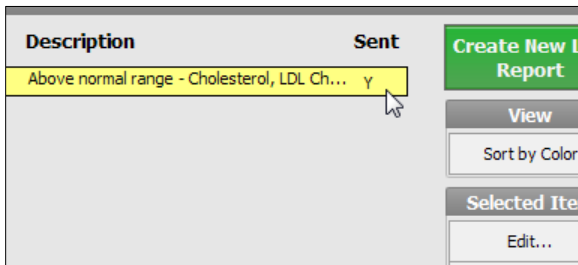
3. An exclamation icon notifies the provider a file is ready for access on the Gaumard Monitors. Instruct the participant to click the patient menu drop down and select the lab report.



- The lab report opens using the system's default application.



- The letter Y represents a shared document. Click the "Stop Sharing button" on the right panel to remove the lab report items from the Gaumard Monitors menu.



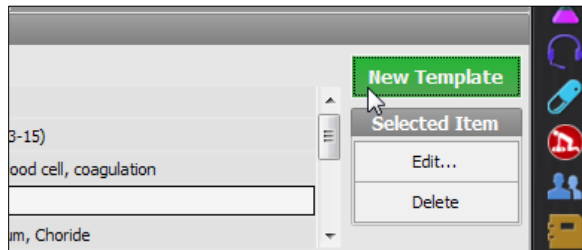
An editable copy of the lab report is stored inside the Gaumard_UI folder on the computer's home screen. Go to page 102 for information on how to access other files from the Gaumard Monitor screen.

CREATING A LAB TEMPLATE

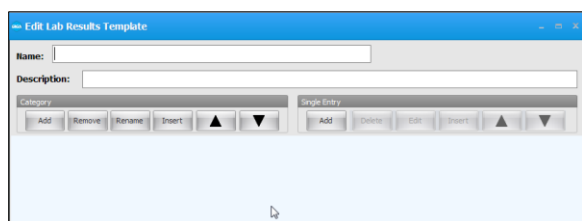
Build new lab templates to supplement new scenarios.

To create a new laboratory test template:

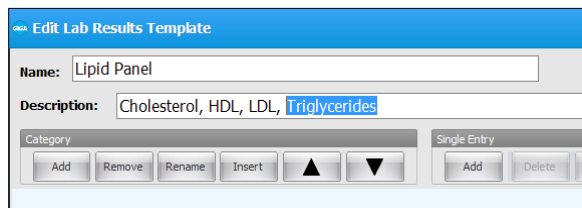
1. Navigate to the bottom of the tab and click “New Template”.



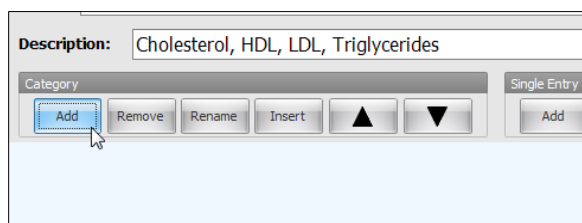
The “Edit Lab Results Template” window is displayed.



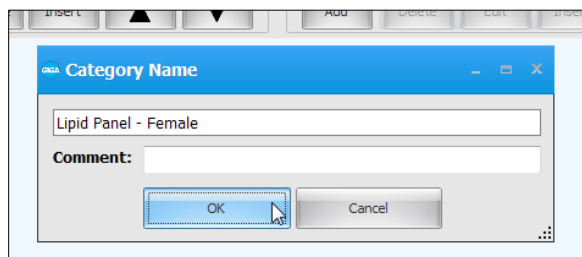
2. Enter a name for the new template followed by a description.



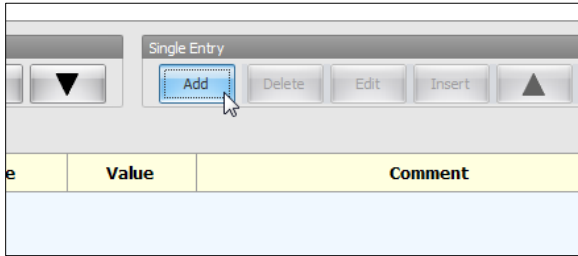
3. Create categories to group a series of tests in a lab report. Click “Add” to create a new category.



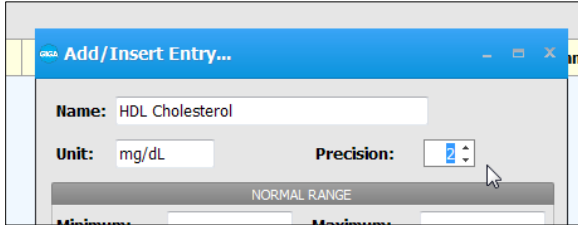
4. Enter the name of the category and click “OK”.



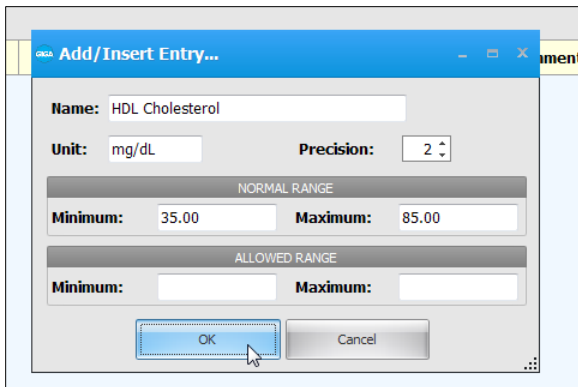
5. Click “add” on the “Single Entry” menu to create a new test under the current category.



6. Enter the name of the test, the unit, and decimal precision.



7. Enter a “Normal Range” the provider to reference. The normal range is visible on the lab report. The “Allowed Range” restricts the minimum and maximum value that can be entered a test result. Click “OK” to add the new test.



- Repeat the process to add more tests and categories. Click “Save” to create the new lab template.

Edit Lab Results Template

Name:

Description:

Category:

Single Entry:

Lipid Panel - Female

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	35.00--85.00	<input type="text"/>	<input type="text"/>
Cholesterol/HDL(Ratio)	0.00--4.40	<input type="text"/>	<input type="text"/>

Lipid Panel - Male

Variable	Normal Range	Value	Comment
HDL Cholesterol(mg/dL)	29.00--71.00	<input type="text"/>	<input type="text"/>
Cholesterol/HDL Ratio(Ratio)	0.00--4.90	<input type="text"/>	<input type="text"/>

Lipid Panel - Both

Variable	Normal Range	Value	Comment
Cholesterol(mg/dL)	0.00--199.00	<input type="text"/>	<input type="text"/>
LDL Cholesterol(mg/dL)	0.00--129.00	<input type="text"/>	<input type="text"/>
Triglycerides(mg/dL)	30.00--200.00	<input type="text"/>	<input type="text"/>

*Allowed value range is displayed in Value column. It won't be visible when entering data

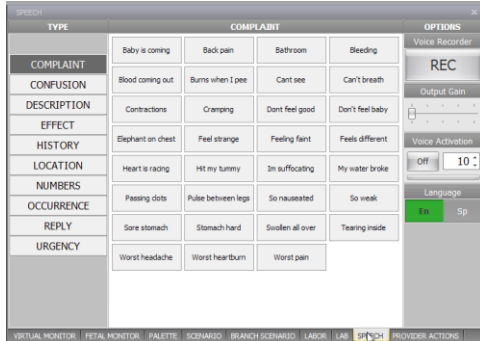
The new template is listed on the “Lab Template” section at the bottom of the Lab tab. Use the buttons on the left panel to edit or delete lab templates.

Template	Description
CBC Differential	Platelets, Differential
Glasgow Coma Scale	assessment of patient's conscious state (3-15)
Hematology	Blood Test - Male - red blood cell, white blood cell, coagulation
Lipid Panel	Cholesterol, HDL, LDL, Triglycerides
Metabolic Panel	Anion Gap, Albumin, Alkaline Phos., Calcium, Chloride

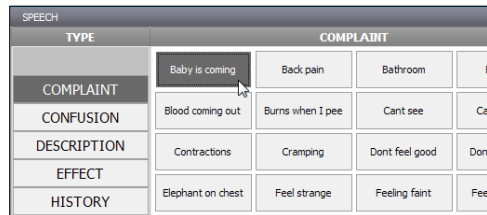
Speech

PRERECORDED SOUNDS

Select the Speech tab to command the simulator to speak aloud. The collection of speech and other sounds covers a wide range scenarios. In addition, use the streaming voice option to speak as the simulator's voice and listen to the student responses.



Click the phrase button to have the simulator speak the phrase aloud. Alternatively, program the phrases into a scenario to have the simulator speak automatically (page 56).



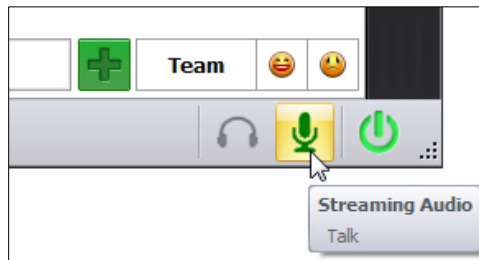
STREAMING AUDIO

Use the streaming voice to speak as the simulator's voice and engage the provider in a realistic conversation. In addition, record and save custom phrases to be played back during scenarios automatically.

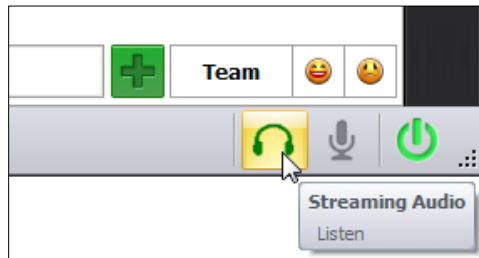
Ensure that the headset and microphone is connected to the PC before starting the GIGA software. The headset minimizes echo and environmental noise to improve audio quality.



Click the "talk" icon and speak in to the headset to talk as the simulator's voice.

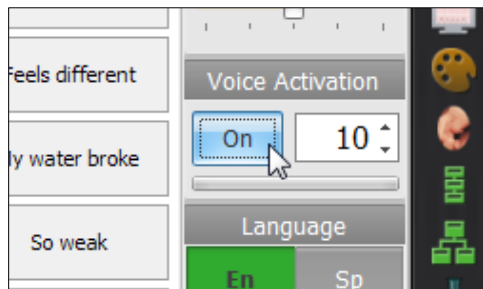


To listen to the provider's response, click "Listen".



VOICE ACTIVATION

Enable the “Voice Activation” feature to switch to the talk mode when voice input is detected automatically. Adjust the mic threshold to set the voice activation sensitivity. The higher the threshold, the less sensitive the microphone is; and vice versa. For instance, if the threshold is set to high, the voice input volume must be high to trigger the voice activation.



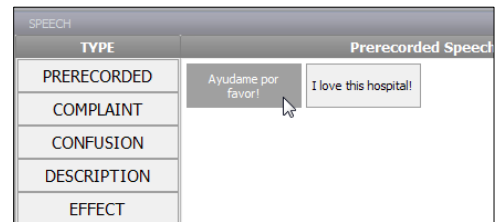
VOICE CLARITY

Voice clarity can be affected by several factors. To improve audio for the listen and talk options please review the following information.

- Connect the headset to the computer before activating the Gaumard control software
- Connect to the simulator using the strongest channel. Assign separate channels to each simulator if working with multiple simulators at a time.
- Adjust the physical mic control attached to the headset cable.
- Adjust the streaming voice “Output Gain” To raise the output gain in increments, tap and hold the control, then slide to the desired level. Higher gain levels increase the talk volume but degrade the audio quality.
- Fine-tune the Windows® microphone settings.

PRERECORDED SPEECH

Create a library of custom recordings to play back as the simulator’s voice using the “Prerecorded Speech” feature.



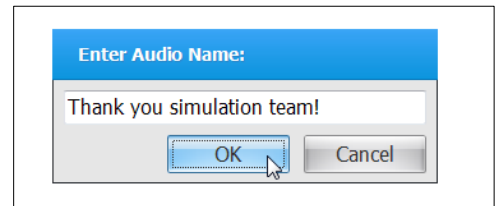
VOICE RECORDER

To record a new custom phrase:

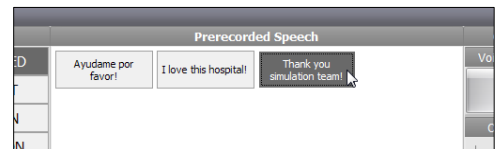
1. Click the “Rec” button and speak into the microphone.



2. Press “Stop” to finish recording.
3. Enter a name and click “OK.”



4. The new phrase is listed under the “Prerecorded Speech” menu.



Medication

The Medication tab is exclusive to the automatic operating mode. Use the medication controls to simulate the physiological effects and reactions of medications administered to the patient model. To simulate the effects of a medication, the GIGA software processes the drug's properties, dosage, and interactions, and then adjusts the patient vital signs accordingly.

The Meds Profile includes a library of preprogrammed drugs. The built in drug editor allows facilitators to stay current with new medications or make changes to the properties of the existing drugs. All of the preprogrammed drugs included in the Med Profile library are found in the 2008 Handbook of Emergency Cardiovascular Care published by the American Heart Association.

MEDICATION

Drug Alteplase (Activase, tPA) **Dose** **Units** mg **Route** IV Infusion **Rate** $\frac{\text{mg}}{\text{min}}$ **Start**

Drug Properties

Description: **Half Life:** 00:25:00 **Peak Time:** 00:08:00 **EC50:** 0.031mg/dl
 Manages acute coronary syndrome and reduces the incidence of congestive heart failure. It can also be used to treat massive **Standard Dose:** Alteplase-SD; 40mg
Over Dose: Alteplase-OD; 150mg

Stop Infusion **Remove from list** **Change Dose and/or Rate** **Rate:** 1 **Manage Drug List**

Fluids & Gas

Saline Volume: ml Rate: ml/min **Start IV**

Oxygen (Cannula)Concentration: % Rate: L/min **Start O2**

VIRTUAL ... FETAL M... PALETTE SCENARIO BRANCH ... LABOR LAB SPEECH MEDICATI... PROVIDE...

ADMINISTERING MEDICATIONS

Follow this guide to administer a medication directly from the medication tab. Alternatively, go to page 126 for information on how to administer medications using the drug recognition arm and the tagged syringes.

To administer a medication from the Medication tab:

1. Select the medication from the Drug drop down menu.

Drug	Dose	Units	Route
Calcium Gluconate			
Captopril (Capoten)			
Carboprost (hemabate)			
Clopidogrel (Plavix)			
Dexamethasone (Decadron)			
Diazepam (Valium)			
Digoxin (Lanoxin, Digitek)			
Digoxin ImmuneFab (Digibind)			
Diltiazem (Cardizem)			
Dinoprostone (Prostaglandin E2, PGE)			
Dobutamine (Dobutrex)			
Dopamine (Intropin)			
Enalapril (Enalaprilat)			
Enalapril (Vasotec)			
Ephedrine			
Epinephrine (Primatene, Adrenalin)			
Eptifibatide (Integrilin)			
Esmolol (Brevibloc)			
Flumazenil (Romazicon)			
Furosemide (Lasix)			
Glucagon (Glucagen)			
Heparin LMW (Enoxaparin, Lovenox)			
Heparin UFH			
Hydralazine (Apresoline)			

A brief description is displayed at the top of the window. The half-life, peak time and drug concentration values are listed in addition to the standard and over dose dosage.

Drug	Dose	Units	Route	Rate
Furosemide (Lasix)		mg	IV Push	

Drug Properties

Description: Diuretic drug used to treat hypertension. **Half Life:** 00:30:00 **Peak Time:** 00:45:00 **EC50:** 2.64mg/dl

Standard Dose: Furosemide-SD; 40mg
Over Dose: Furosemide-OD; 120mg

2. Enter the dose, units, route and rate (if applicable), and click “Administer”.

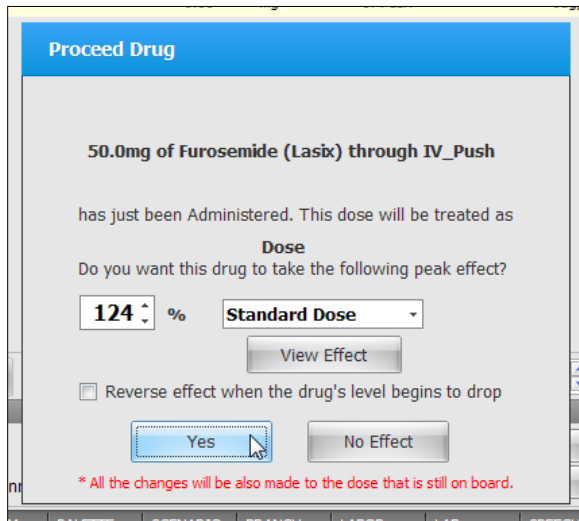
Drug	Dose	Units	Route	Rate
Furosemide (Lasix)	50	mg	IV Push	

Drug Properties

Description: Diuretic drug used to treat hypertension. **Half Life:** 00:30:00 **Peak Time:** 00:45:00 **EC50:** 2.64mg/dl

Standard Dose: Furosemide-SD; 40mg
Over Dose: Furosemide-OD; 120mg

- The "Proceed Drug" window prompts to confirm the dosage effects before applying them. Adjust the peak effect percentage and/or the dosage effect, and then click "Yes" to apply the effects

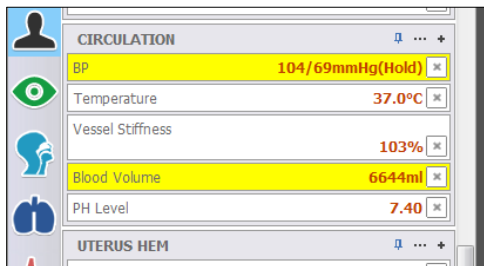


To turn off the Proceed Drug prompt, click Setup>Auto Responses and change the Drug Model Effect settings to "Auto".

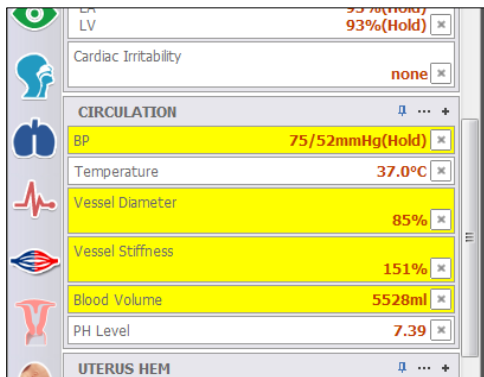
The administered drug panel displays information on dosage rate, does administered, and total time of administration.

Drug	Dose	Units	Route	Rate	
Furosemide (Lasix)	0	mg	IV Push	5.01ug/kg(1.04%sed)	00:00:50

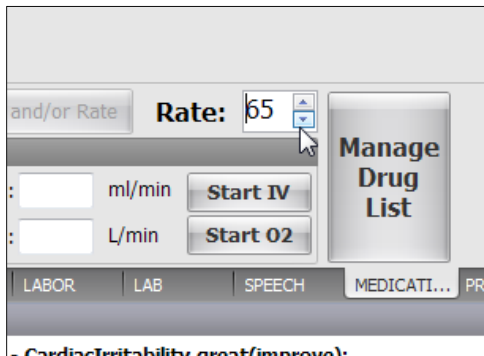
The Auto mode adjusts the patient's vital signs to simulate the effects of the drug automatically.



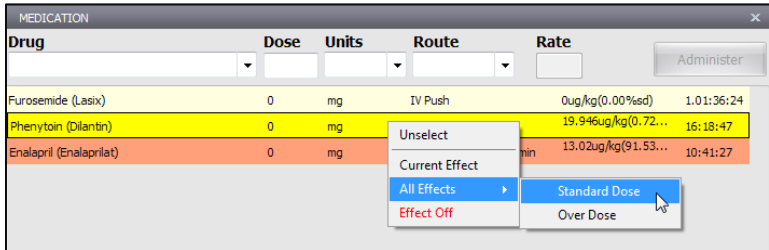
The blood pressure continues to decrease in response to the medication's properties.



4. Increase the "Rate" factor to speed up the effect of a medication on the patient model.



5. Right click on the drug entry to access additional options.

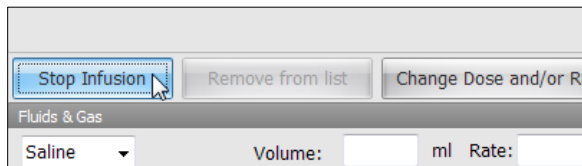


Select from the following options.

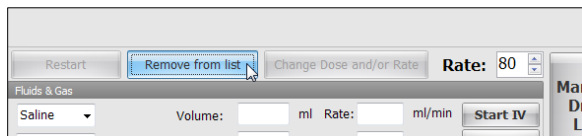
- **Unselect** - Unselect a highlighted drug
- **Current Effects** - View the effect on the patient's vital signs
- **All effects** - View all the available programmed drug effects for this medication
- **Drug effect toggle** - Turn the drug effects on the patient model on or off

REMOVING A MEDICATION

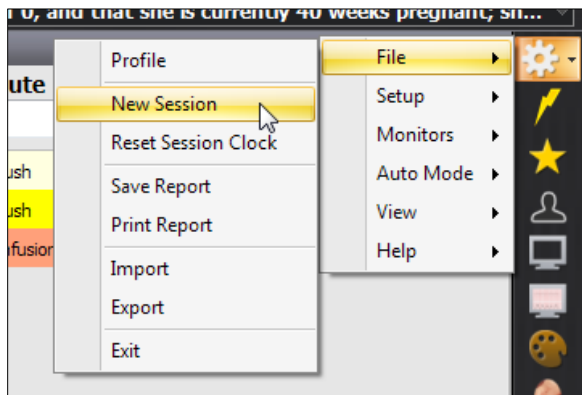
Drugs cannot be removed from the list during the administration process with the exception of IV infusions. To stop an IV infusion before it is finished, highlight the medication from the list, and click stop.



After the dose administration is complete, select the drug and click “Remove from list”.

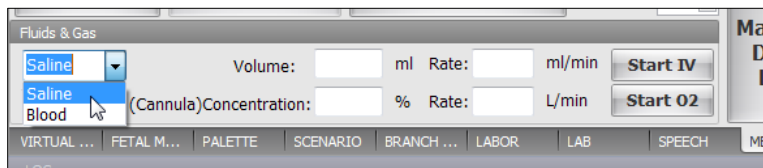


To remove all the medications from the list and reset the effects on the patient model, click “File > New Session”.

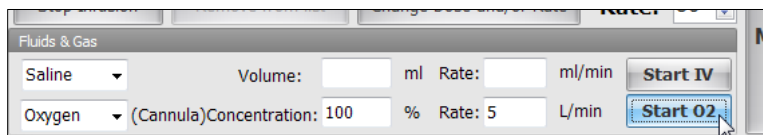


FLUID & GAS

The automatic mode can process the administration of gas and/or fluids to the patient model.



Select from saline, blood, or oxygen and the volume/concentration and rate. Click on “Start” to administer.

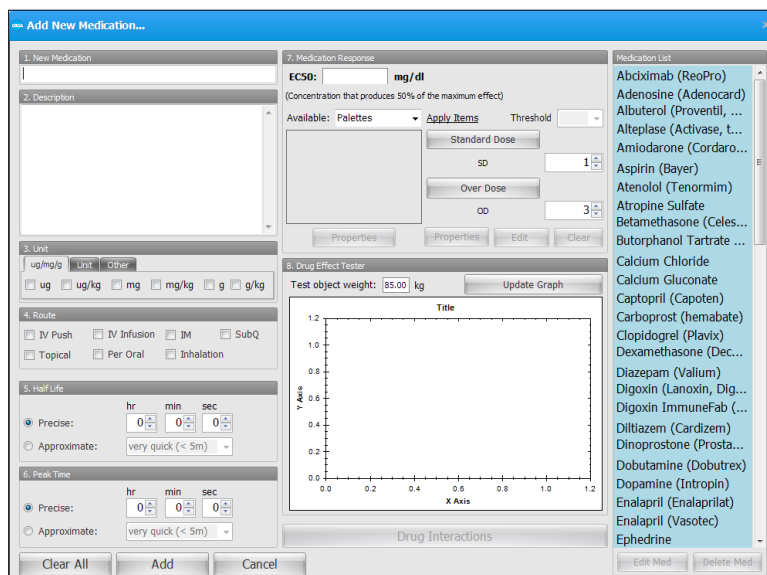


DRUG LIST MANAGER

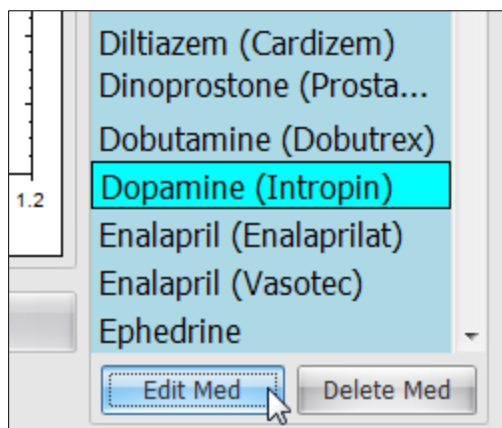
Click the “Manage Drug List” button to open the “Add New Medication...” manager.



Use the “Add New Medication” manager to add new medications, edit medication properties, update existing items, and program medication interactions.



Select a medication from the Medication List and click “edit” to view the medication’s properties.



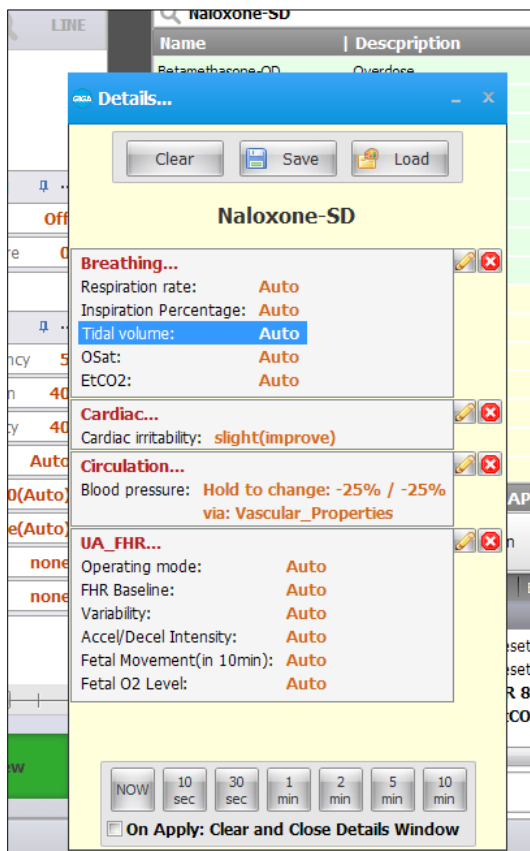
CREATING NEW MEDICATIONS

Each medication is programmed with two palette items. One palette item is programmed with the vital signs adjustments to simulate the effects of a standard dose (SD), and the other palette item is programmed with the effects of an over dose (OD). Additional information such as half-life, peak time, and route is also programmed into the medication properties.

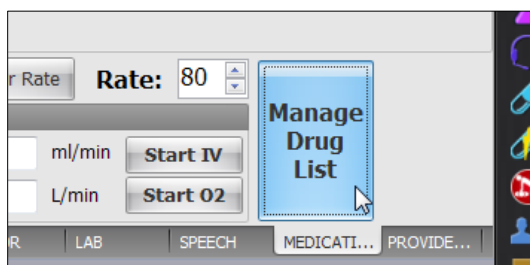
When the medication is administered to the patient, the software applies the palette item associated with the dose threshold. The Auto Mode adjusts the vital signs changed by the palette item gradually to simulate the medication's effect on the patient.

To create a new medication:

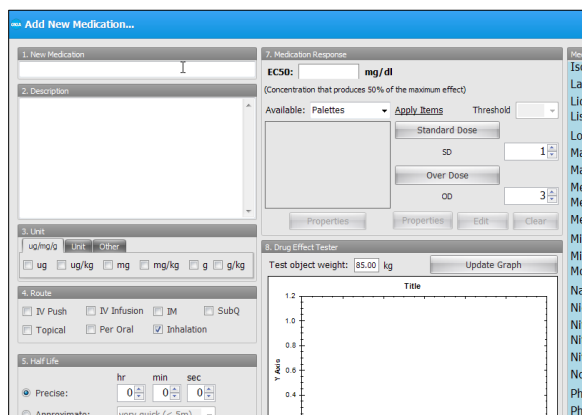
1. Create a palette item using details page for the effects of a standard dose (SD). Then, repeat the process to create a palette item for the effects of an over dose (OD). For general information on creating a palette items, refer to the Details tab section.



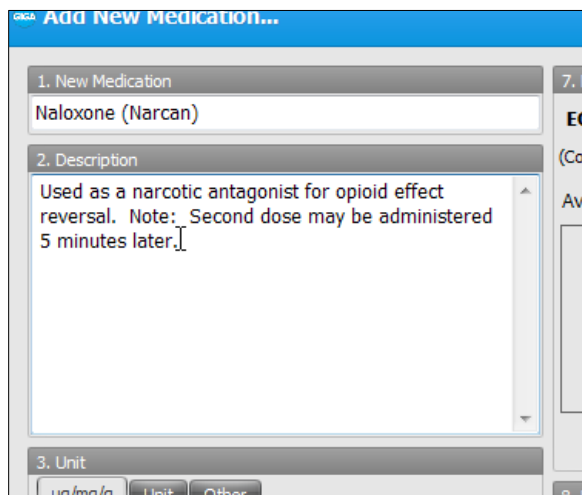
2. After dose effect palettes are created using the Details controls, go to the drug tab and click the "Manage Drug List" button.



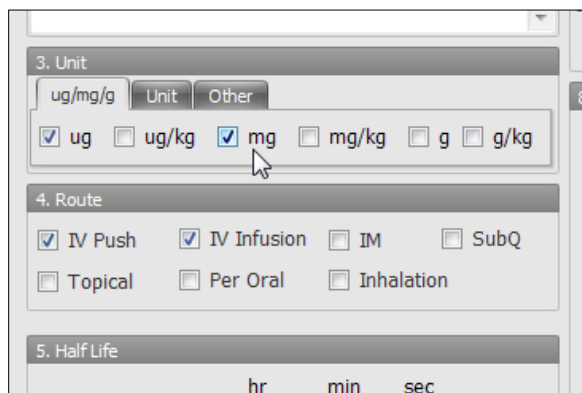
The Add New Medication window is displayed.



3. Type the name of the new medication (e.g. Generic Name (Brand Name)) and enter the medication's description and the dosage information



4. Select the units and the administration route.



5. Enter the drug's Half Life and Peak time.

5. Half Life

Precise: 1 hr 15 min 0 sec

Approximate: very quick (< 5m)

6. Peak Time

Precise: 0 hr 2 min 0 sec

Approximate: very quick (< 5m)

6. Enter half-maximal effective concentration.

7. Medication Response

EC50: .0001 mg/dl

(Concentration that produces 50% of the maximum effect)

Available: Palettes Apply Items Threshold ug

7. Select the standard dose (SD) effect palette created earlier and then click the applicable dosage button to assign it to the threshold. Repeat this step to assign the over dose (OD) effect palette to the Over Dose threshold.

EC50: .0001 mg/dl

(Concentration that produces 50% of the maximum effect)

Available: Palettes Apply Items Threshold ug

Morphine Sulfate-OD

Morphine Sulfate-OD

Naloxone-OD

Naloxone-SD

Naloxone-UD

Standard Dose

SD 1

Over Dose

OD 3

Properties Properties Edit Clear

8. Select the threshold unit and set the dosage amount that will trigger the programmed palette effect.

duces 50% of the maximum effect)

Apply Items Threshold mg

Standard Dose

Naloxone-SD 2

Over Dose

Naloxone-UD 10

Properties Edit Clear

Adenosine

Albuterol

Alteplase

Amiodarone

Aspirin

Atenolol

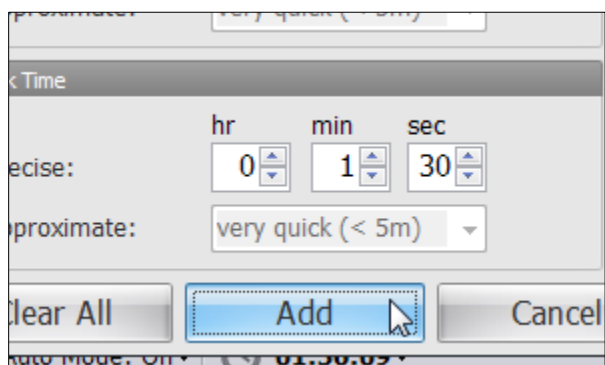
Atropine

Betamethasone

Butorphanol

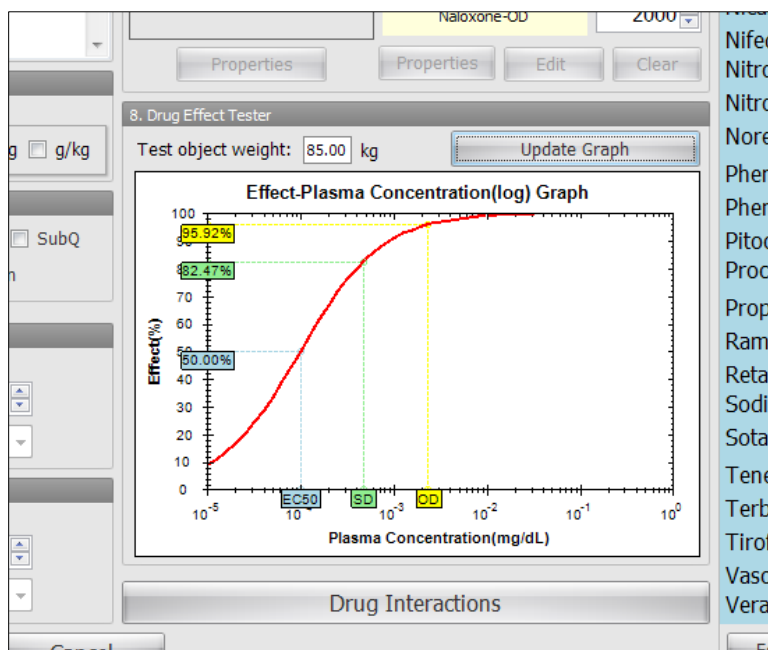
Calcium

9. Click “Add” to save the new medication to the Medication List library.



DRUG EFFECT TESTER

After configuring the drug properties using the “Add New Medication...” menu, click the “Update Graph” button to generate the effect-plasma concentration results. Continue to the next section to program interactors for this drug.



DRUG INTERACTION EDITOR

Use the “Interaction Editor” window to program drug interactions. When two or more medications preprogrammed to interact are administered, the physiologic model will adjust vital signs to simulate interaction effect.

The screenshot shows the "Interaction Editor" window for Naloxone (Narcan). The window is titled "Interaction Editor" and has "Cancel" and "Confirm" buttons at the top right. The main title is "Naloxone (Narcan)".

Current Drug Data:
 Half Life: 01:00:00 Peak Time: 00:01:30
 SD: 400ug OD: 2000ug
 EC50: 0.0001mg/dL

Interactors:
 Captopril (Capoten) [Remove] [Remove All] [Edit]

Drug List: Captopril (Capoten) [Save]

Interactor Data:
 Half Life: 01:54:00 Peak Time: 01:00:00
 SD: 25mg OD: 75mg
 EC50: 0.0240mg/dL

Max Alpha: 1.1 (with a slider control)

Test Panel:
 Test object weight: 75 kg
 Apply Naloxone (Narcan): Dose: 400 ug At time: 0:10:0
 Apply Captopril (Capoten): Dose: 25 mg At time: 0:45:0
 [Update Graph]

Results:
 At time: 00:46:51
 Max Interaction Effect: 82.39%
 Alpha: 1.05
 Compared to Additive, individual drug effect reduced by: 0.90%

Graphs:
 1. **Isobologram (plasma concentration):** Shows the relationship between Naloxone (Narcan) concentration (x 10^-6 mg/dL) on the x-axis and Captopril (Capoten) concentration (mg/dL) on the y-axis. Three curves represent 35%, 50%, and 70% interaction levels. The 70% curve is the highest, followed by 50% and then 35%.

 2. **Time-Effect Graph:** Shows the effect percentage over time (min) for three scenarios: "interaction" (green line), "Naloxone (Narcan) only" (red line), and "Captopril (Capoten) only" (blue line). The interaction curve shows a higher peak effect (around 82%) compared to the individual drug effects (around 60% for Naloxone and 55% for Captopril).

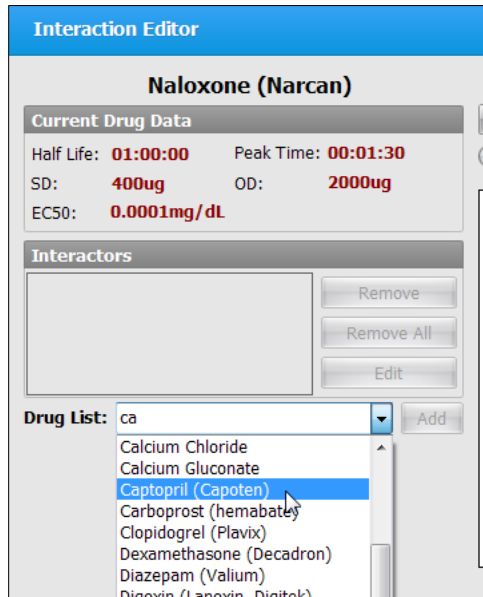
Click “Drug Interactions” on the “Add New Medication...” window to open the Drug Interaction editor.

The screenshot shows a portion of the "Add New Medication..." window. At the top, there is a graph showing "Plasma Concentration(mg/dL)" on a logarithmic scale from 10^-5 to 10^0. Below the graph, the "Drug Interactions" button is highlighted with a blue border and a mouse cursor. To the right of the button, a list of medications is visible, including Nifedipine, Nitroglycerin, Nitroprusside, and Norepinephrine. At the bottom left, there is a "Cancel" button, and at the bottom right, there is an "Edit Med" button.

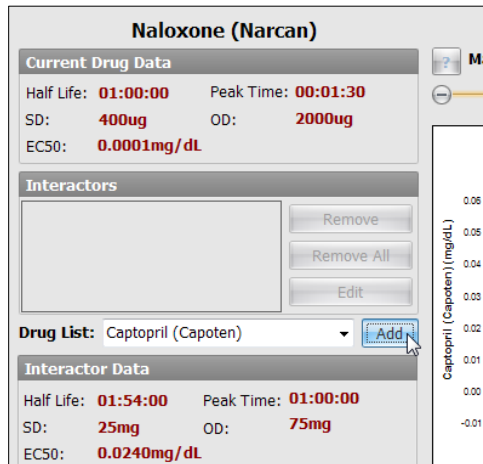
PROGRAMMING INTERACTORS

To program one or more medications to interact with the current drug:

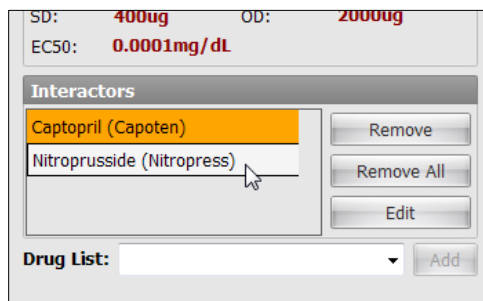
1. Select the interactor from the drug list click "Add":



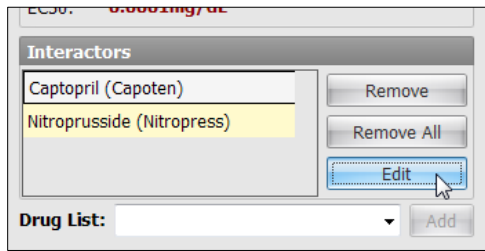
Information about the interactor drug is displayed in the Interactor Data window.



2. The drug is included into the interactors list. Repeat the process to add more drugs to the interactors list if necessary.

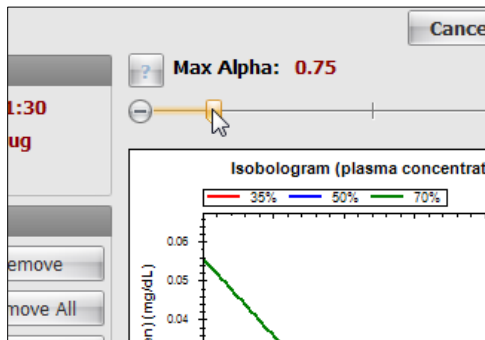


3. Select the interactor and click "Edit"



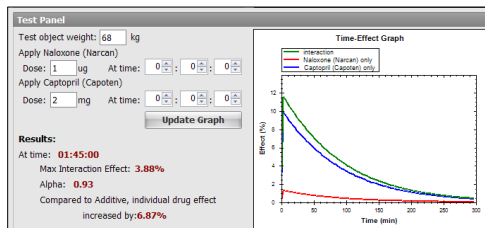
4. Adjust the **Max Alpha** to modify the type of interactivity effect. Monitor the graph for a visual model of the plasma concentration.

- **Alpha = 1:** Additive
- **Alpha < 1:** Synergistic/Induction
- **Alpha > 1:** Antagonistic/Inhibition



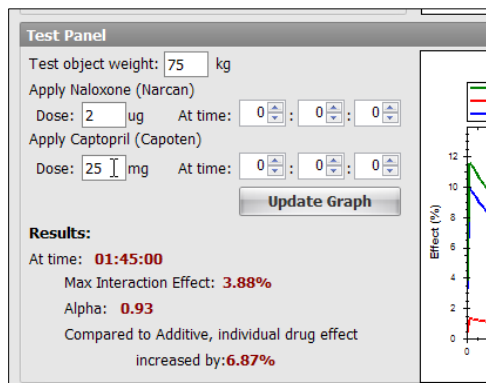
TEST PANEL

Use the test panel to simulate the interaction between the drugs based on dosage and time of administration.

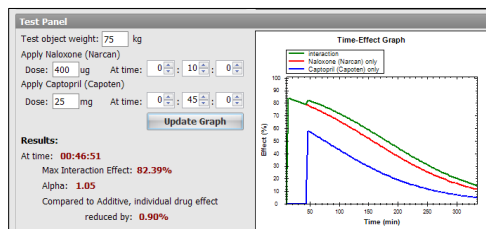


To simulate the medications interactivity using the test panel:

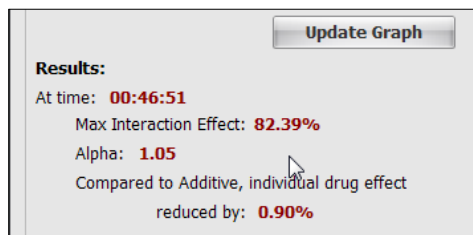
5. Enter the patient's weight and the dose for each drug.



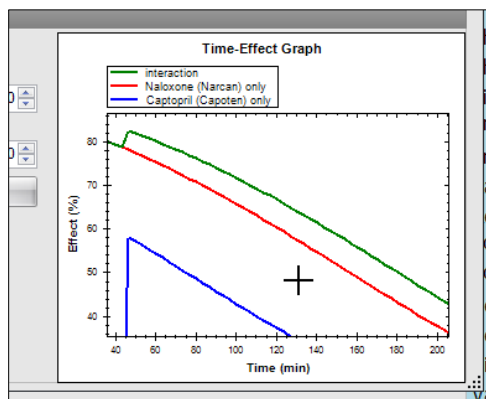
6. Enter the time of administration for each drug and click "Update Graph".



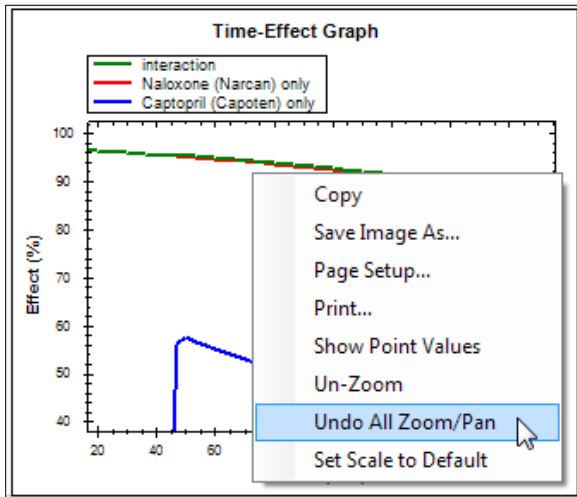
The results indicate that the maximum interaction effect (82.39 %) occurs at 00:46:51. The alpha at that point is 1.01 and the drug effect for each drug is reduced by 0.90%. Fine-tune the Max Alpha control and retest if the drug interaction effect is not realistic.



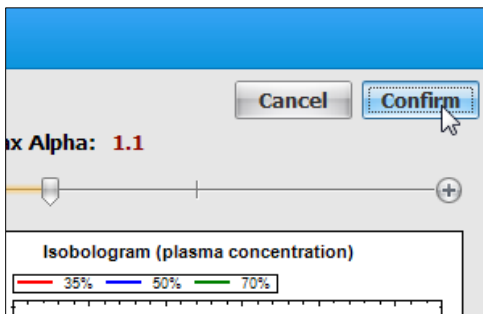
A time-effect graph is generated from the test results. Tap and hold to draw a zoom area.



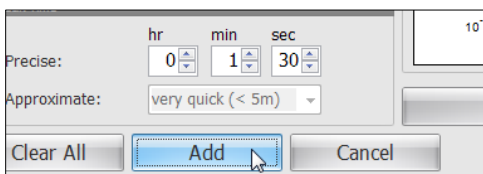
7. Right click anywhere on the graph access the zoom and print options.



8. Click "Confirm" to save the settings.



9. Review all the properties of the new medication in the "Add New Medication..." window, and click "Add" to save the new changes.



In the example below, two drugs preprogrammed to interact have been administered. The interaction information is listed in the Interaction Status panel.

Naloxone (Narcan)	0	ug	IV Push	4.29ug/kg(98.63%sd)	00:10:17
Captopril (Capoten)	0	mg	Per Oral	6.20ug/kg(3.36%sd)	00:09:57
Interaction Status					
More Potent	Eff. Change	Less Potent	Eff. Change	Max Alpha	Current Alpha
Naloxone (Narcan)	0.00%	Captopril (Capoten)	0.00%	1.00	

Evaluation Form

The evaluation tool assists facilitators in reporting and assessing provider interaction using a questionnaire form. A completed evaluation form can then be stored as a digital document or printed for distribution.

The screenshot shows the 'Evaluation Form' window with the following details:

- Load template:** Breech Vaginal Delivery
- Evaluation Name:** Breech Vaginal Delivery
- On-Site Reviewer:** James
- Date:** 01/30/2013
- Section 2: Provider Tasks and Performance**

	Yes	No	N/A
Providers (nurse or doctor) request pediatrics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providers (nurse or doctor) suggest moving to O.R.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provider allows breech to deliver to umbilicus with maternal pushing and does not pull.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

USING BUILT-IN EVALUATION FORM TEMPLATES

Several preprogrammed evaluation templates included in the GIGA software. Each template includes a set of multiple-choice questions, fill in the blank, and true or false questions for a variety of scenarios.

Select an evaluation template from the “Load template” drop down to begin.

The screenshot shows the 'Evaluation Form' window with the 'Load template' dropdown menu open, displaying the following options:

- Eclamptic Seizure
- Breech Vaginal Delivery
- Eclamptic Seizure
- Forceps Delivery
- Postpartum Hemorrhage
- Shoulder Dystocia
- Umbilical Cord Prolapse
- Vacuum Delivery

Enter the name of the facilitator administering the evaluation in On-Site Reviewer field.

The screenshot shows the 'Evaluation Form' window with the following details:

- Load template:** Eclamptic Seizure
- Evaluation Name:** Eclamptic Seizure
- On-Site Reviewer:** James
- Date:** 0
- Section 1: Problems Identified**

Complete the form by answering each question.

Evaluation Name: Ictampptic Seizure
On-Site Reviewer: James **Date:** 01/30/2013

1. Problems Identified
None

2. Provider Tasks and Performance

	Yes	No	N/A
Calls for additional help (Nursing or Physician)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calls for anesthesia.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Providers turn or assist in turning patient to side during seizure.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Inserts tongue blade into mouth.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Places supplemental oxygen on patient.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Places pulse-oximeter on patient.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

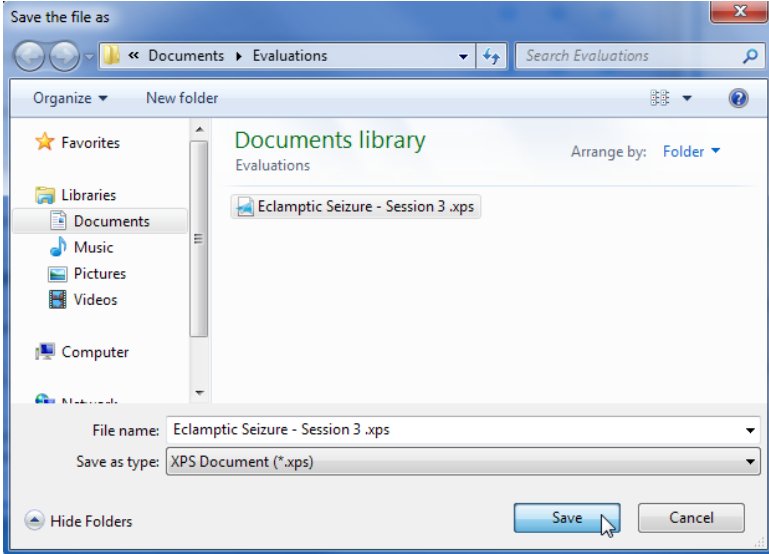
Click "Print" at the top right corner of the screen once the evaluation is completed.

The screenshot shows the software interface with a blue header bar. Below it, there are several buttons: 'Clear', 'Print' (highlighted with a mouse cursor), and 'Go To Edit Mode'. Below the buttons, there are text fields containing 'ictampptic Seizure', 'ictampptic Seizure', 'ames', and 'Date: 01/30/2013'. A 'Print' button is also visible in the top right corner of the window.

Select the Microsoft XPS Document writer to save the finished evaluation as digital document. Click "Print" to save the digital copy in the system.

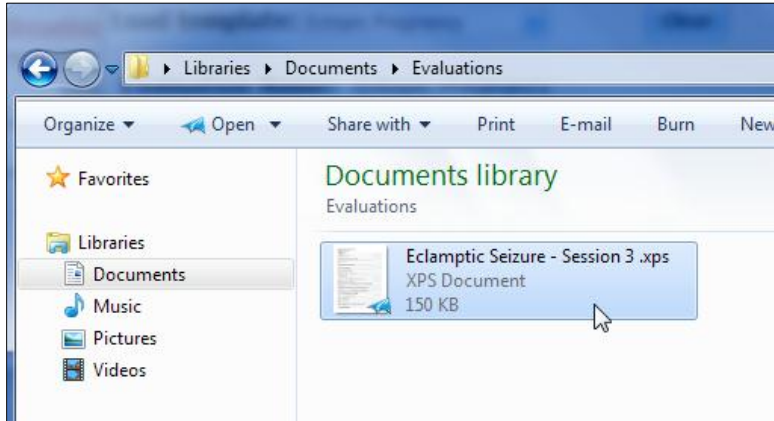
The screenshot shows the Windows Print dialog box. The 'General' tab is selected. Under 'Select Printer', 'Microsoft XPS Document Writer' is chosen. The status is 'Ready'. There are buttons for 'Print to file', 'Preferences', and 'Find Printer...'. The 'Page Range' section has 'All' selected. The 'Number of copies' is set to 1. The 'Collate' checkbox is checked. At the bottom, there are 'Print', 'Cancel', and 'Apply' buttons.

Enter a name for the evaluation and click “Save”.

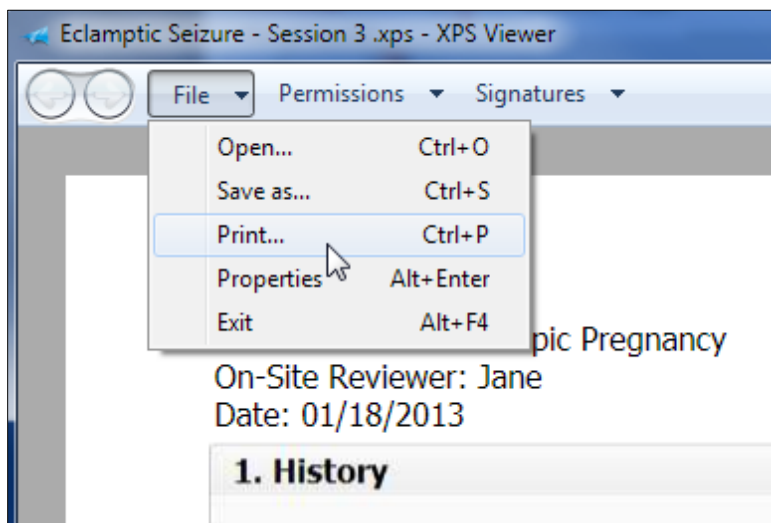


PRINTING AN EVALUATION

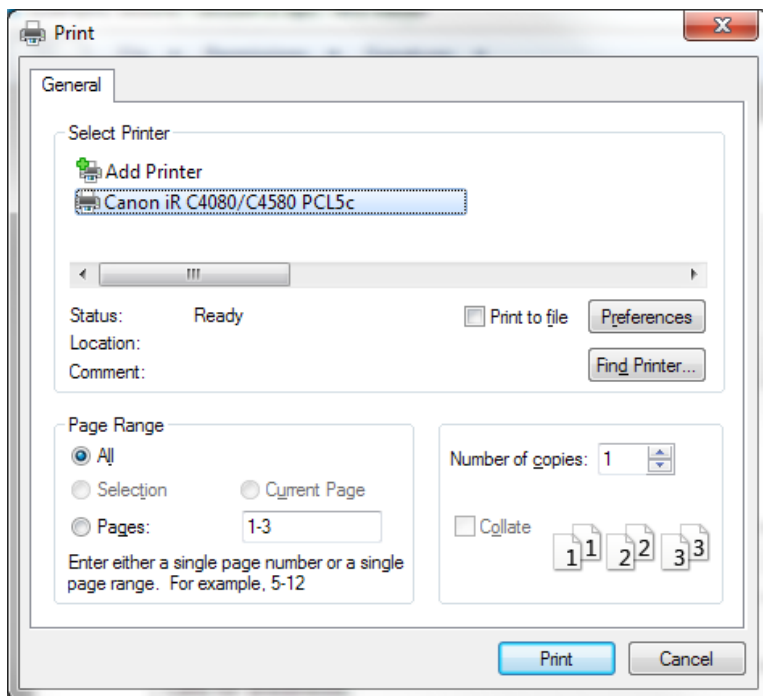
If the PC is connected to a printer, select and open the evaluation document saved in the previous step.



Navigate to the XPS Viewer file menu and select "Print".



Select the printer device from the list box and click print.

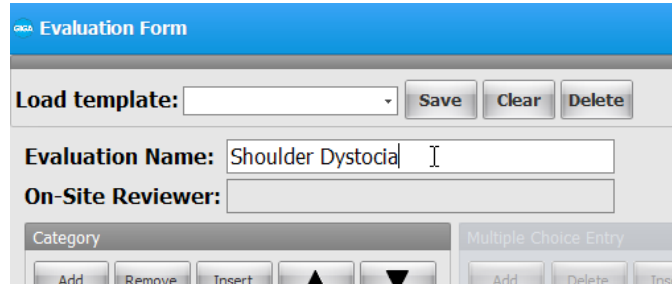


It is recommended that documents be first saved as XPS files before being printed into hard copies.

CREATING NEW EVALUATION TEMPLATES

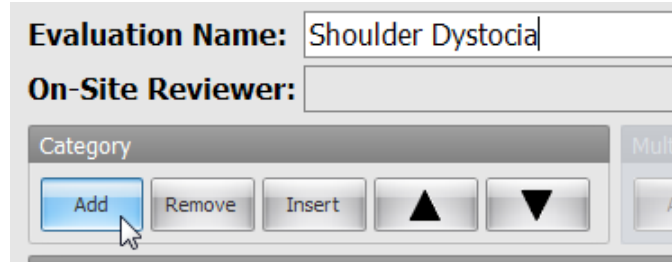
Create new evaluation templates for new scenarios using the edit mode. To enter the edit mode, toggle the “Go To button” located on the top right of the evaluation form window.

Enter a name for the new evaluation template in the “Evaluation Name” field.



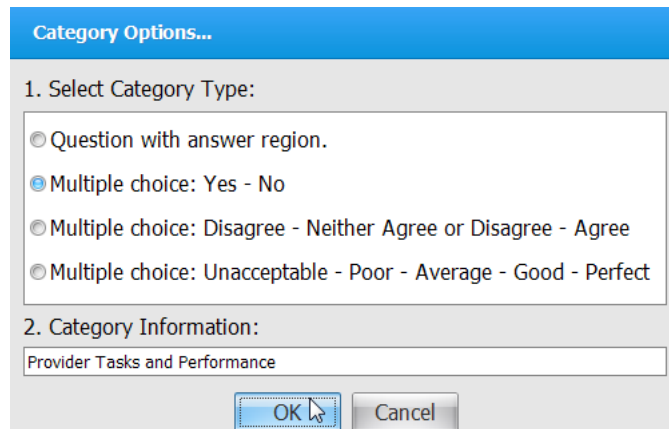
The screenshot shows the 'Evaluation Form' window. At the top, there is a blue header with the text 'OK2 Evaluation Form'. Below the header, there is a 'Load template:' dropdown menu followed by 'Save', 'Clear', and 'Delete' buttons. The 'Evaluation Name:' field contains the text 'Shoulder Dystocia'. Below it is the 'On-Site Reviewer:' field. At the bottom, there is a 'Category' menu with 'Add', 'Remove', and 'Insert' buttons, and a 'Multiple Choice Entry' section with 'Add', 'Delete', and 'Insert' buttons.

Click “Add” on the Category menu.



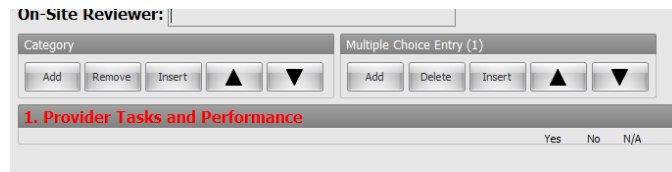
This screenshot is similar to the previous one, but the 'Add' button in the 'Category' menu is highlighted with a mouse cursor, indicating it has been clicked.

Select the category type and enter the category title. Click OK to save.



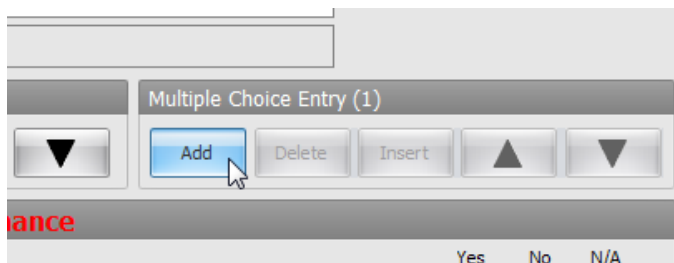
The screenshot shows the 'Category Options...' dialog box. It has a blue header. Under '1. Select Category Type:', there are four radio button options: 'Question with answer region.', 'Multiple choice: Yes - No' (which is selected), 'Multiple choice: Disagree - Neither Agree or Disagree - Agree', and 'Multiple choice: Unacceptable - Poor - Average - Good - Perfect'. Under '2. Category Information:', there is a text field containing 'Provider Tasks and Performance'. At the bottom, there are 'OK' and 'Cancel' buttons.

The new category is now created.

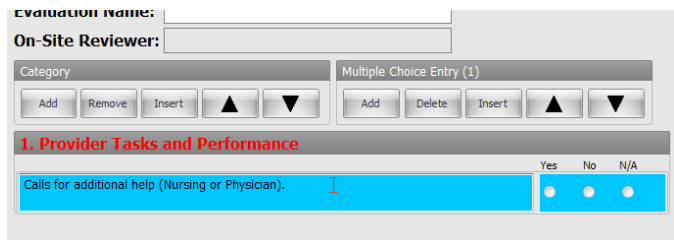


This screenshot shows the 'Evaluation Form' window after the new category has been added. The 'On-Site Reviewer:' field is empty. The 'Category' menu now shows 'Add', 'Remove', 'Insert', and up/down arrow buttons. The 'Multiple Choice Entry (1)' section shows 'Add', 'Delete', 'Insert', and up/down arrow buttons. Below this, the newly created category '1. Provider Tasks and Performance' is listed with 'Yes', 'No', and 'N/A' options.

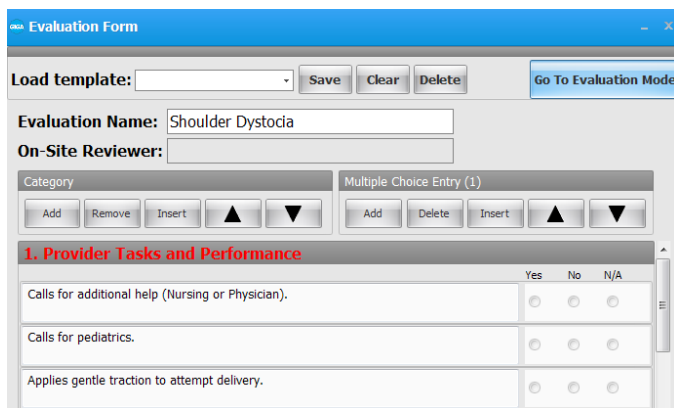
Highlight the new category and then click “Add” on the “Multiple Choice Entry” menu.



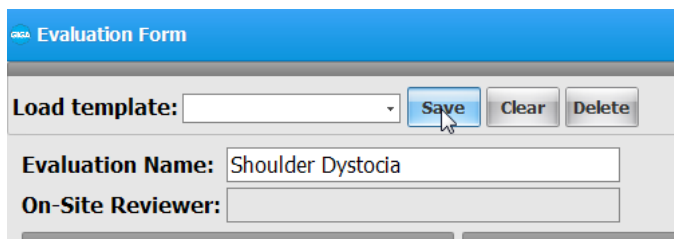
Type the evaluation statement in the new multiple choice field.



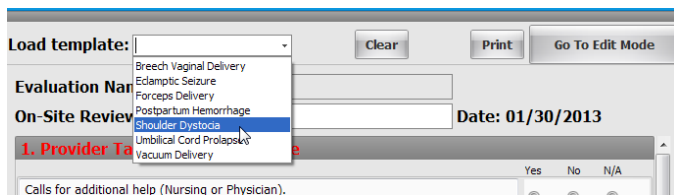
Repeat the previous steps to add more categories, questions, and multiple-choice options.



After the evaluation template design is complete, click Save at the top of the window.

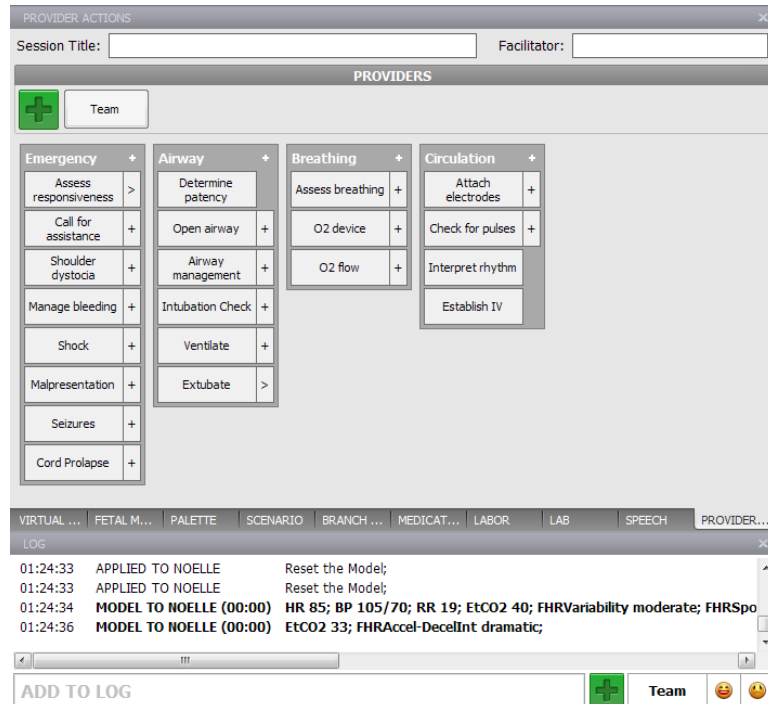


The evaluation form is now available for use.



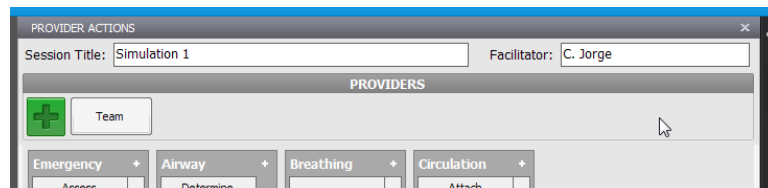
Provider Actions

Use the Provider Actions tab to track actions performed by the provider manually. Each option on the Provider menu generates a time stamped entry in the text log below.



SESSION INFORMATION

Enter the session tile information and the name of the facilitator at the start of the session. The information is included in the final log report.

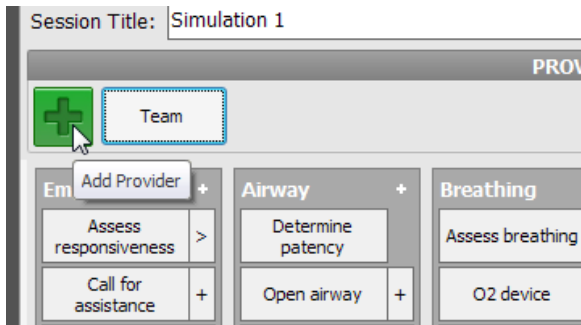


TEAM LOGGING

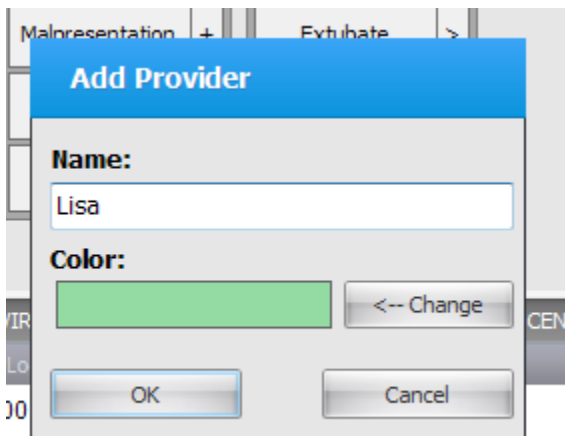
The team logging feature is used to track the individual actions of up to six providers manually. The feature records the name of the provider with the action as an event entry in the log.

To add a new provider to the Provider Actions” window:

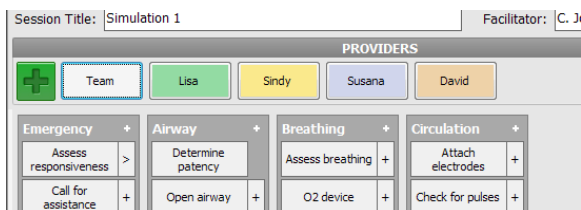
1. Click Add” button to add a new provider.



2. Enter the provider's name and select a color tag. Click OK to save the provider.

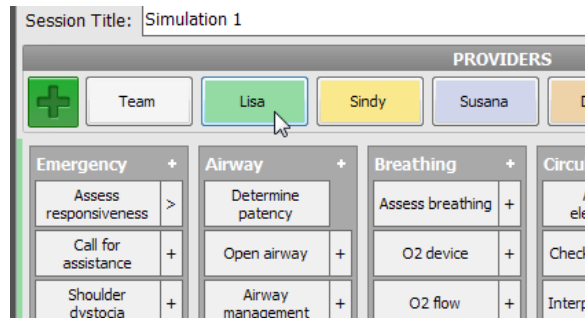


3. The provider is now added to the log tab. Repeat the steps to add up to six different providers.

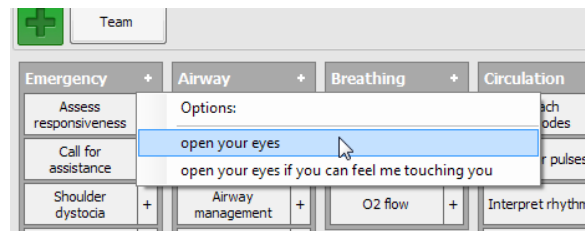


TRACKING PROVIDER ACTIONS

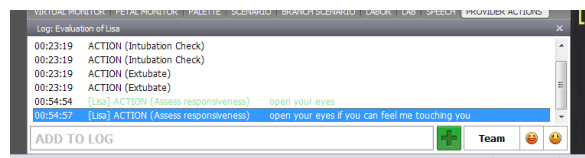
Provider actions can be tracked as a team or individually. Click the provider's name to set the provider as active and track the actions individually.



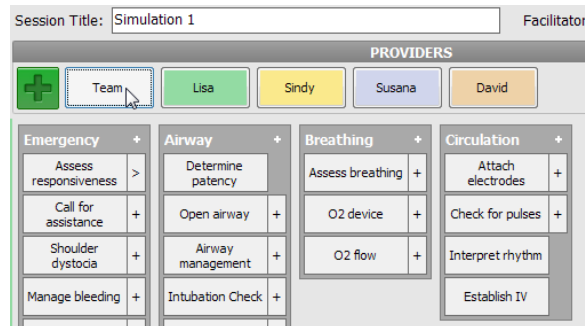
Click the appropriate option to track the action. For example, if the provider assesses the patient's responsiveness by requesting them to open their eyes, click the "Assess responsiveness" button and select "Open your eyes".



The following log entry is generated with the name of the active provider who performed the action:



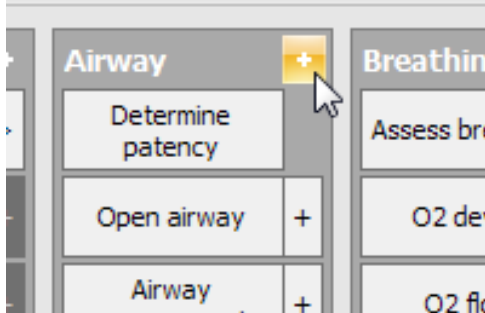
Click the "Team" button to deactivate the active provider and return to general logging. Right click the provider button to delete or rename a provider.



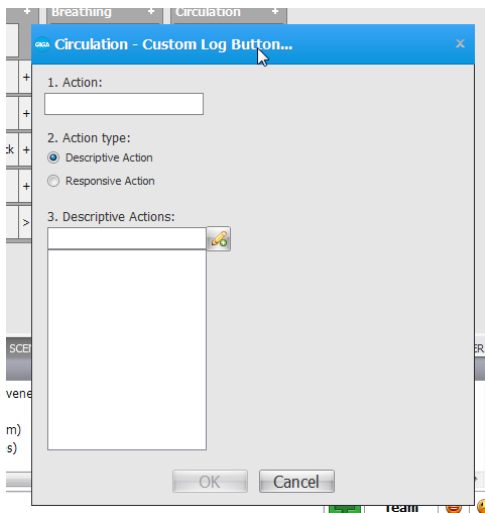
CREATING NEW PROVIDER ACTION BUTTONS

Create new clickable provider action buttons to expand the library of actions. To add a new action to an existing category:

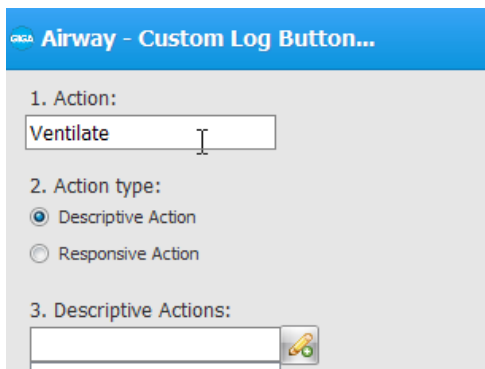
1. Click the + button on the category



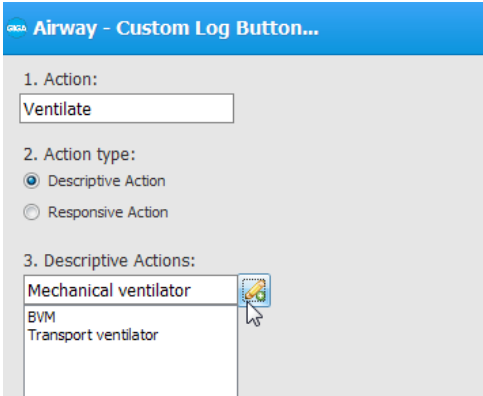
2. The category menu is displayed



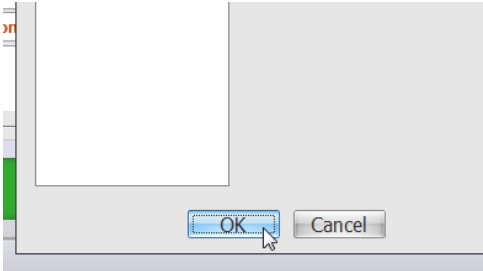
3. Enter the name of the action and select the type of action



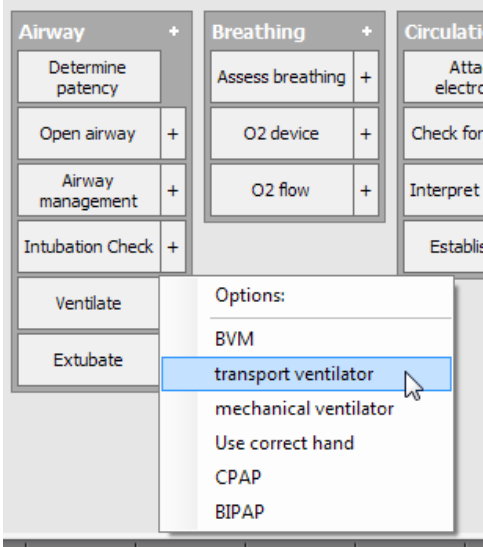
4. Enter a description for the possible action and click + to add. Repeat the process to add several actions.



5. Click OK to save



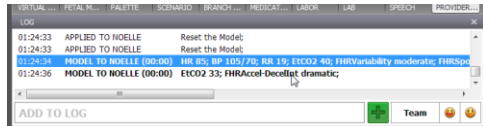
The new action is listed in the airway category.



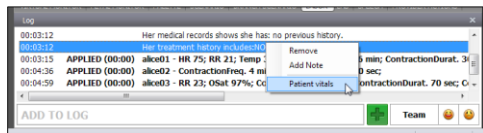
Log

The event log records a time stamped entry of events that occur during the simulation session. In addition, every individual entry records a snapshot of the vital signs parameters at the time the event occurred. The text log records the following events:

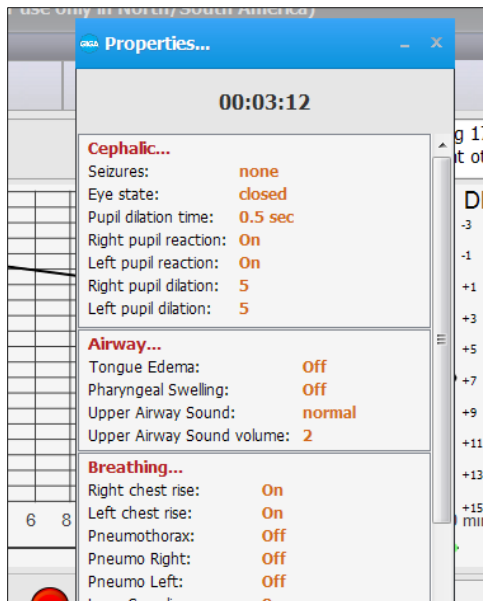
- Vital sign changes applied manually or made by scenario
- Events detected by onboard sensors (e.g. intubation sensor, defibrillation sites)
- Preprogrammed speech phrases
- Satisfactory or unsatisfactory evaluation
- Facilitator notes



Select an entry from the list and right click to view additional options.

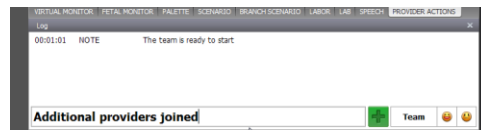


Select “patient vital signs” options to view a snapshot of the vital signs values when the event occurred.



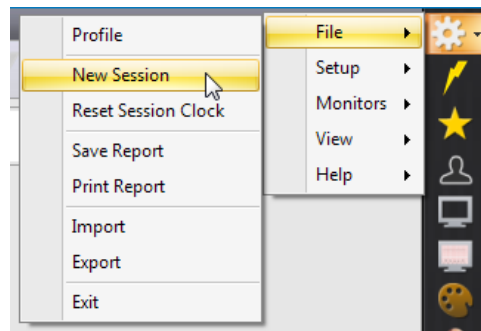
ADDING NOTES

Enter notes into the “add to log” field to record notes manually. The information is categorized in the log as “NOTE”.



CREATING A NEW SESSION LOG

The log event “time stamps” reference the GIGA session clock. At the start of a new simulation exercise, click File>New Session to reset the session clock 00:00:00, reset any vital parameters settings, and clear all the event entries.



SAVING THE LOG INFORMATION

The log information is recorded in a rich text format. Export the log information to save a detailed history of the events that occurred during the session.

To save the session log report as a text file:

1. Click FILE>Save report
2. Enter a name for the report
3. Select the desired name and path, and click “Save”.

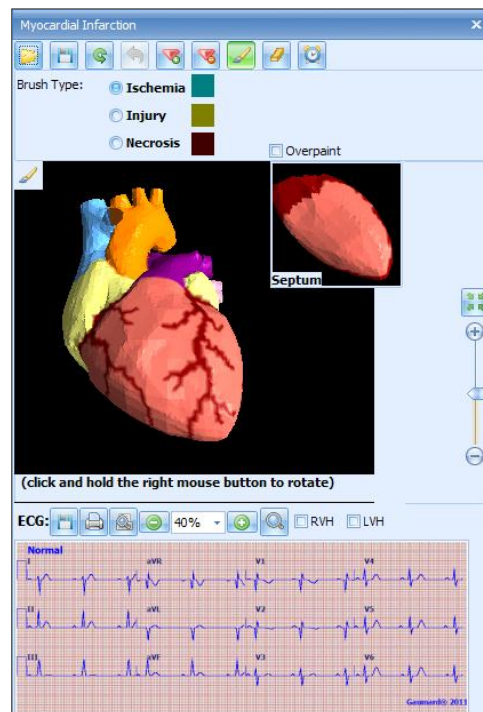
Myocardial Infarction Editor

Use the Myocardial infarction editor to create custom myocardial infarctions using an interactive model of the heart. The ECG generated displaying the effects of the MI can be loaded into the simulator so it can be detected using a real ECG monitor.

To access the editor, click on the MI icon located on the side menu bar.

HEART VIEWER

To rotate the heart, click and hold the stylus button, then rotate the heart to the desired position. The zoom control and the reset rotation button are located on the right of the heart view window.



MI CONTROLS

Located on the left panel are the MI controls. These tools are used for creating myocardial ischemia, injury and necrosis.



Load

Use the load button to access built in MI models or access previously saved items.



Save

After the MI model is created, click Save to store the new preset to the system.



Reset

The reset MI model button resets all the settings to a healthy state.



Undo/Redo button

Move one step backward to undo.

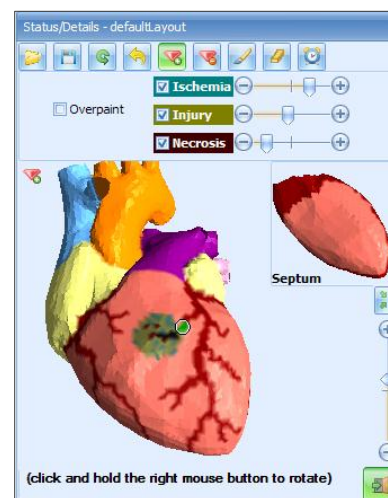


Help

Use the help button to access a PDF version of the instruction manual.

ADD OCCLUSION POINT

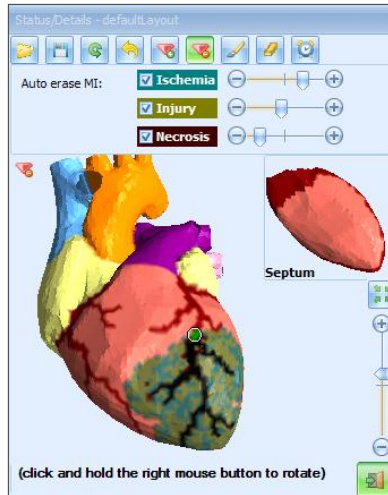
Begin by clicking on the add occlusion point button on the menu. To auto generate MI from an occlusion, select any of the following options: Ischemia, injury and necrosis. The size of each MI type is adjusted by using the slider controls located on the right panel. After the occlusion point properties are set, click the location on the artery where the occlusion point will be generated.



To create an occlusion point without auto generating MI, deselect the MI types from the menu and select a point on the coronary arteries. Enable over paint to overwrite previous occlusions and MI.

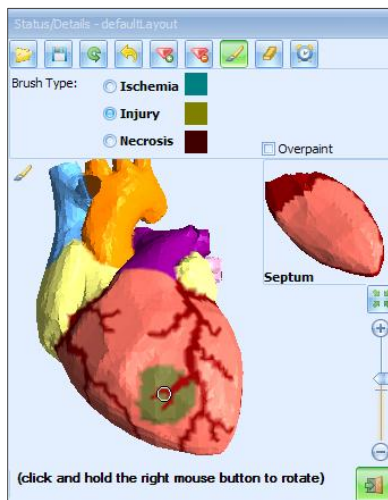
DELETE OCCLUSION POINT

Click on the “delete occlusion point” button and select the green occlusion on the heart viewer using the modified cursor. Deleting an occlusion will also remove any MI that was previously generated.



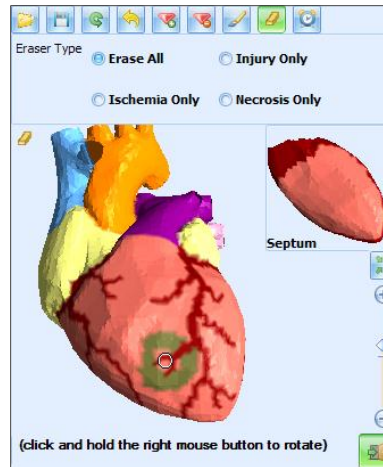
MI PAINT BRUSH

Click on the Paint Brush button to create MI using the modified brush tool.



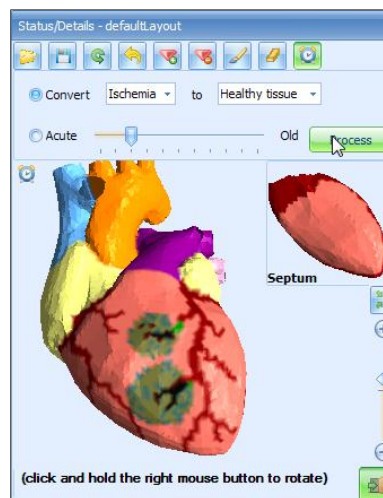
ERASE

Begin by selecting the type of injury that will be erased, then use the modified cursor to delete the injury from the model.



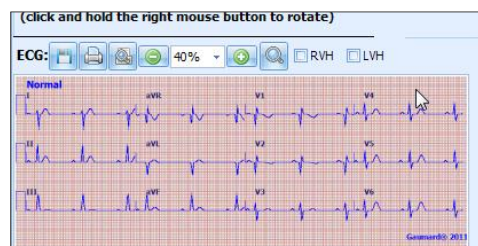
TIME PROGRESSION

Click on the time progression button to convert the MI or select the secondary control to adjust the age of the infarction. To apply the change, click Process.



ECG CONTROLS

Once the MI is created, the 12 lead ECG can be saved for use within a palette or a scenario. Use the ECG controls to save, print, preview, zoom and magnify.



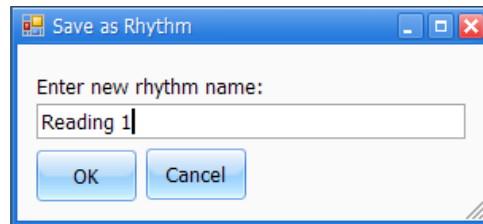


SAVE ECG

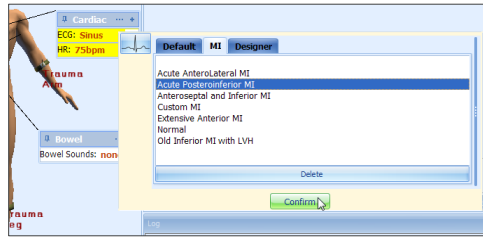
Click the Save ECG button to display the following options.

SAVE AS RHYTHM

Choose Save to Library” then enter a name for the new rhythm in the “Save as Rhythm” window and click OK.



The new custom heart rhythm will be available as an option in the ECG physiological parameter control. Once the heart rhythm is selected, it can be incorporated into a palette or applied immediately.

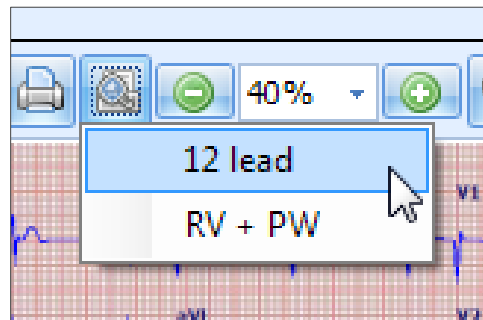


SAVE AS IMAGE

Choose Save Image to store a snapshot of the ECG. When prompted, select a location to save the image.

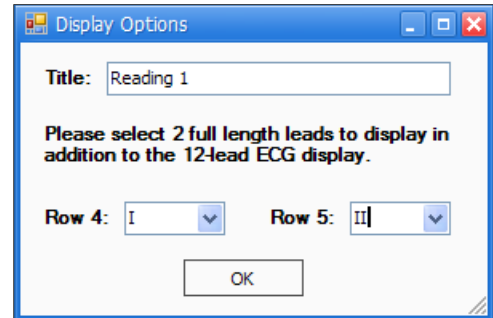
PREVIEW ECG

Use the preview button to display the 12 lead ECG onscreen with an additional 2 full length leads or a preview with RV + PW.



12 LEAD

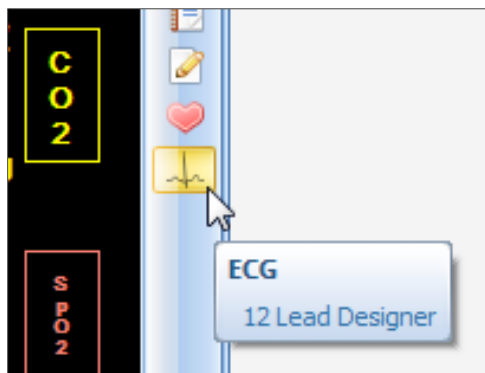
Click **12 lead** and select two full length leads to display in addition to the 12-leads.



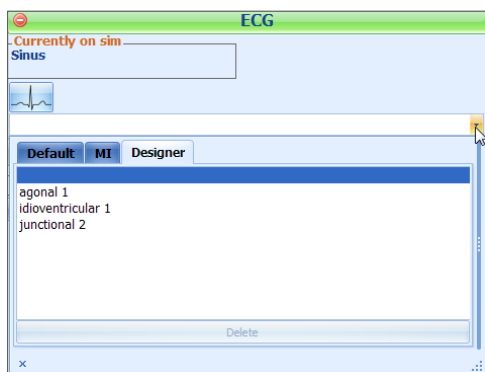
Click ok to display the preview window.

ECG Designer

Use the ECG designer to create a custom 12 lead rhythm. Click the ECG designer button to open the ECG designer window.

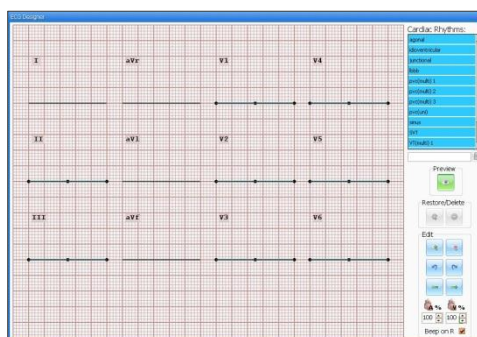


After a rhythm is created and saved, navigate to the designer tab to load the custom rhythm.



EDITING AND CREATING 12 LEAD RHYTHMS USING THE ECG DESIGNER

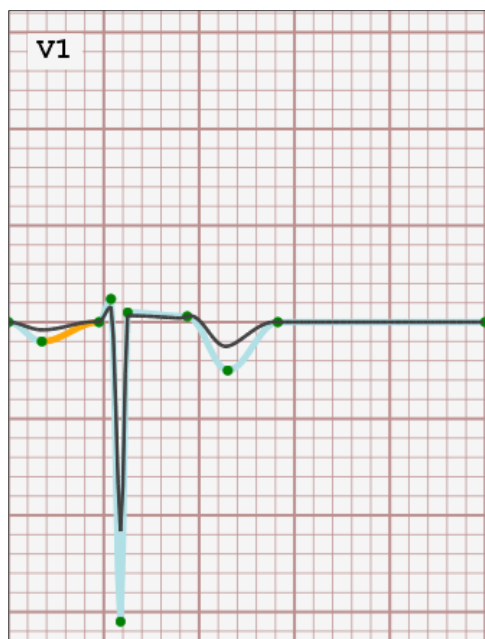
ECG designer starts with a set of flat lines in all waveforms. From this point, new rhythms can be created, or existing rhythms from the GIGA library can be edited and saved as new waveforms. Rhythms drawn in the ECG Designer are assumed to be at 60 beats per minute, with any morphology changes as a result of lower or higher rates being automatically handled by the software.



To edit an existing rhythm, select it from the Cardiac Rhythms list on the top right hand side of the ECG Designer window. New rhythms can be created by simply adding and manipulating points on the default flat lines of the ECG Designer window.

Once a rhythm is loaded, it can be edited by clicking and dragging the dots on waveforms I, II, III and V1-V6. In the precordial leads the dots lie on a green line which shows the waveform generated at the site, while the waveform detected at the patient monitor is shown as a thin black line.

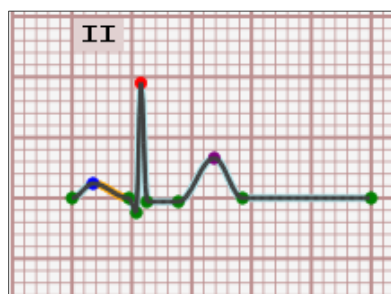
Dots can be added by right clicking on the waveform line, or on the green line for leads V1 through V6. The Preview button in ECG designer hides the editing dots to provide an uncluttered image of the working rhythm.



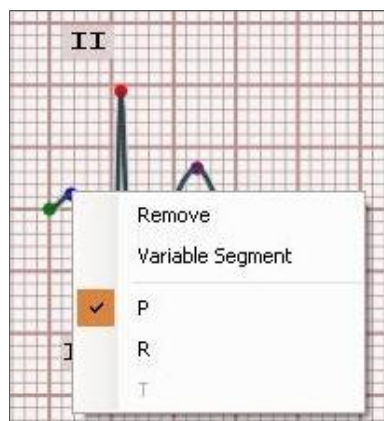
Note that because waveforms I, aVR, aVL and aVF are dependent on lead II, they cannot be edited directly.

HEART SOUNDS TIMING

In order to properly time the heart sounds in custom rhythms, it is necessary that the user identify points P, R and T within the Lead II waveform. These points are colored Blue, Red and Purple, respectively.



In order to identify points P, R and T, right click over the desired point and select the appropriate letter.

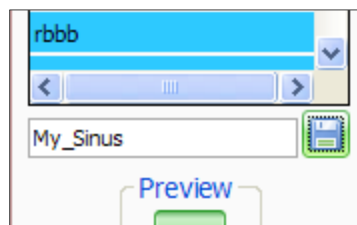


VARIABLE SEGMENT

A variable segment identifies the line between two points that can be extended and reduced as the heart rate decreases and increases. If present, this segment needs to be identified on all lead waveforms.

CONTROL PANEL

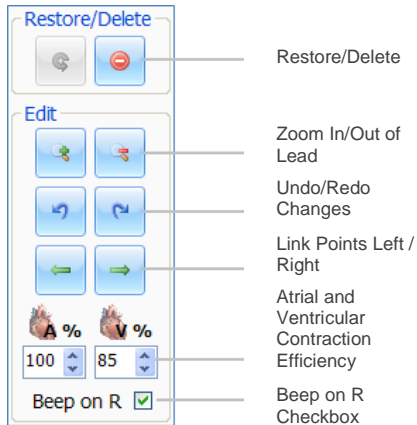
To save a customized rhythm, enter a name in the Save textbox on the right side of the window and click on the Save icon



Rhythms included as part of GIGA Module's ECG library cannot be deleted; however, they can be edited. Modified rhythms can be applied directly from the "Designer" tab of the Rhythm Selection window on the Details tab. Changes made to default rhythms can also be rolled back by selecting the desired rhythm and clicking on the Restore button of the ECG Designer window.

EDITING CONTROLS

The Link Points controls can be used to drag sets of points left or right without modifying an existing drawing. This function can be useful to align waveform features (such as QRS complexes) across several lead waveforms.

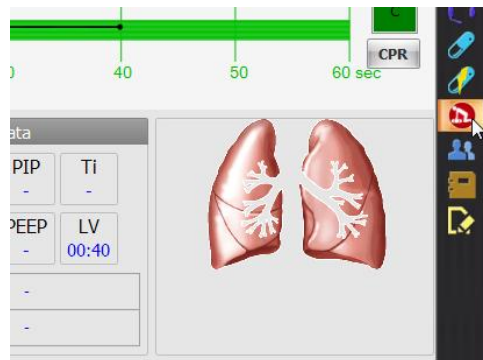


The Atrial and Ventricular Contraction Efficiency values are used by GIGA's Automatic Mode to determine parameters such as blood pressure and oxygenation.

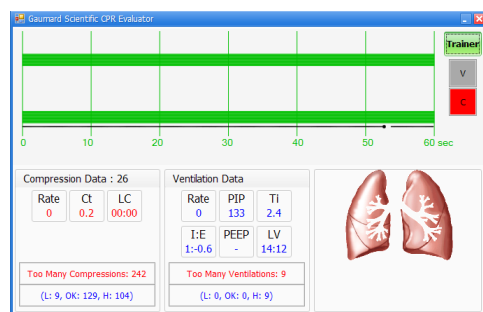
The Beep on R value informs the Gaumard Virtual Monitors (if available) that an ECG beep should occur at the point designated as the R on the Lead II waveform.

CPR Evaluator

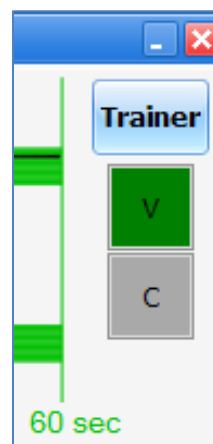
GIGA features a CPR performance evaluator and trainer. Click the CPR icon on the vertical menu bar to open the CPR window.



The CPR evaluator feature provides real time feedback on the provider's compression and ventilation performance.



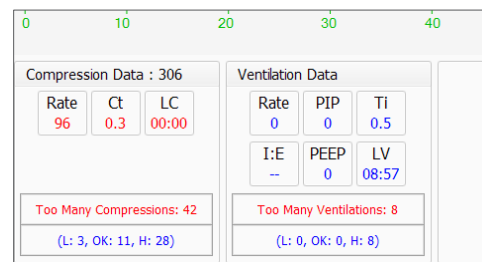
The provider performance indicator boxes are located on the right. The V (ventilation) and C (compression) box fill color changes between the following states:



- **Grey** – No intervention was detected.
- **Yellow** – Compression was too shallow. Ventilation was too weak.

- **Green** – Compression/ventilation was performed correctly.
- **Red** – Compression was too deep. Ventilation was too strong.

Compression and ventilation data is displayed at the bottom of the window as CPR is performed by the provider.



Compression Data

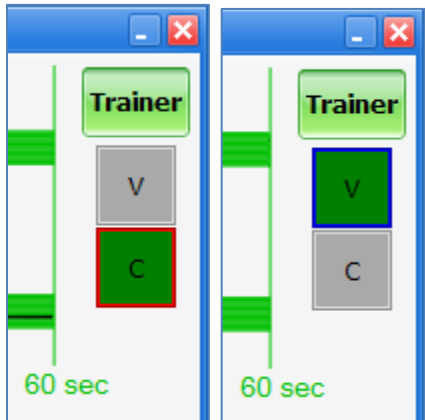
- **Rate** – Rate of compressions in real time.
- **Ct** – (Compression time) – Average length of each compression in seconds.
- **LC** – (Last Compression) – Time elapsed since the last compression performed.

Ventilation Data

- **Rate** – Ventilation rate in real time.
- **PIP** – (approx.) Peak Inspiratory Pressure
- **Ti** – Time Inspiration
- **I:E** – Inspiratory: Expiratory Ratio
- **PEEP** – (approx.) Positive end-expiratory pressure
- **LV** – (Last Ventilation) – Time elapsed since the last ventilation performed.

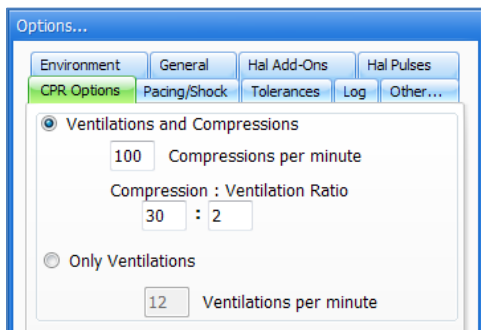
TRAINER

The CPR trainer reference boxes generate a visual prompt of the compression to ventilation ratio programmed in the “CPR Options” menu. Click the “Trainer” button to start. The V (ventilations) and C (compressions) box borders blink to indicate the correct reference CPR rate.



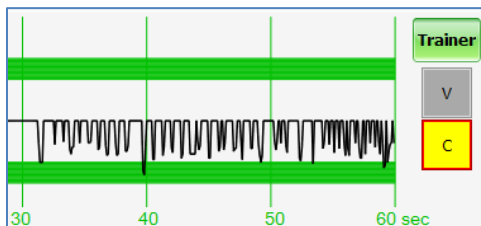
CPR OPTIONS

By default, the CPR trainer is configured to blink the reference borders at a 30:2 compression to ventilation ratio. To change the ratio, navigate to the menu bar and click the CPR dropdown and CPR Options.

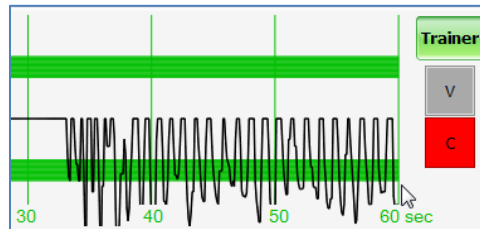


PERFORMANCE EXAMPLES

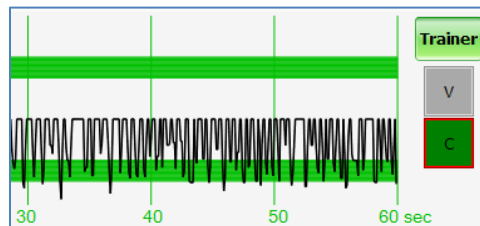
Compressions are too shallow. Waveforms mostly do not reach the green zone. Compression indicator is yellow.



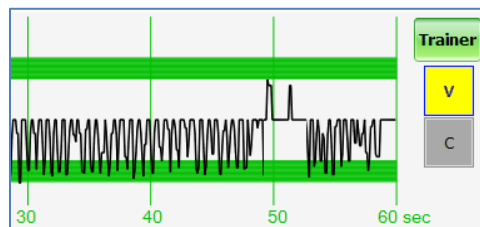
Compressions are too deep. Waveforms mostly exceed the green zone. Compression indicator is red.



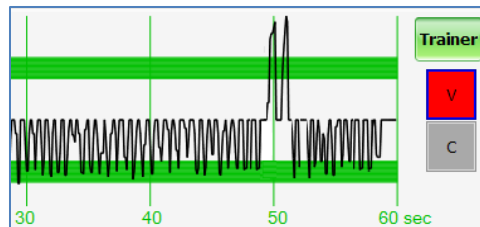
Compressions are performed correctly. Waveform peaks are mostly inside the green zone.



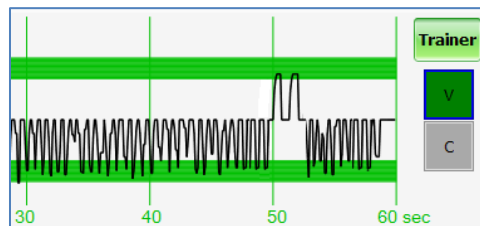
Ventilations are too shallow. Waveform peaks do not reach the green zone.



Ventilations are too strong. Waveform peaks exceed the green zone.

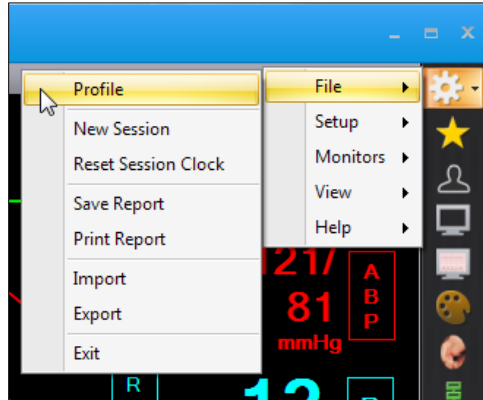


Ventilation was performed correctly. Waveform peak is inside the green zone.



File Menu

File



PROFILE

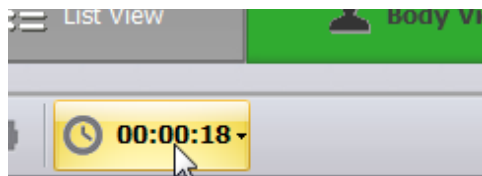
Click the Profile menu option to open the Profiles menu. To switch to a different profile, select the operating mode and the new profile and click "Load".

NEW SESSION

Clicking New Session in the file menu will:

- Clear any loaded/playing scenario
- Clear any loaded/playing palette
- Reset vital signs to normal values
- Clear out log page
- Restart the session clock.

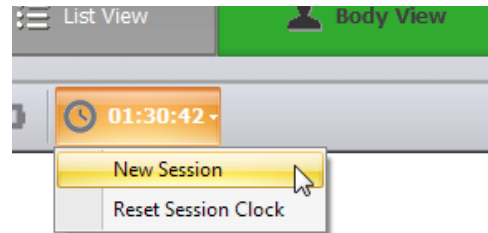
The session clock is located at the bottom of the dialog box.



The shortcut key for starting a new session is: **Ctrl + N**

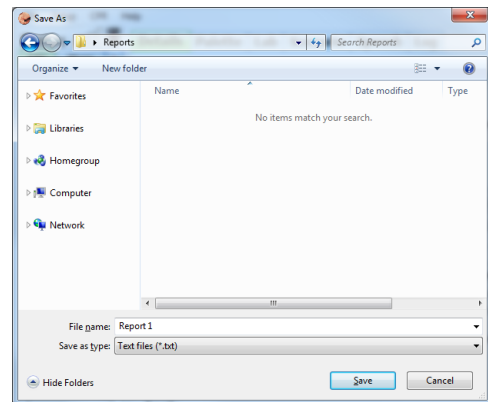
RESET SESSION CLOCK

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 facilitator can also reset the session clock by clicking on the Session button next to the session time.



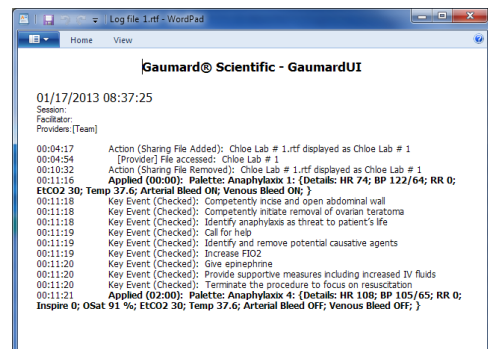
SAVE REPORT

This option allows you to save all the information recorded in the log page 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:



PRINT REPORT

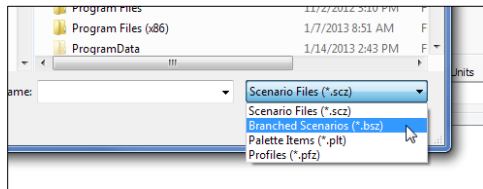
This option allows you to print a text file containing all the information in the log for the latest session. Clicking on “Print Report” brings up the Print dialog box. The shortcut key for this option is **Ctrl + P**.

IMPORT

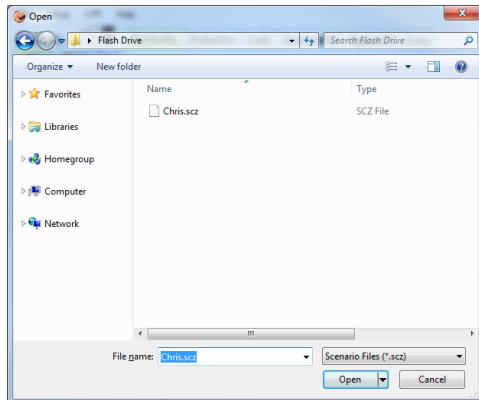
Use the “Import” menu to import palettes, scenarios, and modeling patients created on another PC or stored in a backup location.

To import an item into GIGA:

1. Click File>Import on the menu to access the “Open” menu.
2. Set the type of file to import.



3. Browse to the location where the item is saved and click “Open” to import.



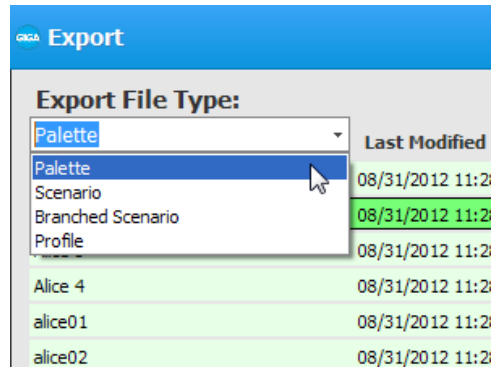
The scenario file is copied to the GIGA scenario library automatically.

EXPORT

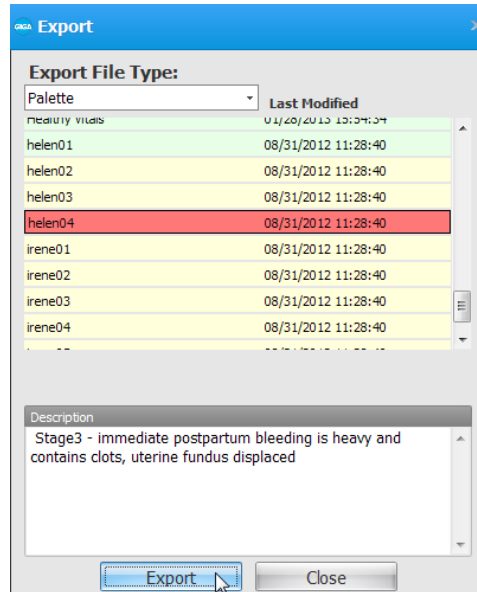
Use the Export feature to backup palettes, scenarios (branched or linear), and model patients files.

To export an item and save it to a location on the computer:

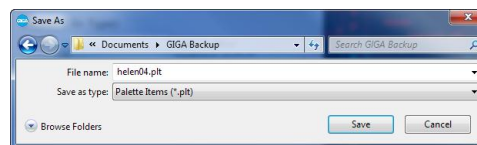
1. Click File > Export to open the “Export” menu
2. Select the file type from the “Export File Type” drop down menu:



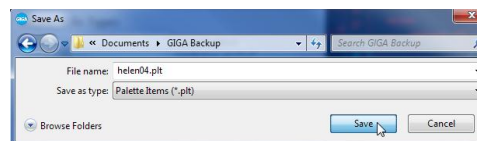
3. Select the item to export from the list and click “Export”



The “Save As” window is displayed.



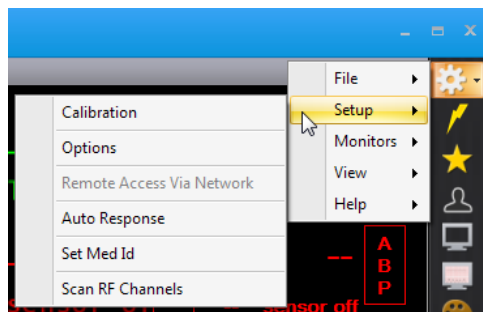
4. Browse to the location where the file will be saved and click “Save”.



EXIT

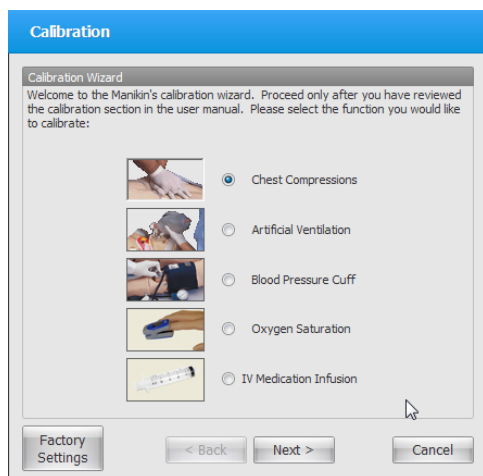
Click File > Exit to close the GIGA software and turn the simulator off. Alternatively, click the power bottom and click the X icon near the top corner of the screen.

Setup



CALIBRATION

Use the Calibration menu to calibrate the simulator's features and to reset the sensors back to default settings.



Chest rise will stop when the "Calibration" menu is active.

- Chest compressions
- Artificial Ventilations
- Blood Pressure Cuff
- Oxygen Saturation
- IV Medication Infusion (Drug recognition)

CHEST COMPRESSIONS

The chest compression calibration wizard records the average depth (as pressure) of 5 chest compressions. GIGA evaluates provider performance using the information recorded during the calibration as the correct benchmark.

To calibrate the compression performance benchmark:

1. Click Setup > Calibration > Chest Compressions, and click "Next"

The wizard prompts to perform compression "#1"

2. Perform one chest compression correctly. A green filled oval indicates that the chest compression was recorded successfully.
3. Perform chest compression # 2 as prompted by the wizard. A green filled oval indicates that the chest compression was recorded successfully
4. Continue the calibration process to record a total of 5 compressions as prompted by the wizard

At the end of the calibrating session, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the settings.

Please test the compressions calibration using the CPR trainer. Go to page 91 learn more about the CPR trainer and the feedback graphic.

VENTILATIONS

The ventilation calibration wizard records the average pressure of 5 ventilations. GIGA evaluates provider performance using the information recorded during the calibration as the correct benchmark.

To calibrate the ventilation performance benchmark:

1. Click Setup > Calibration > Ventilations, and click "Next"

The wizard prompts to perform ventilation "#1"

2. Perform one ventilation correctly. A green filled oval indicates that the chest ventilation was recorded successfully
3. Perform ventilation # 2 as prompted by the wizard. A green filled oval indicates that the ventilation was recorded successfully
4. Continue the calibration process to record a total of 5 ventilations as prompted by the wizard

At the end of the calibration process, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the settings.

Please test the compressions calibration using the CPR trainer. Go to page 91 learn more about the CPR trainer and the feedback graphic.

BLOOD PRESSURE CUFF

Calibrate the Blood pressure cuff feature if the Korotkoff sounds do not match the systolic and diastolic values set using the GIGA controls.

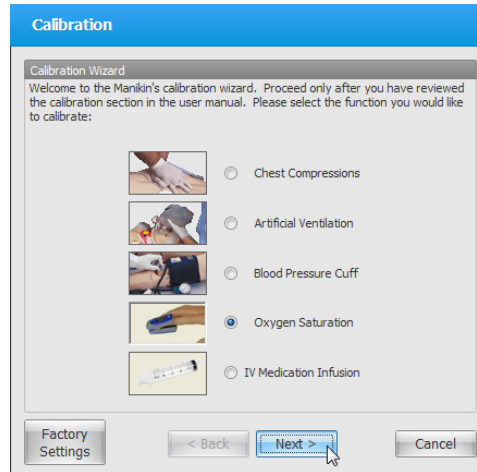
Before starting the calibration process, place the blood pressure cuff on the simulator as it would be placed on a real human patient.

To calibrate the blood pressure feature:

1. Click Setup>Calibration>Blood pressure and click "Next"
2. Verify which arm will be calibrate and click "Next"
3. Set the pressure on the BP cuff to 0 (i.e. cuff valve open) as prompted by the calibration wizard.
4. Click the "OK" button to record the current cuff pressure for the interval. A green filled oval indicates the pressure interval was recorded successfully.
5. Set the pressure on the BP cuff to 20 mmHg as prompted by the wizard. Click "OK" to record
6. Continue increasing the BP cuff pressure as indicated by the prompt and recording the pressure intervals.
7. At the end of the calibration wizard, click "Finish" to close the calibration wizard.

OXYGEN SATURATION

Complete the "Oxygen Saturation" calibration wizard to calibrate the simulator to work with a specific oxygen saturation monitor and sensor. GIGA stores calibration settings for one device at a time. If the oxygen saturation monitor or the sensor is changed, the simulator must be recalibrated to work with the new device.



Disclaimer: Oxygen saturation monitors that detect carbon monoxide and/or methemoglobin are not supported.

To calibrate the oxygen saturation finger:

1. Turn OFF the oxygen saturation monitor and place the oximeter sensor on the left index finger. Verify that the left index finger is centered inside the finger sensor.
2. Go to Setup>Calibration and select "Oxygen Saturation". Click "Next" to continue.
3. Turn ON the oximeter and click "OK" on the dialog box.
4. Adjust the reading on the oximeter monitor screen to match the value displayed on the GaumardUI calibration screen using the arrows on the left column of the calibration dialog box. The first calibration point is 98%.

Use the triple arrows to increase or decrease the reading on the oximeter in large intervals. Use the double arrows for moderate changes, and the single arrows for small changes of one or two percent readings. Wait 10-15 seconds after making an adjustment to allow the oximeter reading to stabilize. This ensures proper calibration.

5. After the value on the oximeter screen is stable, and it matches the value on the GaumardUI calibration window, click “OK”, and then “Next” to continue.
6. Repeat the process to calibrate the following intervals.
7. Click “Finish” at the end of the calibration.

TESTING THE OXYGEN CALIBRATION

To test the oxygen saturation calibration:

1. Go to the details page and vary the oxygen saturation value on the software.
2. Observe that the oximeter reading coincides with the value shown on the status panel (± 3 differences are acceptable on readings above 80%).
3. Test calibration at two points; values between 80% and 95% are recommended.
4. Now take the oximeter sensor off the finger, wait for five seconds, and place the sensor on the finger again in the same position used during the calibration process.
5. Check that the oximeter reading coincides with the value specified on the Details page (± 3 % value differences are accepted).

If both readings do not coincide, make sure to slide the finger all the way into the oximeter sensor. For additional information on troubleshooting the oxygen saturation feature, please go to page 96.

IV MEDICATION INFUSION (OPTION)

Calibrate the IV medication infusion when the infusion rate shown on the drug tab is inaccurate. The IV medication infusion calibrated and tested at the factory.

WARNING: The simulator must be on when introducing fluids into the drug recognition arm. This includes calibration, purging, draining, IV infusion, and injecting fluids into the veins or the filling ports. Introducing fluids into the drug recognition arm while the simulator is off will damage the arm and the simulator. Damage caused by improper use is not covered under warranty.

The drug recognition arm is equipped with a black drain port and a white filling port. Do not reverse the ports while introducing fluids into the system; doing so will damage the system. Do not attempt to fill the IV system without the black drain connector in place. Always leave the black drain port connected during high volume infusions.

To calibrate the IV Medication Infusion feature:

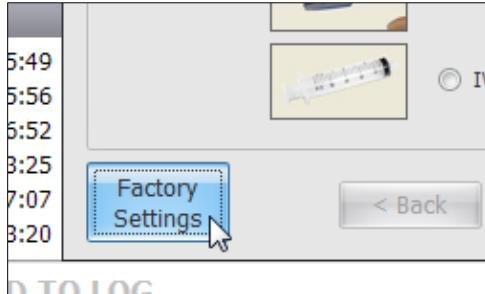
1. Locate the “drug recognition fill kit” included with the package
2. Connect, turn, and lock the drain tube to the black drain port. Place the end of the drain tube inside a container lower than the arm in order to siphon the fluids in the next steps.

Keep the drain tube connected throughout the entire calibration process.

3. Connect, turn, and lock the kit syringe filled with clean water to the white fill port
4. Verify that the simulator is on
5. Inject water into the arm until it exits through the drainage hose and into the container
6. From the calibration menu, select “IV Medication Infusion” and click “Next”
7. As prompted by the calibration window, slowly inject 20 ml of fluids in the forearm using the fill syringe
8. The menu screen displays the volume injected. Once the onscreen value reaches 20 ml, click “OK”.
9. Continue the process as directed by the onscreen instructions until each interval is calibrated
10. Click “Finish” to save the new calibration.

FACTORY SETTINGS

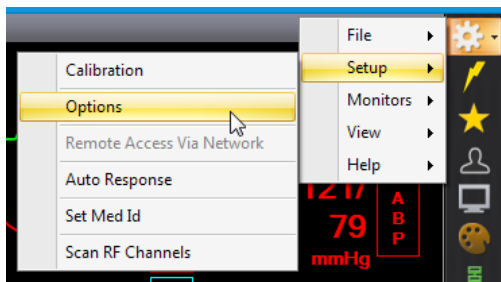
Use the Factory Settings menu to restore sensors settings back to the factory default values. Resetting the sensors deletes all current calibration settings.



Remove all adjuncts, or peripherals that may alter the neutral state of a sensor prior to resetting it.

Click the sensor button to reset it to the factory setting. Please refer to the troubleshooting guide on page 168 if a sensor does not respond.

OPTIONS



GENERAL

Configure general GIGA settings and options.

AUTO-SAVE

Save the log report automatically every number of minutes.

SESSION TIMER

Reset the session timer at the start of a linear, branching, or labor scenario.

ELECTRICAL THERAPY PANEL

Display the defibrillation panel shortcut on the vertical menu bar. Use the electrical therapy panel to defibrillate and pace the simulator virtually.

STAND BY WARNING

Display a notification when attempting to apply new settings while the simulator is in stand-by

UNITS

Change the unit type displayed on the control software and the virtual monitor software.

ENVIRONMENT

Generic: Select “Generic” to scan and connect to the nearest simulator. All upgrade features are disabled while using the Generic connection mode.

Fixed: Select “Fixed” and enter the simulator’s serial number to connect to the simulator without scanning. Upgrade features are serial number dependent. Enter and save the serial number in the “Fixed” field before entering an add-on activation code.

Channel: Set the wireless channel used to connect to the simulator manually. Assign an individual channel to each simulator if multiple simulators are in close proximity of each other.

Check noise in channel: Checkmark “check noise in channel” to force the software to switch to a clearer channel if wireless interference is detected.

HAL ADD-ONS

Enter the applicable upgrade code to activate the upgrade option. Activation codes are unique to the simulator’s serial number. Ensure the simulator’s serial number is saved in the Environment tab “Fixed” option before entering the activation code.

HAL VIRTUAL MONITOR

Use HAL Virtual Vital Signs Monitor - Enter the upgrade code to enable the “Monitors” menu option in the file menu. Open the Monitors>Configuration menu to configure the vital signs broadcast connection settings.

HAL KITS

Use Leg trauma Kit - Checkmark to display the trauma leg bleed controls.

Use arm trauma kit - Checkmark to display the trauma leg bleed controls.

Use Automatic NIBP Kit - Checkmark to enable the non-invasive blood pressure feature. The NIBP feature disables the manual blood pressure feature.

AUTOMATIC MODE

Enter the Automatic Mode activation code to enable the automatic operating mode option in the profile menu.

HAL PULSES

Set the pulse strengths for the normal blood pressure of (120/80)

Set the systolic minimum threshold for each site.

LOG

Log event text entries are color-coded. Use the log tab to customize the color of each log entry type.

PACING SHOCK

GIGA can detect small variations in the heart rate and current during pacing. Each variation could trigger a programmed auto response or create a new entry in the log event. Adjust the threshold for each parameter so only the changes greater than the ones specified will be detected by the GIGA software.

TOLERANCES

Use the Tolerances controls to adjust error margin allowed by the CPR intensity and rate.

The simulator's pupils react to light. Use the "Pupil Sensitivity" controls to recalibrate the pupil reaction if dilation is erratic.

Set ambient light - Click "Set ambient light" to recalibrate the pupil diameter to the current ambient light.

Set Dilation Light - While covering both eyes from most incoming light, click "Set Dilation Light" to set the low light pupil diameter.

Increase/Decrease Sensitivity - Click increase or decrease to adjust the pupil's sensitivity to light

Reset to Default: Reset the pupils' ambient and dilation settings to the factory settings.

CPR OPTIONS

Customize the compression to ventilation ratio signaled by CPR Trainer prompt.

Set the number of compressions per minute

Set the compression/ventilation ratio

Set number of ventilations per minute (if the 'Only Ventilations' button is selected).

OTHER

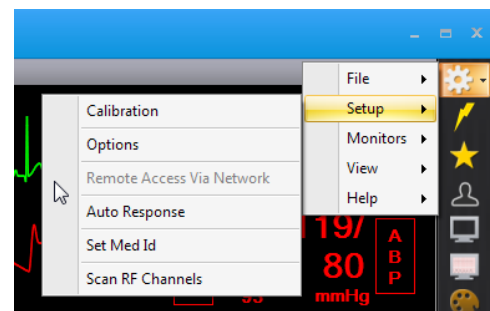
Checkmark "Once a 'Palette' is applied load to "Details Tab" to show the value of each palette's vital signs parameter on the Details tab control fields.

Checkmark the "Link respiration sensor to ECG leads sensors" to generate artifacts with each compression.

Checkmark the "Use A/V" to display the audio and video configuration menu on the menu bar.

REMOTE ACCESS VIA NETWORK

The "Remote Access via Network" feature allows GIGA to communicate with the simulator remotely using the virtual monitor PC as the RF transmitter. The alternate configuration may provide better connectivity in environments with numerous walls or obstructions between the simulator and the control PC.



The USB RF module drivers must be installed on the virtual monitor PC before the "Remote Access via Network" feature can be configured.

Go to www.Gaumard.com to download the latest USB RF module drivers using PC with internet access. Do not connect the Virtual Monitor PC to the internet. Transfer the USB RF module setup file to the virtual monitor PC using a USB drive and complete the installation.

To configure the "Remote Access via Network" connection:

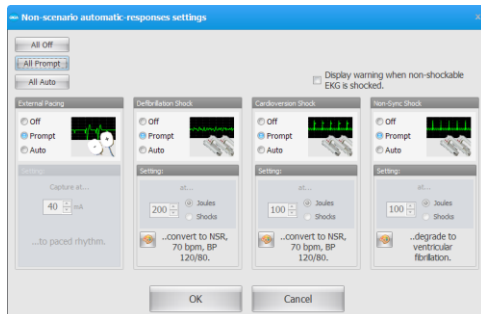
1. Connect the simulator's USB RF module an available USB port on the virtual monitor PC
2. Verify that both computers are connected to the ad-hoc network (e.g. GaumardNet,)
3. Initialize GIGA on the tablet PC open the Remote Access via Network menu from the Setup menu

4. Select the Remote access via network radio button
 5. Verify that Wireless Network Connection is selected from the adapter list
 6. Click “Find available” to auto configure the port used for this connection
 7. Write down the controller IP and port number, then click “Connect”
 8. Navigate to the V menu on the virtual monitor computer and select “Remote access Via Network”
- Please wait 30 seconds for the feature to initialize
9. Enter the “controller IP” and “port number” as shown on step 7 and click “connect”

AUTO RESPONSES

The Non-Scenario Automatic Response feature allows the facilitator to set preprogrammed responses to electrical therapy events. When the electrical therapy is detected, auto-responses can automatically load a specific palette item or prompt the facilitator before making preprogrammed changes to the simulator’s vital signs.

Non-scenario response settings detect electrical therapy administered when a scenario is not in progress. For information on how to configure auto-responses for use during a scenario, go to page 39. To activate the virtual shock panel for administering electrical therapy virtually, go to page 98.

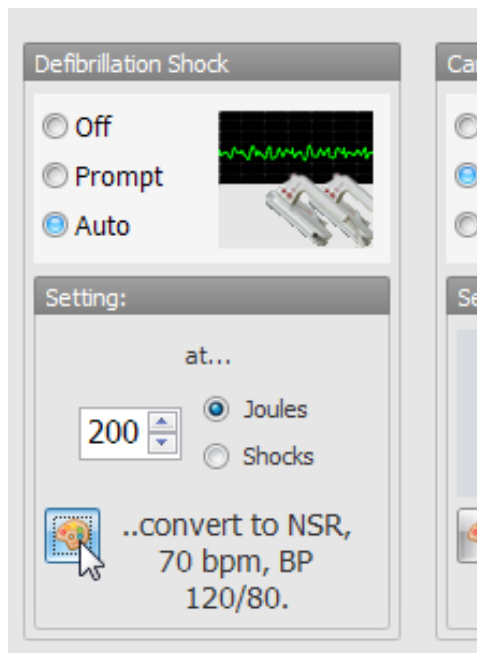


The behavior of each auto response option is explained below:

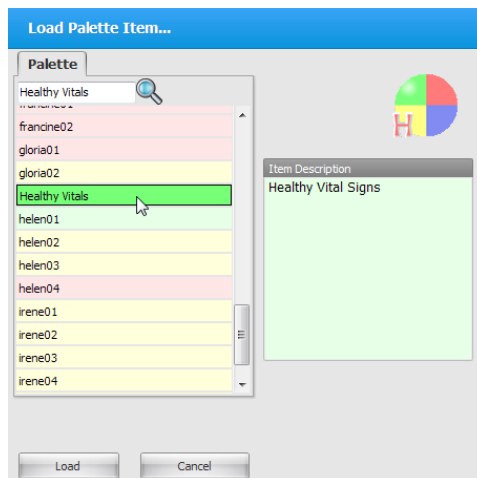
- Off - The software does not respond to the electric therapy
- Prompt - The software detects the electrical therapy and prompts the facilitator before applying the changes configured in the “Settings” section.

- Auto - The software automatically detects the electrical therapy and compares it to a threshold selected by the provider. If the threshold is met, the vitals will automatically change to the parameters specified on the “Settings” section.

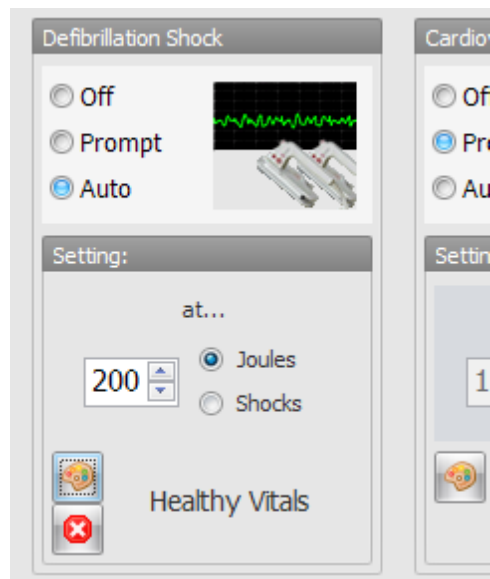
Each type of electrical therapy has a unique set of default parameters. For example, the default response to a defibrillation Shock applies the following vital sign parameter changes: NSR, 75 bpm, BP 120/80. Click the palette button to program a specific palette item as an auto-response.



Select the desired palette from the “Load Palette Item...” window and click “Load”.



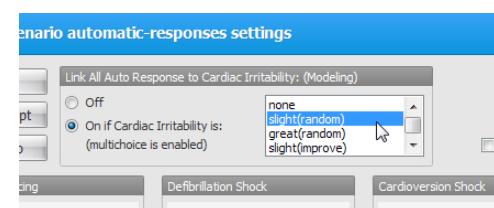
The defibrillation shock auto-response is now configured apply the “Healthy Resting” palette if a virtual defibrillation shock of 200 Joules or greater is detected. The programmed response palette is listed in the “settings:” panel.



AUTOMATIC MODE NON-SCENARIO AUTOMATIC RESPONSES

The “Automatic Mode non-scenario Automatic Responses” are unique to the automatic mode.

Link All Auto Response to Cardiac Irritability - Auto-responses will work only if the cardiac irritability option on the details page matches the selection on this window.



An event prompt is displayed if electrical therapy is detected and the cardiac irritability set does not match the selection on the responses window.

Drug Model Effect – Configure the auto-response behavior for drug administration.

- Auto – Apply the drug effects based on medication’s programmed properties and dosage
- Prompt – Display a confirm prompt before applying the drug’s effects

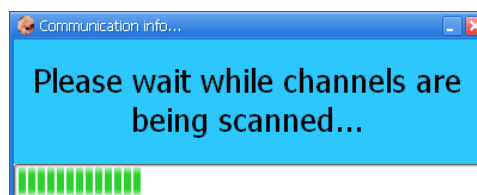
SET MED ID

The “Set Med Id” menu is accessible when the software detects the Drug Recognition Arm on the simulator. Use the Set Med ID menu to program the tagged syringes with a medication type and a concentration. To program a syringe with a medication to work with the drug recognition arm, go to the “Working with the simulator section of the user guide.”

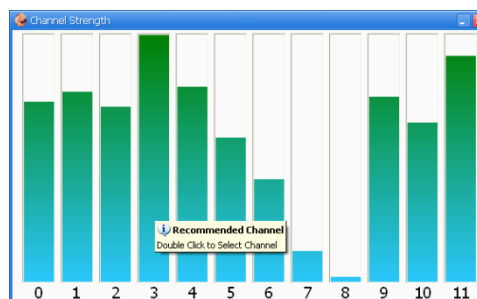
SCAN RF CHANNELS

Use the Scan RF Channel tool to search for the strongest RF communication channel available.

Click the “Scan RF Channels” option in the setup menu to start the scan. Please wait while the system completes the process.

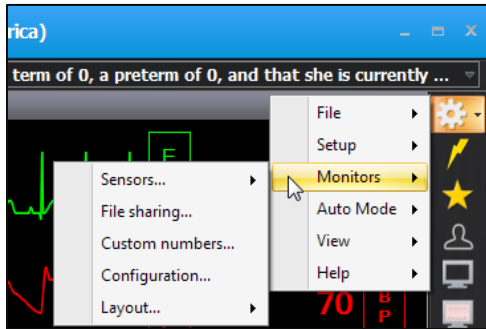


The tallest bar represents the strongest channel. Double click the bar to connect to the simulator using the channel selected.



Monitors

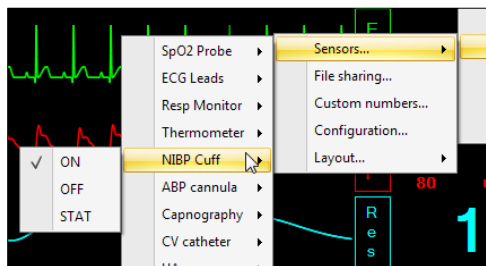
Use the Monitors drop down menu to enable/disable sensors on the virtual monitor screen, share files, program custom scalars, and verify the connection between the GIGA and Gaumard Virtual Monitor software.



If the “Monitors” drop down is not showing, go to Setup>Options> Add-ons, and checkmark “Use Virtual Vital Signs Monitor.”

SENSORS

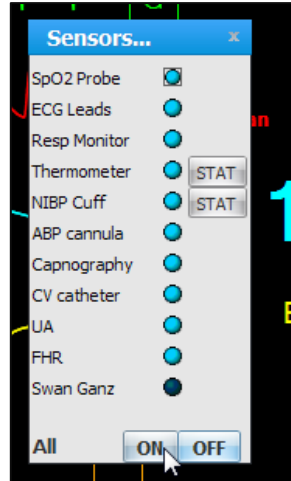
Use the sensors option to enable or disable any of the waveforms displayed in the vital signs monitor. Select the waveform and click “ON” to display the readings on the virtual monitor screen. To disable a parameter reading, click “OFF”. The vital signs monitor sensors defaults to “All On.”



Some sensors, such as NIBP and Thermometer feature a STAT control that will allow the facilitator to activate readings on the virtual monitors from the controller software.

SENSOR CONTROL WINDOW

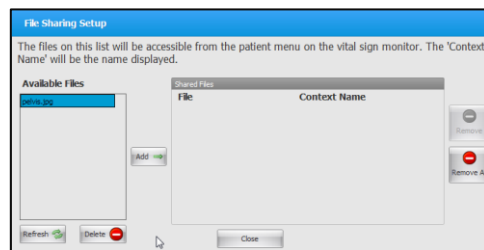
The sensor control window is a floating panel with on/off toggle controls. Click Monitors> Sensors> Window to open the floating sensor control panel.



Single click the circular icon to enable or disable the sensors displayed on the virtual monitor screen. Click the circle dark to disable the sensor and light blue to re-enable it. In the example above, all the sensors are on except the thermometer.

FILE SHARING

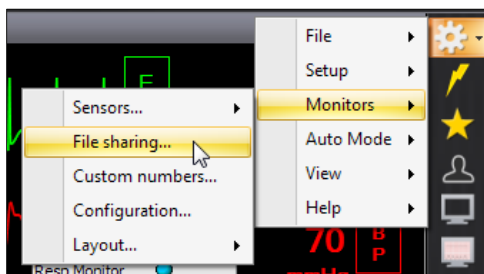
The file sharing menu allows the facilitator to send images, audio, and text files to the virtual monitor screen. Use the file sharing feature to fulfill file requests by the provider during simulation.



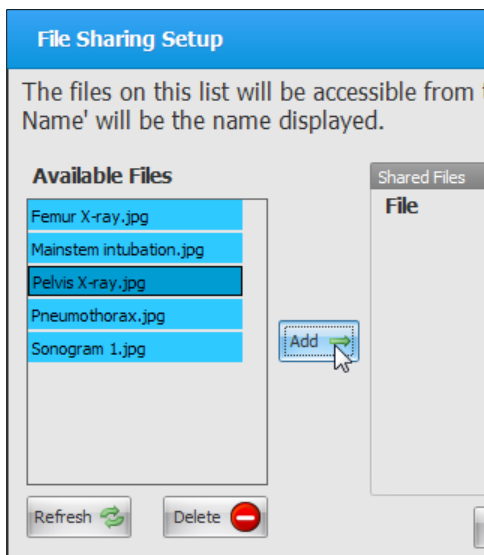
The files used for sharing are stored in the control PC. Before the simulation begins, add mock image (.jpg, .bmp) or text files (.txt) into the Gaumard_UI folder located on the home screen of the control computer.



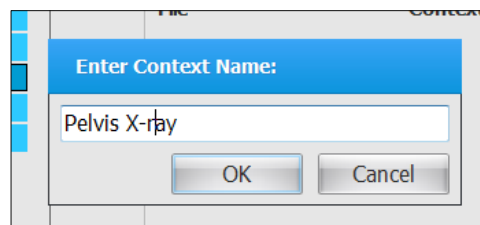
Open the "File Sharing" menu.



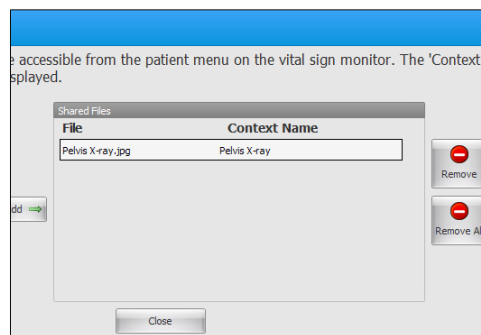
The list of files stored on the Gaumard_UI folder available for sharing is displayed on the left panel. To share a file, select the file from the left panel and click "Add".



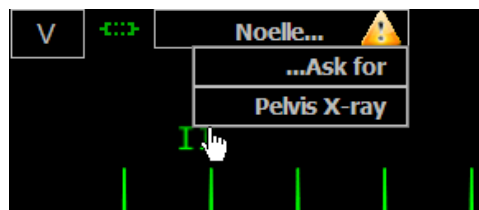
Enter a context name on the pop-up menu and click "OK" to share.



Files currently shared are listed on the "Shared Files" list.



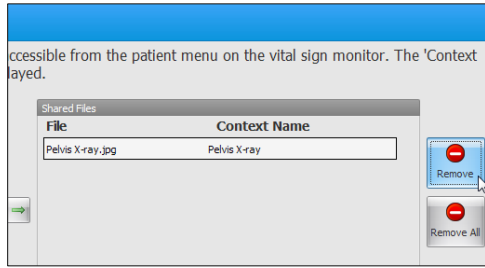
A yellow notification icon is displayed on the patient menu at the top left of the virtual monitor screen. The icon notifies the provider that a file is available for viewing. Click the patient menu and select the file open it.



The x-ray file is now open on the virtual monitor computer.



To unshare the file, select the file from the file sharing menu and click remove.

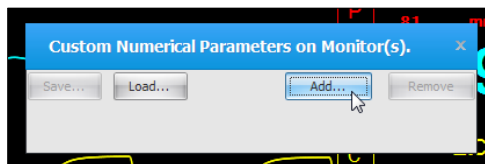


To troubleshoot file sharing access errors, please reference the Gaumard Monitors user guide.

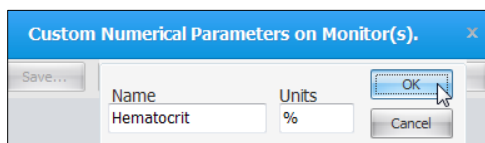
CUSTOM NUMBERS

Use the custom numbers feature to add custom numerical parameters to the Gaumard Monitors screen. For example, glucose levels or platelets count.

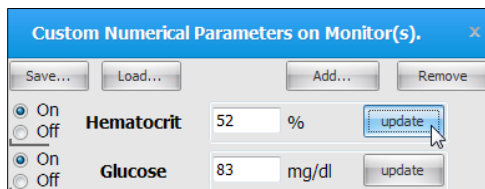
On the GIGA menu bar click Monitors>Custom Numbers to open the “Custom Numerical Parameters on Monitor” menu. Click the “Add” button to create a new parameter.



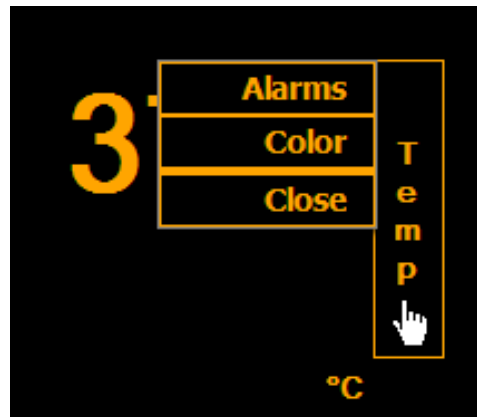
Type the name and units of the new parameter and then click “OK”.



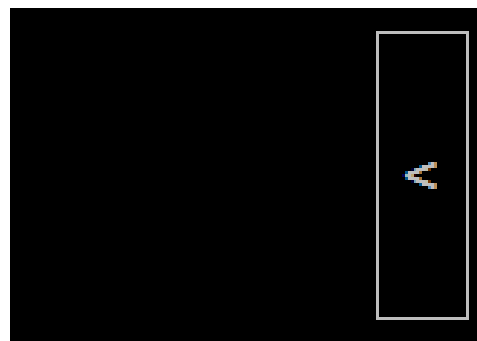
The scalar parameter is now created. Enter a value for the parameter and click “Update”.



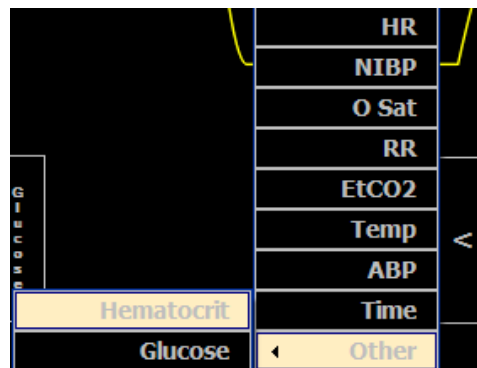
On the virtual monitor screen, click on a scalar’s menu and select “Close” to make the entry available for the custom parameter.



The scalar entry is now a blank field.



Click on the empty scalar menu and select “Other” from the list of available scalar parameters. Select the name of the custom parameter.



The figure below shows two new values: Glucose level and hematocrit levels. Return to the custom parameter menu on the GIGA software to update the values when necessary.



CONFIGURATION

On the GIGA menu bar, click Monitors>Configuration to open the “Virtual Monitor Setup” window. Use the setup window to verify the connection between the GIGA software and the Gaumard Monitors vital signs software, re-configure the communication ports, and view the controller IP address. To troubleshoot connectivity issues between the two computers, please turn to page 174.

CONFIGURE THE VITAL SIGNS BROADCAST

After the wireless ad-hoc link is established between both computers, complete next steps to configure the transmission of the vital signs information.

1. Verify that both computers are connected to the GaumardNet network using Windows® wireless connection menu. If the computers are not connected, select the “GaumardNet” network and click “Connect” manually.



2. Start the GIGA control software.
3. On the GIGA menu bar, click Monitors>Configuration.

The “HAL Virtual Monitor Setup” window is displayed.

4. Set the adapter to “Wireless network connection” and click “Connect” to begin transmitting the vital signs information. Write down the “controller IP” and “Port number”.
5. Start the Gaumard Monitors software on the virtual monitor PC.
6. Click the “V” menu near the top left corner, and then select “Comm Setup”.

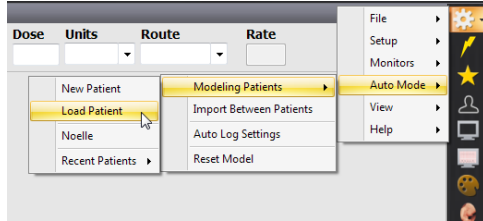
The “TCP Comm Setup” window is displayed.

7. Enter the “Controller IP” and “Port number” displayed on the GIGA “Virtual Monitor Setup” window.

Click “Connect” to accept the incoming connection.

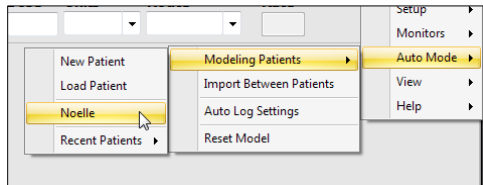
Modeling

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



MODELING PATIENTS

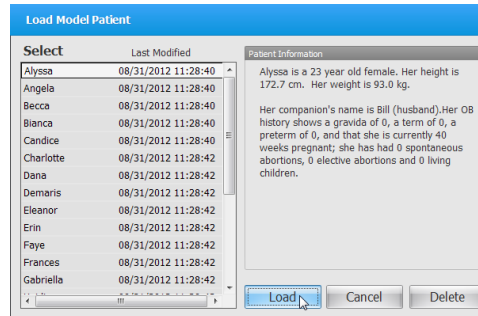
This option allows you to create a new patient or load an already existing one.



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 “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 HAL cannot be deleted, as opposed to any of the patients that you create yourself, which can be deleted.

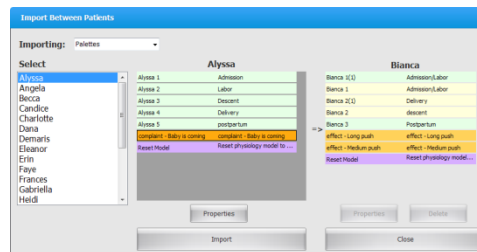
Patient information is displayed on the right side and near the top of the Details tab.

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.

IMPORT BETWEEN PATIENTS

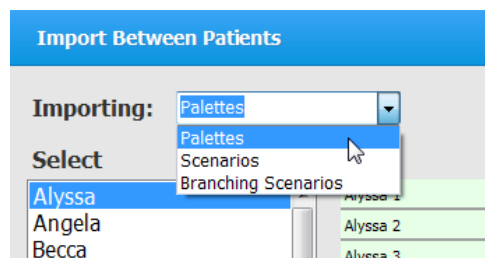
Use the “Import between patients” menu to import palettes, scenarios, and branching scenarios from other patient profiles into the current active one.



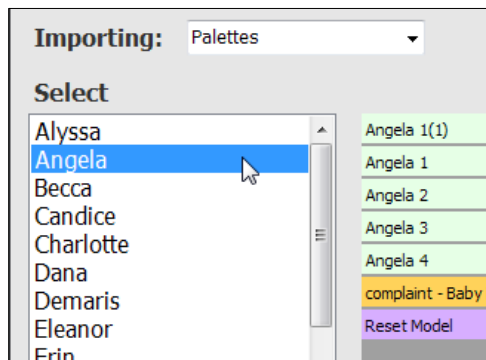
To import an item another patient in to the active patient:

1. Click Auto Mode> Import Patient to open the “Import” menu

2. Select the item category to import



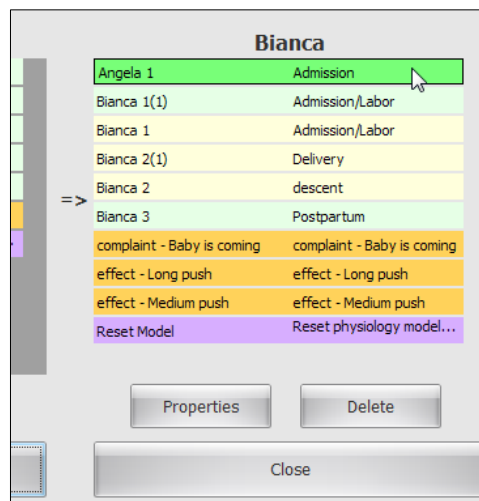
1. Select the patient name that contains the items to be imported into the active patient



2. Select the items to import from the list and click "Import"

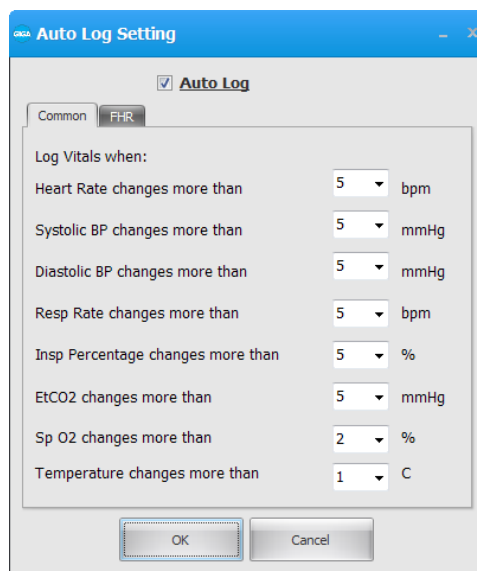


The palettes are now copied into the active patient.



AUTO LOG SETTING

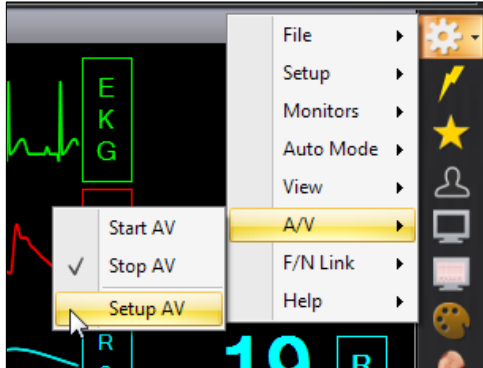
This menu option is used to specify various vitals to be logged automatically after reaching a specific threshold.



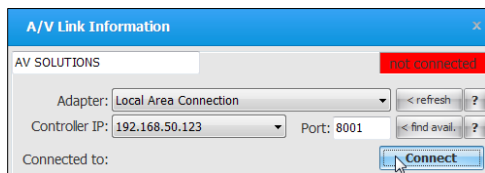
A/V (Audio Video)

GIGA is capable of interfacing with a number of third-party A/V recording systems. Generally, A/V solutions capture footage of the simulation and interlace it with the event information generated by the simulator control software.

To enable the fetal Neo link menu option, go to Set Up > Options > Other and checkmark “Use AV System”.



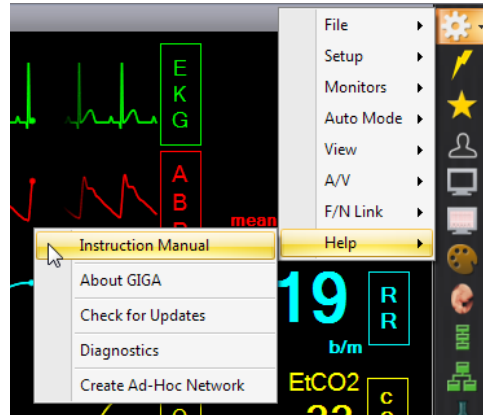
Click “Setup AV” to configure the software connection to the AV system. Enter a port number for the connection and click “Connect” to establish a link. Please contact the AV administrator for information on how to accept incoming connections from the GIGA software.



Return to the A/V menu and click “Start AV” to initialize the recorder. Some third party A/V solutions may not recognize the “Start” command generated by the log event. If the recorder does not start remotely, please start the new video manually using the third party controls.

The log event does not command the recording to stop at the end of the scenario automatically. Click Stop A/V from the menu to end the recording.

Help



INSTRUCTION MANUAL

Click the Instruction Manual option to open a digital copy of the latest “User Guide” information.

ABOUT GUI

Click “About GUI” to view the software version.



CHECK FOR UPDATES

Redistributable GIGA installer files are available for download at <http://www.gaumard.com/software-updates/>.

To update the GIGA software using a flash drive:

1. Download the update file to a flash drive using a computer with internet access
2. Copy the setup file to the simulator’s control computer

3. Run the GIGA update file to update the software

Do not change the wireless network settings. Doing so will disconnect the virtual monitor computer and the Gaumard Monitors vital signs software.

To update the GIGA software using an Ethernet connection:

4. Connect an Ethernet cable to the laptop PC.
5. Click “Check for Updates”.
6. Click “Install” to begin the update. The download progress bar begins to auto-fill as the setup file is downloaded

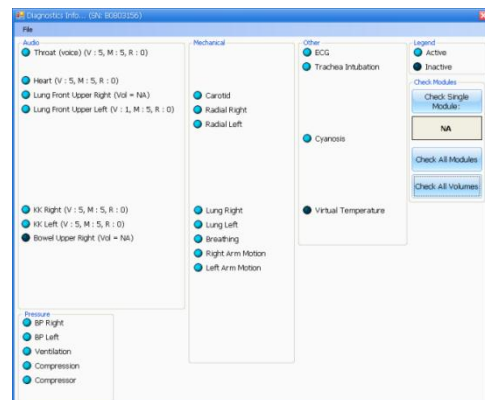
After the download is complete, the update setup wizard is launched automatically.

7. Click “Next”, and follow the wizard to complete the software download.

DIAGNOSTICS

The diagnostics menu is used to test the status of electronic and mechanical components in the simulator.

Click “Check all Modules” to run a full systems check. Active modules report blue. Modules that are inactive or not installed report black.



Working with the Simulator

Overview

Please reference the simulator model features list for detailed information on the standard and optional features for each HAL series model.

AIRWAY & APPEARANCE

- Intubatable airway and nares, accommodating most popular airway adjuncts
- Difficult airway actuators for tongue edema, pharyngeal swelling, and laryngospasm
- Visible and audible gastric inflation with esophageal intubation or upon forceful bag-valve-mask ventilation
- Surgical site for tracheotomy, needle cricothyrotomy or retrograde intubation
- Head tilt/ chin lift
- Jaw thrust

BREATHING

- Control rate and depth of respiration and observe chest rise
- Automatic chest rise is synchronized with respiratory patterns and lung sounds.
- Select independent lung sounds: upper right front and back; upper left front and back; lower right front and back; lower left front and back
- Accommodates assisted ventilation including BVM and mechanical support
- Ventilations are measured and logged
- Gastric distension with excessive BVM ventilation
- Detection and logging of ventilations and compressions
- Simulated spontaneous breathing
- CO₂ on exhalation (10 levels) using replaceable cartridge mounted inside the simulator
- Variable respiratory rates and inspiratory/expiratory ratios
- Attach to real mechanical ventilators
- Bilateral chest rise and fall
- Unilateral chest rise simulates pneumothoraces
- Anterior and posterior auscultation sites
- Bilateral needle decompression at second intercostal Dynamic Airway and Lung compliance/resistance

- Ten levels of static compliance, 15-50 ml/cm H₂O
- Ten levels of airway resistance
- Use in conventional ventilation modes
- Holds PEEP from 5 to 20 cmH₂O
- Exhales real and measurable CO₂
- Vary lung mechanics throughout scenario
- Receive real time feedback from real mechanical ventilator
- Capable of assisting the ventilator at variable respiratory rate

CIRCULATION

- Measure blood pressure by palpation or auscultation using a real BP cuff.
- Korotkoff sounds audible between systolic and diastolic pressures
- Oxygen saturation detected using a real monitor on the left index finger.
- Pulse sites synchronized with BP and heart rate
- Bilateral IV arms with fill/drain sites
- Realistic flashback
- SubQ and IM injection sites for placement exercises
- Intraosseous access at tibia
- Chest compressions generate palpable blood pressure wave form and ECG artifacts
- ECG monitoring using real medical equipment
- Defibrillate, cardiovert and pace using real devices
- Multiple heart sounds, rates and intensities
- ECG rhythms are generated in real time
- Heart sounds synchronized with ECG
- Dynamic 12 lead ECG display
- Bilateral carotid, radial, brachial, femoral, popliteal and pedal pulses synchronized with ECG
- Pulses vary with blood pressure, are continuous and synchronized with the ECG even during a paced rhythm

DRUG RECOGNITION SYSTEM

- Simulator identifies drug type and volume injected into veins of the right hand and forearm
- Supplied with 100 syringes having wireless tags
- Use drugs from library or choose to model other drugs using software template
- Physiologic models update simulated vital signs monitors
- 22 gauge needle recommended; larger needles will decrease venous life
- Supplied with easily replaceable veins

SPEECH

- Wireless streaming audio
- Pre-recorded sounds
- Create and store vocal responses in any language
- Be the voice of the simulator and hear responses at distances up to 100 meters

SYSTEMIC

- Articulating body
- Central cyanosis
- Interchangeable genitalia
- Auscultate bowel sounds
- Catheterizable male/female genitalia
- Blinking eyes with reactive pupils
- Optional trauma amputation arm and/or leg
- Seizure/convulsions
- Supine or semi-recumbent positions

VITAL SIGNS MONITOR

- All in one touchscreen PC with virtual patient vital sign monitor software
- Use selected configuration or create your own configuration to mimic the real monitors used in your facility
- Customize alarms
- Reflect simulator's condition during the scenario
- Share images such as ultrasounds, CT scans, lab results
- Display up to 12 numeric parameters
- Select up to 12 dynamic waveforms

CONTROL

- Proprietary communications module can be used simultaneously with the tablet computer's integrated wireless (IEEE 802.11b) networking device
- Bluetooth® technology in the tablet computer allows wireless printing to compatible printer and quick connections to other devices
- Touchscreen tablet with GIGA™ user interface
- RF communications up to 300 meters in open space; streaming audio 100 meters

OTHER

- One year limited warranty, available extended warranty to three years
- Installation and training services available.
- Technical support and onsite repair.

Features

Disclaimer: The section below describes all possible features in the HAL simulator. The content of this table is subject to change without prior notice. Please contact Gaumard Scientific for the most current information.

Y = Yes included

O = Optional

Category	Feature	HAL S3201	HAL S3101	HAL S3000	
Airway	Nasal intubation	Y	Y	Y	
	Airway intubation	Y	Y	Y	
	Airway complications: pharyngeal swelling, laryngospasm and tongue edema	Y	Y	Y	
	Intubation Sensor	Y	Y	Y	
	Surgical Airway	Y	Y	Y	
	Airway sounds	Y	Y	Y	
Breathing	Respiratory patterns	Y	Y	Y	
	Independent quadrant lung sounds	Y	Y	Y	
	Hemothorax sites	Y	Y	Y	
	Needle decompression	Y	Y	Y	
	Bilateral chest rise	Y	Y	Y	
	Pulmonary ventilation	Y	Y	Y	
	Ventilations are measured and logged	Y	Y	Y	
	Monitor feedback on a real ventilator	Y	N	N	
	Bilateral bronchi resistance	Y	N	N	
	Breathing pattern triggers ventilator assist mode	Y	N	N	
	Variable lung compliance	Y	N	N	
	Real CO ₂ exhalation	Y	O	N	
Cardiac	Heart Sounds	Y	Y	Y	
	ECG Monitoring	Y	Y	Y	
	Electrical therapy	Y	Y	Y	
	12 Lead chest skin	Y	O	O	
	4 Lead chest skin	-	Y	Y	
Circulation	Bilateral pulses	Y	Y	Y	
	Bilateral IV arms	Y	Y	Y	
	Left arm blood pressure	NIBP	Y	N	N
		Manual	Y	Y	O
		Modified	N	N	Y
Drug Recognition arm	Y	O	O		

Category	Feature	HAL S3201	HAL S3101	HAL S3000
	Monitor OSAT using real monitor	Y	Y	O
	Central cyanosis	Y	Y	Y
Neurological	Reactive eyes	Y	Y	Y
	Seizures	Y	Y	Y
Other	CPR evaluation	Y	Y	Y
	Intramuscular injection sites	Y	Y	Y
	Urinary catheterization	Y	Y	Y
	Intraosseous access	Y	Y	O
	Bowel sounds	Y	Y	Y
	Physiologic Modeling	Y	Y	O
	Streaming audio	Y	Y	O
	Virtual vital signs monitor	Y	O	O
	Trauma leg	O	O	O
	Trauma arm	O	O	O
	Pro+ recording and debriefing solution	O	O	O

Airway

NASAL AND ORAL INTUBATION

Intubate HAL's airway via the nasal or oral route using an endotracheal tube or an LMA.

WARNING: Always lubricate the endotracheal tube and the medical device using silicone oil before intubating. Do not introduce liquids into the airway. Doing so can permanently damage the system.

Procedure	Recommended Device Size
Intubation (Blade size)	Miller 4 or MAC 3.5
LMA	Size 4
Nasal Intubation	8 mm outer diameter max
Oral Intubation	ETT 7 or 7.5

AIRWAY COMPLICATION

Use the software controls to enable the airway complications and make intubation more difficult. HAL can display pharyngeal swelling, tongue edema, and laryngospasm.

WARNING (S3201): Do not rotate the head while laryngospasm is on. Doing so may damage the laryngospasm mechanism.

AIRWAY SOUNDS

The simulator can produce audible airway sounds. Use the software controls to change the sound type and adjust the volume. Auscultate using a standard stethoscope.

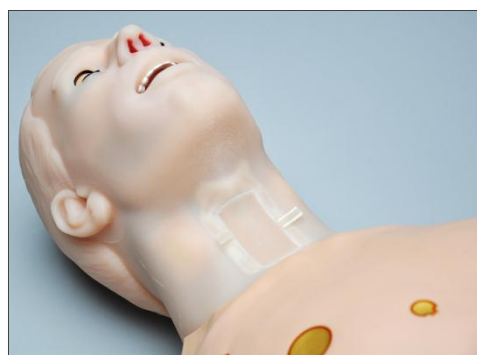
INTUBATION SENSOR

Sensors in the airway detect the placement of the endotracheal tube. If the endotracheal tube is inserted too deep, the left lung is disabled automatically demonstrating right mainstem intubation. Correcting the tube position enables the left lung chest rise.

SURGICAL AIRWAY

HAL includes replaceable surgical airway inserts that allow for tracheotomy or needle cricothyrotomy exercises using real medical equipment. The surgical inserts feature anatomical landmarks. A separate ventilation insert is pre-installed designed to maintain a tight air seal during ventilation and intubation exercises. Interchange the airway inserts as needed. For more information on consumable items, navigate to page **Error! Bookmark not defined.**

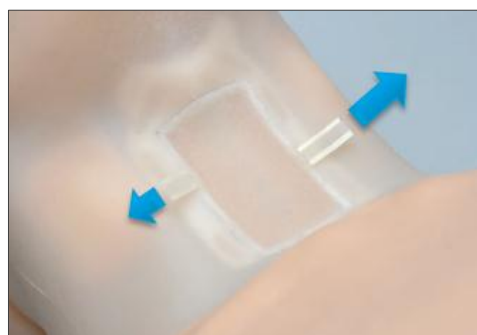
WARNING: Do not perform surgical exercises on the ventilation insert.



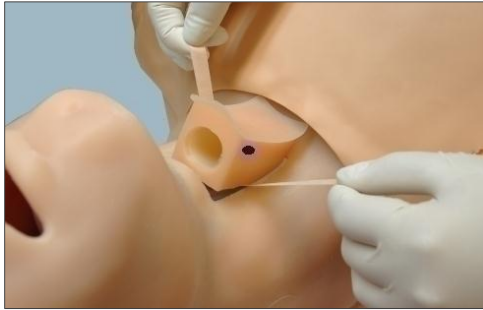
SURGICAL INSERT INSTALLATION

To remove the ventilation insert and install a surgical insert:

1. Remove the ventilation airway insert by pulling on the ribbons located on either side.



The airway ventilation insert is marked by a blue dot on either side.



5. Feel the anatomical landmarks to identify the surgical insert.



2. Adjust the ribbons to accommodate the surgical neck insert.



3. Apply petroleum jelly to all four sides of the surgical insert. The letter T (top) indicates the orientation of the insert's placement.



4. Place the surgical insert inside the cavity with the letter T towards the head and gently press it down into position.



Breathing

BILATERAL CHEST RISE

Bilateral chest rise and fall is automatic. Use the software controls to enable or disable the lungs independently and to adjust the breathing rate and the inspiratory percentage.

VENTILATION

Set the respiratory rate to 0 and ventilate the simulator using a standard bag valve mask. Open the CPR window to monitor the provider's ventilation performance in real time. Complete the ventilation calibration process before using the ventilation feature for the first time.

VENTILATION CALIBRATION

The ventilation calibration wizard records the performance average of five ventilations as the benchmark for correct ventilation. Perform the actions requested by the calibration wizard following the most current CPR guidelines. The CPR window evaluates provider performance based on the benchmark recorded during the calibration process.

To calibrate the ventilation performance benchmark:

1. Click Setup > Calibration > Ventilations, and click "Next"

The wizard prompts to perform ventilation "#1"

2. Perform the first ventilation. A green filled oval indicates that the ventilation was recorded successfully
3. Perform ventilation # 2 as prompted by the wizard. A green filled oval indicates that the ventilation was recorded successfully
4. Continue through the calibration wizard to record a total of five ventilations

At the end of the calibration process, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the calibration settings.

BREATHING PATTERNS

Control the respiratory rate, pattern, and inspiration percentage using the software controls. The breathing patterns are synchronized with the lung sounds and chest rise.

DYNAMIC LUNG (S3201)

HAL's dynamic lungs can simulate the elastic properties of a real human lung. The adjustable lung properties allow for simulating a variety of respiratory complications. Participants can connect HAL to a mechanical ventilator using standard medical procedures and monitor realistic waveform feedback on the ventilator screen. Adjust the lung parameters and the vital signs to improve or deteriorate HAL's condition throughout the simulation.



Some of HAL's dynamic lung features include:

- Connect HAL to a mechanical ventilator directly using a standard ventilator circuit just like a real patient. No proprietary adjuncts, adapters, or intermediary devices are required to connect a ventilator to the simulator.
- Provide mechanical ventilation by volume or pressure
- Provide mechanical ventilation with assist control and other modern ventilation modes
- Use the GIGA controls to adjust HAL's dynamic lung properties on the fly while the simulator is connected to the ventilator.
- Adjust HAL's ten static lung compliance levels (from 15 to 90 mL/cm H₂O) and ten levels of independently controlled airway resistance to deteriorate or improve HAL's condition during the scenario
- HAL holds positive end-expiratory pressure (PEEP 2 - 50 cm H₂O) even while lung compliance and airway resistance levels undergo a change
- Set HAL's inspiratory effort rate to trigger the ventilator for an assisted breath

DISCLAIMER: HAL's operating limitations are consistent with that of a real person. Treating HAL in a manner that would seriously harm a real person is likely to result in damage to the internal lung system.

DISCLAIMER: HAL is not designed to test the performance, functionality, and accuracy of a mechanical ventilator. Always follow the mechanical ventilator's guidelines and precautions.

WARNING: Do not introduce liquids, humidified gases, or administer aerosol medications into the airway. Moisture in the airway will damage the simulator's internal mechanics.

INSTRUCTIONS FOR USE

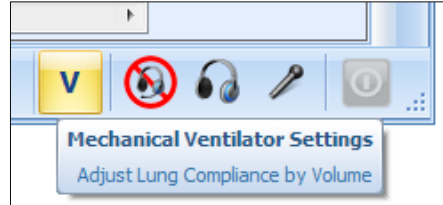
By default, HAL will initialize with healthy respiratory rate of 13 breaths per minute. Connecting the ventilator while the simulator is breathing normally is not recommended. Just as with a real patient, attempting to force air into the airway while Hal is breathing normally will likely trigger the ventilator alarms and put unnecessary stress on the lungs.

Avoid intubating the airway while the simulator is powered off. Doing so will result in inaccurate intubation readings. To reset the intubation sensor, remove the ET tube and restart the software.

To connect HAL to a mechanical ventilator and start assisted ventilation:

1. Using the GIGA software controls, set HAL's respiratory rate to 0
2. For this example, configure the ventilator with the following settings (suggested): breaths per minute frequency: 12-15 bpm, max flow rate 40 L/min, tidal volume 550 mL, patient weight: 75 Kg (165 lbs.), ventilation control by Volume.

3. On the GIGA software, toggle the simulator's lung compliance mode setting to "V" (Adjust lung compliance by Volume). If the ventilator is set to pressure control, set the GIGA lung compliance mode to "P" (adjust lung compliance by pressure)



4. Lubricate the endotracheal tube and intubate HAL. Placement procedures and tube sizes follow the specifications of an adult patient.
5. Connect the ventilator to the patient circuit and initialize the ventilator

Please allow up to 60 seconds while HAL's dynamic lung properties stabilize.

ADJUSTING THE DYNAMIC LUNG CONTROLS

Use the following GIGA controls adjust the simulator's dynamic lung properties. After making a change to a lung parameter (lung compliance and resistance), please allow up to 60 seconds for the lungs properties to stabilize at the new static level. Avoid adjusting the ventilator settings during the brief stabilization period. All other vital signs parameters will continue to trend as specified.

- Lung compliance: Change the lung compliance level to adjust HAL's lung elasticity. Increase the lung compliance to level 9 to make the lungs more flexible. Decrease the lung compliance to level 1 to make the lungs more rigid.
- Resistance: Adjust the "resistance" control to increase or decrease the resistance to airflow during ventilation and exhalation for each lung.
- Patient Trigger Rate: Adjust the "patient trigger rate control" to set the number of inspiratory efforts HAL will make in 1 minute. The patient trigger rate programs HAL to inspire periodically to simulate a real patient attempting to take a breath. Each inspiratory effort can trigger a ventilator's assist mode to deliver a full assisted breath or a spontaneous breath on CPAP.

RESPIRATORY SOUNDS

The simulator generates audible upper, lower, anterior, and posterior lung sounds. Use the software controls to select between the available respiratory sounds and to adjust the volume of each lung independently. The respiratory sounds include normal, wheezing, inspiratory squeaks, crackles, and rales.

HEMOTHORAX SITES

Bilateral chest drain sites located in the 5th intercostal space allow for Pneumo or hemothorax exercises. The hemothorax sites support 32 French straight thoracic catheters only.

WARNING: Use the hemothorax sites for placement exercises only. Do not introduce fluid to the hemothorax sites.



NEEDLE DECOMPRESSION

Bilateral needle decompression sites are located at the second intercostal space. To build up pressure in the pleural space, turn the pneumothorax feature on using the software controls. Treat the tension pneumothorax using a needle. Then, turn the pneumothorax feature off to stop the flow of air through the decompression site. Use smaller gauge needles to extend the life of the chest skin and the needle decompression reservoirs.



REAL CO2 EXHALATION

HAL can exhale real CO₂ with the use of a CO₂ cartridge. Once a CO₂ cartridge is installed in the simulator, use the software controls to adjust volume of CO₂ exhaled. HAL can also be operated without a CO₂ cartridge installed. A virtual CO₂ value is displayed on the virtual monitor PC.

Due to shipping regulations, CO₂ cartridges are not included with the system. The required 16g threaded CO₂ 3/8"-24UNF-2A cartridges can be purchased at most bicycle or hardware stores. 12g threaded cartridges are also compatible with the CO₂ feature.



CO2 SAFETY AND WARNING CHECKLIST

Review the safety and warning checklist information before using the CO2 feature. Failure to comply with the warnings listed below and those included with the original cartridge packaging may result in serious personal injury.

- Always follow the manufacturer's safety and warning information included with the CO2 cartridge package.
- Never point a CO2 cartridge at yourself or others
- Do not use damaged CO2 cartridges
- Do not puncture the cartridge CO2 seal manually
- Do not expose the CO2 cartridges to high temperatures as indicated on the product's packaging
- Install threaded cartridges only (3/8"-24UNF-2A). Do not attempt to install a cartridge that does not meet the specifications listed in this document.
- Do not over tighten the cartridge into the simulator's cartridge harness
- Always verify that the CO2 cartridge is empty using the software diagnostics before removing it. Do not remove the CO2 cartridge if the simulator is not fully operational.

INSTRUCTIONS FOR USE

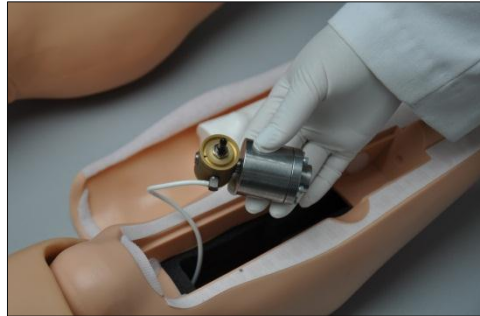
For maximum duration, connect the CO2 cartridge just before the simulation begins. If a CO2 cartridge is installed and left overnight, it will empty within 24 hrs whether it is used or not.

To install a new CO2 cartridge:

1. Remove the right leg skin cover and the tibia bone insert

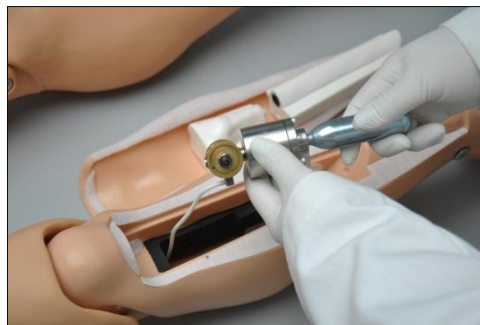


2. Remove the harness adapter located inside the right lower leg chamber.



3. Screw in a new CO2 cartridge into the harness adapter. The harness adapter will puncture the CO2 seal as the cartridge is tightened. The cartridge will feel cool to the touch when the seal is broken. Continue to tighten the CO2 cartridge until is secured.

Do not unscrew the cartridge once the seal is broken.

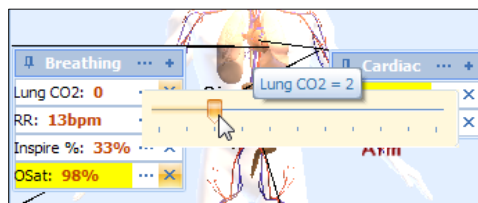


4. Insert the adapter into the chamber and replace the tibia insert and skin.



ADJUSTING CO2 OUTPUT

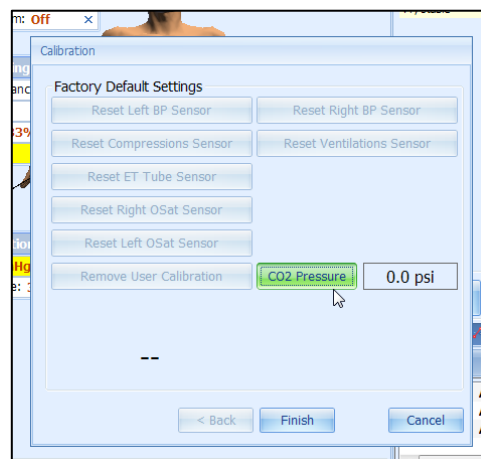
After the cartridge is installed, adjust the Lung CO2 parameter to adjust the volume of exhaled CO2.



The graph below outlines the duration of CO₂ output for each of the programmable CO₂ levels with following parameters: RR=13, Compliance= 8, Airway Resistance=0, VT = 550. Go to page 119 for information on installing the CO₂ cartridge.

CO ₂ Level	Approximate kPa	Approximate duration (in minutes) of CO ₂
0	0	
1	1.7	125
2	2.8	110
3	3.9	75
4	4.7	55
5	5.5	45
6	6	35
7	6.7	30
8	7.3	25
9	7.7	25
10	8.5	20

Do not remove the cartridge if pressurized CO₂ is being reported. Allow the CO₂ cartridge to empty before attempting to remove it.



Unscrew the empty CO₂ cartridge slowly. If CO₂ starts to escape, STOP unscrewing the cartridge and allow the remaining CO₂ to escape before removing the cartridge completely.

WARNING: Never point the CO₂ cartridge at yourself or others.

REMOVING AN EMPTY CO2 CARTRIDGE

A "Low CO₂!" notification is displayed when low CO₂ pressure is detected in the cartridge.



Go to Setup> Calibration> Factory Settings and click "CO₂ Pressure" to view the cartridge pressure reading. Replace the CO₂ cartridge when the pressure reading reports 0.0 psi.

Cardiac

HEART SOUNDS

HAL generates audible heart sounds (normal, distant, systolic murmur, S3 and S4) which are tied to a user defined heart rate and selectable rhythms. Use the software controls to change the heart sound type and volume level.

ECG MONITORING AND ELECTRICAL THERAPY

The simulator is equipped with conductive skin sites that allow the attachment of real electrodes and defibrillator pads. This feature allows the provider to track cardiac rhythms using real medical equipment just like with a human patient.

The simulator's ECG and defibrillation sites generate waveforms detectable using real medical equipment and standard electrodes. Real automated external defibrillators can detect the simulator's heart rhythm and treat shockable rhythms.

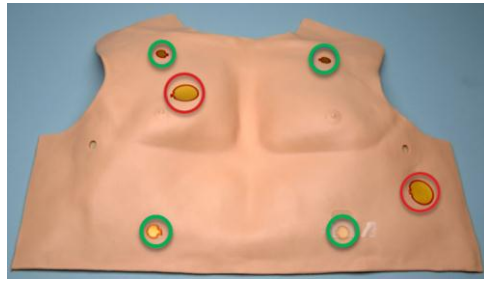
Defibrillation is only supported on the large sternum and apex sites circled RED below. Do not deliver a shock to ECG electrode sites on the shoulders or waist marked GREEN. The warranty does not cover damaged to the simulator caused by applying electrical therapy to the ECG sites.

For exercises that incorporate real electrical therapy of any kind, always follow the safety guidelines and operating procedures outlined in the medical device manufacturer documentation.

12 LEAD CHEST SKIN



4 LEAD CHEST SKIN



ECG AND ELECTRICAL THERAPY CHECKLIST AND WARNINGS

- Always follow the standard medical guidelines and precautions for handling electrical therapy devices. Improper use of a real electrical therapy device may result in personal injury.
- Operate simulator in a well-ventilated area free of flammable gases.
- Ensure the simulator is fully assembled, fully operational, dry, and undamaged before administering electrical therapy. Never apply electrical therapy if the simulator is in contact with a conductive surface or substance.
- Do not leave electrodes or pads attached to the conductive sites when the simulator is not in use.
- Use hard paddles or wet-gel pads preferably. Avoid using solid-gel pads as they increase the risk of burning the simulator's skin if arcing occurs. When using gel patches, make sure not to leave air gaps or bubbles between the pads and the conductive area on the simulator's skin to avoid arcing.
- Clean the conductive sites at the end of the simulation. Refer to the care section for more information on approved cleaning products. Gel residue, adhesive residue, or dirt can increase the risk of arcing during defibrillation.
- Do not reuse gel-adhesive or use expired pads.

- Do not attempt to repair or modify any electrical connections or conductive sites. Discontinue use if wires are exposed, wire insulation is damaged, or if any conductive sites are damaged.
- Electrode gel can become a pathway for electrical current. Do not allow defibrillation pads to overlap ECG sites or gel to carry a current to the ECG sites. Applying an electrical current to the ECG sites will result in damage to the simulator's internal components.
- Some electrical therapy devices may be sensitive enough to detect the simulator's electrical current for operation. If the interference is displayed on the ECG reading, please disconnect simulator's charger and operate the simulator on battery power only.

At the end of the calibration process, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the calibration settings.

CHEST COMPRESSIONS

Set the heart rhythm to asystole and instruct the provider to perform chest compressions. Monitor the depth and frequency of chest compressions from the CPR trainer window. Before using the chest compression feature for the first time, please calibrate the chest compression feature.

COMPRESSION CALIBRATION

The compression calibration wizard records the performance average of five compressions as the benchmark for a correct compression. Perform the actions requested by the calibration wizard following the most current CPR guidelines. The CPR window evaluates provider performance based on the benchmark recorded during the calibration process.

To calibrate the compression performance benchmark:

1. Click Setup > Calibration > Compressions, and click "Next"

The wizard prompts to perform compression "#1"

2. Perform the first compression. A green filled oval indicates that the compression was recorded successfully
3. Perform compression # 2 as prompted by the wizard. A green filled oval indicates that the compression was recorded successfully
4. Continue through the calibration wizard to record a total of five compressions

Circulation

BILATERAL PULSES

The simulator's palpable pulses are blood pressure dependent. Use the software controls to disable the distal pulses to simulate severe hypotension.

Non-Invasive Blood Pressure (S3201 H1209613 OR HIGHER)

HAL's upper left arm can generate palpable oscillations that simulate blood flow. This allows care providers to monitor HAL's blood pressure using a non-invasive blood pressure cuff and oscillometric monitoring equipment.

Complete the NIBP calibration process before using the feature for the first time. The NIBP feature is calibrated to work with one cuff at a time.

NIBP Cuff Size	Adult Large
----------------	-------------

ENABLING THE NIBP FEATURE

To enable the NIBP feature, go to Setup>Options>Hal Add-ons tab and checkmark "Use automatic NIBP".

Enabling the automatic NIBP function disables the manual blood pressure method feature.

NIBP CALIBRATION

Locate the "NIBP Calibration KIT" and follow the steps below to connect the kit bulb to the NIBP cuff line. The kit bulb is used to set the NIBP cuff pressure to the pressure intervals requested by the blood pressure calibration wizard.



To setup the NIBP cuff for calibration using the NIBP calibration kit:

1. Disconnect the NIBP cuff from the monitoring equipment.
2. Connect the kit bulb included with the "NIBP calibration kit" to the NIBP cuff line. The kit adapters included fit a number of different type of connectors found on most NIBP cuffs as seen below.

NIBP connector type 1



NIBP connector type 2



NIBP connector type 3



3. Place the NIBP cuff on the left arm following the placement techniques used on a real human patient.
4. Leave the cuff on the arm and calibrate the blood pressure feature using the software blood pressure calibration wizard and the kit pressure bulb.
5. After the calibration process is complete, disconnect the calibration kit and connect the cuff to the electronic automatic blood pressure monitor.

It is recommended that the NIBP cuff stays placed on the arm after the calibration process is complete. Removing and replacing the NIBP cuff on the arm can affect the accuracy of the readings. If the cuff must be placed on the simulator as part of the exercise, the provider should place the cuff on the arm in the same location it was placed during calibration process.

BLOOD PRESSURE (MANUAL)

Measure the blood pressure using a standard sphygmomanometer. Korotkoff sounds are heard between systolic and diastolic pressure readings. Before using the blood pressure feature for the first time, place the blood pressure cuff on the arm and calibrate the blood pressure feature using the blood pressure calibration wizard.

To enable the manual BP feature, go to Setup>Options>Hal Add-ons tab and uncheck "Use automatic NIBP". Enabling the automatic NIBP function disables the manual blood pressure method feature.

INSTRUCTIONS FOR USE

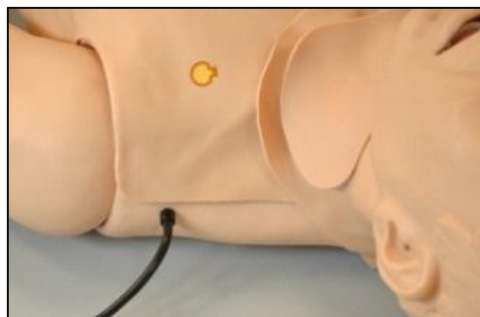
1. Place the cuff around the simulator's upper left arm with the cuff mark at the medial site of the bicep brachii, about an inch (two cm) above the anterior elbow.

Place the cuff in the same position used during the calibration process for accurate readings.

2. Inflate the BP cuff, and auscultate Korotkoff sounds just as with normal patient.

MODIFIED BP PORT FOR VIRTUAL BP SYSTEM (HAL S3000)

Connect the modified blood pressure line to the port on the simulator's left shoulder. Before using the blood pressure feature for the first time, place the blood pressure cuff on the arm and calibrate the blood pressure feature using the blood pressure calibration wizard.



BLOOD PRESSURE CALIBRATION WIZARD

Before starting the calibration process, place the blood pressure cuff on the simulator as it would be placed on a real human patient.

To calibrate the blood pressure feature:

1. Click Setup>Calibration>Blood pressure and click "Next"
2. Set the pressure on the BP cuff to 0 (i.e. cuff valve open) as prompted by the calibration wizard.
3. Click the "OK" button to record the current cuff pressure for the interval. A green filled oval indicates the pressure interval was recorded successfully.
4. Set the pressure on the BP cuff to 20 mmHg as prompted by the wizard and then Click "OK" to record.
5. Continue increasing the BP cuff pressure as indicated by the prompt and recording the pressure intervals.

At the end of the calibration wizard, click "Finish" to close the calibration wizard.

DRUG RECOGNITION (OPTION)

The drug recognition feature enhances the realism of intravenous drug administration exercises by using tagged syringes programmed with virtual medications. During an IV push administration exercise, the drug recognition system can detect the virtual medication injected, the dosage infused, and the administration rate in real time. This allows GIGA to adjust the patient's vital signs in response to the virtual medication infused automatically. For more information on monitoring medications infused into the drug recognition arm, go to page 88.

The drug recognition arm can be identified by the black drainage port located on the right forearm.

WARNING: The simulator must be on when introducing fluids into the drug recognition arm. This includes calibration, purging, draining, IV infusion, and injecting fluids into the veins or the filling ports. Introducing fluids into the drug recognition arm while the simulator is off will damage the arm and the simulator. Damage caused by improper use is not covered under warranty.

The drug recognition arm is equipped with a black drain port and a white filling port. Do not reverse the ports while introducing fluids into the system; doing so will damage the system. Do not attempt to fill the IV system without the black drain connector in place. Always leave the black drain port connected during high volume infusions.

PRIMING THE DRUG RECOGNITION ARM

The drug recognition sensors are active only when fluid is present in the vasculature. Prime the drug recognition arm by filling the forearm vasculature with fluid. This process should be completed before simulation begins.

The drug recognition arm is equipped with a black port for draining and a white port for filling. Do not reverse the ports while introducing fluids into the arm; doing so will damage the system.

Locate the IV Filling kit, which includes the drainage tube (black tip) and filling tube (white tip) and filling syringe.

WARNING: Use only Gaumard's artificial blood concentrate or clean water to fill the vasculature. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

To prime the drug recognition arm for an IV push exercise:

1. Power on the simulator
2. Attach the drain tube to the black output port and place the end of the drain hose inside a container.



Place the collection container below the arm level to siphon the fluids in the next step.

3. Fill the filling syringe with water and connect it to the white port.
4. Insert water in the system until fluids exit through the drainage tube and all air bubbles are purged.
5. Disconnect the drain tube and the fill syringe.

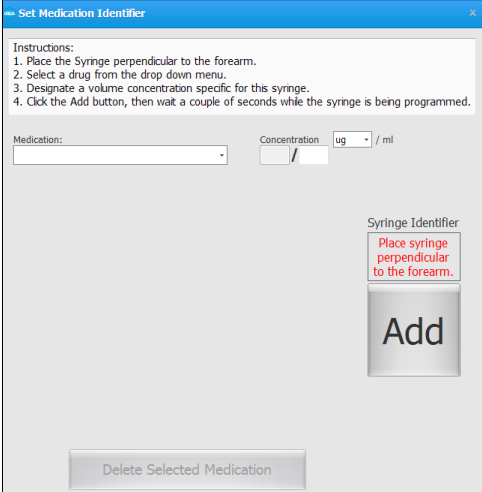
PROGRAMMING THE SYRINGES

The tagged syringes supplied with the Drug Recognition arm must be associated with a virtual medication and a concentration before they are used for the first time. The syringes remain programmed unless the medication properties are deleted manually using the "Set Med ID" menu.

To program a tagged syringe with a virtual medication for use with the drug recognition arm:

1. Power on the simulator
2. From the Setup menu, click "Set Med ID". The Set Med ID option is only available on simulators equipped with the Drug Recognition Arm.

The Set Medication Identifier dialog box is displayed.



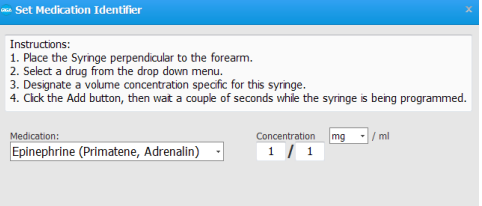
3. Rotate the lower right arm so the palm of the hand is facing up, and place the syringe holder on the simulator's right wrist.



4. Place the tagged syringe in the holder. The syringe must be perpendicular to the surface of the forearm.

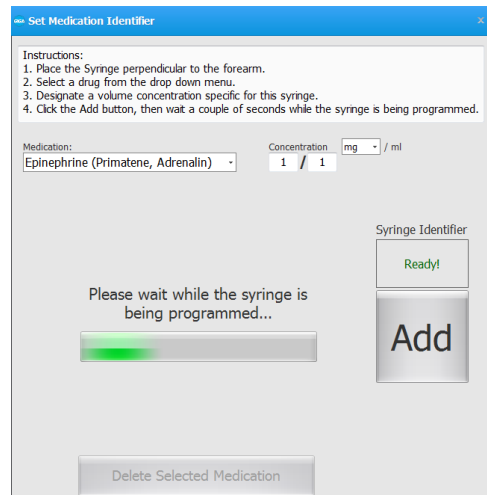


5. Select a drug from the drop-down menu and enter the concentration.



The Syringe Identifier displays “Ready!” when the syringe is in range.

1. Click the “Add” button associate the virtual medication to the syringe. Please wait while process is completed.



The syringe is now associated with the medication type and concentration. The medication association is listed in the “Set Medication Identifier” dialog box. Use the labels provided to identify the syringe with the medication name and concentration.

Repeat the “Set Med ID” process to program additional syringes with other medications.

Reuse tagged syringes by reprogramming the associations. To delete a medication associated with a particular syringe, highlight the desired medication from the “Set Med ID” list and click “Delete Selected Medication” button.

The medication detection feature can trigger auto responses. Drug auto responses move the scenario to the next stage when the drug type and dosage threshold are detected. To learn more about programming drug auto responses in a scenario, go to page 57. .

INSTRUCTIONS FOR USE

To inject fluids into the drug recognition (right) arm using a tagged syringe:

1. Power on the simulator and select the Automatic operating mode
2. Fill the preprogrammed syringe with fluid.
3. Inject a vein on the anterior or posterior right forearm while maintaining the syringe near the arm.

The tagged syringe must be close to the arm for the drug recognition module to detect the medication type.

WARNING

Maximum amount of fluid injected without draining should not exceed 40 mL and the maximum injection rate is 9999 mL/hr.

IV ARM

The simulator is equipped with an IV arm that allows for bolus or intravenous infusions as well as for drawing fluids.

WARNING

The drug recognition arm is equipped with a black drainage port. Reversing the fill and drain connections on a drug recognition arm will damage the system and void the warranty. Please refer to the Drug Recognition section to prime the drug recognition arm for an exercise.

Do not attempt to fill IV system without the drain connector in place.

Always leave the drain port connected when injecting fluids into the system.

Use only Gaumard’s artificial blood concentrate or clean water to fill the vasculature. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

Always flush the IV system with distilled water at the end of every simulation.

INSTRUCTIONS FOR USE

To prime the IV arm for an infusion exercise or to draw fluids:

1. Locate the fill syringe with tubing and the drain tube with pinch-clamp. Fill the syringe with the desired fluid -- water or simulated blood.



2. Connect the syringe with tubing to one port and the drain tube with clamp to the other port as shown.



3. Insert water in the system until fluids exits through the drainage tube into the container and all air bubbles are purged.



The IV arm is now ready for use.

To simulate a patient with no accessible peripheral IV sites, connect only the syringe. Pull the plunger to create suction, which will collapse the veins. Disconnect the syringe tube from the arm port while maintaining suction. The port will seal, and the veins will remain collapsed.

CLEANING THE VASCULATURE

Clean and dry the forearm vasculature at the end of the simulation session to prevent mold or clogs.

To clean and dry the IV arm:

1. Power on the simulator
2. Fill the filling syringe with distilled water
3. Connect the fill syringe and the drain tube to arm
4. Flush the vasculature with distilled water. If the IV arm is not going to be used for a week or more, purge the system with 70% isopropyl alcohol solution.
5. Fill the filling syringe with air and purge the clean water to dry the vasculature.

6. Disconnect the drain tube and filling syringe

Warning:

Do not store the simulator with fluids in the veins. Doing so may lead to molding and damage to the internal electronics. Complete the vasculature cleaning procedure at the end of the simulation sessions.

OXYGEN SATURATION

Use a real oxygen saturation monitor to get an oxygen saturation reading from the left index finger. Before using the oxygen saturation feature for the first time, calibrate the simulator to work with the oxygen saturation monitor to be used during the exercise.



OXYGEN SATURATION CALIBRATION

GIGA stores the calibration settings for one device at a time. If the oxygen saturation monitor or the sensor is changed, the simulator must be recalibrated to work with the new device.

Disclaimer: Oxygen saturation monitors that detect carbon monoxide and/or methemoglobin are not supported.

To calibrate the oxygen saturation finger:

1. Turn OFF the oxygen saturation monitor and place the oximeter sensor on the left index finger. Verify that the left index finger is centered inside the finger sensor.
2. Go to Setup>Calibration and select "Oxygen Saturation". Click "Next" to continue.
3. Turn ON the oximeter and click "OK" on the dialog box.

4. Adjust the reading on the oximeter monitor screen to match the value displayed on the GaumardUI calibration screen using the arrows on the left column of the calibration window. The first calibration point is 98%.

Use the triple arrows to increase or decrease the reading on the oximeter in large intervals, double arrows for moderate changes, and the single arrows for small changes of one or two percent readings. Wait 10-15 seconds after making an adjustment to allow the oximeter reading to stabilize. Doing so ensures proper calibration.

5. After the reading on the OSAT monitor is stable and it matches the value on the GaumardUI calibration window, click "OK", and then "Next" to continue.
6. Repeat the process to calibrate the following intervals.
7. Click "Finish" at the end of the calibration and remove the OSAT monitor from the finger.

INSTRUCTIONS FOR USE

1. Start GIGA and establish communication with the simulator.
2. Connect the oximeter probe to the left index finger of the simulator.
3. Turn on the monitor.
4. Adjust the oxygen saturation using the GIGA software controls.

CENTRAL CYANOSIS

Use the software controls to adjust the cyanosis intensity.

Neurologic

REACTIVE EYES

The simulator is equipped with programmable blinking eyes and pupils that dilate. Use the software controls to change the blinking rate and to enable or disable pupil reaction.

PUPIL CALIBRATION

The eye reaction is factory calibrated. Use the "Pupil Sensitivity" controls to recalibrate the pupil reaction for the current room lighting only if needed.

To calibrate the pupil dilation:

1. From the File menu, go to Setup>Options>Tolerances
2. Click "Set ambient light" to recalibrate the pupil diameter to the current ambient light.
3. Cover both eyes from most incoming light and click "Set Dilation Light" to set the low light pupil diameter.
4. Click increase or decrease to adjust the pupil's sensitivity to light

SEIZURES

The simulator is capable of convulsing to simulate mild or severe seizures. Use the software controls to enable the seizure behavior.

Other

BOWEL SOUNDS

Use the bowel sound controls to change the bowel sound types and adjust the volume levels. Auscultate the bowel sounds using a real stethoscope.

GASTRIC DISTENSION

HAL can exhibit gastric distension if ventilated excessively. To relieve the gastric distension, press down on the stomach gently.

INTRAMUSCULAR INJECTION SITES

Intramuscular injection sites are located on both deltoids and quadriceps for injection technique and placement exercises.

INTRAOSSEOUS ACCESS

HAL features replaceable tibia bones on the left leg for intraosseous access. The hollow bones allow for the aspiration and infusion of fluid using real medical devices.

To fill the tibia bones with fluid:

1. Remove the skin cover from the right leg to access the two-part tibia.
2. Remove lower half of the tibia.



3. Fill the tibial tuberosity with fluid using the filling syringe.



4. Fill the tibia fluid using the filling syringe.



5. Replace tibia bone in the leg and the skin cover.

INSTRUCTIONS FOR USE

Intraosseous access is allowed in the hollow tibia inserts only. To view a list of replacement parts including leg skin covers and tibia bones, go to page **Error! Bookmark not defined.**

RESUSCITATION (CPR)

The simulator features ventilation and compression sensors for monitoring CPR performance. The CPR window detects ventilations when the respiratory rate is set to zero or apneic and compressions when the heart rhythm is in an unhealthy state.

Complete the ventilation and compression calibration process before using the CPR window for the first time. To learn more about the CPR window, go to page 91.

VENTILATION CALIBRATION

The ventilation calibration wizard records the average performance of five ventilations as a benchmark for a correct ventilation. Perform the actions requested by the calibration wizard following the most current CPR guidelines. The CPR window evaluates provider performance based on the benchmark recorded during the calibration process.

To calibrate the ventilation performance benchmark:

1. Click Setup > Calibration > Ventilations, and click "Next"

The wizard prompts to perform ventilation "#1"

2. Perform the first ventilation. A green filled oval indicates that the ventilation was recorded successfully

3. Perform ventilation # 2 as prompted by the wizard. A green filled oval indicates that the ventilation was recorded successfully
4. Continue through the calibration wizard to record a total of five ventilations

At the end of the calibration process, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the calibration settings.

COMPRESSION CALIBRATION

The compression calibration wizard records the average performance of five compressions as a benchmark for a correct compression. Perform the actions requested by the calibration wizard following the most current CPR guidelines. The CPR window evaluates provider performance based on the benchmark recorded during the calibration process.

To calibrate the compression performance benchmark:

1. Click Setup > Calibration > Compressions, and click "Next"

The wizard prompts to perform compression "#1"

2. Perform the first compression. A green filled oval indicates that the compression was recorded successfully
3. Perform compression # 2 as prompted by the wizard. A green filled oval indicates that the compression was recorded successfully
4. Continue through the calibration wizard to record a total of five compressions

At the end of the calibration process, the wizard reports the average peak, pressure, and duration values for the procedure. Click "Save" to store the calibration settings.

STREAMING AUDIO

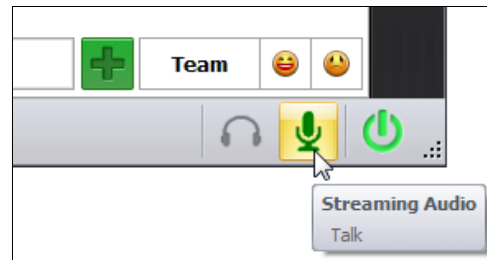
Use the streaming voice to speak as the simulator's voice and engage the provider in a realistic conversation.

INSTRUCTIONS FOR USE

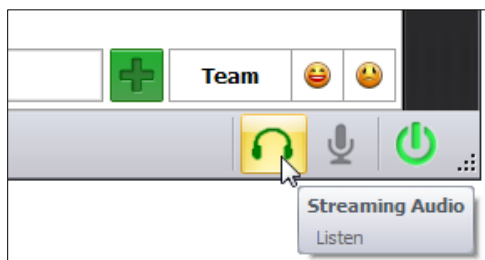
Ensure that the headset and microphone is connected to the PC before starting the GIGA software. The headset minimizes echo and environmental noise to improve audio quality.



Click the "talk" icon and speak in to the headset to talk as the simulator's voice.



To listen to the provider's response, click "Listen".



Reference the GIGA software User Guide for information on additional streaming voice features and functions.

TRAUMA LIMBS

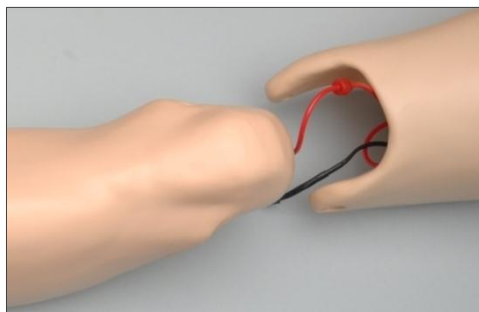
Enhance the realism of a trauma scenario by installing the trauma leg and trauma arm. The interchangeable trauma limbs feature pulsatile bleeding from major arteries consistent with the heart rate and blood pressure. In addition, providers can apply a tourniquet on the limb to reduce the bleeding.



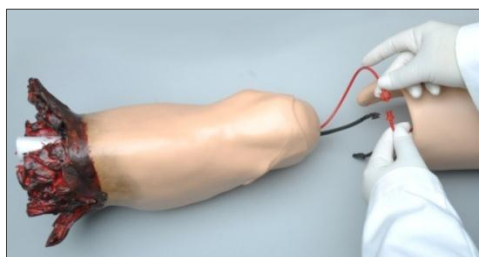
TRAUMA LEG INSTALLATION

To install the trauma leg:

5. Power the simulator off or set it to standby
6. Remove the knee bolt and gently separate the lower leg to expose the pulse tube and power cable.



7. Disconnect the leads from the normal leg and secure the pulse and power connections to the trauma leg.

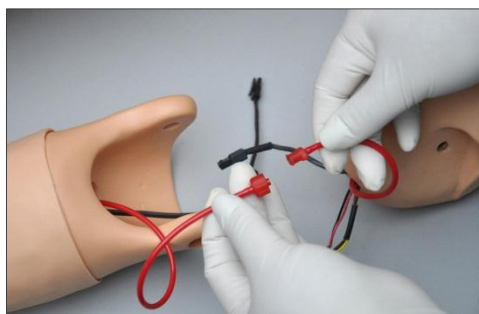


8. Attach and secure amputated lower leg using the original knee bolt.

TRAUMA ARM INSTALLATION

To install the trauma arm:

1. Power the simulator off or set it to standby mode
2. Remove the elbow bolt from the left arm and gently separate the lower arm to expose the pulse tubing and power connection.
3. Disconnect the pulse lead.



4. Connect the red pulse tube and black power cable and screw the trauma arm onto the elbow joint.



FILLING THE TRAUMA LIMB

To fill the trauma limb with simulated blood:

1. Connect an empty 50 cc fill syringe to the blood reservoir port located on the trauma limb and vacuum the air inside.
2. Fill the filling syringe with Gaumard's simulated blood.

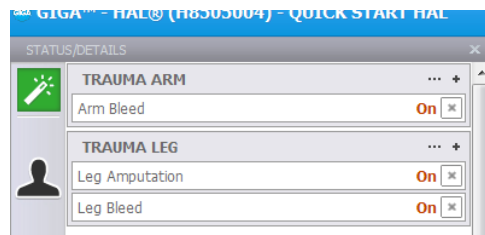
WARNING: Use only simulated blood provided by Gaumard. Any other simulated blood brand containing sugar or any additive may cause blockage and/or interruption of the vasculature system.

3. Connect the filling syringe with simulated blood to the blood reservoir port and inject fluid into the reservoir. Do not overfill the reservoir.

Trauma arm reservoir capacity	120 mL.
Trauma leg reservoir capacity	500 mL.

INSTRUCTIONS FOR USE

Once the trauma limbs are installed and the reservoirs are filled with fluid, set the trauma controls to ON to start the blood flow from the severed arteries.



URINARY CATHETERIZATION

HAL features an internal bladder used for catheterization exercises.

Bladder reservoir capacity	240 mL
Urinary Catheter	18 Fr catheter

To fill the bladder with fluid to perform a catheterization exercise:

1. Unfasten the mid-section skin from the left and right side.



2. Connect the IV fill Syringe to the one way valve located on the right side of the simulator.



3. Fill the bladder bag with a maximum volume of 240 mL



4. Remove the syringe and re attach the midsection skin.

INTERCHANGEABLE GENITALIA

The simulator features interchangeable male and female genitalia.

To install the male genitalia:

1. Remove the female catheter adapter.



2. Insert the male genitalia urethra tube into the catheter port. Ensure the connector is secured to prevent leaks.



INSTRUCTIONS FOR USE

Catheterize the simulator using an 18 Fr catheter lubricated with silicone oil. At the end of the exercise, drain the fluid from the bladder reservoir to prevent mold.

Install the female genitalia reducer adapter to prevent leaks around the catheter.



Appendix

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 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 simply 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.

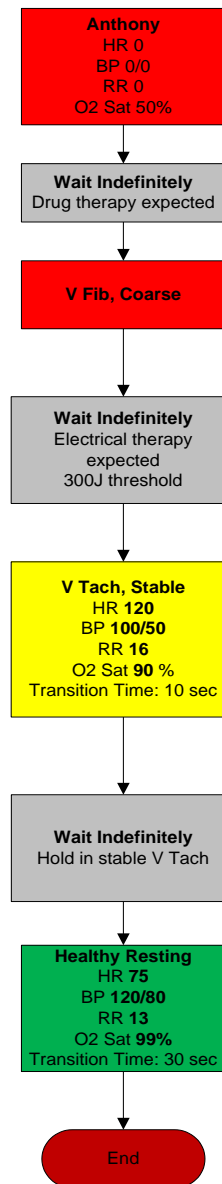
Factory Preset Scenarios Flowcharts

MANUAL MODE

	Scenario Name	Type
1	Anthony	Linear
2	Brent	Linear
3	Christian	Linear
4	Darrell	Linear
5	Evan	Linear
6	Frank	Linear
7	Gerard	Linear
8	Bradycardia	Branching
9	Pulseless Arrest	Branching
10	Tachycardia	Branching

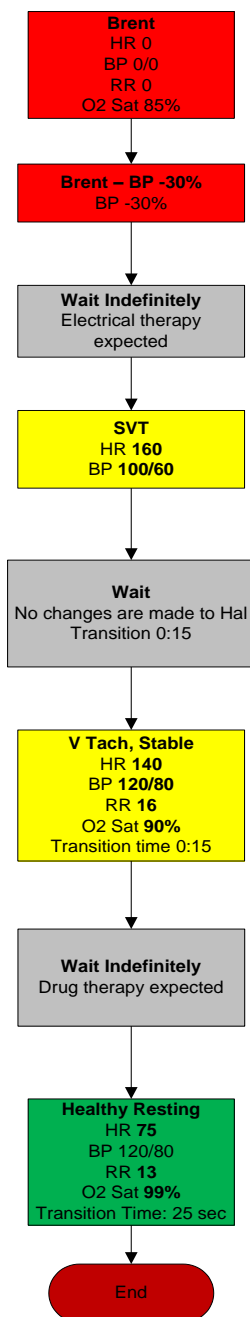


77-yr old man is found pulseless and apneic.



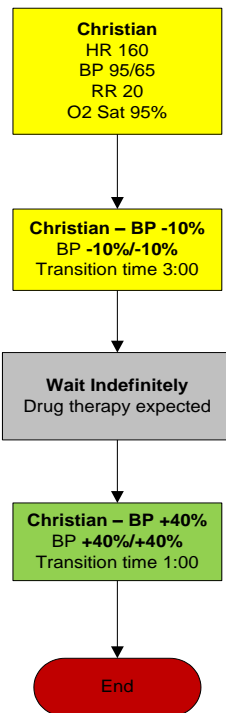


55-year old male complains of substernal chest pain radiating to the jaw . Patient is diaphoretic, trembling, and has a waxing and waning mental status.



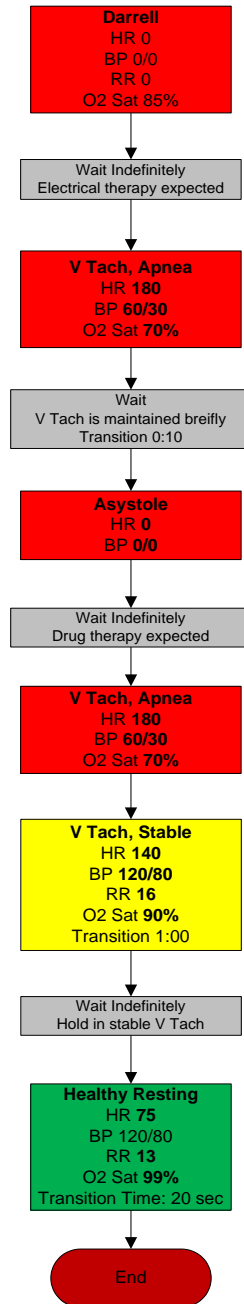


18-yr old college freshman calls EMS after taking a caffeine preparation prior to exams . He is short of breath and says that his heart is "beating fast and funny."



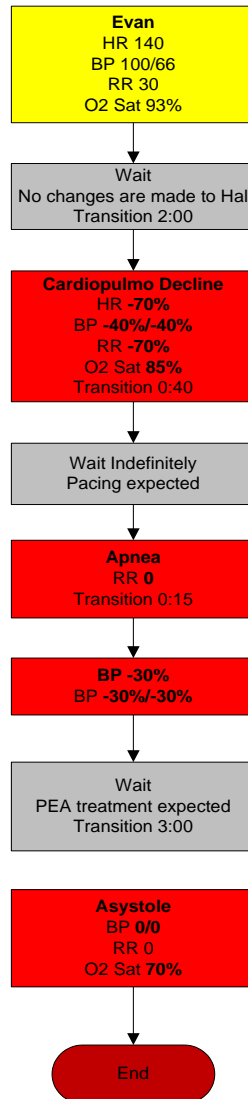


65 year-old complains of dizziness and shortness of breath. He has a history of emphysema and does not know how much "breathing medicine" he has taken. During the interview, his eyes roll back and he slumps in his seat, unresponsive. (No peripheral IV sites are available.)



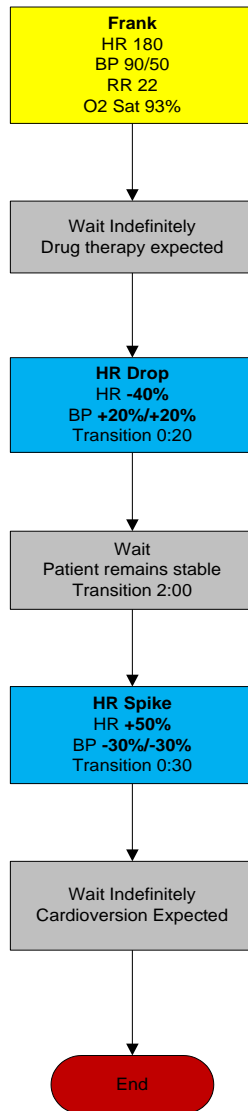


72 year-old is found tachycardic and tachypneic. He is disoriented and barely responsive. Patient's wife says that he has both heart and lung trouble and that they have been unable to afford his medicine in the past month. (After "apnea" item, facilitator should set scenario auto-response to pacing to "none" to simulate loss of capture.)



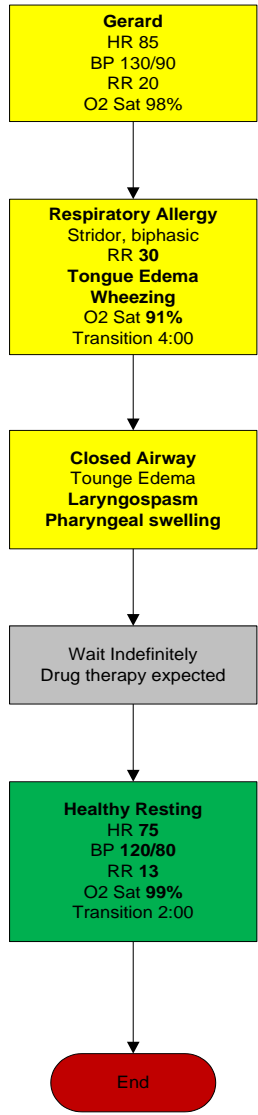


50 year-old found at home complains of weakness and fatigue. He is conscious and alert but slightly short of breath. An empty bottle of digoxin sits on his bedside table. (He will claim not to have taken any in several days. Pharmacological rate control will only be effective briefly.)



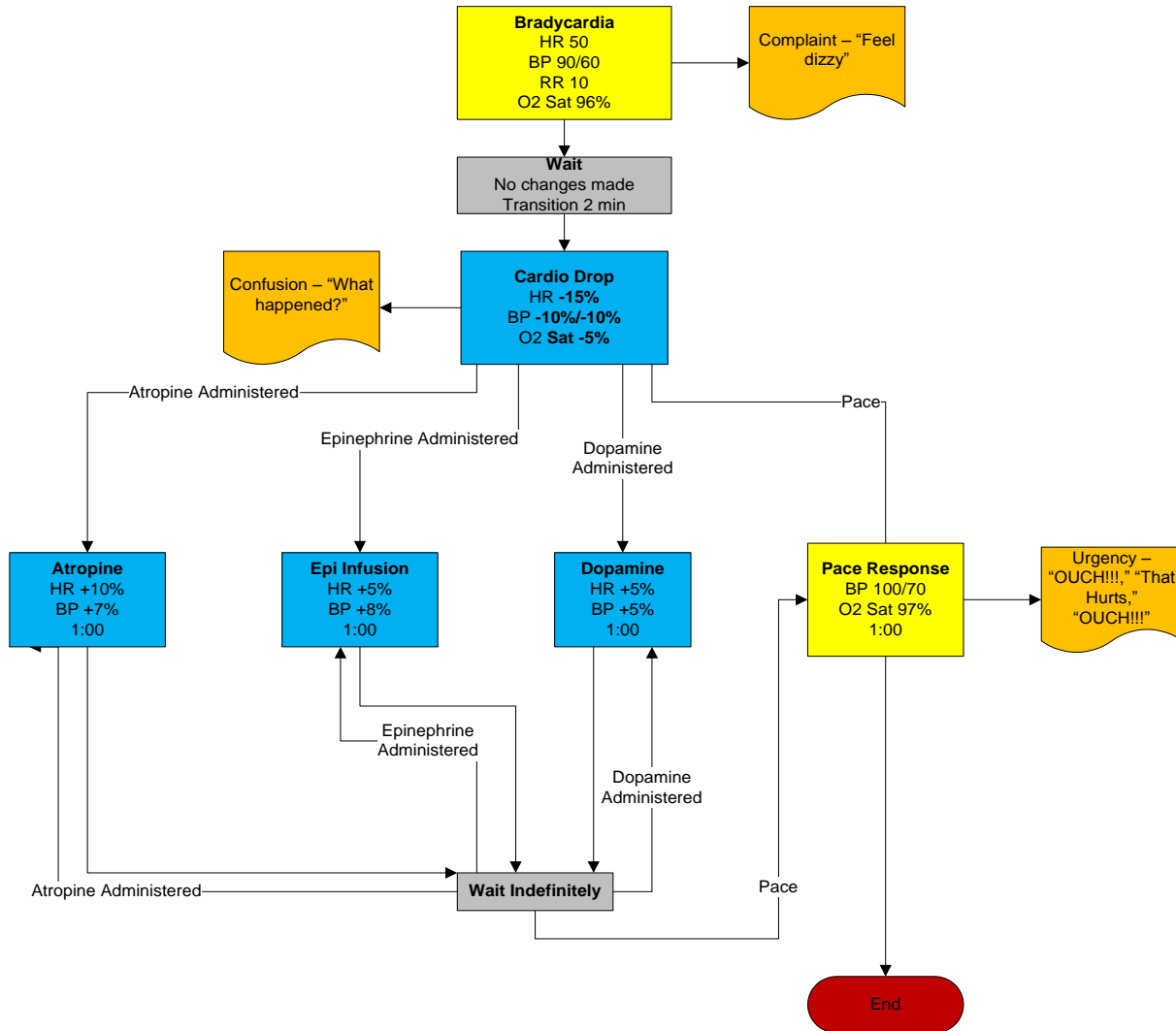


35 year-old man calls for help at local restaurant after onset of alarming respiratory symptoms .
(Patient experiencing allergic reaction to food , asthma attack, or exposure to inhaled toxin.)



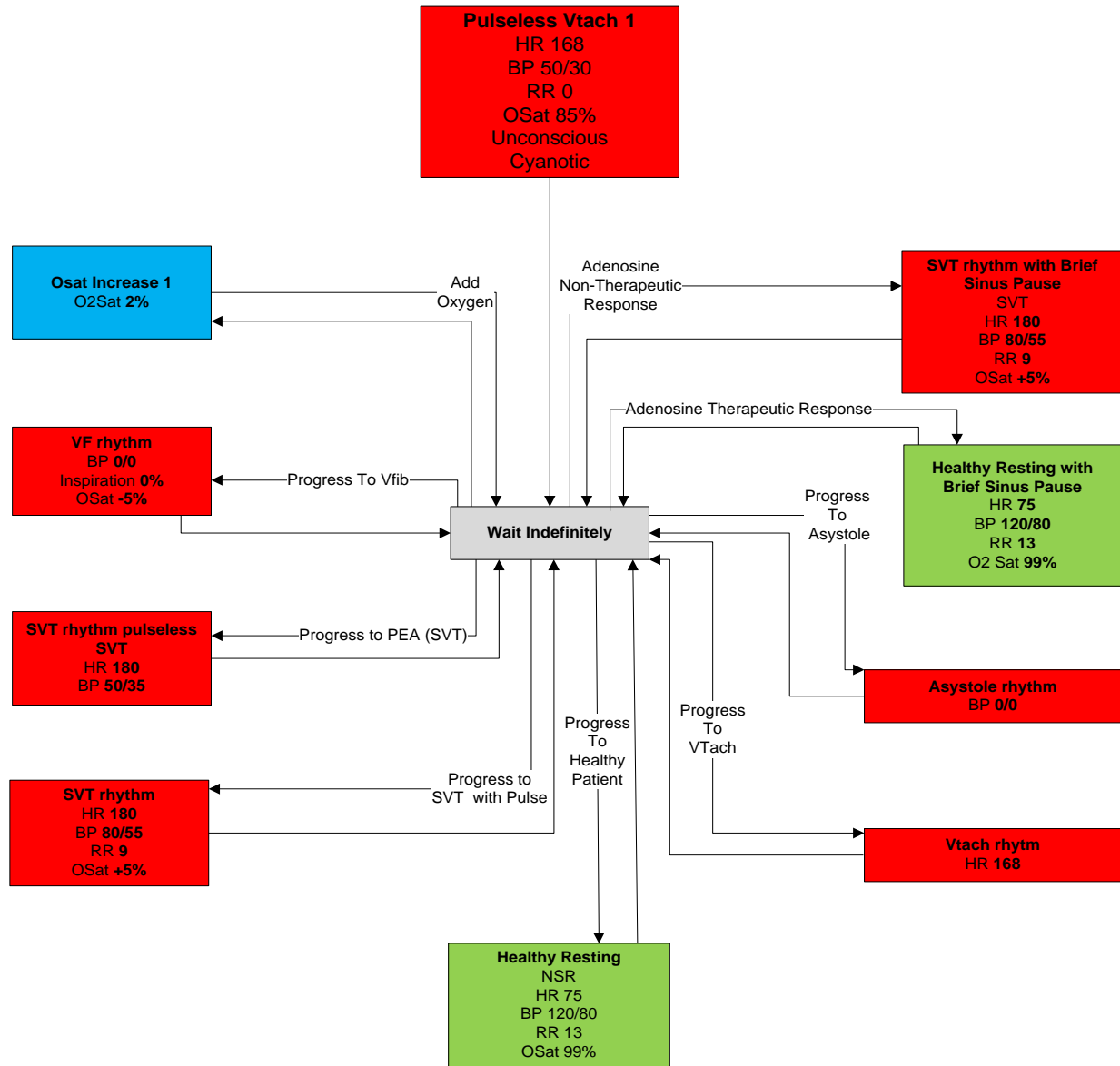


An in-hospital patient is diagnosed with Bradycardia and requires immediate attention.
Note: for this scenario to function as intended the instructor should enable automatic pacing capture in the 'Setup -> Auto-Responses' menu.





A young male was found unconscious.

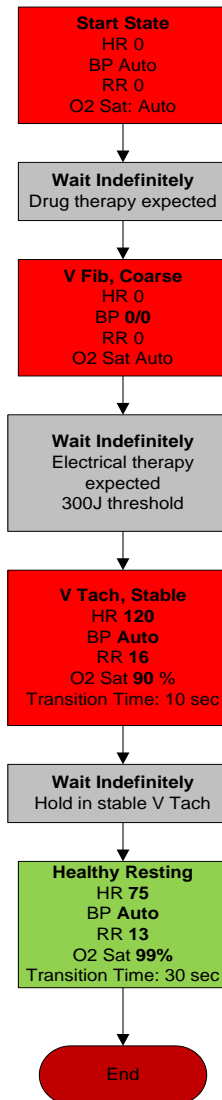


AUTOMATIC MODE

	Scenario Name	Patient Name	Type
1	Pulseless and Apneic	Anthony	Linear
2	Chest Pain	Brent	Linear
3	Overdose Caffeine	Christian	Linear
4	Apnea	Darrell	Linear
5	Cardiac Resp. Failure	Evan	Linear
6	Drug Overdose	Frank	Linear
7	Respiratory Allergy	Gerard	Linear
8	Unexpected OSat Drop	Nicolas	Linear
9	Cardiac Arrest	Brent	Branching
10	Sudden Collapse	Darrell	Branching
11	Pulmonary Edema	Ira	Branching
12	Trauma	Jim	Branching
13	Bradycardia	Kevin	Branching
14	Diving Accident	Lloyd	Branching
15	Tamponade	Matthew	Branching
16	Airway Obstruction	Nicolas	Branching

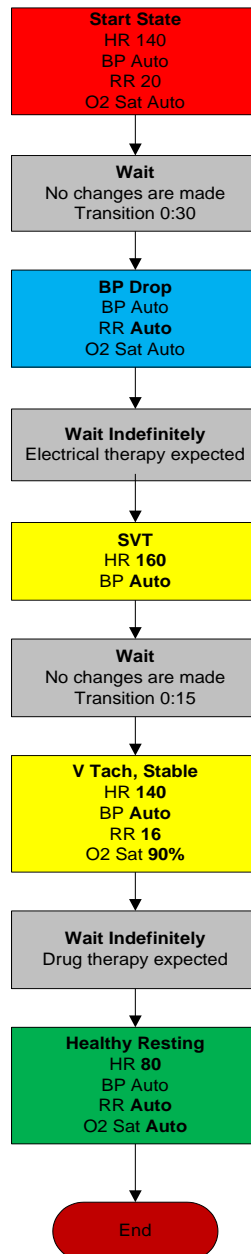


77-yr old man is found pulseless and apneic.



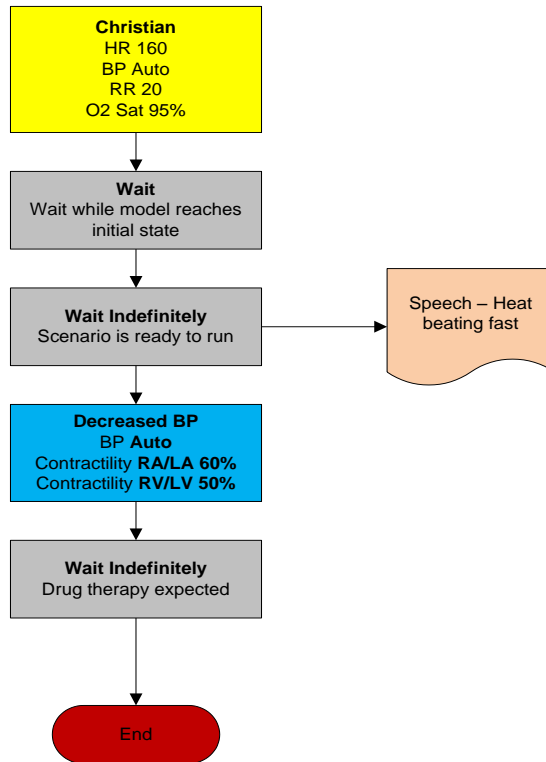


55-year old male complains of substernal chest pain radiating to the jaw . Patient is diaphoretic, trembling, and has a waxing and waning mental status.



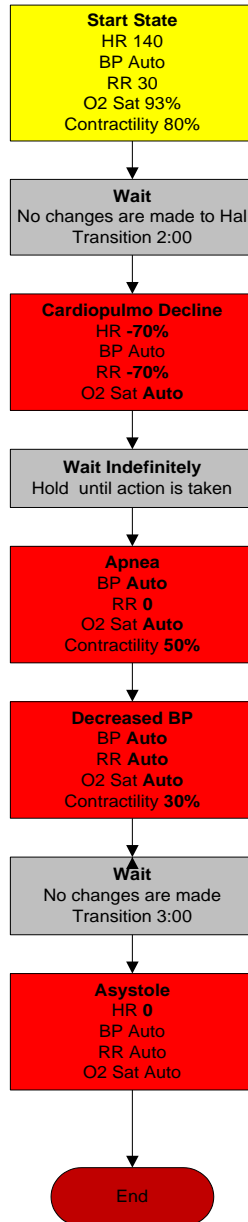


Christian is short of breath and says that his heart is "beating fast and funny."



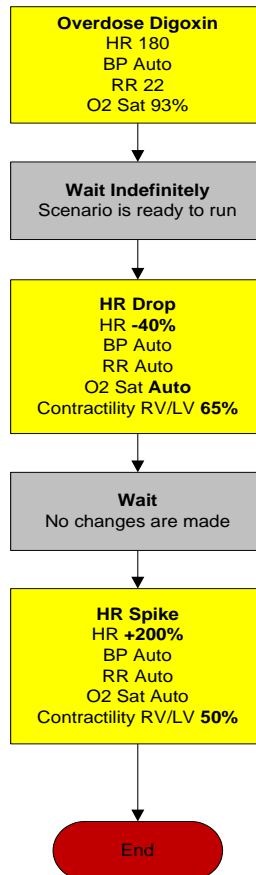


The patient is found tachycardic and tachypneic. He is disoriented and barely responsive. (After "apnea" item, facilitator should set scenario auto-response to pacing to "none" to simulate loss of capture.)



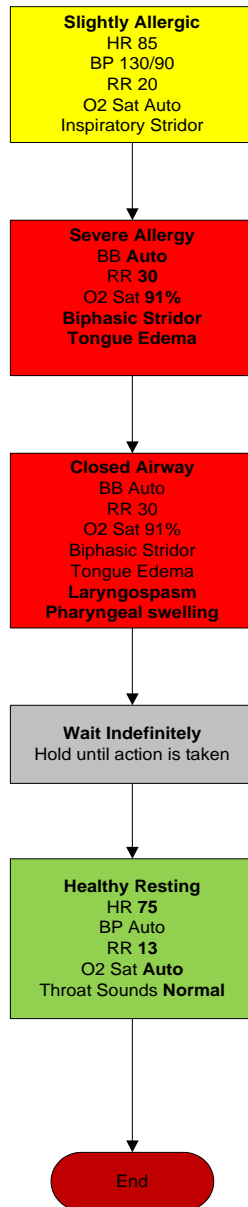


Frank was found at home and complains of weakness and fatigue. He is conscious and alert but slightly short of breath. An empty bottle of digoxin sits on his bedside table. (He will claim not to have taken any in several days. Pharmacological rate control will only be effective briefly).



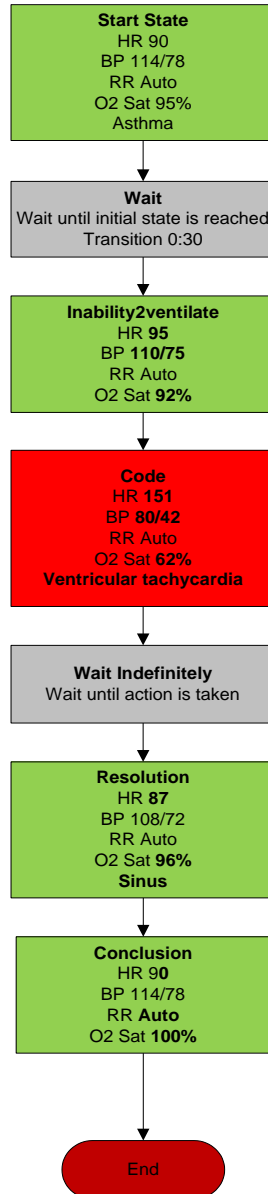


Patient calls for help at local restaurant after onset of alarming respiratory symptoms. (Patient experiencing allergic reaction to food, asthma attack, or exposure to inhaled toxin.)



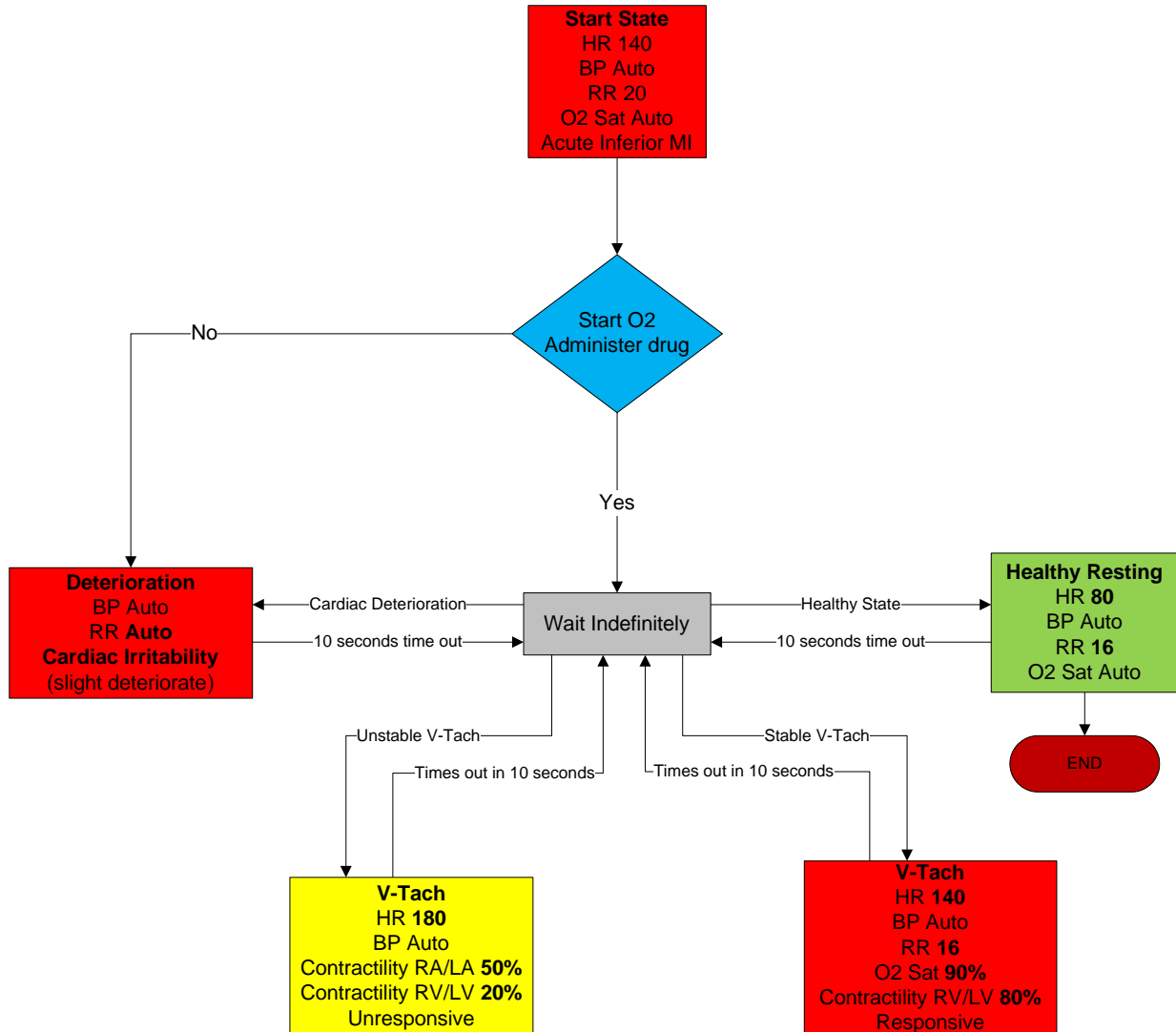


Patient is intubated and connected to breathing circuit. But the vitals start to drop because of the blocked airway. When the problem is recognized and the correct action is taken, the patient goes to a stable state.



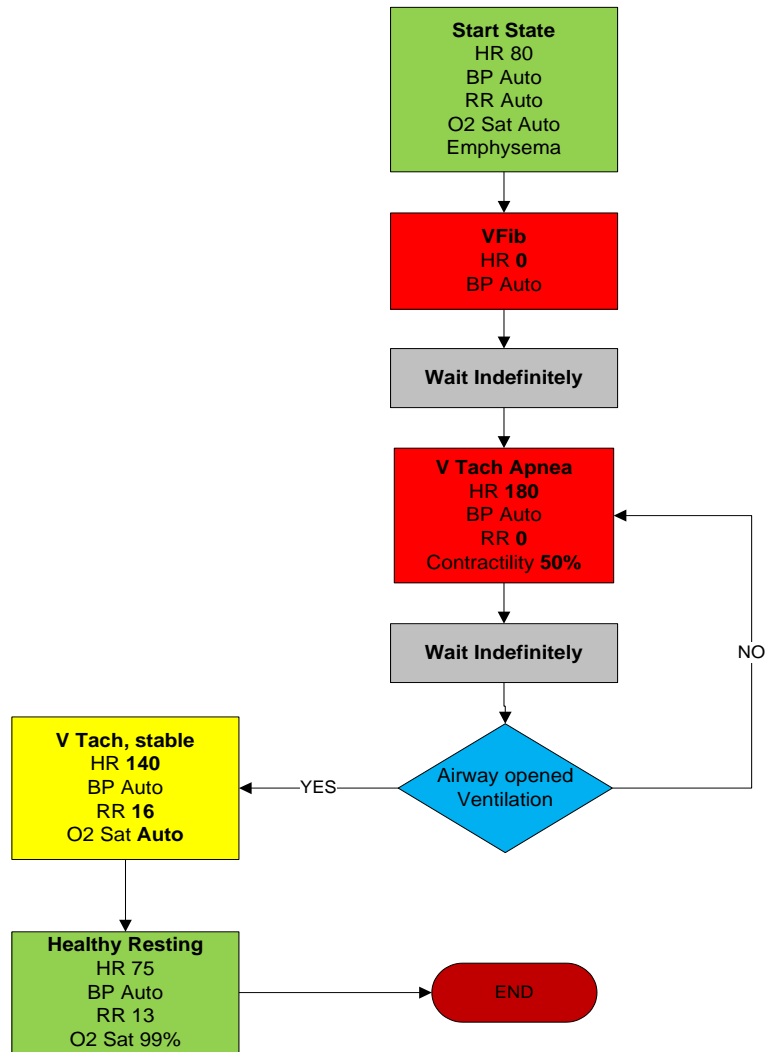


Brent complains of substernal chest pain radiating to the jaw. Patient is diaphoretic, trembling, and has a waxing and waning mental status.



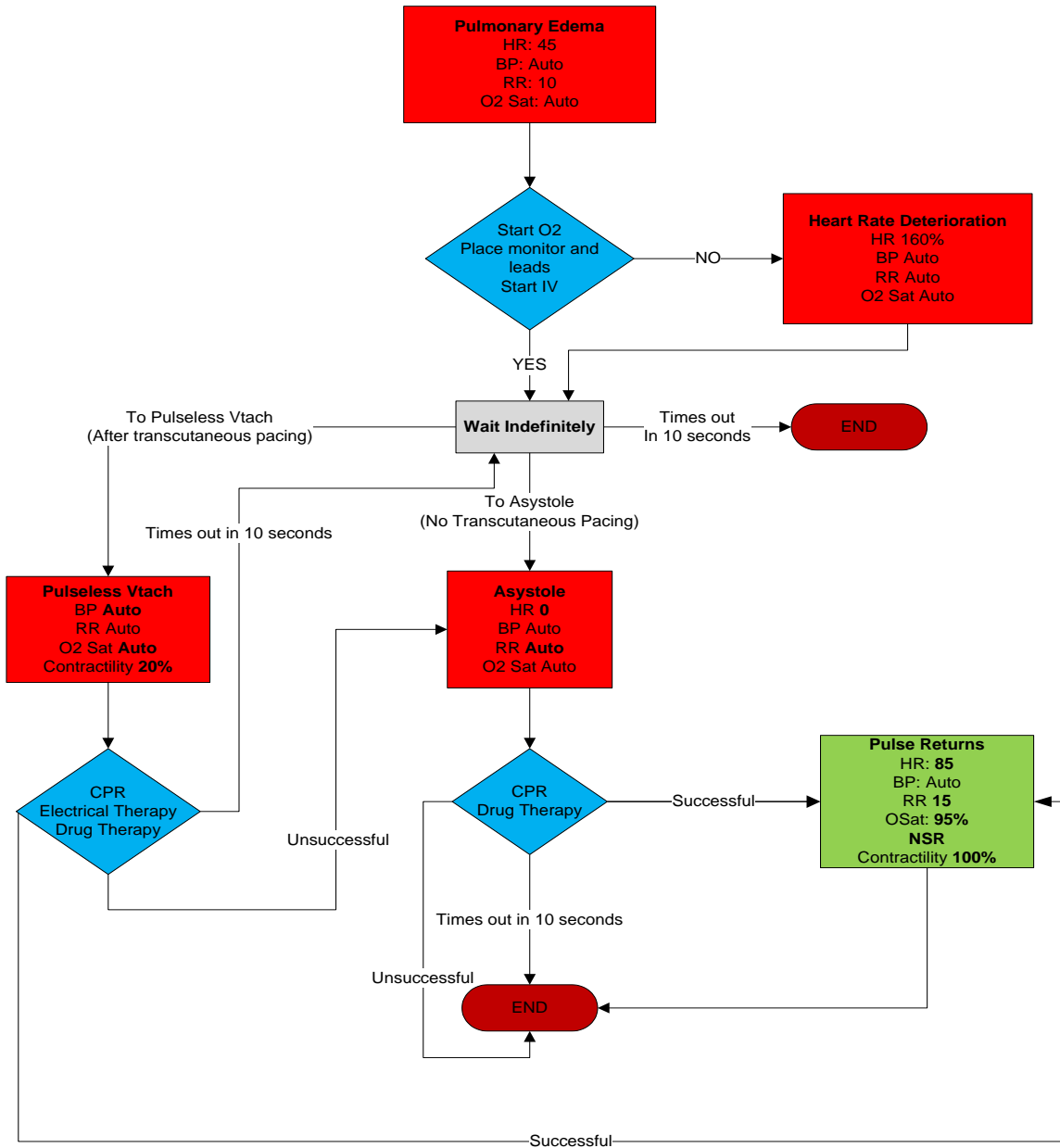


Darrell complains of dizziness and shortness of breath. During the interview, his eyes roll back and he slumps in his seat, unresponsive. (No peripheral IV sites are available.)



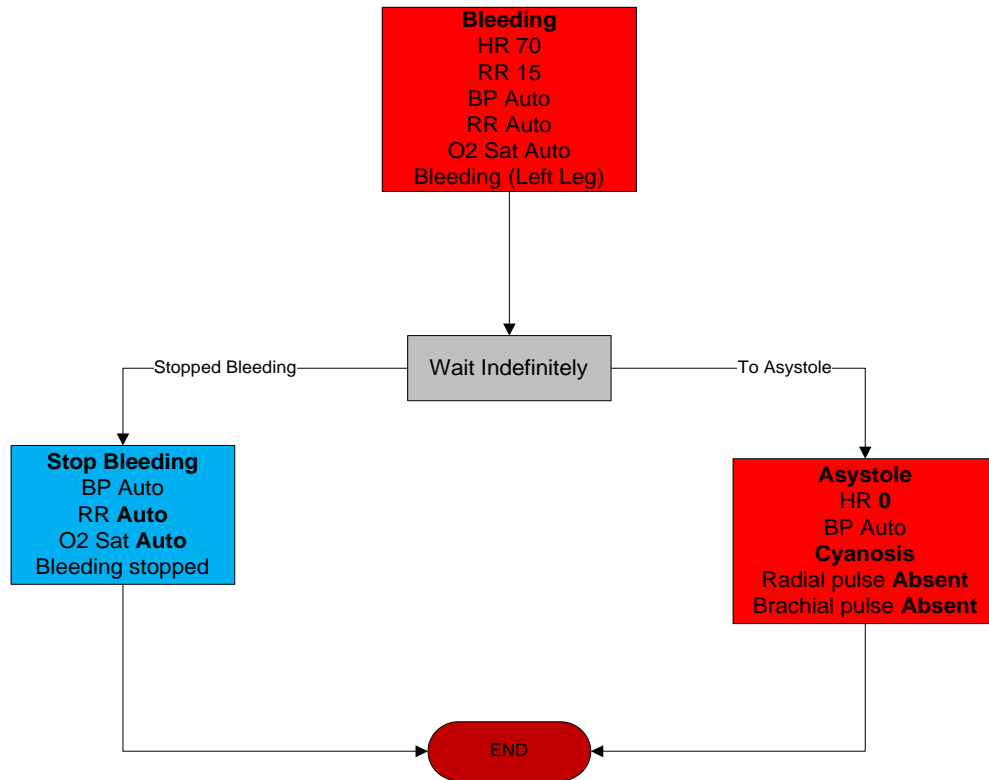


The patient is found complaining of chest discomfort and shortness of breath. She is weak, lightheaded, and diaphoretic.



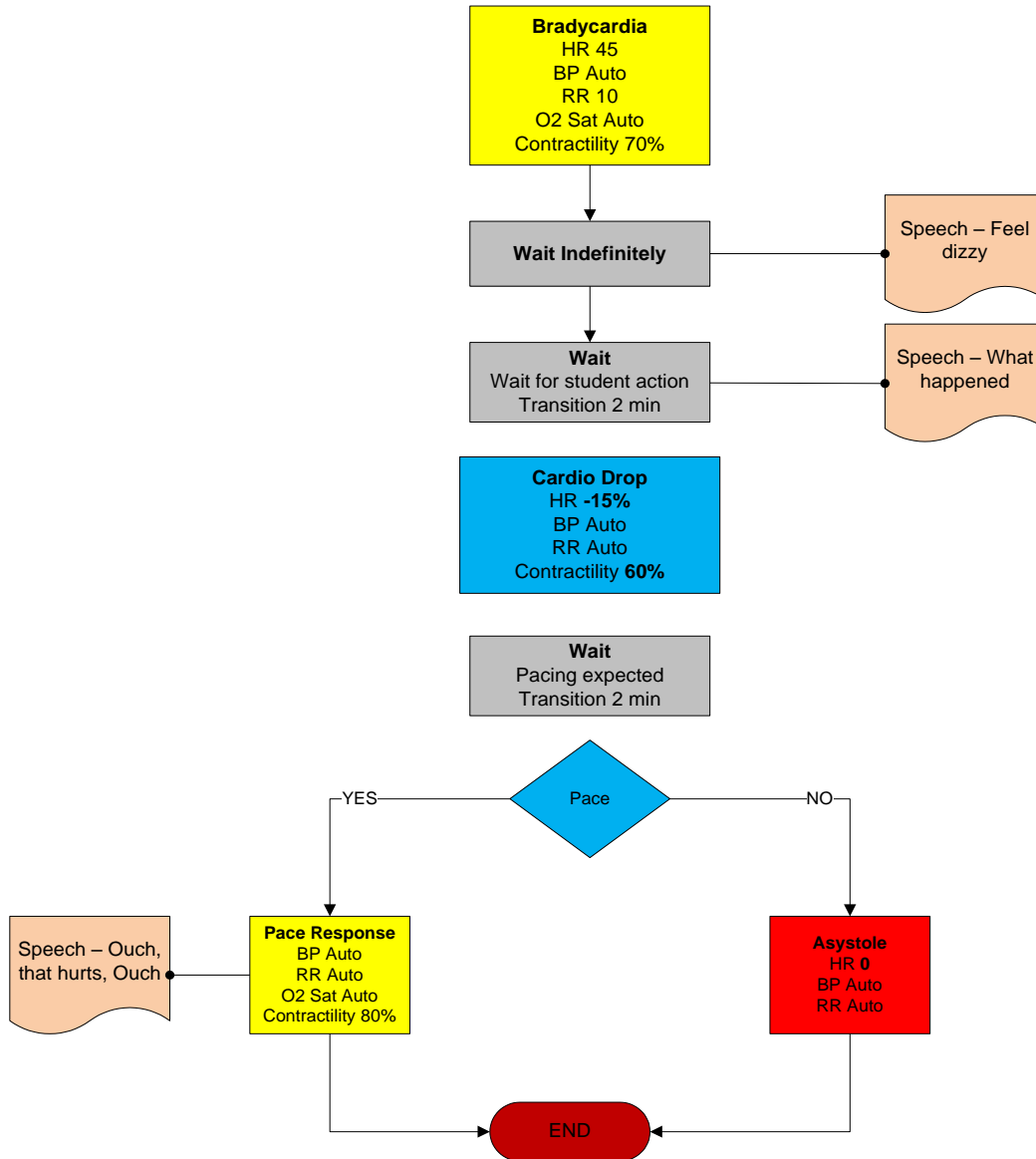


The victim was found in a building collapse accident. His left leg is amputated and Bleeding.



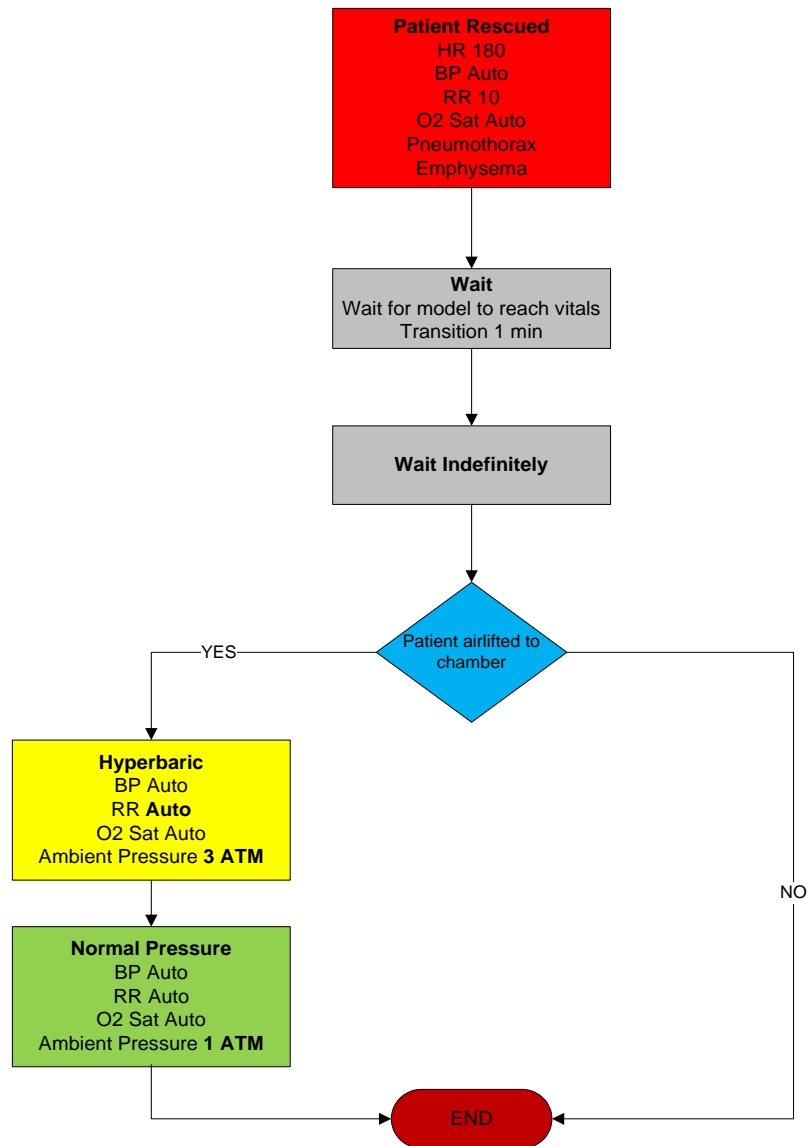


Note: for this scenario to function as intended the instructor should enable automatic pacing capture in the 'Setup -> Auto-Responses' menu. A in-hospital patient is diagnosed with Bradycardia and requires immediate attention.



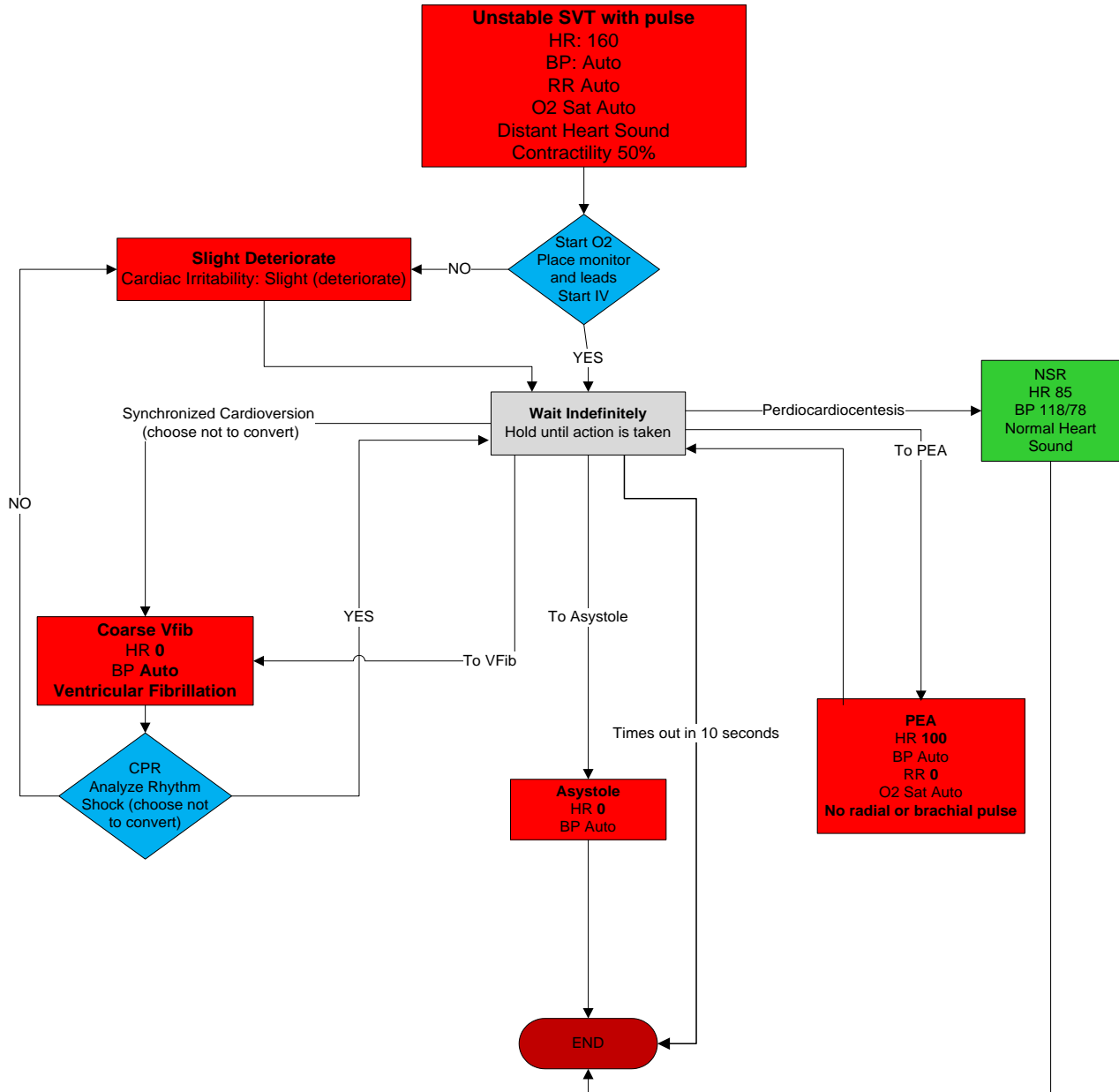


Patient was just rescued from a diving accident. He is unconscious and unresponsive while the boat crew clears his equipment. He has a pulmonary edema that won't heal until he is placed in a hyperbaric chamber.



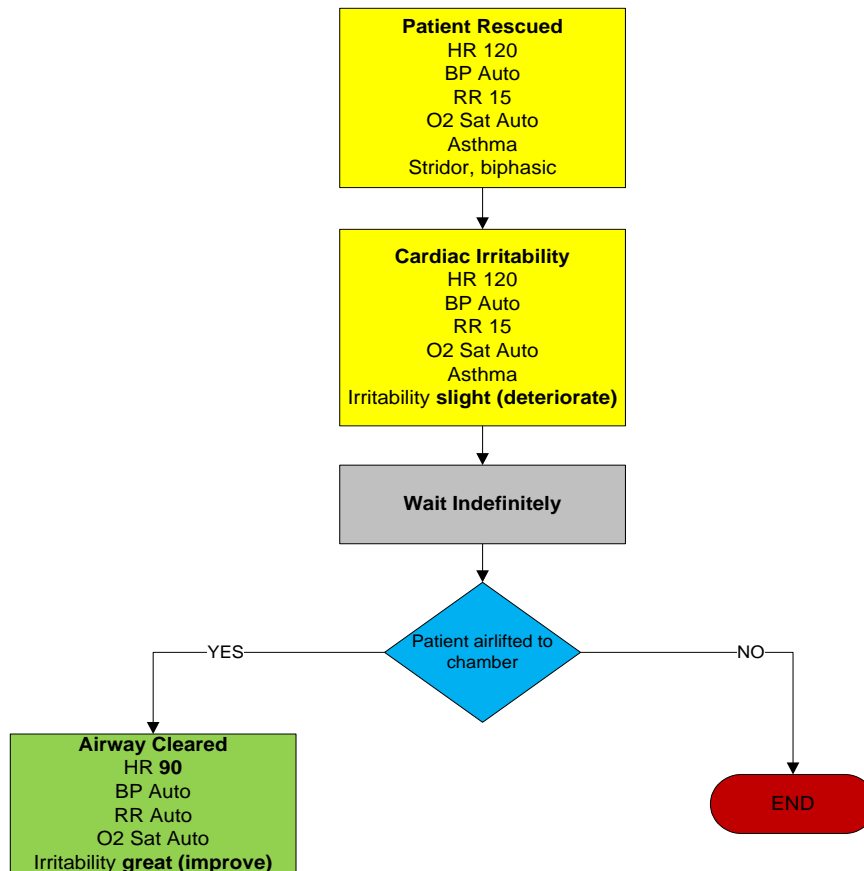


A young male was found injured in a high speed collision after drag-racing on the expressway. He lost control of vehicle and crashed into a highway divider. BAC: 0.10.





Patient is intubated and connected to breathing circuit. But the vitals start to drop because of the blocked airway. When the problem is recognized and the correct action is taken, the patient goes to a stable state.



Troubleshooting

Symptom	Possible Cause	Solution
<p>Communication never gets established or is lost</p> <p>(blinking communication indicator is consistently red)</p>	Battery is discharged or damaged	Plug the charger and if communication is established then charge battery as per procedure explained in the manual.
	Computer is too far away from simulator	Get simulator closer to computer
	Trying to communicate with a different simulator	<p>Make sure to select the right simulator when opening the software.</p> <p>In a multiple simulator environment (“Setup/Options” menu), make sure to enter the right Serial Number</p>
	Starting more than one simulator simultaneously	Select different channels for each of the simulators, and then try to turn them on one at a time, which means to wait until a link have been established between the tablet and the first simulator. Only after that, start the User Interface 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: X’ (X = number from 1 – 11).
	All others	Close the User Interface software and unplug the RF module for at least 5 seconds, then plug it back in. Restart the software and wait for initialization
Simulator doesn't run for the time specified on the manual	Battery not charge properly	<p>Make sure that LED indicator on battery charger goes thru the sequence described in its label, usually red or orange after plugging it, and then green when charge is completed.</p> <p>If LED does not go thru label's indications, then:</p> <ul style="list-style-type: none"> • Check plug connection making sure it is all the way in. • Make sure you are using the appropriate charger, which is 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 simulator in your facility, make sure that your computer is properly set-up to control the simulator that you wish to control. Go to Options... on the Setup pull-down menu and check the Environment preferences
Commands are taking longer than usual to take effect or simulator is not	Distance between computer and simulator is reaching its limit, or there are too many obstructions in between	Get simulator closer to computer or move away from obstructions.

Symptom	Possible Cause	Solution
reporting every action (Signal strength indicator is low)	(walls, etc.)	
	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 (menu) Setup -> Options-> Environment -> Select 'Auto change to channel: X' (X = number from 1 – 11).
Sound quality while streaming audio is poor	Noisy channel or another Gaumard tetherless simulator is nearby	Select a different channel (see "Options and more" section). When more than one simulator is in the vicinity, allow one channel between simulators.
	Computer too far from simulator	Streaming audio can't reach as far as normal data with a range of up to 150 ft. / 50 meters line of sight between simulator and PC. Keep antenna upright for maximum range.
	Sound too low or too loud	Sound volume at PC side is managed from PC's volume control. Simulator sound volume is managed thru "Output Gain" slider under the "Speech/Streaming Options" tab. Always talk as close as possible as microphone in order to improve quality. Using a headset is recommended.
	Respiration and other undesirable sounds are heard by instructor	Since simulator's microphone sensitivity is high in order to capture the voice of providers, it also captures all surrounded noises on or around the simulator. This is normal and it is not a malfunction. Disable the tablet's onboard microphone and enable the headset input using the Windows audio setting.
Streaming audio does not work; streaming voice controls are not shown.	"Single" simulator is checked under "Setup/Options" menu.	Make sure to select multiple simulator environment ("Setup/Options" menu), and enter the Serial Number of the simulator you are trying to communicate. Streaming audio does not work when "Single" simulator is checked.
GIGA has set the power mode to STAND-BY automatically	The battery on the simulator is depleted	In Hal Revision 14 and lower, replace battery for a charged one. For S3004, S3009, and S3010, plug the external power supply. For all others including Hal Revision 15 and above plug in the charger.
"RF module not found" message is displayed when GIGA 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 disconnect the RF module for 10 seconds, then plug it back in and restart the software
Chest compressions are not properly detected or not detected at all	Is the communication signal strength indicator consistently low?	See "Scan RF Channels" section
	Is the respiratory rate set to	Set respiration rate to zero

Symptom	Possible Cause	Solution
	'0 / min'? Chest compressions are only detected when the respiratory rate is set to 0 per minute (0 / min). Otherwise they are ignored	
	All others	See "Calibration" section
Artificial ventilations are not properly detected or not detected at all	Is the communication signal strength indicator consistently low?	See "Scan RF Channels" section
	All others	See "Calibration" section
NIBP values are not accurate	NIBP is disabled or not installed	Go to Setup>Options>HAL Add-Ons and check mark "USE NIBP". Continue to the NIBP hardware section to calibrate the NIBP feature.
Korotkoff sounds do not match systolic and/or diastolic set values	BP sensors are offset	Recalibrate BP cuff sensors on the simulator as per "Calibration" section
	NIBP feature is enabled	Go to Setup>Options>HAL Add-Ons and un check "USE NIBP". Continue to the hardware section to calibrate the manual blood pressure.
	Wrong placement of BP Cuff (only for simulators with tetherless BP cuff feature)	See correct cuff placement under section "Circulation"
Simulator's chest does not rise with artificial ventilation (e.g. BVM)	Simulator is 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 User Interface software
	Surgical insert is installed	The ventilation trachea insert provides a better seal for ventilation.
Low chest rise (or no chest rise at all) while breathing	Wrong settings or disable 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 or turn the simulator off and then on again.
Loss of brachial pulse	Brachial pulses disable	Make sure to enable brachial pulse on "Details" tab page.
	Wrong reading of corresponding BP sensor	Brachial pulse is cut off when BP cuff pressure is above Systolic. If it is not connected, then recalibrate BP cuff sensors on the simulator as per "Calibration" section.

Symptom	Possible Cause	Solution
Reporting intubation when it is not	Wrong sensor reading	Reset “ET Tube” sensor on simulator as per “Calibration” section. Do not turn on (or power cycle) the simulator while being intubated, doing so would cause the sensor to report wrong intubations.
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 not heard or heard not at desired volume level Cyanosis intensity is too much or too little	Volume not set to user’s criteria	Every sound has a volume control. Play with volume control to get it to desired level
Cyanosis intensity is too much or too little	Cyanosis intensity not set to user’s criteria	Set Cyanosis level to a desired level by playing with the “Set Max cyanosis level” control
Pupils (either one or both) dilating either while blinking or when not supposed to	Wrong dilation calibration	Set pupil dilation level properly by following procedure described in the manual under section “Options and more...” (see Tolerances Tab)
Pupils constricting-dilating constantly	This might happens either when the simulator is under intense light or wrongfully calibration	Try the “Set to Ambient Light” feature under “Options/Tolerances” (see section “Tolerances “).
Oximeter reading does not coincide with value set	Using a different Oximeter/Sensor for which the simulator was calibrated	<ul style="list-style-type: none"> The simulator must be calibrated with the Oximeter instrument that it is going to be used (including the Pulse Oximeter Sensor). Oximeter Sensors cannot be swapped even with same kind of oximeter’s brand and model. An oximeter which includes carbon monoxide and/or methemoglobin sensing cannot be used. Oximeter has been placed on the arm that doesn’t have the O2Sat feature. Check in the Diagnostic if that arm has the feature installed
	Pulse Oximeter Sensor not properly placed	Make sure to slide the Pulse Oximeter Probe all the way into the simulator’s finger. Make sure the emitter part (the red light) of the probe is on the nail side of the finger. If user is sure that the probe is properly placed, it means that it was not when calibration was performed, then re-calibration is necessary. See O2Sat calibration section for more info.

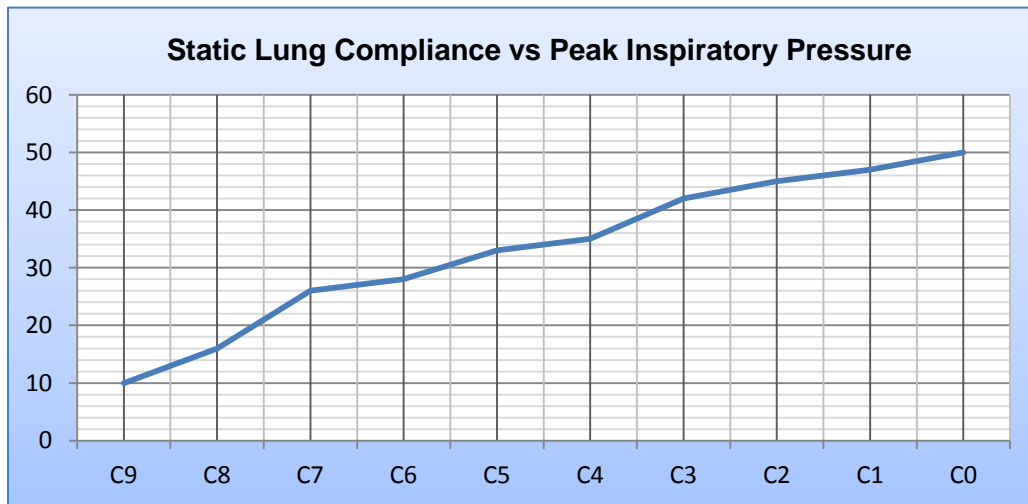
Symptom	Possible Cause	Solution
	Offset value within +/- 2	User should expect a +/- 2 discrepancy between value set and Oximeter reading for O2Sat values above 80%, and +/-3 below 80%.
Drug ID is not being read	Syringe has not been programmed	See “IV Medication Infusion” section
	Syringe is not in the field of the RFID reader	This could happen when injecting the cephalic vein close to the hand and having the syringe sideways to the plane of the forearm.
	Wrong calibration	Calibrate the drug arm as per calibration instructions
	Injecting too fast	Maximum injection rate is 9999 ml/hr. This rate won't be exceeded when injecting into the veins using a 22 g needle.
	Not reading the syringe ID	If RFID tag on syringe is not read, the system tends to read fewer amounts than actually injected. This could happen when infusing the drug thru the side port on the arm. When doing so, place a tagged syringe on the syringe holder. See “IV Medication Infusion” section
	Fluid reservoir is full	The maximum amount of fluid injected properly read before purging the internal reservoir is 50 cc. Make sure to purge the reservoir or permanently connect a purging line (see instructions)
CO ₂ not being exhaled	Empty CO ₂ cartridge	Make sure the CO ₂ cartridge is in place. For S3201, the User Interface displays the “Low CO ₂ ” message when CO ₂ pressure is low. Notice that CO ₂ cartridge must be plug just before the training section starts to get maximum duration. If left overnight, the cartridge will slowly empty. (See “CO ₂ exhalation” section). The CO ₂ cartridge once it is plugged, will empty within 24 hours whether it is used or not.
	CO ₂ pressure regulator is “OFF”	For S3201, go to “Calibration/Factory Settings” and then press the “CO ₂ Pressure” button. In the window to the right a value between 3-6 psi (ideal 4.5 psi) indicates good level. Should not be the case, call tech support for advanced troubleshooting.
Mechanical Ventilator is not triggered when assisting the simulator	Settings exceeding the simulator's capabilities	The simulator is able to trigger the ventilator either when: - Flow ≤ 1 Lts/min, or Pressure ≤ 1 cmH2O

REFERENCE LUNG COMPLIANCE VALUES

The graph below shows the relation between HAL's nine lung compliance levels and the resulting peak inspiratory pressure readings on the ventilator. At compliance level 9, the lung is most compliant so the PIP is relatively low, while at compliance level 0 the lungs are least compliant resulting in higher PIP. For this example, the ventilator was set with the following parameters:

- Ventilation type: Volume controlled
- Tidal volume of 550 mL
- Flow of 40 l/min
- Patient weight is 75 Kg (165 lbs.)

To accommodate for fluctuations in the results as seen on ventilators, values on the graph may differ by +/- 2.



Wireless Network

GIGA generates the vital signs information displayed on the virtual monitor PC. The information is transmitted through a wireless ad-hoc connection between the two computers in real time.

The wireless settings are configured at the factory, so no additional configuration is required. Please reference the troubleshooting information on page 102 to resolve common connectivity issue before attempting to reconfigure the network.

Use the “Create an ad-hoc Wireless network” tool to configure the wireless ad-hoc link between the two computers. Then, configure the connection between GIGA and the Gaumard Monitors software.

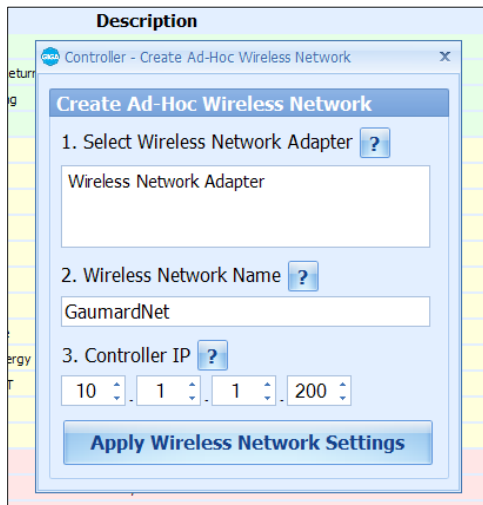
GIGA NETWORK CONFIGURATION

Complete the next steps using the “Controller - Create Ad-Hoc Wireless Network” tool built in to GIGA software.

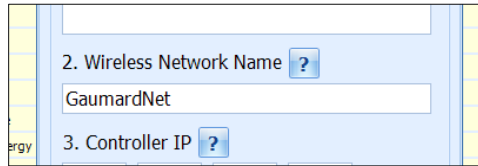
1. From the menu bar, go to Help > “Create ad-hoc Wireless Network”

The “Controller - Create Ad-hoc Wireless Network” window is displayed

2. Select the “Wireless Network Adapter”. If the wireless adapter is not listed, first enable the adapter using the Windows® network menu and then return to this window.

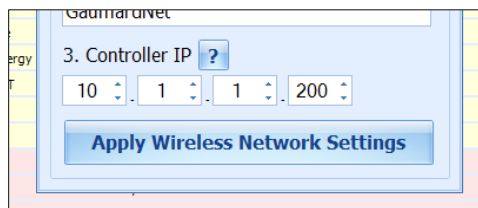


3. Enter a wireless network name (case sensitive). Use the same wireless network name to configure the Gaumard Monitors PC. “GaumardNet” is the required name for Windows® 7 computers.



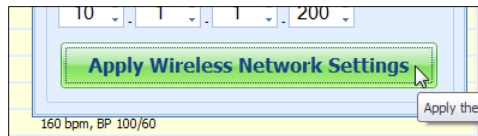
4. Set the “Controller IP”.

On each control PC and virtual monitor PC, enter the same values for the first three IP fields and a set unique value for the last field. The suggested address is for the **Controller IP** is **10.1.1.200**



5. Click “Apply Wireless Network Settings” to save the settings.

6. Restart the computer.

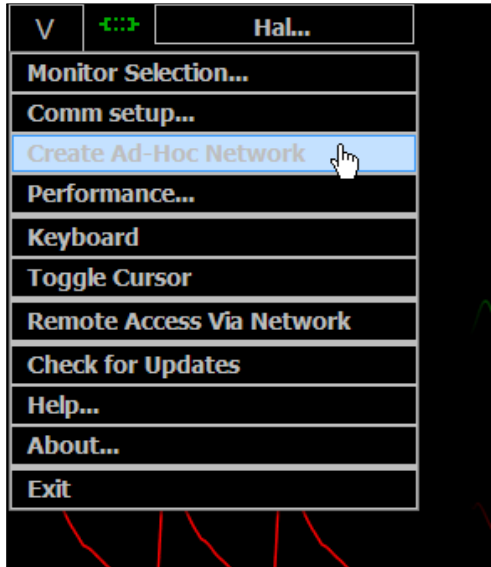


GAUMARD MONITORS NETWORK CONFIGURATION

After the GIGA control computer is configured, complete the next steps using the “Create an ad-hoc network tool” included in Gaumard Monitors software.

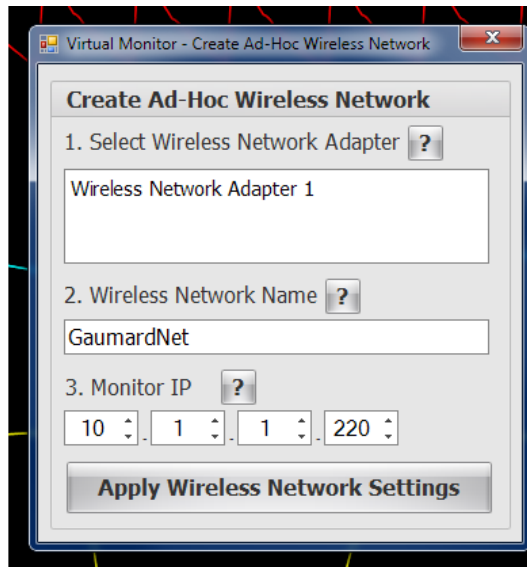
1. On the virtual monitor computer, click the Gaumard Monitors icon to start the vital signs software.

- Click the V menu near the top left corner and select “Create Ad-Hoc Network”.

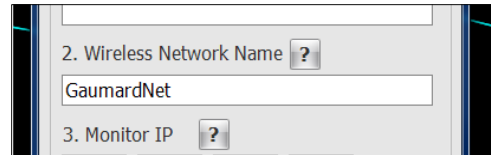


The “Virtual Monitor - Create ad-hoc Wireless Network” window is displayed.

- Select “Wireless Network Adapter”. If the wireless adapter is not listed, first enable the adapter using the Windows® network menu and then return to this window.

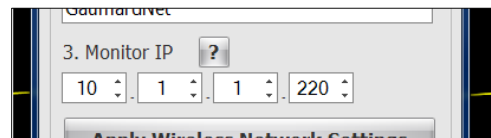


- Enter a wireless network name (case sensitive). Use the same name entered in the controller computer. “GaumardNet” is the required name for Windows® 7 computers.



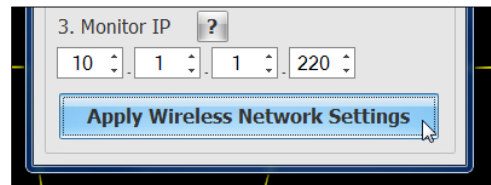
- Set the “Monitor IP”.

On each control PC and virtual monitor PC, enter the same values for the first three IP fields and a set unique value for the last field. The suggested address is for the **Monitor IP** is **10.1.1.220**



- Click “Apply Wireless Network Settings” to save the settings.

- Restart the computer.



CONFIGURE THE VITAL SIGNS BROADCAST

After the wireless ad-hoc link is established between both computers, complete next steps to configure the transmission of the vital signs information.

1. Verify that both computers are connected to the GaumardNet network using Windows® wireless connection menu. If the computers are not connected, select the “GaumardNet” network and click “Connect” manually.



2. Start the GIGA control software.
3. On the GIGA menu bar, click Monitors> Configuration.
The “HAL Virtual Monitor Setup” window is displayed.
4. Set the adapter to “Wireless network connection” and click “Connect” to begin transmitting the vital signs information. Write down the “controller IP” and “Port number”.
5. Start the Gaumard Monitors software on the virtual monitor PC.
6. Click the “V” menu near the top left corner, and then select “Comm Setup”.
The “TCP Comm Setup” window is displayed.
7. Enter the “Controller IP” and “Port number” displayed on the GIGA “Virtual Monitor Setup” window.

Click “Connect” to accept the incoming connection.

Selected parts list S3201

Item ID	Name	Type	Description
S3201.001	A/C Virtual Monitor	R	A/C Powered 17" Touch Screen monitor and desktop, VM software included
S3201.002	D/C Virtual Monitor	R	D/C Powered 12" Touch Screen Mobile Monitor with stylus, VM software included
S3201.003	D/C Virtual Monitor Upgrade	A	D/C Powered 12" Touch Screen Mobile Monitor with stylus upgrade
S3201.004.L	Traumatic Leg Amputation	A	Trauma Amputation Leg for HAL, light color (also available medium or dark)
S3201.005.L	Traumatic Arm Amputation	A	Trauma Amputation Arm for HAL, light color (also available medium or dark)
S3201.006	Casualty Simulation Kit	A	Bleeding and non-bleeding wounds
S3201.009	Power Package	R	100-240 V AC battery charger with rechargeable battery
S3201.018.L	Chest skin	R	12 lead chest skin, light color (also available medium or dark)
S3201.024L.R2.L	Lower Left Osat Arm Revision 2	M	Lower left Osat arm with Osat index finger and microphone, light color (also available medium or dark)
S3201.027L.D	Lower left leg	R	Lower left leg assembly, dark color (also available medium or light)
S3201.028R.L	Right I/O leg	R	Lower Right I/O leg assembly, light color (also available medium or dark)
S3201.029R.L	I/O Leg Skin Cover	C	Light color (also available medium or dark)
S3201.030	Reservoir bone	R	Reservoir bone used in I/O leg access
S3201.031	I/O Bones	C	Replacement bone for I/O leg
S3201.032.D	Surgical Trachea		Surgical trachea insert, dark color
S3201.032.L	Surgical Trachea		Surgical trachea insert, light color
S3201.032.M	Surgical Trachea		Surgical trachea insert, medium color
S3201.054L.M	Real BP Upper Left Arm	M	Medium color upper left arm assembly with real BP for use with normal cuff, medium color (also available light or dark)
S3201.060	Simulator Transport Case	R	Soft storage and transport case with wheels

Item ID	Name	Type	Description
S3201.078	CO ₂ Exhalation	A	CO ₂ Exhalation feature ordered at the time of initial purchase
S3201.080	Simulated Blood Concentrate	C	
S3201.081	Silicone Oil	C	Oil-based silicone lubricant
S3201.087	Wireless Streaming Audio Headset	R	
S3201.104	ECG/Pacer Module	R	
S3201.211	ETC Pro+	A	Recording and debriefing solution. Includes two wireless and hard-wired camera for multiple video and audio stream.
S3201.211.U	ETC Pro+ Upgrade	U	Recording and debriefing solution upgrade. Includes two wireless and hard-wired camera for multiple video and audio stream.
S3201.224L.R2.L	Lower Left Osat Arm Rev 2 Reveining	M	Lower left Osat arm with Osat index finger and microphone reveining, light color (also available medium or dark)
S3201.410	Drug Recognition Syringes	R	Set of 10 drug recognition syringes with tags
S3201.411	Replacement Antecubital Veins	R	Set of 10 veins 21" long and 10 veins 7" long
S3201.412	Drug Recognition Filling Kit	R	60cc syringe with fill and drain tubes
S3201.413	Syringe Programming Holder	R	
S3201.INST	In-Service Training	A	Day of in-service training and installation

Selected parts list S3101/S3000

Item ID	Name	Type	Description
S3101.001	A/C Virtual Monitor	A	A/C Powered 17" Touch Screen monitor
S3101.002	D/C Virtual Monitor	A	D/C Powered 12" Touch Screen Mobile Monitor with stylus
S3101.004.L	Traumatic Leg Amputation	A	Trauma Amputation Leg for HAL®, lite color
S3101.005.L	Traumatic Arm Amputation	A	Trauma Amputation Arm for HAL®, lite color
S3101.006	Casualty Simulation Kit	A	Bleeding and non-bleeding wounds
S3101.009	Power Package	R	100-240 V AC battery charger with rechargeable battery
S3101.016.L	Neck Collars	C	Lite color neck collars, set of 6
S3101.018.L	Chest skin	R	Lite color
S3101.023L.L	Lower Left Arm	C	Lower left IV arm, lite color
S3101.023R.L	Lower Right Arm	C	Lower right IV arm, lite color
S3101.024L.L	Lower Left Osat Arm	C	Lower left IV arm with Osat index finger, lite color
S3101.024R.L	Lower Right Osat Arm	C	Lower right IV arm with Osat index finger, lite color
S3101.025.L	Abdominal skin	R	Lite color
S3101.027L.D	Lower left leg	R	Lower left leg assembly, lite color
S3101.027L.L	Lower left leg	R	Lower left leg assembly, lite color
S3101.028R.L	Right I/O leg	R	Lower Right I/O leg assembly, lite color
S3101.029R.L	I/O Leg Skin Cover	C	Lite color
S3101.030	Reservoir bone	R	Reservoir bone used in I/O leg access
S3101.031	I/O Bones	C	Replacement bone for I/O leg, set of 7
S3101.043.L	Intramuscular Thigh Injection Sites	R	Lite color, set of 2 (one per leg)
S3101.048	Adult IV Filling Kit	R	Fluid dispensing syringe with filling tube
S3101.049	Adult I/O Filling Kit	R	
S3101.060	Simulator Transport Case	R	Soft storage and transport case with wheels
S3101.061	Simulator Transport Case	A	Hard storage and transport case with wheels
S3101.080	Simulated Blood Concentrate	C	
S3101.081	Silicone Oil	C	Oil-based silicone lubricant

Item ID	Name	Type	Description
S3101.200	Audio & Video Recording System	A	
S3101.400R.L	Automatic Drug Recognition System	A	Automatic Drug Recognition light color right arm
S3101.400R.M	Automatic Drug Recognition System	A	Automatic Drug Recognition dark color right arm
S3101.400R.U.D	Automatic Drug Recognition System	U	Automatic Drug Recognition dark color right arm UPGRADE
S3101.400R.U.L	Automatic Drug Recognition System	U	Automatic Drug Recognition light color right arm UPGRADE
S3101.INST	In-Service Training	A	Day of in-service training and installation

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 properly 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)

Contact Us

On the web

www.Gaumard.com

Technical Support

support@gaumard.com

Sales and Customer Service

sales@gaumard.com

Phone:

Toll-free in the USA: (800) 882-6655

Worldwide: 01 (305) 971-3790

Fax: (305) 667-6085

Before contacting Tech Support **you must:**

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

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)

Always dispose of this product and its components in compliance with local laws and regulations.



The HAL simulation system is protected by US patent; other Patents Pending.

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