Pediatric HAL®

S3004/S3005

Gaumard®
Simulators for Health Care Education

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

User Guide 14.5.1

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Introduction

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General Care, Maintenance, and Warnings

The Gaumard warranty does not cover damage caused by misuse. It is critical to understand and comply with the following guidelines to prevent injury to the user and damage to the simulator.

PROCEDURES

Do not attempt to intubate without lubricating the airway adjunct with silicone lubricant (provided). Intubating the simulator without lubrication may result in damage to the airway.

Avoid using surgical tools to cut the neck skin. The precut opening allows the insertion of most medical devices. Always lubricate the medical adjunct before insertion.

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 the simulator with the same precautions that would be used with a real patient.

IV ARM

Vein tubes contain 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.

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.

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

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. Upon 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.

STORAGE

Store the simulator 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 NOELLE at an ambient temperature of 95 degrees Fahrenheit (35 Celsius).

Do not store the simulator with a discharged battery. Re-charge the backup battery at the end of every simulation session. In addition, recharge the battery at least once every 30 days even if the simulator is not in use; otherwise, permanent loss of capacity might occur because of self-discharge.

Do not allow any objects to rest on the face or chest skin or store the simulator face down. Pressure points on the face and chest skin may warp or damage the skin.

CLEANING

Clean the simulator with a cloth dampened with diluted liquid dishwashing soap. If medical adhesives remain on the skin, clean with alcohol wipes.

Do not use citric acid cleaners anywhere on the simulator. Doing so will cause pitting of the various materials comprising your simulator.

The simulator is "splash-proof" but not waterproof. Do not submerge or allow water to enter the interior of the simulator. Do not expose the tablet computer to water or excessive dust.

Always purge and drain the internal fluid reservoirs and vein reservoirs at the end of the simulation session. Doing so will prevent molding or clogging.

Defibrillation / ECG

ELECTRICAL THERAPY

Defibrillation is allowed only on the large sternum and apex sites. Do not deliver a shock to ECG electrode sites on the shoulders or waist .

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

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 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.

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, the simulator'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.

Terminology

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

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

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

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

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

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

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

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

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

Getting Started

Simulator Setup

SIMULATOR PLACEMENT

Prepare the simulation area prior to unboxing the simulator. The simulator's designated area should have ample space for multiple participants to move about freely.

Remove the simulator from the blue case with the assistance of at least two persons. Avoid lifting the simulator by the arms as it could damage the shoulder joints.

Rest the simulator on a patient bed capable of supporting the weight of a real patient. It is recommended that HAL's head rest flat on the bed or on a thin pillow to prevent the face skin from shifting.

BATTERY (HAL 1 YEAR)

HAL 1 Year includes two separate power adapters labeled "**Pediatric 1 Year Charger**" and "**Pediatric 1 Year Power Supply**". Please review the use for each adapter before using the simulator for the first time.

Pediatric HAL 1 year has a maximum battery runtime of approximately 3 hrs. The battery charge is displayed on the software panel after the connection with the simulator is established. Total runtime is dependent on the breathing rate, volumes, seizures, and muscle tone.

Feature	Runtime
Internal Battery	3 hours

WARNING: Do not store the simulator with a discharged battery. Recharge the battery at the end of every simulation session. If the simulator will not be used for an extended period, re-charge the battery at least once every 30 days. Doing so will prevent damaging the battery due to discharging.

CHARGING THE BATTERY (HAL 1 YEAR)

The Pediatric HAL 1 Year battery can only be recharged using the "Pediatric HAL 1 year Charger" while the simulator is off or in standby. Neither the battery charger nor the power supply adapter recharge the battery while the simulator is in use.

Turn the simulator off and connect the battery charger to recharge the battery.

To charge the battery:

1. Close the UNI software to turn the simulator off
2. Connect the adapter labeled "Pediatric 1 Year HAL Charger" to the battery port located on the simulator's right side.
3. Allow the simulator to charge for 2-3 hours (or until the charger displays a green light). The charger indicator light will show red during the charge period and green once the process is complete.
4. After the charger indicator light turns green, disconnect the charger. The simulator is ready for use.

Avoid using the simulator while the battery charger is connected. Please reference the troubleshooting guide for information on how to resolve battery issues.

USING THE POWER SUPPLY (HAL 1 YEAR)

The "power supply" adapter allows the simulator to operate through long simulations sessions by drawing power from the wall outlet and not battery reserve. Use the power supply for simulation sessions lasting 2 hours or more. If simulation sessions are shorter than 2 hours, using the simulator's battery reserve is recommended.

The "power supply" adapter will not re-charge the battery. Avoid using the "power supply" adapter if the simulator's battery is completely depleted.

To operate the simulator from wall power using the power adapter:

1. Fully recharge the simulator's battery using the "Battery Charger" adapter.
2. Disconnect the "Charger" and connect the "Power Supply" adapter.
3. Activate the UNI software. The UNI battery icon will display a lightning icon while the power supply is connected.

Please contact Gaumard for information on the power supply upgrade for earlier Pediatric HAL models.

BATTERY (HAL 5 YEAR)

HAL 5 year is equipped with an internal battery that allows the simulator to operate while untethered.

Feature	Runtime
Internal Battery	3 hours

CHARGING THE BATTERY (HAL 5 YEAR)

To charge the battery, connect the “HAL 5 year charger” adapter to the battery port located on the simulator’s right side. The “HAL 5 year charger” can recharge the battery while the simulator is operating.

Battery charge time is approximately 2 hours. The AC adapter’s status indicator light displays red when the battery is charging and green when the process is complete. To display the battery level, the UNI software must first establish a connection with the HAL.

WARNING: Do not store the simulator with a discharged battery. Recharge the battery at the end of every simulation session. If the simulator will not be used for an extended period, re-charge the battery at least once every 30 days. Doing so will prevent damaging the battery due to discharging.

Control Tablet PC

The tablet PC is preloaded with the UNI 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 Working with UNI section.

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 "Working with the Simulator" section for more information about the streaming voice feature.

Always connect the streaming audio headset before starting the UNI 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.

VIRTUAL MONITOR 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.

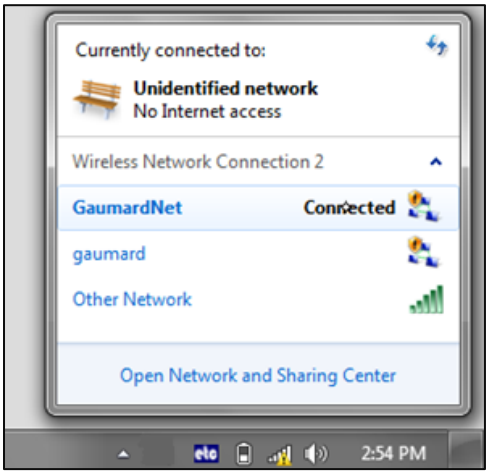
To setup the virtual monitor PC:

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.

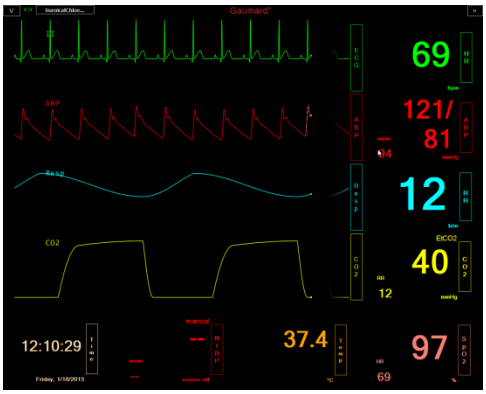
To verify the wireless link between the two computers, click the wireless icon located on the task tray. The wireless network name is configured at the factory and may differ from the one seen below. To troubleshoot connection issues between the virtual monitor computer and the controlling tablet, please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



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 UNI control software.



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

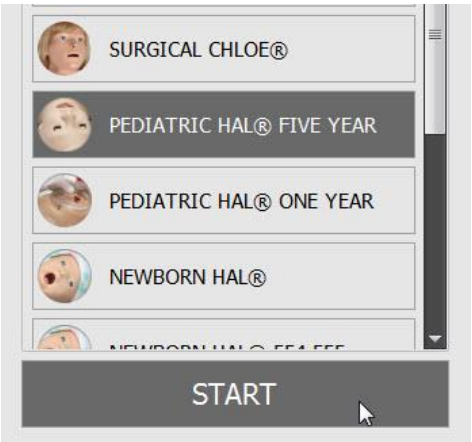
Working with UNI

Initializing the Simulator

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

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

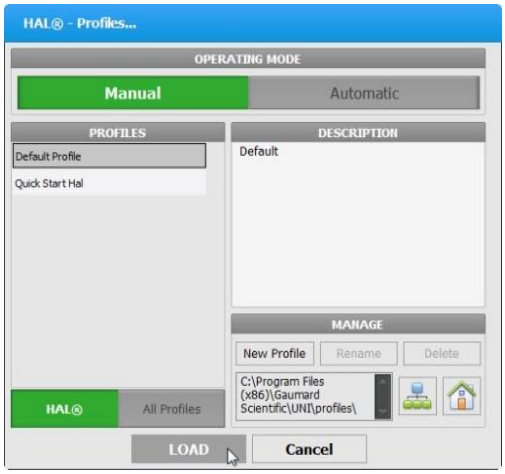
The simulator selection menu is shown. Select Pediatric HAL and click "Start".



The wireless link between UNI 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.

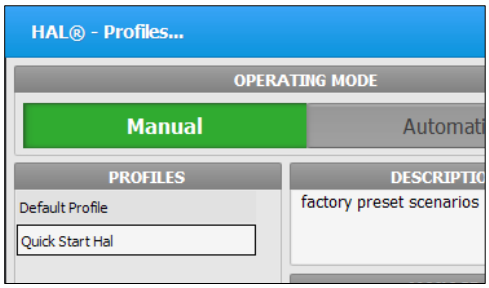


The UNI control software has two modes of operation: Manual and Automatic. Each mode includes a Quick Start profile with preprogrammed scenarios exercises created in conjunction with experienced healthcare instructors and working medical professionals. Continue to the next section to learn more about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



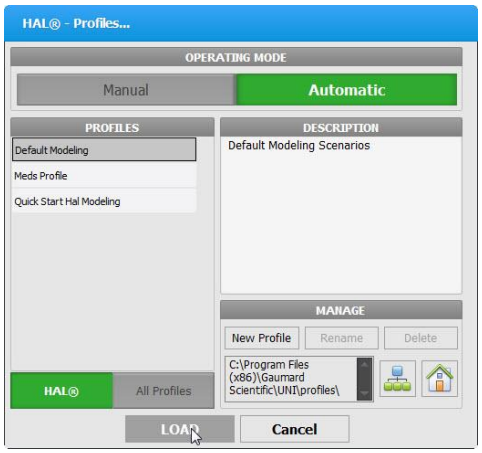
The Manual mode includes the following profiles:

Default Profile – includes one palette with healthy vital signs.

Quick Start Pediatric HAL – includes basic preprogramed 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 digital UNI user guide



The Automatic mode includes the following built-in profiles:

Default Modeling– includes one palette with healthy vital signs.

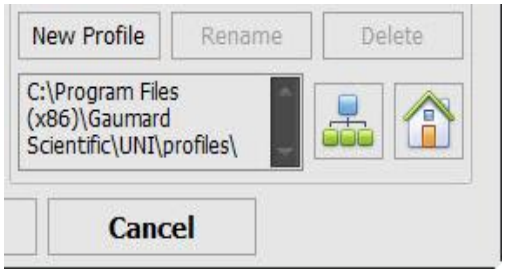
Meds Profile – This profile includes a library of pre-programmed drugs to be used on simulations.

Quick Start Pediatric Hal Modeling – includes a library of scenarios configured for the Automatic operating mode

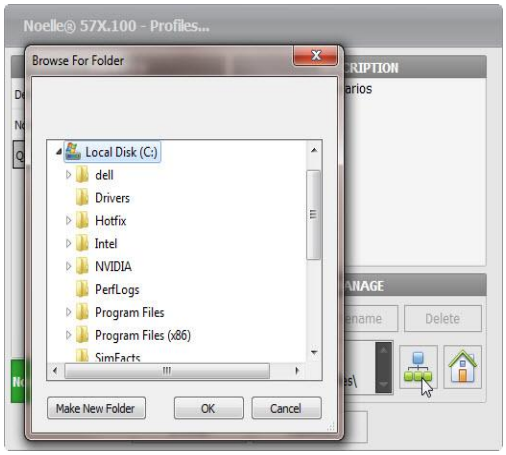
MANAGING PROFILES

Use the Manage Profile Menu to create a new profile and edit this profile.

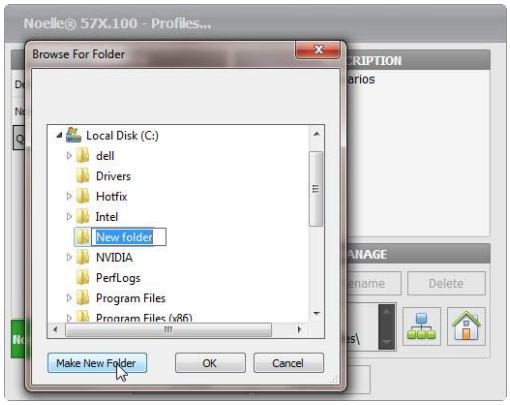
In addition, the profile folder location will be shown below the “New Profile” icon.



Use the “Map Profiles folder“ icon to select the location of the new profile to be created on the server.

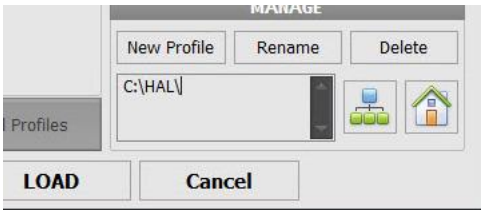


Select the server location and click “Make New Folder” to create the profile folder.



Assign a name to the folder and click “OK”

The new profile folder location will show up. Then proceed to create a new profile, see instructions detailed below.



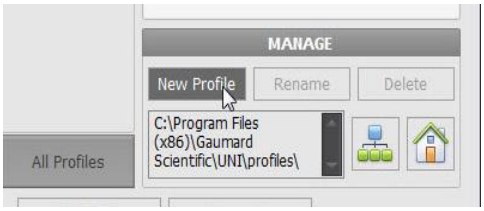
Use the “Home” icon to reset to default profiles folder.

CREATING A NEW PROFILE

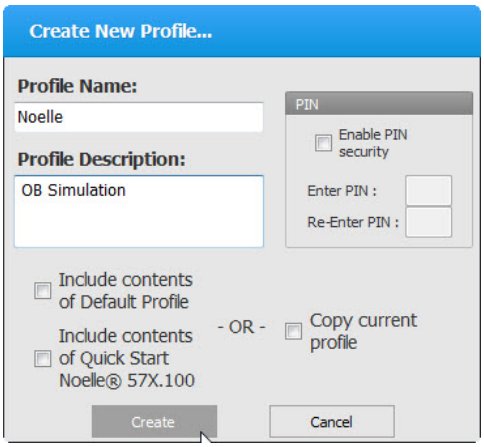
Profiles store palette, scenario, and option settings independently; changes made to one profile have no effect on the others. Below are some examples on how profiles are used.

- 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”.



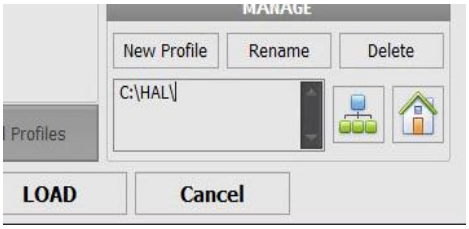
Enter a name for the new profile followed by a description.



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

Lastly, click “Create” to save the new profile

Click “Rename” or “Delete” to change the name of delete this new profile.

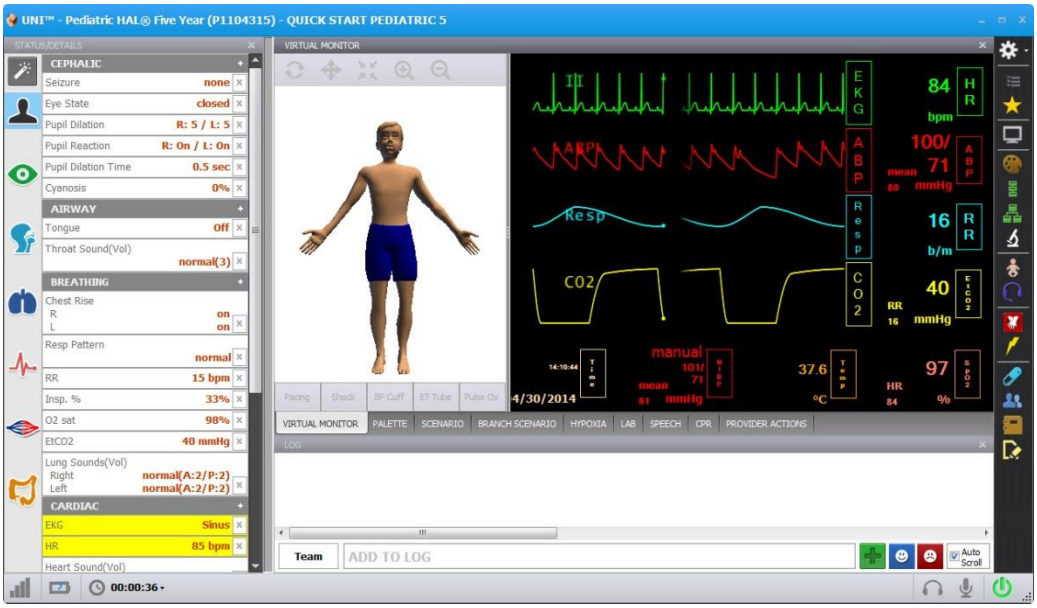


For more information about the UNI software, refer to the digital User Guide under Menu/Help/Instruction Manual.

UNI Interface

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

The UNI 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 icon is depleted, the simulator is set to STAND-BY mode automatically to protect some of the simulator's internal components.

Simulator will not initialize until connected to the charger or the battery is replaced with a fully charged spare.

WARNING

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

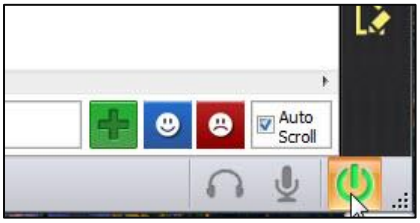
Feature	Runtime
Internal Battery	Approx. 3 hours

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 UNI software. Toggle the power button to set the simulator to stand-by mode and then again to resume.



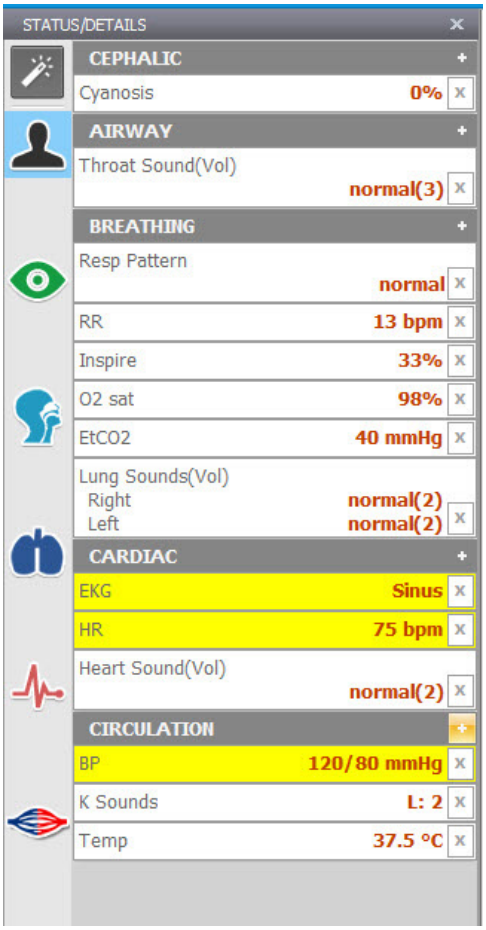
For more information about the UNI software, refer to the digital User Guide under Menu/Help/Instruction Manual.

Status / Details Controls

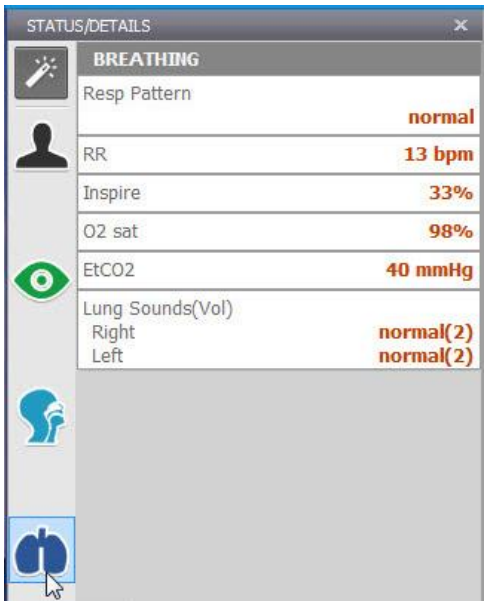
The Status/Details panel is used to monitor and control the simulator's vital signs. The individual parameter controls displayed on the details tab provide the simplest method for controlling the simulator's vital signs, sounds, and features.

The Status/Details tab displays the vital signs controls in a list format.

SYSTEMS LIST VIEW

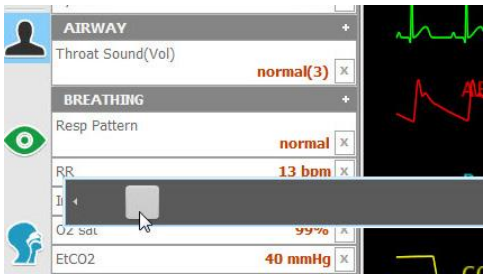


The Status/Details panel is used to monitor and control the simulator's vital signs. The individual parameter controls displayed on the details tab provide the simplest method for controlling the simulator's vital signs, sounds, and features.

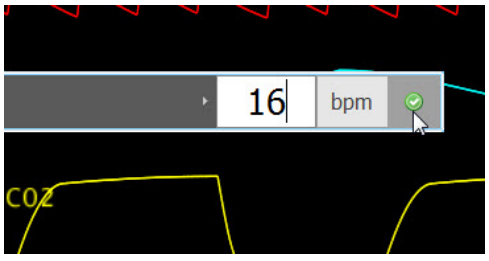


CHANGING VITAL SIGNS

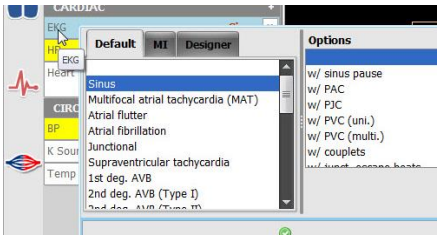
To adjust numerical values click the slider control. (e.g. heart rate, blood pressure, respiratory rate, etc.).

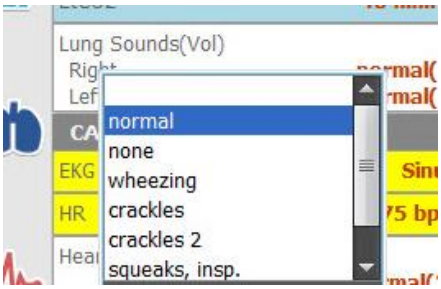


Alternatively, use the keyboard for manual entry and click the green checkmark to confirm the change.

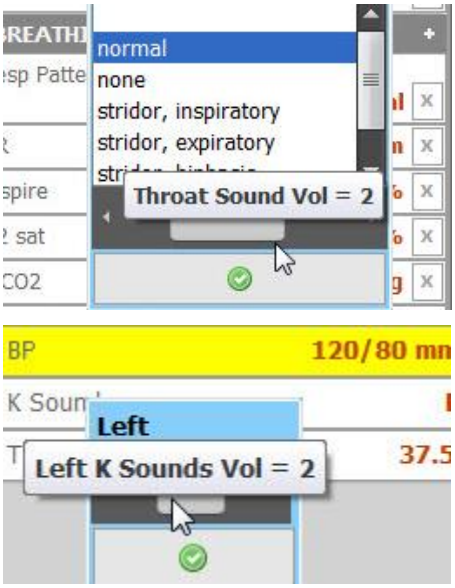


To change patterns, sounds, and rhythms, click on the specific control to display the library (e.g. EKG rhythms, heart and lung sounds, respiratory patterns, etc.)





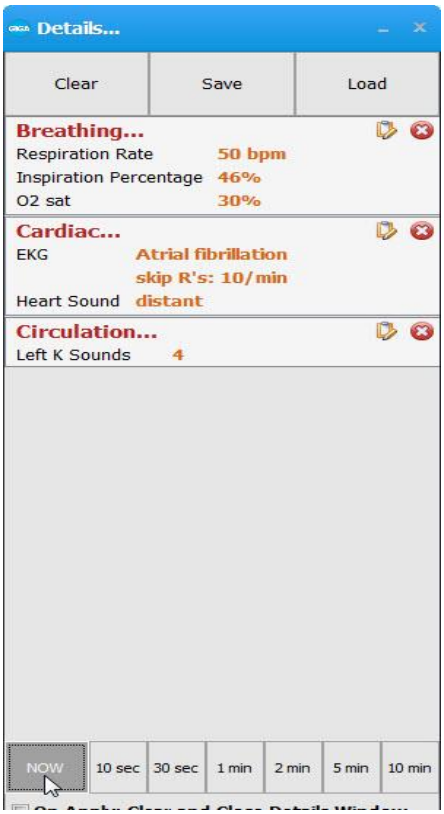
Click the slider control below the sound library to adjust the volume of the sounds.



APPLYING CHANGES

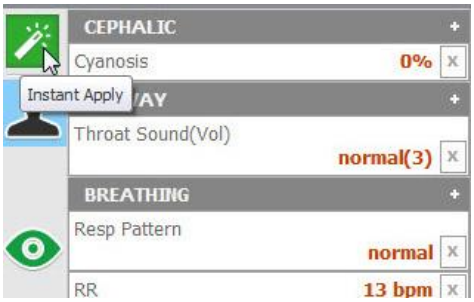
No changes will be made to the simulator's condition until the new settings are submitted using the "Apply" panel.

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.



Vital sign parameters can be edited or removed using the edit and remove parameter tabs

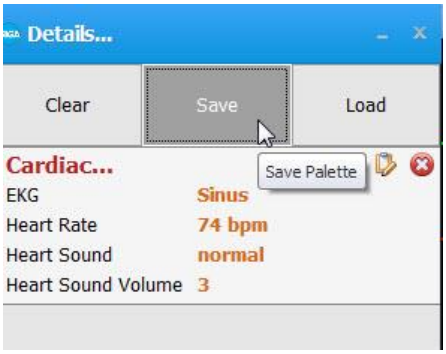
Enable the "instant apply" option and click the control to change the vital sign to a new value without the need to use "Apply" panel. Vital signs undergoing change blink yellow.



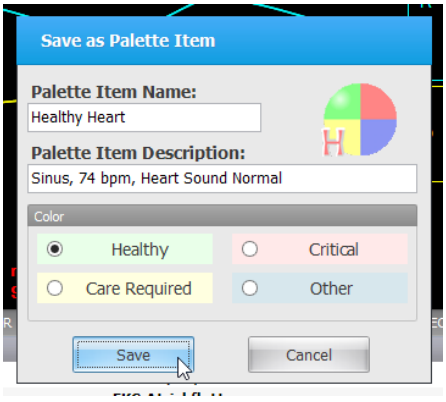
CREATING PALETTE ITEMS

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.

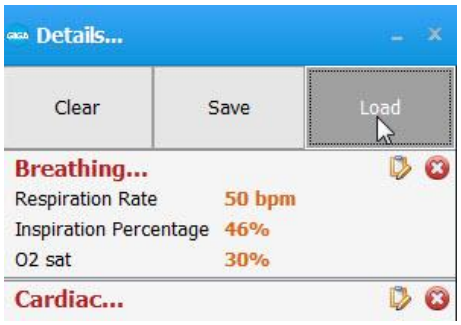
To create a new palette item, set the values for the desired vital signs parameters using the details controls and click “Save”.



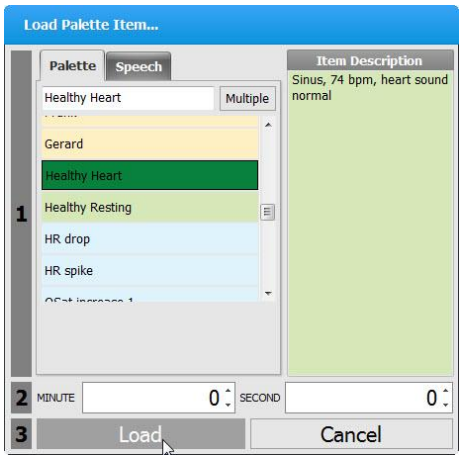
Enter a name for the palette, a description, and choose color code. Click “Save” to create the new palette Item. Palette items are stored in the active profile.



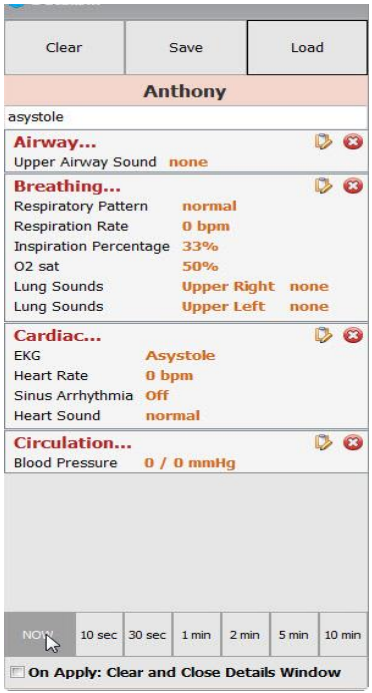
When the palette is needed, click the Load button to select the palette from the library.



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

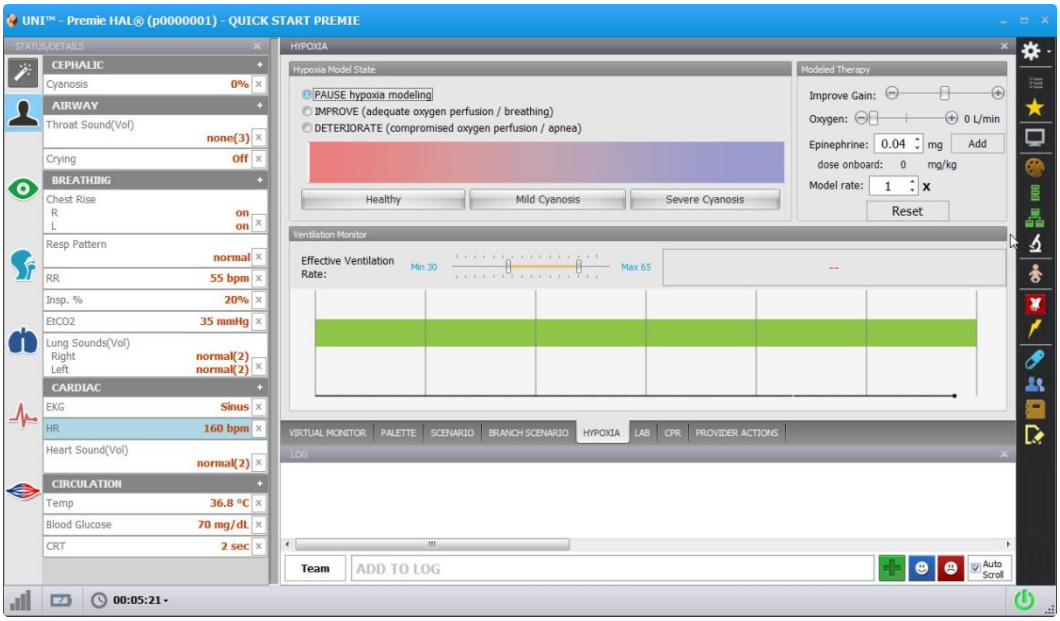


Click the apply option to submit the changes.



Modeling (Pediatric S3004_S3005)

Use the Hypoxia tab to evaluate the effectiveness of provider intervention on an apneic patient. The model adjusts the cardiac, oxygen saturation, and cyanosis dynamically in response to effective ventilations. The model also responds to the administration of epinephrine and oxygen.



HYPOXIA MODEL STATE

The hypoxia model options improve or deteriorate the cardiac and respiratory vital signs gradually.

- Pause - Model will pause at the current state.
- Improve - Trend the vital signs to a healthy state.
- Deteriorate - Trend the vital signs to a severe cyanotic state. Ventilations are detected when the respiratory rate is at 0.

CYANOSIS LEVELS

Select the cyanosis level to move to any of the following states immediately:

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

MODELED THERAPY

The modeled therapy menu provides additional intervention options.

- Improve Gain - Adjust the slider to increase or decrease the cyanotic response to ventilations.
- Oxygen - Adjust the slider to administer oxygen to the fetus in liters per minute.
- Epinephrine - Administer epinephrine to the model. Set the epinephrine dose and then click “add”. Administering epinephrine increases the heart rate.

Reset - Click “Reset” to clear the oxygen flow and the epinephrine dose onboard

Working with Pediatric HAL

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

	Simulator Feature	**HAL 5 Year S3005**	**HAL 1 Year S3004**
Airway	Nasal Intubation	Y	Y
	Oral Intubation	Y	Y
	ET Tube Position Sensor	Y	Y
	Tongue Edema	Y	Y
	Cricothyrotomy / Tracheostomy	Y	Y
	Airway Sounds	Y	Y
Breathing	R/L Chest Rise	Y	Y
	R/L Lung Sounds	Y	Y
	Ventilation Sensor	Y	Y
Cardiac	Heart Sounds	Y	Y
	ECG Lead II	Y	Y
	Defibrillation/ Cardioversion / Pacing	Y	Y
	Compression Sensor	Y	Y
Circulation	Bilateral IV arms	Y	Y
	Blood Pressure (Left Arm)	Y	Y
	Bilateral Pulses (Carotid, Brachial, Radial, Femoral, Radial)	Y	Y
	Disable Radial Pulse	Y	Y
	Central Cyanosis	Y	Y
Neurological	Reactive Eyes	Y	Y
	Seizures	Y	Y
Other	CPR evaluation	Y	Y
	Intraosseous Access	Y	Y
	Intramuscular Injection Sites	Y	Y
	Urinary Catheterization	Y	Y
	Gastric Distention	Y	Y
	Bowel Sounds	Y	O
	Automatic Mode	O	O
	Streaming Audio	O	O

Airway

AIRWAY COMPLICATION

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

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	5 Year - S3005	1 Year - S3004
Intubation (Blade size)	Miller 2 or MAC 3	Miller 1
LMA	Size 2/2.5	Size 1.5/2
Nasal Intubation	10 Fr catheter	10 Fr catheter
Oral Intubation	Lubricated ETT 5.0 or 5.5 no cuff; 10 Fr suction catheter	Lubricated ETT 3.5 no cuff; 8 Fr suction catheter
Nasogastric Tube	10 Fr catheter	10 Fr catheter

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 automatically disabled demonstrating right mainstem intubation. Correcting the tube position enables the left lung chest rise.

AIRWAY SOUNDS

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

Cricothyrotomy/Tracheostomy

Providers can perform a cricothyrotomy through the precut opening on the neck skin. The airway itself features an opening covered with tape that simulates the soft cricothyroid membrane.

Avoid using surgical tools to cut the neck skin. The precut opening allows the insertion of most medical devices. Always lubricate the medical adjunct before insertion.

REPLACING THE CRICOTHYROID TAPE

To replace the cricothyroid membrane tape:

1. Turn off the simulator and place it on a clean flat surface
2. Unscrew the bolts located at either side of the midsection
3. Gently slide the skin off each bolt and life the chest skin over the face to expose the airway
4. Remove the punctured cricoid tape from the airway and any glue residue
5. Wrap a new piece of tape around the airway to cover the cricoid opening. Ensure that the tape provides an airtight seal to prevent air leaks

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.

RESPIRATORY SOUNDS

The simulator is generates anterior, left and right 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.

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.

Cardiac

HEART SOUNDS

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

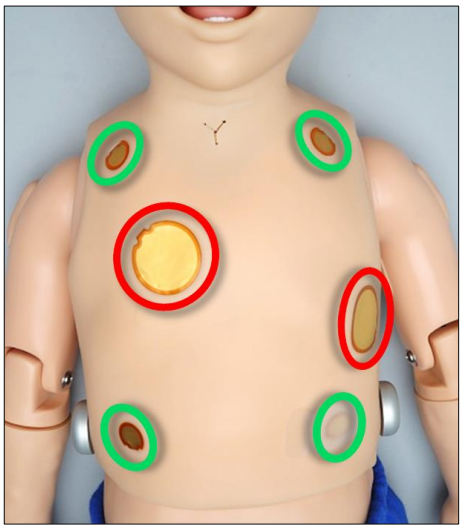
ECG MONITORING AND ELECTRICAL THERAPY

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, pacing, and cardioversion is supported only on the large sternum and apex sites circled RED. 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 an electrical charge 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.



ECG AND DEFIBRILLATION 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 reused 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.

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

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.

Circulation

BILATERAL PULSES

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

IV ARM

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

WARNING

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 (HAL 5 YEAR)

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.

INSTRUCTIONS FOR USE (HAL 1 YEAR)

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

1. Locate the fill syringe kit and port adapters. Fill the syringe with water or simulated blood.
2. Using the kit adapters, connect the syringe and drain tube to the vein ports located on the forearm.
3. Push fluid into the vein port until it exits through the drain tube.
4. Disconnect the fill syringe and drain tube.

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 VEINS

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. Fill the filling syringe with distilled water
2. Connect the fill syringe and the drain tube to arm
3. 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.
4. Fill the filling syringe with air and purge the clean water to dry the vasculature.
5. 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.

BLOOD PRESSURE PORT

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.

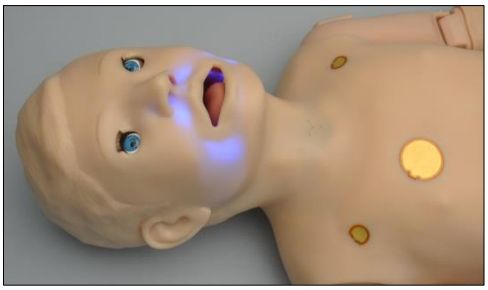
To calibrate the blood pressure feature:

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.

CENTRAL CYANOSIS

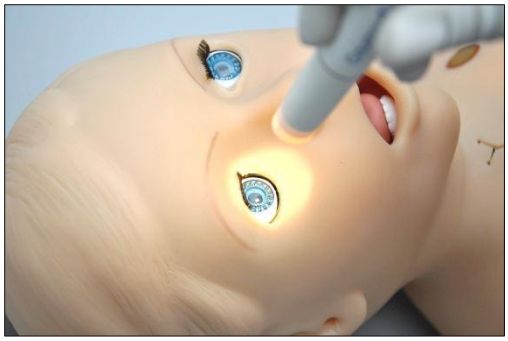
Use the software controls to adjust the cyanosis intensity.



Neurological

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

URINARY CATHETERIZATION

HAL features an internal bladder for catheterization exercises.

Simulator Model	Maximum Infusion Volume (mL)	Catheter size
S3004 HAL 1 year	48	8 Fr
S3005 HAL 5 year	90	10 Fr

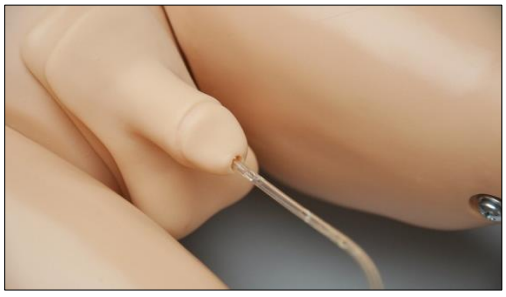
To fill the bladder with fluid to perform a catheterization exercise:

1. Place the simulator face down and locate the bladder fill port.

2. Fill the kit syringe with water.
3. Connect the fill kit syringe to the bladder fill port.
4. Inject fluid into the bladder. Do not exceed the maximum infusion volume.

INSTRUCTIONS FOR USE

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



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.

INTRAMUSCULAR INJECTION SITES

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

GASTRIC DISTENSION

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

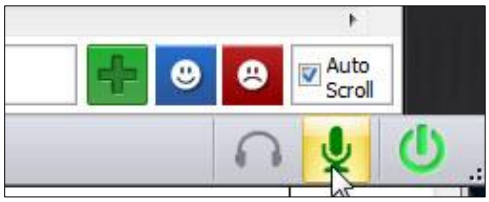
STREAMING AUDIO

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

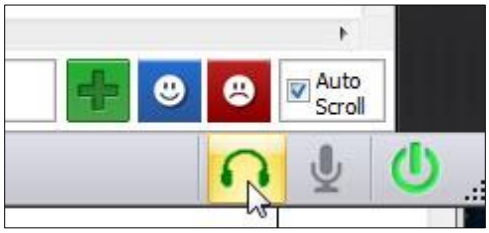
INSTRUCTIONS FOR USE

Ensure that the headset and microphone is connected to the PC before starting the UNI 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 UNI software User Guide for information on additional streaming voice features and functions.

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.

2. Remove the tibia insert.

3. Remove the bone’s reservoir cap and use the fill kit syringe to fill the bone reservoir with fluid.
4. Replace tibia bone in the leg and the skin cover.

INSTRUCTIONS FOR USE

Intraosseous access is only supported on the hollow tibia insert. To view a list of replacement parts including leg skin covers and tibia bones, go to the Appendix.

Appendix

More about 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. 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 therefore be applied to a wide range of scenarios. The key is to include only 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 available setting on the Status/Details panel. Remember that only the settings you specify will cause a change in the simulator, and all other settings will remain constant. Therefore, by starting with a complete state, the simulator’s condition will always be the same when the scenario starts, regardless of what she 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 UNIis 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 do not, 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 a scenario should be created with the assumption that the providers will perform correctly. As long as they do, the scenario can be allowed to continue.

Naturally, preparation must be made for what might happen to the simulator 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 Status/Details panel.

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

As 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

Scenario Flow Charts

PEDIATRIC HAL 5 YEAR SCENARIOS

Category	Scenario
Respiratory	
	1. Asthma
	2. Foreign Body Aspiration
	3. Upper Airway Obstruction (Toy Balloon)
	4. Epiglottitis
Trauma	
	1. Chest Injury
	2. Hypothermia
	3. Alcohol Ingestion
	4. Organophosphate Poisoning
	5. Renal Failure and Hyperkalemia
Cardiac	
	1. Soccer boy with SVT
	2. Cardiac Arrest
	3. Cardiac Ischemia
	4. Cardiac Tamponade

	5. Supraventricular Tachycardia
Systemic	
	1. Gram Negative Sepsis
	2. Status Epilepticus
	3. Fire Victim
	4. Septic Distributive Shock
	5. Diabetic Ketoacidosis
Automatic	
	Adenosine OD
	Adenosine SD
	Adenosine UD

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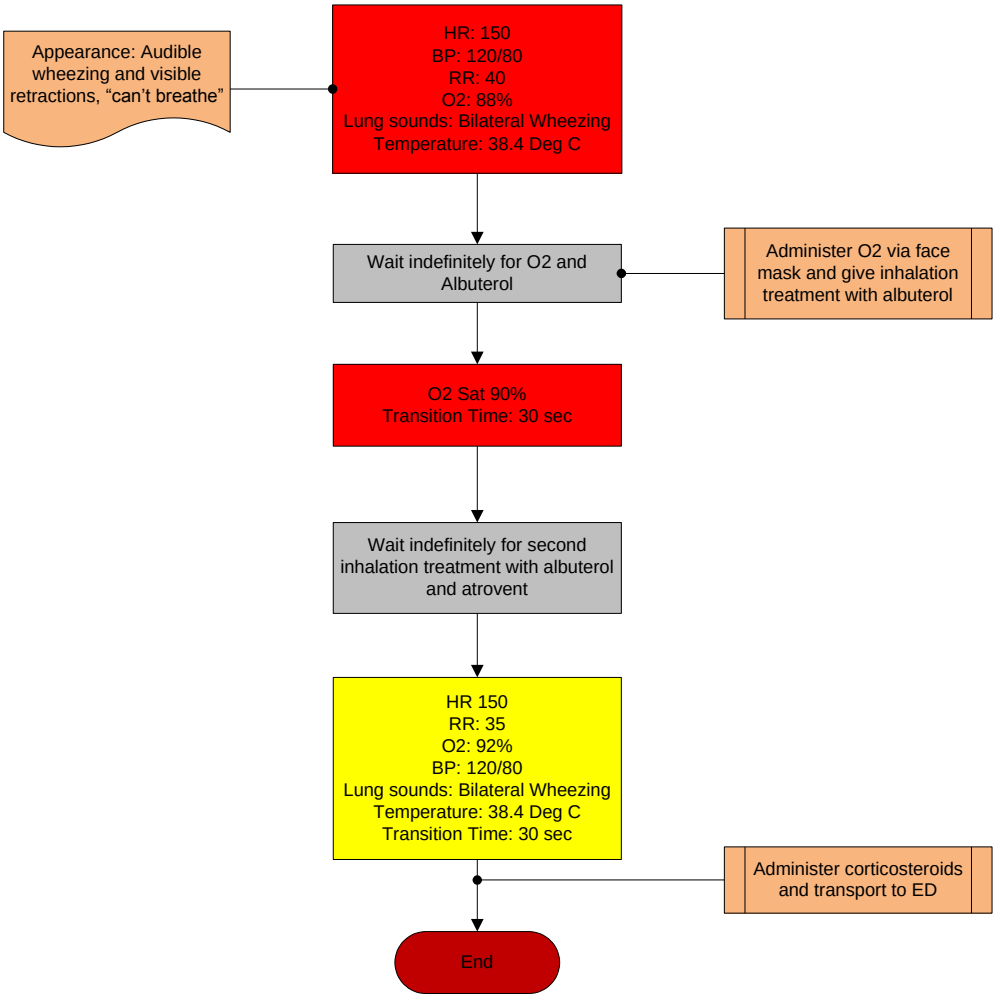
Pediatric HAL® Five Year - Respiratory Scenario

Asthma

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



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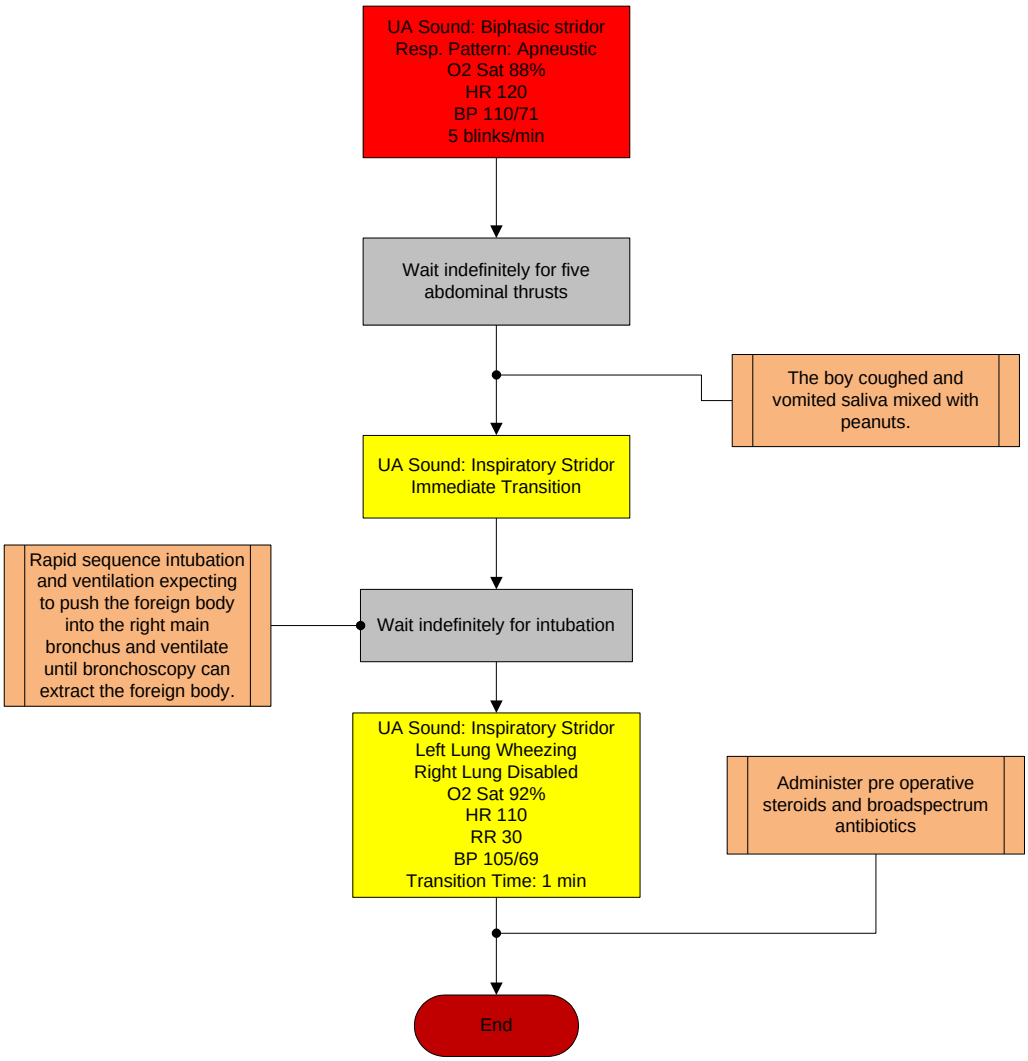
Pediatric HAL® Five Year - Respiratory Scenario

Foreign Body Aspiration

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



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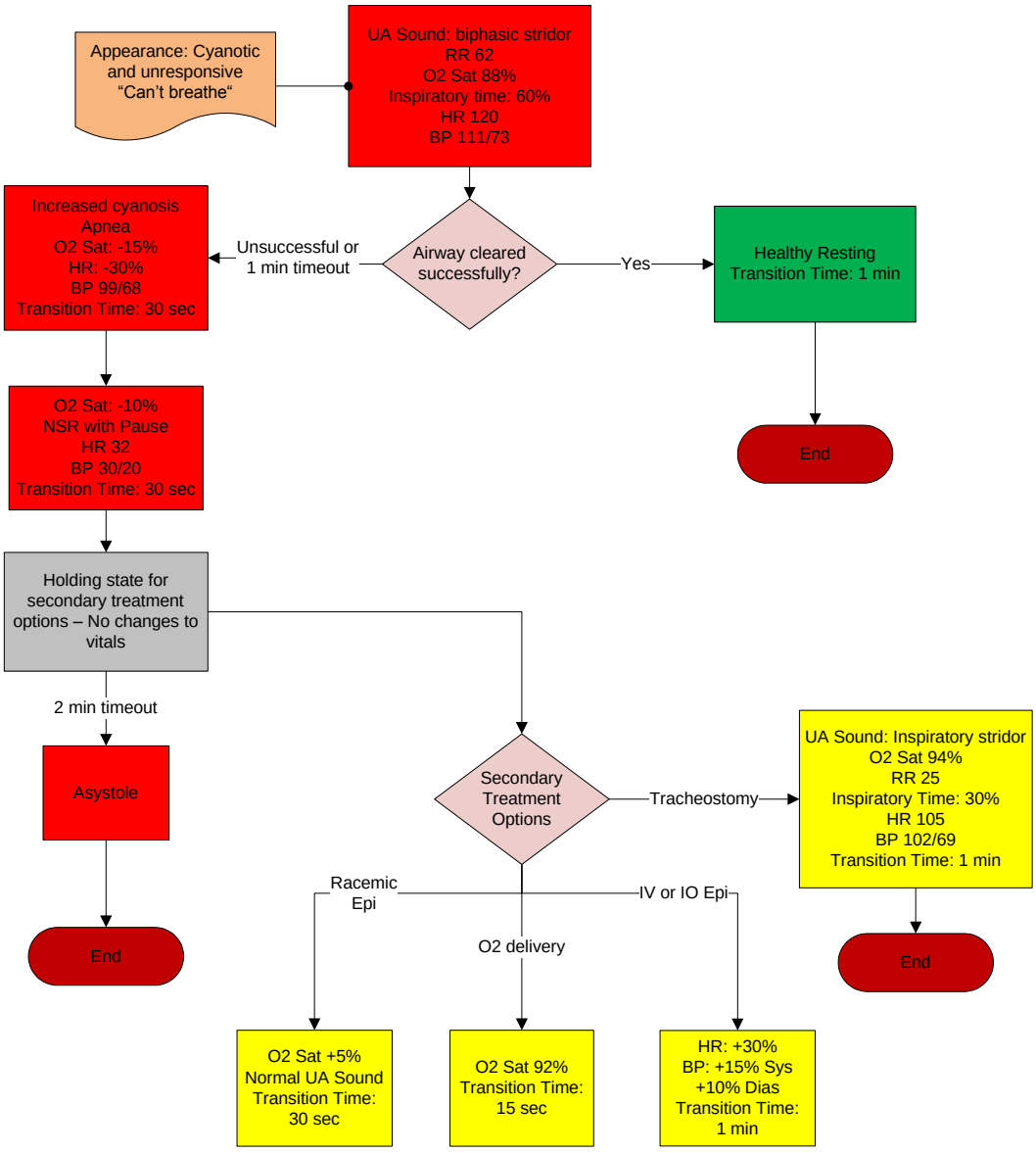
Pediatric HAL® Five Year - Respiratory Scenario

Upper Airway Obstruction

"Toy Balloon 5yr"

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



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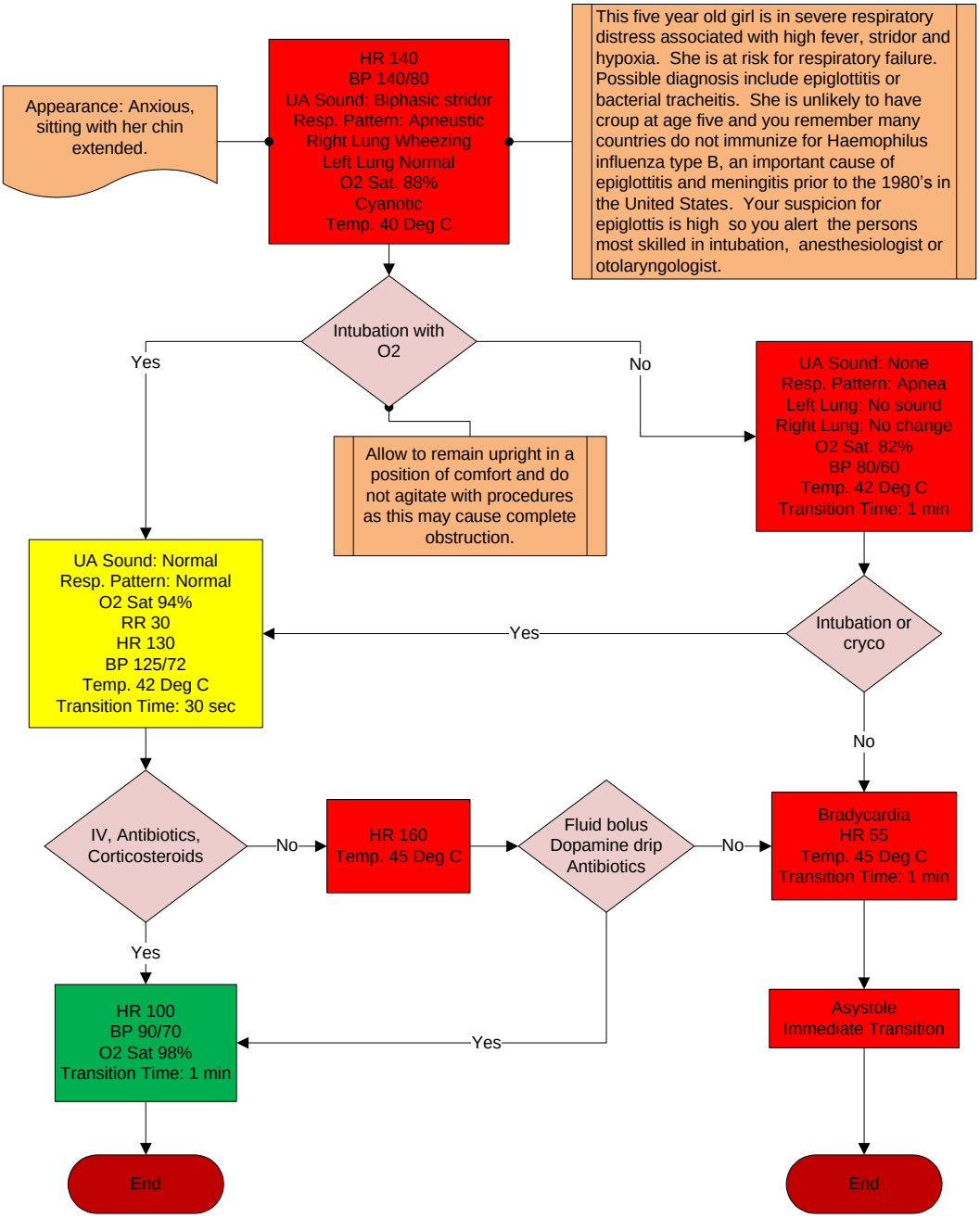
Pediatric HAL® Five Year - Respiratory Scenario

Epiglottitis

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



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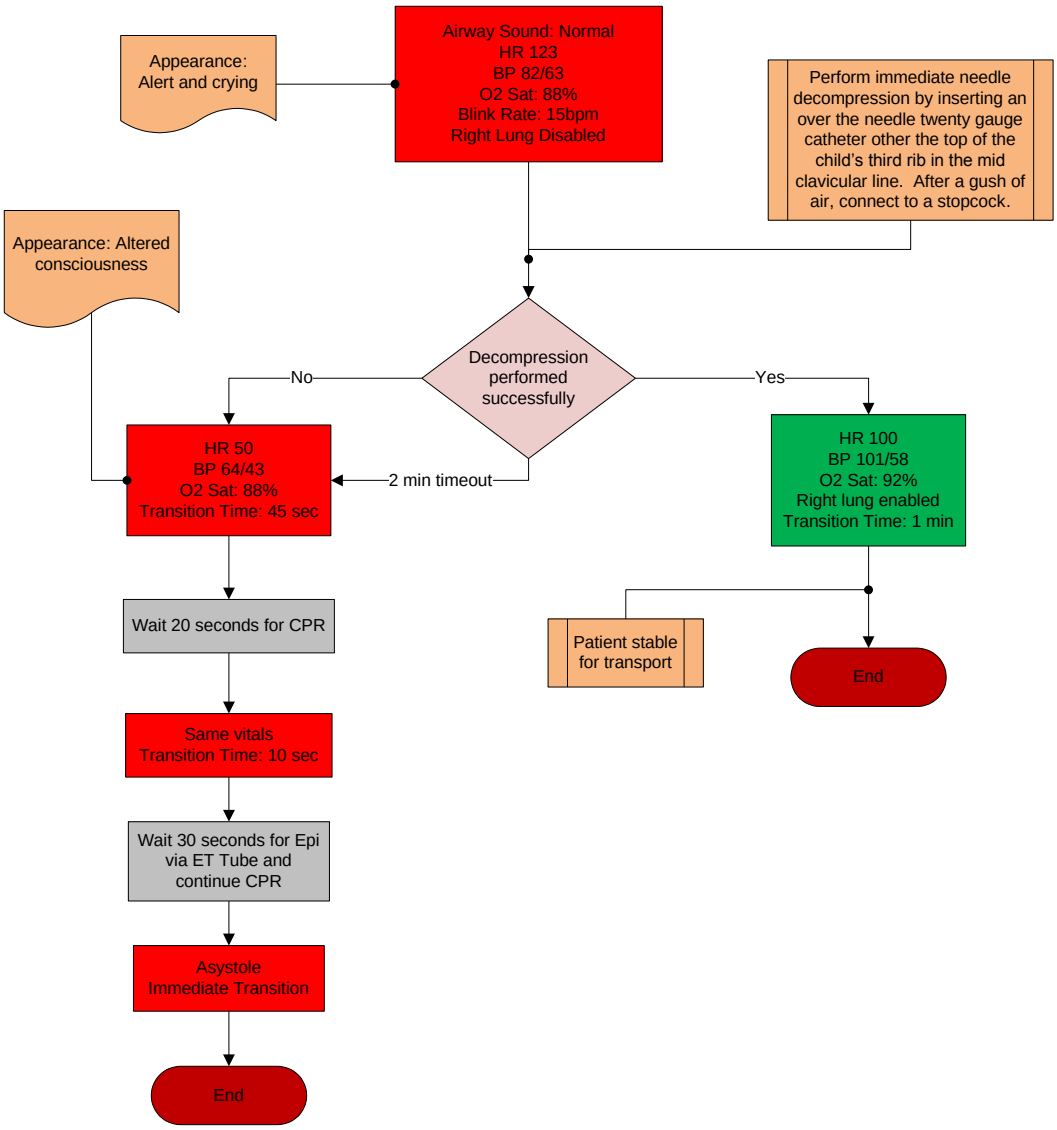
Pediatric HAL® Five Year - Trauma Scenario

Chest Injury

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



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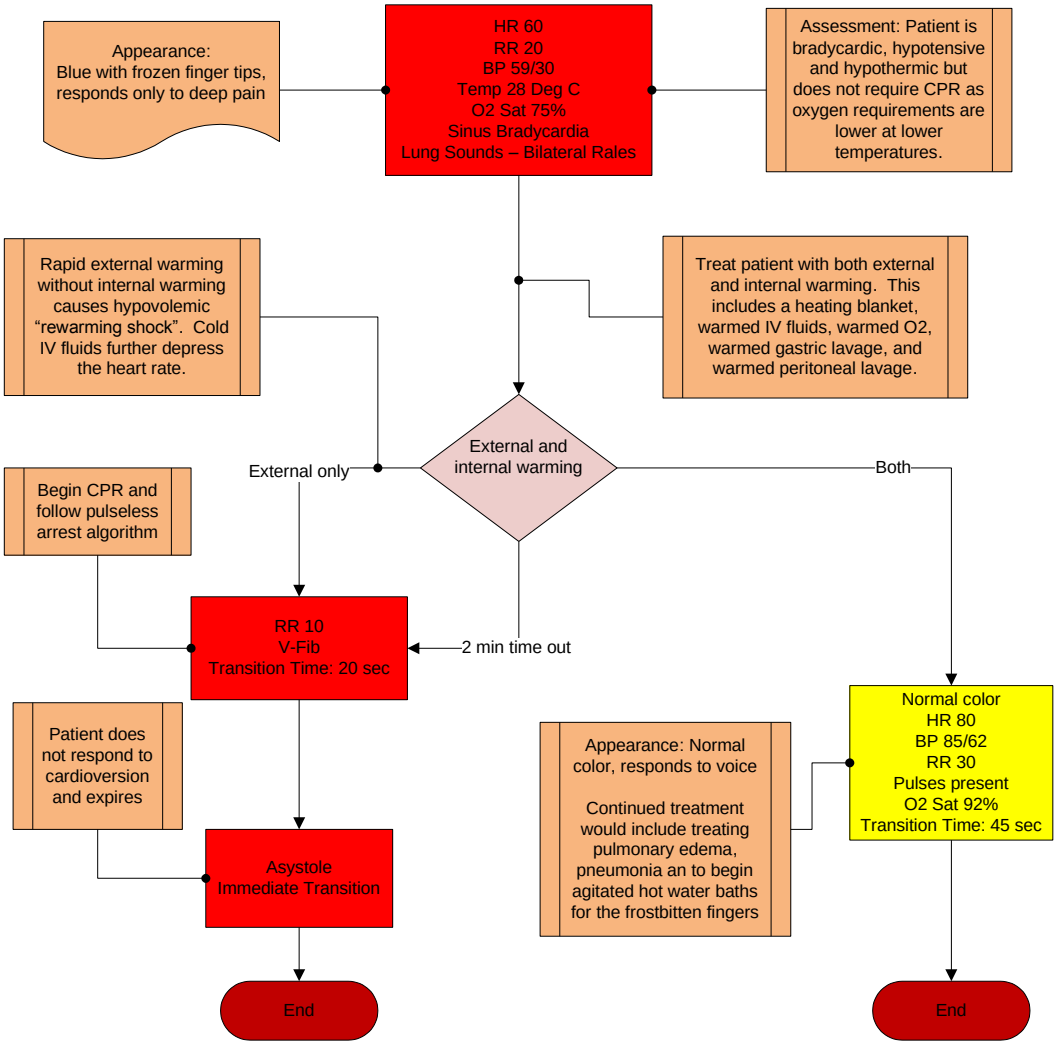
Pediatric HAL® Five Year - Trauma Scenario

Hypothermia

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



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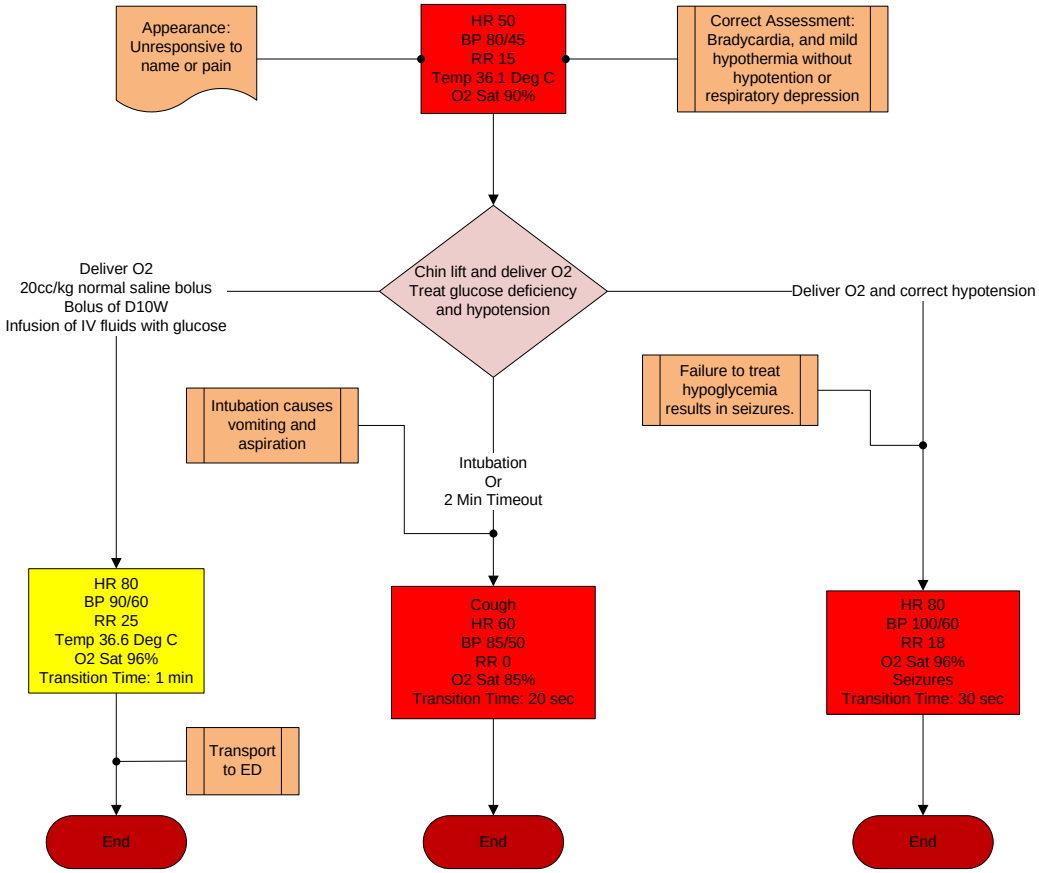
Pediatric HAL® Five Year - Trauma Scenario

Alcohol Ingestion

Bradycardia and Hypoglycemia

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

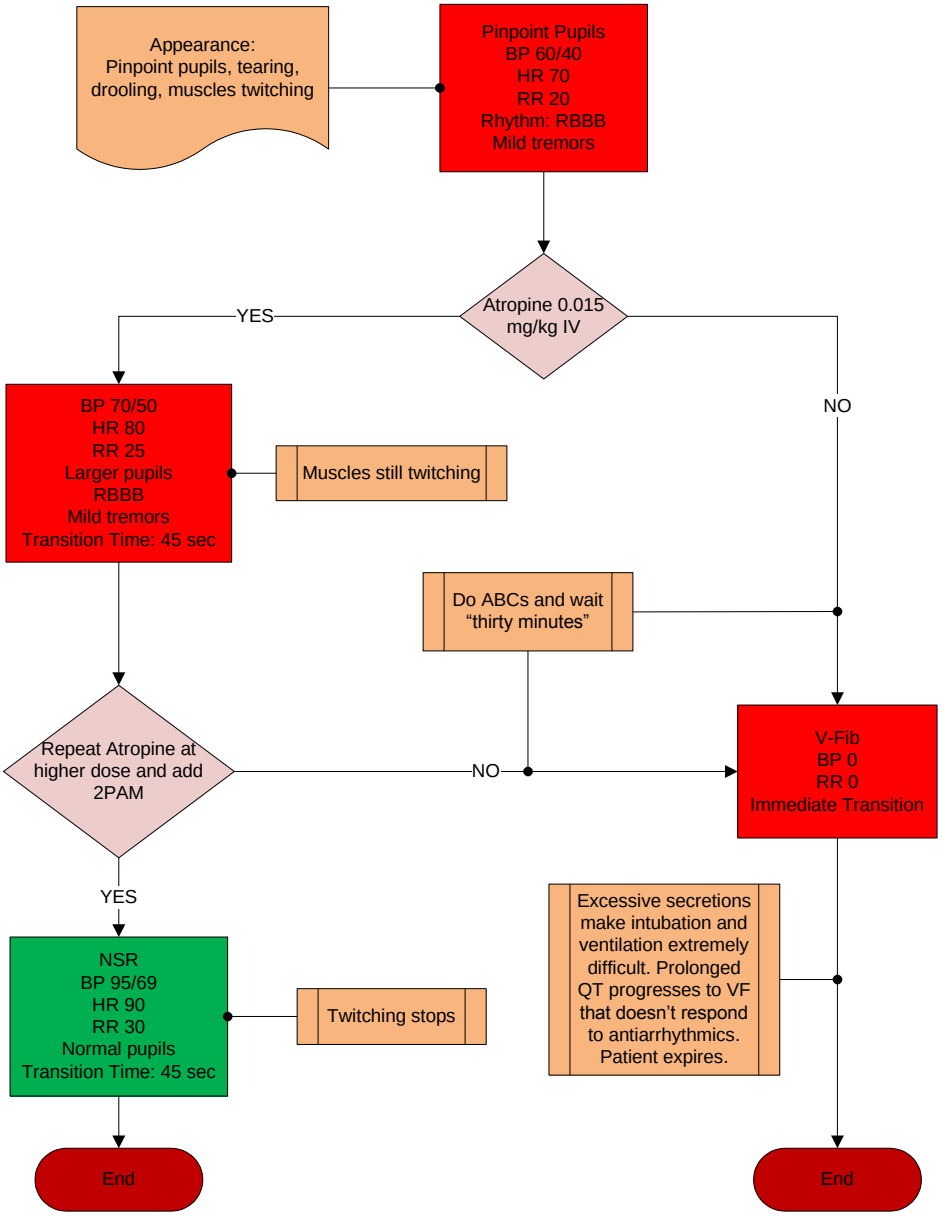


Pediatric HAL® Five Year - Trauma Scenario

Organophosphate Poisoning

"OP Poisoning"

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



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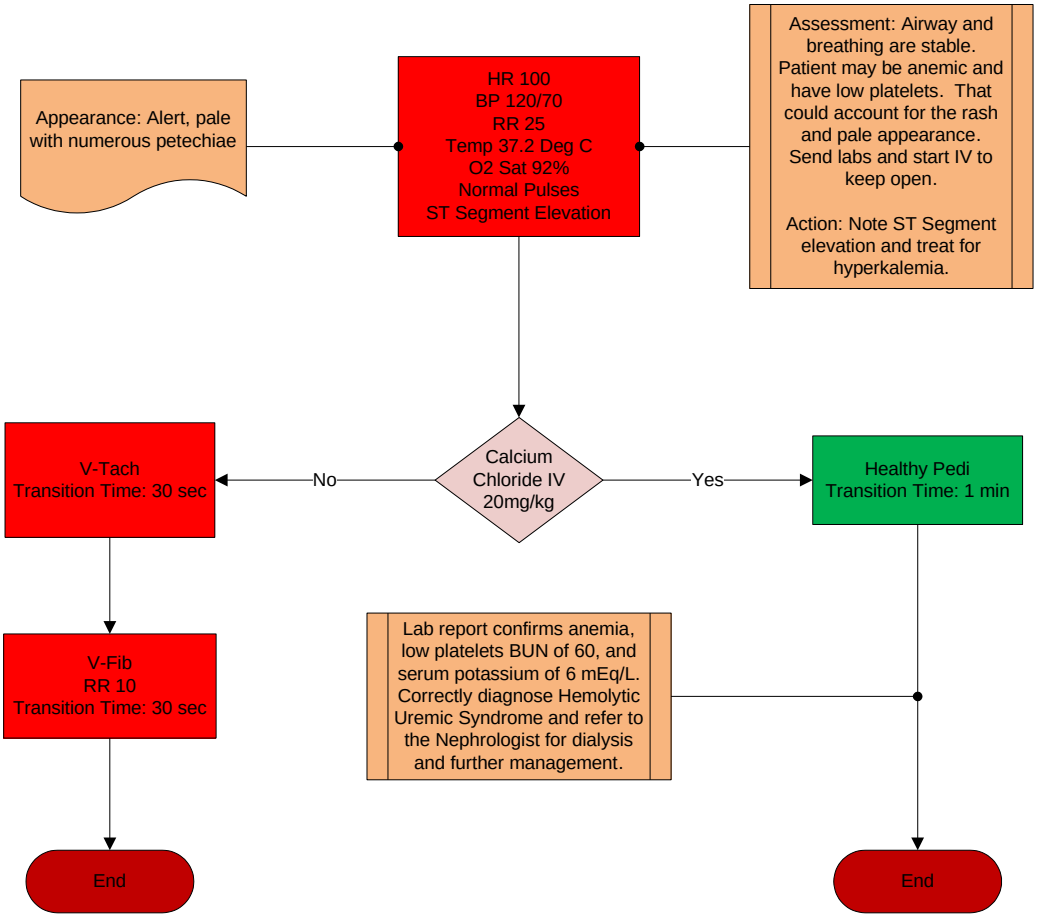
Pediatric HAL® Five Year - Trauma Scenario

Renal Failure and Hyperkalemia

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



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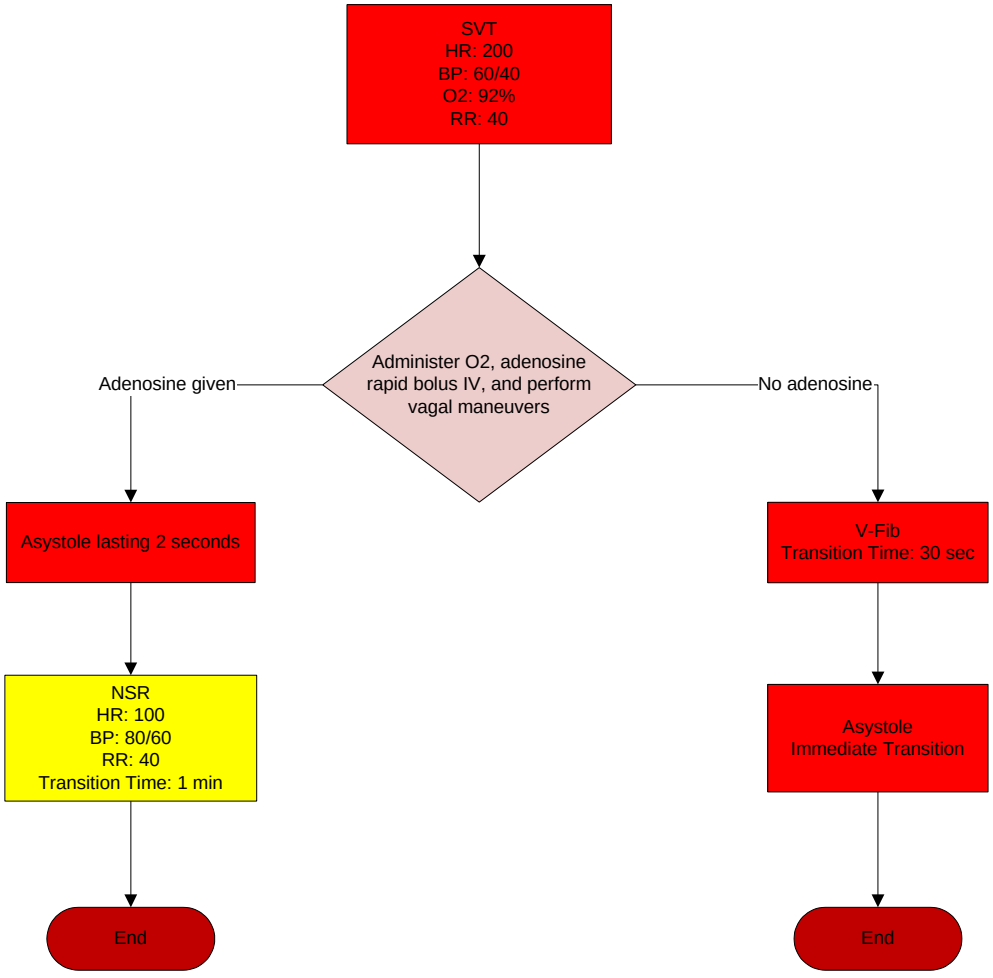
Pediatric HAL® Five Year - Cardiac Scenario

Soccer Boy with SVT

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



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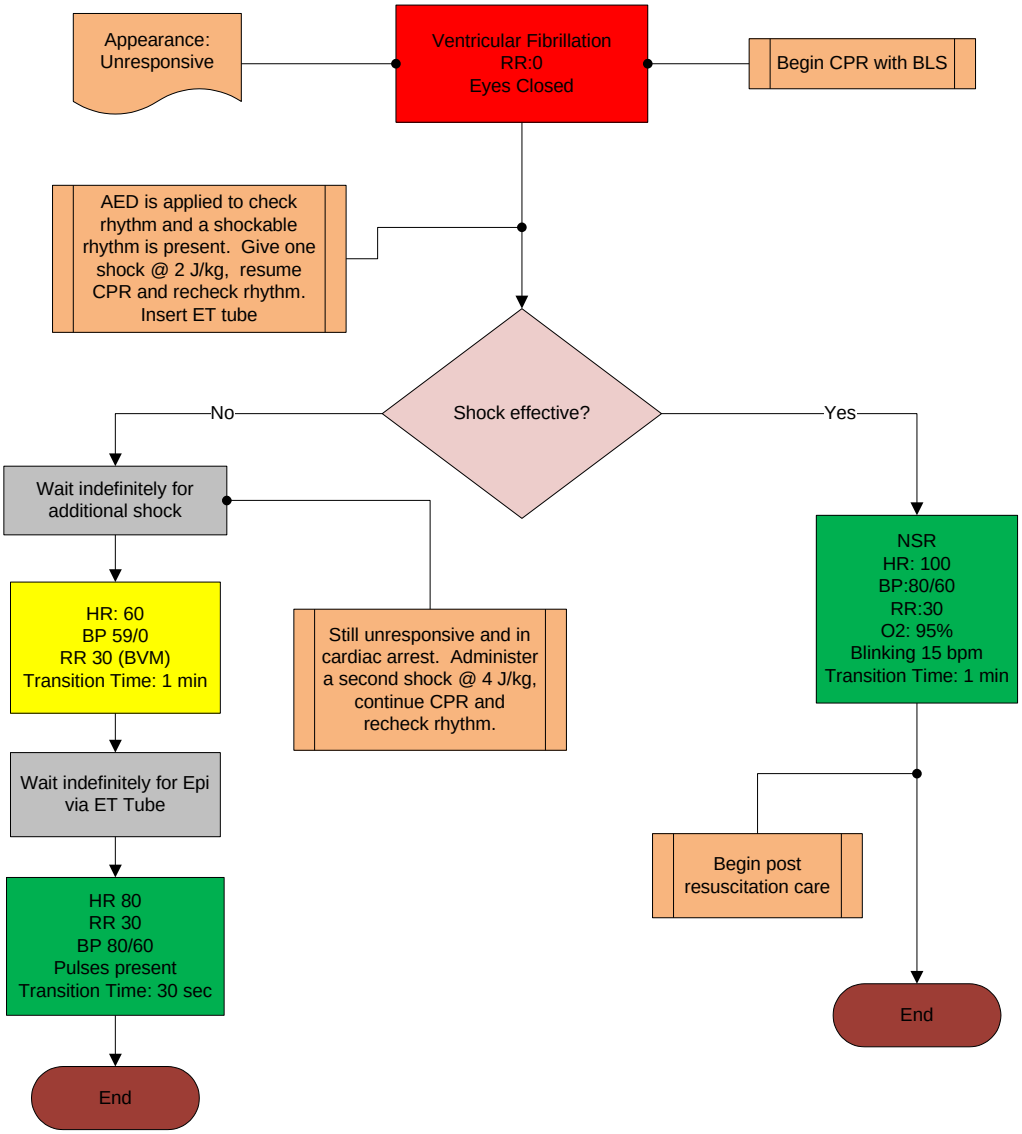
Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Arrest

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



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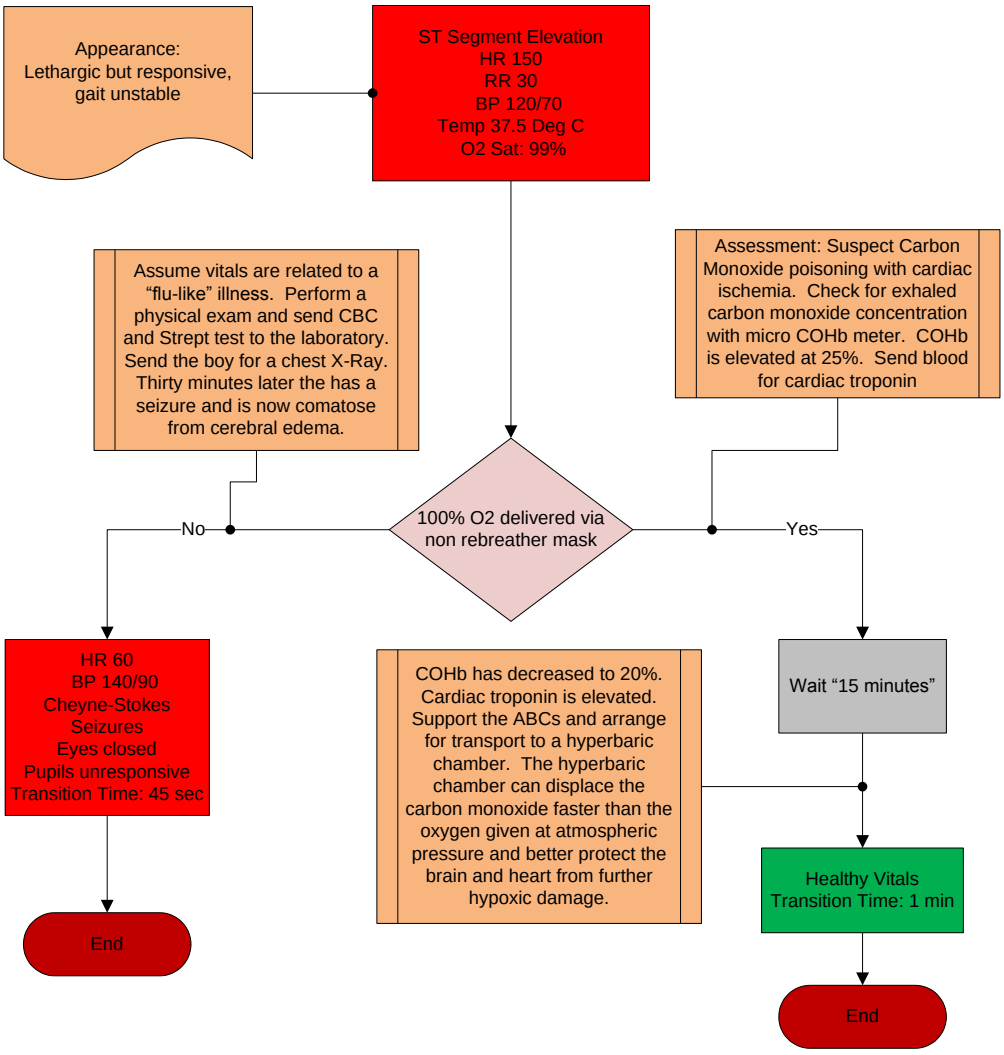
Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Ischemia

Carbon Monoxide Poisoning

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



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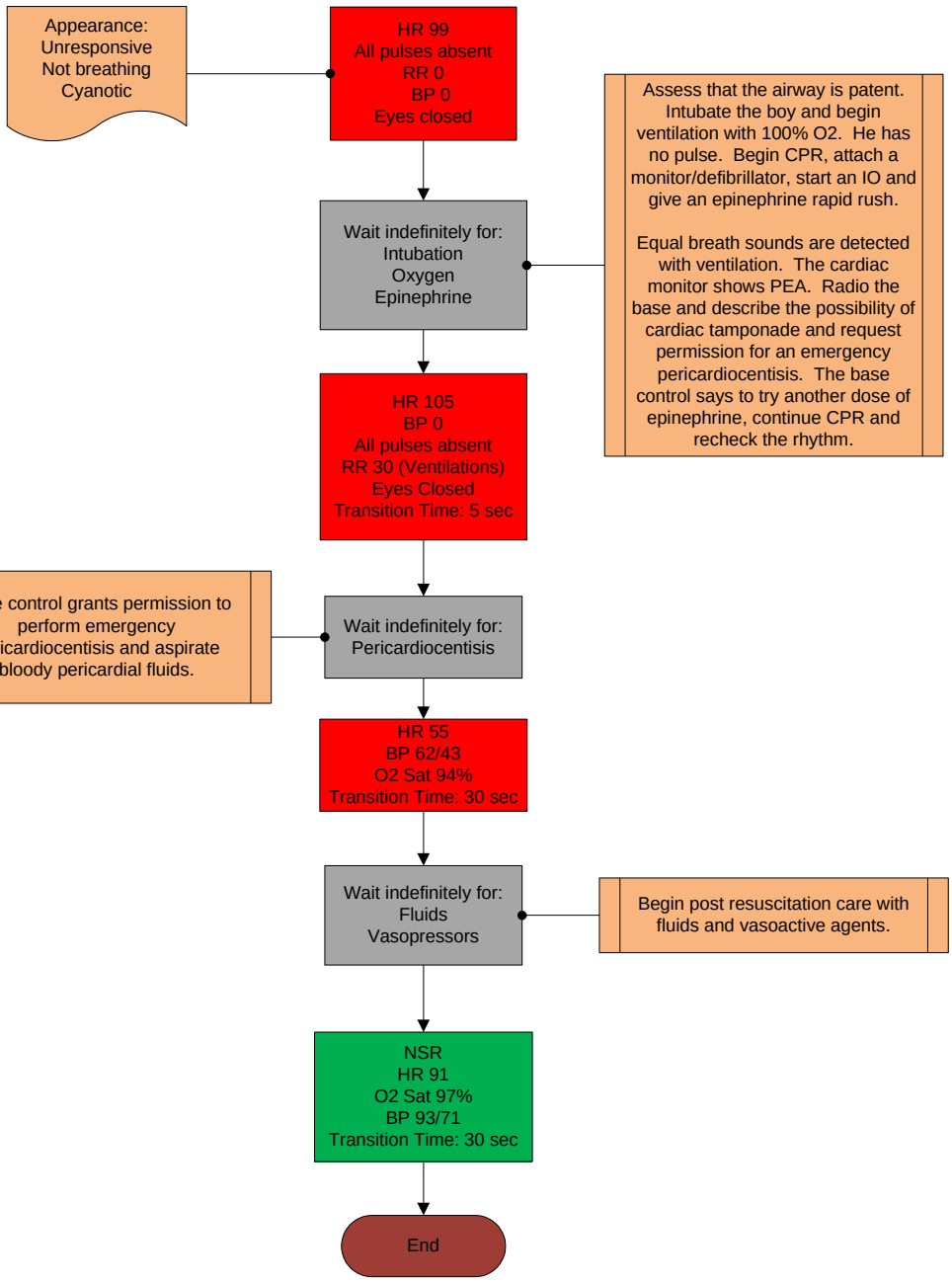
Pediatric HAL® Five Year - Cardiac Scenario

Cardiac Tamponade

Obstructive Shock / Pulseless Arrest

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



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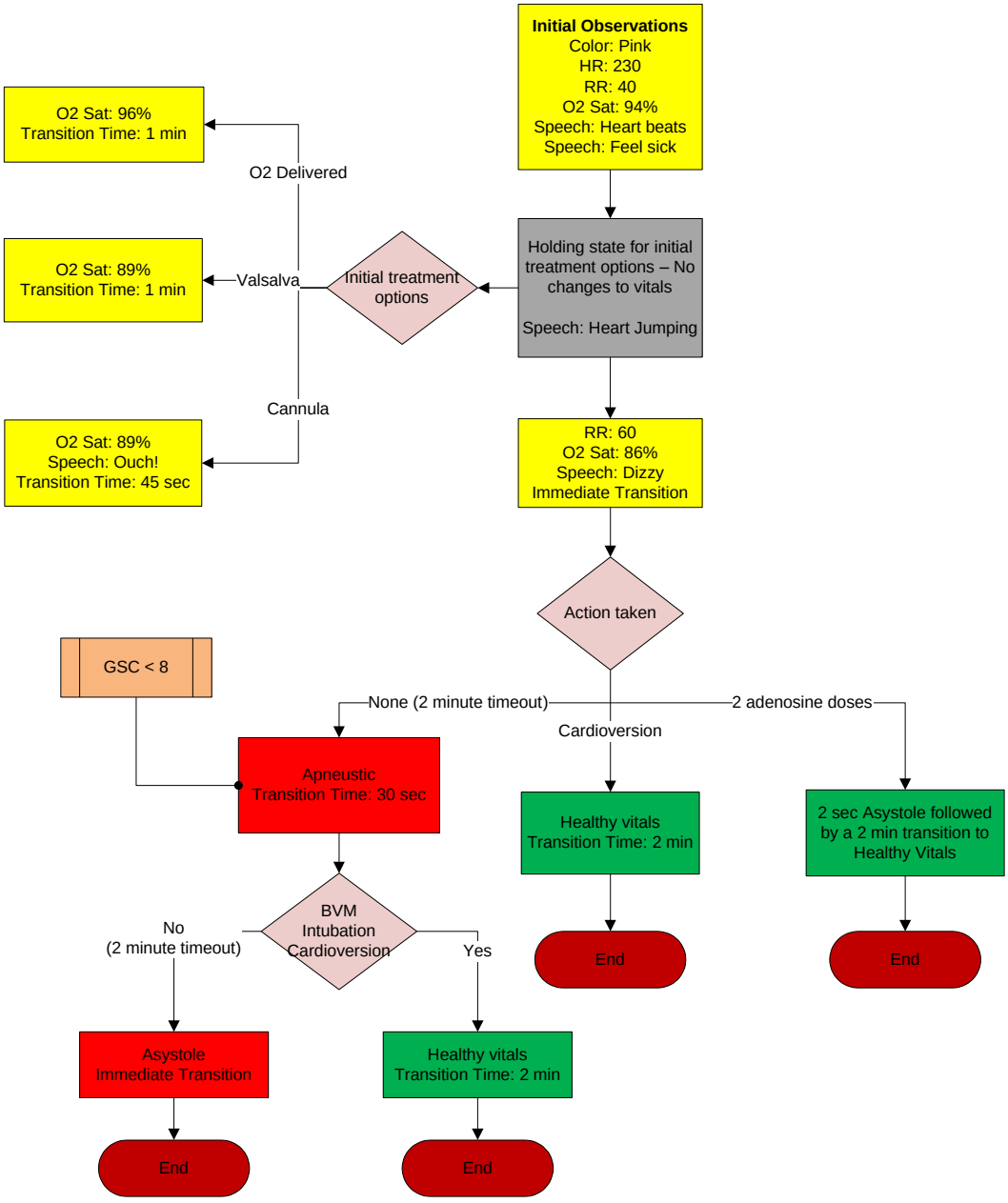
Pediatric HAL® Five Year - Cardiac Scenario

Supraventricular Tachycardia

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



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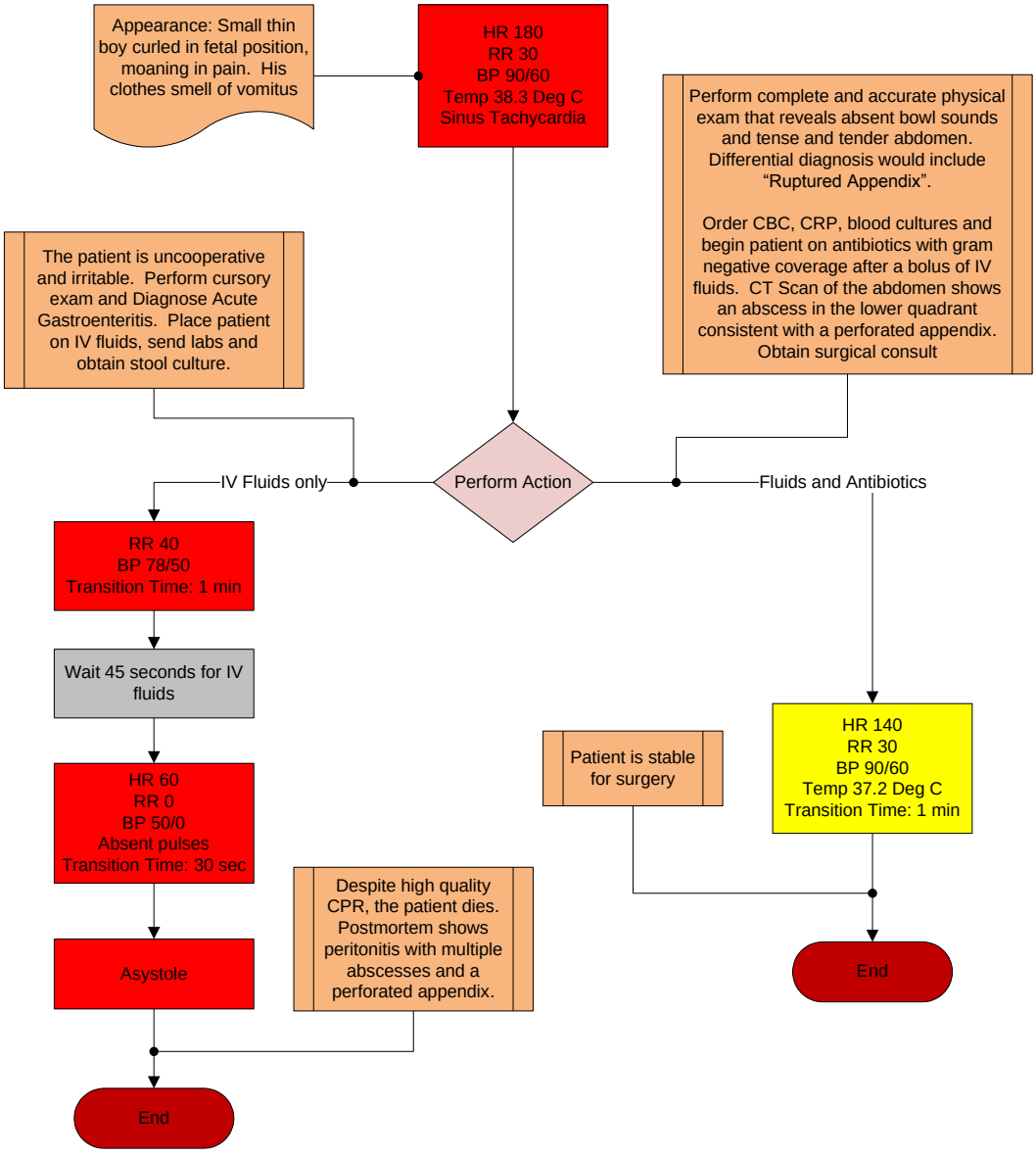
Pediatric HAL® Five Year - Systemic Scenario

Gram Negative Sepsis

Perforated Viscous and Peritonitis

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



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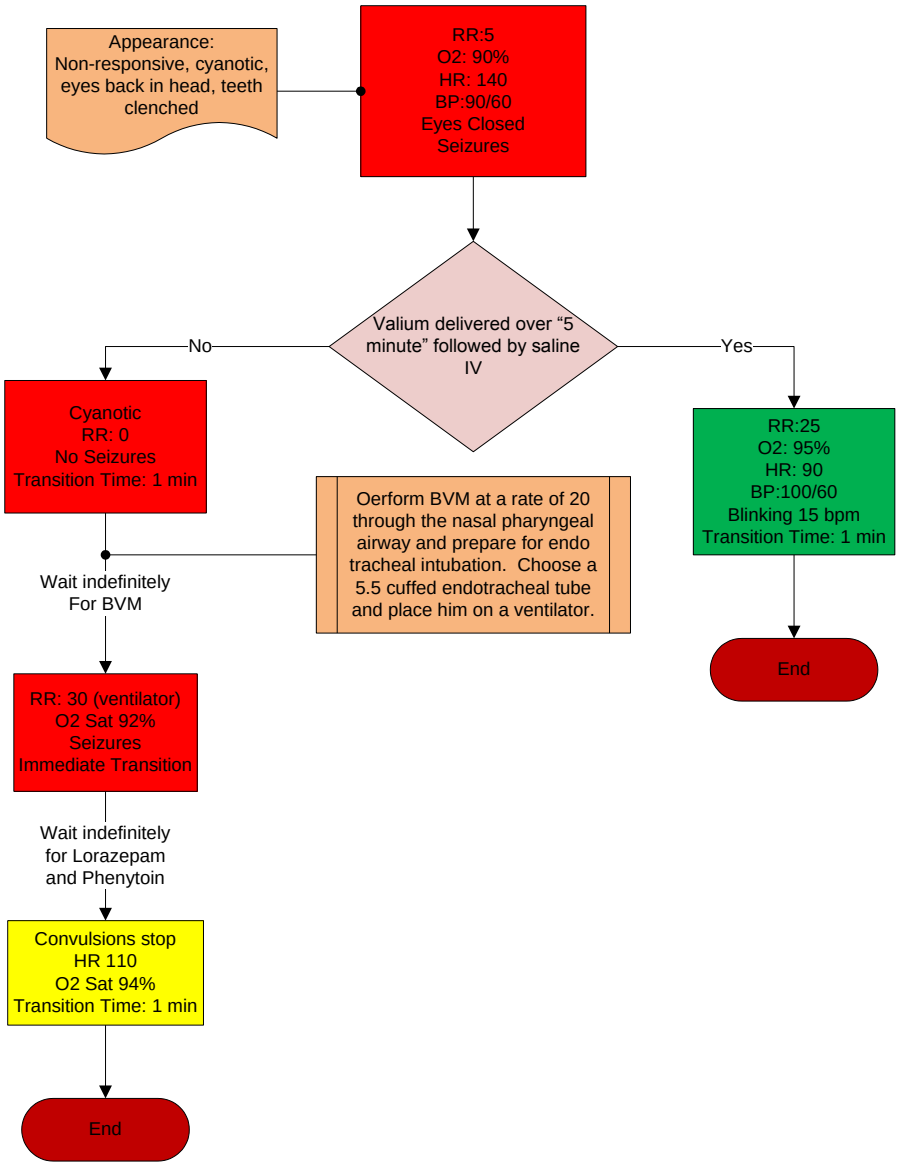
Pediatric HAL® Five Year - Systemic Scenario

Status Epilepticus

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



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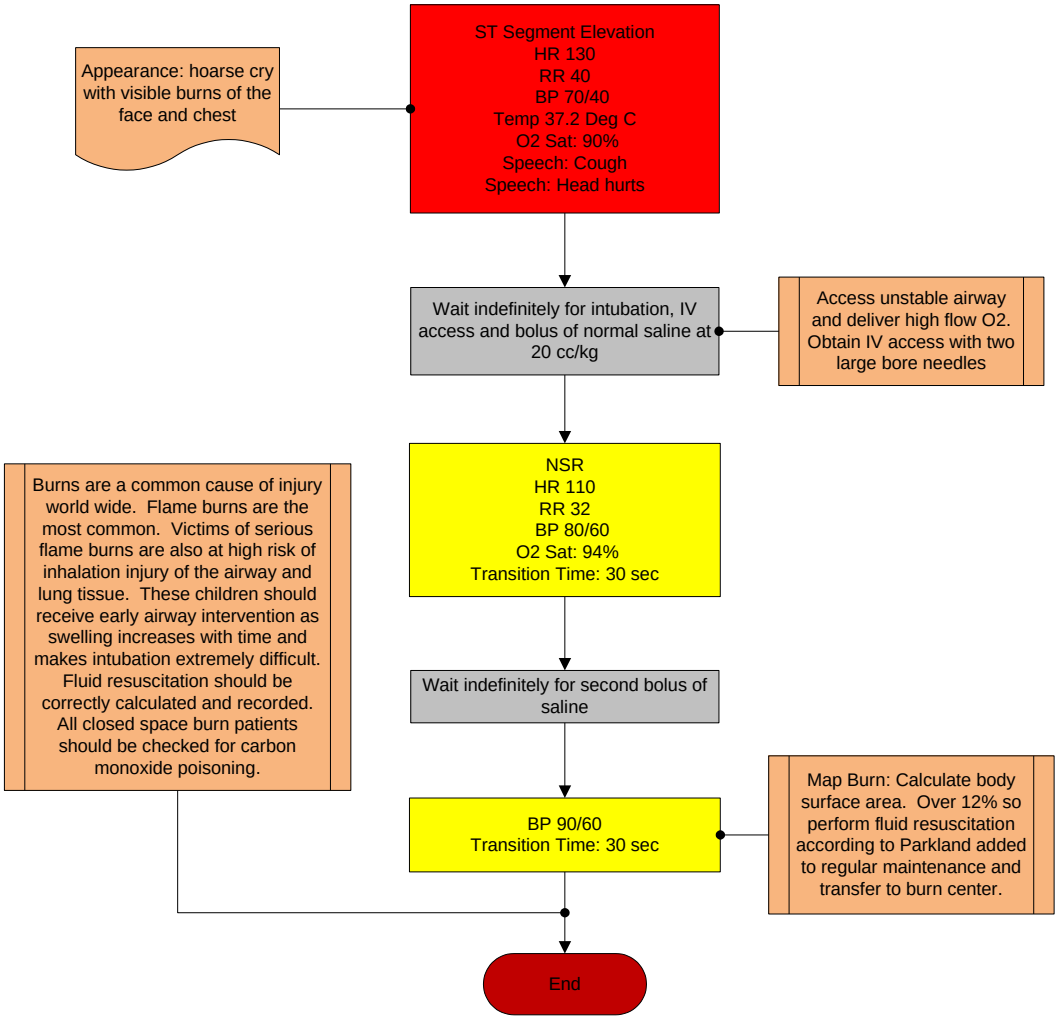
Pediatric HAL® Five Year - Systemic Scenario

Fire Victim

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



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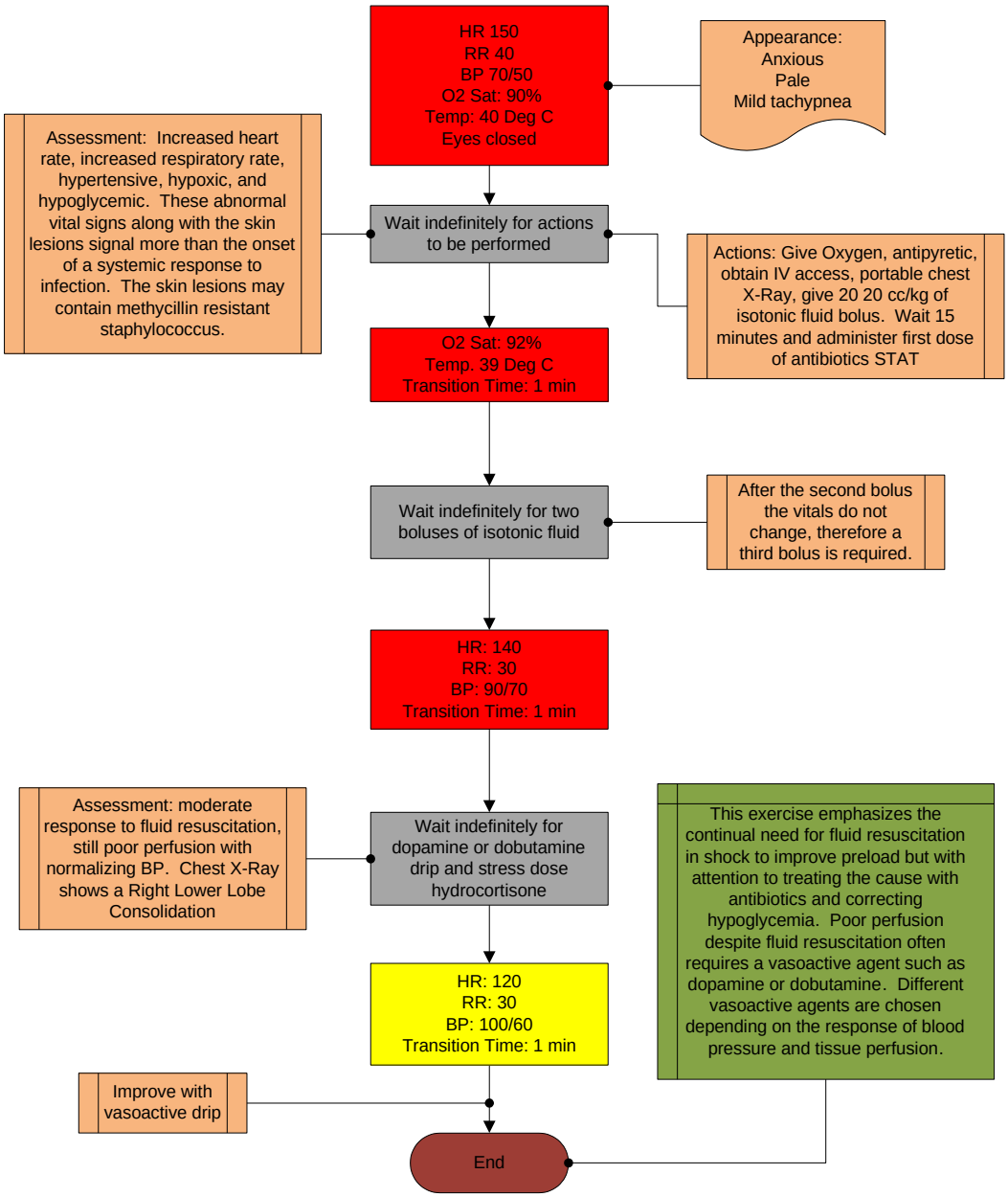
Pediatric HAL® Five Year - Systemic Scenario

Septic Distributive Shock

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



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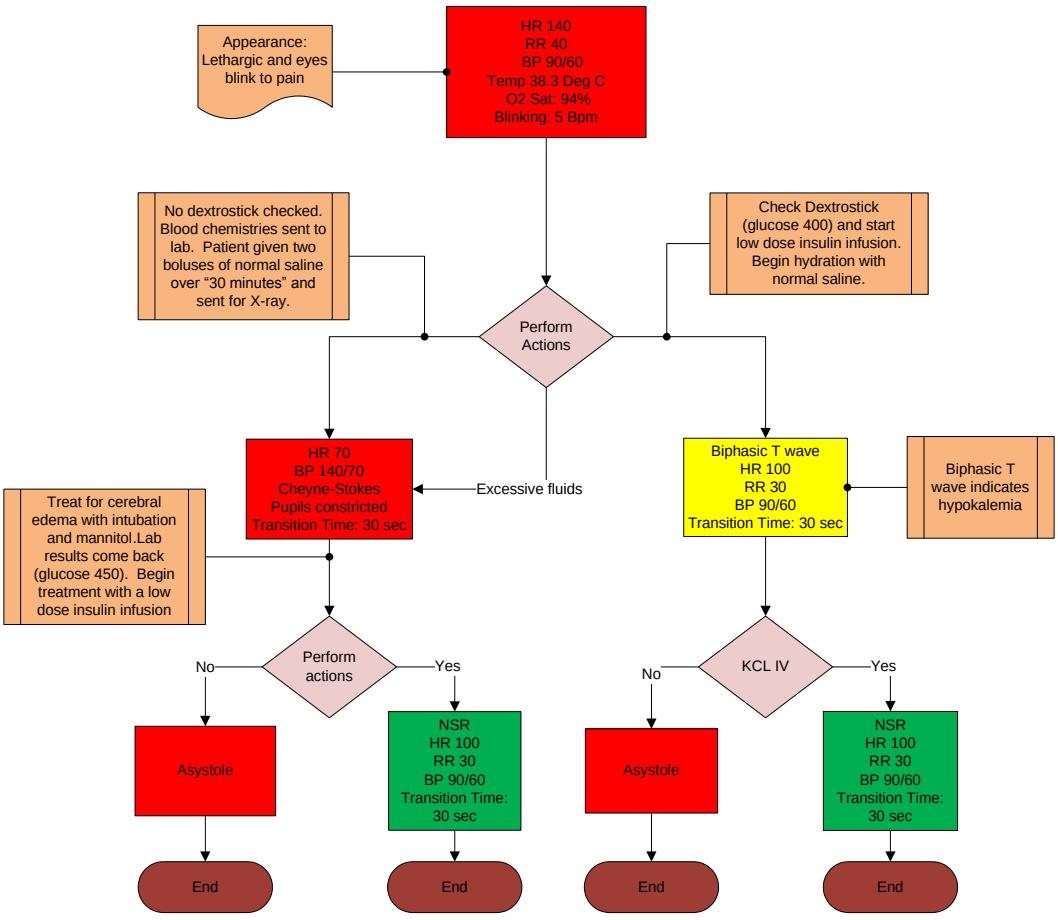
Pediatric HAL® Five Year - Systemic Scenario

Diabetic Ketoacidosis

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



PEDIATRIC HAL 1 YEAR SCENARIOS

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

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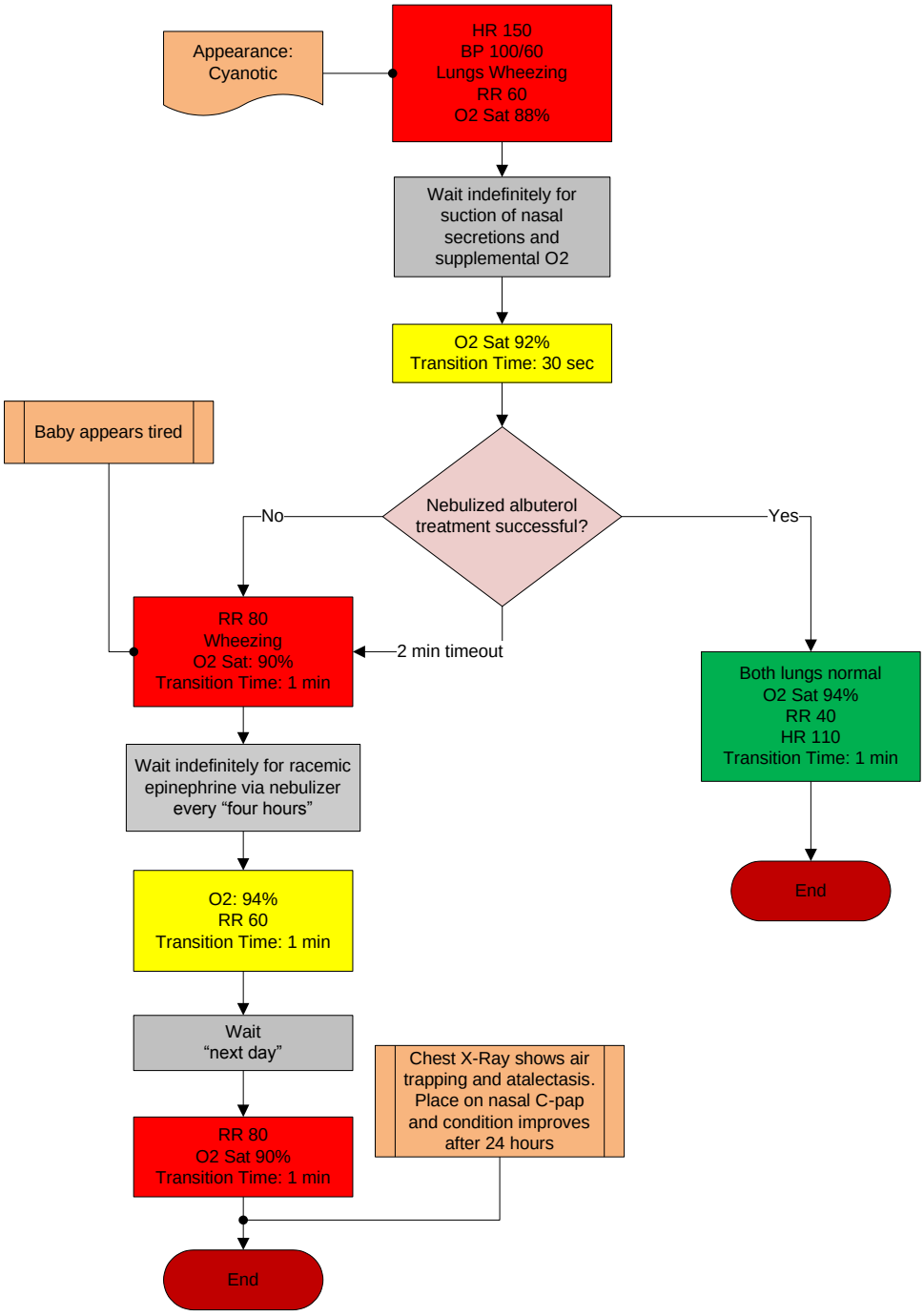
Pediatric HAL® One Year - Respiratory Scenario

Bronchiolitis

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

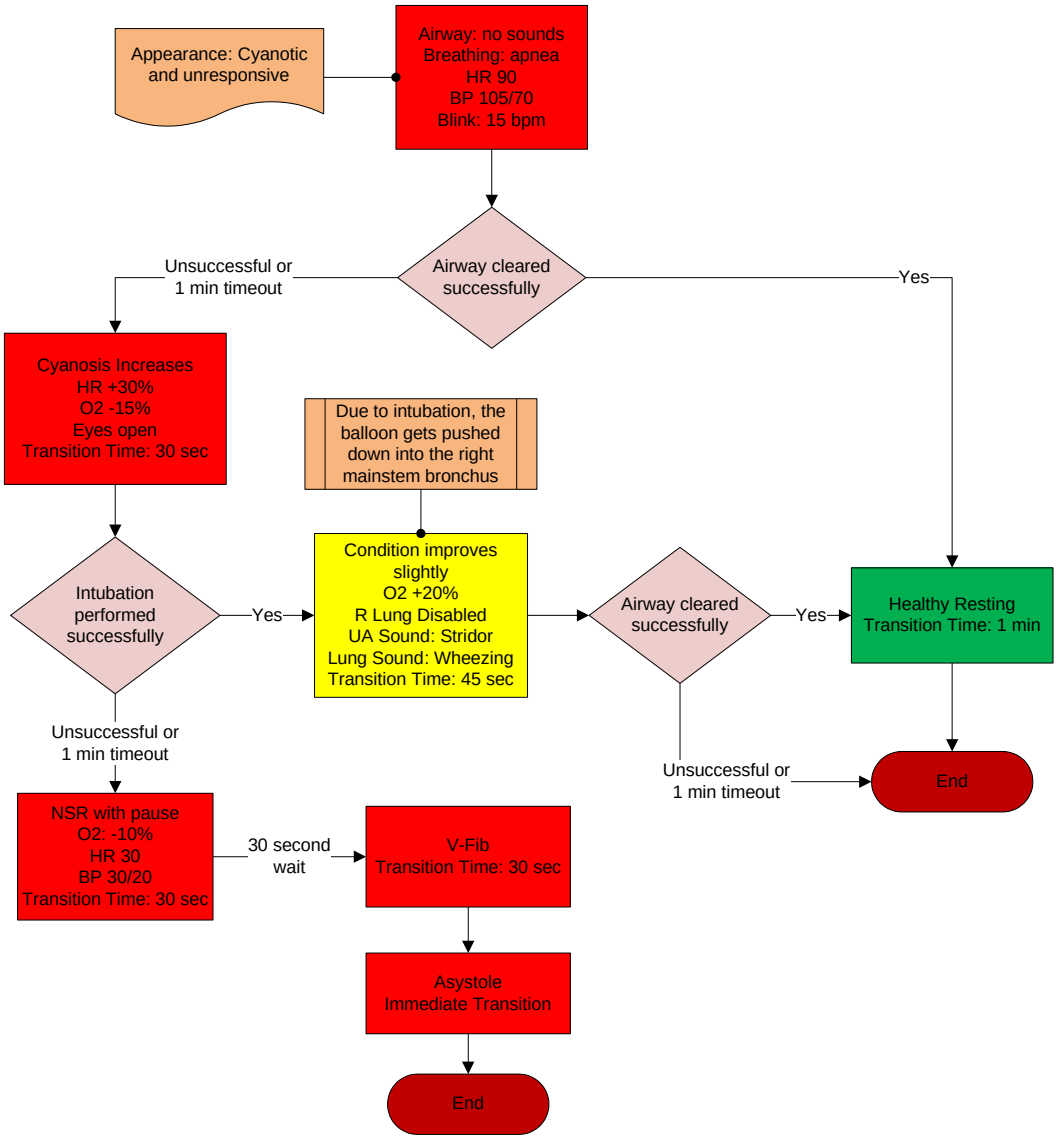


Pediatric HAL® One Year - Respiratory Scenario

Upper Airway Obstruction

"Toy Aspiration"

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



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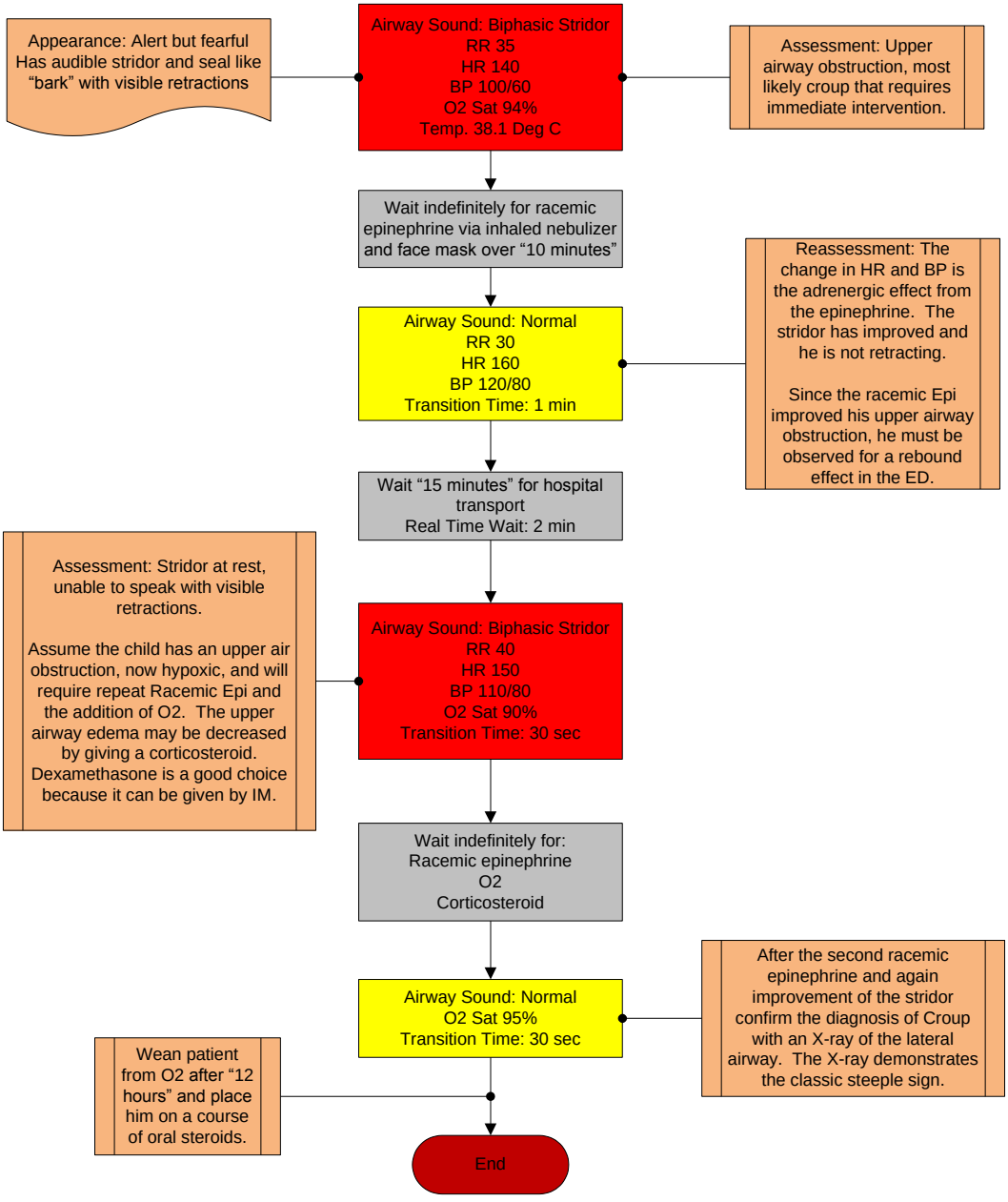
Pediatric HAL® One Year - Respiratory Scenario

Croup

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



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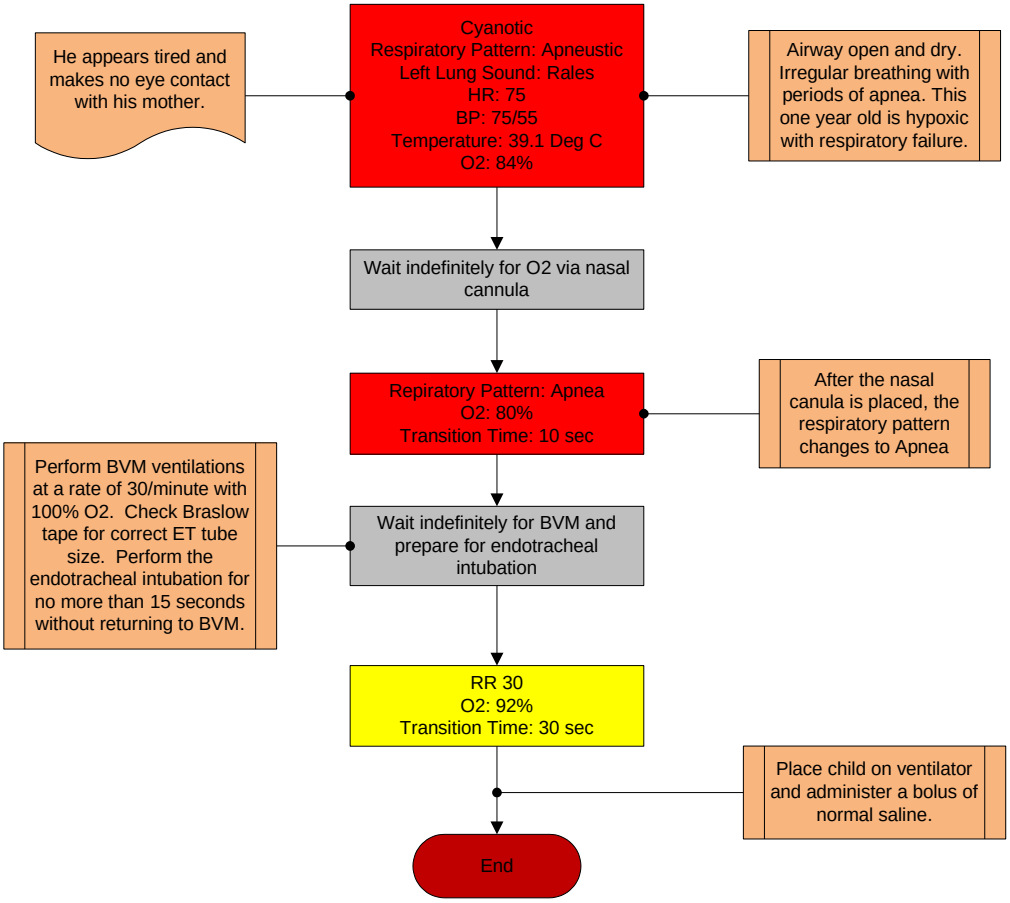
Pediatric HAL® One Year - Respiratory Scenario

Pneumonia

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



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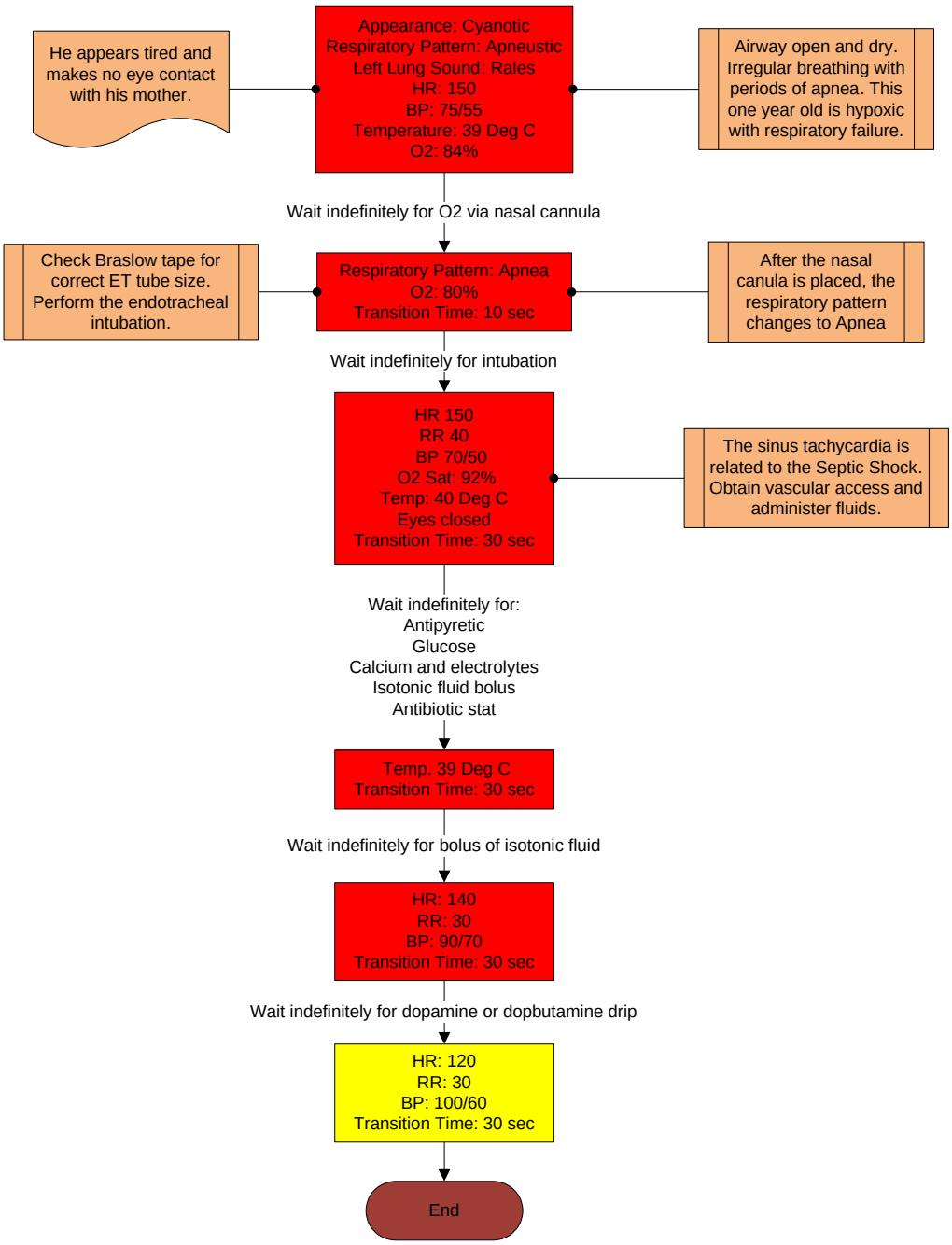
Pediatric HAL® One Year - Respiratory Scenario

Pneumonia with Septic Shock

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



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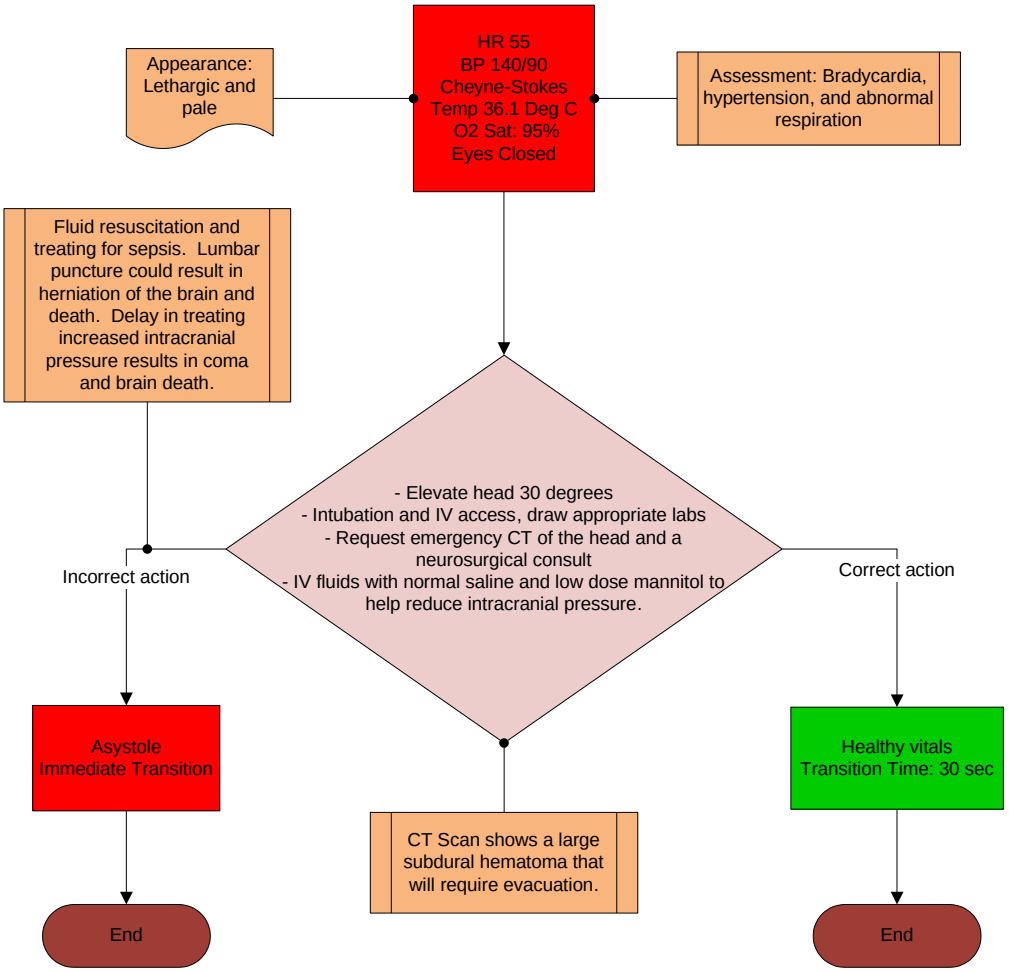
Pediatric HAL® One Year - Trauma Scenario

Shaken Baby Syndrome

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



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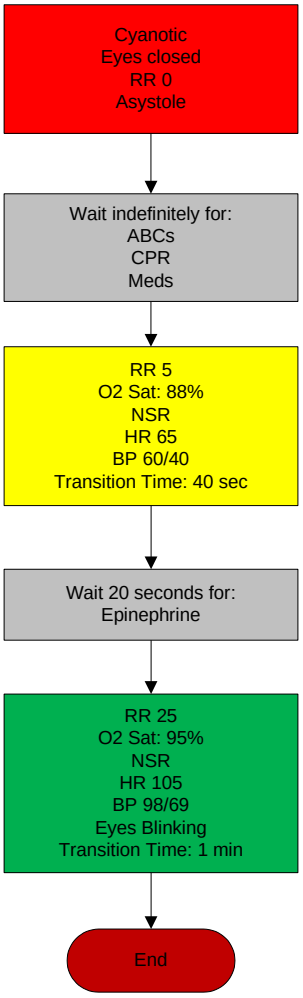
Pediatric HAL® One Year - Trauma Scenario

Drowning Boy

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



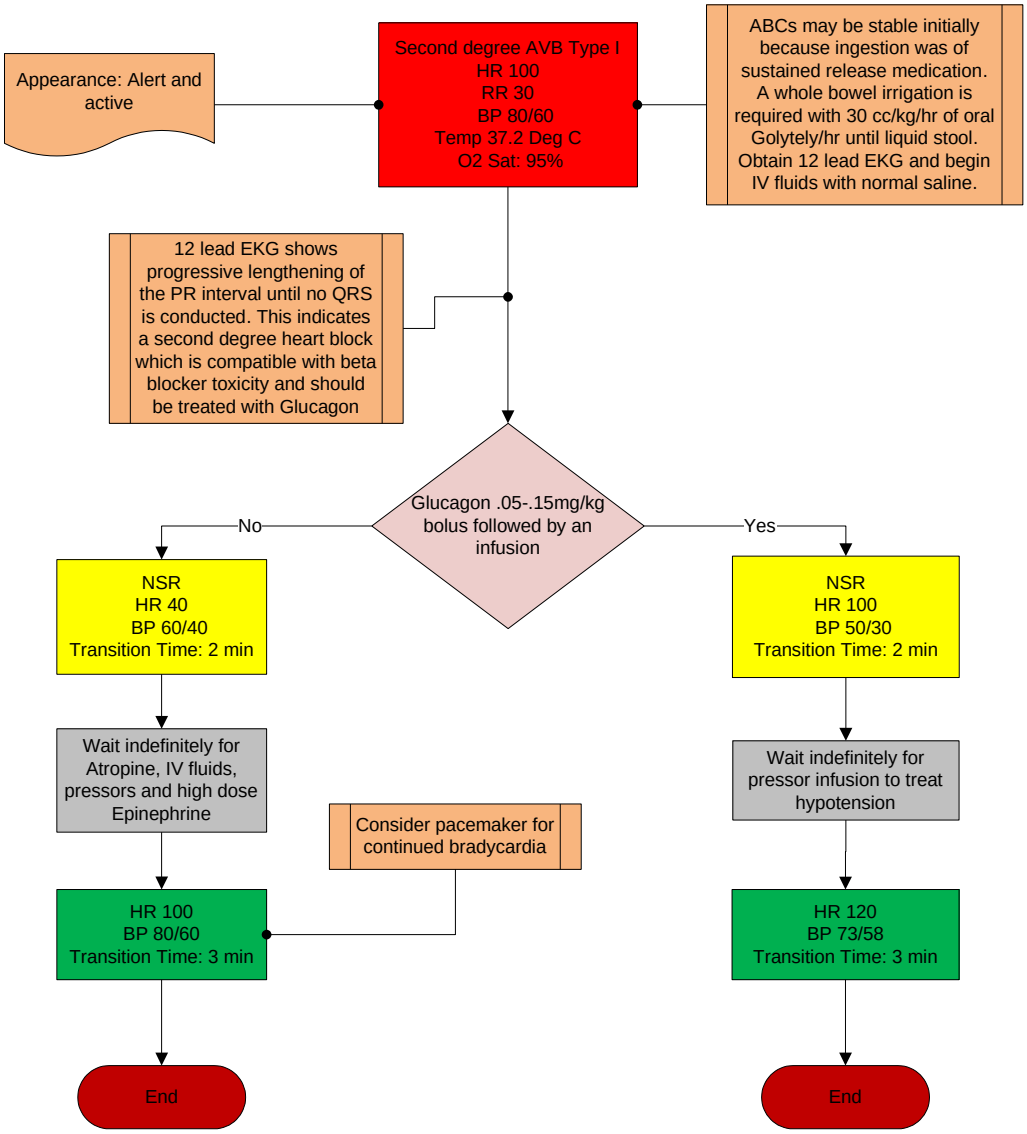
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Second Degree Heart Block

Mobitz Type I (Wenkebach)

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



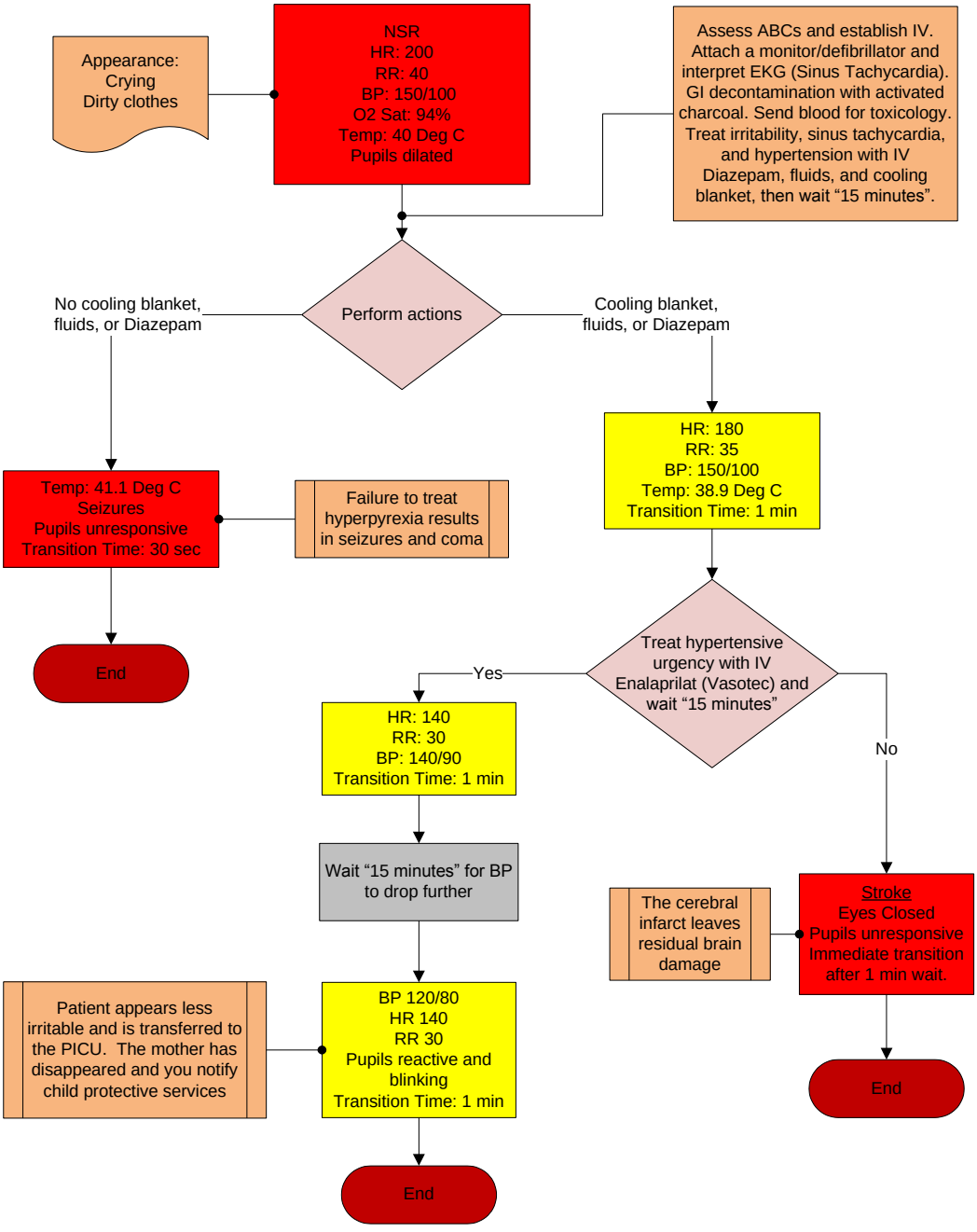
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Sinus Tachycardia and Hypertension

Methamphetamine Ingestion

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

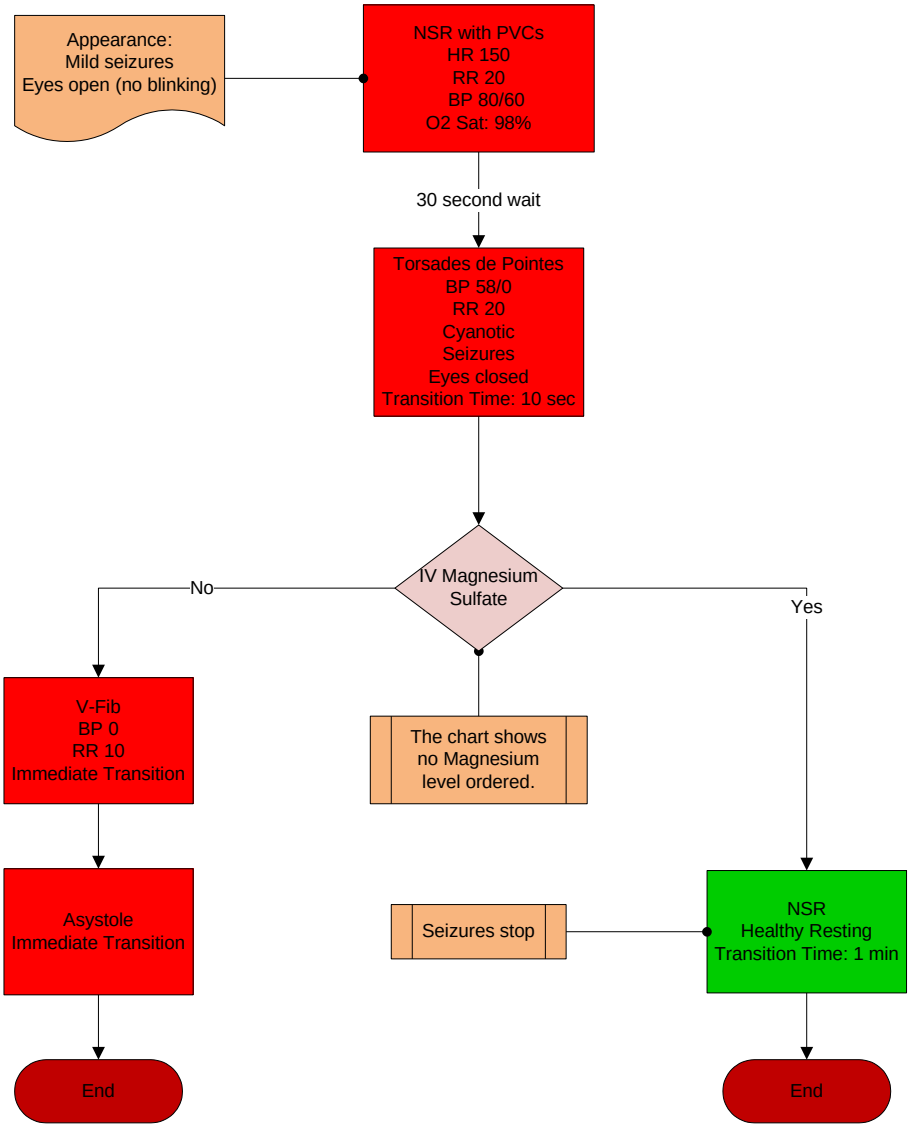


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Cardiac Scenario

Congenital Heart Failure

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

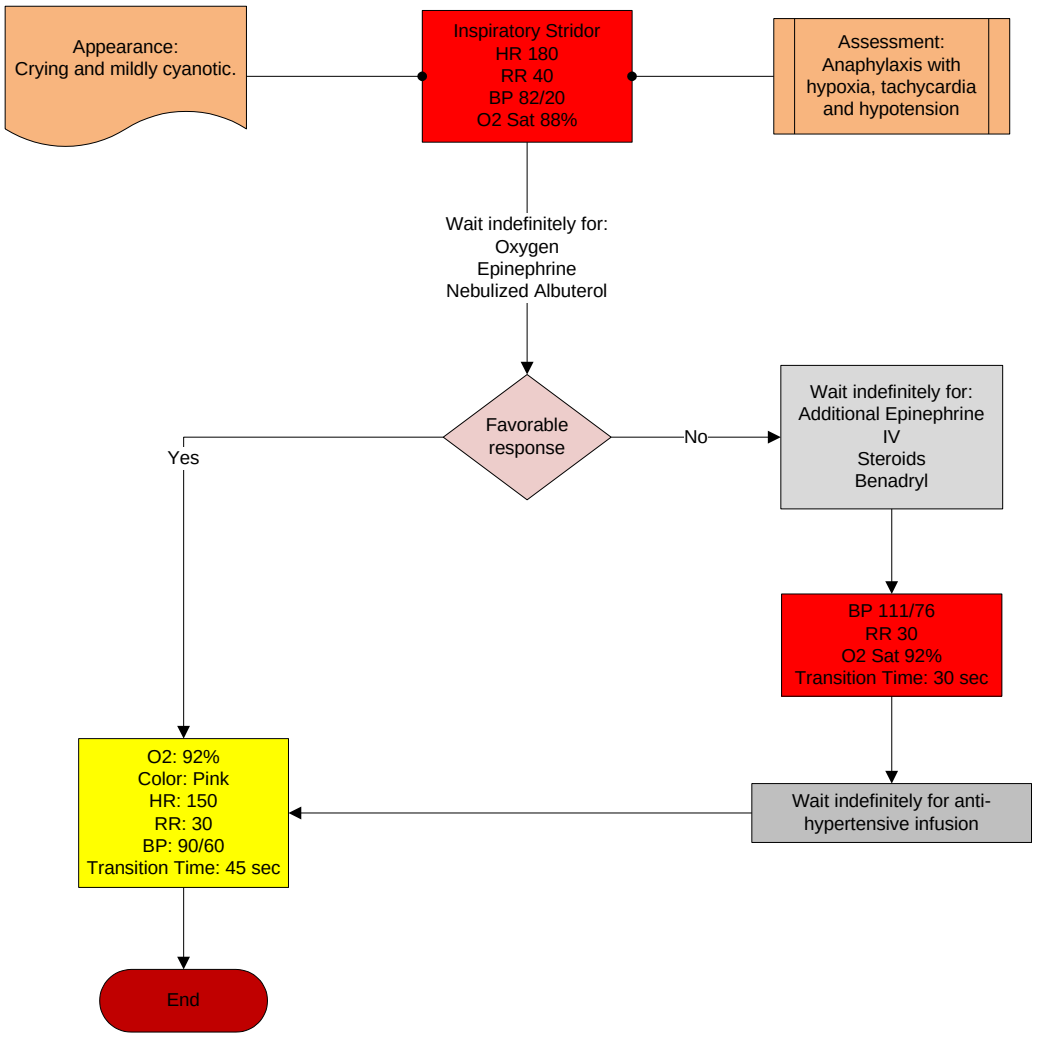


Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Systemic Scenario

Bee Sting

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



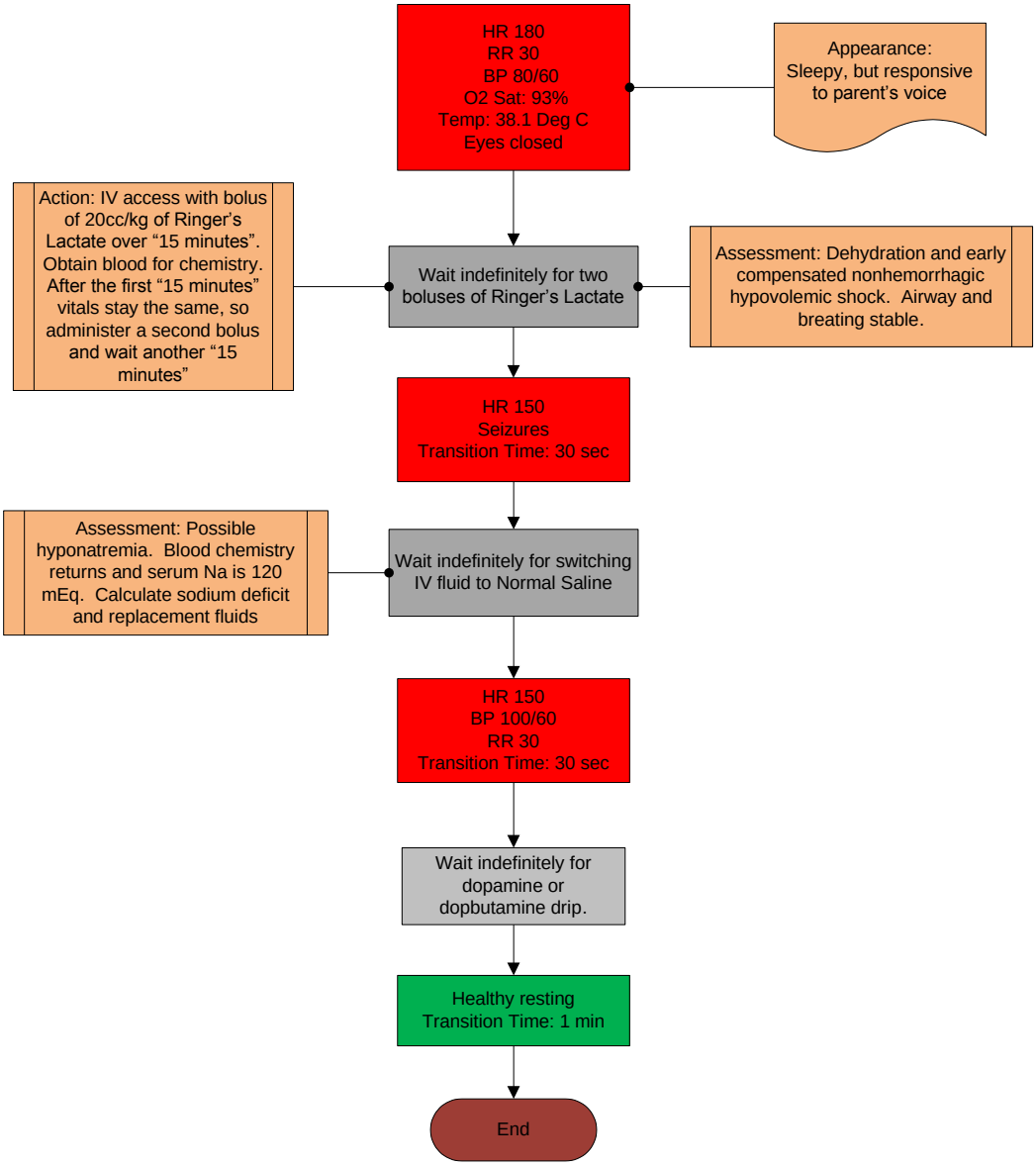
Gaumard®
Simulators for Health Care Education

Pediatric HAL® One Year - Systemic Scenario

Hypovolemic Shock

Hyponatremic Seizures

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



Troubleshooting

Symptom	Possible Cause	Solution
Communication never gets established or is lost (**blinking communication indicator is consistently red**)	Battery connectors in the manikin are reversed	Make sure to connect red wire to red terminal, and black to black
	Battery is discharged	Make sure battery is charged.
	Computer is too far away from simulator	Get simulator closer to computer
	Trying to communicate with a different simulator	Make sure to select the right simulator when opening the software. In a multiple simulator environment, make sure to enter the right Serial Number
	Starting more than one simulator with its own tablet	Select different channels for each of the simulators, and then turn them on one at a time, meaning: Wait until a link has been established between the tablet and the simulator (the yellow window goes away). Only after that, start running the GaumardUI software in the second tablet, and so on for the rest of the simulators. To do so, go to menu Setup → Options → Environment → Select "Auto change to channel: #" (# = number from 1 – 11).
	All others	Close the GaumardUI software and unplug the RF module for at least 5 seconds, then plug it back in. Disconnect one terminal from the battery and reconnect after 5 seconds. Restart the software and wait for initialization
Simulator doesn't run for the time specified on the manual	Battery not charged properly	Make sure that LED indicator on battery charger goes through the sequence described in its label, usually red or orange after plugging it, and then green when charge is completed. If LED does not go through label's indications, then: ▪ Check plug connection making sure it is all the way in. ▪ Make sure you are using the appropriate charger, labeled with its simulator name
Simulator doesn't respond to any command even that blinking communication indicator is consistently green	The computer is properly communicating with a simulator, but not necessarily the one you intend to control	If you have more than one manikin in your facility, make sure that your computer is properly set-up to control the manikin that you wish to control. Go to Options... on the Setup pull-down menu and check the Environment preferences

Symptom	Possible Cause	Solution
Commands are taking longer than usual to take effect or simulator is not reporting every action (**blinking communication indicator is consistently yellow**)	Distance between computer and manikin is reaching its limit *or* there are too many obstructions between (walls, etc)	Get simulator closer to computer or move away from obstructions
	There's too much RF interference either from another Gaumard tetherless simulator in the vicinity or an RF radiator.	Try changing the RF channel by going to the menu for Setup → Options → Environment → Select "Auto change to channel: #" (# = number from 1 – 11).
GaumardUI has set the power mode to STAND-BY automatically	The battery on the manikin is depleted	Plug charger for all others including
"RF module not found" message is displayed when GaumardUI is started	RF module not connected	Connect the RF module to any USB port.
	RF module not identified by the computer	Close the software and try disconnecting the RF module for at least five seconds, then plug it back in and restart the software
Chest compressions are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "**blinking communication indicator is consistently yellow"**
	Is the respiratory rate set to "0 / min"? Chest compressions are only detected when the respiratory rate is set to 0 per minute (0 / min). Otherwise they are ignored	Set respiration rate to zero
	All others	See "Calibration Wizard" section inside User's Manual
Artificial ventilations are not properly detected or not detected at all	Is the communication indicator panel consistently yellow?	See solution above in section making reference to "**blinking communication indicator is consistently yellow"**
	All others	See "Calibration Wizard" section inside User's Manual
Simulator's chest does not rise with artificial ventilation (e.g. BVM)	Simulator not running	In some simulators, the trachea is disconnected from the lungs when they are not on.
	Disable lung/s	Enable the lungs from "Status/Detail" panel on the GaumardUI software
Low chest rise (or no chest rise at all) while breathing	Wrong settings or disabled lungs	Make sure lungs are enabled and both respiration rate and inspiration percent are different than "0". Try changing the respiration rate to a different value, and if still nothing happens, try turning the manikin off and restarting everything to make sure the internal air compressor gets its initial settings
Loss of brachial pulse	Brachial pulses disabled	Make sure to enable brachial pulse on "Status/Details" panel

Symptom	Possible Cause	Solution
Pre-built scenarios don't show up		Select "Quick Start Scenarios" when starting the software. Should user forget to do so, there's no need to shut down the software and open it again in order to load the pre-built scenarios. Go to "File/Profile" menu and then select "Modeled Scenarios"
A sound is absent or is not heard at desired volume level	Volume not set to user's criterion.	Every sound has a volume control. Play with the volume control to get it to the desired level.

Wireless Network

UNI 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.

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 UNI and the Gaumard Monitors software.

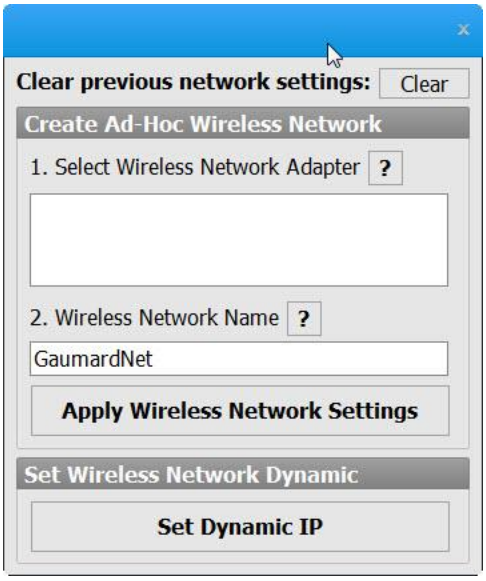
UNI NETWORK CONFIGURATION

Complete the next steps using the “Controller - Create Ad-Hoc Wireless Network” tool built in to UNI 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.

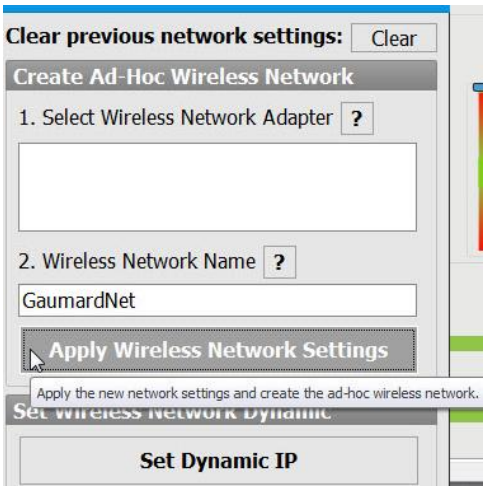


3. Enter a wireless network name (case sensitive). Use the same wireless network name to configure the Gaumard Monitors PC. “GaumardNet” is the required name for Windows® 7 computers.

4. Click “Set Dynamic IP”.to set the wireless network dynamic.

5. Click “Apply Wireless Network Settings” to save the settings.

6. Restart the computer.

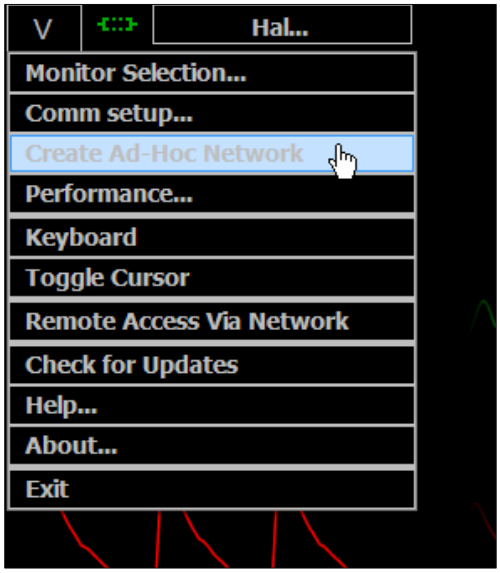


GAUMARD MONITORS NETWORK CONFIGURATION

After the UNI control computer is configured, complete the next steps using the “Create an ad-hoc network tool” included in Gaumard Monitors software.

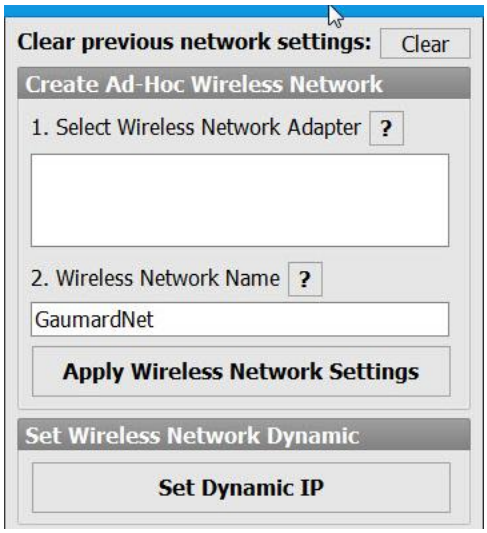
1. On the virtual monitor computer, click the Gaumard Monitors icon to start the vital signs software.

2. Click the V menu near the top left corner and select “Create Ad-Hoc Network”.

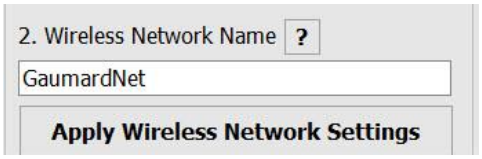


The “Virtual Monitor - Create ad-hoc Wireless Network” window is displayed.

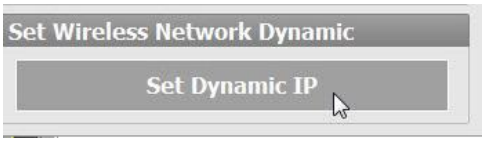
3. Select “Wireless Network Adapter”. If the wireless adapter is not listed, first enable the adapter using the Windows® network menu and then return to this window.



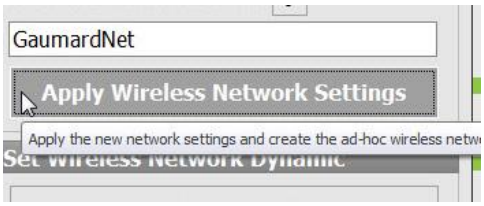
4. Enter a wireless network name (case sensitive). Use the same name entered in the controller computer. “GaumardNet” is the required name for Windows® 7 computers.



5. Click “Set Dynamic IP”.to set the wireless network dynamic.



6. Click “Apply Wireless Network Settings” to save the settings.



7. Restart the computer.

CONFIGURE THE VITAL SIGNS BROADCAST

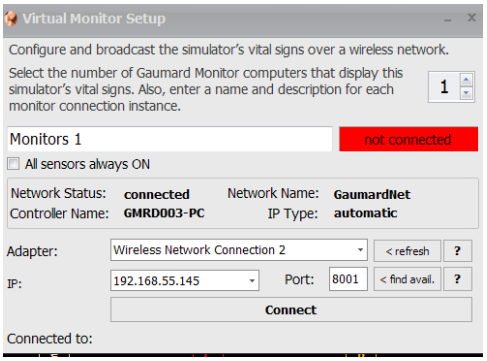
After the wireless ad-hoc link is established between both computers, complete next steps to configure the transmission of the vital signs information.

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 UNI control software.
3. On the UNI menu bar, click Monitors> Configuration.

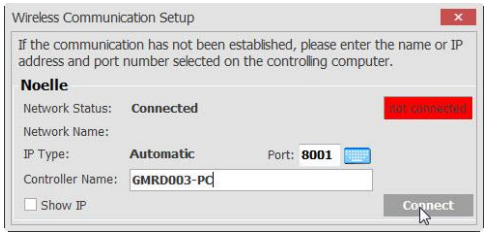
The “HAL Virtual Monitor Setup” window is displayed on the UNI menu bar, click Monitors> Configuration.

The “HAL Virtual Monitor Setup” window is displayed.

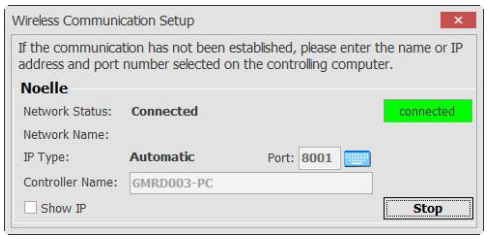


4. Set the adapter to “Wireless network connection”
5. Verify the network status and network name, then click “Connect” to begin transmitting the vital signs information.
6. Write down the “Controller Name” and “Port number”.
7. Start the Gaumard Monitors software on the virtual monitor PC.
8. Click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

The “TCP Comm Setup” window is displayed



9. Click “Connect” to accept the incoming connection.

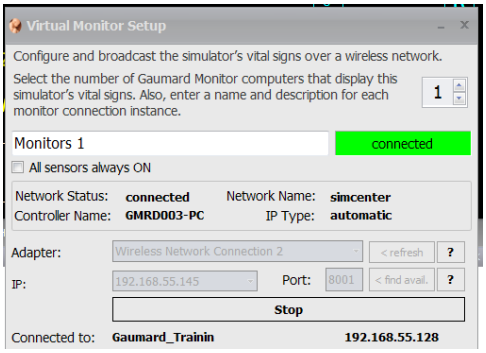


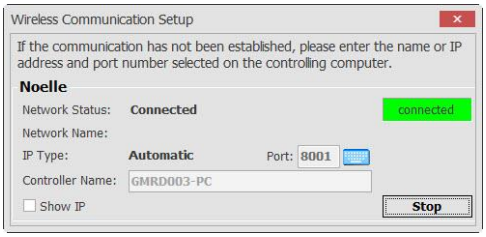
To connect both computers using a local internet network, follow the steps below:

1. Verify that both computers have applied “Set Wireless Network Dynamic”. Refer to UNI and Gaumard Monitors network configuration sections for instructions.
2. Disconnect both computers to the GaumardNet network and connect them to the local network manually using Windows® wireless connection menu.
3. Repeat the same steps listed above to connect the UNI software to the Gaumard Monitors software.

.

4. Repeat the same steps listed above to connect the UNI software to the Gaumard Monitors software.





Spare Parts List

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

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

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

Warranty

EXCLUSIVE ONE-YEAR LIMITED WARRANTY

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

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

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

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

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

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

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

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

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

EXTENDED WARRANTY

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

- Two-Year Extension (covers second and third years)

Call for pricing (USA only)

Contact

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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