Gaumard®
Simulators for Health Care Education

HAL® S3201 & S3000

Advanced Multipurpose Patient Simulator

USER GUIDE

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Warning icon: Very important information that must be heeded so that the simulator is not damaged.

Caution icon: Important information to be aware of and proceed with caution.

Note icon: Additional information and/or tips for usage of the simulator.

HAL® S3201 and S3000 Simulators are 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.

1. Introduction

1.1 SPECIFICATIONS

HAL® S3201

- Weight: ~ 81.7 Lbs.
- Length: ~ 70 inches

HAL® S3000

- Weight: ~75.3 Lbs.
- Length: ~ 70 inches

Connectivity & Power

- Wired connectivity: Gaumard USB Communication Module (RJ45)
- Wireless connectivity: Gaumard USB Com. Module RF IEEE 802.15.4
- Bluetooth connectivity
- Battery Charger:
  Input: 100-240V~/50-60Hz/ 700mA - 500 mA/50VA
  Output: 12 V

1.2 CARE AND MAINTENANCE

Damage caused by misuse is not covered by your warranty. It is critical to understand and comply with the following guidelines.

The lubricants and other accessories provided are for use with the accompanying patient simulator only. The lubricants and other accessories are not suitable for human use or medical treatment/diagnosis and should never be used for such purposes.

Never assemble or disassemble the simulator while it is turned ON. Failure to comply with this warning may result in electrical damage to the simulator.

General

- Avoid contact of rings, nails, and sharp objects to the simulator's skin. These objects can leave indents or small tears in the skin.
- Ball point pens, ink, and markers permanently stain the skin.
- Do not wrap this or any other Gaumard product in newsprint.
- Replacement parts and/or consumables are available from Gaumard Scientific or from your Distributor.

Operating Conditions

- Operating temperature: 50°-95° F (10°-35° C)
- Humidity: 5%-95% (non-condensing)

Storage Conditions

- 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.
- Humidity: 40%-60% (non-condensing)
- Do not store the simulator with a discharged battery. Re-charge the battery at the end of every simulation session.
- 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 of the simulator while in storage for an extended period of time.
- Do not store the simulator face down. Pressure points on the face and chest skin may warp or damage the skin.
- Store the simulator laying flat. Do not store the simulator sitting up.

To avoid damage to the simulator, please store and ship it in the clear poly bag provided.

Procedures

- Do not attempt to intubate without lubricating the airway adjunct with MINERAL OIL lubricant. Do not use silicone oil as a lubricant. Failure to lubricate the device will make intubation very difficult and is likely to result in damage to the simulator's airway.
- Mouth to mouth resuscitation without a barrier device is not recommended. It will contaminate the airway.
- Treat the simulator with the same precautions that would be used with a real patient.
- Only use Gaumard's provided simulated blood. Any other simulated blood containing sugar or any additive may cause blockage and/or interruption of the fluid system.

General Cleaning

- The simulator should be cleaned with a cloth dampened with diluted liquid dish washing soap.
- Remove all traces of any lubricant.
- A secondary cleaning with a cloth dampened with 70% isopropyl alcohol can be performed if required
- Allow to dry completely
- Do not clean with harsh abrasives.
- Do not use povidone iodine on the simulator.
- Only the body of the simulator is "splash-proof" but not water-proof. The head cannot be splashed with any liquid. Do not submerge or allow water or other liquids to enter the interior of the simulator.
- A lint roller or masking tape may be used to remove lint or small particles from the skin of the simulator.
- Always purge with clean distilled water and then drain the reservoirs at the end of the simulation day. Doing so will retard the formation of mold and prevent clogging of the system.

ECG and Electrical Therapy

- Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.
- Defibrillation is only allowed on the sternum and apex sites or the anterior and posterior sites. Remember to always use the Adapters for

Non-Snap DEF Electrodes in these locations.
- **NEVER** deliver a shock to ECG electrode sites. Doing so will result in internal damage to the simulator. This is considered improper use and is **NOT** covered by the simulator's warranty. The system will require repair at a Gaumard facility.
- Make sure the defibrillation pads to be used on the simulator are in good condition.
- 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.
- To aid removal of ECG gel, sprinkle baby powder on the residual ECG gel to dry it up and remove it gently with the pad of your finger.
- Medical products, such as electrodes, may use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed.
- Should dark traces appear on the conductive sites due to gel residue or previous arcing, use a pencil eraser to remove the traces and then clean with alcohol.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- Use hard paddles or wet-gel pads.
- Avoid using solid-gel pads since they present higher risk of burning the simulator's skin.
- Gel pads have a shelf-life. Confirm they are not expired to avoid arcing.
- Be 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.

Mechanical Ventilator

- Always follow the mechanical ventilator's guidelines and precautions.
- HAL is not designed to test the performance, functionality, and accuracy of a mechanical ventilator.
- Do not introduce liquids, humidified gases, flammable gases, or administer aerosol medications into the airway. Moisture in the airway will damage the simulator's internal mechanics.
- HAL's operating limitations are consistent with that of a real human. Treating HAL in a manner that would seriously harm a real person is likely to result in damage to HAL's internal mechanics. Always treat HAL as a real patient.

IV Arm, Drug Recognition, & Needle Decompression

- Only use Gaumard's provided simulated blood. Any other simulated blood containing sugar or any additive may cause blockage and/ or interruption of the vasculature system.
- The use of needles larger than 22 gauge will reduce the lifetime of the lower arms' skin and veins.
- The simulator must be powered on when working with the drug recognition arm. This includes calibration, purging, draining, IV infusion, Set Med Id and injecting fluids. Failure to do so will permanently damage the simulator and void the warranty.
- You must always have water in the IV vasculature for the drug recognition module to work.
- Do not inject fluids into the intramuscular sites.
- Do not add liquids to the hemothorax sites. Doing so will damage the simulator and void the warranty.
- Maximum amount of fluid injected without draining should not exceed 40 mL and the maximum injection rate is 9999 mL/hr.
- At the end of every simulation session, you must purge the IV system with clean water with the simulator powered on. If the drug recognition arm is not going to be used for long periods of time (a week or more), purge the system with 70% isopropyl alcohol solution. Failure to do so may permanently damage the system.

CO2 Cartridge

- Always follow the manufacturer's safety and warning information included with the CO2 cartridge package.
- Never point a CO2 cartridge at yourself or others
- Do not use damaged CO2 cartridges
- Do not puncture the cartridge CO2 seal manually
- Do not expose the CO2 cartridges to high temperatures as indicated on the product's packaging
- Install only threaded cartridges (3/8"-24UNF-2A). Do not attempt to install a cartridge that does not meet the specifications listed in this document.
- Do not over tighten the cartridge into the simulator's cartridge harness
- Always verify that the CO2 cartridge is empty using the software diagnostics before removing it. Do not remove the CO2 cartridge if the simulator is not fully operational.
- Make sure the simulator is not in contact with any electrically conductive surfaces.
- Use the simulator only in a well-ventilated area, free of all flammable gases.
- NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics. Discontinue use if any wires are found exposed with damaged insulation.
- Real medical products, especially electrodes, sometimes use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed. Refer to Care and Cautions for more information.
- Electrode gel on the skin between any two electrode targets can become a pathway for electrical current, just as in real life. If this occurs, HAL's skin can be burned.
- Do not allow defibrillation pads to overlap ECG sites. Doing so will may damage the simulator and cause arcing.
- Should dark traces appear on the conductive patches due to gel residue or previous arcing, use a pencil eraser to remove the traces and then clean with alcohol.

Setup

- When connecting the battery to the simulator, make sure to match the black and red wires are connected to the corresponding red and black battery terminals.
- Do not use universal AC adapters. Only use the AC adapter supplied with the simulator.
- NEVER disconnect the communications module while the UNI software is running. The software will halt, and the module may be damaged.
- Do not remove the chest skin without technical guidance. Internal components are serviced by Gaumard certified technicians only.
- Never connect HAL to Ethernet cards, LAN networks or unauthorized diagnostic equipment. Doing so may cause damage to the system.
- Do not connect the RJ45 cable directly to the tablet's Ethernet port. Wired communication can only be established using the RF module wired port.
- Turn HAL OFF before replacing the battery. Failure to do so could result in serious damage to the system.

1.3 TERMINOLOGY

Facilitator/User

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

Clinical State

A collection of vital signs details that demonstrates a patient's progress or decline during a session.

Profile

A unique software configuration, including custom clinical states, scenarios, and options. Each profile acts as a separate program so, 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 play list. Scenarios provide a level of automation that unburdens the facilitator and allows standardized presentation of symptoms.

Scenario Item

A clinical state item that is part of a scenario. Scenario Items may also represent a fixed delay period such as "Wait" or a pause such as "Wait Indefinitely."

UNI 3

The software application used to control the simulator and evaluate care providers.

1.4 COMPARISON OF S3201 & S3000

	Features	HAL® S3201	Trauma HAL® S3040.100	HAL® S3000	HAL® S1000	Code Blue®III S300.100
General	Age	Adult	Adult	Adult	Adult	Adult
	Full-body patient	✓	✓	✓	✓	✓
	Palpable anatomical landmarks	✓	✓	✓	✓	✓
	Reinforced joints support dragging or carrying	-	✓	-	-	-
	Articulated neck, jaw, arms, and legs	✓	✓	✓	✓	✓
	Patient positions: supine, sitting, prone, and more	✓	✓	✓	✓	✓
	Wireless and tetherless; all operating components are contained inside the patient simulator[1]	✓ [1]	✓ [1]	✓ [1]	✓ [1]	✓ [1]
	Battery life[2]	6 hours[2]	10 hours[2]	6 hours[2]	6 hours[2]	4 hours[2]
	Available in light, medium, or dark skin tones at no extra charge	✓	✓	✓	✓	✓
Neuro	Eyes simulate normal, miosis (constricted), and mydriasis (blown) pupil state	✓	✓	✓	✓	✓
	Programmable blinking and photosensitive pupils	✓	✓	✓	-	-
	Seizures	✓	✓	✓	-	-
	Eyes, ears, and mouth secretions	-	✓	-	-	-
	Streaming voice	✓	✓	✓	✓	-
	Preprogrammed responses in multiple languages	✓	✓	✓	✓	✓
Airway	Airway sounds	✓	✓	✓	✓	✓
	Tongue edema	✓	✓	✓	✓	-
	Laryngospasm	✓	✓	✓	✓	-
	Pharyngeal swelling	✓	✓	✓	-	-
	Surgical airway	✓	✓	✓	✓	-
	Head-tilt/chin-lift and jaw thrust	✓	✓	✓	✓	✓
	Oral/nasal intubation	✓	✓	✓	✓	✓
	Supports supraglottic airway devices	✓	✓	✓	✓	✓
	Tracheal intubation depth detection	✓	-	✓	✓	✓
	Esophageal intubation	✓	✓	✓	✓	✓
	Supports fluid administration via NG tube	-	✓	-	-	✓
Breathing	Spontaneous breathing with selectable patterns	✓	✓	✓	✓	✓
	Needle decompression	✓	✓	✓	✓	-
	Chest rise with BVM ventilation	✓	✓	✓	✓	✓
	Ventilations are measured and logged	✓	✓	✓	✓	✓
	Programmable unilateral chest rise	✓	✓	✓	✓	-
	Unilateral chest rise with mainstem intubation	✓	✓	✓	✓	✓
	Selectable normal and abnormal lung sounds	✓	✓	✓	✓	✓
	Anterior lung sound locations	4 Quadrants	4 Quadrants	4 Quadrants	Upper L/R	Upper L/R
	Posterior lung sound locations	4 Quadrants	-	4 Quadrants	-	-
	Programmable dynamic lung compliance (9 Levels)	✓	-	-	-	-
	- Supports therapeutic levels of PEEP	✓	-	-	-	-
	- Bilateral bronchi resistance (10 Levels)	✓	-	-	-	-
	Triggers mechanical ventilator for assisted breaths	✓	-	-	-	-
	Bilateral chest tube insertion	✓	✓	✓	✓	-
Circulation	Automatic virtual drug recognition	✓	-	-	-	-
	Real CO_2 exhalation	✓	Option[3]	Option[3]	Option[3]	-
	Intraosseous access at tibia	✓	✓	✓	✓	✓
	Intraosseous access at sternum	-	✓	-	-	-
	IV training arm	✓	✓	✓	✓	✓
	SpO_2 monitoring using real devices	✓	✓	✓	Detection	Detection

	Features	HAL® S3201	Trauma HAL® S3040.100	HAL® S3000	HAL® S1000	Code Blue®III S300.100
Circulation	Palpable pulses	✓	✓	✓	✓	✓
	- Carotid	✓	✓	✓	✓	✓
	- Brachial	✓	Right only	✓	Left only	Left only
	- Brachial cubital	-	✓	-	-	-
	- Radial	✓	✓	✓	Left only	Left only
	- Femoral	✓	✓	✓	✓	✓
	- Popliteal and pedal	✓	✓	✓	-	-
	Measure BP using automatic BP cuff	✓	Option	-	-	-
	Measure BP via auscultation	✓	✓	✓	✓	✓
	Central cyanosis	✓	✓	✓	✓	✓
	Intramuscular injection sites in anterolateral thigh	✓	✓	✓	✓	✓
	Intramuscular injection sites in deltoids	✓	✓	✓	✓	✓
	CPR feedback and reporting	✓	✓	✓	✓	✓
	Chest compressions generate palpable pulses	✓	✓	✓	✓	✓
	Defibrillate and pace using real devices	✓	✓	✓	✓	✓
	Snap-compatible defibrillation sites	Option[3]	-	Option[3]	✓	✓
	Heart sounds	✓	✓	✓	✓	✓
	4-lead ECG monitoring using real devices	✓	✓	✓	✓	✓
	12-lead ECG monitoring using real devices	✓	Option[3]	Option[3]	Option[3]	-
	Preprogrammed ECG library	✓	✓	✓	✓	✓
Other	Gastric suctioning	-	✓	-	-	-
	Bowel sound locations	4 Quadrants	4 Quadrants	4 Quadrants	General area	-
	Male urinary catheterization	✓	✓	✓	Option[3]	-
	Gastric distension	✓	✓	✓	✓	✓
Trauma	Trauma arm right	-	✓	-	-	-
	Trauma arm left	Option	✓	Option	-	-
	Trauma leg right	-	✓	-	-	-
	Trauma leg left	Option	✓	Option	-	-
	Supports tourniquet application	✓	✓	✓	-	-
	Tourniquet placement detection	-	✓	-	-	-
	Femoral artery occlusion response	-	✓	-	-	-
	Pressure-sensitive axillary trauma wound	-	✓	-	-	-
	Pressure-sensitive groin trauma wound	-	✓	-	-	-
	Auto-filling blood reservoir	-	✓	-	-	-
Control and accessories	Simulator control software license	✓ UNI® 3	✓ UNI® 3	✓ UNI® 3	✓ UNI® 3	✓ OMNI® 2
	Control interface	✓ Microsoft Surface Pro	✓ Microsoft Surface Pro	✓ Microsoft Surface Pro	✓ Laptop PC	✓ Hand-held Tablet
	Simulation Learning Experiences™ scenario package	✓	✓	✓	✓	-
	NeuroSim™ Intracranial Hemodynamic Module	Option	Option	Option	Option	-
	Gaumard Vitals™ Bedside Patient Monitor	✓	Option	Option	Option	Option
	Gaumard Vitals™ Portable Patient Monitor	Option	Option	Option	Option	Option
	Rolling travel case	✓	✓	✓	✓	Option

✓ Standard feature

1. Maximum wireless range will vary depending on environmental factors and conditions. 2. Battery life estimates dependent on active features and settings; results may vary. 3. Option available only at the time of order. Extended service plans, product installation, and training services are available. Product design and price subject to change without notice.

1.5 DEVICE SIZES FOR ADULT HAL

Invasive Procedure	Recommended Device Size	Helpful Hints
Intubation Blade Size	MAC 3.5 or MIL 4	-
LMA	Size 4	Lubricate using Gaumard lubricant
Oral Intubation	7.5 ETT no cuff, and/ or 7.0 ETT with cuff	Lubricate using Gaumard lubricant, but ensure no fluids are introduced into the airway.
Nasal Intubation	Maximum of an 8 mm outer diameter	Lubricate using Gaumard lubricant
Cricothyroid Needle	21 gauge needle	Replace Cricothyroid insert as needed
Hemothorax	32 Fr straight thoracic catheter	Insert the thoracic catheter in an upwards direction into the pre-made bilateral incisions on the chest skin of HAL located at the 5th intercostal space. Be sure to lubricate the catheter prior to insertion.
IV Arm System	21-23 gauge needle	Smaller needle sizes extend the lifespan of the veins and arm skin
Urinary Catheter	18 Fr catheter	Lubricate using Gaumard lubricant. Reservoir Size: 240 mL
Needle Decompression	21-23 gauge needle recommended but takes up to 14 gauge maximum	Insert the needle into either 2nd intercostal space on HAL's chest skin. Take care to not pierce the large defibrillation gold patches or small EKG gold patches. Replace the Needle Decompression inserts after each exercise.
Left Trauma Arm (Option)	-	Reservoir: 150mL (170 mL Max)
Left Trauma Leg (Option)	-	Reservoir: 700mL (720 mL Max)

2. Initial Setup

2.1 UNBOXING

A 1-day in-service (on-site unboxing and training) may be purchased for HAL S3201 or S3000 where a Gaumard Field Service technician will perform the unboxing, assembly, and training of the simulator.

Save ALL boxes and shipping materials HAL is shipped with in the event he may need to be sent in for repair.

Contact your Gaumard Sales Representative or Gaumard Customer Service about purchasing a 1-day in-service for your HAL.

- Remove the simulator from the case carefully 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 or table 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.

2.2 PACKAGE CONTENTS

Item Name - Box 1	Item Count
HAL Roller Soft Case	1
HAL simulator	1
Lower Left Leg with Pedal Pulse	1
Lower Right I/O Leg with CO2 System & Pedal Pulse	1
Battery Installed	1
100-240 V AC Battery Charger with Label	1
Blood Pressure Cuff	1
Replacement Bone for I/O Leg	7

Item Name - Box 1	Item Count
I/O Leg Filling Kit	1
Short	1
NIBP Calibration Kit	1
Silicone Male Genitalia	1
Injection Set	1
Allen-Key (HEX)	3
Talcum Powder (internal use)	1
Mineral Oil Lubricant	1
Replaceable Needle Pneumothorax decompression sites	6

Item Name - Surgical Trachea Insert Box	Item Count
Trachea Skin Covers	10
Simulated Cricothyroid Membranes	10
Surgical Cricoid Insert	1
Surgical Trachea Inserts	5
Surgical Trachea Base	1

Item Name - Box 2	Item Count
Wireless Tablet PC with Stylus Control	1
Computer Accessories (Bump Case, Keyboard)	1
RF Communications Module with RJ45 Port	1
15′ RJ45 Cable	1
Headset for Streaming Voice	1
Wireless Router	1
OMNI Link Wireless Adapter Kit	1
HAL User Guide	1
HAL SLE Courseware Package	1

Item Name - Box 3	Item Count
Bedside Virtual Monitor Computer	1

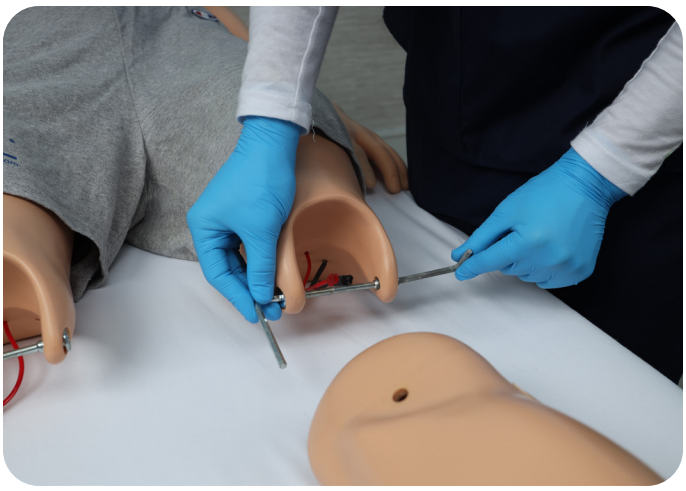
2.3 SIMULATOR ASSEMBLY

The HAL S3201 and S3000 ship with the battery and his lower legs disconnected. You will be required to connect the battery and the lower legs before proceeding with the usage of HAL.

Leg Assembly

To attach HAL's lower legs:

1. Use the Allen Key set to unscrew the hardware that is installed at the knee.

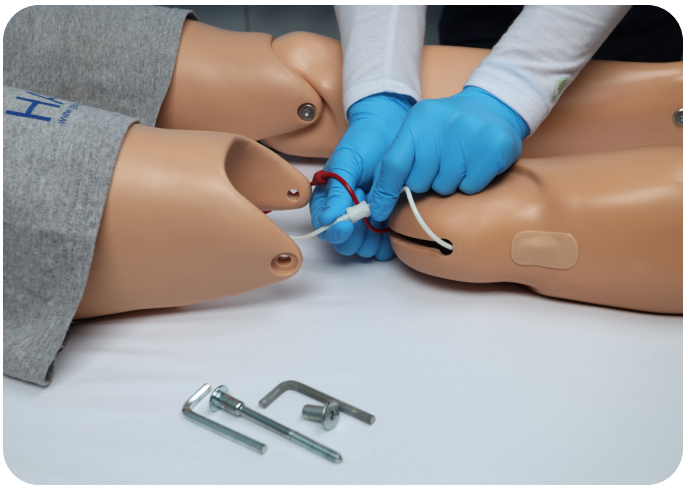


2. For HAL's left leg, bring the lower leg close to the upper leg and connect the red pulse line by screwing the connectors together.

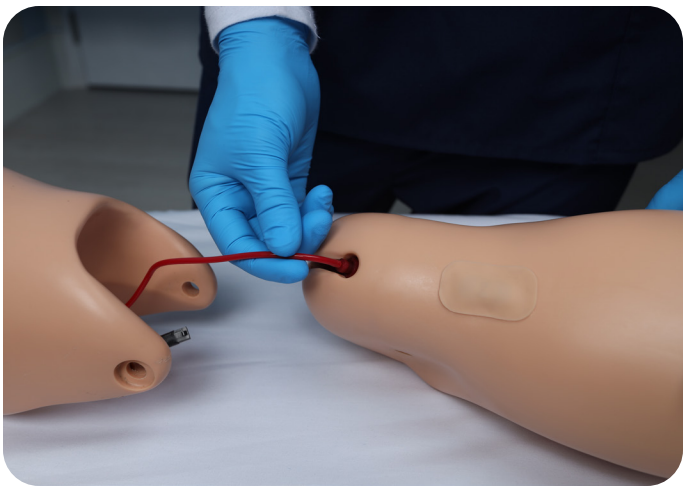
On HAL's left leg, there is a red pulse line and a black electrical connector. Once the red pulse line from the upper leg is connected to the lower leg this will provide the pneumatic connection for HAL's popliteal and pedal pulses. The black electrical connector is available when switching out the healthy lower leg for the optional trauma lower leg (subject to additional purchase).

3. For HAL's right leg, bring the lower leg close to the upper leg and connect the red pulse line and white CO2 line.

On HAL's right leg, there is a red pulse line and a white CO2 line. Once the red pulse line from the upper leg is connected to the lower leg this will provide the pneumatic connection for HAL's popliteal and pedal pulses. The white CO2 line connects to the regulator in the leg. A CO2 canister can be connected to the regulator to provide CO2 exhalation for HAL.



4. After connecting the necessary lines on each leg, push the connectors through the opening in the lower leg.



By pushing the connectors through the available opening in the lower leg this protects the pulse line or CO2 line from kinking once the upper and lower legs are connected.

5. Slide the lower leg into the upper leg and align the holes where the hardware goes.

6. Slide the hardware through the aligned holes on the upper and lower legs.

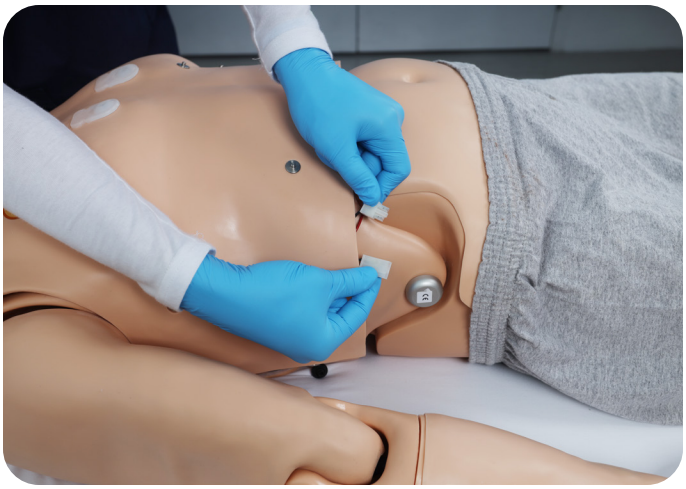
7. Use the Allen Key set to tighten the hardware to secure the upper and lower legs together.

Connecting the Battery

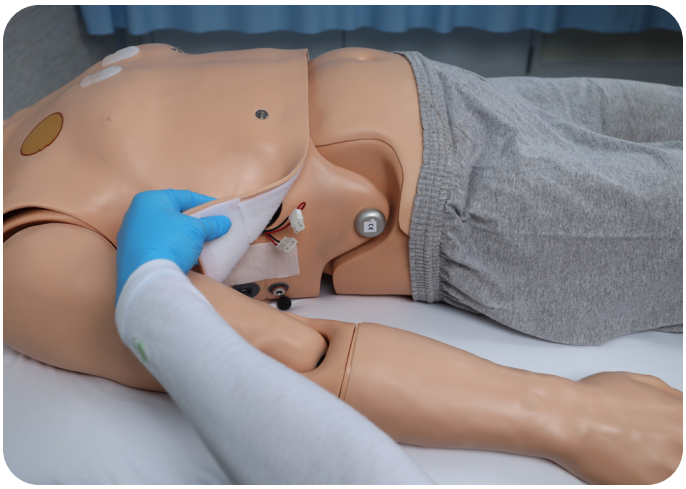
HAL is shipped with his internal battery disconnected. Connect the battery leads before proceeding to use HAL.

To connect the internal battery leads:

1. Locate the battery connectors on HAL's right side of his torso.

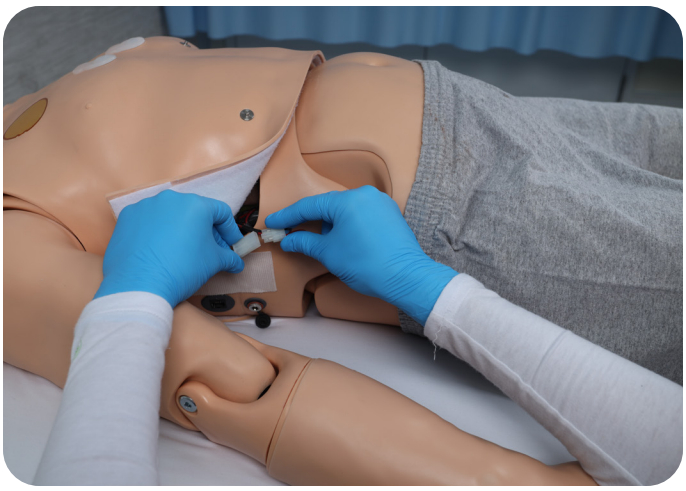


2. Gently lift HAL's chest skin from the right side to disengage the corner from its Velcro.

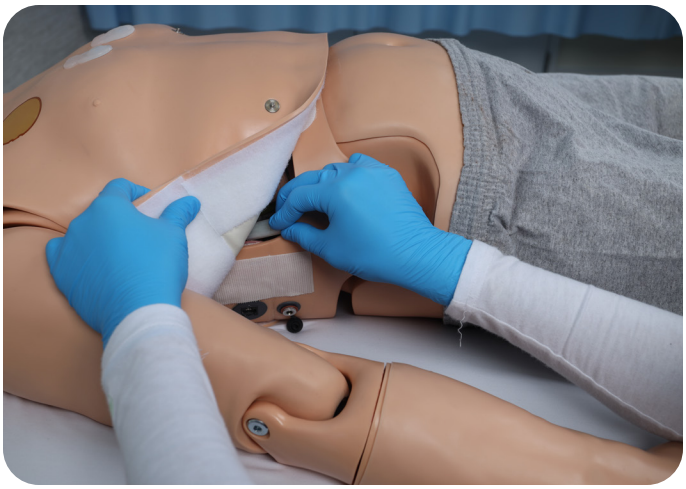


3. Connect the internal battery leads.

When connecting the internal battery leads the connectors will snap together for a secure connection.

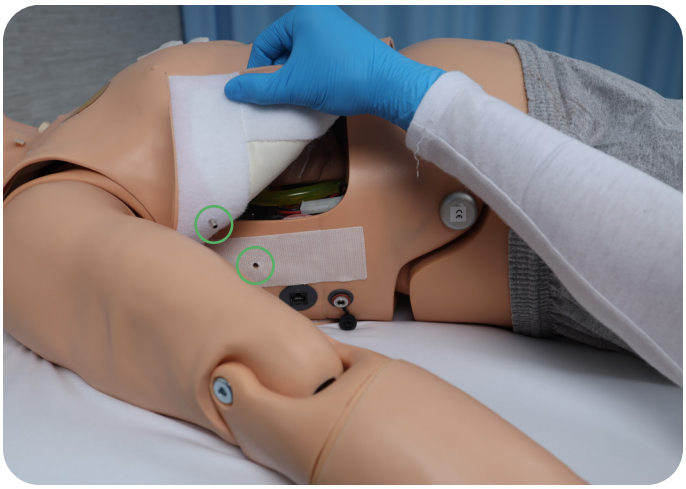


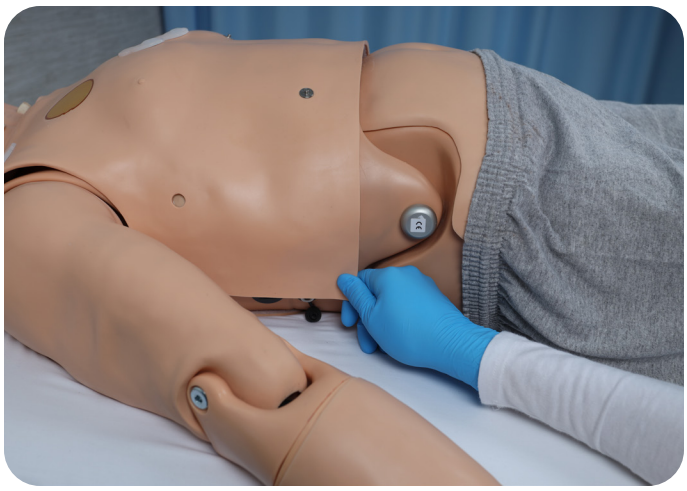
4. Tuck the connected battery leads into the torso of HAL.



5. Re-attach HAL's chest skin by lining up the metal pin on the chest skin to the corresponding hole on HAL's torso.

The metal pin ensures that the chest skin is properly aligned and secured.





2.4 CHARGING HAL

In order to successfully use HAL, his battery must be charged prior to being turning on.

Connecting the Battery/Power Supply

1. If HAL is not already turned off, turn HAL off by closing out of the UNI software.
2. Grab the Adult HAL Charger.
3. Connect the charger to the charging port located on HAL's right side.

   NOTE: Align the pins on the charger to the port to ensure a proper fit.
4. Allow HAL to charge for 2-3 hours (or until the charger displays a green light).

   NOTE: The charger indicator light will show red during the charge period, transition to an orange/yellow light, and finally green once the battery is fully charged.
5. After the charger indicator light turns green, disconnect the charger. HAL is ready for use.

Once the Battery Charger is plugged in, the LED light on the battery charger will light up to notify you of the level of charge.

Green = fully charged battery

Orange = has some charge

Red = no charge at all

Battery Cycling

The battery is an integral part of your simulator and requires appropriate care to maintain efficiency and longevity.

Overcharging or leaving the battery idle for long periods of time will damage the battery and lower the amount of potential charge overtime.

To ensure maximum battery life, cycle the battery and avoid overcharging by adhering to the following warnings and guidelines.

Avoid Overcharging the Battery

Do not leave the simulator charging continuously for extended periods of time (i.e., several days). It is good practice to unplug the charger once the battery is charged.

- It is recommended to charge the simulator the day or night before a simulation to allow the battery time to fully charge.
- Unplug the simulator when in use unless while running a simulation the UNI software indicates a critically low battery. In these cases, it is advisable to plug in the simulator's battery charger to act as a power supply to finish the simulation. Once the simulation is completed, turn the simulator off and allow the simulator's battery to charge.

Avoid Battery Idleness

Do not leave the simulator idle for extended periods of time (i.e., months, years). The battery's capacity for charge will deteriorate if there is no cycling in the level of charge.

- If you plan to store away and not use the simulator for an extended period of time, it is recommended to fully charge the battery before storage. As part of routine maintenance, plan a time each month to cycle the battery and fully charge it before storing the simulator away again.

Cycling the Battery

1. Obtain the correct battery charger for the simulator and plug the wall adapter end into a voltage source.
2. With the simulator turned off, plug the charger into the charging port on the simulator.
3. Leave the simulator plugged into the charger until the LED light on the charger indicates that the battery is fully charged (if available) or until the required amount of time for charging has passed.
4. Disconnect the simulator from the charger.
5. The simulator is ready to be used for simulation.
6. Use the simulator's battery charge until depleted.
7. Repeat this process as needed.

If preparing the simulator for storage, arrange for a time every month to "cycle the battery" of the simulator. Then, store the simulator with a fully charged battery until the next scheduled usage.

Never store your simulator with a depleted battery for an extended period.

2.5 TURNING ON HAL VIA RF COMMUNICATION

The controlling tablet/PC transmits the startup and control commands to HAL through the use of the UNI software and RF Communication Module.

Wireless RF Communication

Always follow your simulator's charging procedures and have a fully charged simulator before initializing it with the UNI software.

To turn on HAL:

1. Turn on the tablet/PC.

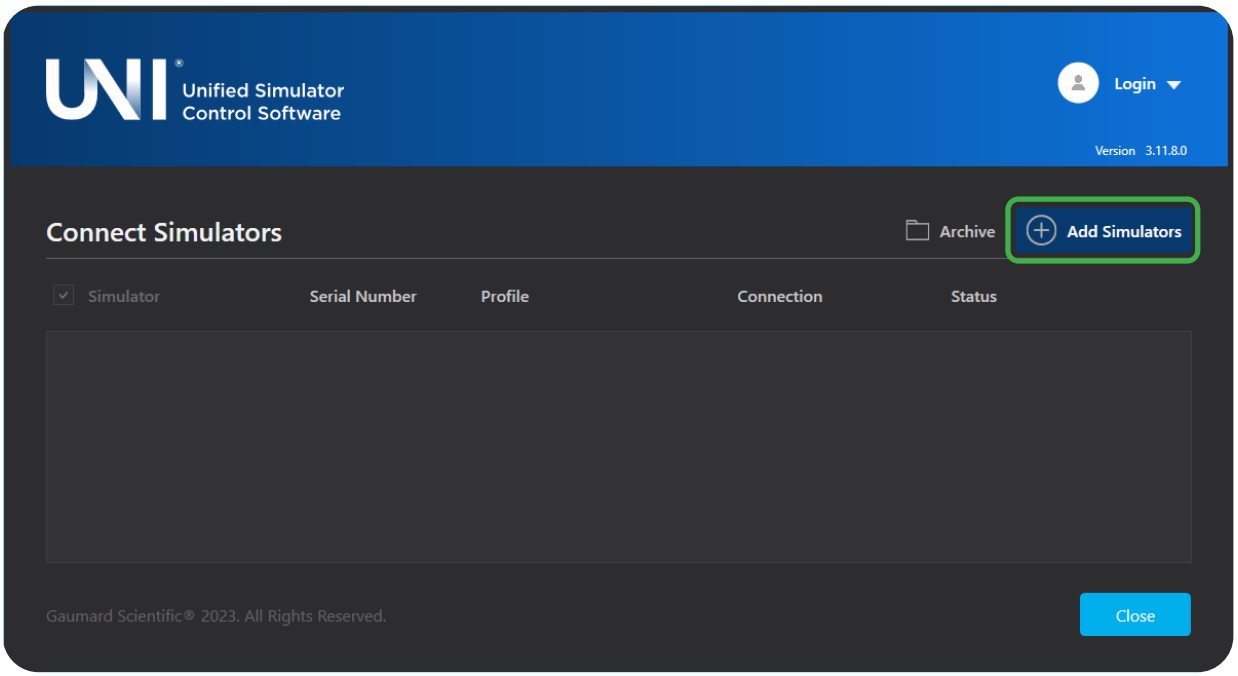
   Read the manufacturer's care and caution information to learn more about the tablet/PC.

2. Plug in the RF Communication module into an available USB port.

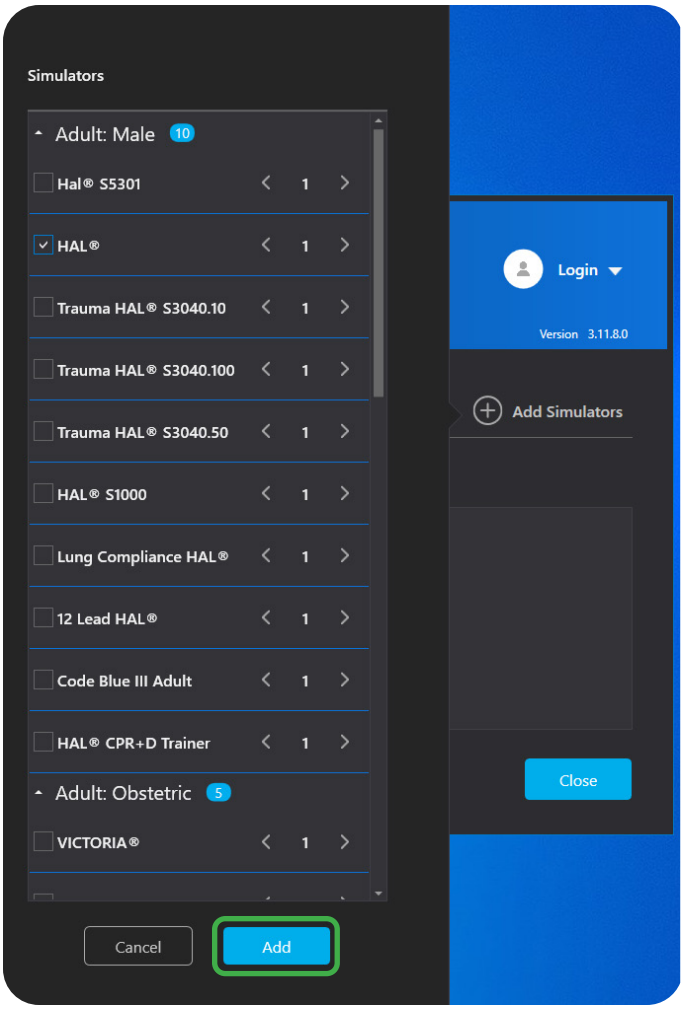
3. Double click on the UNI icon that is installed on the home screen.

4. The UNI initialization window will appear. Allow UNI to load.

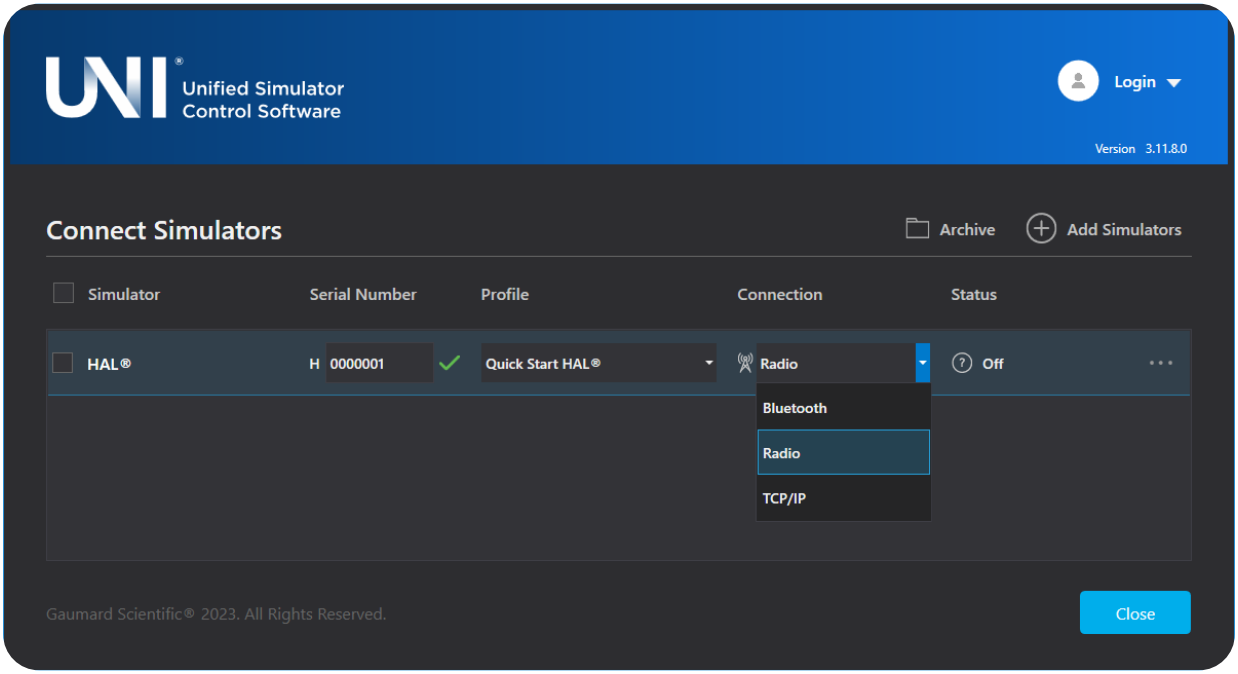
5. Click on **+ Add Simulator**.



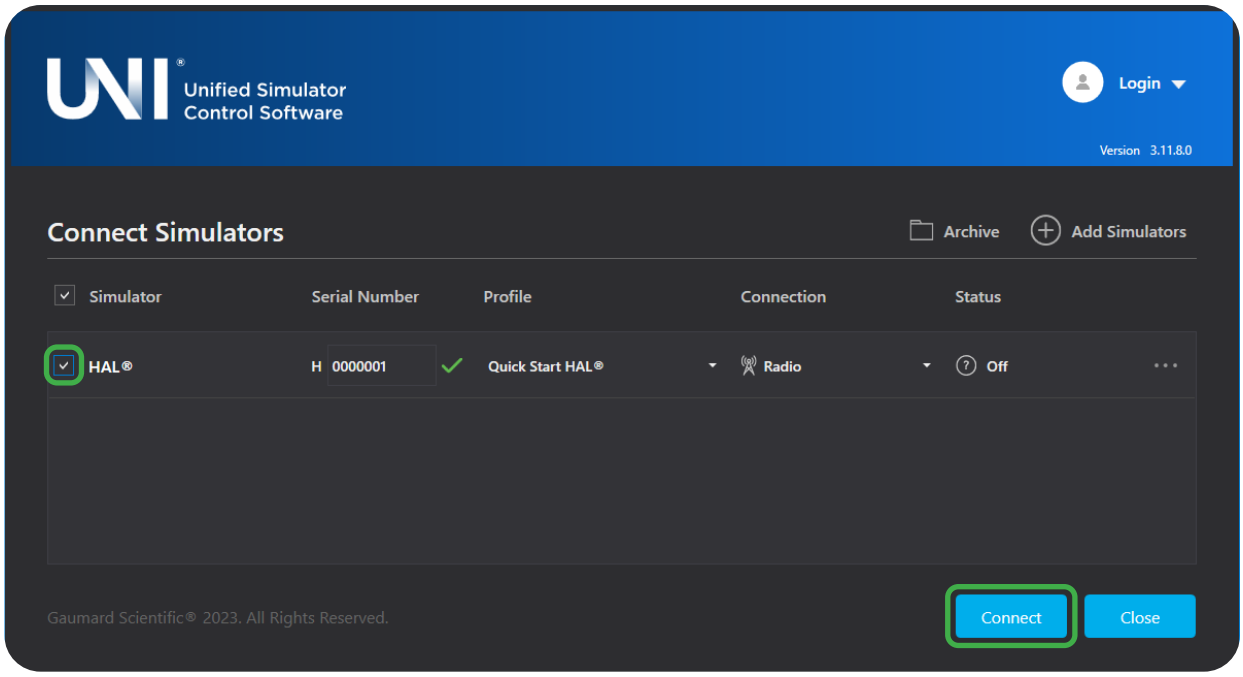
6. Select your simulator's profile from the list and click **Add**.



7. Enter the serial number of the simulator, select the desired profile, and for **Connection** select **Radio**.



8. Click the checkbox for the simulator and click **Connect**.



Wired RF Communication

Always follow your simulator's charging procedures and have a fully charged simulator before initializing it with the UNI software.

Wired RF Communication may be an appropriate option to use as a communication method when having issues connecting to the simulator or as a troubleshooting step when talking with Technical Support.

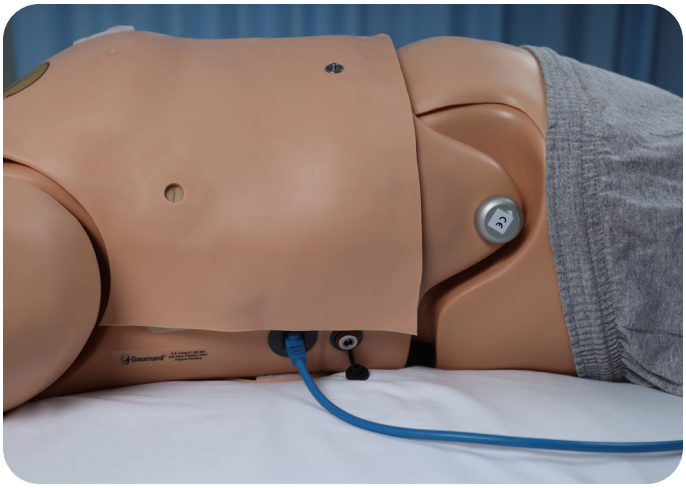
To turn on HAL via Wired RF Communication:

1. Turn on the tablet/PC.

Read the manufacturer's care and caution information to learn more about the tablet/PC.

2. Plug in the RF Communication module into an available USB port and connect the blue Ethernet cable into the Ethernet port located on the RF Communication module.

3. Connect the other end of the blue Ethernet cable to the available RJ45 port on the right side of HAL's torso.



4. Perform steps 3 - 8 from the previous section to finish the **Wired RF Communication** setup.

2.6 TURNING ON HAL VIA BLUETOOTH

HAL also has the capability to connect to its UNI tablet/PC via a Bluetooth connection provided by an **OMNI Link Wireless Adapter Kit**.

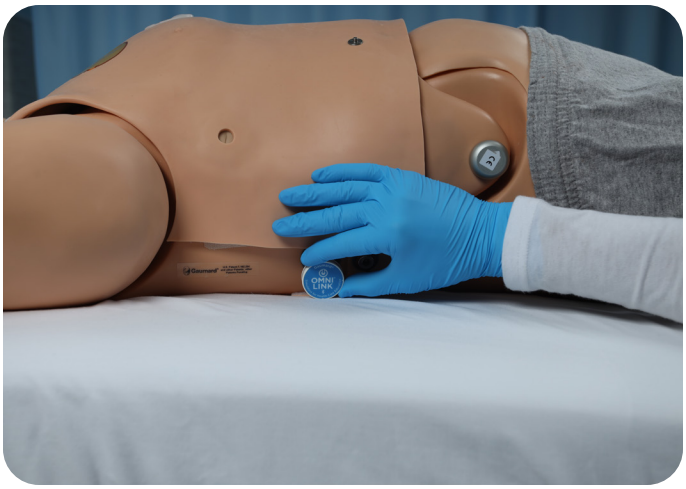
The **OMNI Link Wireless Adapter Kit** began shipping as standard with **HAL SN: 2101325** and above.

For simulators without the **OMNI Link Wireless Adapter Kit** refer to section "2.5 Turning ON HAL VIA RF Communication" on page 17

To initialize HAL via a Bluetooth connection using the **OMNI Link Wireless Adapter Kit**:

Plugging in the OMNI Link

1. Remove the **OMNI Link** from its package.
2. Plug the **OMNI Link** into the RJ45 port on the side of the simulator.



3. Press the power button on the **OMNI Link** to enable **Bluetooth**.

The **OMNI Link** will flash green when broadcasting a Bluetooth signal.

Turning on the Simulator with OMNI Link

After plugging in the OMNI Link into HAL's RJ45 port you may now proceed with establishing a connection to him through the UNI software.

To turn ON HAL using the OMNI Link's Bluetooth:

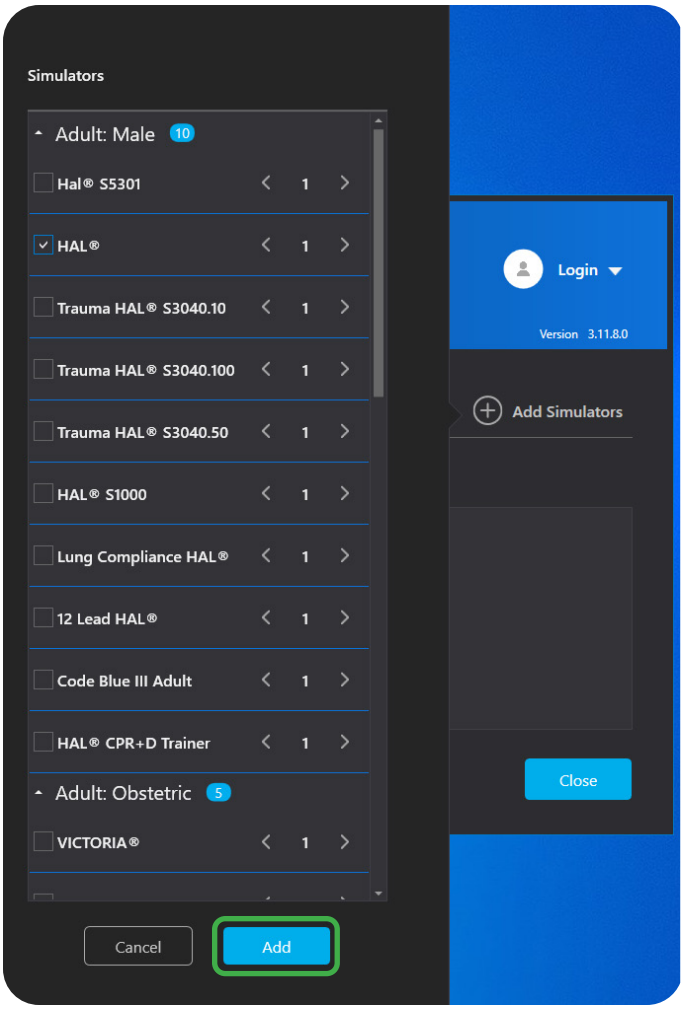
1. Disconnect the RF Communication module from the UNI tablet/PC.

2. Turn on the UNI tablet/PC and double click the UNI icon that is installed on the home screen.

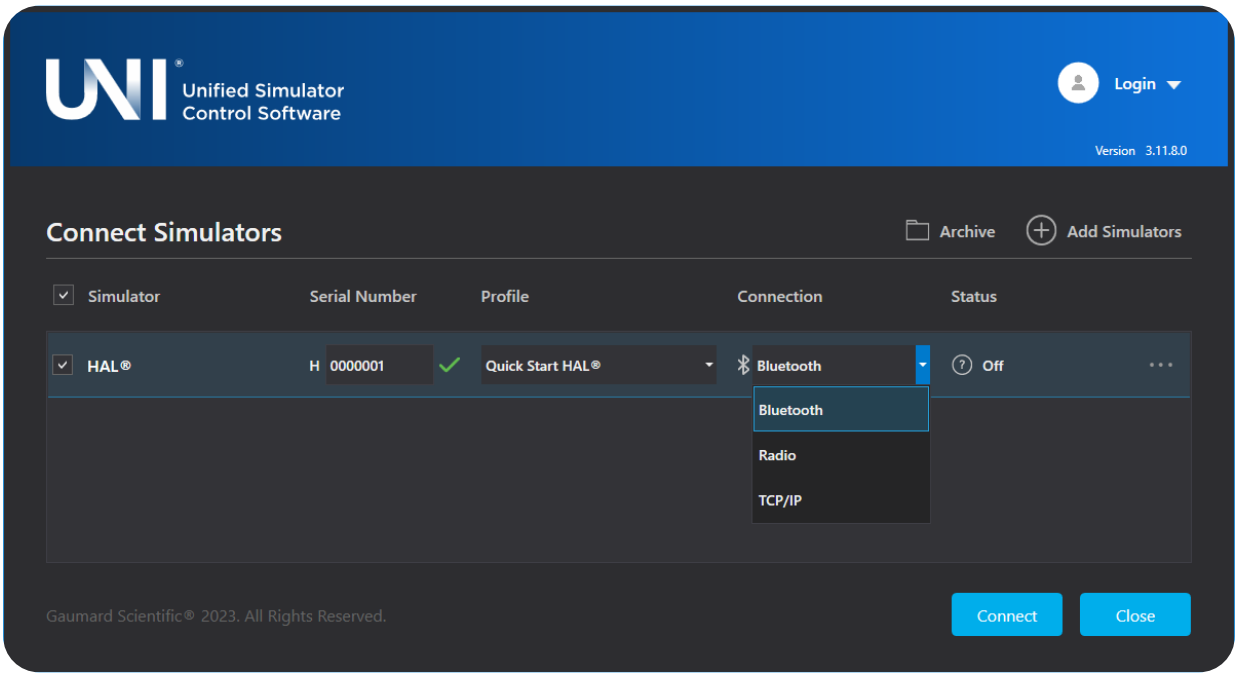
3. The UNI initialization window will appear. Allow UNI to load.

4. Click on **+ Add Simulator**.

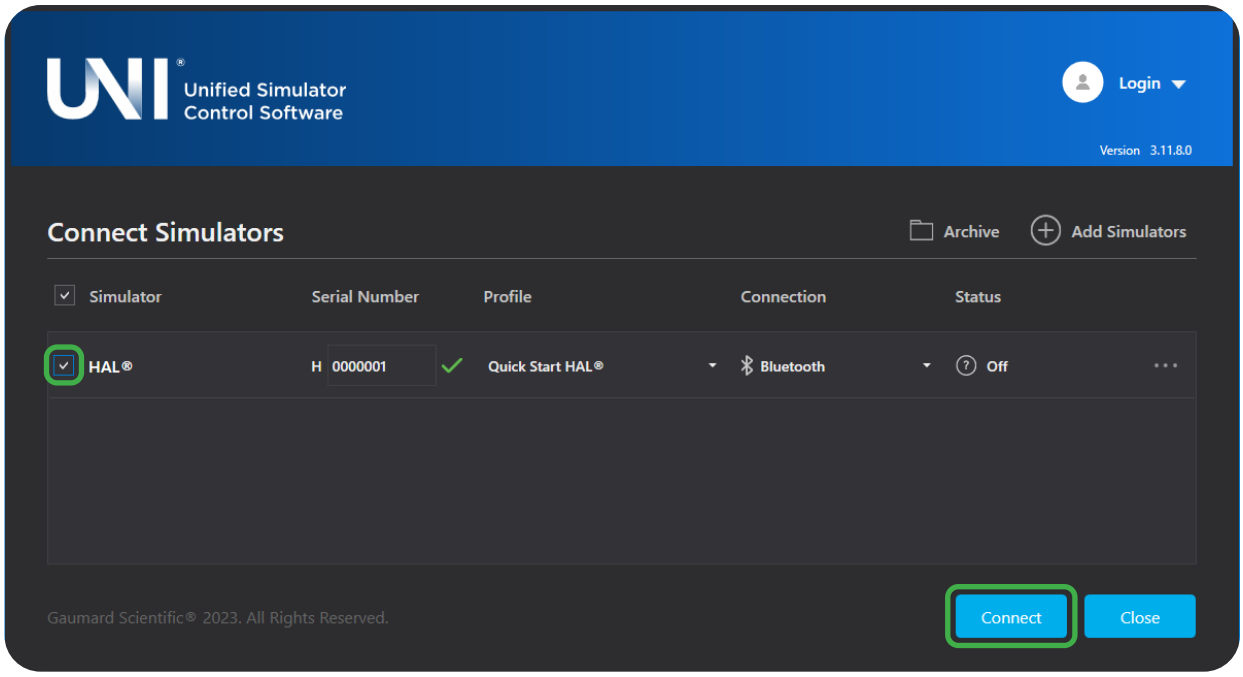
5. Select your simulator's profile from the list and click **Add**.



6. Enter the serial number of the simulator, select the desired profile, and for **Connection** select **Bluetooth**.



7. Click the checkbox for the simulator and click **Connect**.



2.7 TURNING ON HAL VIA TCP/IP

HAL has the ability to set up his RF Communications Module and UNI connection remotely from a Bedside Virtual Monitor (subject to additional purchase).

To initialize your simulator via TCP/IP (Remotely from the Bedside Virtual Monitor):

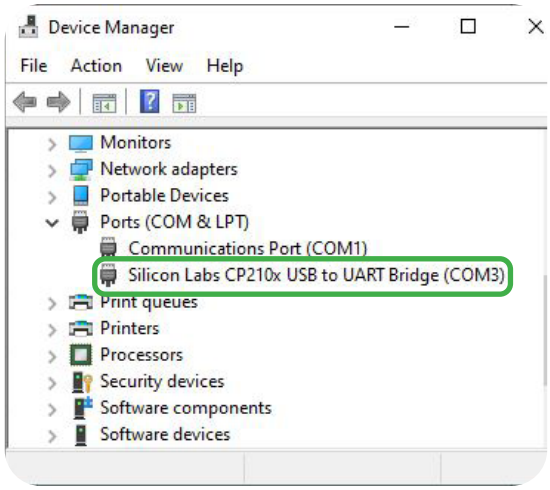
1. Gather the simulator, RF Communications Module, Bedside Virtual Monitor, and control tablet/PC.

   It is recommended to follow your simulator's charging procedures and have a fully charged simulator before initializing it with the UNI software.

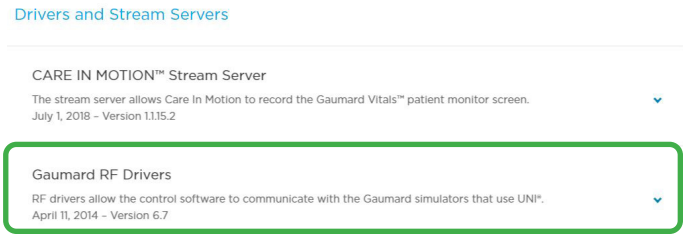
2. Plug the RF Communications Module into an available USB port on the Bedside Virtual Monitor.

3. Ensure that the **RF Module Drivers** are downloaded on the Bedside Virtual Monitor.

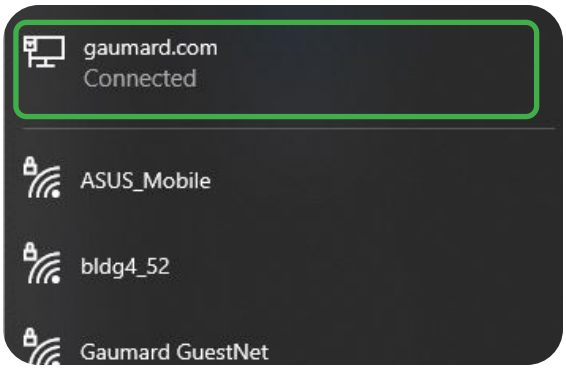
   When you have the RF Communications Module plugged into your device, you may check the **Device Manager** to verify that the RF Communications Module is being recognized. It will only be recognized if you have the **RF Drivers** installed. The RF Communications Module will appear as "Silicon Labs" under the "Ports" section of the **Device Manager**.



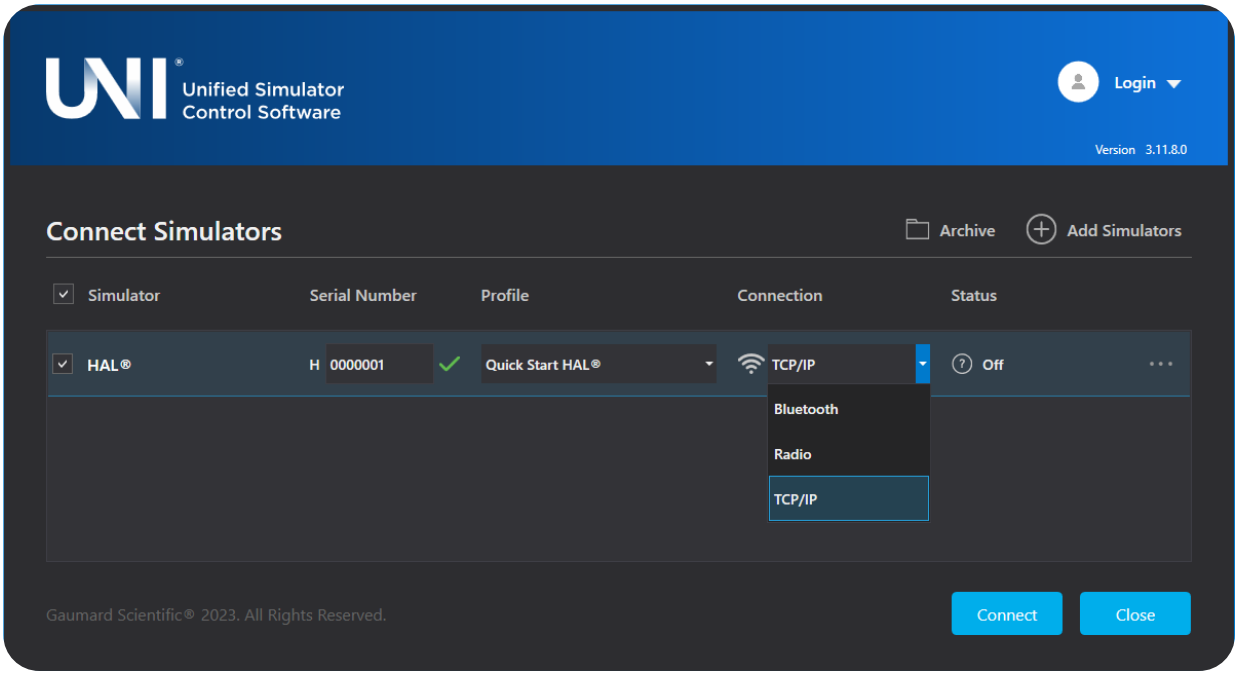
If the **RF Drivers** are not installed, go to: https://www.gaumard.com/gaumard-software to download and install them.



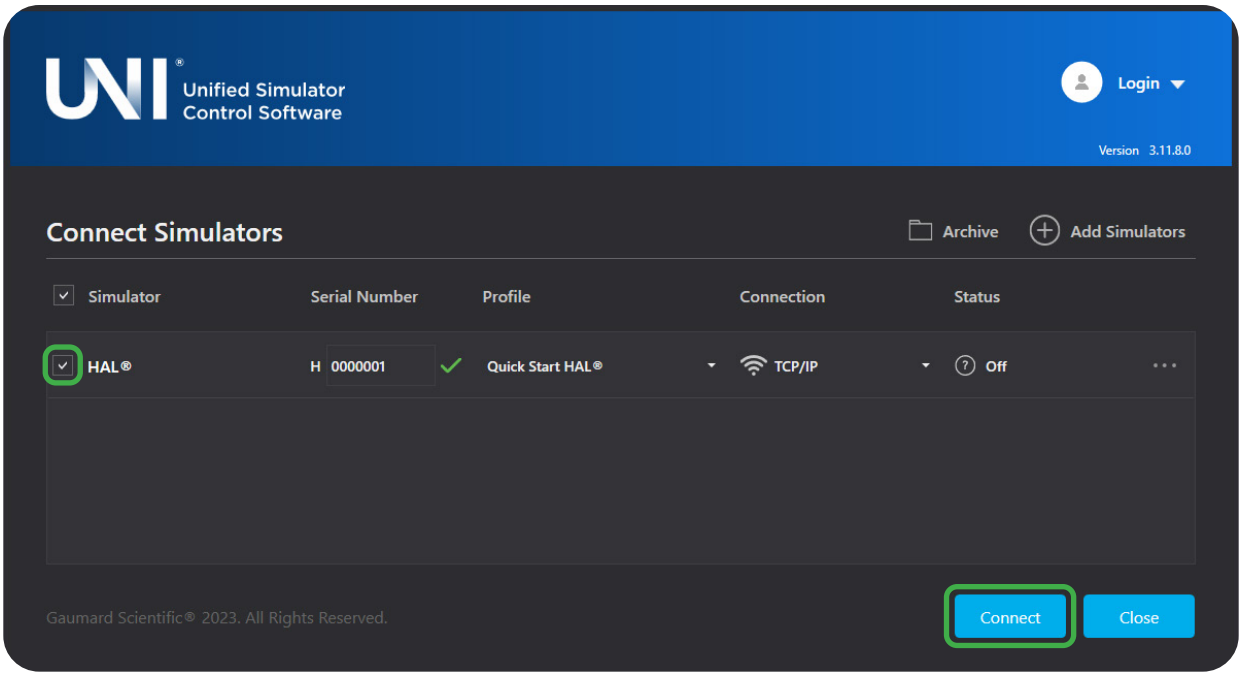
4. Verify that the Bedside Virtual Monitor and the UNI tablet/PC are connected to the same Wi-Fi network.



5. Launch the UNI software, select the desired simulator, and set the **Connection** to **TCP/IP**.



6. Click the checkbox for the simulator and click **Connect**.

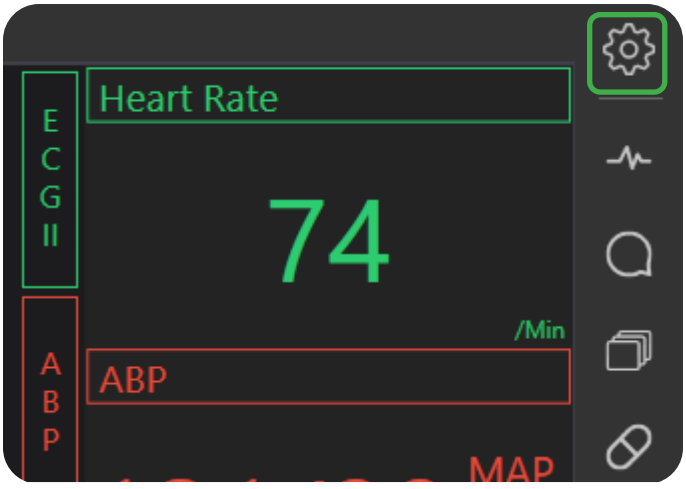


Connecting UNI 3 and Gaumard Vitals

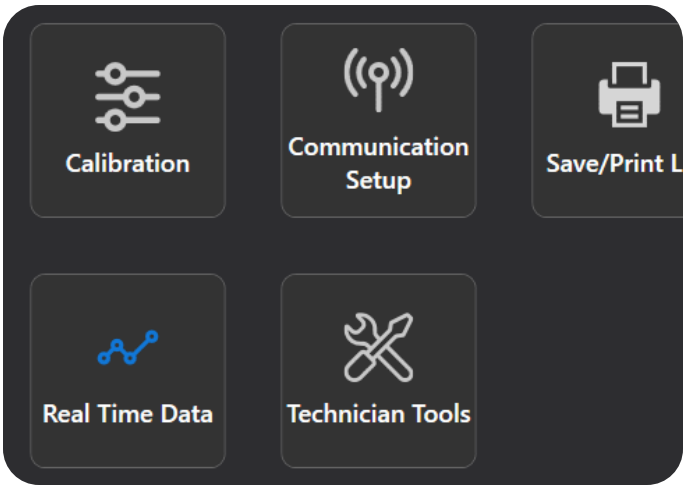
After selecting TCP/IP as the Connection and UNI 3 launches, in order to complete the TCP/IP connection UNI 3 and Gaumard Vitals need to be connected.

To connect UNI 3 and Gaumard Vitals:

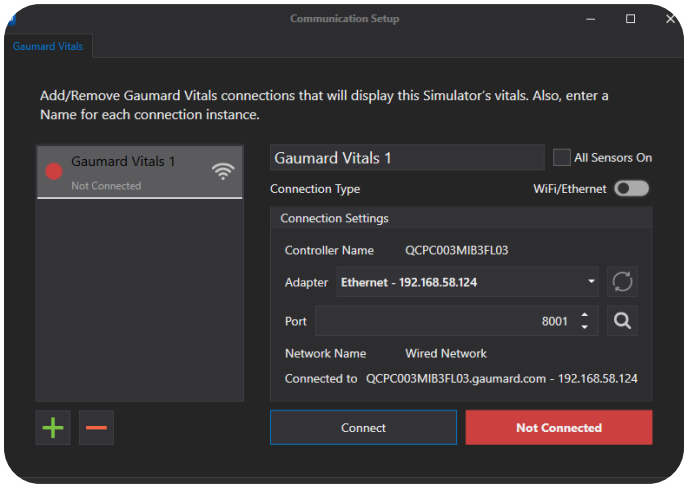
1. In UNI 3, click **Settings** in the upper right corner.



2. In the **Current Simulator** section, click **Communication Setup**.



3. On the **Communication Setup** window, take note of the **Adapter** and **Port** numbers.

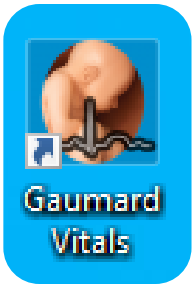


The selected Adapter needs to be the Ethernet option. In this example, the resulting Ethernet IP address is 192.168.58.124. This IP address number is what will be plugged into the Communication Setup on Gaumard Vitals so the software can communicate with each other.

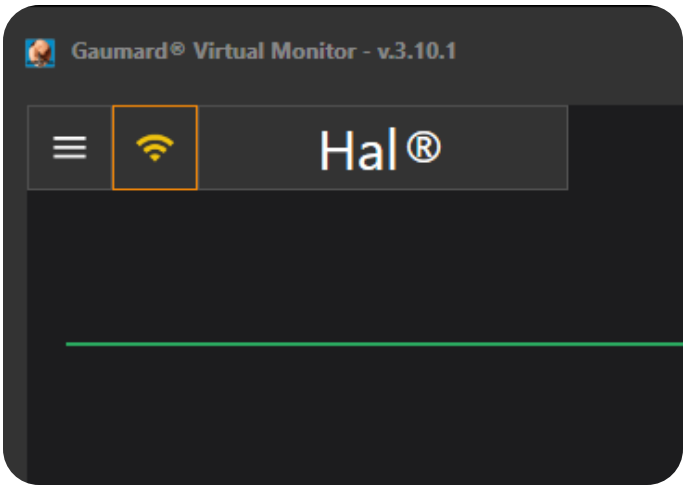
The Port number would only need to be manually changed if attempting to connect multiple Bedside Virtual Monitors to this instance of UNI 3. In this example, the only Port number is 8001. This number will also be plugged into the Communication Setup on Gaumard Vitals to complete the software setup.

4. Leave the UNI tablet/PC and move over to the Bedside Virtual Monitor.

5. Double click on the Gaumard Vitals icon that is installed on the home screen of the Bedside Virtual Monitor.

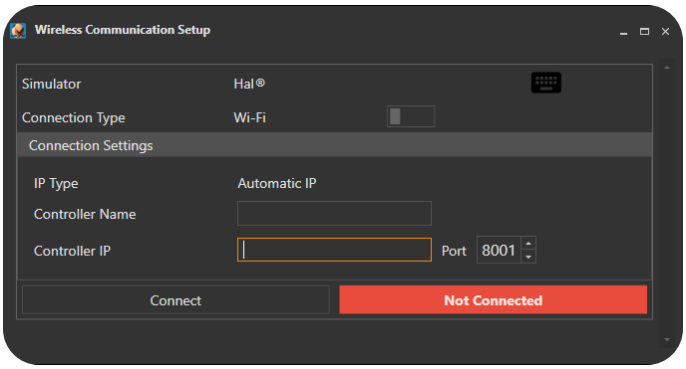


6. Click on the **Communication Signal** in the upper left of Gaumard Vitals.

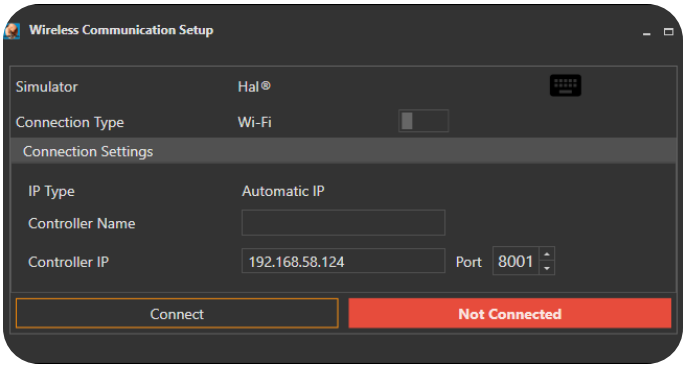


7. Enter into the **Controller IP**, the IP from the **Adapter** field on UNI 3 (step 3).

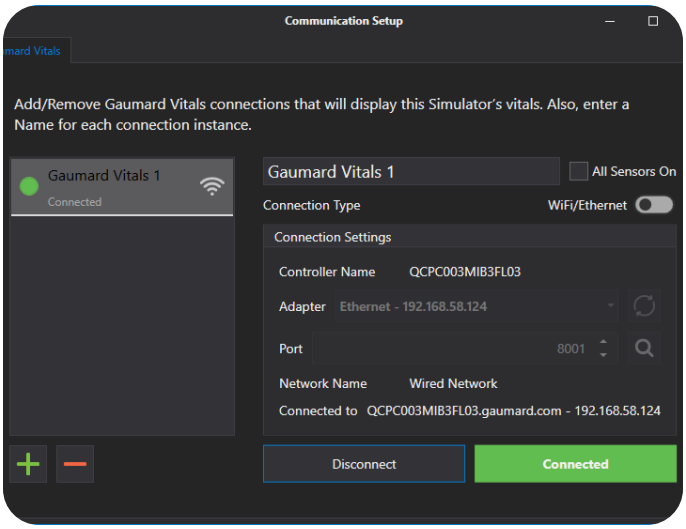
8. Check that the **Port** numbers are the same on UNI and Gaumard Vitals

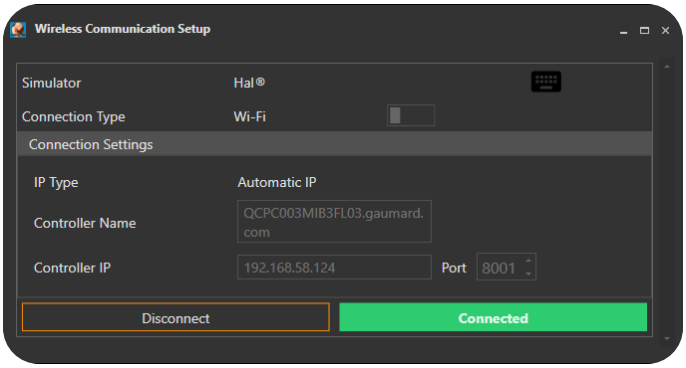


9. Click **Connect** on the **Communication Setup** windows on UNI 3 and Gaumard Vitals.



After clicking **Connect** both the **Communication Setup** windows on UNI 3 and Gaumard Vitals will attempt to complete the connection. When successful, the indicator in the bottom left with turn green and state **Connected**.

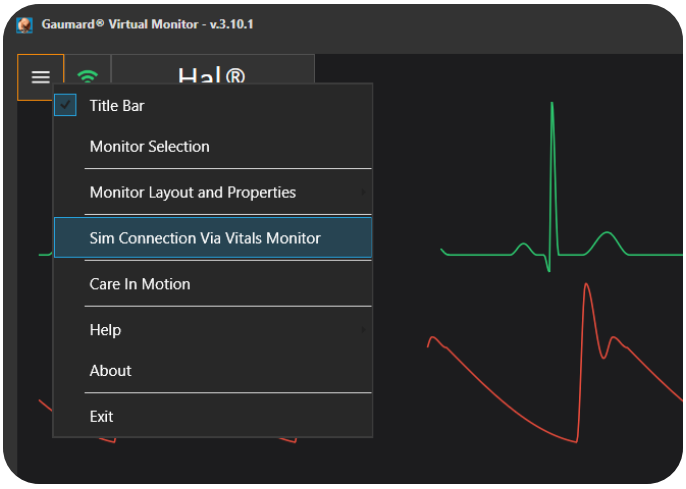




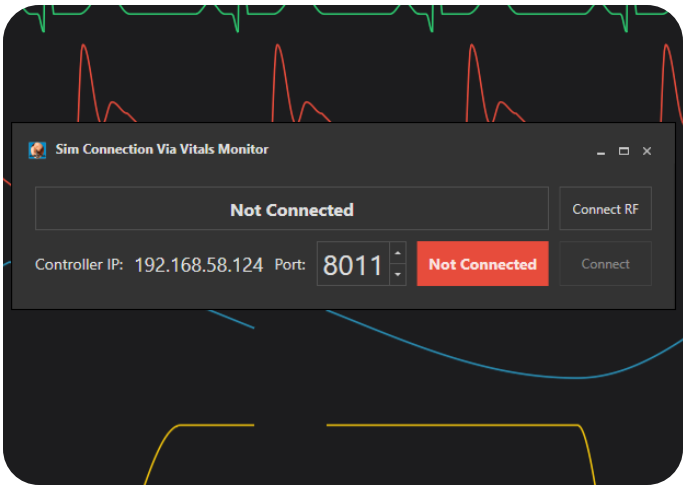
Completing the TCP/IP Connection

After establishing UNI 3 and Gaumard Vitals connection, to finish up the TCP/IP communication:

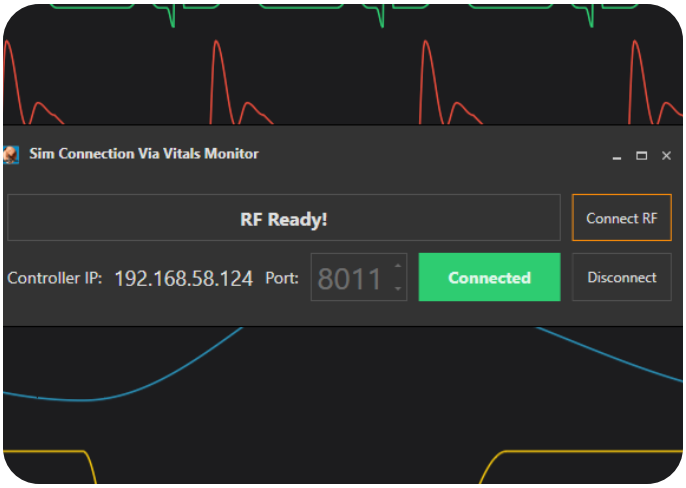
1. Click on the **Menu** in the upper left corner of Gaumard Vitals and select **Sim Connection Via Vitals Monitor**.



2. Click **Connect RF**. The Sim Connection Via Vitals Monitor will search and connect to the available RF.



3. Once the RF is ready, click **Connect** on the bottom right of the **Sim Connection Via Vitals Monitor** window.



The UNI 3 and Gaumard Vitals are now connected via TCP/IP and the simulator is ON.

3. Working with HAL

3.1 NEUROLOGICAL

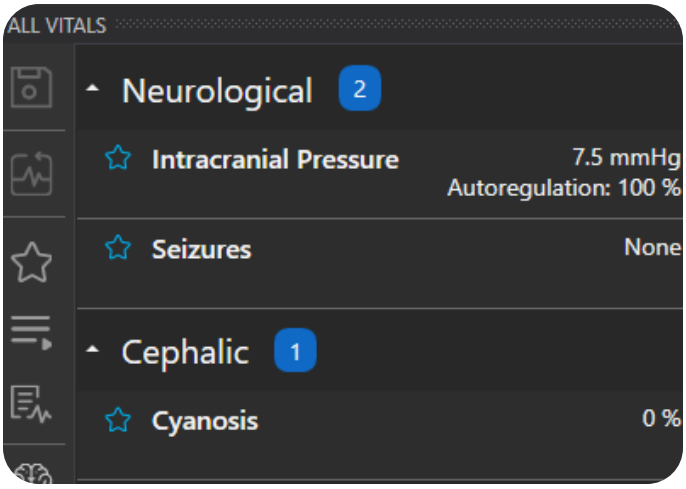
3.1.1. Intracranial pressure

Intracranial pressure (ICP) is the pressure within the cranium. The cranium is a rigid structure composed of three main components: brain, cerebrospinal fluid (CSF), and blood. Any change to the volume of any one of these components will change the pressure within the cranium (i.e., intracranial pressure).

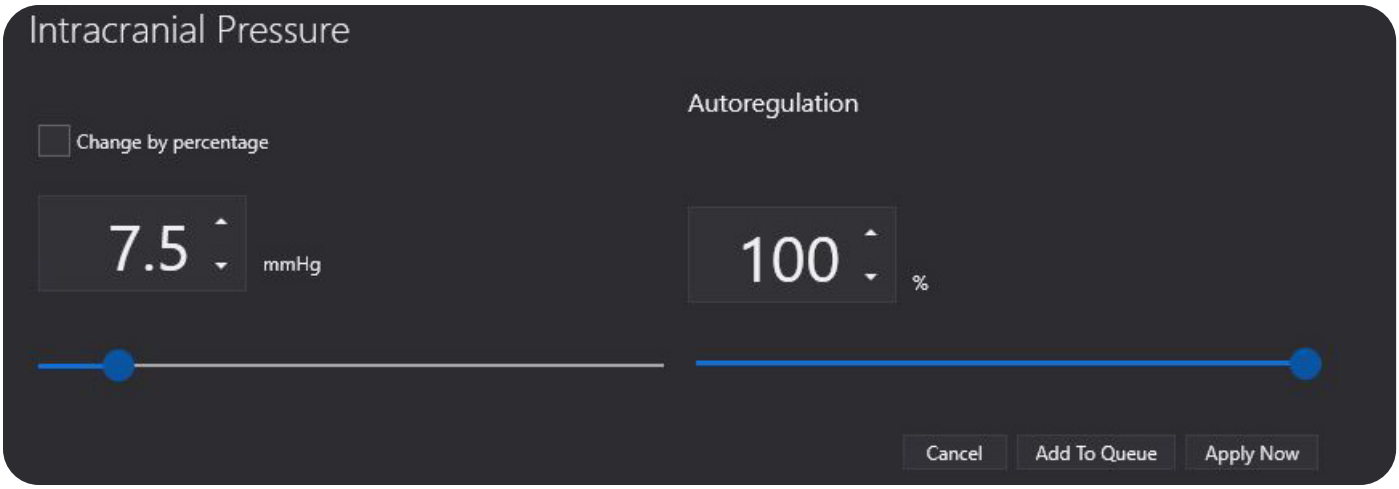
HAL has an Intracranial Pressure vital available in UNI 3 to simulate changes in ICP. Although this vital is a virtual control that will not affect HAL physically, the change in pressure can be seen on the virtual monitor tab in UNI 3 and/or displayed on an optional Bedside Virtual Monitor as a numeric value and a waveform. The Intracranial Pressure vital consists of an adjustable ICP value in units of mmHg and an Autoregulation percentage to increase or decrease the intensity of the ICP waveform's amplitude that is displayed.

To adjust HAL's Intracranial Pressure:

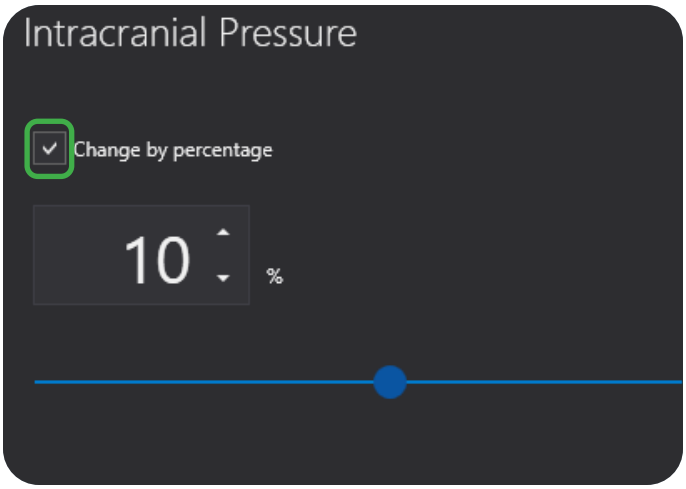
1. In UNI 3, under the **Neurological** section click on the **Intracranial Pressure** vital.



2. On the Intracranial Pressure window that appears, use the slider bar or enter a new value to change the values of pressure and autoregulation.

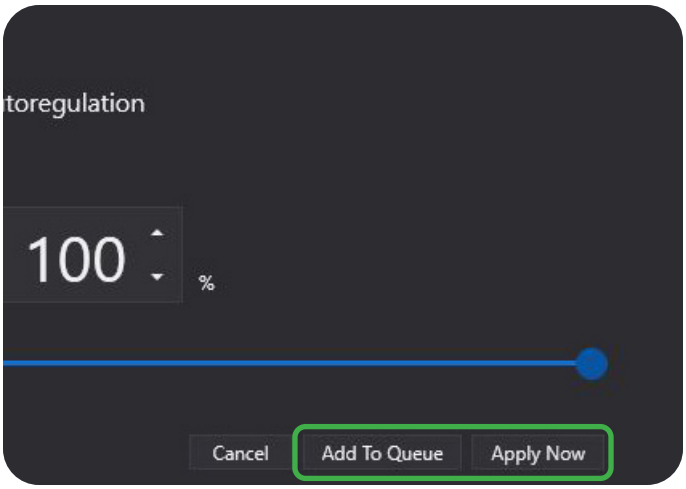


3. Check **By Percentage** to affect the ICP by percent rather than mmHg.



4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

The value in units of mmHg will display the numeric value of ICP and Autoregulation % will affect the intensity of the ICP waveform.



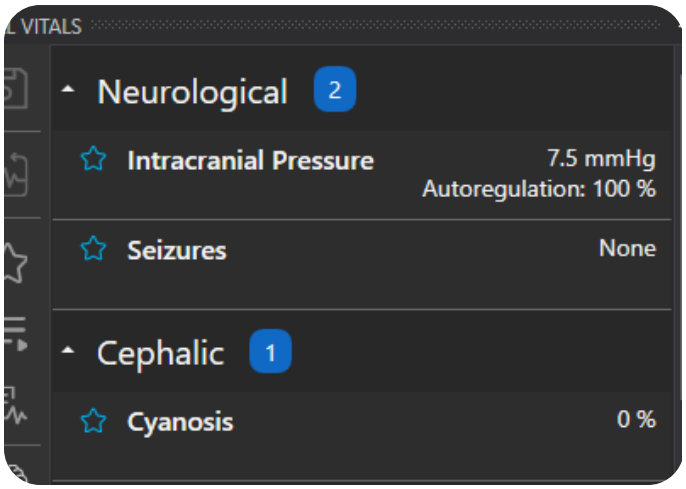
3.1.2. Seizure

A seizure is a burst of uncontrolled electrical activity between brain cells that causes temporary abnormalities in muscle tone or movements, behaviors, sensations, or states of awareness.

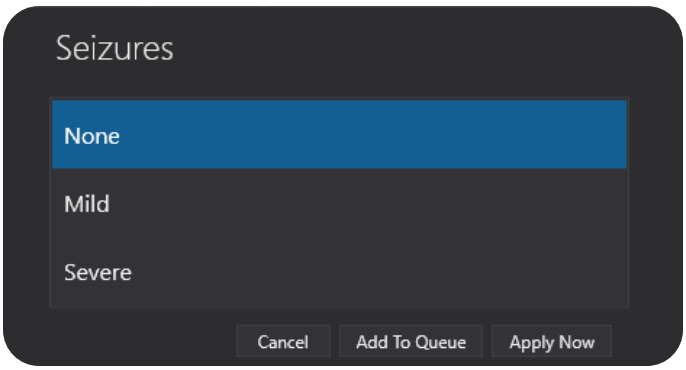
HAL has the ability to seize in various levels of severity (mild or severe). To better observe HAL's seizures when they are activated it is recommended to position a backboard under HAL while in a patient bed or have HAL laying on a hard surface.

To activate seizures:

1. In UNI 3, under the **Neurological** section click on **Seizures**.



2. Select either **None, Mild,** or **Severe**.



Remember to place HAL on a sturdy surface (like placing a back board under him while in bed) to make the appearance of his seizure more apparent.

3. Click **Apply Now** to immediately apply the type of seizure selection to HAL or click **Add To Queue** to load at a later time.

3.2 CEPHALIC

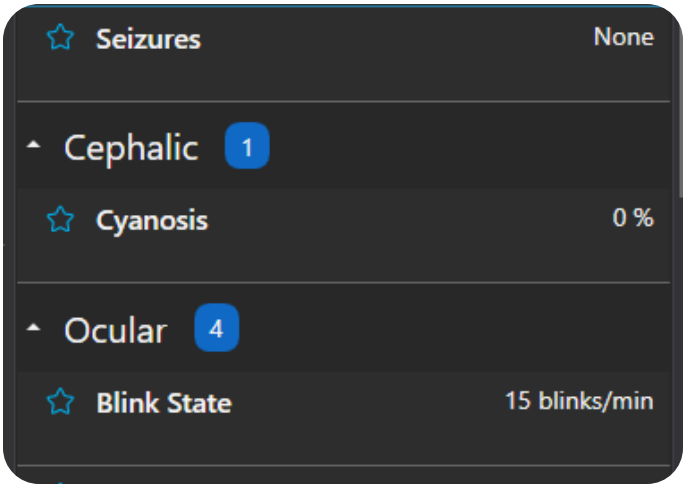
3.2.1. Cyanosis

Cyanosis may be used to add realism to simulation by adding another sign participants should assess.

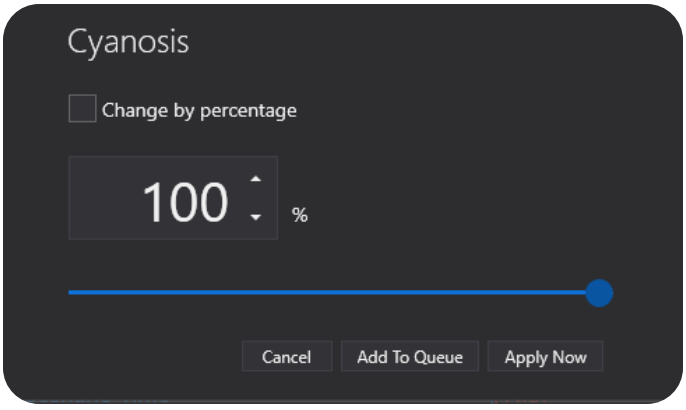
HAL can present cyanosis circumorally on a sliding scale of intensity.

To apply cyanosis and intensity to HAL:

1. In UNI 3, under the **Cephalic** section click on **Cyanosis**.



2. Use the **Intensity** slider bar to increase or decrease the displayed color appearance on HAL.

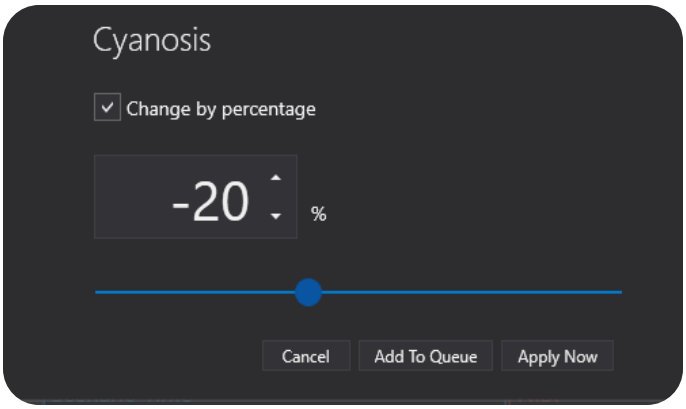


Normal is HAL's default appearance. Cyanosis will activate HAL's circumoral LEDs with a programmed color (the color can be adjusted through calibration). The **Intensity** slider bar operates on a sliding scale from 0-100%. The higher the percentage, the more intense the cyanosis will appear and vice versa.

3. Check **By Percentage** to change **Cyanosis** by percentage rather than beats per minute.

   The **current value** of cyanosis will change by the set +/- percentage change to the new value.

4. Click **Apply Now** to immediately apply the skin appearance settings to HAL or click **Add To Queue** to load at a later time.



3.3 OCULAR

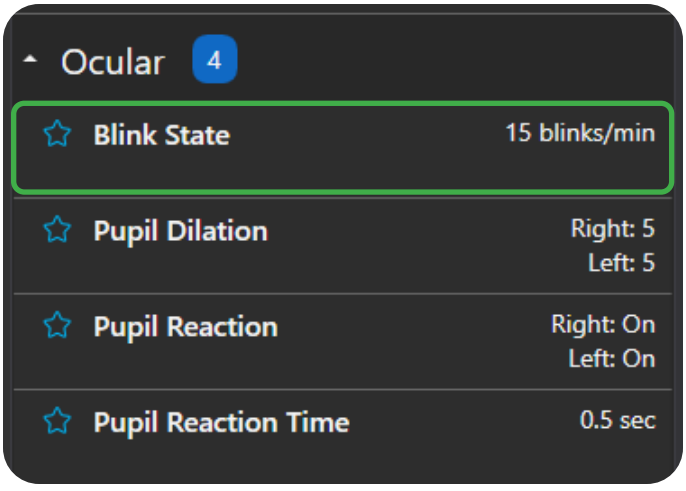
HAL can incorporate a plethora of ocular abilities such as different blinking rates, pupil dilation, and reactions,

3.3.1. Blink State

HAL's blink state controls the blinking rate or lack thereof with pre-programmed options. HAL's default blink state is set to 15 blinks per minute.

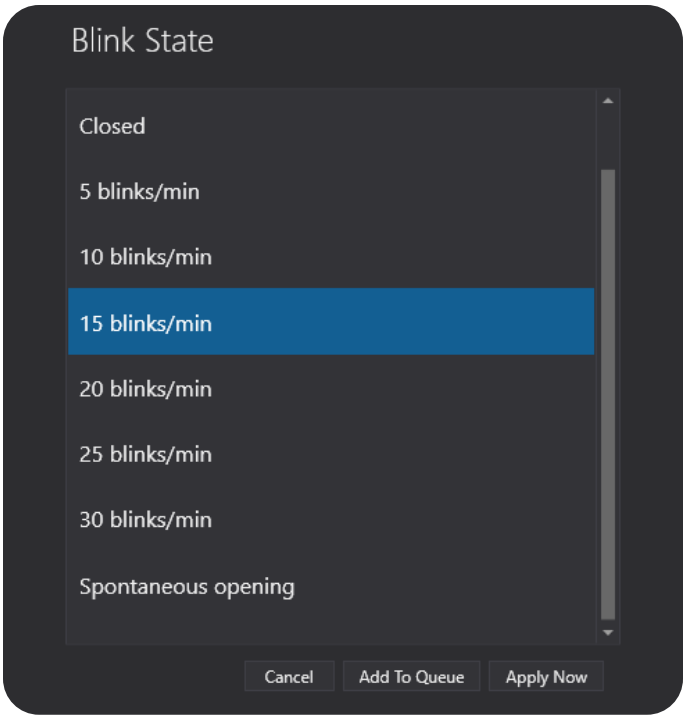
To change HAL's blink state:

1. In UNI 3, under the **Ocular** section click on the **Blink State** vital.



2. Select from the available list of options:

- **Open**
- **Closed**
- Rates varying from 5 - 30 blinks/min in increments of 5
- **Spontaneous Opening**



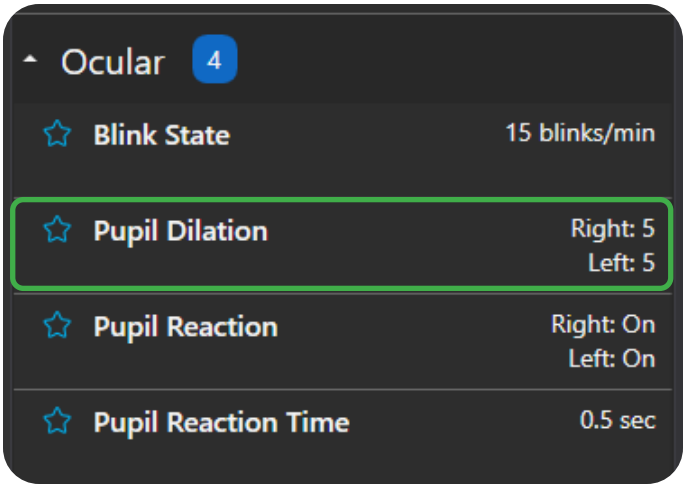
3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

3.3.2. Pupil Dilation

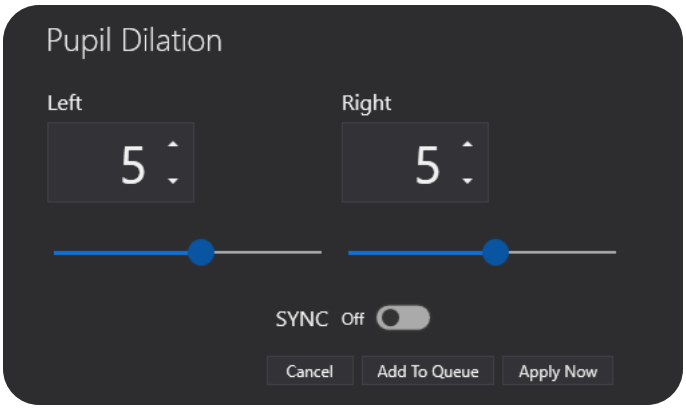
Pupil Dilation controls HAL's pupil size making it easy to manually constrict or blow up for assessments. HAL's default pupil dilation is set to a level of 5 on this control's sliding scale of 0 - 9.

To affect HAL's pupil size:

1. In UNI 3, under the **Ocular** section click **Eyelid State**.



2. Use the slider bar or enter the numeric level from 0 - 9 for the pupil size for the **Left** and **Right** eyes.



A level of 5 is considered normal for HAL. Adjust the level to a lower number to constrict HAL's pupils or to a higher number to dilate his pupils.

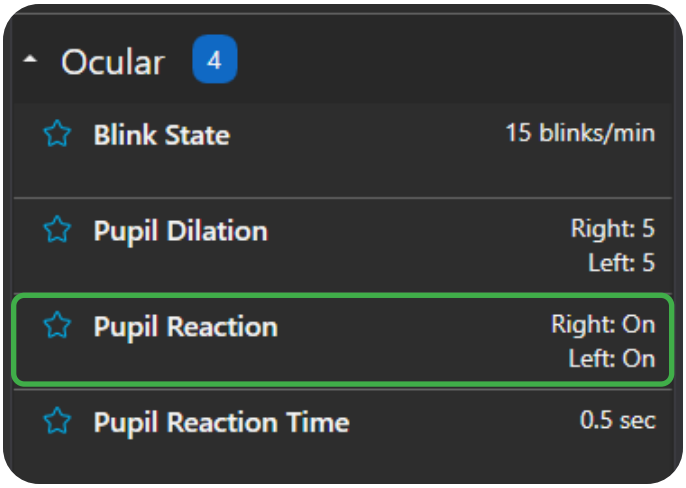
3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

3.3.3. Pupil Reaction

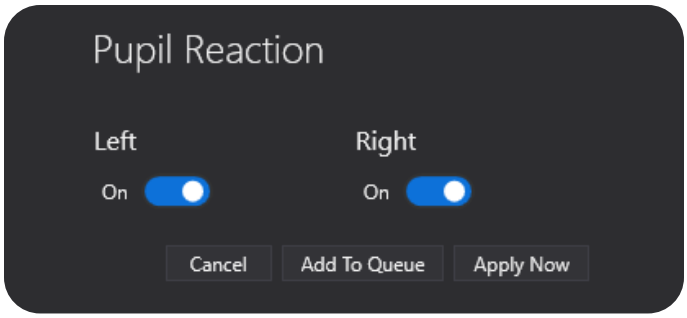
Just as in a real patient, HAL's pupils are reactive to light. The reaction of HAL's pupils can be controlled independently of each other to assist in simulating medical conditions.

To control HAL's pupil reactions:

1. In UNI 3, under the **Ocular** section click **Pupil Reaction**.



2. Flip the switch for **Left** and/or **Right** to turn HAL's reaction ON or OFF.



ON will make that eye of HAL's be reactive to light and OFF will prevent that eye from reacting even when light is shone in his eye.

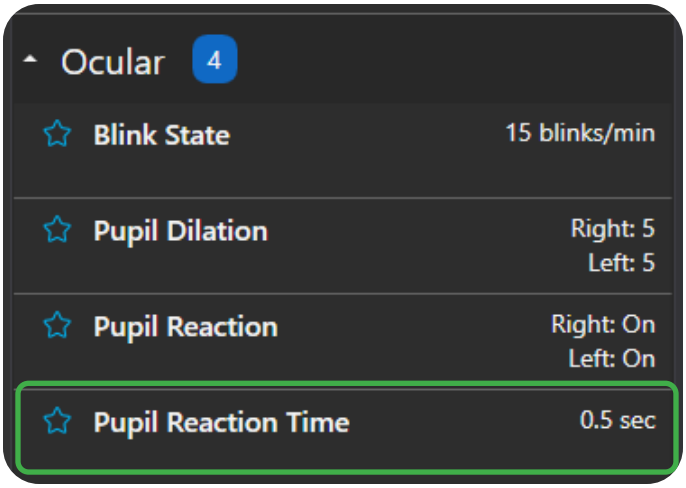
3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

3.3.4. Pupil Reaction Time

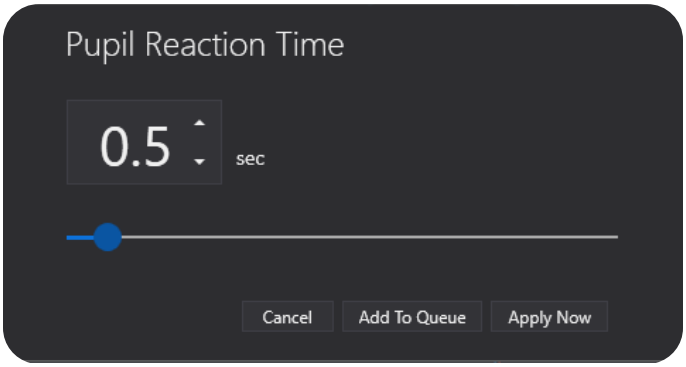
In conjunction with **Pupil Reaction**, **Pupil Reaction Time** controls how quickly HAL's pupil will react to a light source (when pupil reaction is turned ON for that eye).

To adjust HAL's pupil reaction time:

1. In UNI, under the **Ocular** section click **Pupil Reaction Time**.



2. Enter a numeric value or use the slider bar to adjust the **Pupil Reaction Time** on a scale from 0-10 seconds.



HAL's normal Pupil Reaction Time is set to a time of 0.5 seconds by default. As the time in seconds increases, so will the time it takes for HAL's pupils to react to light.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

3.4 AIRWAY

HAL has three types of airway inserts (ventilation insert, surgical cricoid insert, and surgical trachea insert) that each serve a unique purpose. In addition to those inserts, HAL also has a few airway complications and throat sounds that can be combined with intubation techniques and airway assessments.

3.4.1. Ventilation Insert

The **Ventilation Insert** is pre-installed on HAL and is designed to maintain an air tight seal during bag valve mask ventilation, intubation, and mechanical ventilation exercises. For this reason it is NOT recommended to cut the **Ventilation Insert**. Instead, use the other two surgical airways for making incisions.

The **Ventilation Insert** also has anatomical landmarks that can be palpated which assists with adding another level of realism to your simulation. .

To remove the **Ventilation Insert**:

1. Pull the ribbons that are exposed at HAL's throat until the **Ventilation Insert** pops out.

To re-install the **Ventilation Insert**:

1. Push the **Ventilation Insert** into the opening at HAL's throat.

Be sure to keep the ribbons exposed on the sides of the **Ventilation Insert** so that the insert can be easily extracted in the future. Secure the Ventilation Insert at the top by pressing the holes in the skin onto the knobs available on HAL's throat.

To assist with inserting the **Ventilation Insert**, spray the sides of the insert with lubricant.

3.4.2. Surgical Cricoid Insert

The **Surgical Cricoid Insert** allows users to perform cricothyrotomy procedures with real medical equipment and works especially well with a tracheal hook.

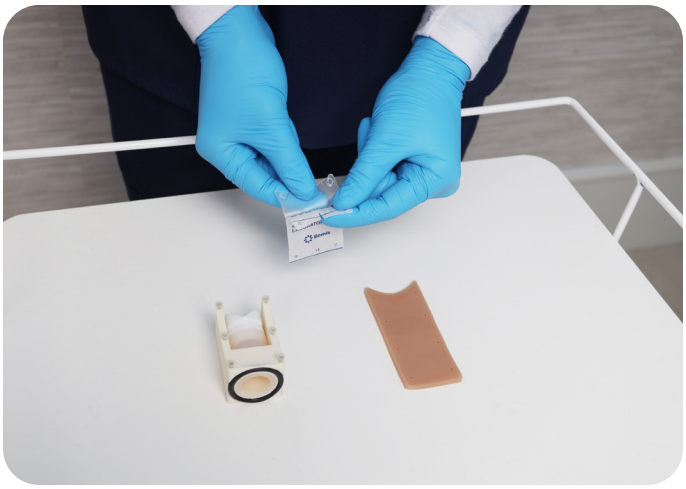
The **Surgical Cricoid Insert** consists of its base, a simulated cricothyroid membrane, and trachea skin cover. These layers allow users to cut either lateral or medial incisions and with tactical cricothyrotomy kits

To setup and install the **Surgical Cricoid Insert**:

1. Remove any insert that is installed in HAL's airway.

2. Obtain the **Surgical Cricoid Insert**, simulated cricothyroid membrane, and trachea skin cover.

3. Peel the paper off the simulated cricothyroid membrane and fit the punched holes around the edges to the knobs on the surgical cricoid insert.



4. Place the trachea skin cover shiny side down on top of the cricothyroid membrane and fit the skin's punched holes around the edges onto the knobs as well.

5. Push the **Surgical Cricoid Insert** into the opening at HAL's throat.

Be sure to keep the ribbons exposed on the sides of the **Surgical Cricoid Insert** so that the insert can be easily extracted in the future. Secure the Surgical Cricoid Insert at the top by pressing the holes in the skin onto the knobs available on HAL's throat.

To assist with inserting the **Surgical Cricoid Insert**, spray the sides of the insert with lubricant.

3.4.3. Surgical Trachea Insert

The **Surgical Trachea Insert** consists of the insert, the simulated trachea, the simulated cricothyroid membrane, and the trachea skin cover.

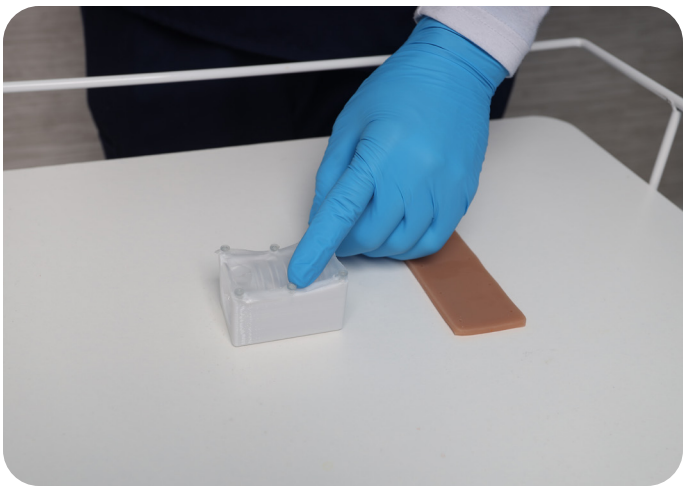
To setup and install the **Surgical Trachea Insert**:

1. Remove any insert that is installed in HAL's airway.

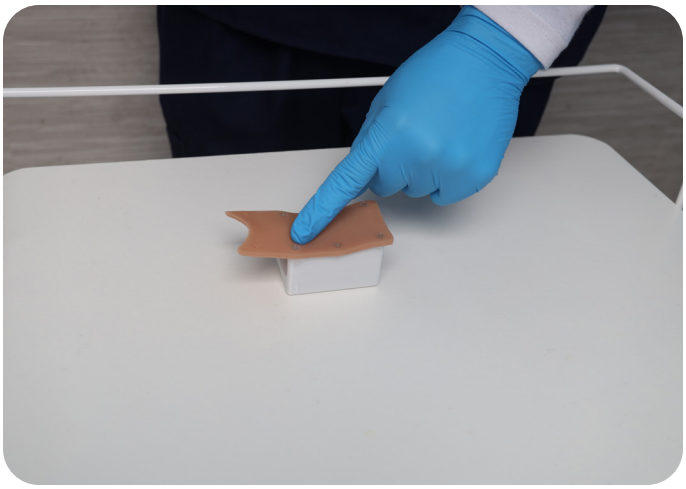
2. Obtain the **Surgical Trachea Insert**, simulated cricothyroid membrane, trachea, and trachea skin cover.

3. Insert the simulated trachea into the **Surgical Trachea Insert.**

4. Peel the paper off the simulated cricothyroid membrane and fit the punched holes around the edges to the knobs on the surgical cricoid insert.



5. Place the trachea skin cover shiny side down on top of the cricothyroid membrane and fit the skin's punched holes around the edges onto the knobs as well.



6. Insert the **Surgical Trachea Insert** into HAL's airway.

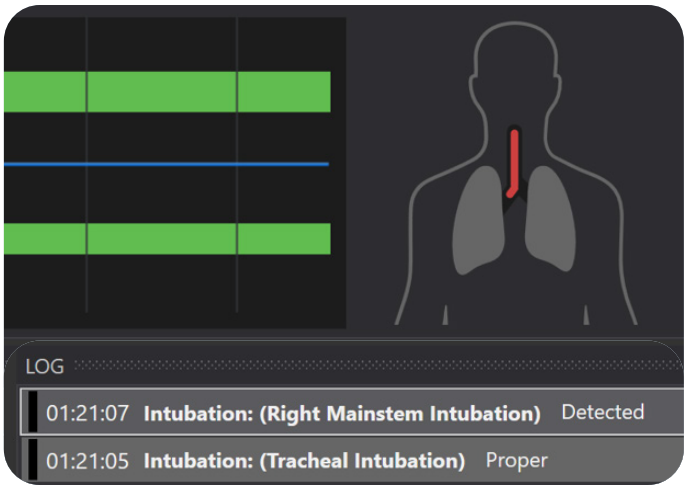
3.4.4. Intubation & Intubation Sensors

HAL supports the use of real adjuncts for intubation and retrograde intubation.

When intubating, spray the adjunct with **MINERAL OIL** lubricant prior to inserting it through HAL's airway.

Prior to retrograde intubation, spray the adjunct and the airway insert with **MINERAL OIL** lubricant prior to performing the procedure. The will help to lubricate the airway to prevent tearing when the airway adjunct is inserted through HAL's airway and up through his mouth.

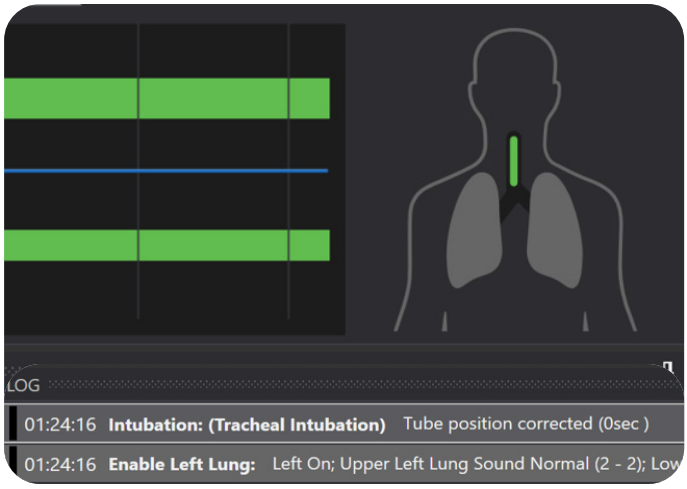
During intubation, HAL has an intubation sensor that will detect endotracheal placement, log the position, and will trigger right mainstem when intubation is too deep to automatically present unilateral chest rise until corrected.



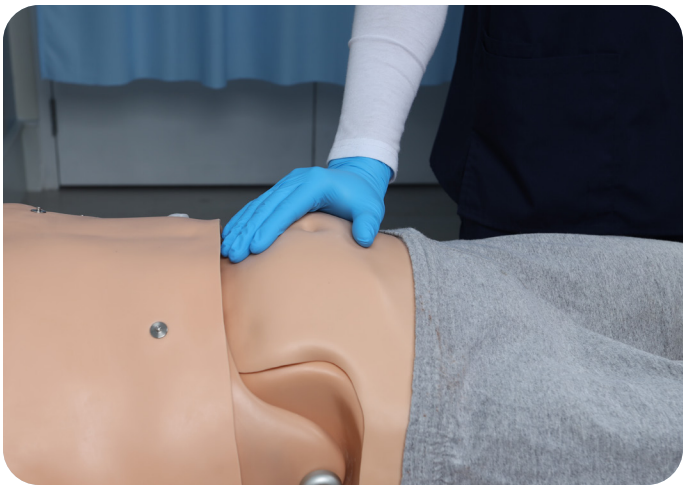
In UNI 3, click the **CPR** tab to view the visual graphic of HAL's airway and intubation sensor that detects endotracheal tube placement.

Correcting the endotracheal tube position will re-enable HAL's left lung chest rise.

All activity in regards to intubating HAL will be recorded in the UNI log as well to review during debriefing.



In cases of esophageal intubation and ventilation, HAL will display gastric distension in his lower belly.



3.4.5. Airway complications

To add another layer of realism to difficult intubation scenarios, activate one or all of HAL's airway complications which include tongue edema, laryngospasm, and pharyngeal swelling.

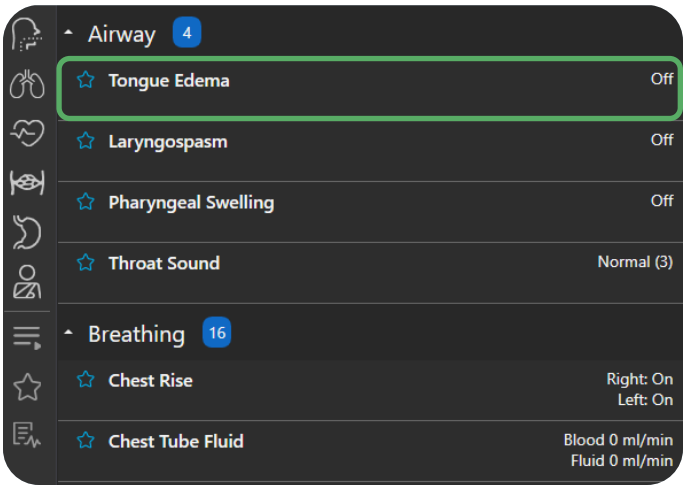
Tongue Edema

Tongue edema is the swelling of the tongue which can make intubation difficult since the tongue doesn't depress as easily.

HAL's tongue edema operates pneumatically so when it is turned ON, his tongue will inflate with air. When it is turned OFF, his tongue will deflate and go back to normal.

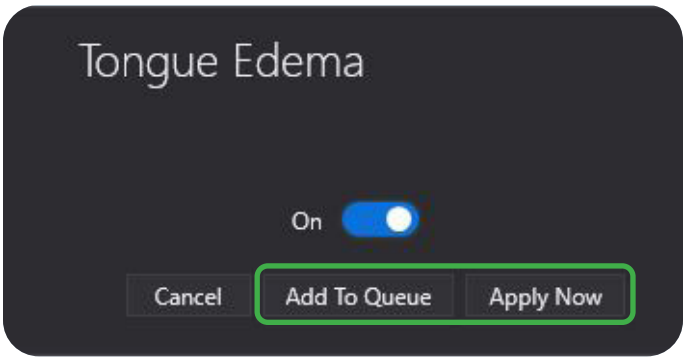
To activate tongue edema on HAL:

1. In UNI 3, under the **Airway** section click **Tongue Edema**.



2. Select **ON** or **OFF**.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.



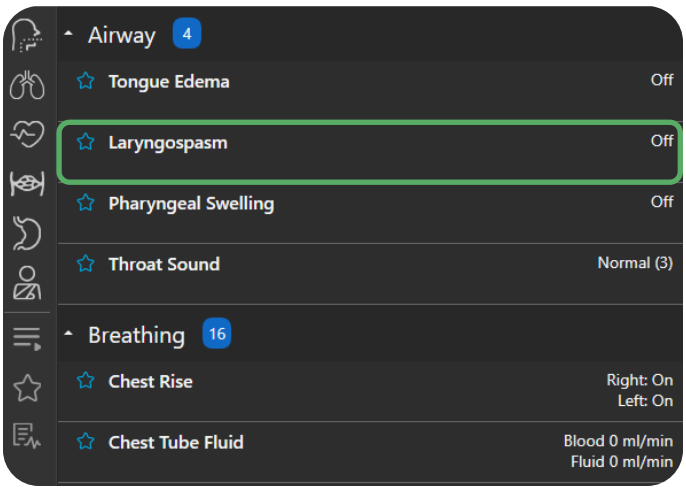
Laryngospasm

Laryngospasm are spasms of the vocal chords that make it difficult to speak or breathe.

HAL's laryngospasm operates pneumatically so when it is turned ON, HAL's larynx will inflate with air. When it is turned OFF, his larynx will deflate and go back to normal.

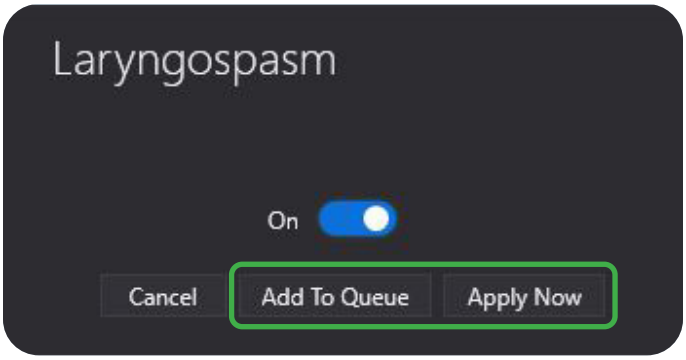
To activate HAL's laryngospasms:

1. In UNI 3, under the **Airway** section click **Laryngospasm**.



2. Select **ON** or **OFF**.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time



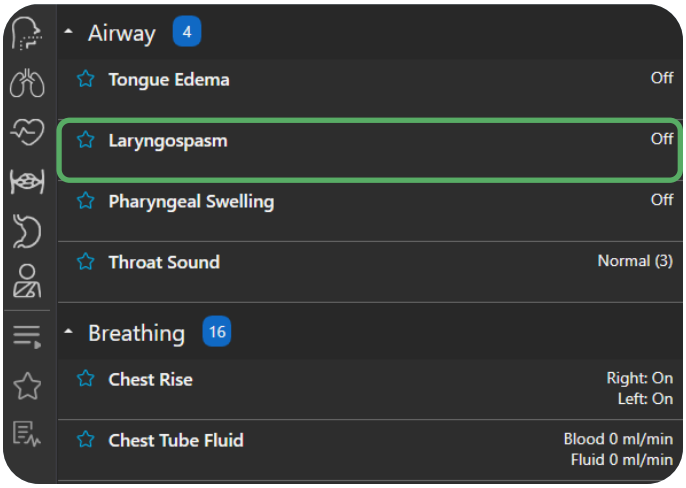
Pharyngeal Swelling

Pharyngeal swelling, or pharyngitis, is the swelling that occurs at the back of the throat between the tonsils and the larynx.

HAL's pharyngeal swelling operates pneumatically so when it is turned ON, his pharynx will inflate with air. When it is turned OFF, it will deflate and go back to normal.

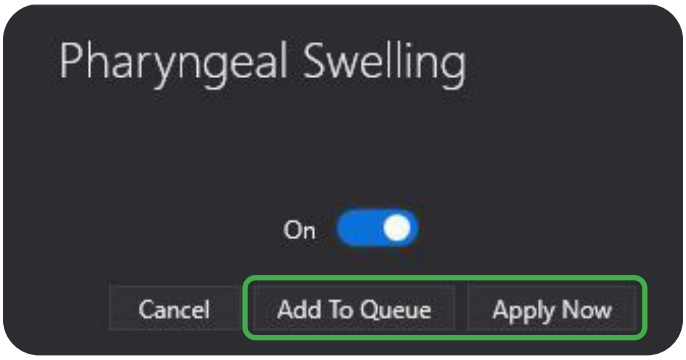
To activate pharyngeal swelling:

1. In UNI 3, under the **Airway** section click **Pharyngeal Swelling**.



2. Select **ON** or **OFF**.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

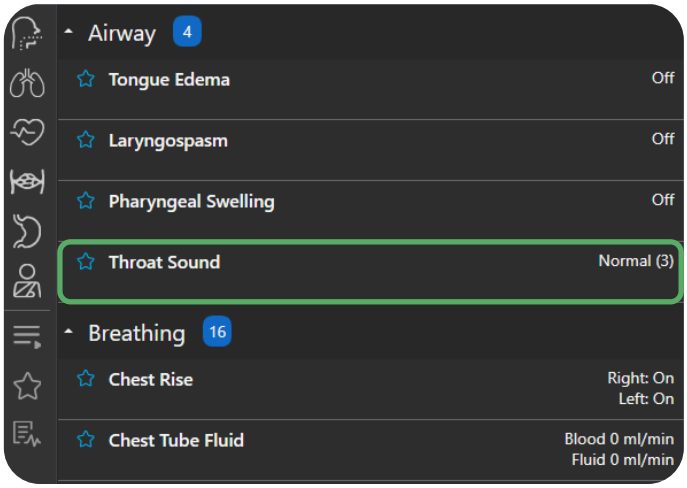


3.4.6. Throat Sounds

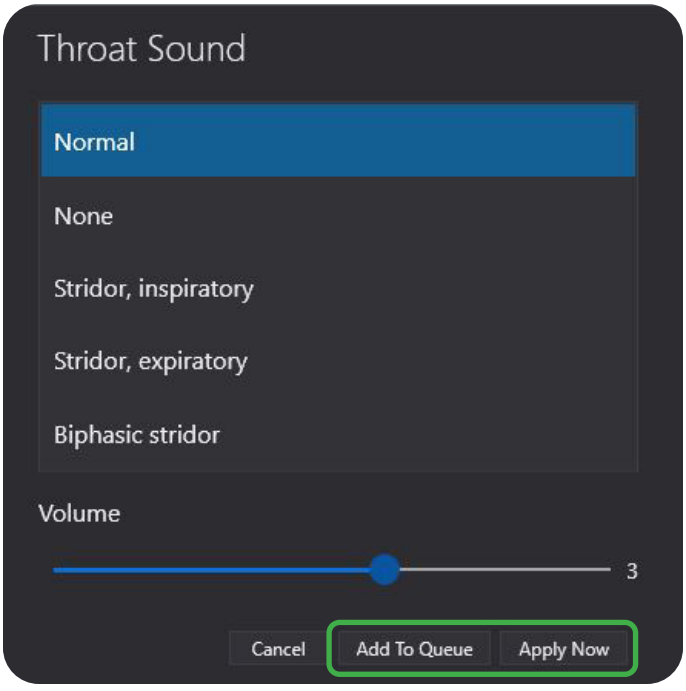
To mimic real patients with breathing issues, HAL has normal and abnormal throat sounds that include different types of stridor which can be selected to give auditory clues for assessments.

To select throat sounds and adjust their volume:

1. In UNI 3, under the **Airway** section click **Throat Sound**.



2. Select from the available options the type of **Throat Sound** for HAL.



3. Use the **Volume** slider to increase or decrease the volume level of the selected throat sound.

4. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

3.5 BREATHING

HAL has an impressive range of breathing capabilities that simulates life like chest rise, pneumothorax, hemothorax, different respiratory patterns, lung sounds, oxygen saturation, mechanical ventilator options, and vitals waveforms.

3.5.1. Chest Rise, Pneumothorax, & Needle Decompression

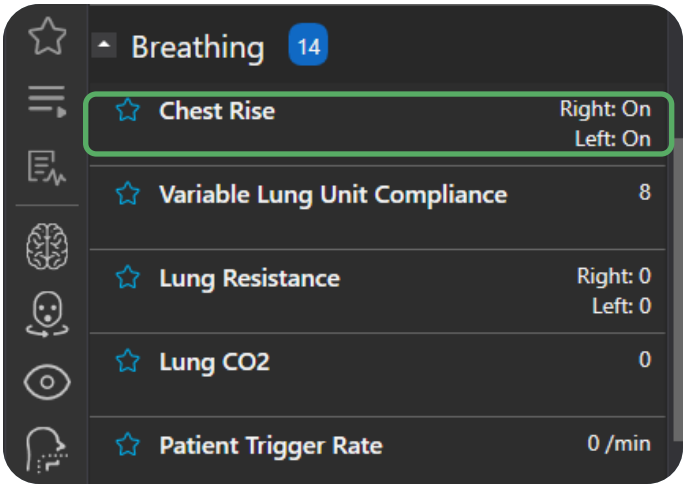
HAL's realistic bilateral chest rise allows providers to visually assess breathing. HAL's chest rise can also be controlled to independently stop one side of the chest from rising to simulate a variety of breathing conditions. In particular, HAL can simulate a pneumothorax on either side of his chest by selecting this option in UNI 3. Once it is activated in UNI 3, this pressurizes the needle decompression sites with air.

Chest Rise

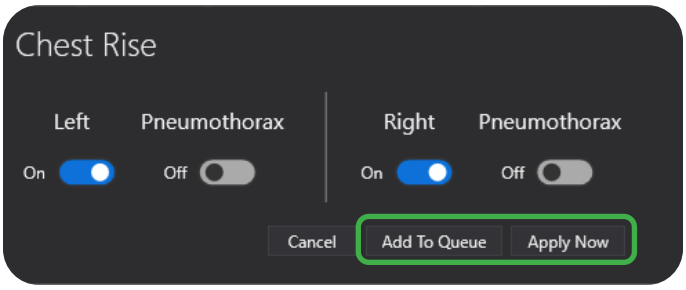
By default HAL presents normal, bilateral chest rise but this can be adjusted to present unilateral chest rise for the left or right, whichever is preferred, or even no chest rise at all.

To change HAL's chest rise settings:

1. In UNI 3, under the **Breathing** section click **Chest Rise**.



2. Click on the switch for **Left** and/or **Right** to turn chest rise **ON** or **OFF**.



When the switch is highlighted blue this indicates that the feature is ON. When the switch is greyed out this indicates that the feature is OFF.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

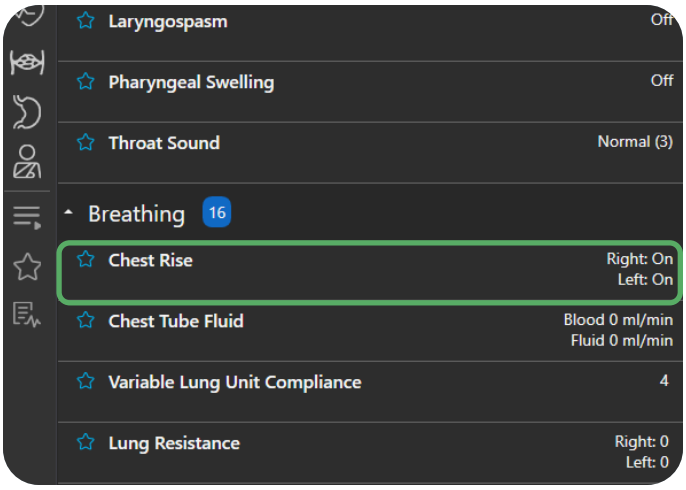
Pneumothorax

A pneumothorax occurs when air leaks into the space between the lung and the chest wall causing the lung to collapse under the pressure of the accumulated air in the pleural space. A pneumothorax could be due to a variety of reasons such as a chest injury or lung disease. A pneumothorax is a life threatening condition and requires immediate attention. To relieve the air built up in the pleural space a needle decompression procedure is performed.

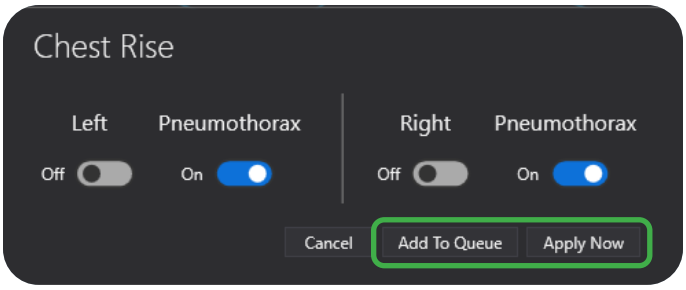
HAL's pneumothorax setting in UNI 3 will disable the selected side chest rise and begin to pressurize the **Needle Decompression insert** located between the second and third intercostal spaces.

To enable pneumothorax for HAL:

1. In UNI 3, under the **Breathing** section click **Chest Rise**.



2. Click on the switch for **Pneumothorax.**



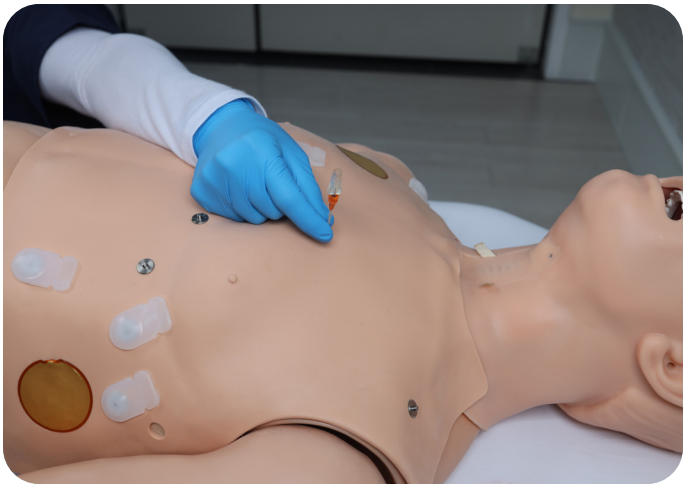
When the switch is highlighted blue this indicates that the feature is ON. When the switch is greyed out this indicates that the feature is OFF.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

Needle Decompression

Needle Decompression is the procedure of inserting a needle into the pleural space to decompress the accumulated air gathered there to help relieve a pneumothorax, or collapsed lung.

HAL has bilateral needle decompression sites that are located between the second and third intercostal spaces. There is a latex tubing inside HAL's ribcage that builds up pressure once the pneumothorax feature is activated in the UNI software. Once the pneumothorax is treated by performing a needle decompression, a slight pleural pop may be audible and the user will have to manually turn the chest rise back on for that side of the chest in UNI 3.



After selecting **Pneumothorax** for HAL's **Chest Rise**:

Use an appropriately sized needle to insert into HAL's **Needle Decompression Insert** to relieve the air that has built up.

Once the needle decompression is performed, a slight hiss of air may be audible and the loss of pressure will be logged in UNI. After the **Needle Decompression Insert** has been pierced, the insert will have to be repaired with sil-poxy or replaced for the next exercise.

Replacing the Needle Decompression Inserts

After puncturing the **Needle Decompression Inserts** you may use loc-tite to try to seal the puncture and get more use out of the insert. If the **Needle Decompression Insert** can no longer pressurize, it will have to be replaced.

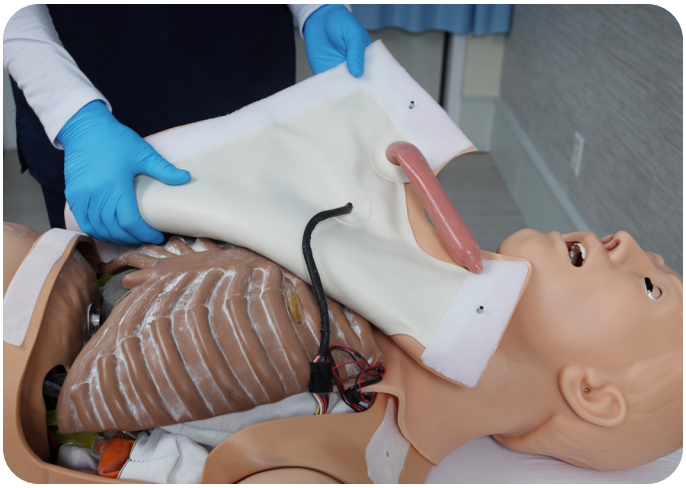
To replace the **Needle Decompression Inserts**:

1. Turn the simulator OFF.

   Do not remove HAL's chest skin while he is breathing. Doing so may negatively affect the calibration of HAL's dynamic lung system. Additionally, when HAL's chest skin of off do not rearrange any of HAL's lung bags.

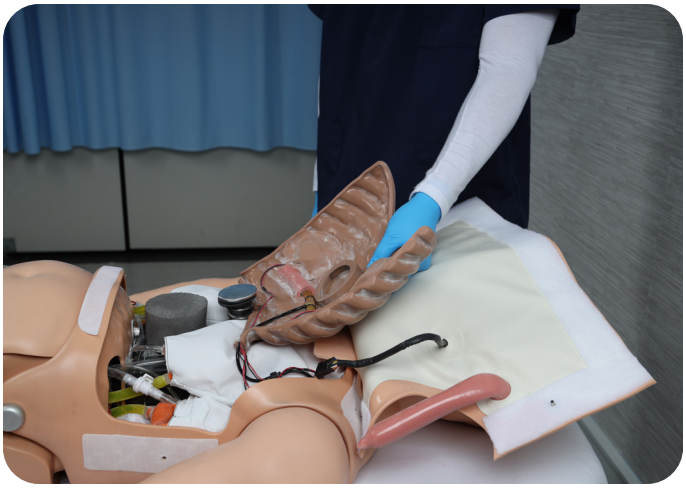
2. Gently lift the chest skin up and off HAL to reveal the ribcage.

   Ideally just lay the chest skin over HAL's face to keep it out of the way.



The Needle Decompression Inserts contain latex.

3. Flip the ribcage over to reveal the needle decompression sites and the latex inserts.



4. Pull the punctured latex inserts out from the needle decompression sites.

5. While removing the latex insert, roll the black o-ring off of the latex insert and onto the plastic T connector.

Roll the black o-ring onto the plastic T connector so that it can be reused. This process makes it easier to roll the o-ring onto the end of the new latex insert to secure it to the connector. .

6. Slide a new latex insert onto the connector.

7. Roll the black o-ring onto the latex insert to secure it to the connector.

8. Flip the ribcage down and pull the latex insert through the needle decompression site.

9. Press and adjust the latex insert into its proper position in the needle decompression site.

10. Reattach HAL's chest skin.

3.5.2. Hemothorax & Chest Tube Placement

A hemothorax occurs when blood pools into the space between the lung and the chest wall causing the lung to collapse under the pressure of the accumulated fluid in the pleural space. A hemothorax is commonly caused by traumatic injury and is a life threatening condition that requires immediate attention. To remove the excess blood gathered in the pleural space a thoracostomy, or placement of a chest tube, is performed.

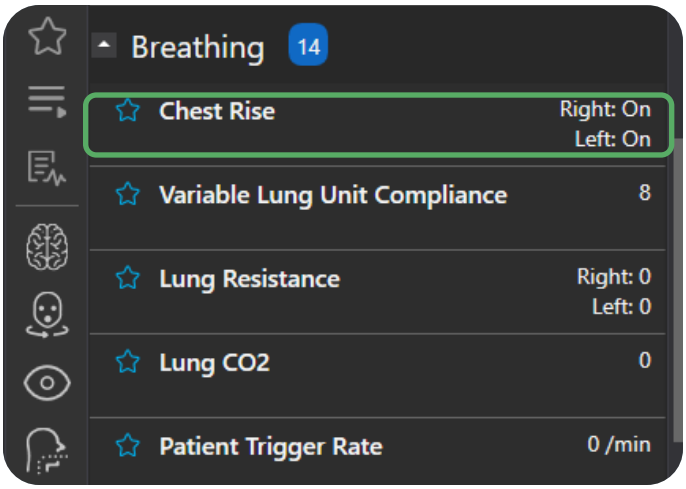
HAL has bilateral locations on his torso that are pre-cut to allow for chest tube placement. It is important to understand that no fluid should be introduced into the chest tube placement locations.

Hemothorax

To simulate a hemothorax simply disable one or both sides of the **Chest Rise** in UNI 3. Then, insert a chest tube at an upwards angle into the available chest tube placement location. Once a chest tube is placed revisit the **Chest Rise** in UNI 3 and re-enable chest rise to simulate resolution to a hemothorax.

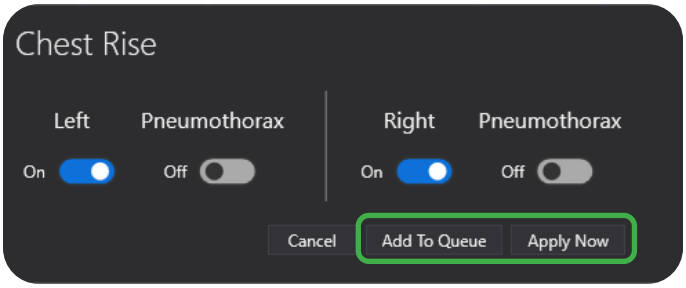
To disable or enable **Chest Rise**:

1. In UNI 3, under the **Breathing** section click **Chest Rise**.



2. Click on the switch for **Left** and/or **Right** to turn chest rise **ON** or **OFF**.

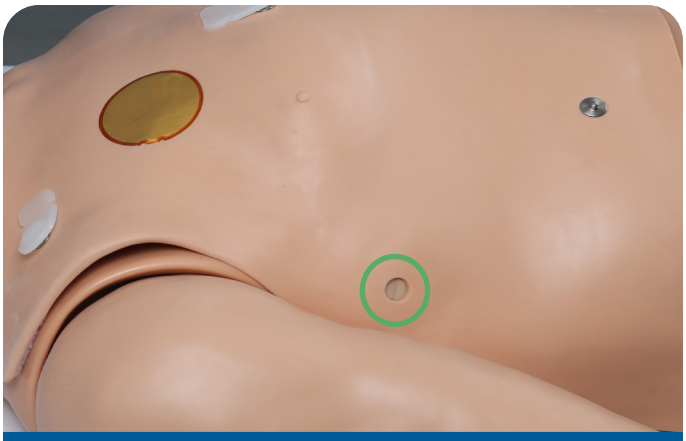
> When the switch is highlighted blue this indicates that the feature is ON. When the switch is greyed out this indicates that the feature is OFF.



3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.

Chest Tube Placement

Left Chest Tube Placement



Right Chest Tube Placement

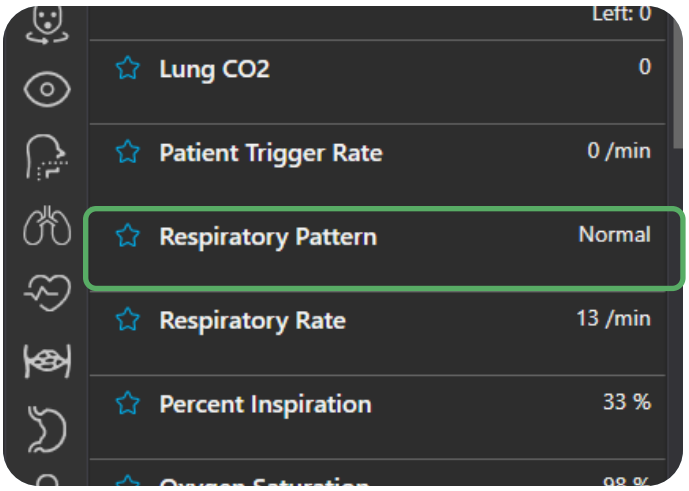
3.5.3. Respiratory Rate & Patterns

HAL has selectable respiratory rates with a range from 0 to 60 breaths per minute and different respiratory patterns that include **Normal**, **Kussmauls**, **Cheyne Stokes**, **Biots**, **Apneustic**, and **Apnea**.

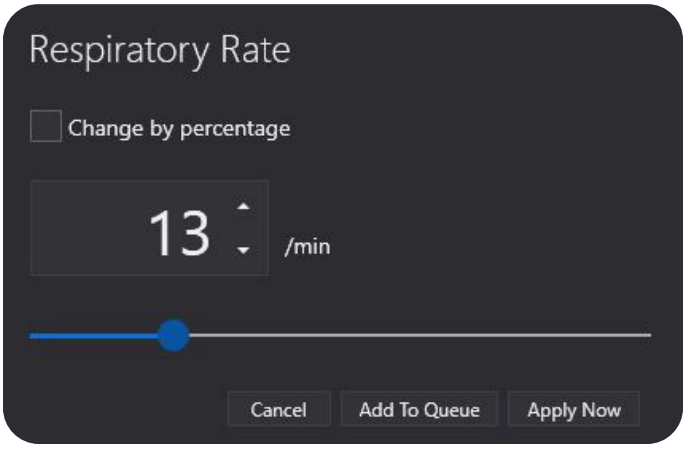
Respiratory Rate

To change HAL's respiratory rate:

1. In UNI 3, under the **Breathing** section click **Respiratory Rate**.

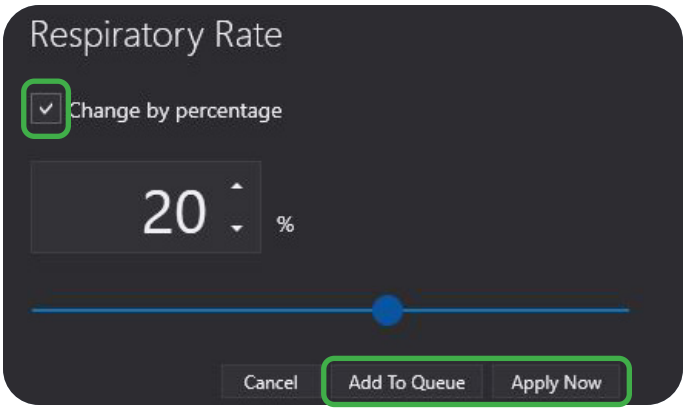


2. Use the slider bar or enter a new value to change the **Respiratory Rate**.



3. Check **By Percentage** to affect the **Respiratory Rate** by percent rather than bpm (breaths per minute).

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

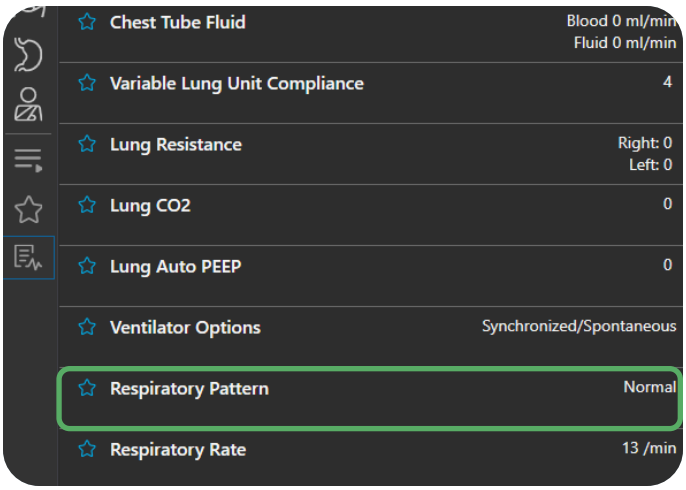


Respiratory Pattern

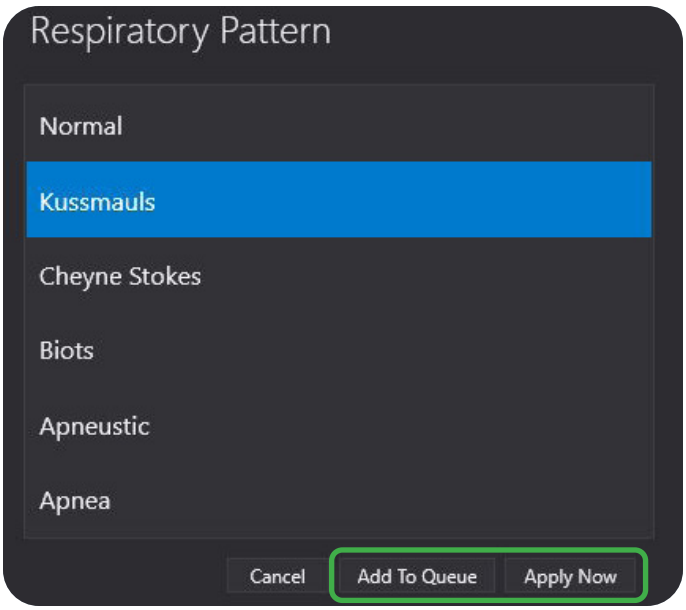
By default, HAL presents a normal breathing pattern with chest rise and fall.

To change HAL's breathing pattern:

1. In UNI 3, under the **Breathing** section click **Respiratory Pattern**.



2. Select from the available options a **Respiratory Pattern**.



3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

3.5.4. Dynamic Lung System & Controls (S3201)

HAL S3201 has patented dynamic lungs that support the use of real mechanical ventilators and standard patient circuits.

The dynamic lungs work together with UNI 3's programmable settings (**Variable Lung Unit Compliance, Lung Resistance, Lung Auto PEEP, Ventilator Options, Percent Inspiration/ Inspiratory Effort**) to support standard mechanical ventilators and modes of ventilation including:

- Continuous Mandatory Ventilation (CMV)
- Volume assist/control
- Pressure assist/control
- Pressure support ventilation (PSV)
- Pressure or volume controlled Synchronized Intermittent Mandatory Ventilation (SIMV)
- Continuous Positive Airway Pressure (CPAP)
- Weaning/liberation
- Therapeutic levels of PEEP

Mechanical Ventilator Guidelines

Always follow your manufacturer's guidelines and precautions of your mechanical ventilator and any other medical devices.

Do NOT introduce liquids, humidified gases, oxygen, or administer aerosol medications into the airway of HAL. Moisture in the airway will damage the simulator's internal sensors and mechanics.

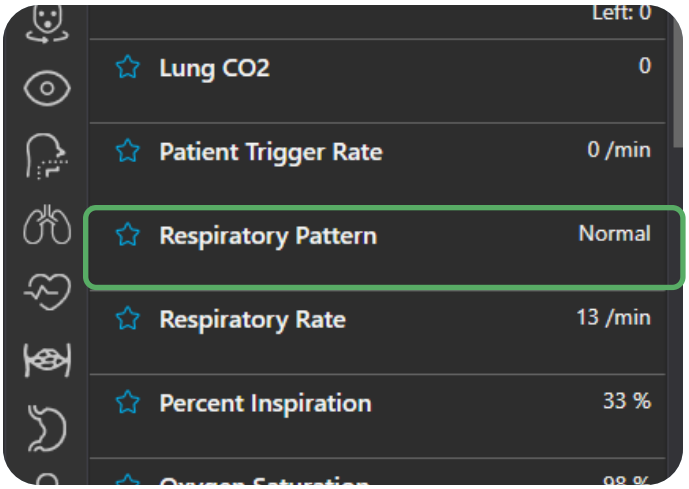
HAL's operating limitations are consistent with that of a real patient. Treating HAL in a manner that would seriously harm a real patient is likely to result in damage to the internal mechanics. Always treat HAL like a real patient.

- HAL's theoretical weight is 75 kg (165 lbs.) which may be a dimension needed for respiratory therapy calculations.
- The flow/pressure trigger rates on the mechanical ventilator may need to be adjusted so it can easily recognize HAL's inhalations. The suggested settings on the mechanical ventilator are:
  - Flow ≤ 3 Lts/min, or
  - Pressure ≤ 3 cmH2O
- Place HAL in a clinical state that requires mechanical ventilation.
- Always remember to properly lubricate any adjunct used to intubate HAL with his provided MINERAL OIL lubricant.

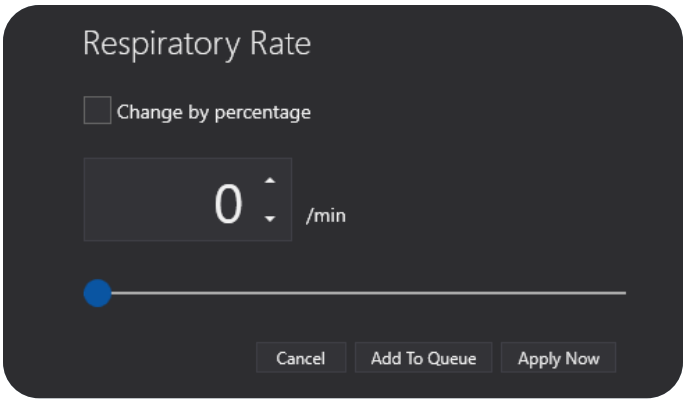
In preparation for connecting HAL to the mechanical ventilator, set HAL's respiratory rate to **zero**.

To set the respiratory rate to zero in the UNI software:

1. Under the **Breathing** section click **Respiratory Rate**.



2. Adjust the slider bar all the way to the left or type in zero.



After setting the respiratory rate to zero, proceed to intubate HAL using the recommended device sizes. Please remember to thoroughly lubricate the ETT before intubating to prevent airway tears.

After intubation, connect the ventilator circuit and power on the ventilator.

Continue reading the following sections for further information on lung compliance, lung resistance, and patient trigger rate to use with the mechanical ventilator.

Variable Lung Unit Compliance

Lung Compliance refers to the elasticity and surface tension of the lungs. In simple terms, lung compliance is how difficult or how easy it is for the lungs to expand and contract.

For example, let's say there is a patient with pulmonary fibrosis, a disease that scars the lungs resulting in thick, stiff lung tissue. In this case, since the lung tissue is very stiff this makes it harder for the lungs to expand thus making the patient very short of breath. These lungs would be considered to have a lower than normal compliance due to the difficulty of the lungs being able to inflate.

In relation to HAL's UNI 3 setting, to mimic a set of "stiff" lungs or low compliance, set his **Variable Lung Unit Compliance** to a value lower than 8 (his default, normal compliance value).

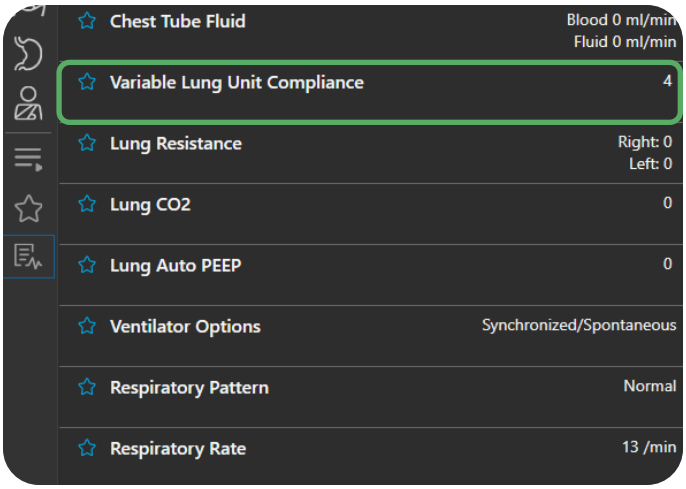
In another example, let's say there is a patient with emphysema, a condition where the inner walls of the air sacs (alveoli) weaken and rupture causing reduced elastic recoil of the lungs. These lungs have lost their shape and become "floppy", making them fairly easy to inflate (inhale) but difficult to deflate (exhale). These lungs would be considered to have a higher than normal compliance due to the decreased work needed to expand the lungs.

In relation to HAL's UNI 3 setting, to mimic a set of "loose" lungs or high compliance, set his **Variable Lung Unit Compliance** to a value higher than 8 (his default, normal compliance value).

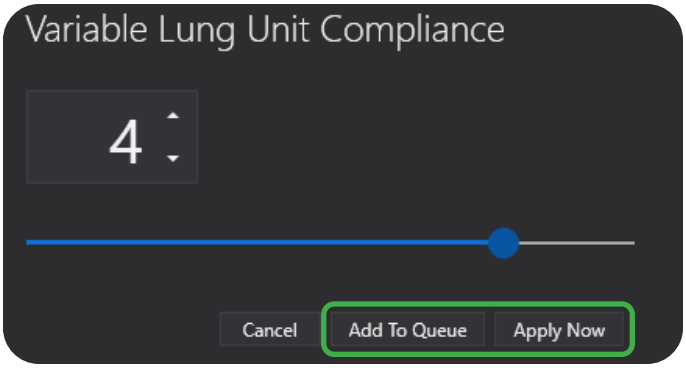
Changes to HAL's **Variable Lung Unit Compliance** to mimic the principles given in these examples can be seen in the feedback provided when HAL is connected to a mechanical ventilator.

To change HAL's lung compliance:

1. In UNI 3, under the **Breathing** section click **Variable Lung Unit Compliance**.



2. Enter a numeric value or use the slider bar to change the level of **Variable Lung Unit Compliance**.



HAL's default is set to a "normal" lung compliance at level of 4. To simulate low lung compliance, decrease HAL's level of Variable Lung Unit Compliance. To simulate high lung compliance, increase HAL's level of Variable Lung Unit Compliance.

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

Lung Resistance

Lung resistance, more commonly known as airway resistance, is the resistance to flow of air caused by any friction with the airways. Resistance in an airway is inversely proportional to the radius of the airway. This means constricted airways, which have a smaller radius, have a higher airway resistance making it harder for air to flow through. Unconstricted, or healthy, airways have a larger radius that results in a lower airway resistance, making it easier for air to flow through.

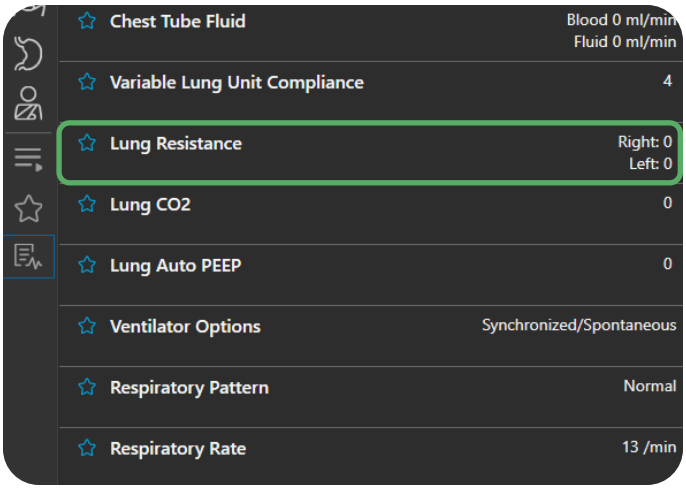
Any changes to the trachea, bronchi, or bronchioles, the anatomy that makes up the conducting zone for air to pass through, can affect airway resistance and ultimately the breathing process for a patient. Take an asthma attack, for example, where the bronchioles constrict and spasm. The constriction and spasming of the bronchioles reduce the radius of the airway thus increasing the resistance and making it difficult for a patient to get air through their airway.

After an asthma attack, the bronchioles relax and go back to their normal, healthy state with a larger radius. The larger radius of the airway decreases the resistance and allows air to flow through easier than before.

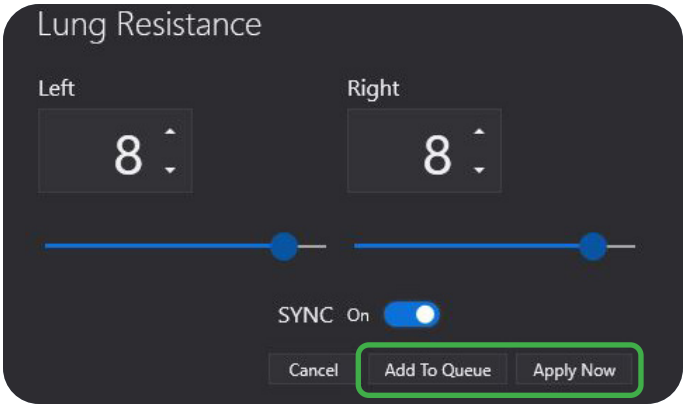
In relation to HAL's UNI 3 setting, the independent levels of **Lung Resistance** range from 0 - 9, where level 0 exhibits an unconstricted airway and level 9 simulates a totally obstructed airway that shuts off HAL's breathing. To mimic the example of an asthma attack, or other airway conditions, increase the level of **Lung Resistance** above 0 (his default, normal lung resistance value). To simulate recovery from an asthma attack, set HAL's **Lung Resistance** to a lower level or a level of 0 for a normal, healthy airway.

To change HAL's lung resistance:

1. In UNI 3, under the **Breathing** section click **Lung Resistance**.



2. Enter a numeric value or use the slider bar to change the level of **Lung Resistance** for HAL's **Left** and/or **Right** airway.



HAL's default is set to a "normal" lung resistance at level of 0. To simulate increased lung resistance, increase HAL's level of Lung Resistance up to level 9, which simulates a totally obstructed airway.

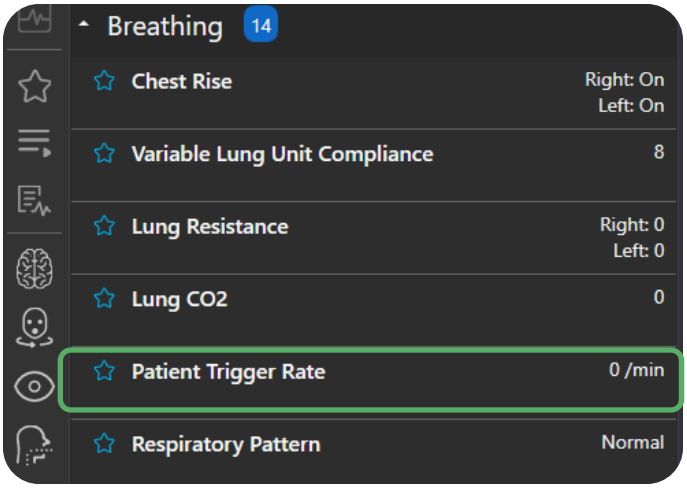
3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

Patient Trigger Rate

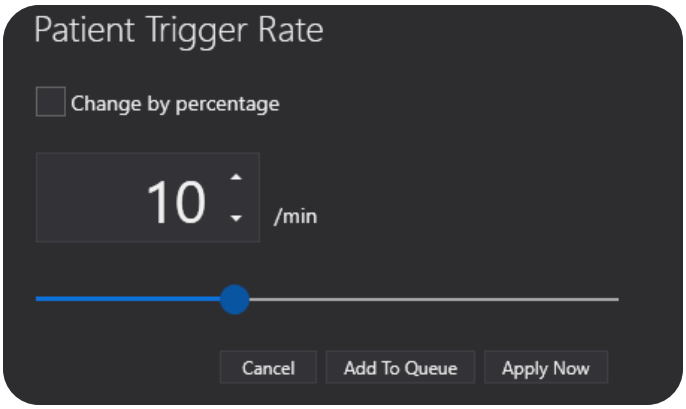
HAL is able to trigger the mechanical ventilator with shallow inhalations (gasps) as a signal for breathing assistance. The rate at which he may trigger the ventilator, called the **Patient Trigger Rate** in UNI 3, is programmable.

To adjust this rate in the UNI software:

1. Under the **Breathing** section click **Patient Trigger Rate**.



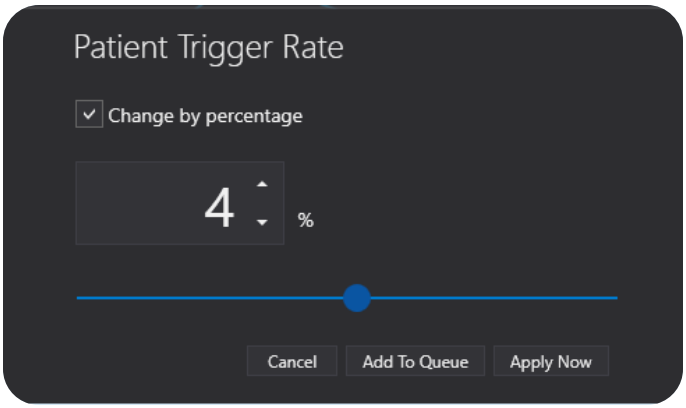
2. Adjust the slide bar or type in the desired rate on a range from 0 - 30 breaths per minute.



3. Check **By Percentage** to change **Patient Trigger Rate** by percentage rather than breaths per minute.

> The **current value** of the **Patient Trigger Rate** will change by the set +/- percentage change to the new value.

4. Click **Apply Now** to immediately apply the settings to HAL or click **Add To Queue** to load at a later time.



3.5.5. Lung Sounds & Quadrant Locations

Lung Sounds

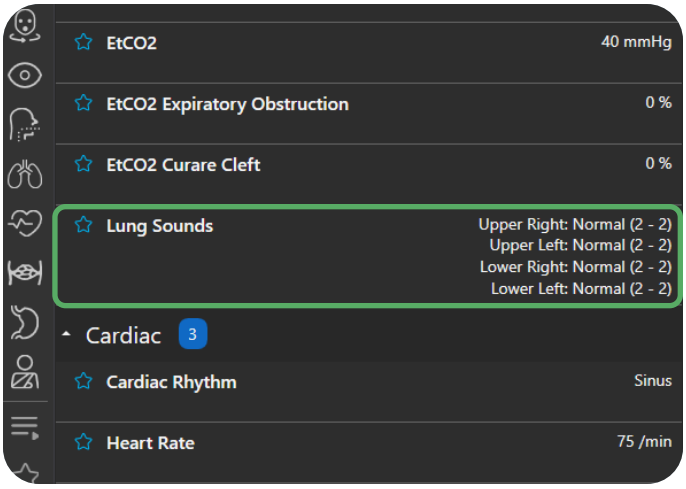
HAL has four independent anterior and posterior lung sound auscultation quadrants with lung sounds which include:

- Normal
- None
- Bronchial
- Crackles (Fine)
- Crackle (Coarse)
- Muscle noise (inspiratory)
- Pleural Rub (inspiratory)
- Rhonchi (expiratory)
- Squeaks (inspiratory)
- Wheezing (biphasic)
- Wheezing 1 (expiratory)
- Wheezing 2 (expiratory)

These are a great addition for various auscultation assessments!

To change HAL's lung sounds:

1. In UNI 3, under the **Breathing** section click **Lung Sounds**.

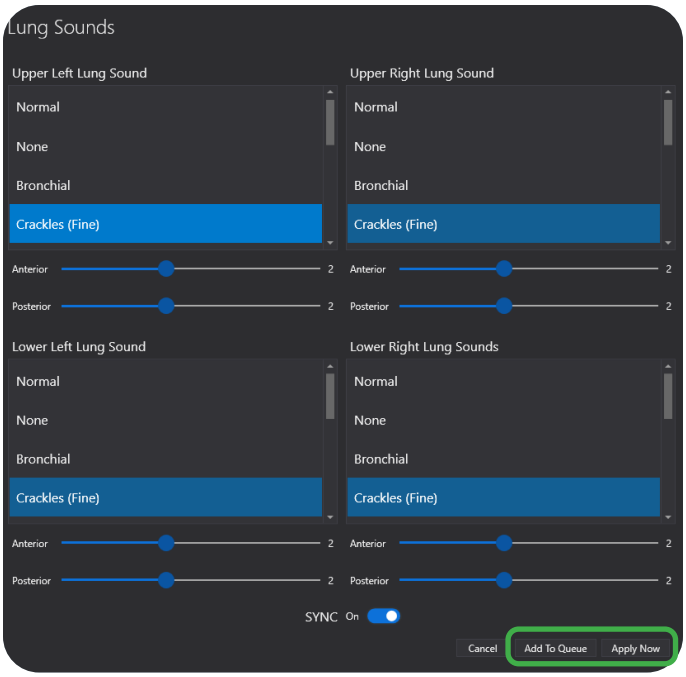


2. Select from the available options to change the **Lung Sounds** for the **Upper Left Lung**, **Upper Right Lung**, **Lower Left Lung**, and **Lower Right Lung** quadrants. .

HAL's default Lung Sounds are set to Normal.

3. Use the slider bars below each lung quadrant to adjust the volume level for the **Anterior** and **Posterior** speakers.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

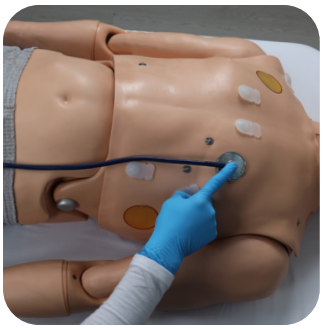


Lung Sounds Quadrant Locations

HAL's lung sounds can be auscultated using a real stethoscope in 8 locations: 4 anterior and 4 posterior.





3.5.6. Oxygen saturation, Calibration, & Finger Location

Oxygen saturation refers to the percentage of hemoglobin bound to oxygen within red blood cells. HAL can simulate this with a programmable oxygen saturation which can be monitored using real pulse oximetry sensors on his left index finger.

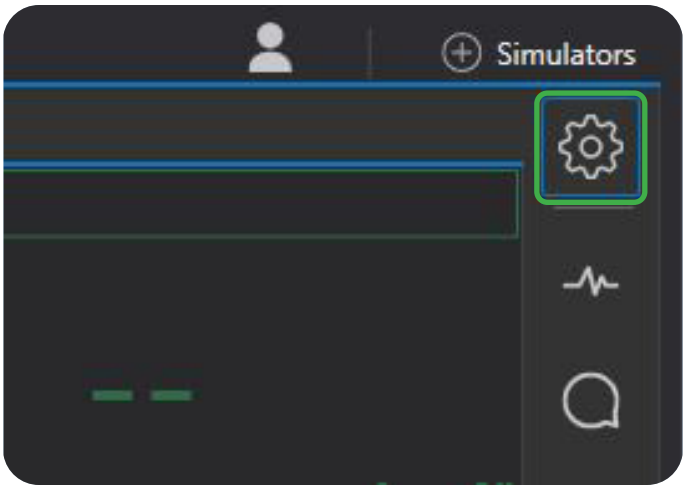
Starting with serial number **H2304863** and onwards, HAL S3000 has, as standard, the oxygen saturation feature.

Prior to using the oxygen saturation feature, calibrate the pulse oximetry device to HAL's left index finger.

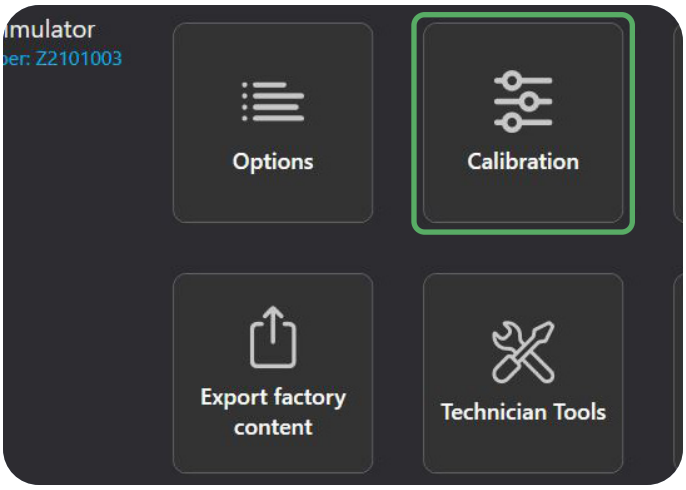
Oxygen Saturation Calibration

To calibrate the simulator with the pulse oximetry device:

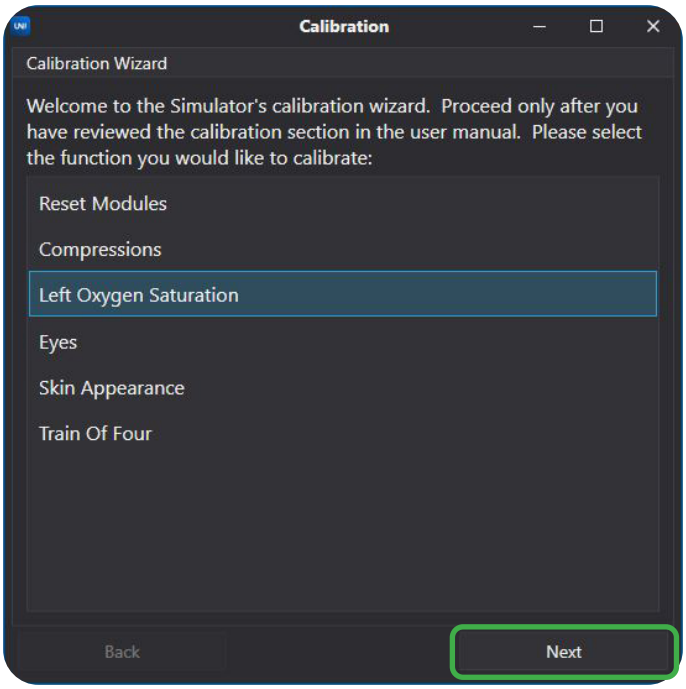
1. In the upper right corner of UNI 3, click **Settings**.



2. Scroll through the menu and click **Calibration**.

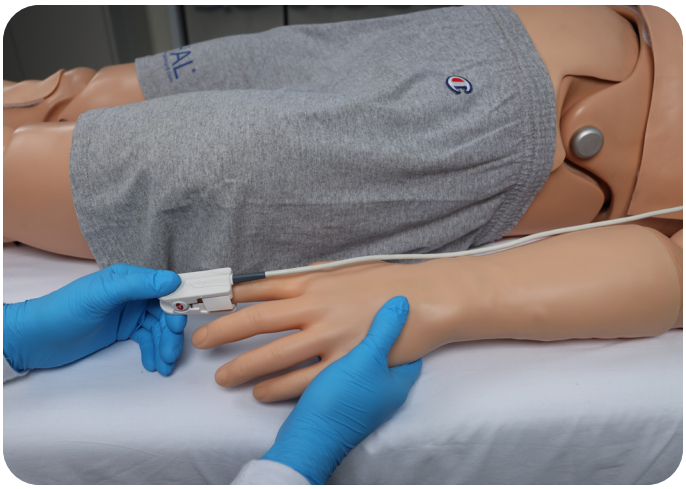


3. Select **Left Oxygen Saturation**.



4. Click **Next.**

5. Place the pulse oximeter device on HAL's left index finger.



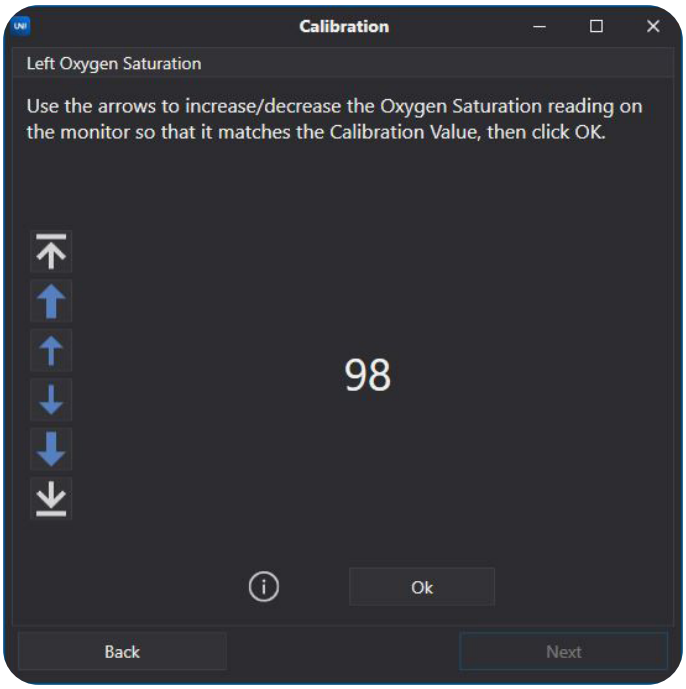
6. Slowly, use the arrows to adjust the oximeter's values to match the values shown on the UNI calibration menu.

   The arrows that are used to adjust the oximeter reading will affect the numbers on the actual oximeter. The numbers shown on the UNI calibration menu WILL NOT be changed.

7. Click **OK** once the values on the oximeter monitor and the UNI calibration menu match.

   The grey bubble will turn green and proceed to the next value.

8. Continue this calibration process and adjust the values for the oximeter device using the arrows until the process is done. Once done, click **Finish**.

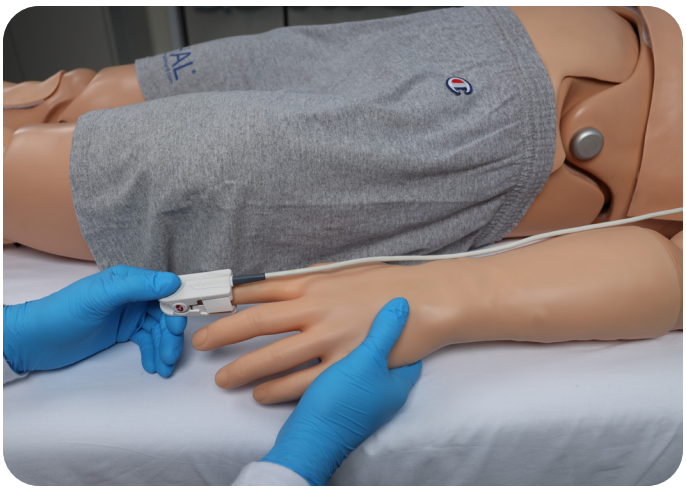


Oxygen Saturation & Finger Location

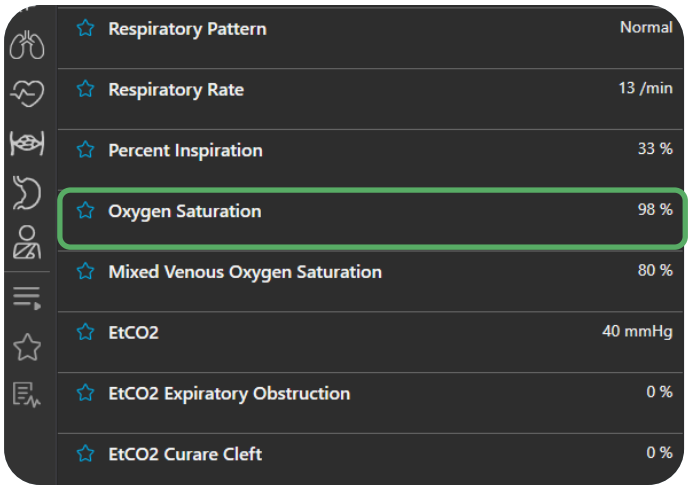
After calibrating the pulse oximeter, proceed with programming HAL's oxygen saturation levels.

To change HAL's oxygen saturation levels:

1. Place the pulse oximetry device on HAL's left index finger.

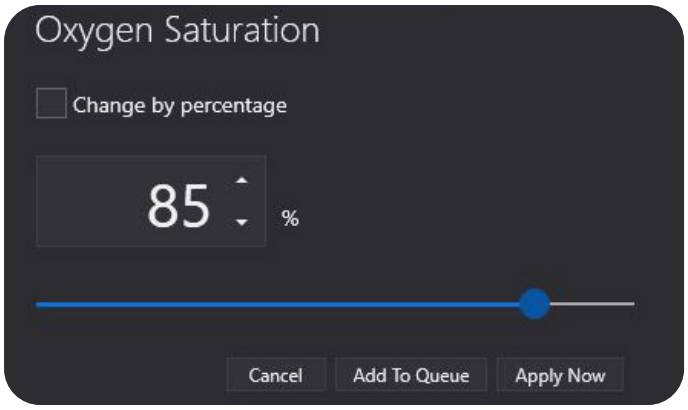


2. In UNI 3, under the **Breathing** section click **Oxygen Saturation**.



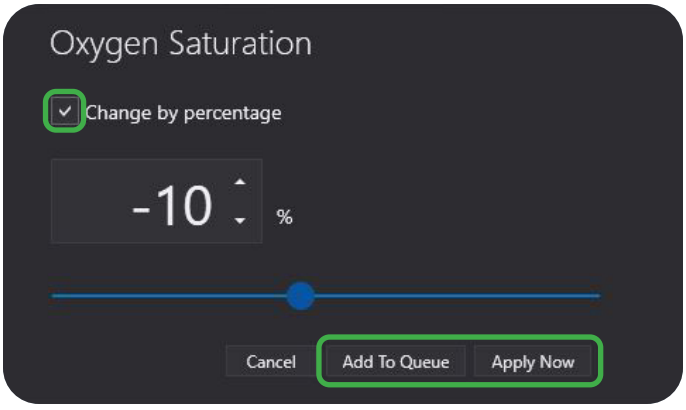
3. Enter the numeric value or use the slider bar to change the level of **Oxygen Saturation**.

HAL's default Oxygen Saturation is set to 98%.



4. Check **By Percentage** to affect the **Oxygen Saturation** by percentage.

5. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



3.5.7. Lung CO2, Capnography, & EtCO2 Controls

Lung CO2 Setup & Capnography

HAL has the ability to exhale real carbon dioxide (CO_2) which can be captured on a capnogram. Once a CO2 cartridge is purchased and installed, the amount of CO2 can be controlled by changing the **Lung CO2** levels in UNI 3.

HAL S3201 has the CO2 feature as standard while this is an optional feature for the HAL S3000 (subject to additional cost).

Due to shipping regulations, CO_2 cartridges are NOT included with the simulator. The required 16-gram threaded CO_2 3/8" - 24UNF-2A cartridges can be purchased at most bicycle or hardware stores. 12-gram threaded cartridges are also compatible.

It is recommended that the CO2 cartridge be installed at the start of the simulation day to get the maximum duration of run time.

To install the CO2 cartridge for Lung CO2:

1. Remove the skin cover on the right lower leg.

2. Remove the tibia bone from inside the lower right leg.

3. Pull out the CO2 regulator and connect a new CO2 cartridge by screwing it into the regulator.

> As the cartridge is tightened, the CO2 regulator will puncture the CO2 seal. When the seal on the cartridge is broken, it will begin to feel cold to the touch. Continue to tighten the CO2 cartridge until it is fully secured in the CO2 regulator but be sure to NOT over-tighten!

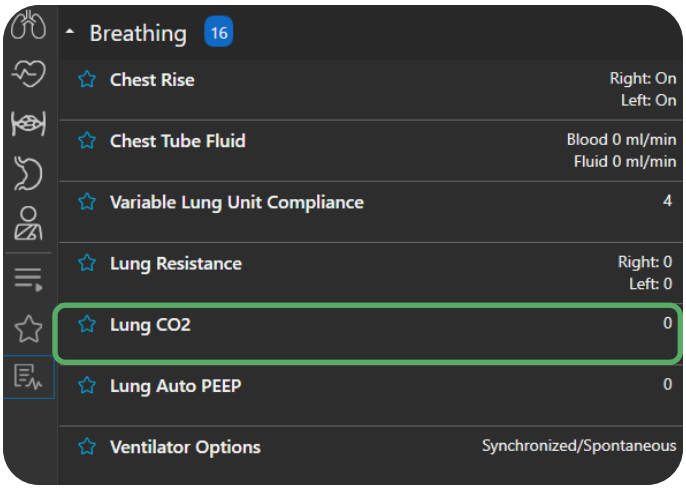
4. Fit the CO2 regulator with the CO2 cartridge attached back into the cavity of the lower right leg.

5. Replace the tibia bone and skin cover.

After installing an appropriate sized CO2 cartridge, the amount of CO2 that HAL exhales can be controlled through **Lung CO2**. By default, HAL's **Lung CO2** is set at a level of 0. This means that he will not exhale any measureable CO2. As the levels of **Lung CO2** increase, so does the measureable amount of CO2 that HAL exhales. At a level 10, HAL will exhale his maximum amount of CO2.

To change HAL's Lung CO2:

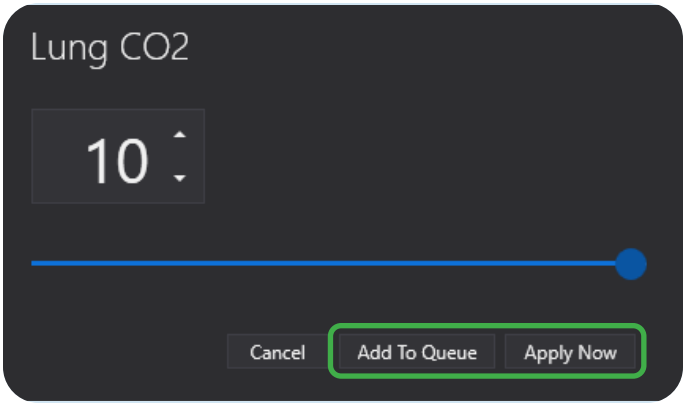
1. In UNI 3, under the **Breathing** section click **Lung CO2.**



2. Enter a numeric value or adjust the slider bar to the desired level within a range of 0-10.

> When Lung CO2 is at zero, there will be no exhalation of CO2. As the levels of Lung CO2 are increased, the amount of CO2 exhaled will increase.

3. Click **Apply Now** to immediately apply the selection to HAL or click **Add To Queue** to load at a later time.



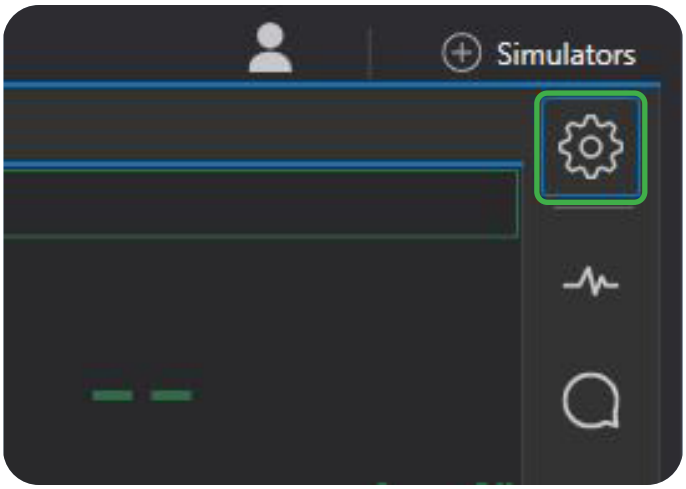
4. Intubate HAL with an appropriate sized endotracheal tube and attach a capnometer to monitor his CO2 exhalation.

Checking and Replacing CO2 Cartridges

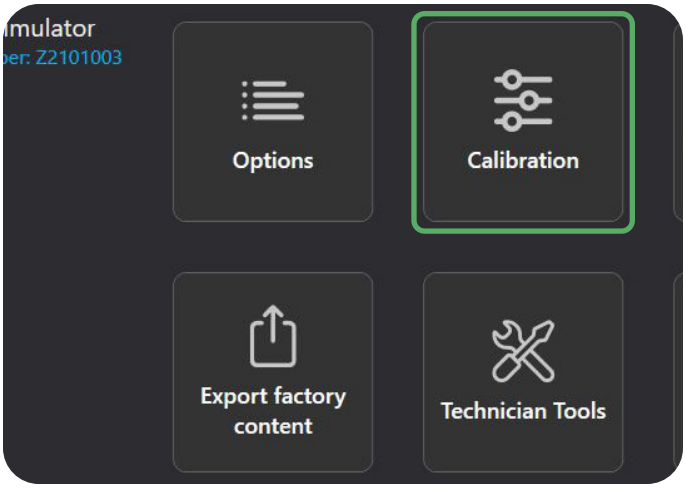
The CO2 cartridge used for the **Lung CO2** and capnography will eventually run out and will require replacing. It is always best practice to confirm there is no CO2 left in the CO2 cartridge before removing it and replacing it with a new one. CO2 levels in the cartridge may be checked either by checking through UNI 3's calibration menu or by turning HAL OFF to disconnect his lower right leg to test for CO2.

To check HAL for left over CO2 through the UNI 3 software:

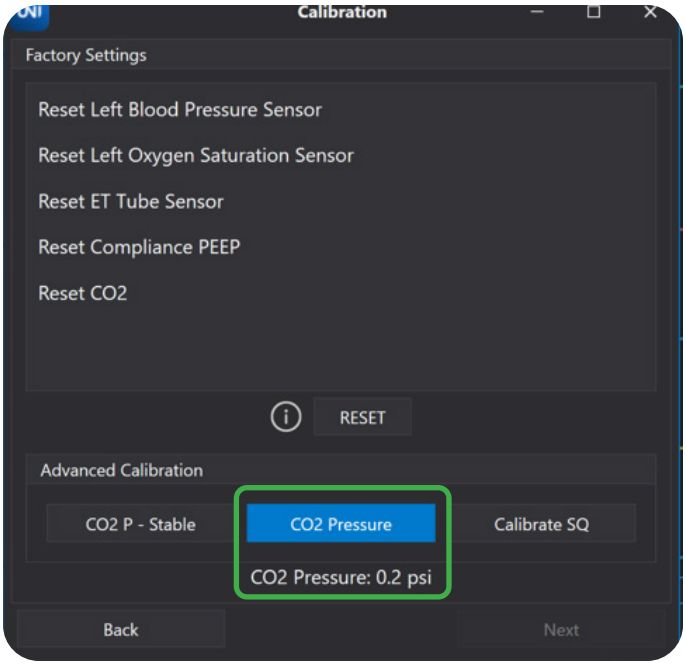
1. With HAL connected to UNI 3, click **Settings.**



2. Under the **Current Simulator** section, click **Calibration**.



3. Click **Reset Modules** and then click **CO2 Pressure** to check the PSI of CO2 in HAL's system.



If the PSI reading is greater than zero then CO2 is still in HAL's system. Turn on HAL's Lung CO2 so that CO2 is exhaled from the system.

Another way to check if HAL has any CO2 in his system is to fish out the white tubing from the back of his left leg, disconnect it, and use a pin to depress the white cross. When the white connector is depressed if you hear a hiss of air escaping this will indicate that there is still CO2 in the cartridge. If there is not an audible hiss, then there is minimal to no CO2 in the cartridge.

1. Gently pull out the white CO2 line from the back of HAL's left leg.

2. Disconnect the white CO2 connector and identify the female connector that has a white + in its center.

3. Use a thin Allen key to press down on the white + in the center of the female connector.

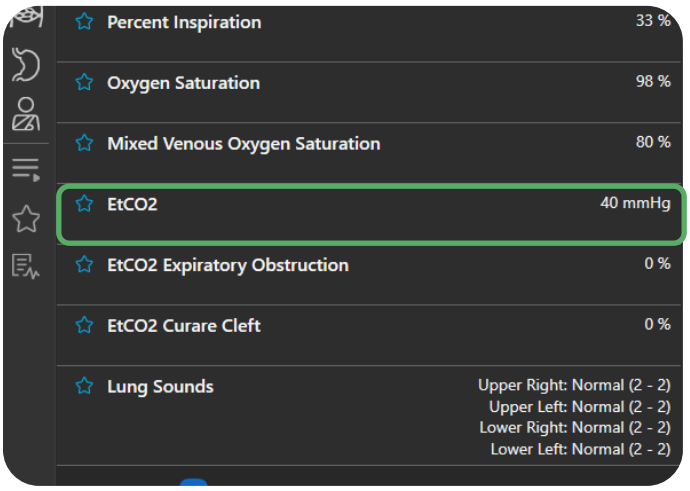
If you hear a hiss of air escaping this means that the CO2 cartridge still has CO2. If you do not hear a hiss of air this means that the CO2 cartridge is empty and can be safely removed.

EtCO2

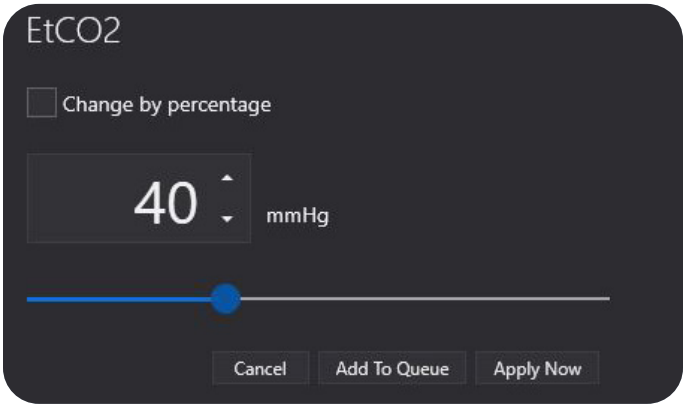
In UNI 3, **EtCO2** is a virtual value that can be displayed on the Monitor tab within UNI or on a Bedside Virtual Monitor (option available for purchase).

To change EtCO2:

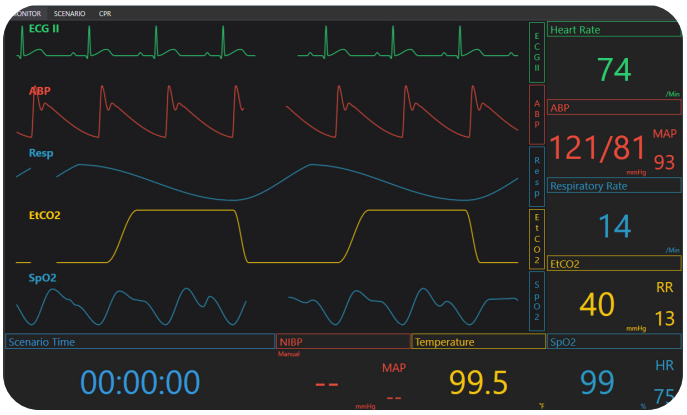
1. In UNI 3, under the **Breathing** section click **EtCO2.**



2. Enter the numeric value or use the slider bar to change the level of **EtCO2**.

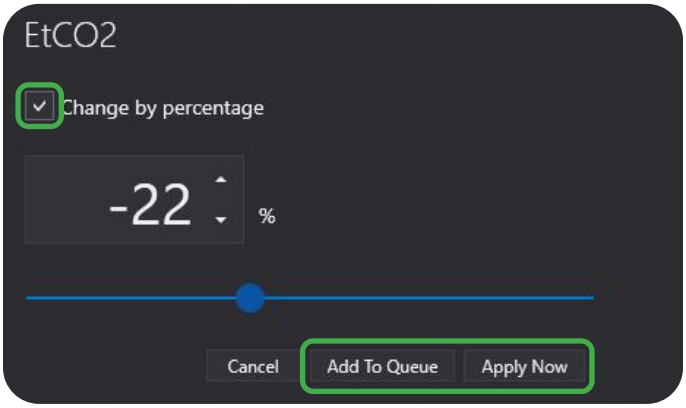


HAL's default EtCO2 is set to 40 mmHg which is displayed on the Monitor tab in UNI as the yellow trace.



3. Check **By Percentage** to affect the **EtCO2** by percentage rather than mmHg.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

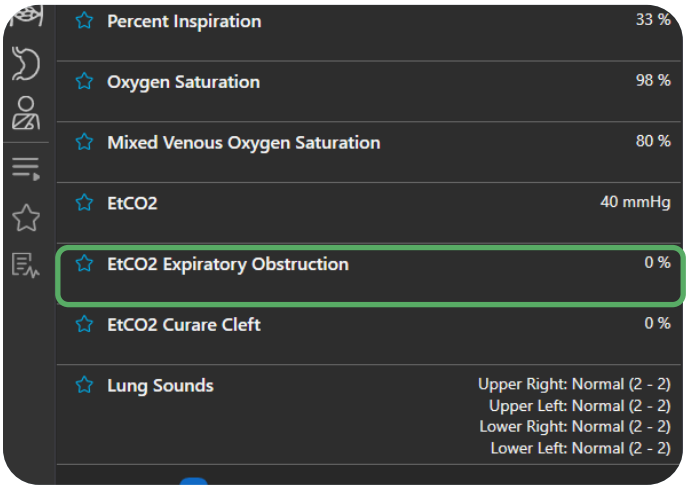


EtCO2 Expiratory Obstruction

EtCO2 Expiratory Obstruction is a virtual value that can be changed to affect HAL's EtCO2 waveform on the Monitor tab within UNI or on a Bedside Virtual Monitor (option available for purchase).

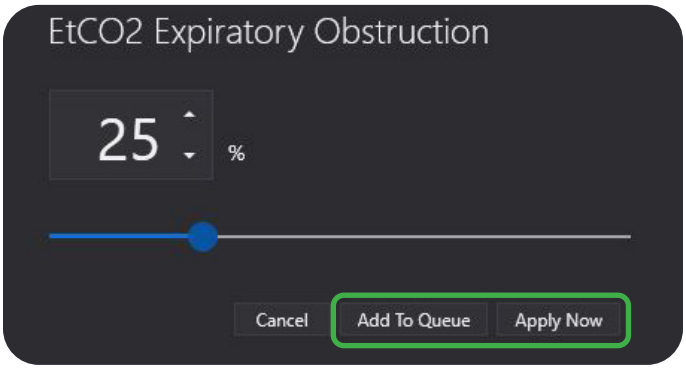
To change the level of **EtCO2 Expiratory Obstruction**:

1. In UNI 3, under the **Breathing** section click **EtCO2 Expiratory Obstruction.**



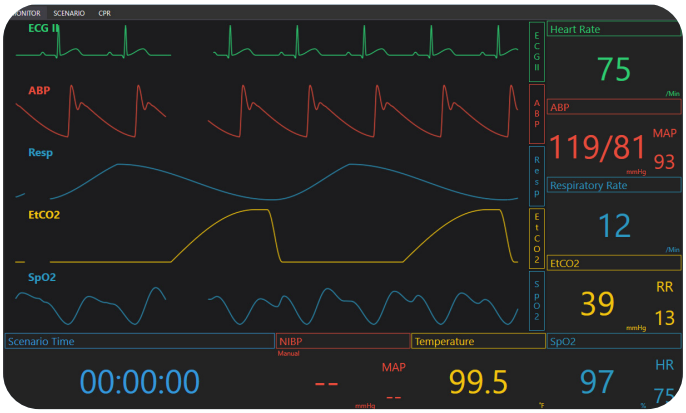
2. Enter the numeric value or use the slider bar to change the level of **EtCO2 Expiratory Obstruction**.

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



HAL's default EtCO2 Expiratory Obstruction is set to 0%. As you increase the percentage of

Expiratory Obstruction in UNI 3, the curve of the EtCO2 becomes more dramatic resulting in a "shark fin".



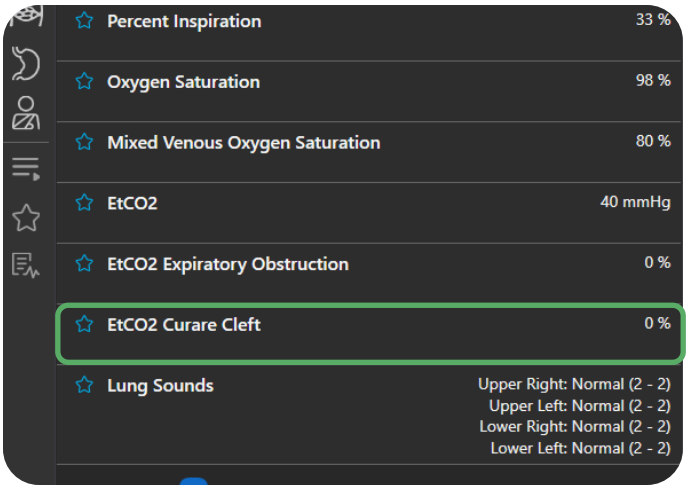
EtCO2 Curare Cleft

An EtCO2 Curare Cleft is a sudden dip, or "cleft", in the plateau of the EtCO2 waveform. This cleft may have different causes but an example can be seen in anesthesia simulations when muscle relaxants are beginning to subside in a patient and the patient takes breakthrough breath.

HAL can simulate an EtCO2 Curare Cleft on his EtCO2 waveform within UNI on the Monitor tab or it can be displayed on a Bedside Virtual Monitor (option available for purchase).

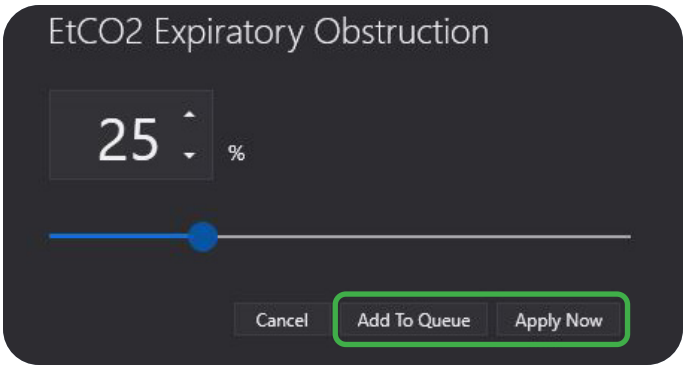
To change the severity of the Curare Cleft for HAL:

1. In UNI 3, under the **Breathing** section click **EtCO2 Curare Cleft.**



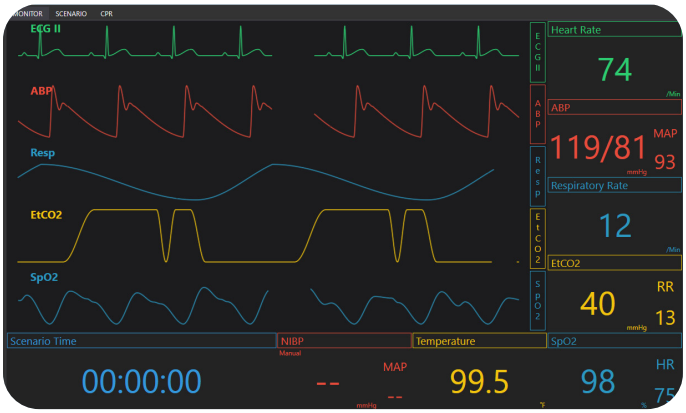
2. Enter the numeric value or use the slider bar to change the level of **EtCO2 Curare Cleft.**

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



HAL's default EtCO2 Curare Cleft is set to 0%.

As you increase the percentage in UNI 3, the cleft seen in the plateau portion of the EtCO2 waveform increases.



3.6 CARDIAC

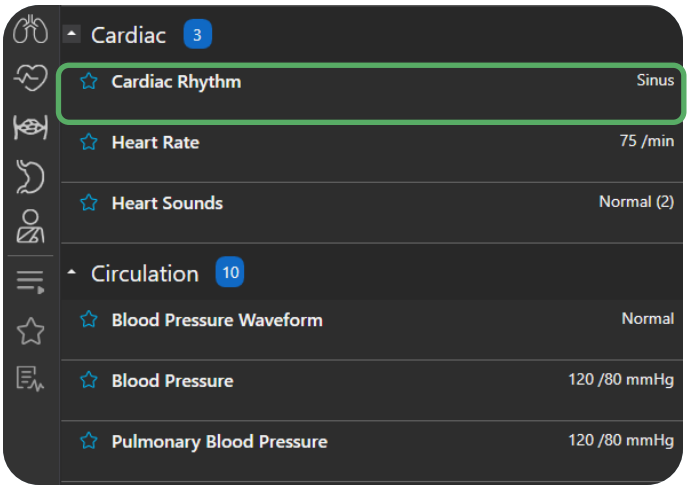
HAL's cardiac capabilities, to name a few, include heart sounds and auscultation sites, 4-lead and 12-lead ECG monitoring using real monitoring devices, defibrillation, and CPR feedback.

3.6.1. Cardiac Rhythm

HAL has an ECG library with 25+ different cardiac rhythms to choose from.

To choose a different cardiac rhythm for HAL:

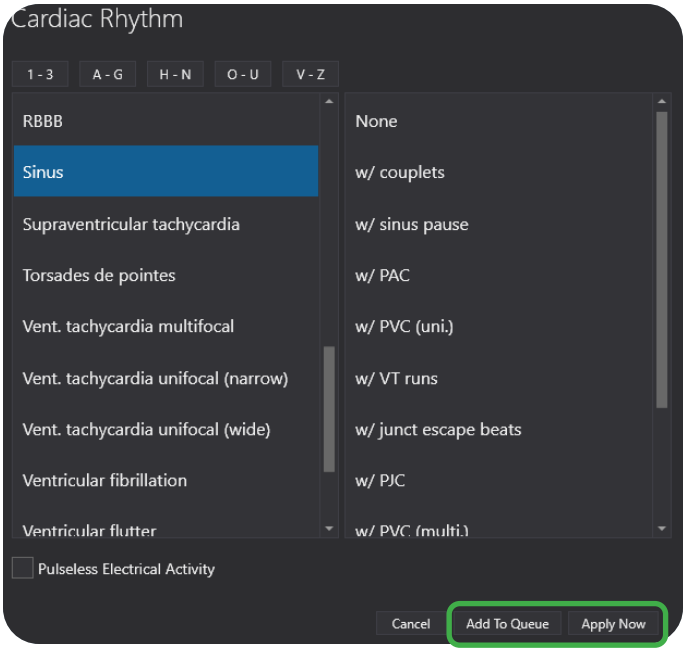
1. In UNI 3, under the **Cardiac** section click **Cardiac Rhythm**.



2. Select from the available options to change HAL's **Cardiac Rhythm**.

HAL's default Cardiac Rhythm is set to Sinus.

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

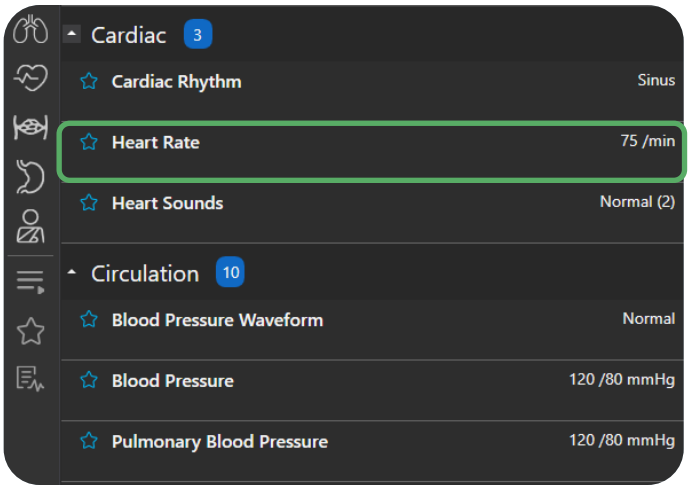


3.6.2. Heart Rate

HAL's programmable heart rate can be changed to suit any simulation needs.

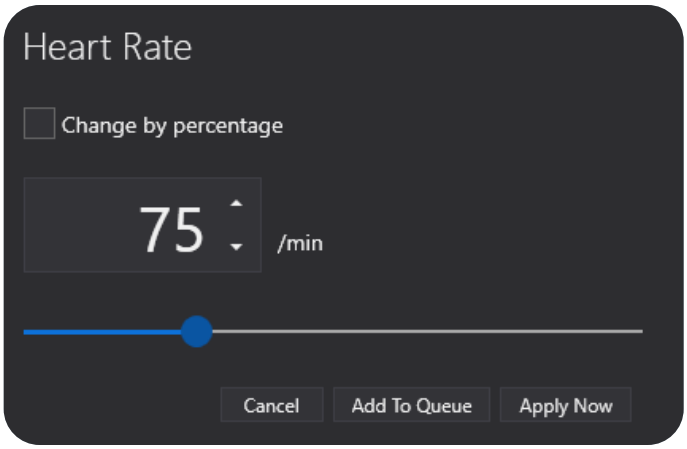
To change HAL's heart rate:

1. In UNI 3, under the **Cardiac** section click **Heart Rate**.



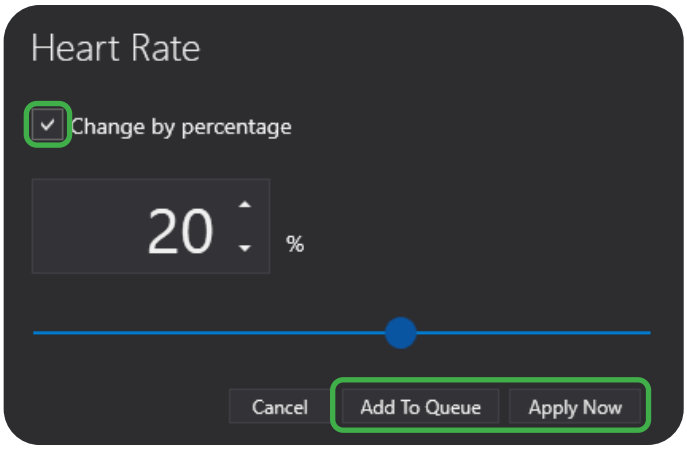
2. Enter a numeric value or adjust the slider bar to change HAL's heart rate.

HAL's default heart rate is 75 beats per minute.



3. Check **By Percentage** to change the **Heart Rate** by percentage rather than beats per minute.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



3.6.3. Heart Sounds & Locations

Heart Sounds

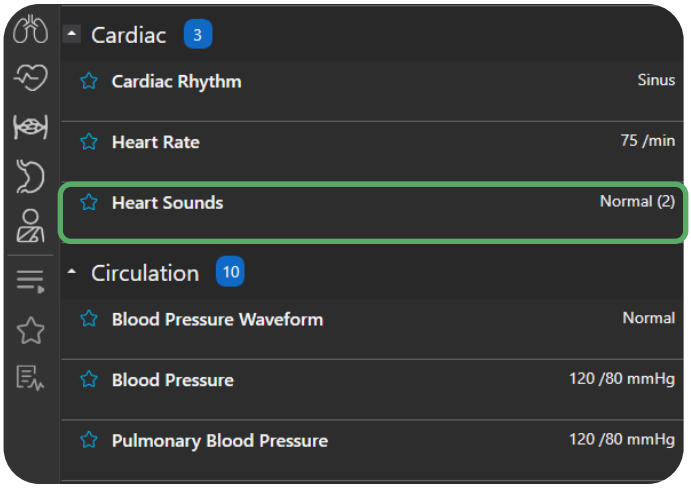
HAL has anterior heart sounds which include:

- Normal
- None
- Distant
- Systolic murmur
- S3
- S4
- Aortic regurgitation
- Aortic stenosis
- Mitral valve prolapse
- Mitral stenosis
- Mitral regurgitation
- Physiological S2 split

These are a great addition for various auscultation assessments!

To change HAL's heart sounds:

1. In UNI 3, under the **Cardiac** section click **Heart Sounds**.

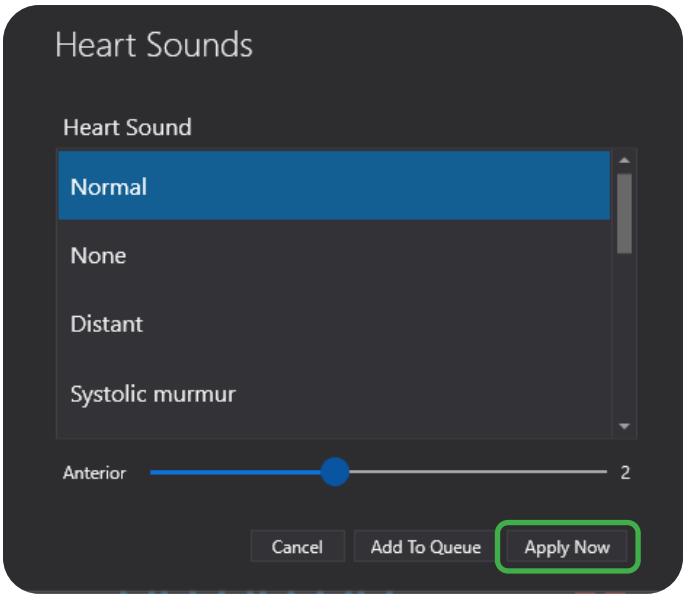


2. Select from the available options to change the **Heart Sounds**.

HAL's default Lung Sounds are set to Normal.

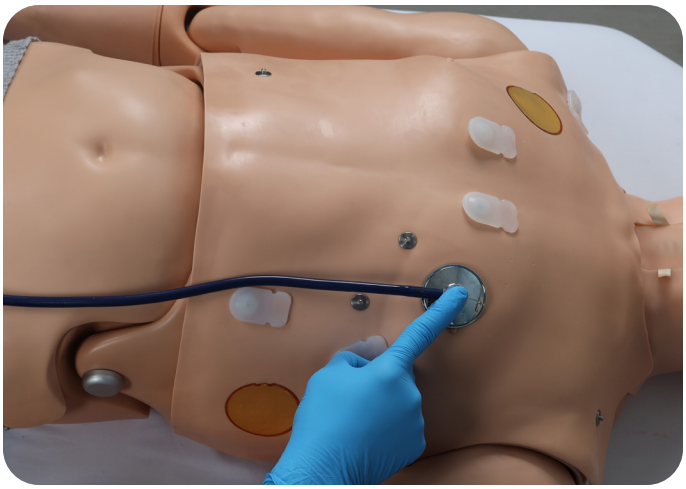
3. Use the slider bar below the selected heart sound to adjust the volume level for its **Anterior** speaker.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



Heart Sounds Locations

HAL has an anterior heart sound speaker located on the left side of the chest. .



3.6.4. ECG & Defibrillation

HAL supports 4-lead and 12-lead ECG monitoring using real medical monitoring equipment. HAL also supports standard defibrillation, double sequential defibrillation, cardioversion, and pacing with live energy with anterior/lateral and anterior/posterior pad placement.

ECG & Defibrillation Guidelines

Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.

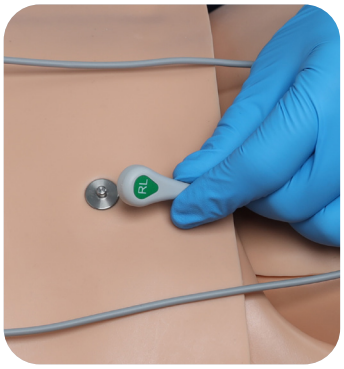
- Defibrillation is only allowed on the sternum and apex sites or the anterior and posterior sites. Remember to always use the Adapters for Non-Snap DEF Electrodes in these locations.
- Make sure the defibrillation pads to be used on the simulator are in good condition.
- It is a good practice to remove gel residues after every use. Failure to do so will leave behind a film of electrode gel that hardens causing arcing and pitting.
- To aid removal of ECG gel, sprinkle baby powder on the residual ECG gel to dry it up and remove it gently with the pad of your finger.
- Medical products, such as electrodes, may use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed.
- Should dark traces appear on the conductive sites due to gel residue or previous arcing, use a pencil eraser to remove the traces and then clean with alcohol.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- **NEVER** deliver a shock to ECG electrode sites. Doing so will result in internal damage to the simulator. This is considered improper use and is **NOT** covered by the simulator's warranty. The system will require repair at a Gaumard facility.
- Use hard paddles or wet-gel pads.
- Avoid using solid-gel pads since they present higher risk of burning the simulator's skin.
- Gel pads have a shelf-life. Confirm they are not expired to avoid arcing.
- Be 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.

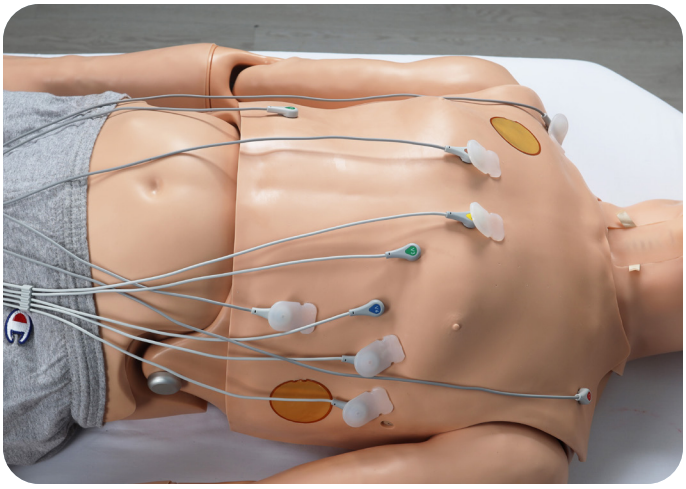
ECG Setup

To prepare HAL for an ECG simulation there are two methods of connecting him to a real medical monitoring device. You can either directly connect the ECG leads to the ECG snaps pre-installed on his torso or Adapters for Non-Snap ECG electrodes can be used together with gel electrodes to connect the ECG leads.

To connect an ECG monitor to HAL's pre-installed ECG snaps:

1. Connect the ECG leads directly to HAL's pre-installed ECG snaps by pressing the lead onto the ECG snap.





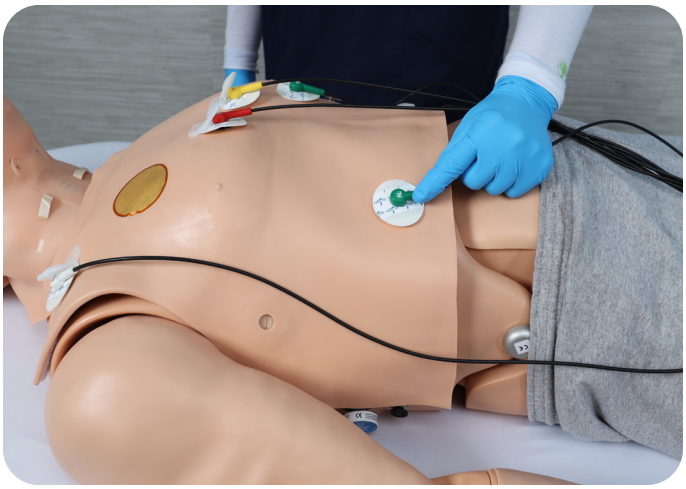
Use the **Adapters for Non-Snap ECG** electrodes to simulate the process of placing gel electrodes on HAL and then connecting ECG leads.

To attach the **Adapters for Non-Snap ECG** electrodes:

1. Obtain the 10 Adapters for Non-Snap ECG electrodes from HAL's accessories and connect one to each of HAL's pre-installed ECG snaps.

2. Use real gel ECG electrodes and place one atop each of the **Adapters for Non-Snap ECG**.

3. Connect the ECG leads to the gel ECG electrode by pressing the lead onto the ECG snap.



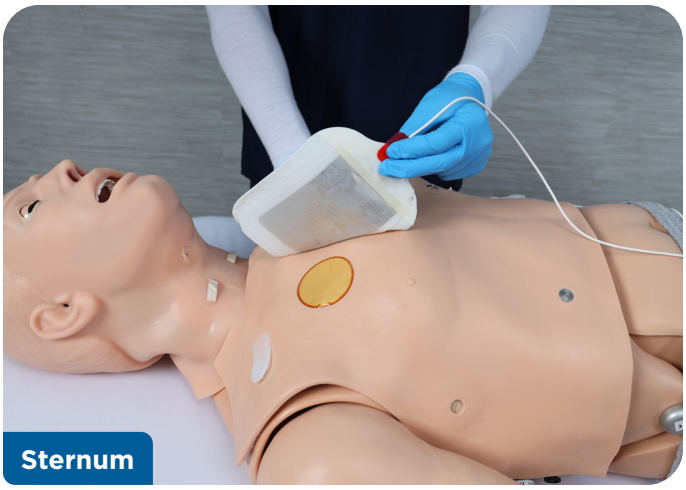
Defibrillation Setup

HAL supports standard defibrillation, cardioversion, and pacing with live energy on his apex and sternum sites.

In order to provide electrical therapy to HAL, attach the defibrillation pads to the large gold patches on his chest skin or attach the optional modified defibrillation snaps to the posts on his shoulder and side to disburse the electrical therapy energy safely.

To apply defibrillation pads to HAL's large gold patches**:**

1. Obtain defibrillation pads.
2. Apply the first defibrillation pad to the large gold patch on the sternum location.



3. Apply the second defibrillation pad to the large gold patch on the apex location.

Do not overlap an ECG site with the defibrillation patch. Always place the defibrillation patch in an orientation that avoids this.

Do NOT deliver electrical therapy to ANY of HAL's ECG electrode sites. If electrical energy is delivered to any of the ECG electrode sites this has the potential to short circuit HAL's ECG module.

HAL is now ready to be connected to a defibrillation device. Apply pads to any of the locations where an Adapter for Non-Snap DEF Electrodes have been placed.

3.7 CIRCULATION

3.7.1. Pulse Locations & Controls

Pulse Locations

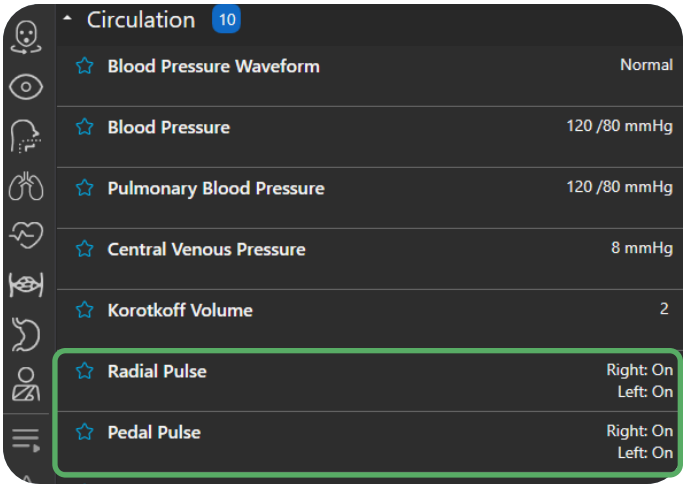
HAL has bilateral palpable pulses located at the carotid, brachial, radial, femoral, popliteal, and pedal locations.

Pulse Controls

HAL has independent controls to turn his bilateral radial and/or pedal pulses ON or OFF.

To disable or enable radial or pedal pulses:

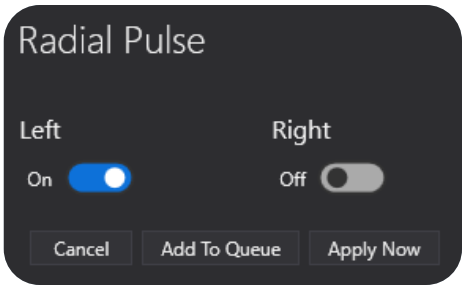
1. In UNI 3, under the **Circulation** section click **Radial Pulse** or **Pedal Pulse**.

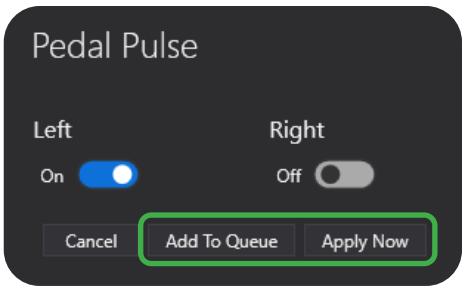


2. Click on the switch to turn the pulses **ON** or **OFF**.

HAL's default Radial and Pedal pulses are turned ON. When the switch is highlighted blue the pulses are ON and when the switch is grayed out, the pulses are OFF.

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.





3.7.2. Blood Pressure, Controls, & Waveforms

Depending on the model of HAL, blood pressure can be taken by means of an automatic Non-Invasive Blood Pressure (NIBP) cuff and/or an auscultatory manual blood pressure cuff with sphygmomanometer. The blood pressure and volume of Korotkoff sounds are adjustable through the use of the UNI software.

HAL S3201 supports methods of blood pressure with an automatic NIBP cuff and an auscultatory manual cuff as standard.

HAL S3000, starting with serial number **H2304863** and onwards only supports the use of an auscultatory manual blood pressure cuff with sphygmomanometer. HAL S3000s with serial numbers prior to **H2304863** and earlier only support a modified blood pressure cuff with sphygomanometer.

Auscultatory Blood Pressure (S3201 & S3000)

HAL's non-invasive auscultatory method of taking blood pressure requires a standard blood pressure cuff (provided in his accessories). The bell of a stethoscope is placed above the bend of HAL's elbow to auscultate for Korotkoff sounds, which the volume can be controlled in UNI 3.

To connect HAL S3201/S3000 blood pressure cuff to perform non-invasive auscultatory blood pressure monitoring:

1. Obtain the Blood Pressure Cuff from HAL's accessories and wrap it around his left bicep as you would a real patient.

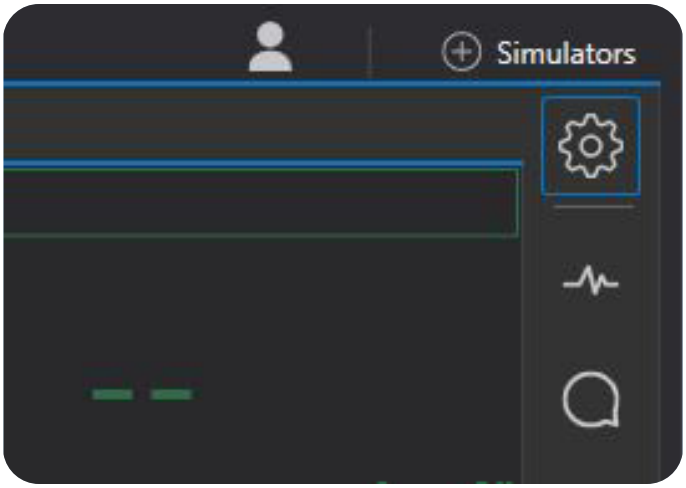
2. Use the attached sphygmomanometer to inflate the cuff and place the bell of a stethoscope above the bend of HAL's elbow to listen for Korotkoff sounds.

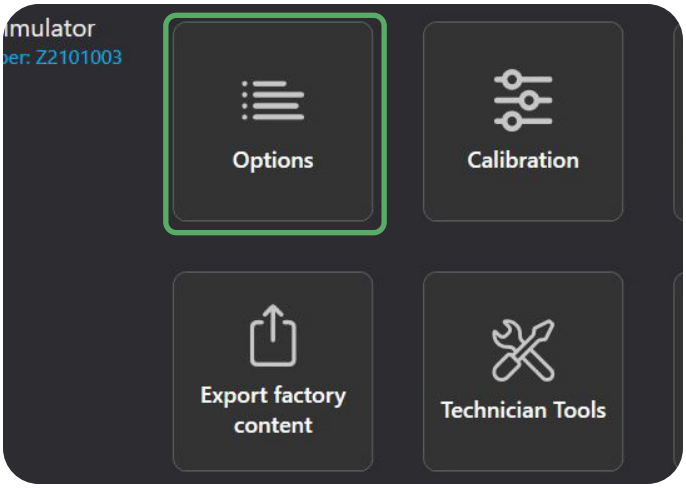
Automatic (Oscillometric) Blood Pressure

The Automatic (Oscillometric) NIBP feature became available starting with HAL serial numbers **H1209613** and above. If your simulator falls outside of this serial number range your HAL is not compatible with the automatic/oscillometric feature.

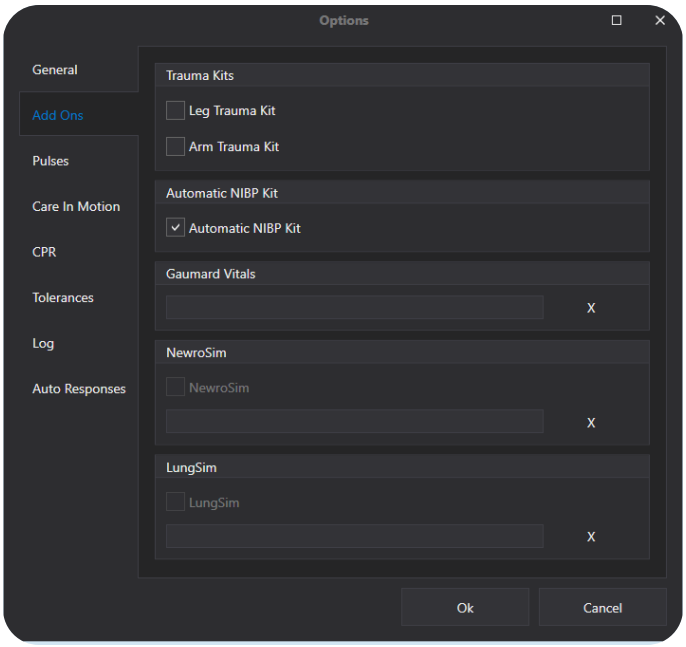
Enable Automatic NIBP

1. Click on **Settings** and select **Options**.





2. Click **Add Ons.**



3. Check mark the **Automatic NIBP Kit** box.

4. Click **OK.**

After enabling the feature in the UNI software, to be able to use an automatic NIBP cuff there is a modification to the cuff that needs to occur to calibrate it.

HAL does not include an automatic NIBP cuff due to customers having different automatic NIBP equipment. However, HAL does include an automatic NIBP calibration kit that provides connectors that work with the desired automatic NIB cuff.

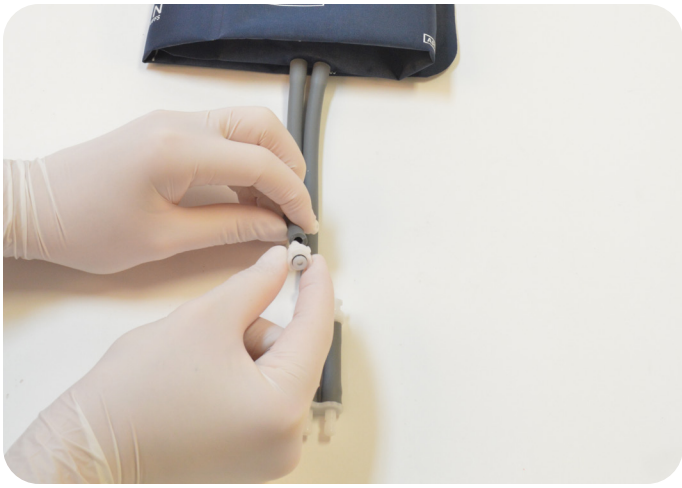
To make the modification to the NIBP cuff:

1. Gather the **NIBP Calibration Kit** from HAL's accessories.

2. Cut the tubing on the automatic NIBP cuff.

3. Take out 2 sets of male and female connectors from the **NIBP Calibration Kit**.

4. Push each connector into the tubing that was cut.



One male and one female connector will be on each side.

The connections should be as shown here: One male and female on each side. This is so when the automatic NIBP cuff is calibrated air will not escape.

Calibrating & Using the Automatic NIBP cuff

Before using the automatic NIBP feature be sure to calibrate the cuff to HAL.

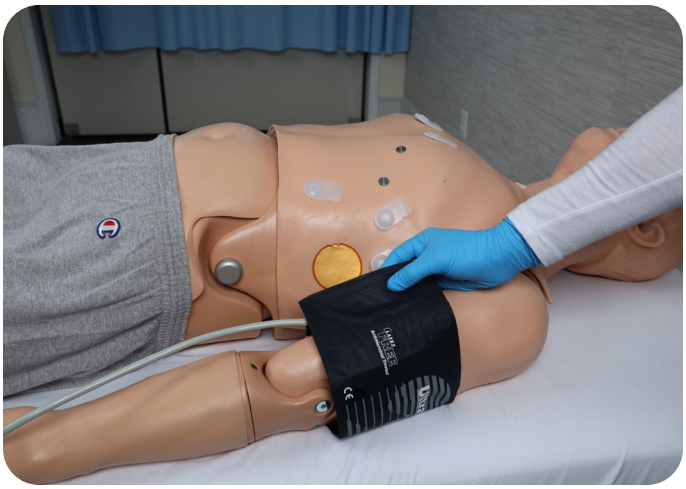
To set up the automatic NIBP cuff for calibration:

1. Gather the modified automatic NIBP cuff and the NIBP Calibration Kit.

2. Connect the calibration kit bulb and sphygmomanometer to the cuff.

   The kit has a male connector and will connect to the female connector available from the cuff.

3. Place the blood pressure cuff on HAL as you would a real patient.



4. Click on **Settings** and then **Calibration**.

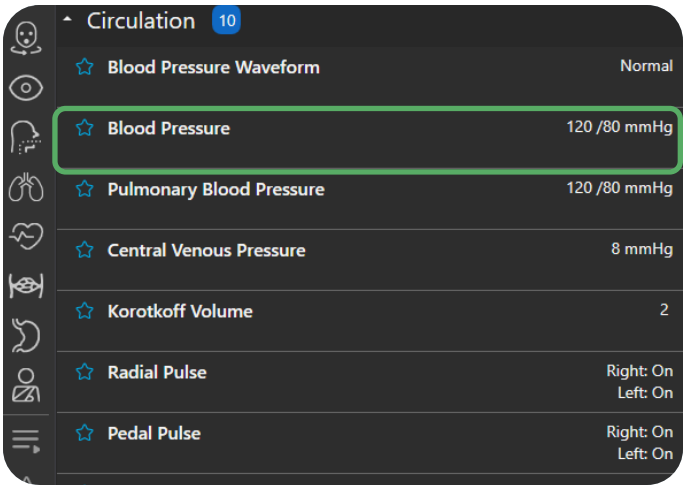
Blood Pressure

To adjust the values for all methods of taking blood pressure on HAL (invasive and non-invasive) use the **Blood Pressure** control in UNI 3.

The **Blood Pressure** values will be displayed on the real monitoring devices and on the Monitor within UNI as the **ABP** parameter. If the optional Bedside Virtual Monitor is purchased, the Blood Pressure values may also be displayed on there as well.

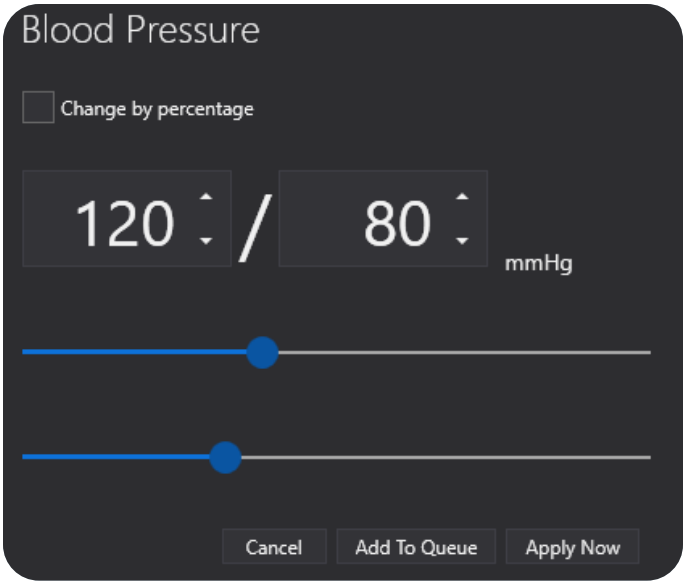
To change HAL's Blood Pressure:

1. In UNI 3, under the **Circulation** section click **Blood Pressure.**

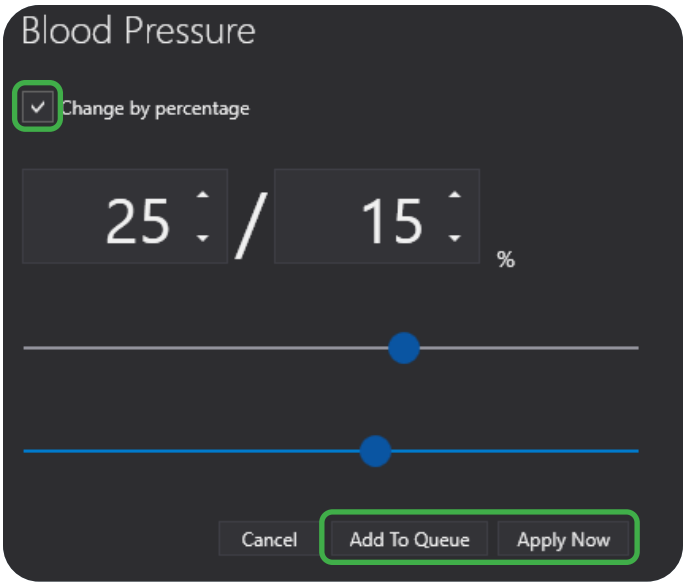


2. Enter a numeric value or adjust the slider bar to change HAL's systolic and diastolic Blood Pressure.

HAL's default blood pressure is 120/80 mmHg.



3. Check **By Percentage** to change the **Blood Pressure** by percentage rather than by units of pressure.



4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

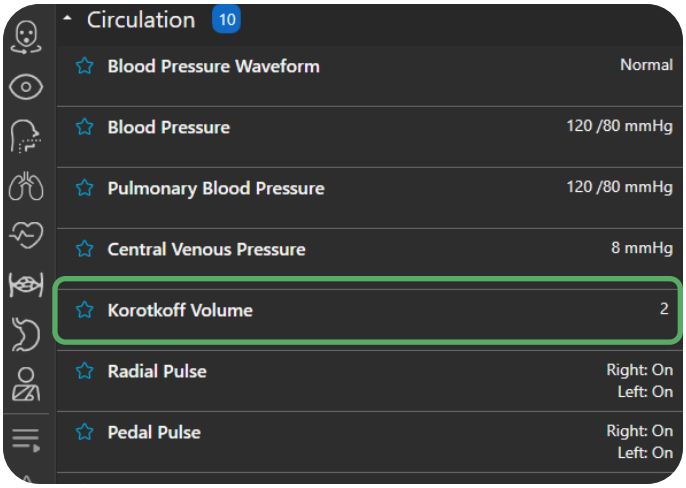
Korotkoff Volume

Korotoff sounds are the "tapping" or "knocking" sounds heard with a stethoscope as the cuff deflates when taking blood pressure. These sounds are generated by the changing blood flow that happens as the cuff deflates and blood rushes through the artery.

HAL's has the ability to simulate Korotkoff sounds when taking his blood pressure. The volume of these sounds can be controlled so assist with the assessment.

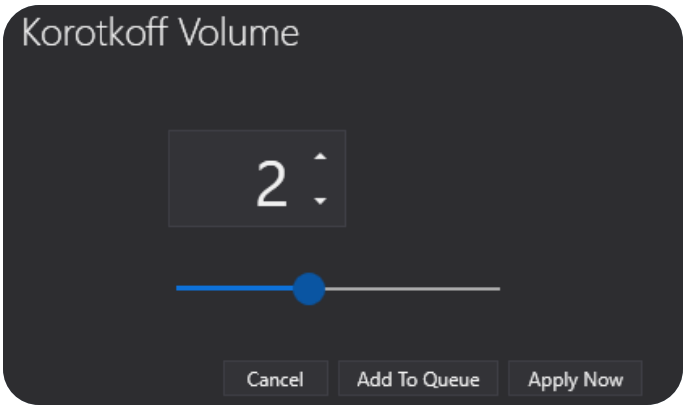
To change the Korotkoff volume level:

1. In UNI 3, under the **Circulation** section click **Korotkoff Volume.**



2. Enter a numeric value or adjust the slider bar to change the **Korotkoff Volume**.

3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

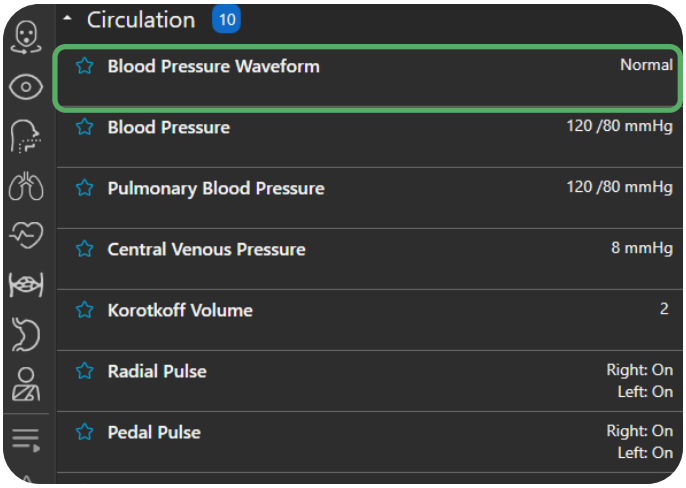


Blood Pressure Waveform

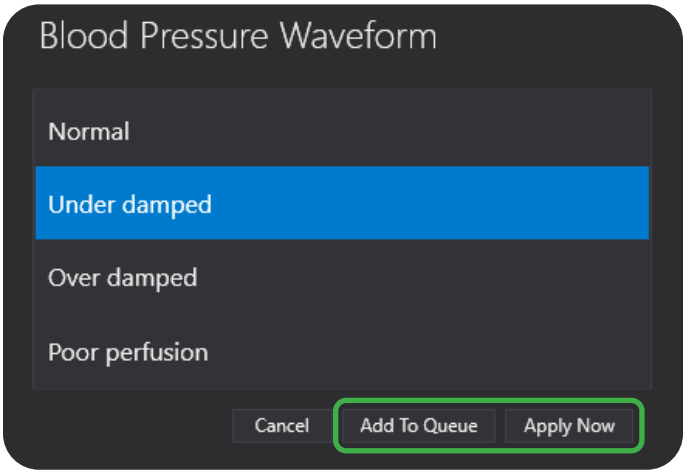
In UNI 3, **Blood Pressure Waveform** display different ABP waveforms on the Monitor tab within UNI or on a Bedside Virtual Monitor (option available for purchase).

To change the selection for the **Blood Pressure Waveform**:

1. In UNI 3, under the **Circulation** section click **Blood Pressure Waveform.**

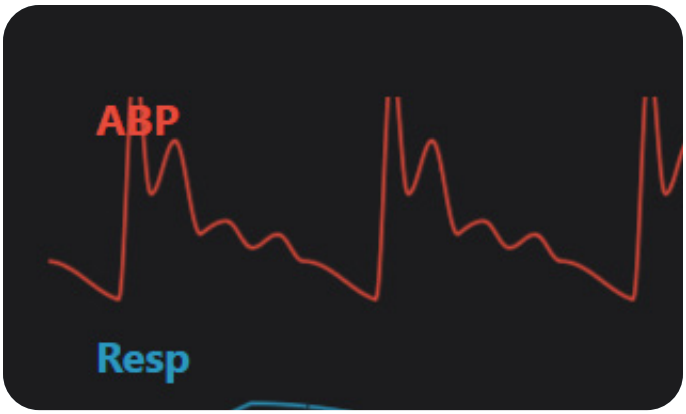


2. Select from the available options.

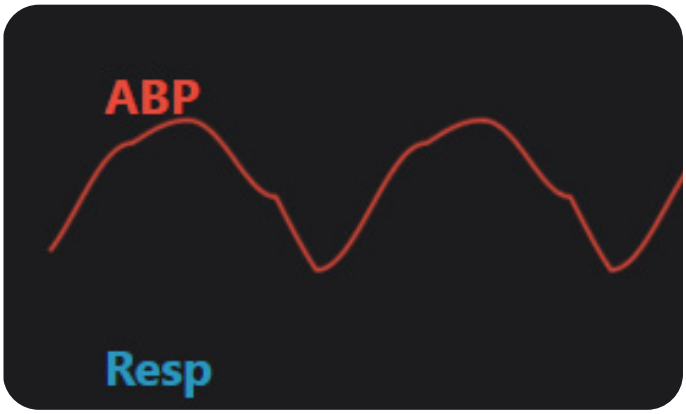


3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

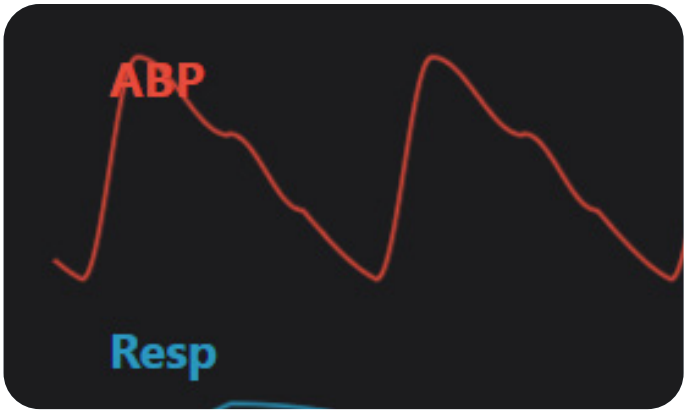
When **Under damped** is selected for the **Blood Pressure Waveform** this is how the waveform is displayed.



When **Over damped** is selected for the **Blood Pressure Waveform** this is how the waveform is displayed.



When **Poor Perfusion** is selected for the **Blood Pressure Waveform** this is how the waveform is displayed.

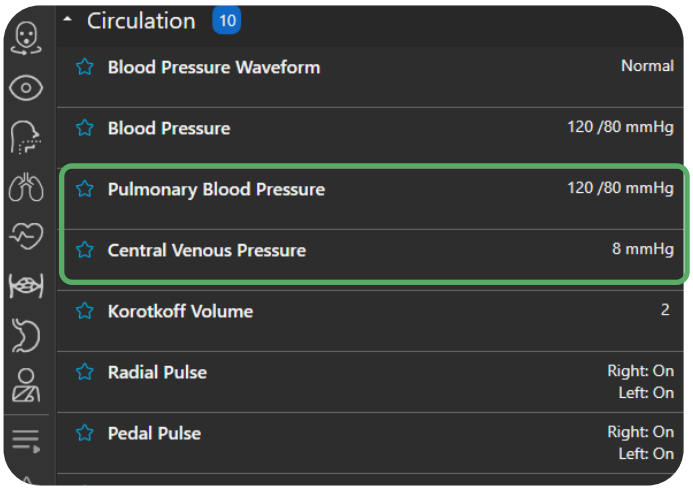


Pulmonary Blood Pressure & Central Venous Pressure

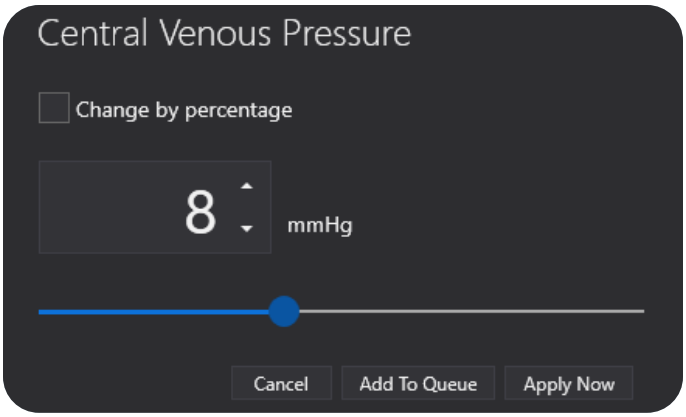
Pulmonary Blood Pressure and **Central Venous Pressure** are virtual values that can be changed to affect HAL's EtCO2 waveform on the Monitor tab within UNI or on a Bedside Virtual Monitor (option available for purchase).

To change the level of these pressures:

1. In UNI 3, under the **Circulation** section click **Pulmonary Blood Pressure** or **Central Venous Pressure.**

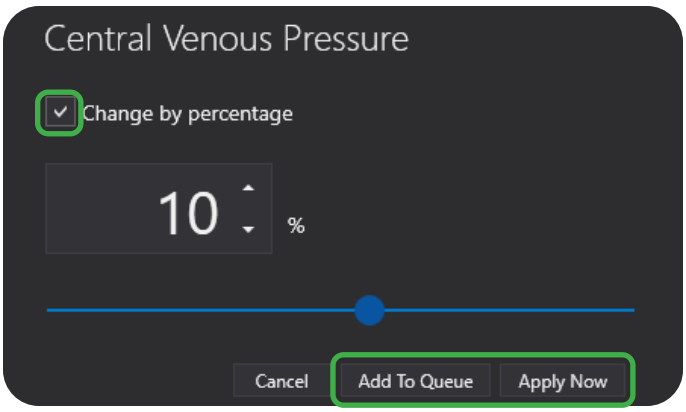


2. Enter the numeric value or use the slider bar to change the level of the pressure.



3. Check **By Percentage** to change the **Blood Pressure** by percentage rather than by units of pressure.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



3.7.3. IV arm

HAL S3201 has both a Drug Recognition right arm and a left IV arm.

HAL S3101 and S3000 have bilateral IV arms.

HAL's IV arms provide excellent practice for performing IV infusions, blood draws, simulating bulging veins, and simulating collapsed veins. It is best practice to prime the IV arm for infusion exercises or to draw fluids and to always clean and purge the IV systems at the end of each simulation day.

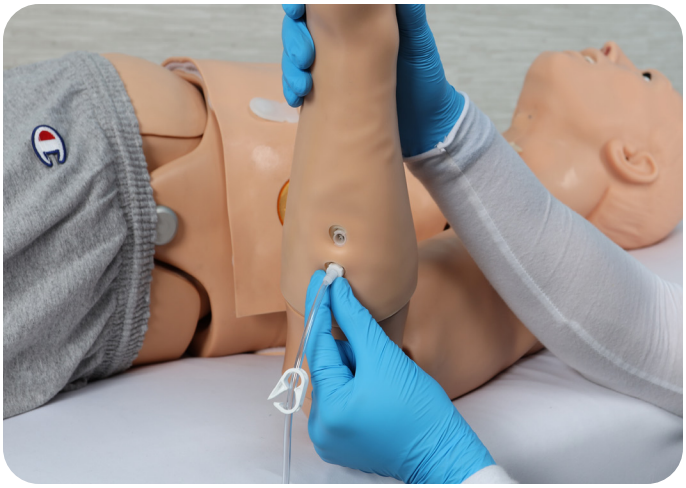
Use only diluted Gaumard's artificial blood concentrate or clean water to fill the vasculature of the IV arms. Any other simulated blood brand may contain sugar or other additives that may cause blockage of the vasculature system.

To prime the IV arm for exercises:

1. Obtain the IV filling kit and attach the drainage hose to an available port on the lower arm.

   HAL S3201 has a right Drug Recognition arm and a left regular IV arm. HAL S3101 and HAL S3000 have bilateral regular IV arms. On the Drug Recognition arm the IV ports are color coded: black is the drainage port and white is the fill port.

   For regular IV arms both ports are white which signifies that this system is one continuous loop of veins therefore it doesn't matter which port is connected to the drain or fill. Either way the fluid will be able to successfully flow through.



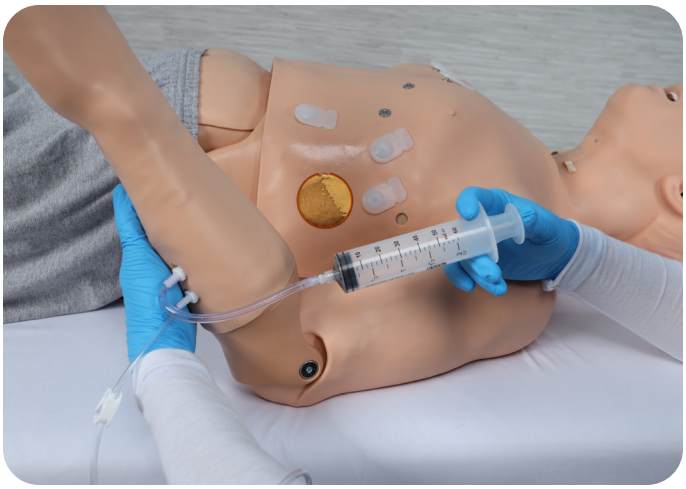
2. Fill the Filling Syringe with either diluted Gaumard artificial blood concentrate or clean water and connect to an available port on the IV arm.

Use only diluted Gaumard's artificial blood concentrate or clean water to fill the vasculature of the IV arms. Any other simulated blood brand may contain sugar or other additives that may cause blockage of the vasculature system.

3. Push the fluid through the IV arm until fluid exits the drainage hose and air bubbles are not present.

To simulate bulging veins, at this step clamp the drainage hose and push a little more fluid into the IV system - not excessively but just enough to plump the veins.

To simulate collapsed veins, at this step clamp the drainage hose and pull back on the filling syringe to remove a small amount of fluid from the IV system.



4. Disconnect the Filling Syringe.

Leave the drainage hose in place if performing infusion exercises so that the infused fluid can exit the system. Failure to leave the drainage hose in place while performing infusion exercises may burst the veins.

The IV arm is now ready for simulation exercises!

3.7.4. Drug Recognition

Train medication administration and management to improve patient safety with HAL's drug recognition system!

HAL has drug recognition sensors integrated into his lower right arm and is also supplied with 20 syringes that can be programmed for specific drugs. This drug recognition system works together to detect medication type, concentration, and dose when they are administered.

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

HAL must be turned on when introducing fluids into the drug recognition arm. This includes calibration, purging, draining, IV infusion, and injecting. Introducing fluids into the drug recognition arm while the simulator is off will damage the arm and its drug recognition components.

The drug recognition arm has a black drainage port and a white filling port. Do NOT reverse the ports while introducing fluids into the system.

HAL's drug recognition arm needs to be primed before being used during simulation so that it can perform accurate volume readings.

Priming the Drug Recognition Arm

The drug recognition sensors are active only when fluid is present in the system. Prime the Drug Recognition arm by filling the system with fluid, either clean water or diluted Gaumard artificial blood concentrate. This process should be done before simulation begins so that the system is ready.

To prime the drug recognition arm for infusion exercises:

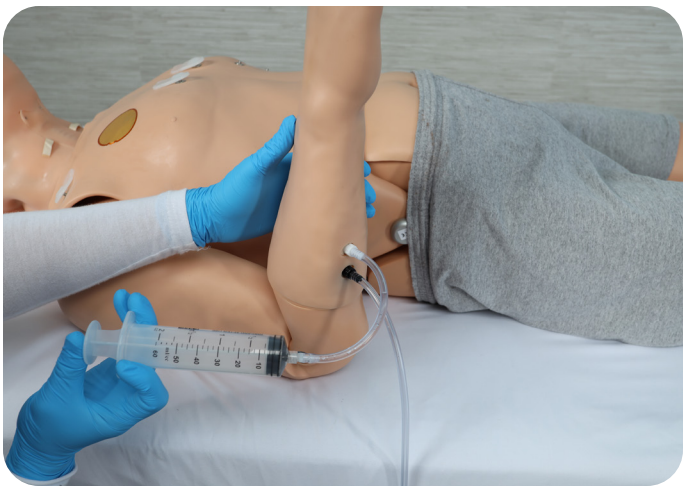
1. Be sure that the simulator is turned ON and connected to UNI.

2. Attach the drain tube to the black drainage port on the right lower arm.

Place the open end of the drain into a waste collection container.

3. Fill the filling syringe with clean water or diluted Gaumard artificial blood concentrate and connect the syringe to the white port on the right lower arm.

4. Push the fluid into the system until fluid exits the drain and there are no air bubbles appearing.



Programming the Drug Recognition Syringes

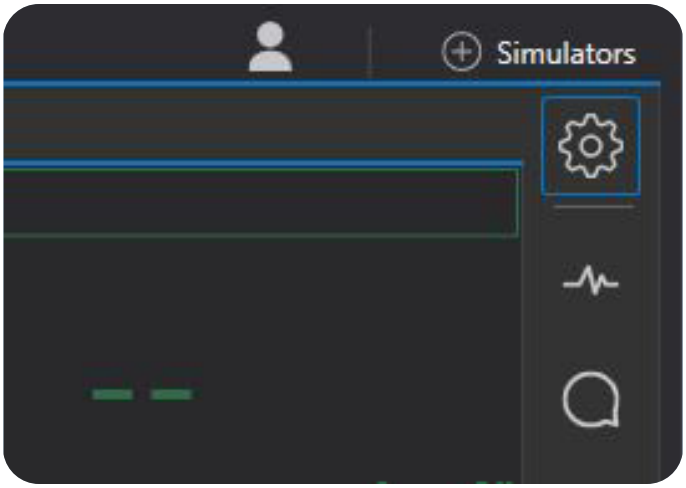
In HAL's accessories, there are 2 packages of 10 Drug Recognition syringes and a syringe programming holder. These items, along with UNI3 and HAL, will be needed to successfully program the Drug Recognition syringes to a drug that has already been pre-programmed into UNI or a custom programmed drug.

To program a Drug Recognition Syringe:

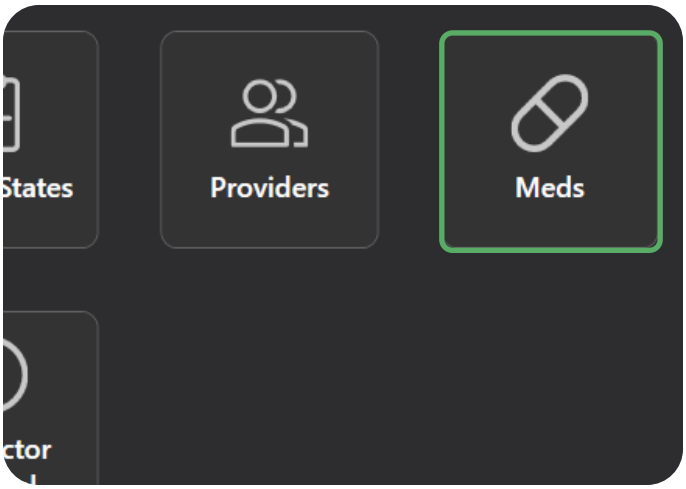
1. Be sure that the simulator is turned ON and connected to UNI.

2. Attach the syringe programming holder to the right wrist of HAL.

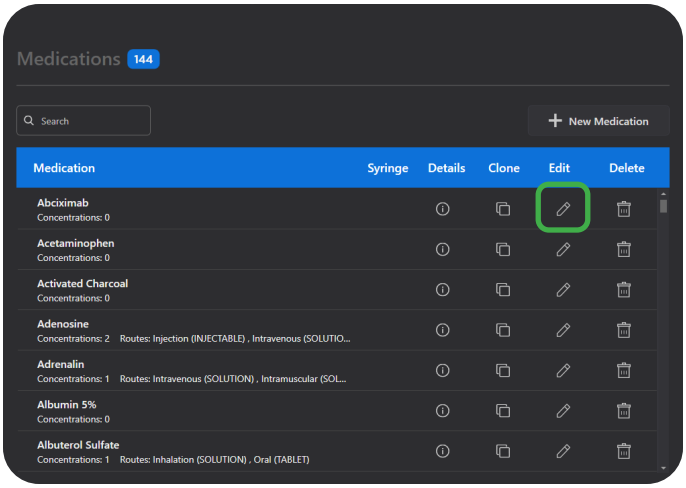
3. In UNI, click **Settings**.



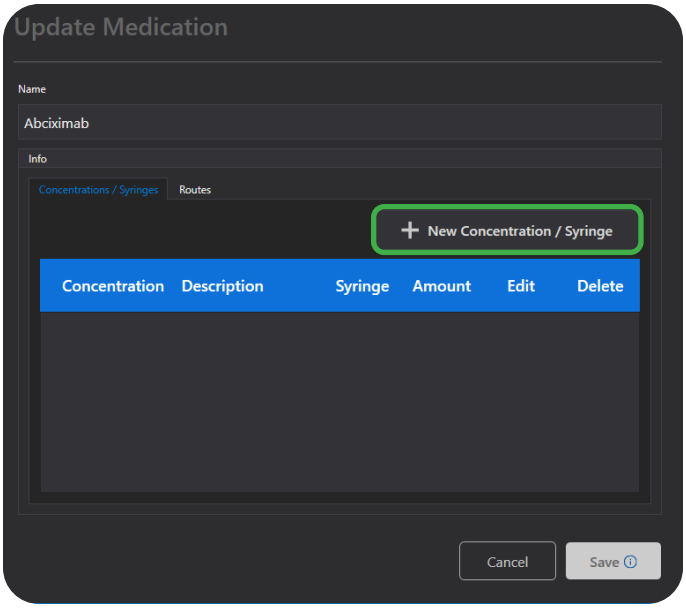
4. Click the **Meds** button.



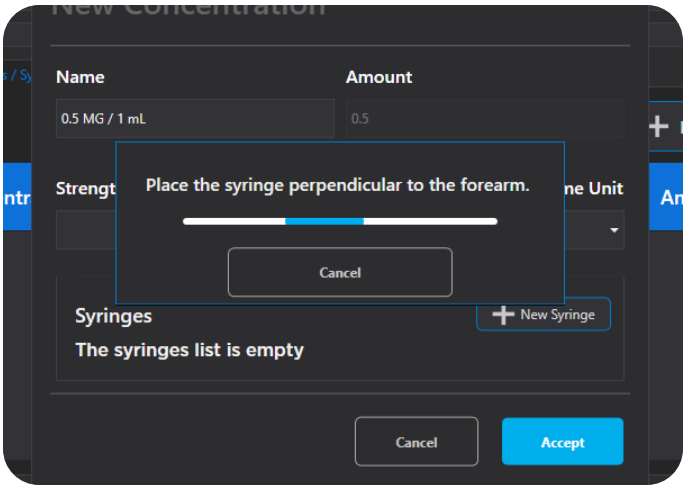
5. Click the **Edit** icon on the **Medication** that will be assigned to the drug recognition syringe.



6. Click **+ New Concentration/Syringe**.



7. Place a drug recognition syringe perpendicular to the forearm.

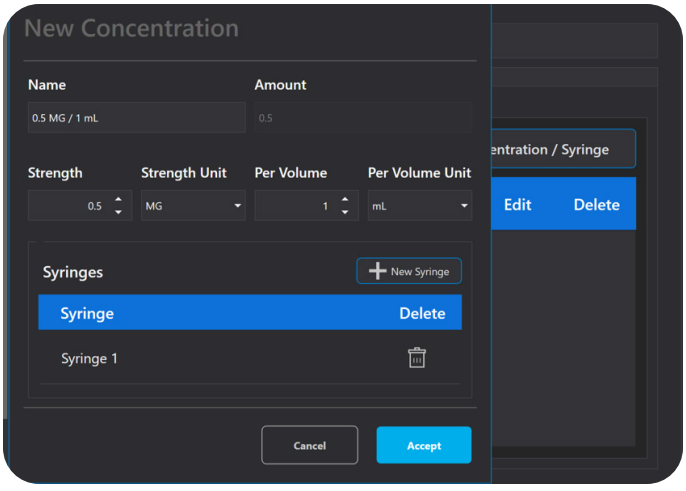


While the syringe is in the **Syringe Programming Holder** this orients the syringe perpendicular to the drug recognition arm. Once the drug recognition syringe is perpendicular to the wrist, UNI will receive this feedback and allow the user to program a drug name to the syringe.

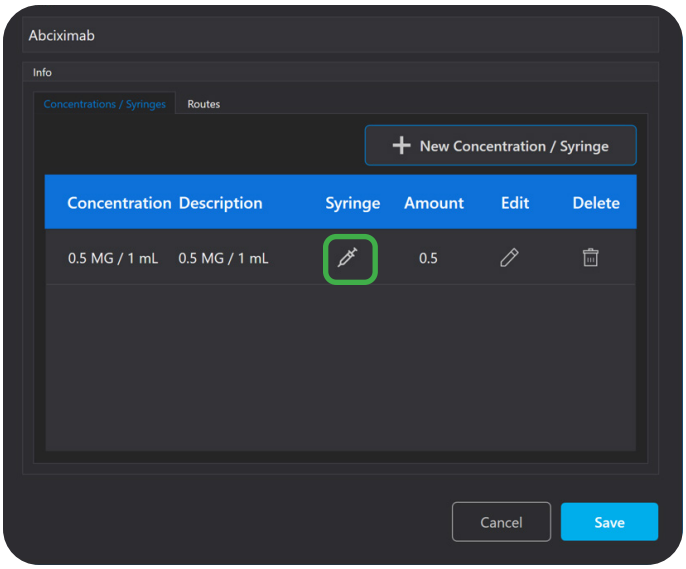
8. Once UNI 3 detects a signal from the drug recognition syringe placed perpendicular to HAL's arm it will program it and add it to the **Syringes** list.

The syringes remain programmed unless the medication properties are deleted manually and reprogrammed using this process.

9. Click **Accept**.

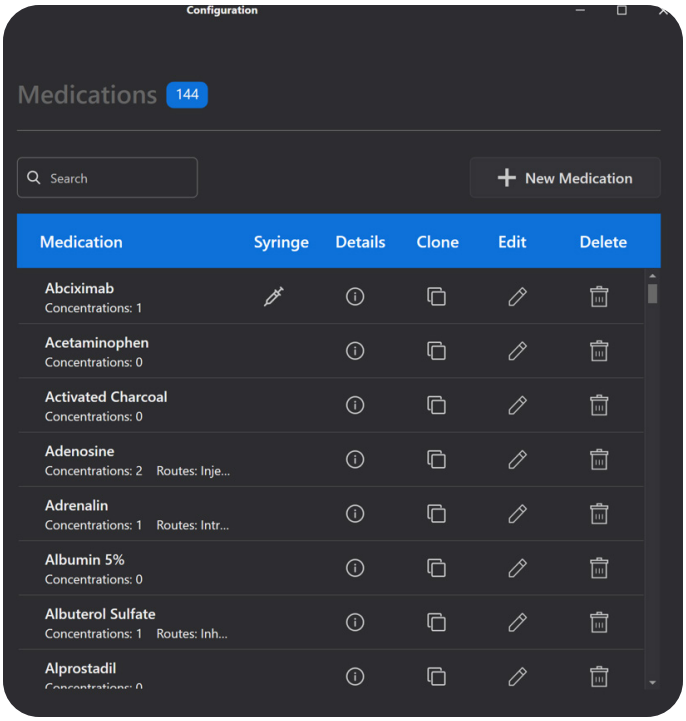


When a drug recognition syringe is programmed to a Medication, the information line will update to display a syringe icon.



10. Click **Save**.

From the main **Medications** list, any drug recognition syringes that are programmed to a **Medication** will have a syringe icon displayed next to the **Medication** name.



3.7.5. Male Genitalia & Catheterization

Installing the Male Genitalia

HAL S3201 and S3000 have a removable male genitalia that can be catheterized.

To install the Male Genitalia:

1. Obtain the Male Genitalia and align the fluid connector to the urine port oh HAL's pelvis.

> Be sure that the white fluid connector slides into the urine port. If the fluid connector is not properly inserted there may not be any fluid return when catheterizing HAL.

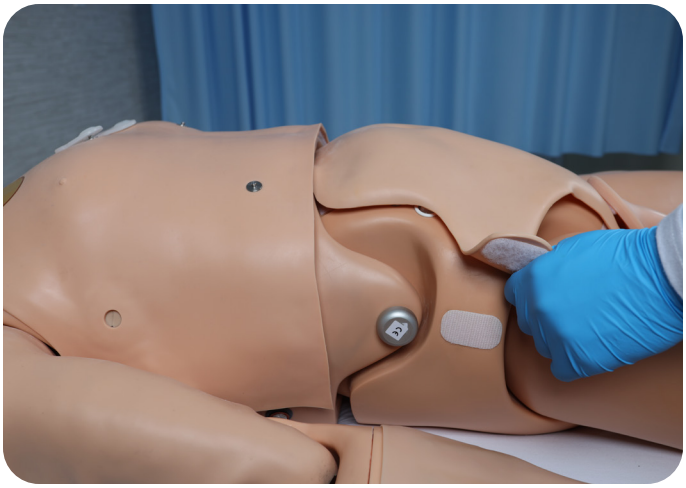
2. Press on the top and bottom of the Male Genitalia to secure the Velcro to the simulator.

Filling the Bladder

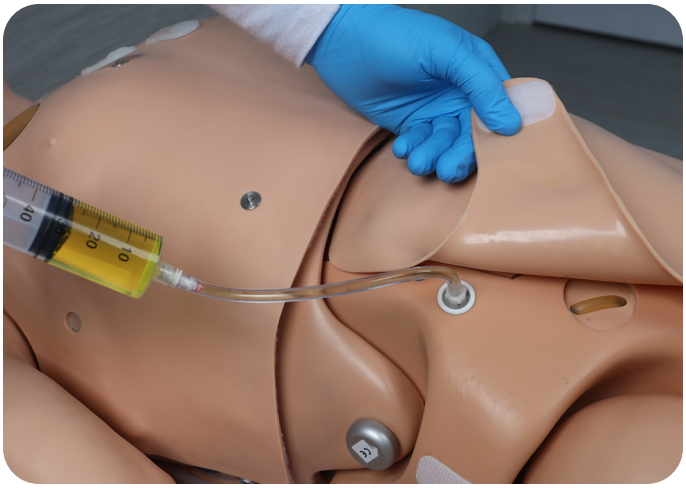
To prepare HAL for catheterization, fill the bladder with diluted Gaumard artificial urine or clean water. HAL's bladder can hold up to **240 mL** and the Male Genitalia should be catheterized with an **18 Fr** straight catheter.

To fill the bladder:

1. Lift HAL's abdominal skin cover at the Velcro attachment.



2. Fill the Bladder Filling Syringe with fluid and connect it to the bladder port located under the abdominal skin cover on the right side.



3. Fill the Bladder Reservoir up to 240 mL.

Catheterization

To catheterize HAL:

1. Lubricate an **18 Fr** straight catheter.

Remember to always lubricate the catheter with the simulator's accompanying lubricant, MINERAL OIL, prior to insertion. This will help the catheter to slide into the male genitalia smoothing and prevent skin tears.

2. Insert the lubricated catheter into the urethra until there is fluid return.

3.7.6. Temperature, Blood Glucose, & Capillary Refill Time

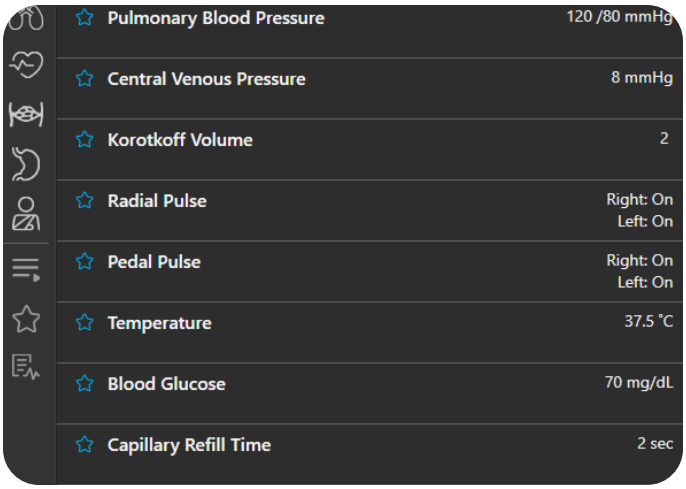
HAL contains a few other circulation vitals such as temperature, blood glucose, and capillary refill time that are virtual. This means that these vitals will appear in UNI 3 and can be controlled on the software but there is no physical feature on the simulator. These virtual vitals are still great tools that can be used and seen on an accompanying Gaumard Vitals bedside virtual monitor.

Temperature

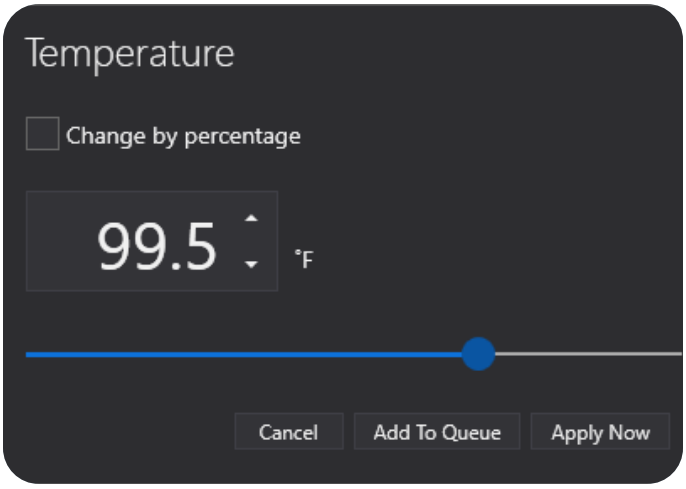
The human body's temperature is a crucial aspect of its functioning and overall health. Maintaining an optimal temperature is essential for the body to perform its various physiological processes efficiently.

To manipulate HAL's virtual temperature to simulate different health conditions:

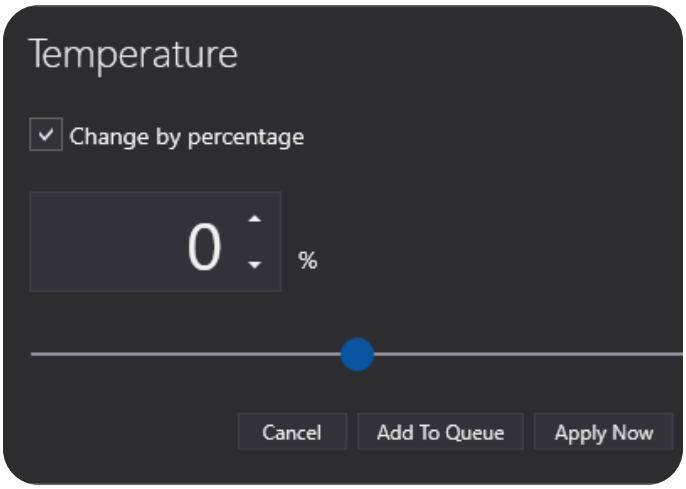
1. Under the **Circulation** section click **Temperature.**



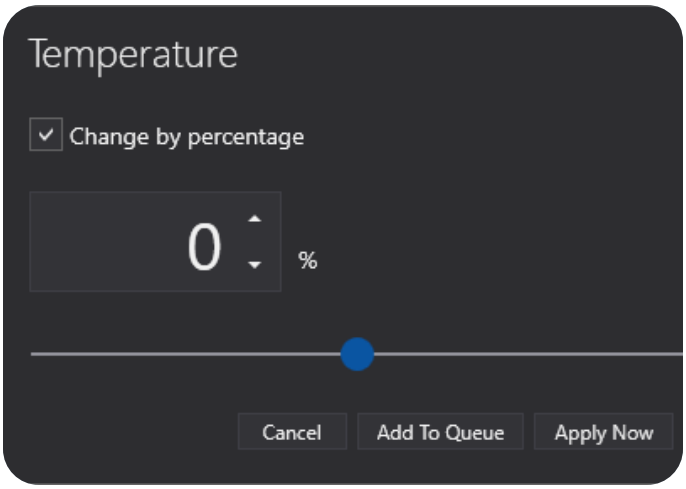
2. Enter the numeric value or use the slider bar to change the level of the pressure.

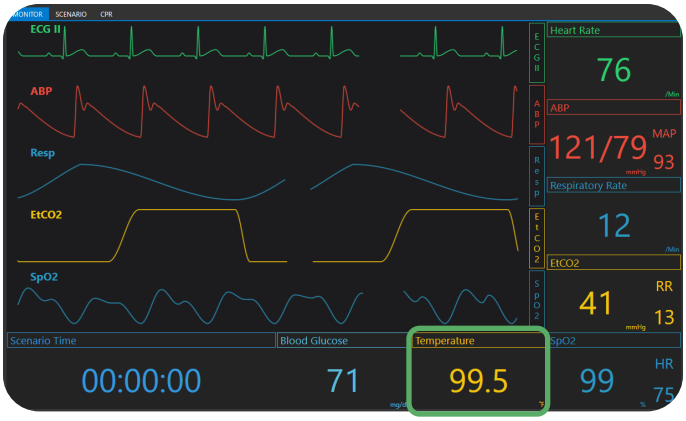


3. Check **By Percentage** to change the **Temperature** by percentage rather than by units of degrees.



4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



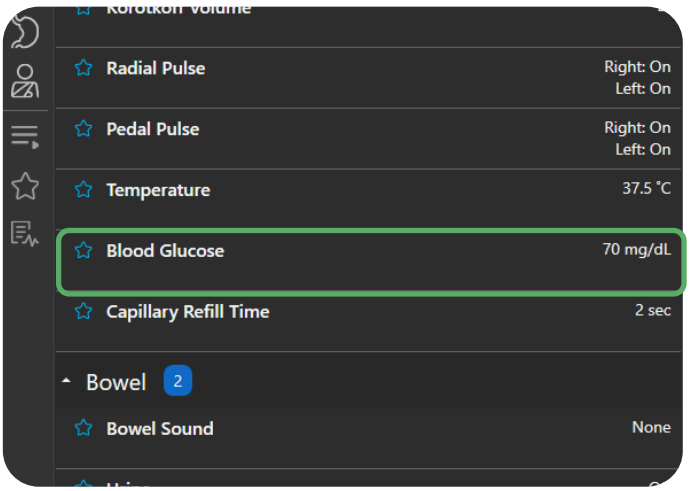


Blood Glucose

The Blood Glucose control in UNI 3 is only a virtual vital that may be displayed on the Monitor within UNI and/or on the Bedside Virtual Monitor (option available for purchase).

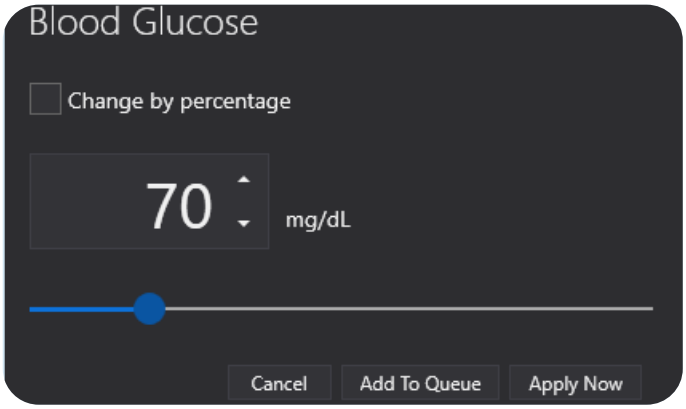
To change HAL's virtual Blood Glucose reading:

1. In UNI 3, under the **Circulation** section click **Blood Glucose.**

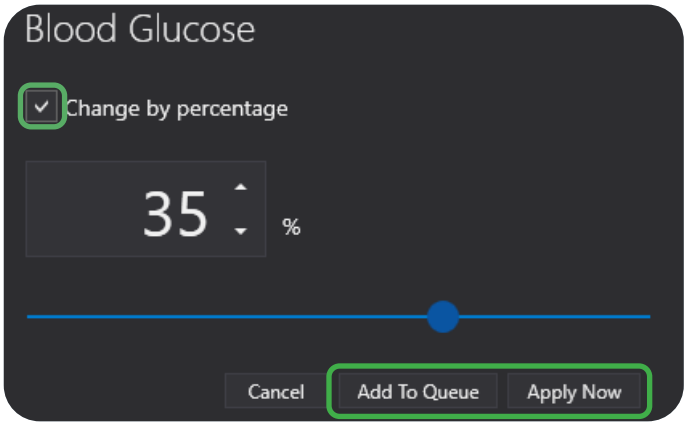


2. Enter a numeric value or adjust the slider bar to change the value of **Blood Glucose**.

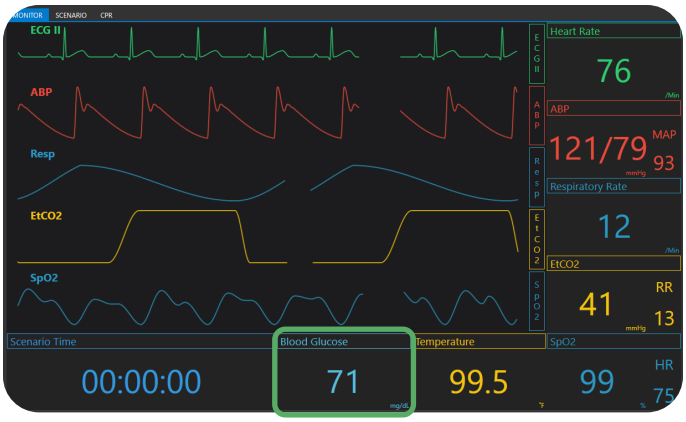
3. Check **By Percentage** to change the **Blood Glucose** by percentage rather than by units of volume.



4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



The Blood Glucose value can be selected to appear on the Monitor within UNI or on a Bedside Virtual Monitor (option available for purchase).



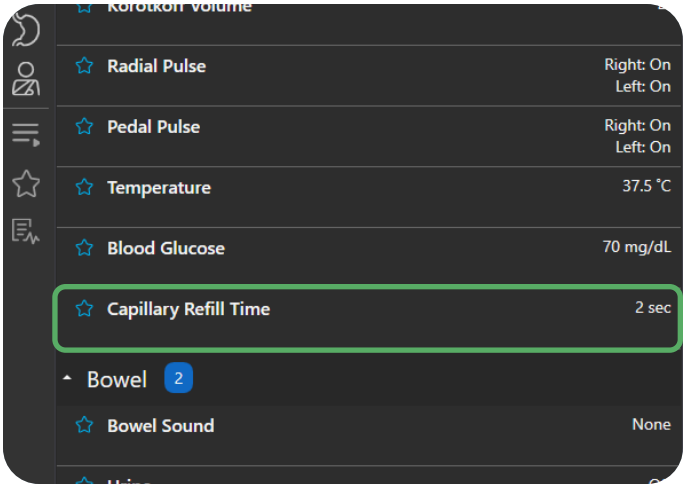
Capillary Refill Time

Capillary Refill Time refers to the time taken for a distal capillary to regain its normal color after enough pressure has been applied to turn the nail bed white, or "blanched".

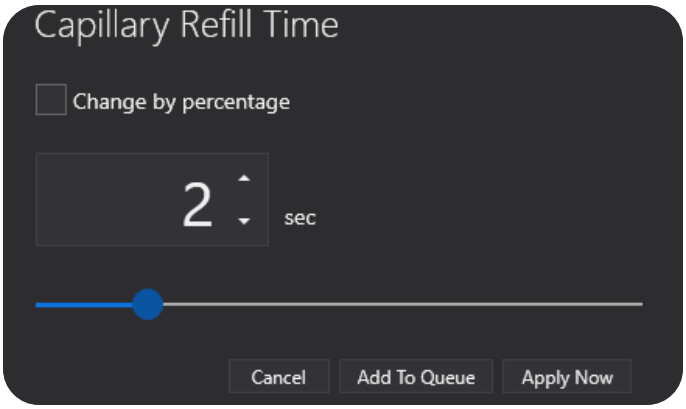
Capillary Refill Time is a virtual vital for HAL S3201. S3101, and S3000. The theoretical time taken for HAL's nail bed to regain his normal color may be controlled through UNI 3.

To adjust HAL's **Capillary Refill Time**:

1. In UNI 3, under the **Circulation** section click **Capillary Refill Time.**

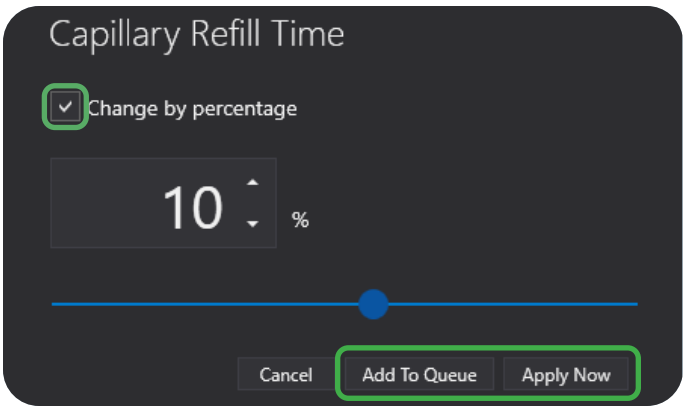


2. Enter a numeric value or adjust the slider bar to change the **Capillary Refill Time**.



3. Check **By Percentage** to change the **Capillary Refill Time** by percentage rather than by units of time.

4. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



3.7.7. Intraosseous Tibia

HAL S3201 and S3000 have, as standard, intraosseous access on the right leg tibia. HAL S3000 standardized this feature starting with serial number **H2304863** and onwards.

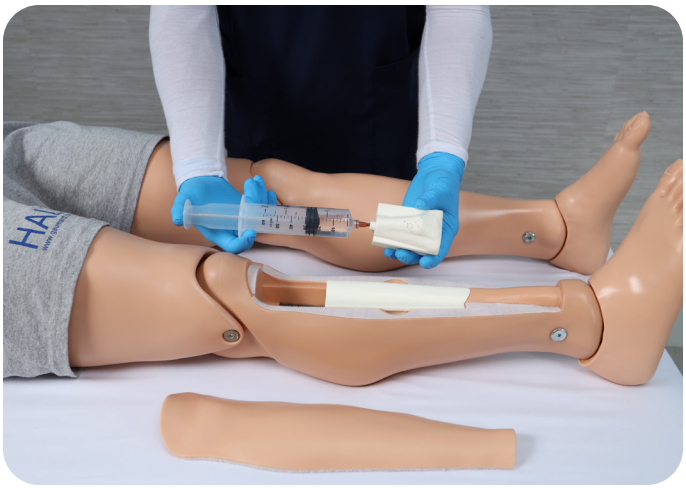
The tibia bones are replaceable and are hollow to allow for the aspiration and infusion of fluid using real medical devices.

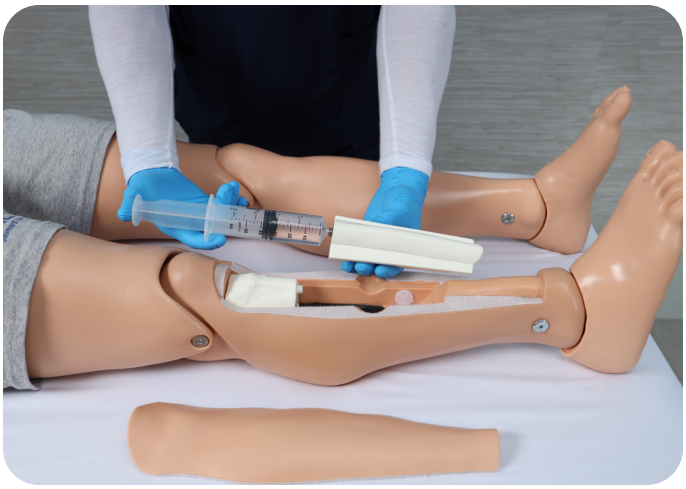
To fill the tibia bones with fluid:

1. Remove the skin cover from the right leg to access the two-part tibia.

2. Remove both parts of the tibia.

3. Fill the tibial tuberosity and the lower tibia with fluid using the fill syringe.





4. Immediately after filling fit the tibial tuberosity into the port of the lower tibia.

5. Place this assembly back into the space available in the right leg.

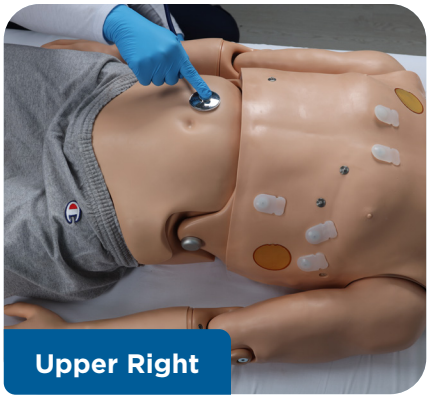
6. Replace the skin cover.

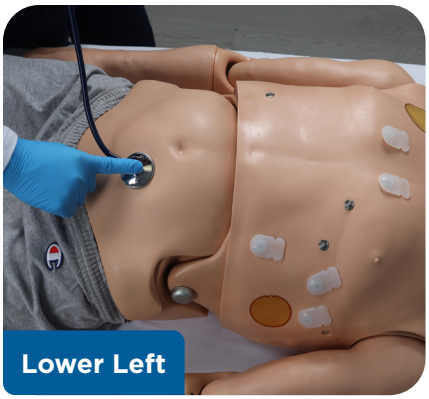
3.8 BOWEL

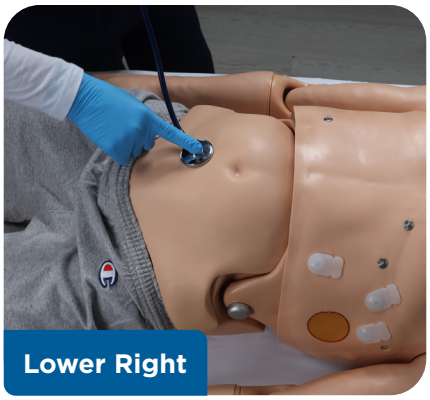
3.8.1. Bowel Locations & Controls

Bowel Locations

HAL has four quadrants dedicated to bowel sounds.





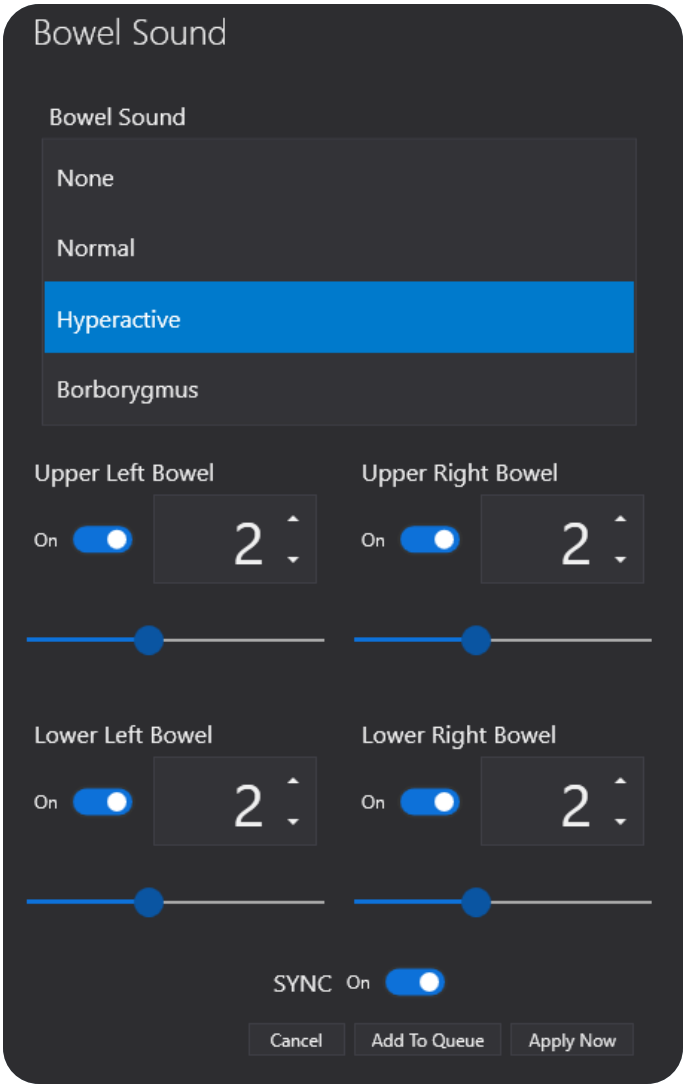


Bowel Controls

HAL has 4 distinct bowel sounds that includes **None**, **Normal**, **Hyperactive**, and **Borborygmus**.

To change the bowel sounds and adjust the bowel volumes on HAL:

1. In UNI 3, under the **Bowel** section click **Bowel Sound**.
2. Select the desired bowel sound from the available options.
3. Click on the switch to turn the bowel sounds **ON** or **OFF** for that particular quadrant.
4. Enter the numeric level or use the slider bar to adjust the volume for each individual bowel quadrant.
5. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



4. UNI® 3 Control Software

4.1 UNI 3 BASICS

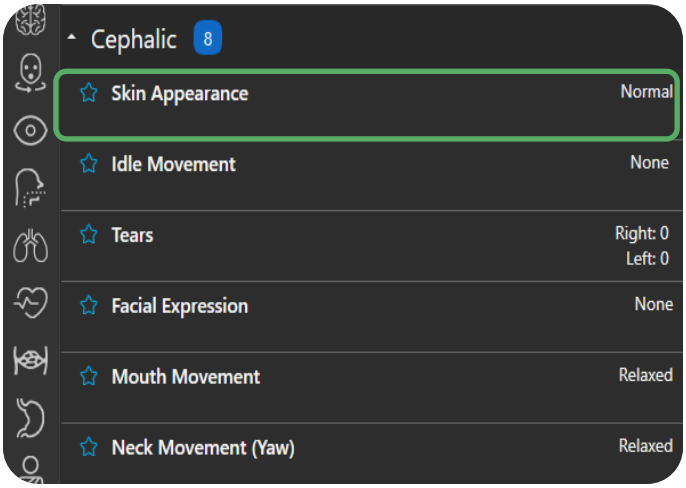
4.1.1. Create & Apply A Clinical State

How to Create a Clinical State

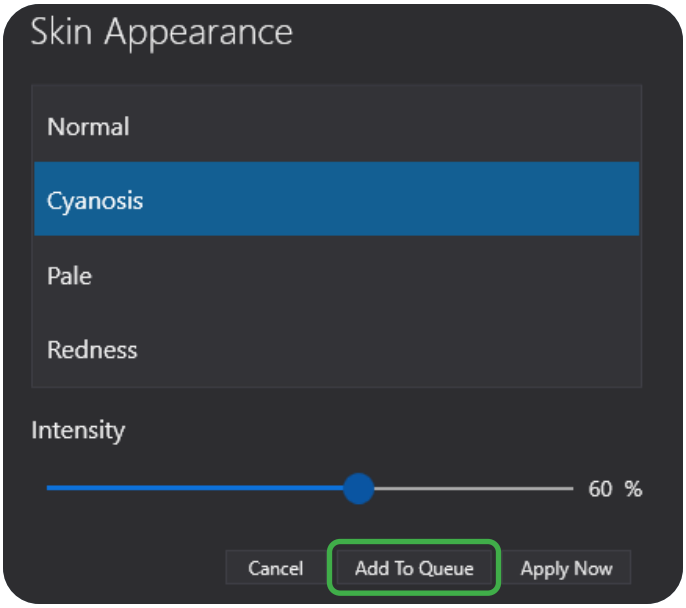
UNI 3's **Clinical States** refer to a group of programmed vitals being applied to HAL.

To create a Clinical State in UNI 3:

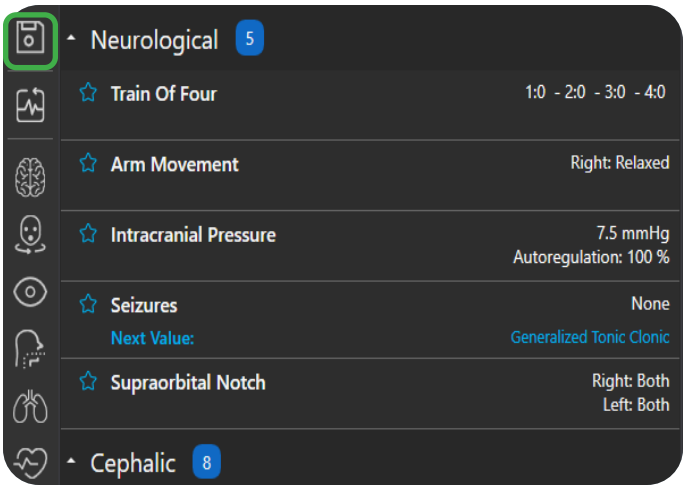
1. On the left side of UNI 3, click on a vital and make a change.



2. Click **Add to Queue**.



3. Click **Save Queue as Clinical State** icon.

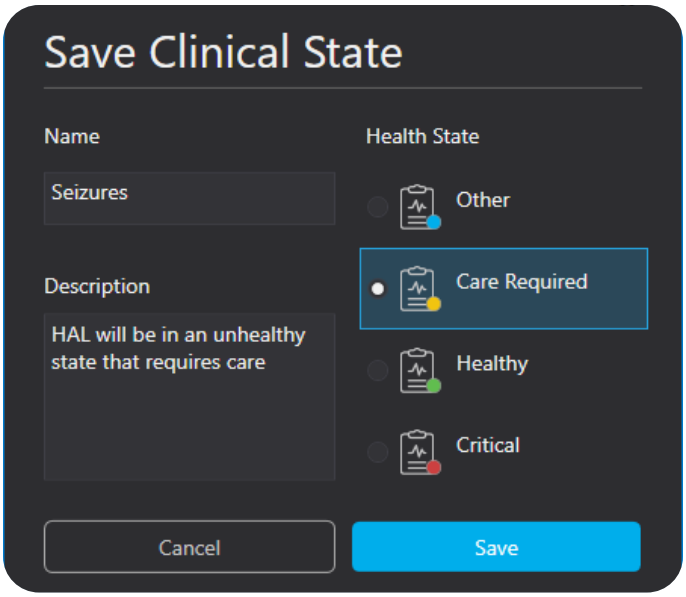


4. On the **Save Clinical State** window, type in a **Name** to identify this **Clinical State** by and provide a short **Description**.

5. Select a **Health State**.

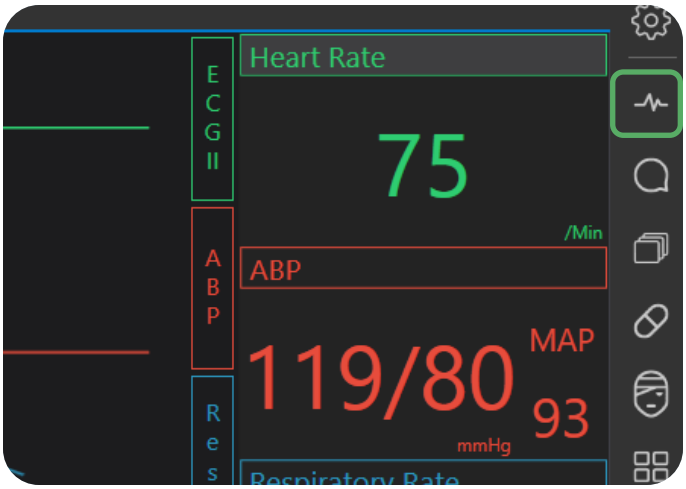
This helps to organize your Clinical States when viewing them in the library.

6. Click **Save**.



How to Apply a Clinical State

1. On the right side of UNI 3, click on the **Clinical States** icon.

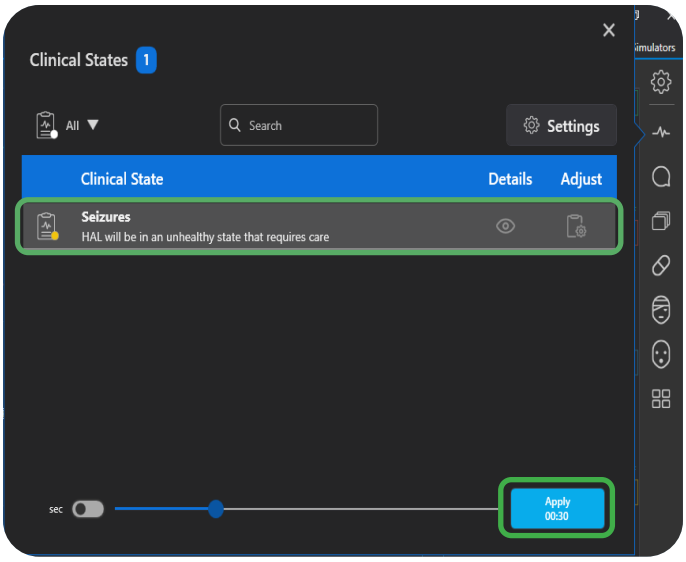


2. Click on the Clinical State that was created.

3. Set an amount of time to apply the Clinical State.

> If you want the Clinical State to be applied immediately, do not set a time. If you want the Clinical State to be applied at a later time, use the slider bar to set that time.

4. Click **Apply**.



4.2 SCENARIOS

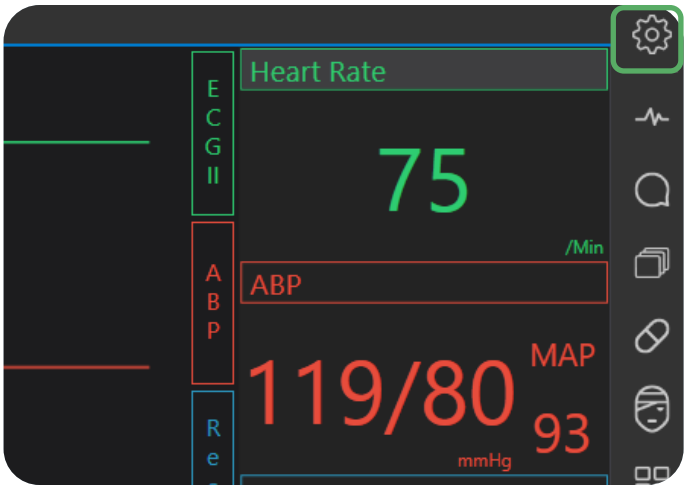
4.2.1. Create & Play A Scenario

How to Create a Scenario

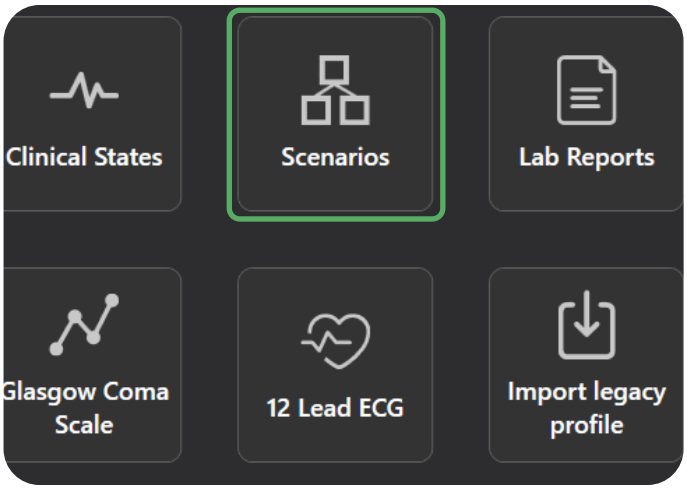
Create and apply scenarios in UNI 3 to simulate a multitude of experiences! UNI 3 has the capability to build a very simple, linear scenario to very complex, multi-path scenarios.

To create a simple, linear scenario:

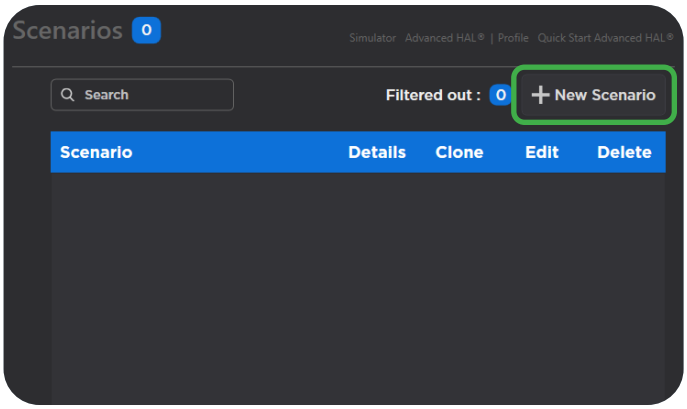
1. In UNI 3, click on the **Settings** menu in the upper right corner.



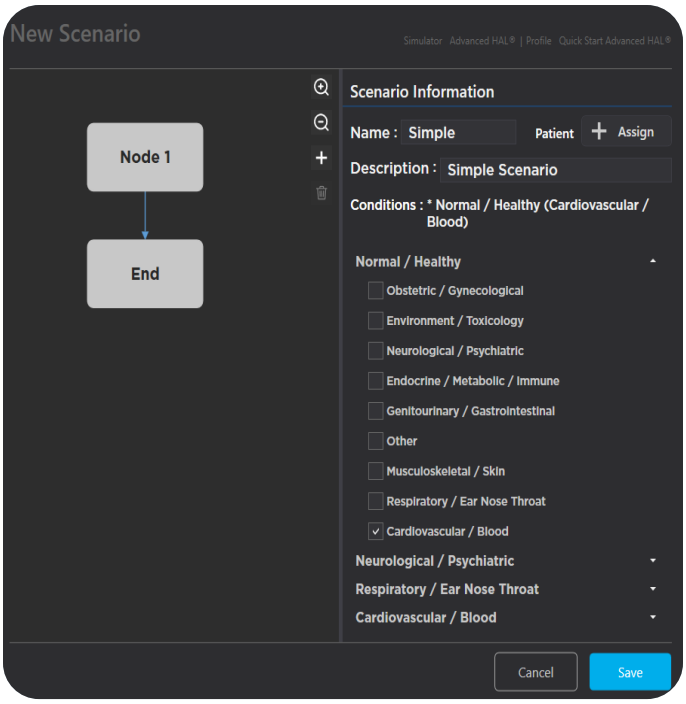
2. Under **Simulator Model**, click **Scenarios**.



3. Click **+ New Scenario**.

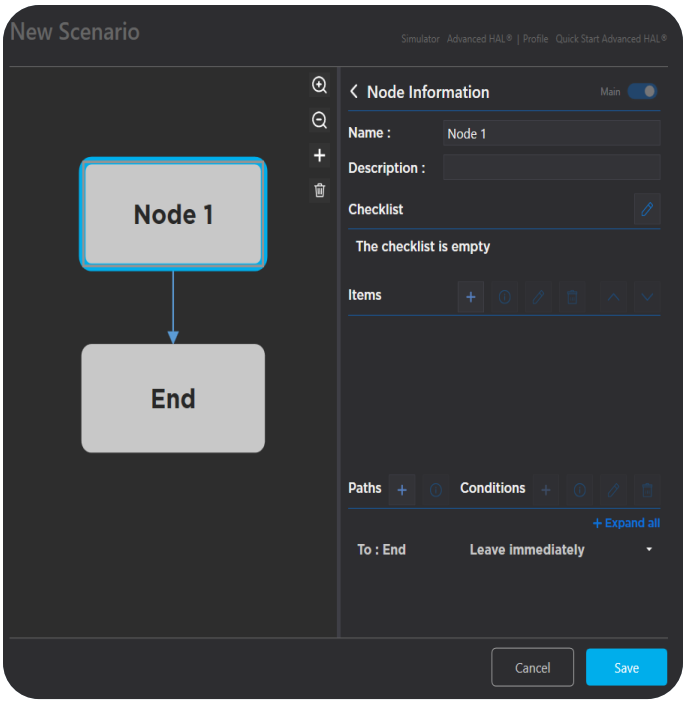


4. Give your scenario a **Name**, **Description**, and assign it a **Condition**.



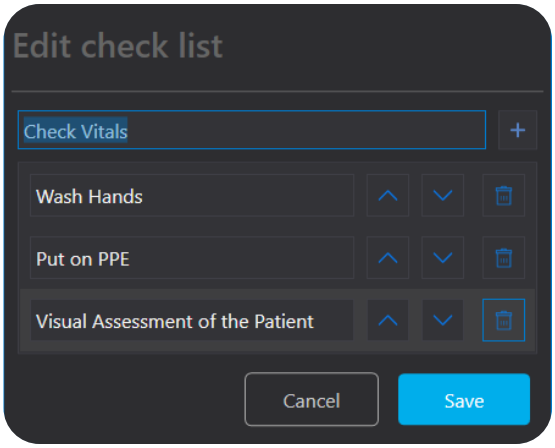
5. Click on **Node 1** to add information.

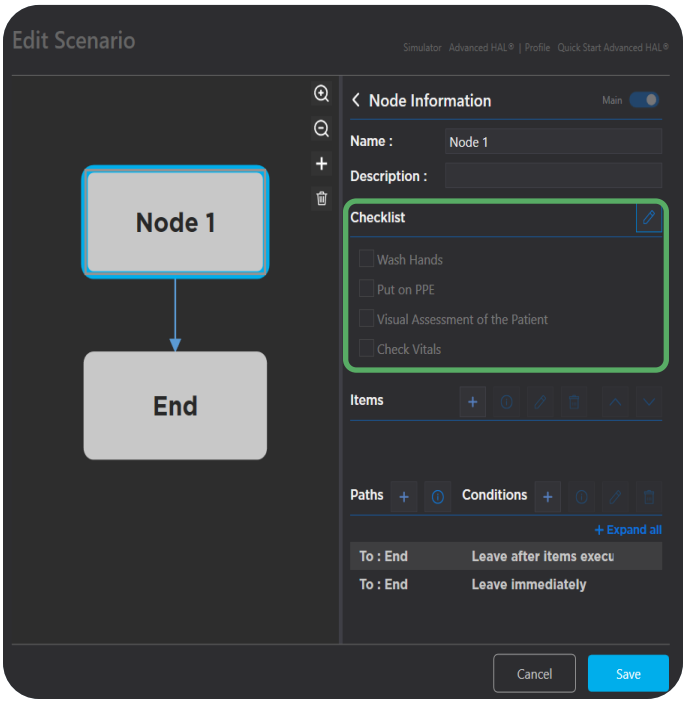
Nodes contain **Checklists**, **Items**, **Paths**, and **Conditions**.



6. Click on the **Edit Checklist** pencil icon to add a checklist to the **Node**.

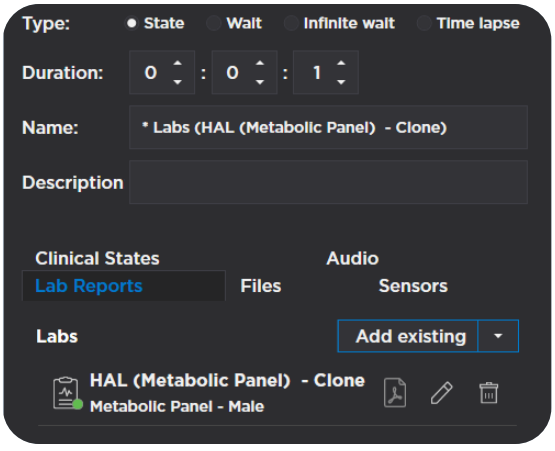
Checklists allow the user to create a list of actions or notes they would like to see participants do during the scenario. The checkboxes next to each entry allows the user to keep track of what the participants do or not.

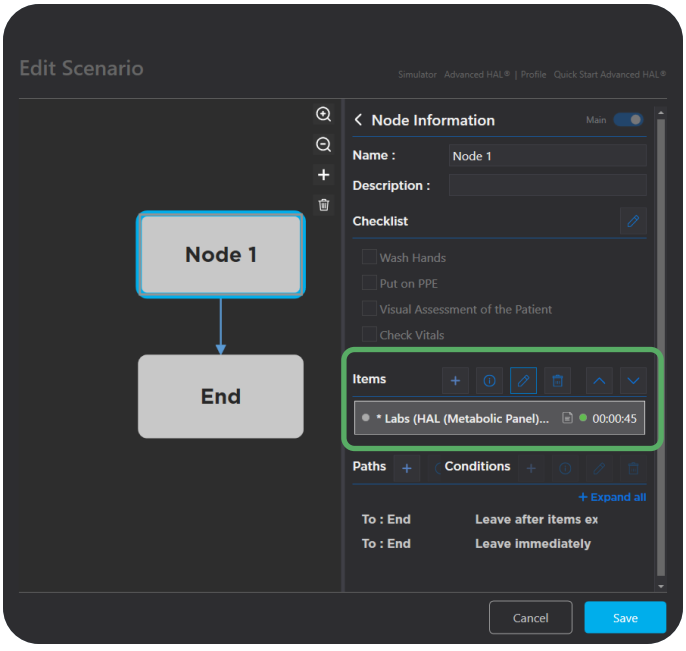




7. Click on the **Add Item** + icon to add an item to the **Node**.

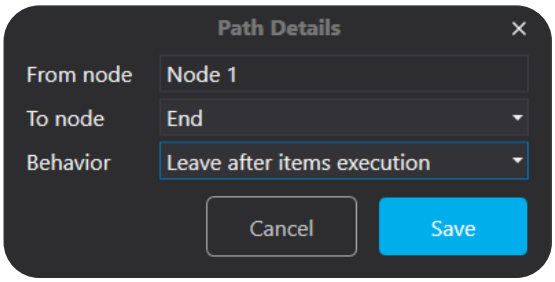
Items include **Lab Reports**, **Files**, **Sensors**, **Clinical States**, and **Audio**. All of these items can be created beforehand and then added to a scenario.

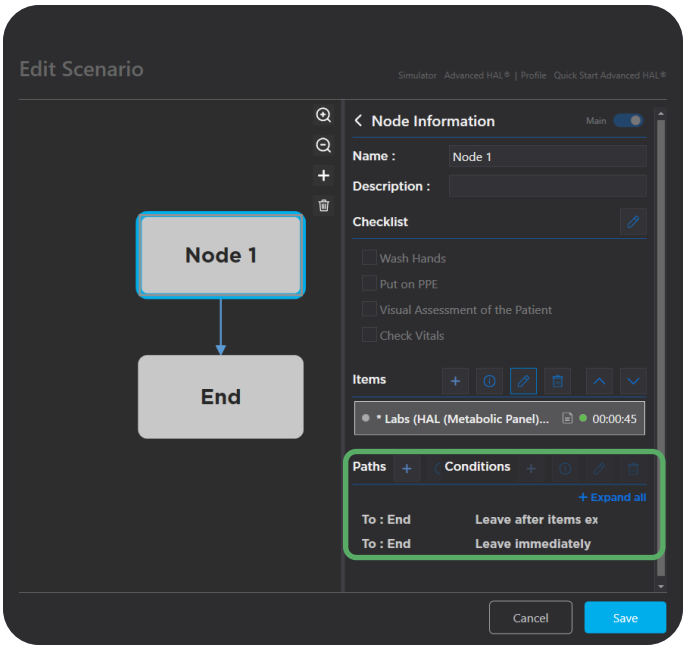




8. Click on the **Add Path** + icon to add a path to the **Node**.

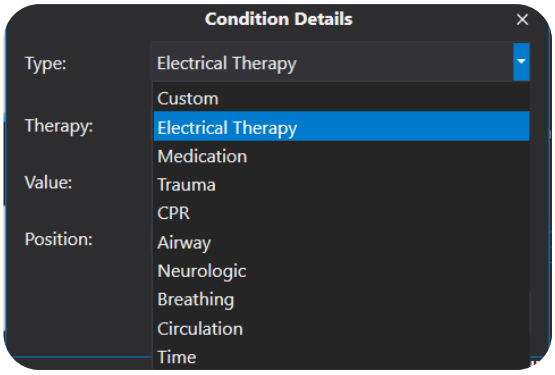
A **Path** refers to the trajectory from one node to another after the last **Item** in a node plays. In this example, **Paths** can be used to tell **Node 1** to go to the **End**.

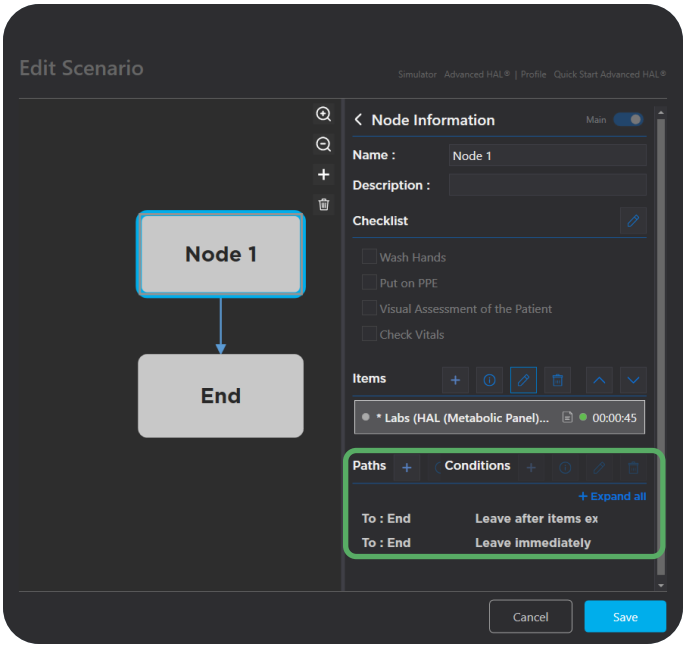




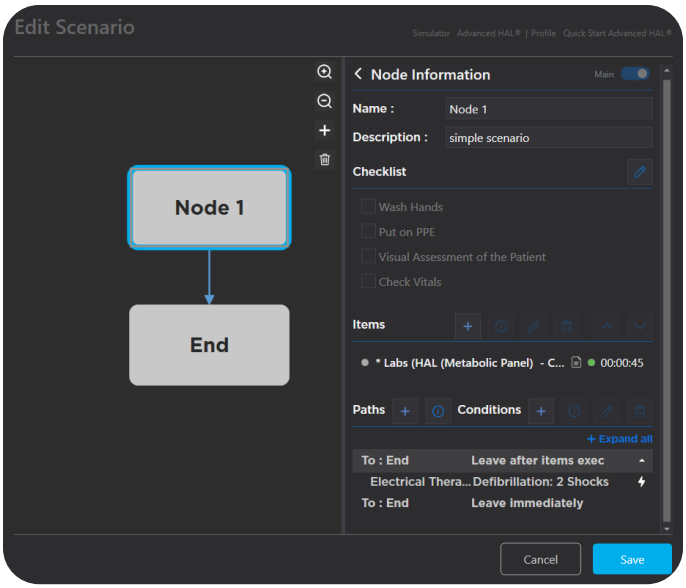
9. Click on a **Path** that has been added, then click the **Add Condition** + icon to add a condition to the Node.

A **Condition** refers to the additional actions participants need to address before a **Node** finishes. This includes performing **Electrical Therapy**, administering **Medication**, performing **CPR**, packing or applying pressure to a **Trauma** site, opening an **Airway**, triggering a **Neurologic** pressure sensitive sites.





10. Click **Save** to save all of the added information to your scenario.

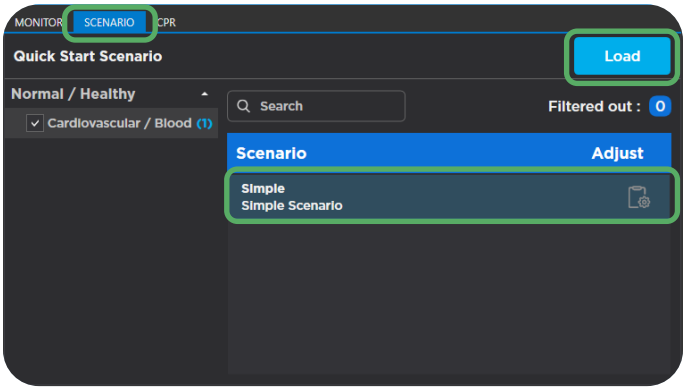


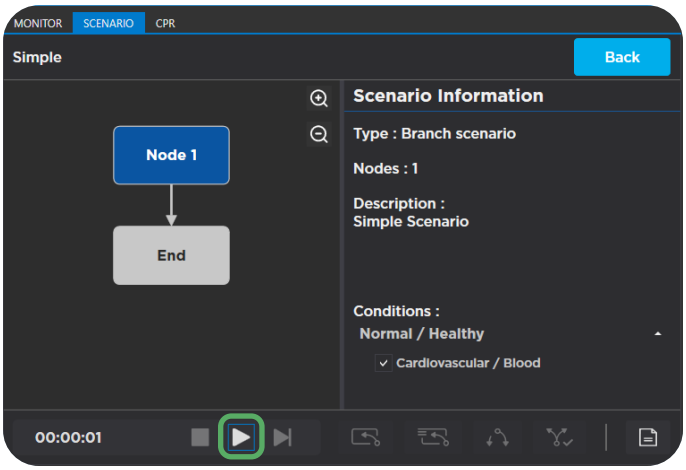
How to Play a Scenario

After creating a scenario the next step is to load and play it!

To load and play your scenario:

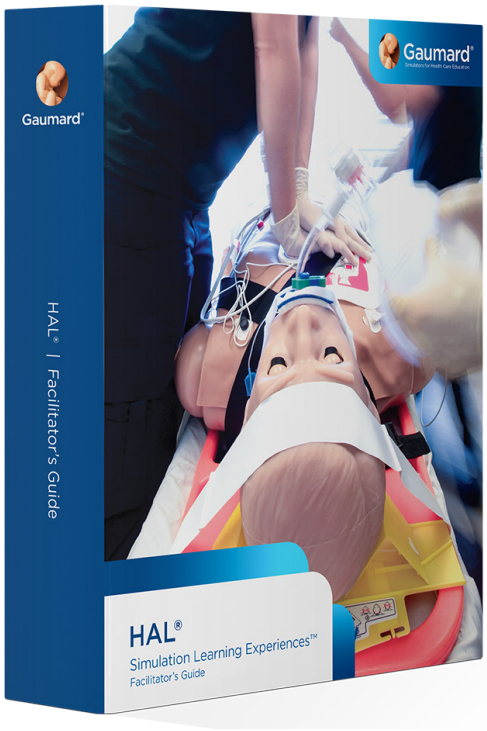
1. In UNI 3 along the top toolbar, click the **Scenario** tab.
2. Select the desired scenario.
3. Click **Load**.
4. Click **Play**.





4.2.2. Simulated Learning Experiences (SLE)

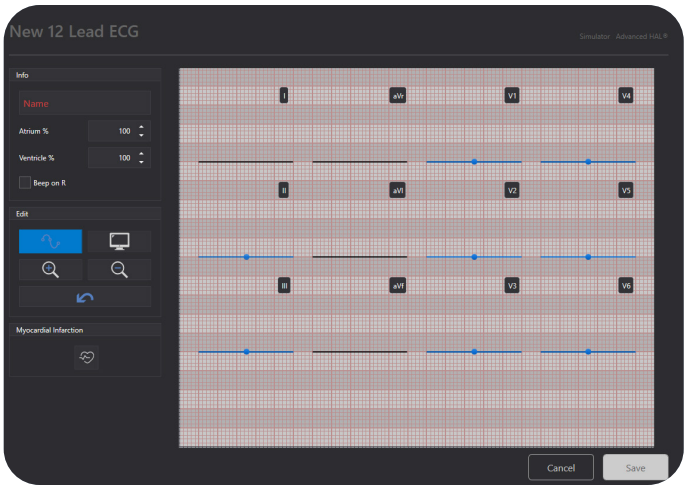
HAL S3201 Simulated Learning Experiences (SLEs) package provides you with a library of ready-to-use, evidence-based scenarios designed to help maximize participant's learning through outcome-focused simulated clinical patient encounters. The package includes 10 SLEs complete with a facilitator's guidebook for planning, setting up, and facilitating each learning experience:



- Acute Anterolateral Myocardial Infarction
- Acute Sepsis Related to Diabetic Ulcer
- Atrial Fibrillation
- COPD Exacerbation
- Diabetic Ketoacidosis
- Opioid Overdose
- Pulmonary Embolism
- Sepsis Related to Pneumonia
- Severe Sepsis
- Supraventricular Tachycardia

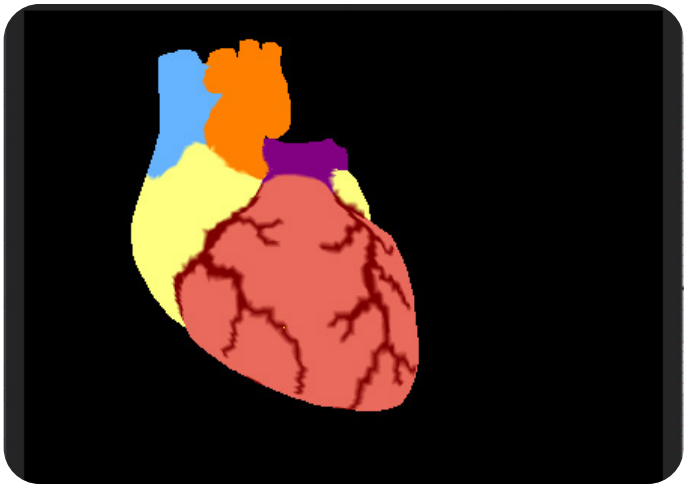
4.3 ECG DESIGNER & MYOCARDIAL INFARCTION MODEL

HAL S3201 is equipped with a 12 Lead Chest Skin and ECG Pacer Module as standard which is required to work with UNI 3's 12 Lead ECG Designer.



The 12 Lead ECG Designer allows you to create your own ECG rhythms, select them in the UNI software, and display their waveforms on real medical monitoring equipment, the Monitor tab in UNI 3, or a Bedside Virtual Monitor (option available for purchase). All 12 Lead Chest Skins have the ability to use the ECG Designer in their UNI software.

Embedded in the 12 Lead ECG Designer, the Myocardial Infarction (MI) Model tool is used to assist in creating MI images and corresponding ECG rhythms.

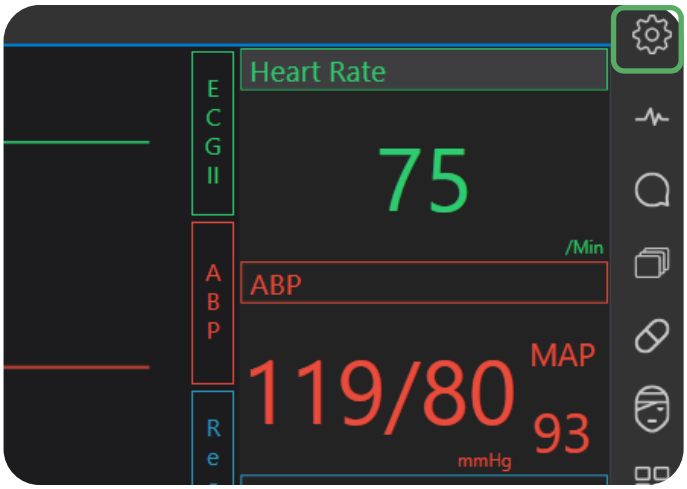


4.3.1. Access, Create, Save, & Load a Custom 12 Lead ECG

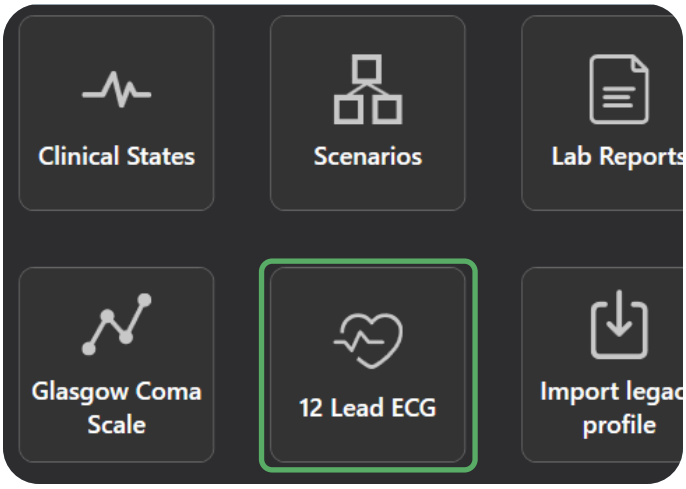
Access the 12 Lead ECG Designer

To open the 12 Lead ECG Designer:

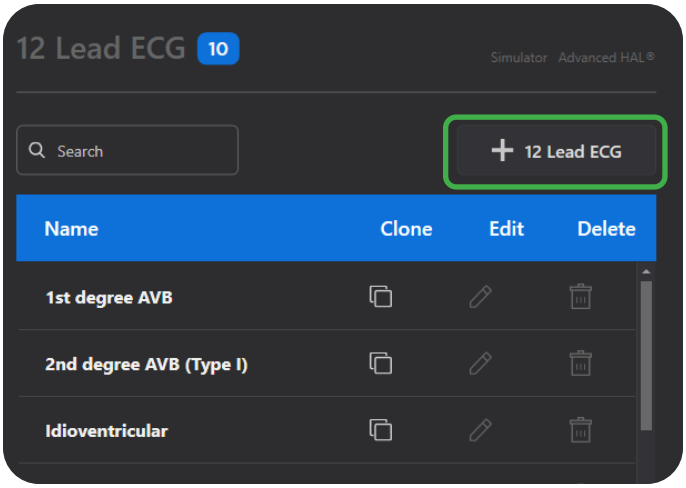
1. In UNI 3, click on the **Settings** menu in the upper right corner.



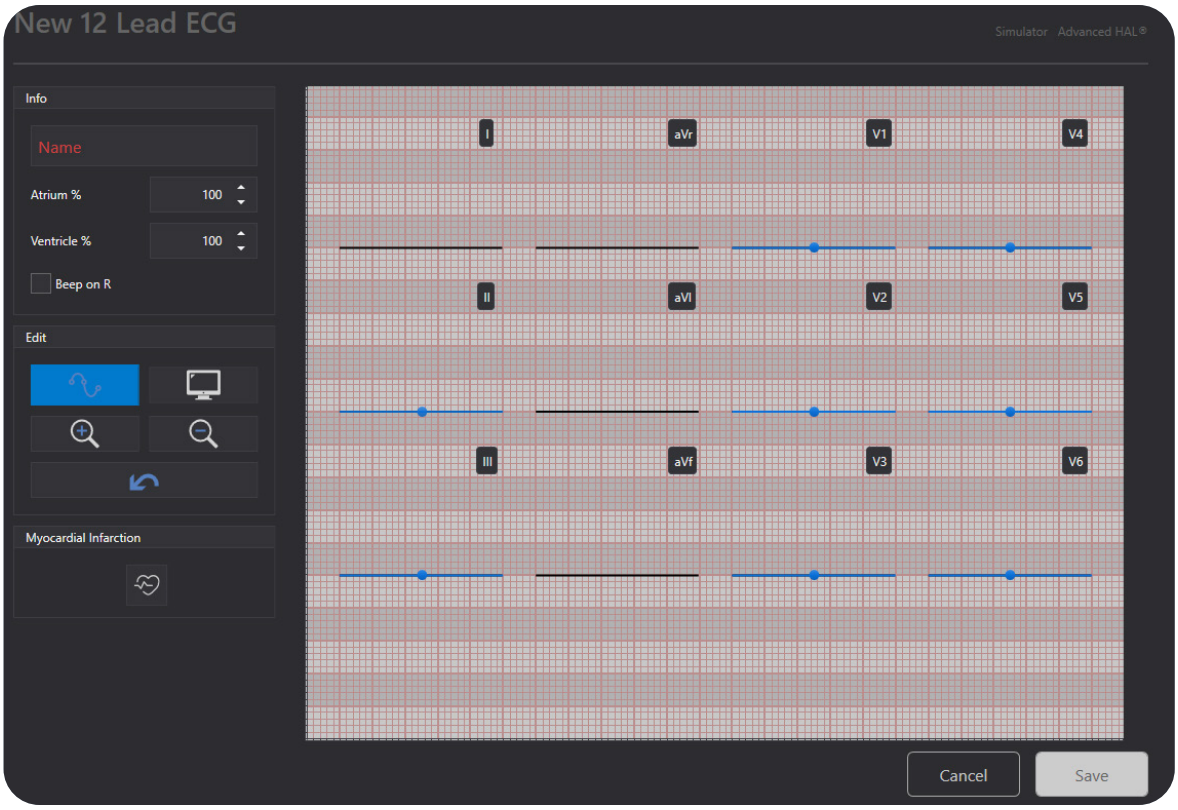
2. Under **Simulator Model**, click **12 Lead ECG**.



3. Click **+ New 12 Lead ECG.**



This will open the ECG Designer window where you may customize your own ECG.



Create a 12 Lead ECG

The ECG Designer opens with a set of flat lines in all waveforms. These flat lines can be adjusted to create new rhythms or existing rhythms can be loaded and edited. Whether creating a new ECG from scratch or editing a pre-existing rhythm they can all be saved and become part of the UNI ECG library.

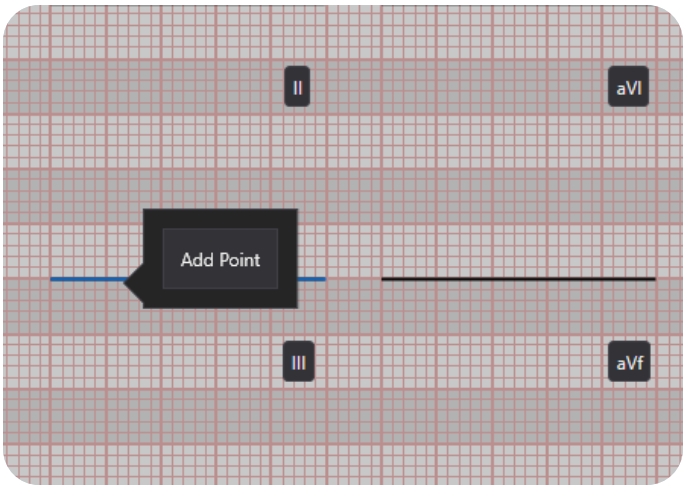
Rhythms drawn in the ECG Designer are assumed to be 60 beats per minute. Any morphology changes as a result of lower or higher rates will be automatically handled by the UNI software.

Waveforms I, aVR, aVl, and aVF are dependent on Lead II therefore they cannot be edited directly but rather indirectly based on changes to Lead II.

To create a new rhythm from scratch when starting with all flat lines for the waveforms:

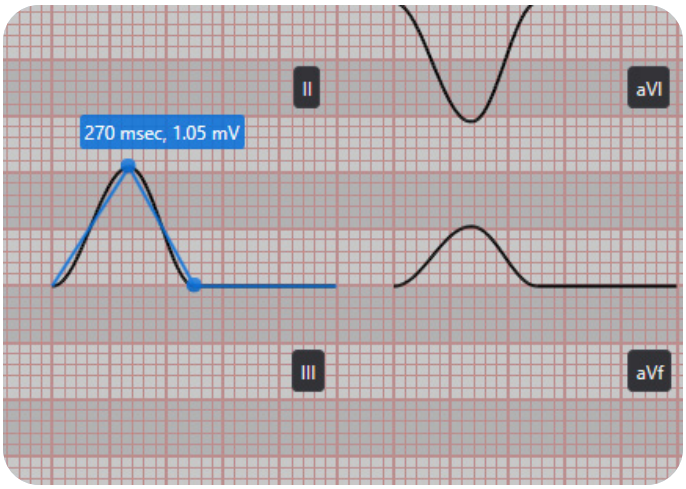
1. Click on any of the blue highlighted leads/waveforms to **Add Point**.

   Add as many points to the lead/waveform as needed. These points are used to drag the lead/waveform into the desired parameters (amplitude, trough, wavelength, etc.,).



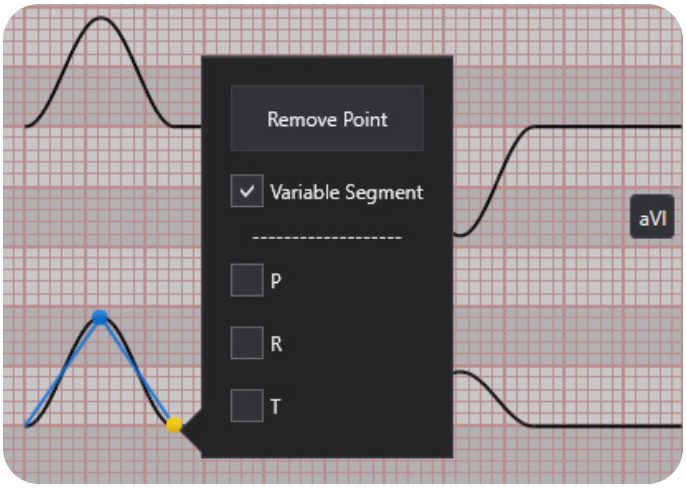
2. Drag the points on the lead/waveform to shape into the desired EKG waveform.

   As the point is dragged the EKG Designer will tell you the units of ms/mV of the new location for the point.



3. If desired, a **Variable Segment** can be identified. This refers to the line between two points that can be extended or reduced as the heart rate decreases or increases. Click on a desired point and select **Variable Segment**.

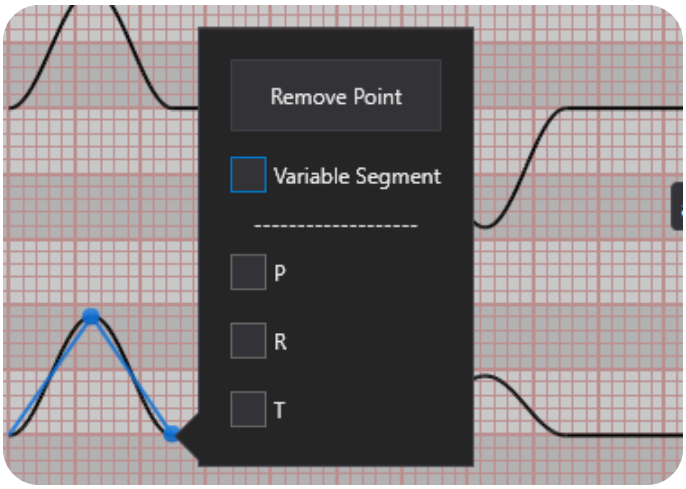
   Once selected, the variable segment will become highlighted in yellow. If a variable segment is present, this segment needs to be identified on all lead waveforms.



To remove elements added to the lead/waveform:

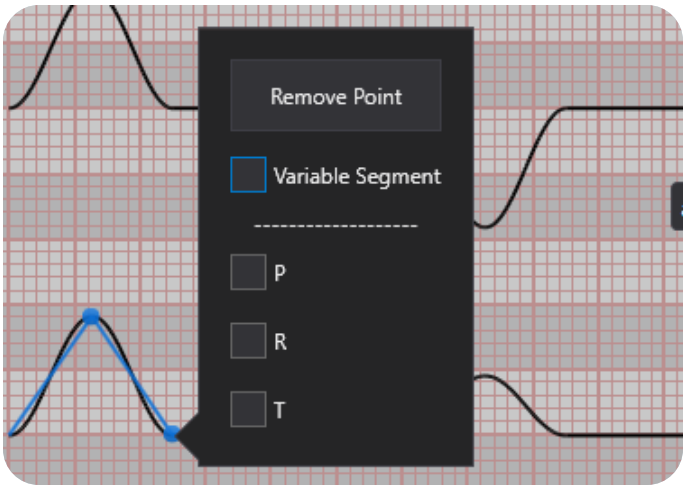
1. To remove the highlighted **Variable Segment**, right click on the point and de-select the **Variable Segment** option.

   This will remove the yellow highlight for that segment.



2. To remove a point, right click on the point and select **Remove**.

   When a point is removed the waveform will revert back to its x-axis.



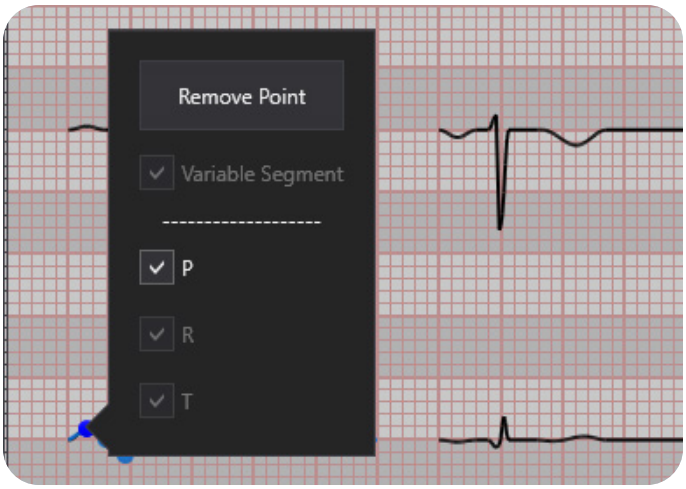
Assigning Variables to a 12 Lead ECG

When creating custom ECG rhythms it is important to identify P, R, & T points on Lead II so, if desired, the ECG can be properly synched to "Beep on R" when connected to real medical monitoring equipment or a Bedside Virtual Monitor.

On Lead II add enough points and drag them into the desired form as discussed in the previous section, then:

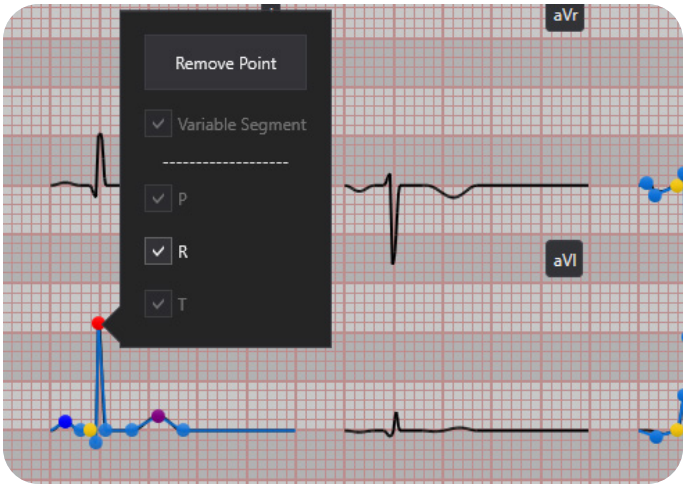
1. To identify the **P** point, right click on the desired point and select **P**.

Once selected, the P point will appear as a blue dot on the waveform.



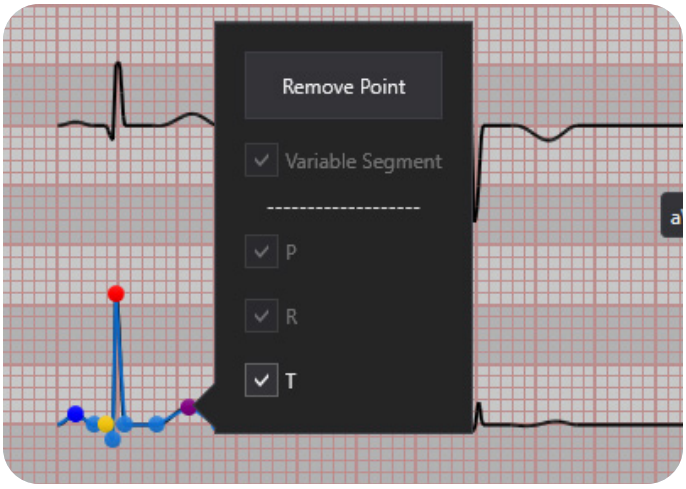
2. To identify the **R** point, right click on the desired point and select **R**.

Once selected, the R point will appear as a red dot on the waveform.



3. To identify the **T** point, right click on the desired point and select **T**.

Once selected, the T point will appear as a purple dot on the waveform.



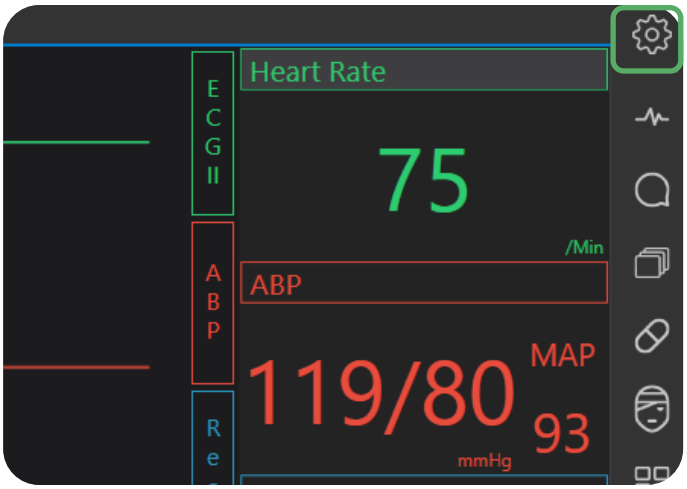
Modify a Pre-Existing ECG

It is also possible to load a pre-existing ECG rhythm, make further changes, and save it as a new rhythm.

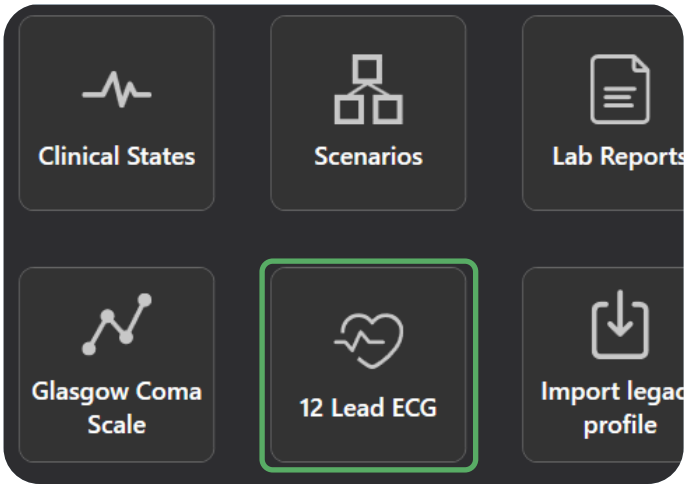
There are some default ECG rhythms that cannot be directly modified which include **1st degree AVB**, **2nd degree AVB (Type I)**, **Idioventricular**, **Junctional**, **LBBB**, **RBBB**, **Sinus**, **Supraventricular tachycardia**, **Vent**. **tachycardia unifocal (narrow)**, and **Vent**. **tachycardia unifocal (wide)**. It is easy to identify these as the non-editable ones since the **Edit** icon will be grayed out for them. Instead, these ECGs can be cloned, or copied, and the edits can be done and saved on this copy. All other custom created ECGs can be directly edited or copied and edited as well.

To modify an existing ECG file:

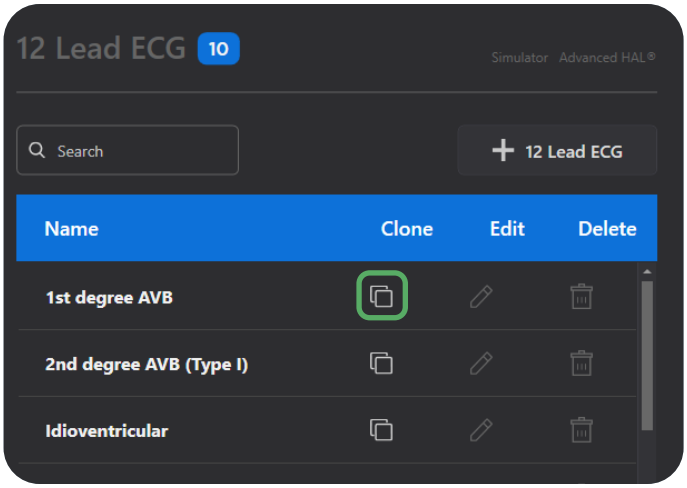
1. In UNI 3, click on the **Settings** menu in the upper right corner.



2. Under **Simulator Model**, click **12 Lead ECG**.

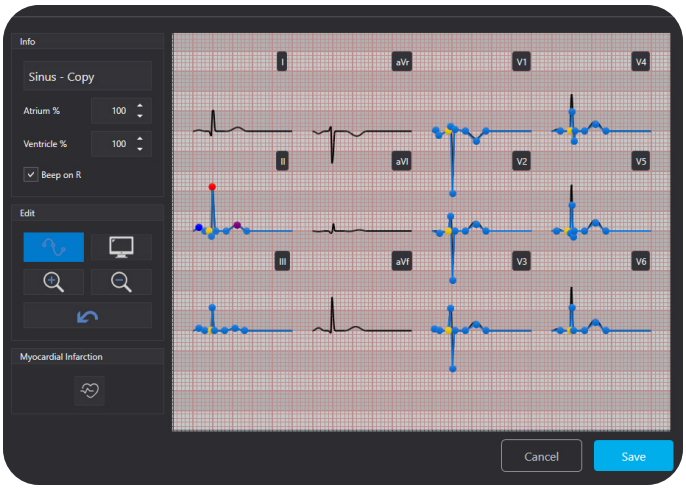


3. Click the **Clone** icon on the selected ECG rhythm**.**



Or, if the **Edit** tool is available for the selected ECG rhythm, click the pencil icon.

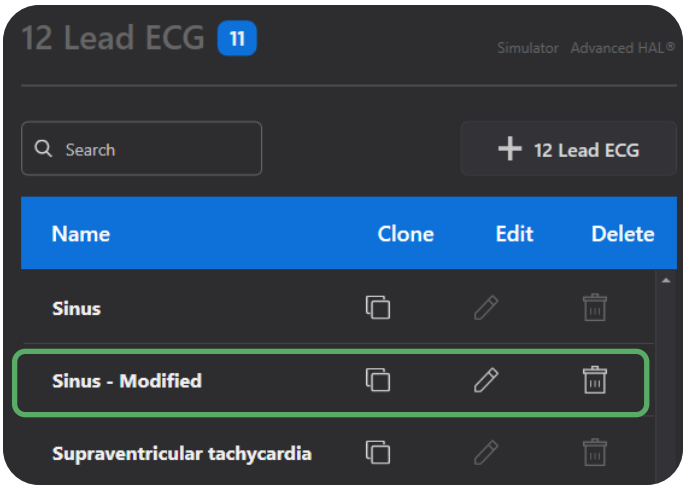
4. This will open a copy of the selected ECG rhythm. Make your modifications to the ECG rhythm.



As discussed in the previous sections, the adding and removing of points, variable segments, and identification of P, R, T points can also be done to ECG files copied and edited.

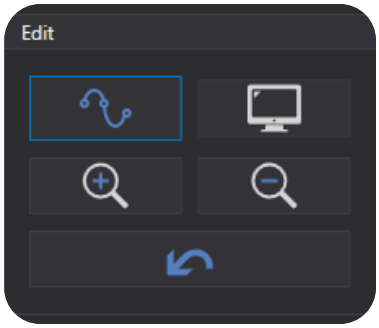
5. Click **Save**.

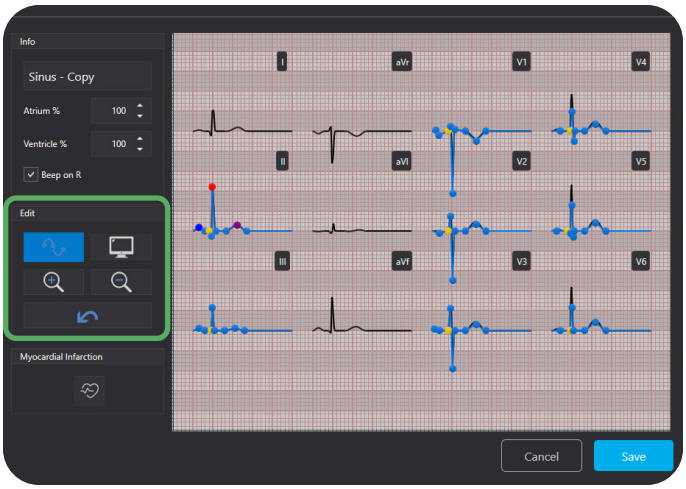
The edited and saved ECG rhythm will now appear as part of the 12 Lead ECG rhythm list.



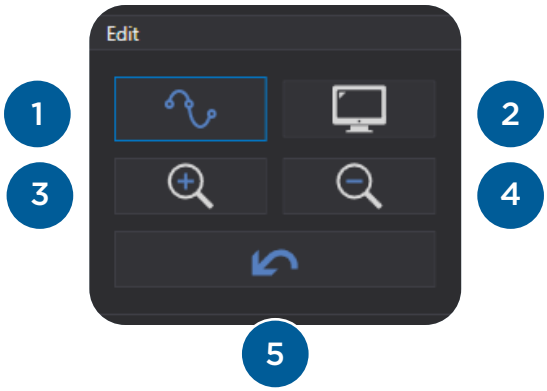
Other Editing Tools

In addition to the previously discussed ways to edit ECG waveforms, the left side **Edit** toolbar can also be utilized.





The tools in this toolbar include:



1. **Preview**: View the waveforms as they would appear on a monitor (without points and highlights).

2. **Preview Rhythm on VM**: See the EKG rhythm on the UNI Virtual Monitor tab and/or to a connected Bedside Virtual Monitor.

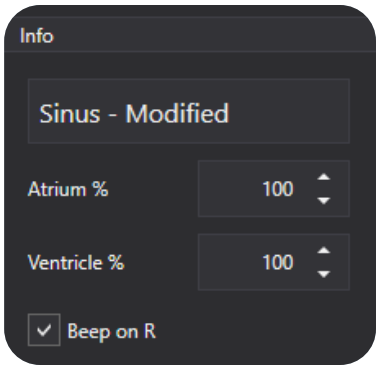
3. **Zoom to Lead**: Click this button then the desired lead for closer inspection.

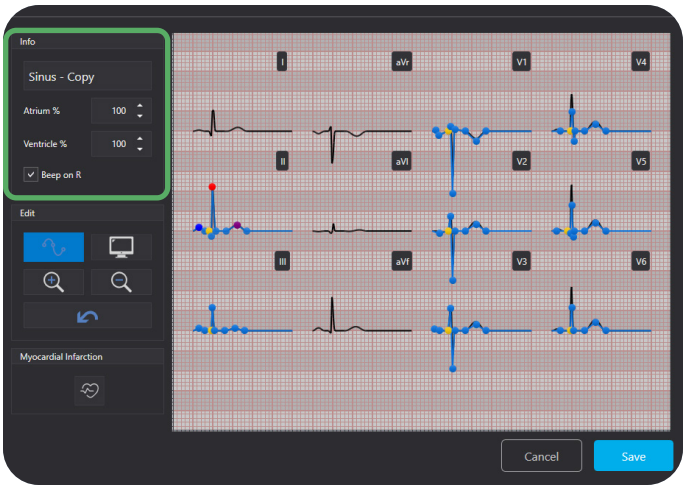
4. **Zoom Out**: Click this button to revert to the normal view of all leads.

5. **Reset 12 Lead**: Click this to reset all leads to their baseline.

Save an ECG Rhythm

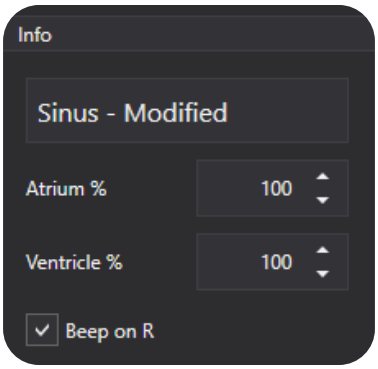
After creating a custom ECG or editing an existing one, use the left side **Info** toolbar to save the ECG.





To save an ECG:

1. Type a name for the ECG rhythm into the text field.

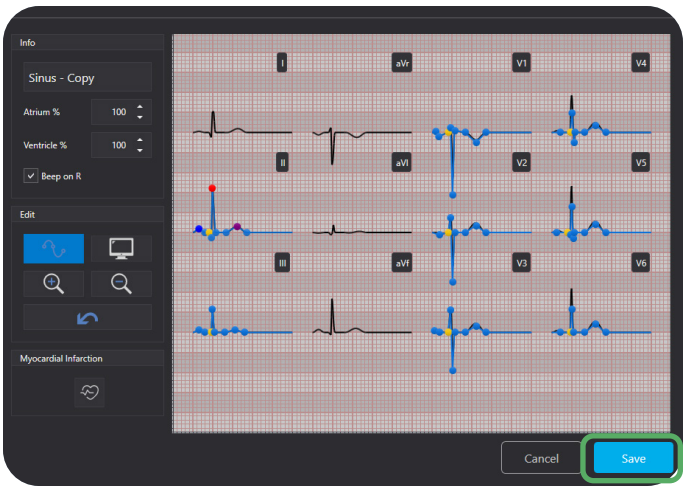


2. Determine the **Atrium** and **Ventricle** percentages for the created ECG.

   The percentage set for the **Atrium** and **Ventricle** here will determine Blood Pressure and Oxygenation. 100% indicates optimal blood flow.

3. If desired, checkmark **Beep on R**.

   Beep on R refers to the point on Lead II that was assigned to be **R** and when this box is checked it will tie the heart sound to beep on the **R** point when played on a Bedside Virtual monitor or real medical monitoring devices.



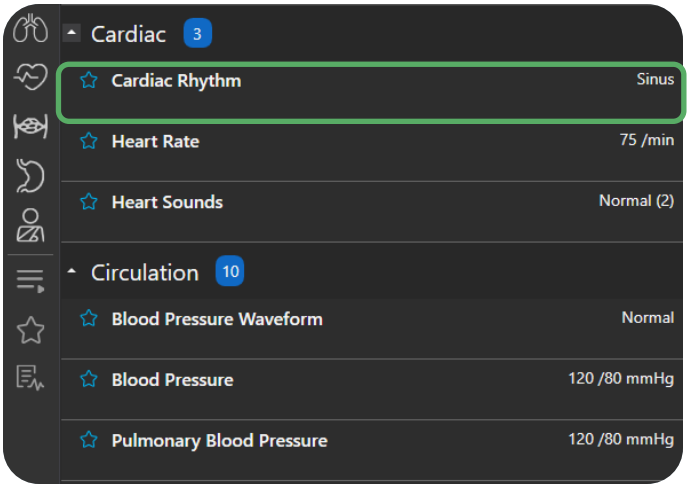
4. Click **Save**.

Load a Custom ECG Rhythm

After creating and saving an ECG they become part of the UNI 3 **Cardiac Rhythm** library.

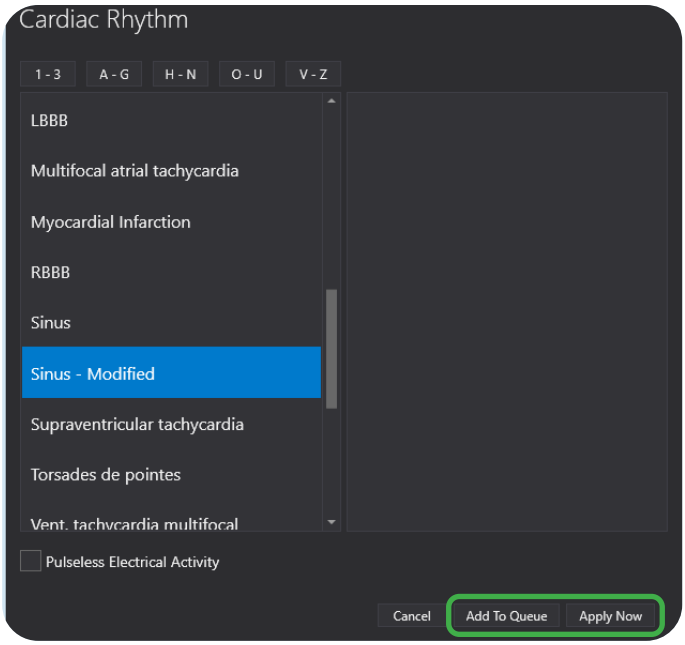
To access the ECGs in the **Cardiac Rhythm** library:

1. In UNI 3, under the **Cardiac** section click **Cardiac Rhythm**.



2. Search the Cardiac Rhythm list for the name of the created ECG and select it.

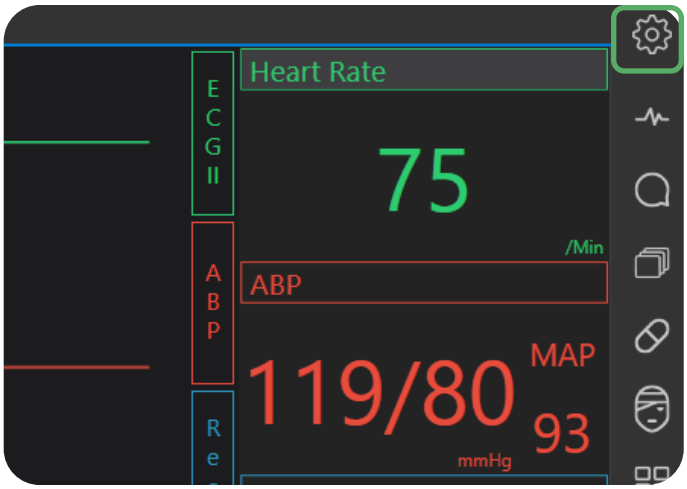
3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.



4.3.2. Myocardial Infarction (MI) Model Access & Tools

Access the Myocardial Infarction (MI) Model

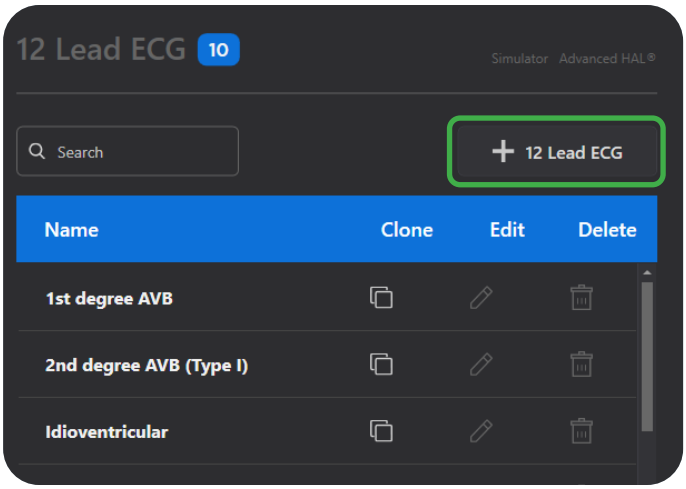
The Myocardial Infarction (MI) model is a tool to help generate a 12 Lead ECG due to a lesion on the heart. Once a lesion has been added (Ischemia, Injury, Necrosis) a 12 lead Rhythm will be generated on the designer. Use the ECG Designer to modify the rhythm and save it. Changes on the 12 Lead ECG designer will not be reflected on the MI model.



The MI Model is part of the 12 Lead ECG Designer. To access it:

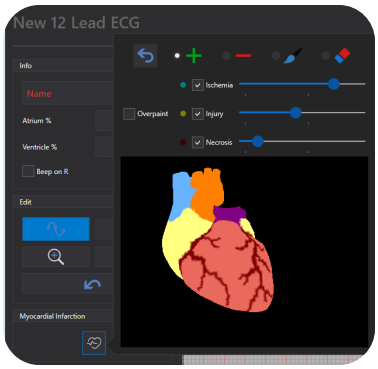
1. In UNI 3, click on the **Settings** menu in the upper right corner.

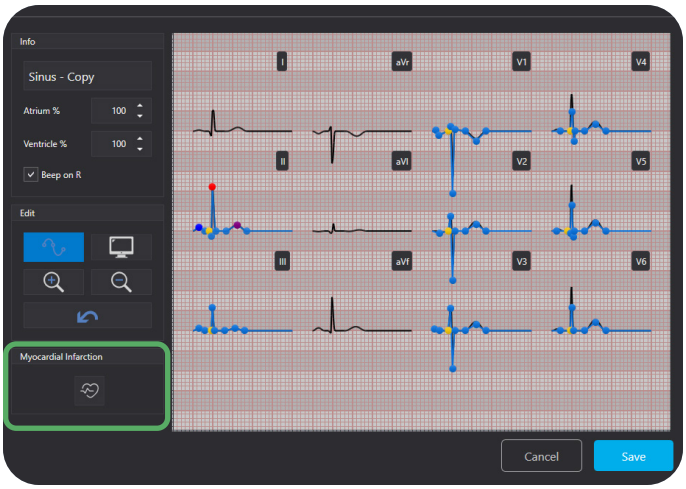
2. Under **Simulator Model**, click **12 Lead ECG**.



3. Click **+ New 12 Lead ECG.**

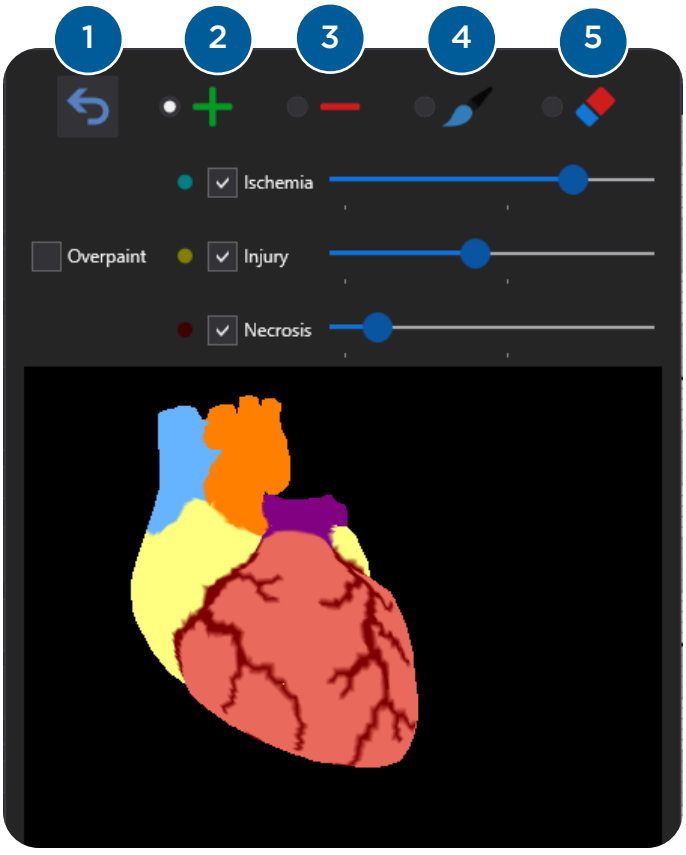
4. Click on the Myocardial Infarction icon to open the model.





MI Model Top Toolbar

The MI Model has various tools available to assist in creating lesions on the 3D model of the heart. The tools across the top are as follows:



1. **Reset**: Reset the MI Model back to a healthy state. A warning message will ask if you are sure.

2. **Add Occlusion Point**: Assign the level of severity of Ischemia, Injury, and Necrosis using the slider bar and click this button to apply those properties to the 3D heart model.

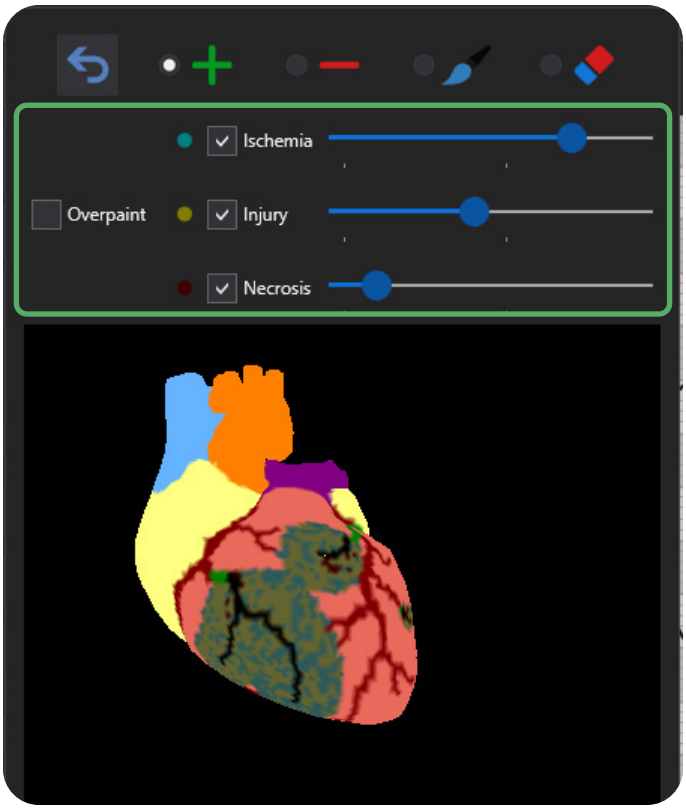
3. **Delete Occlusion Point**: Check mark the types of lesions (Ischemia, Injury, and/or Necrosis) that need to be removed from the 3D heart model, click this button, and then click the green occlusion points to remove.

4. **Paint brush**: Select a brush type (Ischemia, Injury, and Necrosis) to paint that injury anywhere on the 3D heart model.

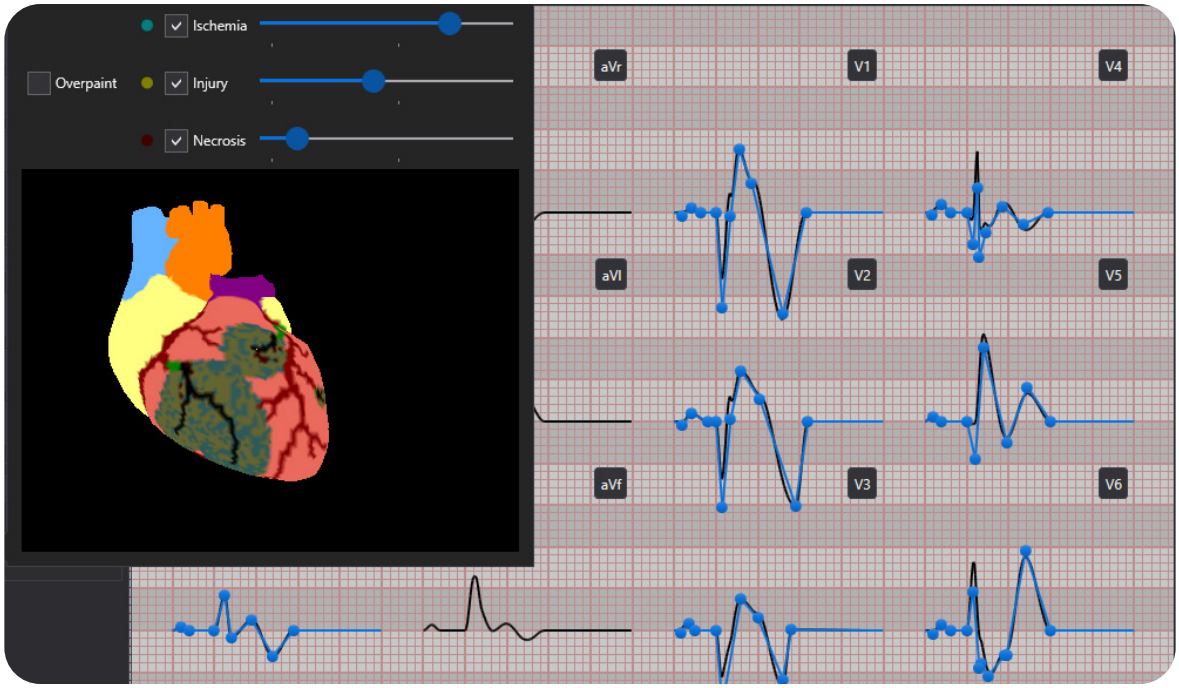
5. **Eraser**: Select the eraser and type of injury to erase to pass the eraser over the 3D heart model to remove.

MI Model Lesion Tools

The lesion tools for the MI model includes ischemia, injury, and necrosis. Use the slider bars here for each type of lesion to increase or decrease the intensity that will be applied when an occlusion point is added to the heart model.



As lesion intensity and occlusion points are added to the MI Model, an ECG is generated from this trauma and is available to save and use as a **Cardiac Rhythm** for HAL. Refer to the previous section on how to save newly created or edited ECGs.



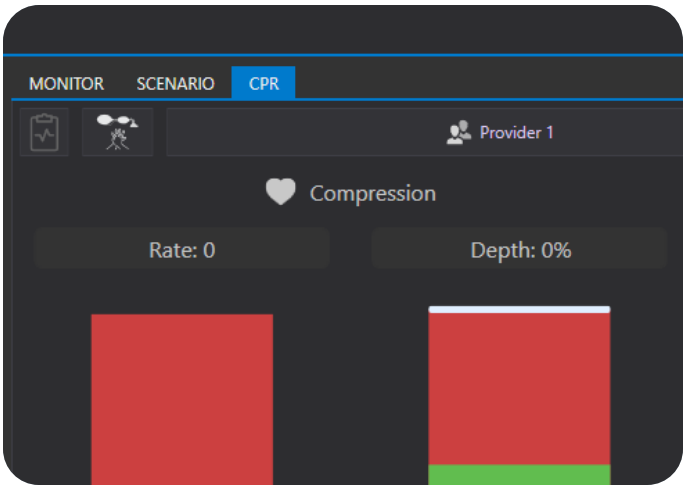
4.4 CARDIOPULMONARY RESUSCITATION (CPR)

Cardiopulmonary Resuscitation (CPR) is an emergency lifesaving procedure performed when the heart stops. Per the American Heart Association, immediate CPR can double or triple chances of survival after cardiac arrest by keeping the blood flow active - even partially.

UNI 3 features a CPR performance evaluator and trainer that may record CPR cycles, provide CPR evaluations, and generate reports. This CPR feature is a great tool to evaluate compressions and ventilations effectiveness according to the user defined settings.

The CPR tab is located within UNI 3 towards the top of the software. To view the CPR window:

1. Located at the top of UNI 3, click on the **CPR** tab.



This will display the CPR window with the following features:

1. Reports
2. Simultaneous Ventilation & Compression
3. Compression Provider
4. Switch Providers
5. Ventilation Provider
6. Coach
7. Record
8. Compression Rate
9. Compression Depth
10. Compression to Ventilation Ratio
11. Total CPR Cycles
12. Total CPR Time
13. Ventilation PIP
14. Ventilation Duration
15. Graphical Representation of Compressions and Ventilations
16. Airway System View

4.4.1. CPR Settings

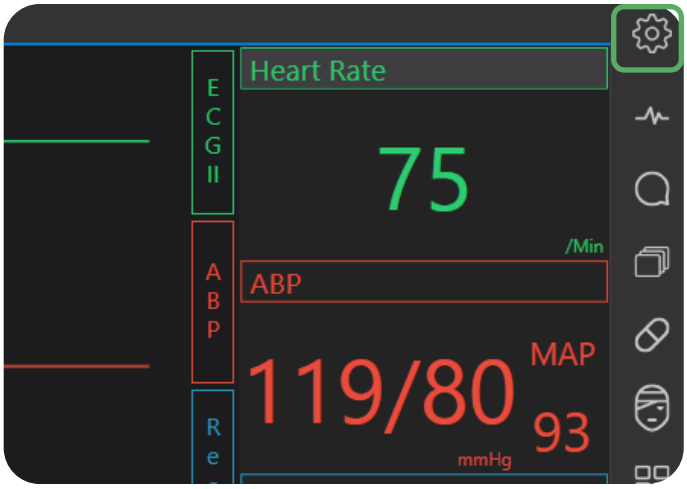
UNI 3's CPR settings are customizable to suit your simulation needs.

Access the CPR settings to adjust:

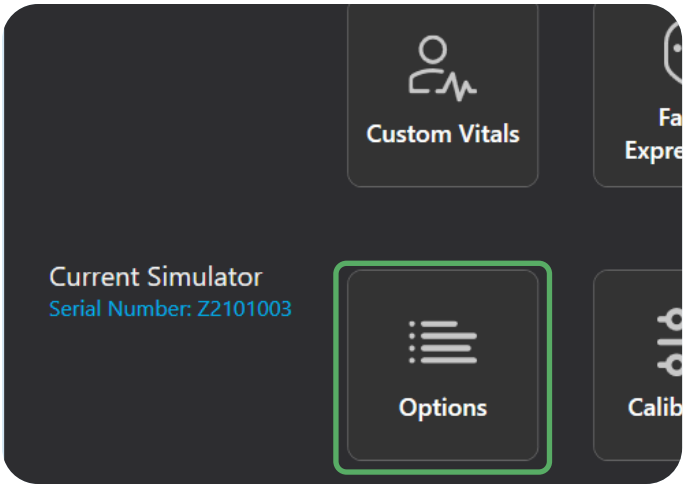
- Compression per Ventilation Ratio
- Compression Rate
- Compression Depth
- Ventilation Rate
- Ventilation PIP
- Ventilation Duration
- Release Threshold
- CPR Automatic Calculations for EtCO2, Blood Pressure, and Oxygen Saturation

To access the CPR settings:

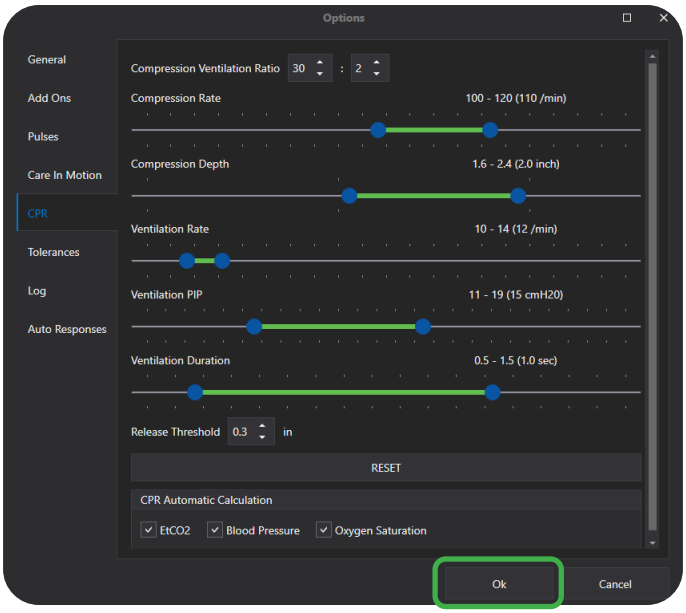
1. In UNI 3, click on the **Settings** menu in the upper right corner.



2. Under **Current Model**, click **Options**.



3. On the left side, select the **CPR** tab and make adjustments to the CPR settings.



4. Click **Ok**.

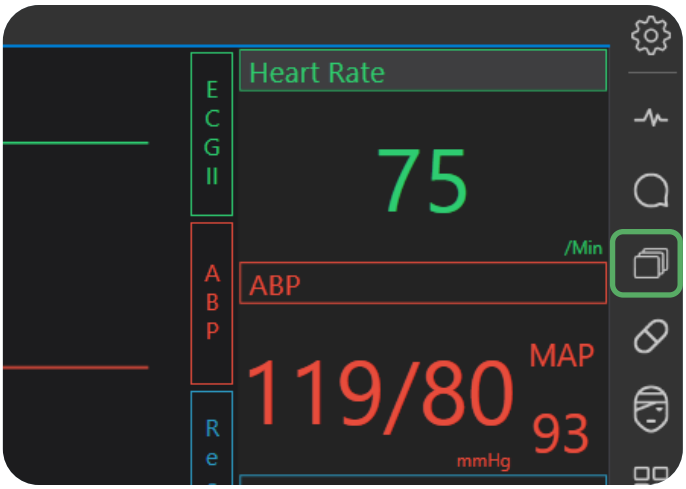
4.4.2. Providers, Coach, Record, & Report

Designate Providers

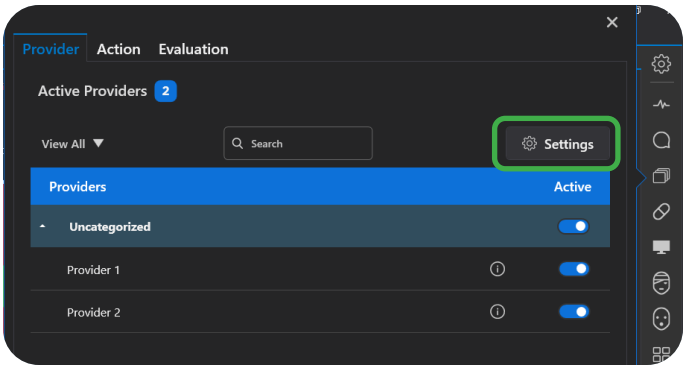
In order to designate **Providers** for delivering compressions and ventilations, the names of your Providers need to be created to UNI 3.

To create **Providers**:

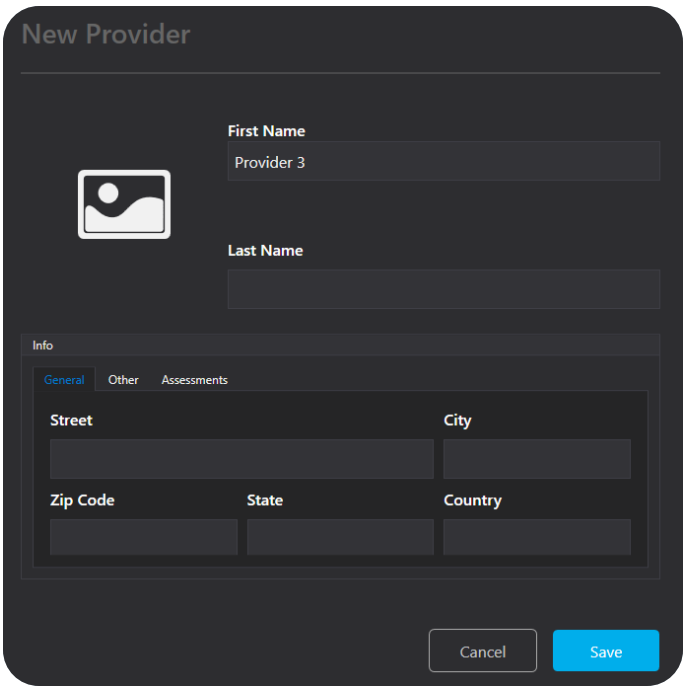
1. Click on the **Providers/Actions** icon from the right toolbar.



2. Click **Settings**.

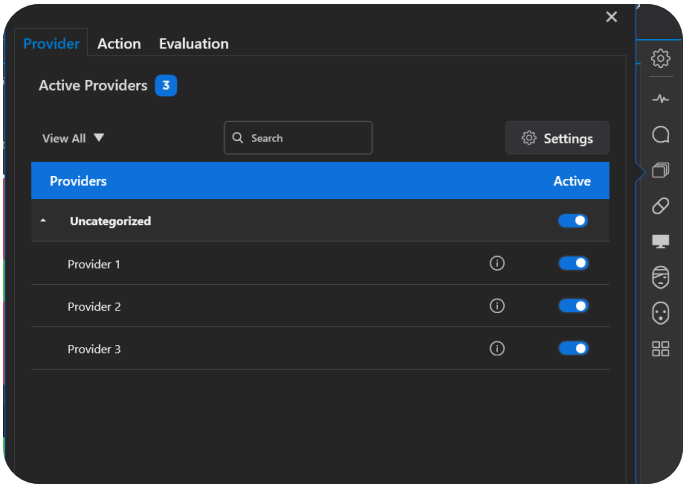


3. Click **+ New Provider**.



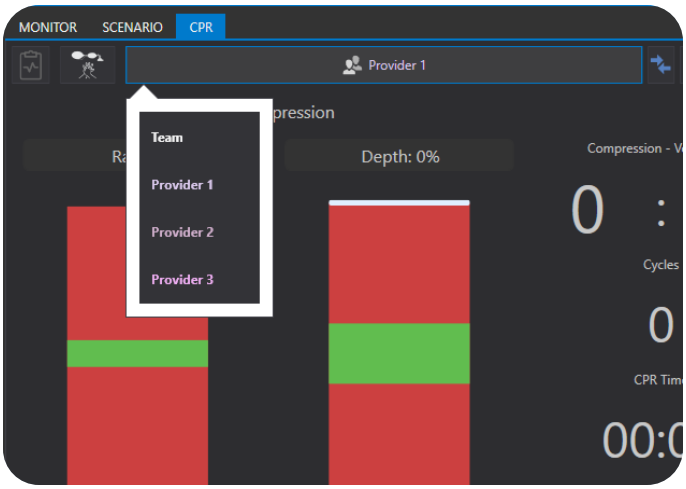
4. Click **Save**.

5. Click on the **Providers/Actions** icon from the right toolbar and switch **Active** ON.



To designate a **Provider** for compressions and ventilations for a CPR session:

1. On the **CPR** window, click on the **Compression Provider** button.
2. Select the desired **Provider** for chest compressions.



3. On the CPR window, click on the **Ventilation Provider** button.
4. Select the desired **Provider** for ventilations.

Coach a CPR Session

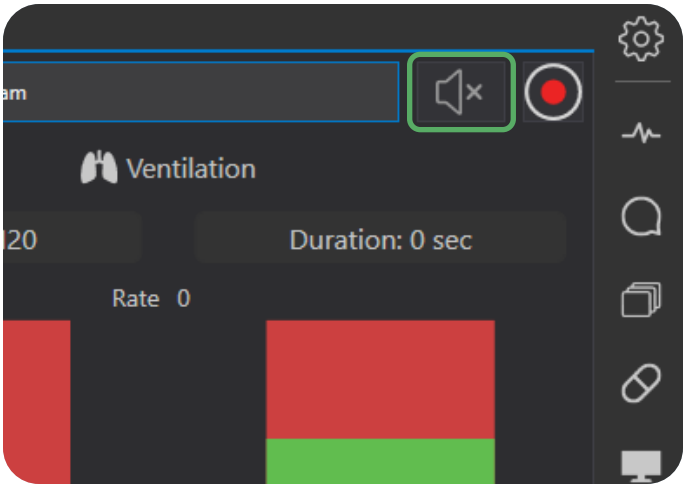
The **Coach** mode generates audible cues for the compression to ventilation ratio programmed in the CPR settings. For example, if the Compressions to Ventilation ratio is set to 30 compressions to 2 ventilations, the Coach mode will start with 30 short beeps to signal the compressions followed by 2 long beeps to signal the ventilations.

Coach mode also enables audible commands when the detected chest compressions meet the following criteria:

- If the detected chest compressions per minute are below the programmed CPR settings, the audible command **FASTER** is played.
- If the detected chest compressions per minute are above the programmed CPR settings, the audible command **SLOWER** is played.
- If the detected chest compression depth is below the programmed CPR settings, the audible command **HARDER** is played.
- If the detected chest compression depth is above the programmed CPR settings, the audible command **TOO DEEP** is played.
- If the detected chest compressions recoil is not complete, the audible command **RELEASE** is played.

To turn **Coach** mode **ON**:

1. On the **CPR** window, click the **Coach** button.
2. To turn **Coach** mode **OFF**, click the **Coach** button again.

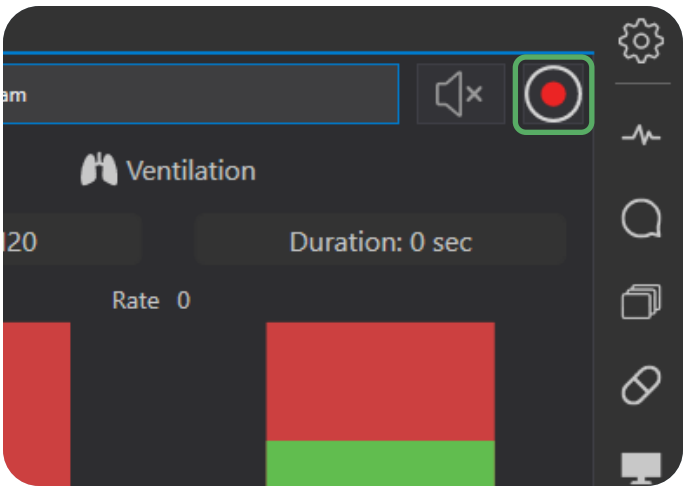


Record a CPR Session & Generate a Report

Compression and ventilation data that is displayed on the CPR window and in the UNI 3 log can be recorded and used to generate a report after a CPR session is completed. CPR sessions can incorporate all of the optional features mentioned in the previous sections or use the default settings the CPR window is loaded with.

To start recording a CPR session:

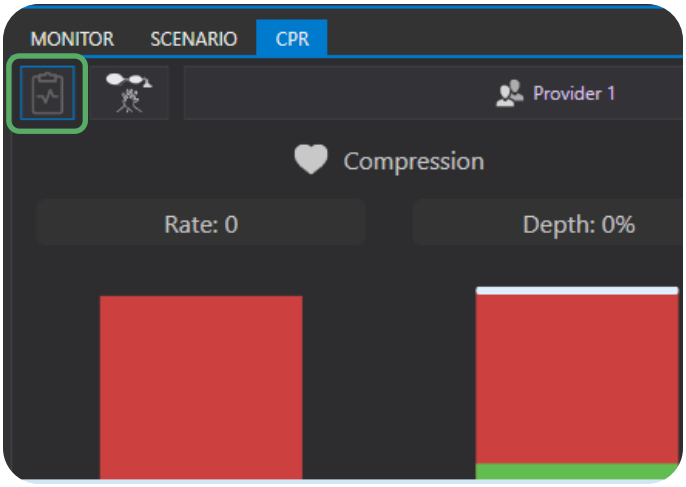
1. On the **CPR** window, click the **Record** button.
2. To stop a recording, click the **Record** button again.



Once a CPR session has been recorded, all of the data will be collected and will automatically generate a CPR **Report**.

To access the CPR **Reports:**

1. On the **CPR** window, click the **Reports** button.



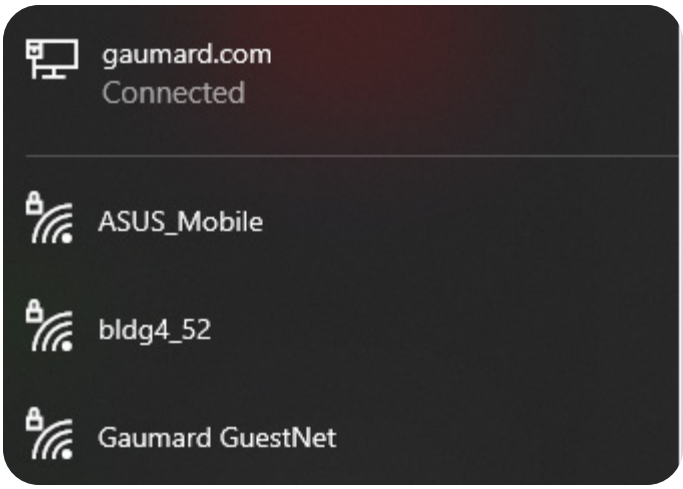
5. Routine Maintenance

5.1 UPDATING UNI 3

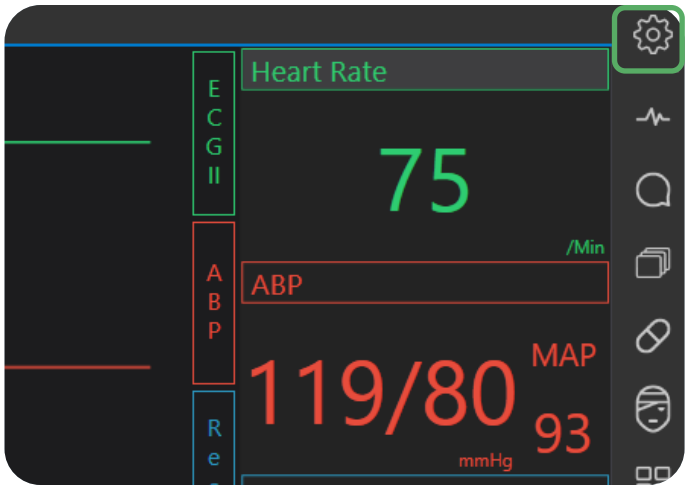
It is important to update UNI 3 to the latest version for any added features, improvements, and fixes!

To update UNI 3:

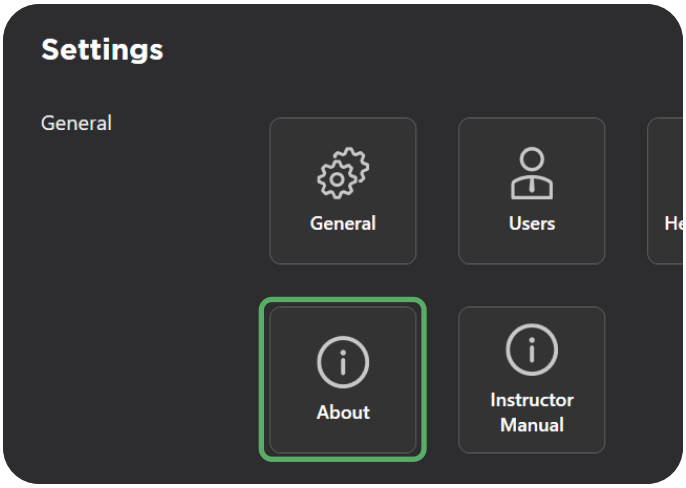
1. Connect the UNI 3 tablet/PC to a Wi-Fi network that has internet.



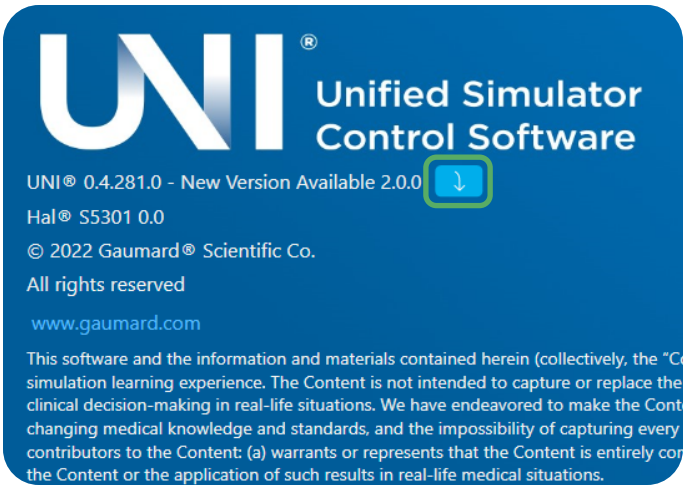
2. Launch **UNI 3**.
3. Click **Settings**.



4. Under the **General** section, click **About**.

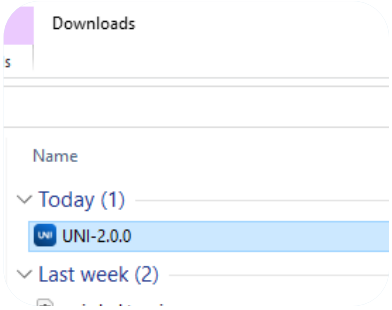


5. On the **About** window, click on the **Download** button.

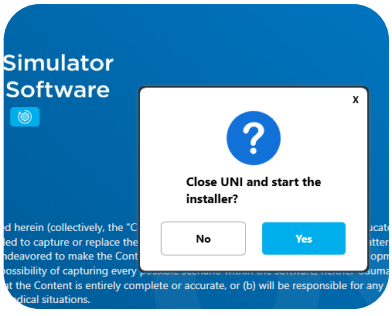


There are two options here:

6. Click the **Folder** icon to go to the installer downloaded to your tablet/PC's **Downloads** folder.



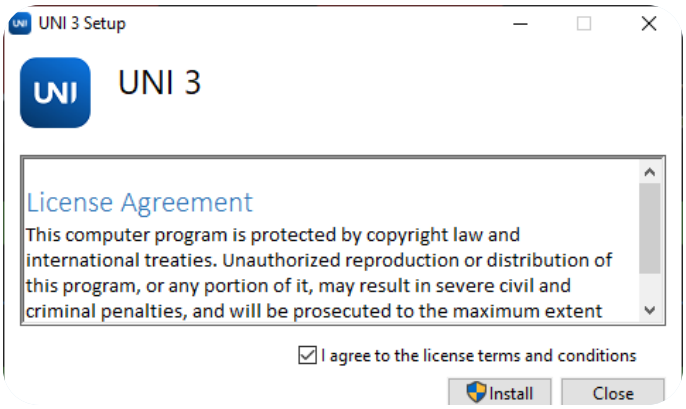
7. Or, click the **Gear** icon to close UNI and start the installer.



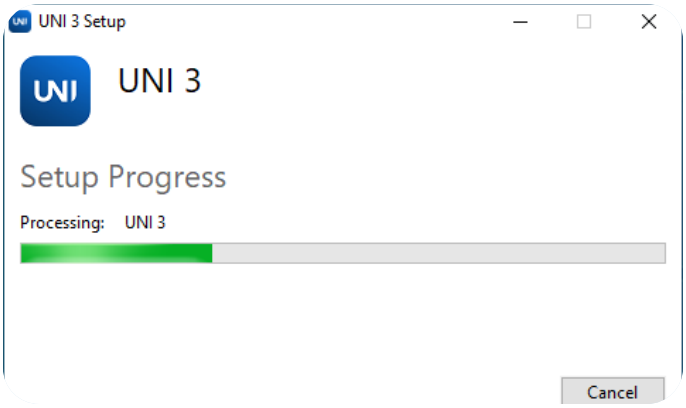
For either option, you will have to launch and run the installer:

1. Check the agreement to the license terms and conditions.

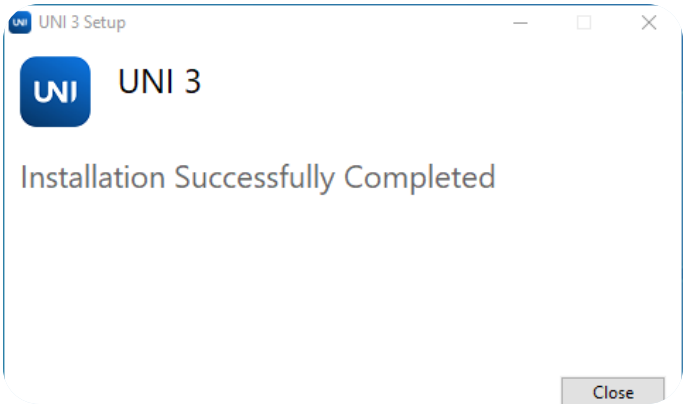
2. Click **Install**.



Allow UNI 3 to install the updates. A progress bar will display the installation process.



3. Once the installation is successfully completed, click **Close**.



4. Double click the **UNI 3** icon on your desktop to launch the updated software.

5.2 BATTERY CYCLING & STORAGE

Battery Cycling

The battery is an integral part of your simulator and requires appropriate care to maintain efficiency and longevity.

Overcharging or leaving the battery idle for long periods of time will damage the battery and lower the amount of potential charge overtime.

To ensure maximum battery life, cycle the battery and avoid overcharging by adhering to the following warnings and guidelines.

Avoid Overcharging the Battery

Do not leave the simulator charging continuously for extended periods of time (i.e., several days). It is best practice to disconnect the battery charger once the battery is fully charged.

- It is recommended to charge the simulator the day or night before a simulation to allow the battery time to fully charge.
- Unplug the simulator when in use unless while running a simulation the UNI software indicates a critically low battery. In these cases, it is advisable to plug in the simulator's battery charger to act as a power supply to finish the simulation. Once the simulation is completed, turn the simulator off and allow the simulator's battery to charge.

Avoid Battery Idleness

Do not leave the simulator idle for extended periods of time (i.e., months, years). The battery's capacity for charge will deteriorate if there is no cycling in the level of charge.

- If you plan to store away and not use the simulator for an extended period of time, it is recommended to fully charge the battery before storage. As part of routine maintenance, plan a time each month to cycle the battery and fully charge it before storing the simulator away again.

Cycling the Battery

1. Obtain the correct battery charger for the simulator and plug the wall adapter end into a voltage source.
2. With the simulator turned off, plug the charger into the charging port on the simulator.
3. Leave the simulator plugged into the charger until the LED light on the simulator's charger is green.
4. Disconnect the simulator from the charger.
5. The simulator is ready to be used for simulation.
6. Use the simulator's battery charge until depleted.
7. Repeat this process as needed.

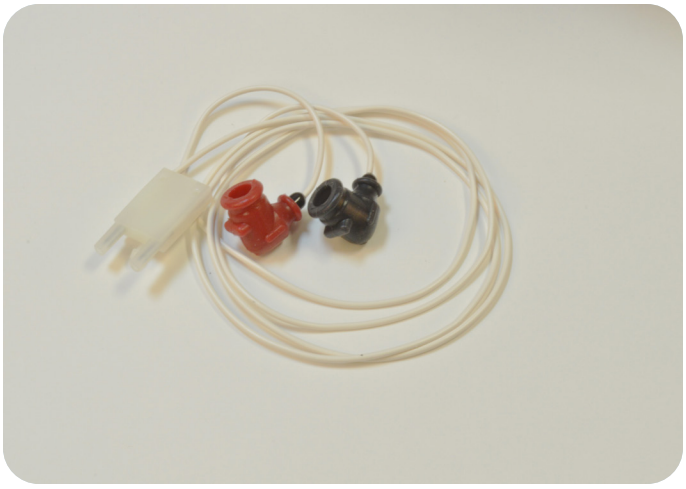
If preparing the simulator for storage, arrange for a time every month to "cycle the battery" of the simulator. Then, store the simulator with a fully charged battery until the next scheduled usage.

Never store your simulator with a depleted battery for an extended period.

6. Options

6.1 SNAP COMPATIBLE DEFIBRILLATION SITES

At initial time of purchase HAL S3201 and S3000 have the option to install snap compatible defibrillation sites. These snaps allow for easy attachment and clean up of a modified defibrillation snap adapter cable which allows the simulator to be hooked up to real medical monitoring equipment.



6.2 LEFT TRAUMA ARM & LEFT TRAUMA LEG

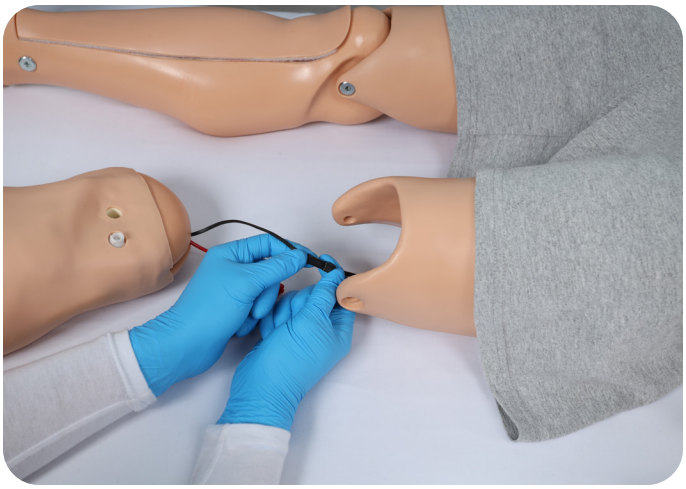
At the initial time of purchase of HAL S3201 and/or S3000, customers have the option to purchase trauma limbs (left arm & left leg only) to add additional functionality to the simulator.

Assemble the Left Trauma Leg

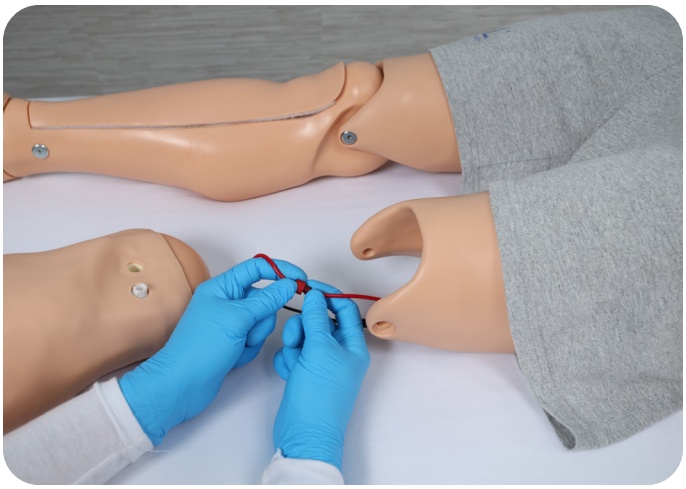
1. Remove the lower left leg as shown in section "Leg Assembly" on page 15.

2. Obtain the Trauma Leg.

3. Connect the black power cable from the **Trauma Leg** to the corresponding black power cable coming from the thigh.

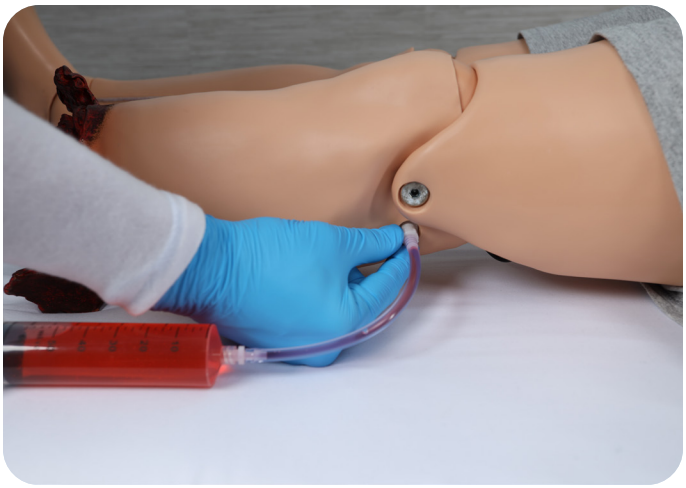


4. Connect the red pulse line from the **Trauma Leg** to the corresponding red line coming from the thigh.



5. Align the **Trauma Leg** with the thigh and secure the knee hardware with the provided Allen keys.

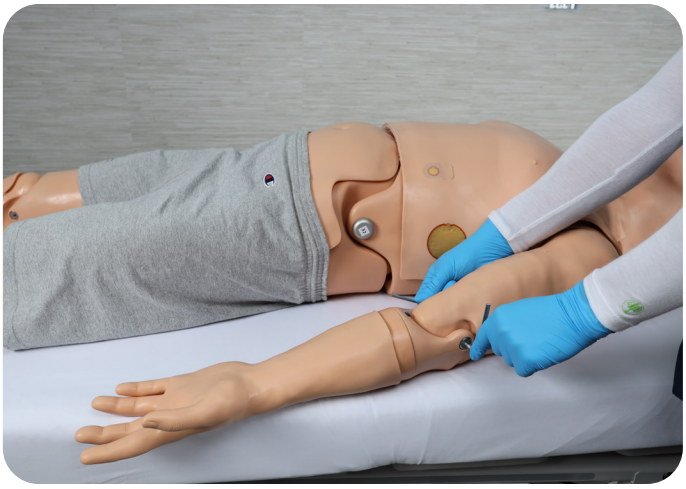
6. Fill the Filling Syringe with diluted Gaumard artificial blood and connect to the white port located on the outside of the leg.



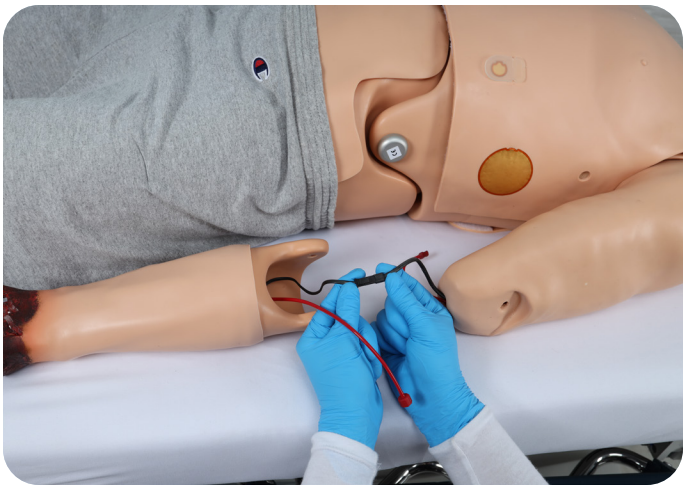
7. Push fluids

Assemble the Left Trauma Arm

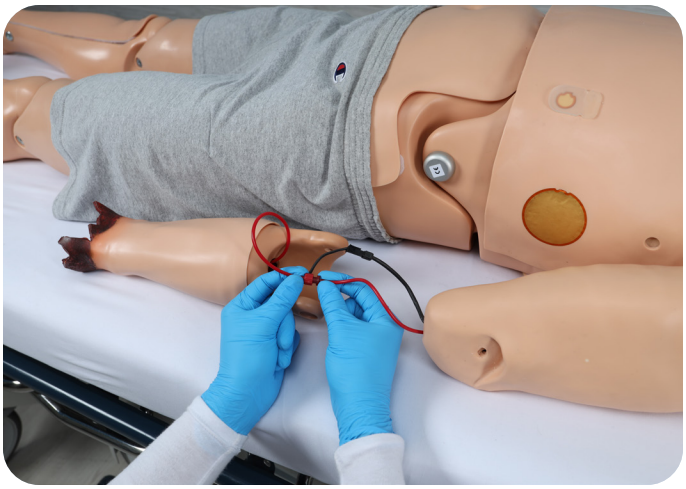
1. Remove the left lower arm using the provided Allen keys to loosen the elbow hardware.



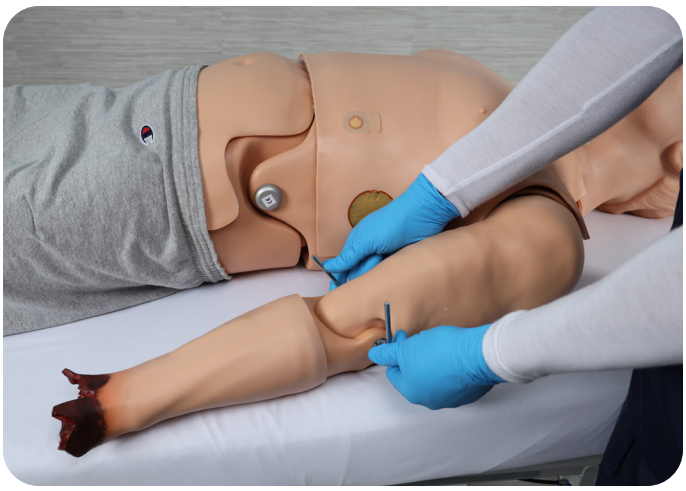
2. Connect the black power cable from the **Trauma Arm** to the corresponding black cable coming from the upper arm.



3. Connect the red pulse line from the **Trauma Arm** to the corresponding red line coming from the upper arm.

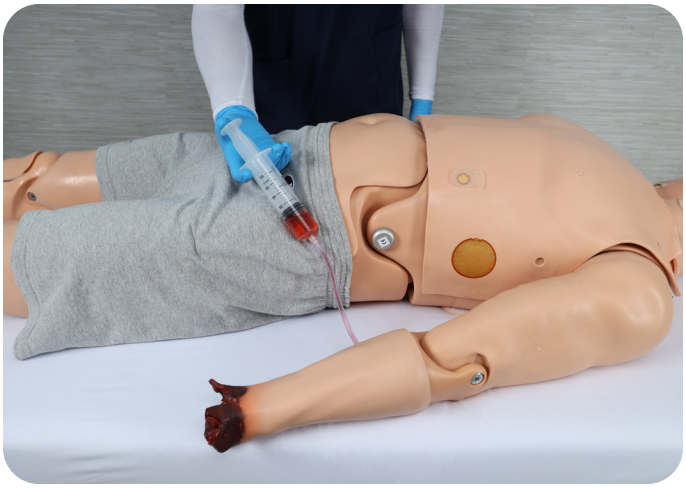


4. Align the Trauma Arm with the upper arm and secure the elbow hardware with the provided Allen keys.



5. Fill the Filling Syringe with diluted Gaumard artificial blood concentrate and connect the syringe to the white port on the inside of the left Trauma Arm.

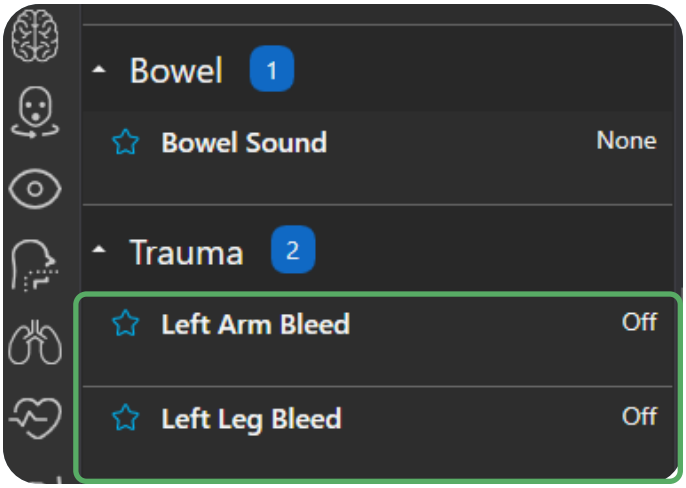
6. Push the fluid.



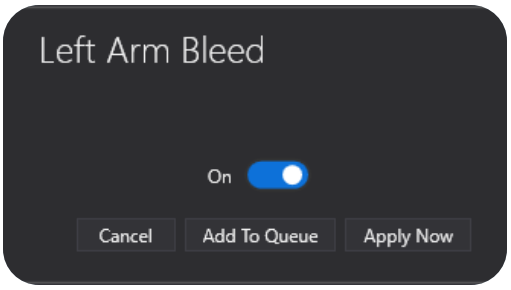
Activating the Trauma Bleed

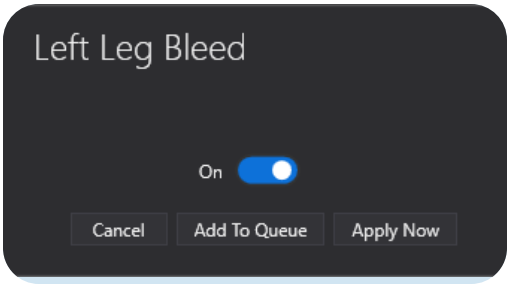
After attaching the Trauma limbs to HAL, to activate their bleeding:

1. Under the **Trauma** section click **Left Arm Bleed** and/or **Left Leg Bleed.**



2. Click the switch to **ON**.





3. Click **Apply Now** to immediately apply the selections to HAL or click **Add To Queue** to load at a later time.

7. Appendix

7.1 GAUMARD SALES TERMS AND CONDITIONS

These Gaumard Scientific Company, Inc. ("Gaumard") Sales Terms and Conditions ("Terms") apply to the sale or use of Gaumard equipment ("Equipment"), Software ("Software" as defined in paragraph 13), and supplies ("Supplies"), collectively referred to as "Product" or "Products" between Gaumard and the entity named on the applicable Gaumard Purchase Order ("Customer") (collectively, "Party" or "Parties"). The Parties, intending to be legally bound, agree as follows.

1. Agreement. Customer agrees to purchase from Gaumard the Products set forth in quotes and purchase orders accepted by both Customer and Gaumard. These Terms, along with any Exhibits, any applicable Gaumard Purchase Order documents, Gaumard Warranty documents, Gaumard Cares Service Plan documents, and any other purchasing or service documents executed by the Parties constitute the complete and entire agreement between Gaumard and Customer (collectively referred to herein as the "Agreement"). This Agreement will supersede all other quotations, agreements, understandings, warranties, and representations (whether written or oral) between the Parties with respect to the subject matter set forth in the Agreement. Any Customer documentation (including Customer's purchase order terms and conditions) that conflicts with or attempts to modify the Agreement in any way is hereby rejected and of no effect unless specifically agreed to in writing and signed by the Parties. No provision of this Agreement shall be waived, amended, modified, superseded, canceled, terminated, renewed, or extended except in a written document signed by both Parties or signed by the Party against whom the modification is sought to be enforced. This agreement can be terminated by Gaumard without cause by giving thirty (30) days prior written notice to Customer.

2. Prices, fees, and charges for Products and services (including maintenance, installation, and training as described in the applicable Gaumard Purchase Order documents, Gaumard Warranty documents, Gaumard Cares Service Plan documents) ("Service" or "Services") are payable in United States (U.S.) Dollars only, and do not include any applicable taxes or shipping charges. If Customer claims any tax exemption, it must furnish a valid tax exemption certificate before shipment of Products. Unless such certificate is furnished, Customer agrees to pay at its sole expense all applicable taxes, assessments, fees, penalties, import duties, and merchandise processing fees that may be levied or assessed upon Customer or Gaumard with respect to this Agreement, the Products, or any interest thereon. Gaumard reserves the right to increase prices on thirty (30) days written notice to Customer.

3. Payment. Customer shall pay all invoiced amounts within twenty (20) days from the invoice date, unless otherwise agreed upon by Gaumard in writing. Gaumard may require some or all of the purchase price to be paid in advance by Customer, unless Gaumard grants credit approval as determined in Gaumard's sole discretion on a case by case basis (taking into account factors such as credit rating, payment history, and size of order). A late charge will be due on any unpaid balance at a rate of 1.0% per month or the maximum rate otherwise permitted by law, whichever is lower. Gaumard may charge interest at the maximum rate permitted by law on all amounts not paid by the invoice due date. Gaumard retains a purchase money security interest in all Products sold to Customer to secure payment of the total purchase price thereof. Customer hereby grants Gaumard the right to file a copy of this Agreement with any appropriate authorities to evidence this security interest. Customer agrees to execute and deliver such other documents as Gaumard may request in connection therewith. Gaumard shall not be obligated to deliver any Product or perform any Service during any period when Customer payment is past due. Customer will be responsible for all costs (including reasonable attorneys' fees) incurred by Gaumard to collect overdue payments and/or to take possession or otherwise dispose of Products for which payment is overdue.

4. Product Shipment and Risk of Loss. Unless otherwise agreed to in writing by Gaumard All Products will be shipped

F.O.B. Origin, regardless of any provisions for payments of freight, insurance, the form of shipping documents, or

selection of carrier by Gaumard. F.O.B. Origin means title to the Products passes to the Customer at the shipping dock of Gaumard or Gaumard's supplier or authorized agent. Customer is responsible for shipping charges and for the cost of insurance paid to cover any losses from Gaumard's shipment point to Customer's receipt. Gaumard will assist Customer in processing any loss claims. Gaumard shall use reasonable efforts to meet the specified delivery dates. If Gaumard fails to make delivery within a reasonable time for reasons other than Customer's fault or circumstances beyond Gaumard's reasonable control, then Customer's only remedy is the right to terminate the applicable Purchase Order, whereupon Gaumard will refund any prepayments received from Customer relating to such Purchase Order.

5. Installation and Acceptance. Product orders are subject to 1) written acceptance by Gaumard, 2) receipt of specified deposits, as applicable and 3) continuing credit approval. If applicable, Gaumard will install Equipment at an agreed upon location ("Installation"). Installation shall be complete upon Gaumard's demonstration that the Equipment meets Gaumard's then-current operating specifications ("Installation"). Installation is subject to Customer cooperating in preparing and maintaining the site in compliance with Gaumard specifications, including but not limited to, applicable electrical and other connection regulations and all environmental conditions. If Customer fails to accept shipment of

Products other than for breach of warranty, Customer shall immediately pay the full purchase price as if shipment and Installation had occurred. If Customer fails to accept Products and if Gaumard decides to store ordered Products, Customer shall be responsible for Gaumard's reasonable insurance, handling, and storage charges. If Gaumard elects not to store ordered Products, Gaumard may arrange shipment and storage in a bonded warehouse at Customer's sole risk and expense.

6. Delay of Performance. The Parties' obligations under this Agreement are subject to force majeure, including but not limited to, civil insurrection, terrorism, fire, flood, labor disputes, shortages, delays of suppliers or contractors, or government priority systems, actions taken or threatened by any governmental agencies, acts of God or other contingencies or acts not within the sole control of the Parties. Gaumard reserves the right during any shortage period to (a) make Supplies available to Customer (as it sees fit) without any liability to Customer, and (b) to make substitutions and modifications in the specification of any Products, provided such substitutions or modifications do not materially affect the performance of Products.

7. WARRANTIES. Gaumard warrants that if a Product proves to be defective in material or workmanship within one year from the date on which title to the Product passes to the Customer ("Warranty Period"), 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: (a) Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product; (b) Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to properly clean the Gaumard product; and (c) Damage resulting from a repair or attempted repair of the Gaumard product by anyone other than Gaumard or a Gaumard representative. Replacement parts are warranted for the remainder of the Warranty Period or ninety (90) days from shipment, whichever is longer. Services are warranted to be supplied in a workman-like manner. Gaumard does not warrant that use of the Products will be uninterrupted or error-free, or that the Products will operate with non-Gaumard authorized third-party products. THE FOREGOING WARRANTIES ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. SUCH LIMITED WARRANTY IS GIVEN SOLELY TO THE ORIGINAL CUSTOMER AND IS NOT GIVEN TO ANY THIRD PARTY INCLUDING, WITHOUT LIMITATION, SUBSEQUENT PURCHASERS OR USERS OF THE PRODUCTS OR CUSTOMERS OF THE CUSTOMER. THIS WARRANTY IS VOID UPON TRANSFER OF PRODUCT BY CUSTOMER TO ANY OTHER ENTITY. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED

WARRANTIES SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO CUSTOMER. These warranties do not apply to any Products that are supplied on a pre-release or "as-is" basis.

8. Warranty Claims and Remedies. In the event of any warranty claim, Gaumard will replace with new or repaired items any Product part or component that is in breach of the above limited warranties. Alternatively, Gaumard may elect to repay or credit to Customer an amount equal to the purchase price of the defective Product. Items replaced shall become Gaumard property. All claims shall be initiated by contacting Gaumard within the applicable Warranty Period and within thirty (30) days after discovery of the non-conformity. If Customer has failed to notify Gaumard within the Warranty Period, then Customer shall be barred from instituting any action thereafter. Customer shall not return the Product to Gaumard without prior authorization from Gaumard. If the necessary repairs to the Product are covered by this limited warranty, then Customer 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 Customer will be liable for all repair costs in addition to costs of shipping and handling. Upon request, Gaumard must be given access to and an opportunity to inspect the Product and any working areas and storage areas. These remedies shall comprise Gaumard's entire liability and Customer's exclusive remedy for breach of warranty and are in lieu of any other remedies at law or equity.

9. LIMIT OF LIABILITY. GAUMARD SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL LOSSES, DAMAGES, OR EXPENSES (INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, DATA, OR USE), DIRECTLY OR INDIRECTLY ARISING FROM THE SALE, HANDLING, SERVICE, OR USE OF PRODUCT OR SERVICES ORDERED OR FURNISHED, OR FROM ANY CAUSE RELATING THERETO. EXCEPT FOR PERSONAL INJURY OR DEATH TO THE EXTENT RESULTING FROM GAUMARD'S NEGLIGENT OR INTENTIONALLY WRONGFUL ACTS OR OMISSIONS, IN NO EVENT SHALL GAUMARD BE LIABLE UNDER ANY LEGAL THEORY OR FOR ANY CAUSE RELATED TO A PRODUCT OR SERVICE, WHETHER BASED UPON WARRANTY, CONTRACT, TORT, NEGLIGENCE, OR OTHER THEORY, EVEN IF ADVISED OF THE POSSIBILITY THEREOF, FOR ANY AMOUNT IN EXCESS OF THE PRICE, FEE, OR CHARGE RECEIVED BY GAUMARD FOR SUCH PRODUCT OR SERVICE.

10. Governmental Authorizations. Customer is responsible for compliance and costs associated with all required licenses, permits, or other governmental authorizations, including but not limited to, any license or certification needed for Customer to use the Product, and any export or import license, exchange permit, or the like ("Licenses"), even if applied for by Gaumard on Customer's behalf. If any authorization is delayed, denied, revoked, restricted, or not renewed, Gaumard shall not be liable, and Customer is not relieved of its obligations. Customer represents and agrees that it will handle all Product and technical data related to the Licenses so that it conforms to all applicable U.S. laws and regulations, including U.S. export licensing laws and the U.S. Foreign Corrupt Practices Act. Customer shall not trans-ship, divert, re-export or otherwise dispose of any U.S. origin goods or technology obtained from Gaumard except as U.S. laws and regulations expressly permit.

11. Indemnity.

Gaumard agrees to indemnify, defend and hold Customer, its officers, directors, employees, agents and contractors harmless from and against all loss, damage, liability, cost and expense (including reasonable attorneys' fees and expenses) by reason of any claims or actions by third parties against Customer for (1) bodily injury or death, and damage, loss or destruction of any real or tangible personal property, which third party claims arise out of or relate to Gaumard's gross negligence or willful misconduct or (2) infringement or misappropriation by Gaumard of any intellectual property rights under this Agreement.

a. Customer agrees to indemnify, defend and hold Gaumard, its officers, directors, employees, agents and contractors harmless from and against all loss, damage, liability, cost and expense (including reasonable attorneys' fees and expenses) by reason of any claims or actions by third parties against Gaumard for (1) bodily injury or death or damage, loss or destruction of any real or tangible personal property, which third party claims arise out of or relate to Customer's gross negligence or willful misconduct; (2) infringement or misappropriation by Customer

of any intellectual property rights; or (3) Customer's or its customer's use of the Products or Services, including without limitation, defamation, libel, slander, obscenity, pornography, or violation of the rights of privacy or publicity, or spamming or any other tortious or illegal conduct.

12. Software License. For purposes of these Terms, the term "Software" includes all Gaumard computer software, firmware, and associated documentation, whether in printed or machine-readable form, supplied by reason of this Agreement or for use in connection with Equipment or Services. To the extent the Product includes Software, Customer's use of the Software is governed by the Gaumard End User License Agreement attached as Exhibit A to these Terms.

13. Confidential Information. Customer shall maintain the confidentiality of any information provided or disclosed by Gaumard relating to the Software (as defined above), business or customers of Gaumard, as well as this Agreement and its terms (including the pricing and other financial terms under which the Customer will be obtaining the Services hereunder). Customer shall use reasonable care to protect the confidentiality of Gaumard's information disclosed, but no less than the degree of care it would use to protect its own confidential information, and shall only disclose Gaumard's confidential information to its employees and agents having a need to know this information and who are subject to confidentiality agreements having terms at least as restrictive as those contained herein. The obligations of confidentiality set forth herein shall not apply to any information in the public domain at the time of disclosure.

14. Intended Uses. Products are only intended for the uses described in the applicable user's manual or instructions for use. Customer assumes all risks associated with non-listed uses of Products and hereby indemnifies and holds Gaumard harmless from any claim associated with such non-listed uses.

15. Compliance with Laws. Gaumard and Customer agree to comply with all federal and state laws that govern the enforceability and performance of this Agreement.

16. HIPAA Compliance. As of the Effective date, the Parties are not planning to transfer any personal patient information between them. However, the Parties understand and agree that this Agreement may become subject to the Health Insurance Portability and Accountability Act of 1996 as amended ("HIPAA"), the privacy and security regulations promulgated thereunder, including 45 C.F.R. 160, 162 and 164, as amended (the "HIPAA Regulations"), and Title XIII of Division A and Title IV of Division B (the "Health Information Technology for Economic and Clinical Health Act ("HITECH"), part of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5) ("ARRA"). The Parties agree to strictly comply with HIPAA and to execute any documents that may be required by HIPAA, HITECH, and any other applicable federal or state privacy laws and regulations. The Parties agree that if they directly or indirectly gain access to Protected Health Information ("PHI") held by the other Party during any interaction, the receiving Party will keep the PHI confidential under the terms of this Agreement

17. State Reporting and Disclosure Laws. Unless otherwise noted in this Agreement, the cost of any Product training provided by Gaumard shall be included in the purchase price of the Product where applicable. Customer acknowledges and agrees that state reporting laws may require Gaumard to disclose certain aspects of this arrangement.

18. Fraud and Abuse. Gaumard hereby certifies that it is not currently a listed vendor in the: (a) Federal General Services Administration's "List of Parties Excluded from Federal Procurement or Nonprocurement Programs" in accordance with

Presidential Executive Orders 12549 and 12689 "Debarment and Suspension;" and (b) in the Office of the Inspector General of the Department of Health and Human Services' "List of Excluded Individuals/Entities." Any discounted pricing terms offered under this Agreement may be a "discount or other reduction in price" under the Federal Anti- Kickback Statute, 42 U.S.C. § 1320a-7b(b). Customer shall take all actions necessary to comply with the Anti-Kickback Statute discount safe harbor regulations, 42 C.F.R. § 1001.952(h), including but not limited to, (1) maintaining

accurate records reflecting the pricing terms of items and Services purchased under this Agreement, (2) fully and accurately report any discount received under this Agreement if applicable, and (3) make available information provided to Customer by Gaumard concerning cost reports and other filings with the government, including but not limited to, the Secretary of the U.S. Department of Health and Human Services or other state agencies.

19. Bankruptcy. Except as may be prohibited by applicable bankruptcy laws, a Party to this Agreement may elect to terminate this Agreement (including any Purchase Orders) if any of the following situations arise: (1) the other Party becomes insolvent or is unable to pay debts as they become due; (2) a voluntary or involuntary bankruptcy proceeding is instituted by or against a Party hereto; or (3) an appointment of a receiver or assignee for the benefit of creditors occurs on behalf of a Party hereto.

20. Waiver and Severability. If either Party fails to perform obligations under this Agreement, such nonperformance shall not affect the other Party's right to enforce performance at any time. Waiver of any remedy or material breach of any subject matter contained in this Agreement shall not be viewed as a waiver unless agreed to by the Parties in writing. Each provision of this Agreement is separate and independent of one another, and the unenforceability of any provision will not affect the enforceability of any other provision. If any provision is held to be excessively broad or unenforceable, such provision shall be modified so that it is enforceable to the fullest extent possible by law.

21. Assignment. Customer shall not assign this Agreement without the prior written consent of Gaumard, which consent shall not be unreasonably withheld or delayed. Subject to the foregoing, the rights and obligations herein will be binding upon the successors and assigns of Customer.

22. Notices. Any required notices will be given in writing to Gaumard as set forth in the applicable Gaumard Purchase Order or other purchasing document.

23. Governing Law. Upon execution, this Agreement shall be governed and viewed under the laws of the State of Florida without reference to its conflict of laws provisions. Customer and Gaumard specifically agree that any action relating to the relationship between the Parties, the Agreement, or Products provided, purchased or licensed hereunder, shall be brought and tried in the Courts of Dade County, Florida. Customer waives all objections to, and consents to the jurisdiction of such Courts.

24. Miscellaneous. See applicable Gaumard Purchase Order documents, Gaumard Warranty documents, and Gaumard Cares Service Plan documents for other terms and conditions, which may include, but are not limited to: Term, Termination, Customer Training and Support, and Product Repairs and Tune Ups.

7.2 END USER LICENSE AGREEMENT

GAUMARD END USER LICENSE AGREEMENT

This End User License Agreement ("EULA") sets forth the respective rights and responsibilities between the entity named in the Purchase Order associated with this EULA ("End User") and Gaumard Scientific Company, Inc., a Florida corporation ("Gaumard"), relative to the Gaumard Software (as defined below). This EULA is effective as of the date Gaumard accepts and confirms the Purchase Order (the "Effective Date"). BY USING THE GAUMARD SOFTWARE, END USER IS AGREEING TO BE BOUND BY THE TERMS OF THIS EULA. IF END USER DOES NOT AGREE, END USER MAY NOT USE THE GAUMARD SOFTWARE.

1. Definitions.

1.1 "Gaumard Documentation" means the Gaumard user and operations manuals, guides, and related materials provided by Gaumard to End User to facilitate use of the Gaumard Products.

1.2 "Gaumard Equipment" means Gaumard hardware components for medical simulation and training, including manikins and associated instrumentation, and other hardware and tangible products sold by Gaumard to End User.

1.3 "Gaumard Products" means Gaumard Software licensed and Gaumard Equipment sold or otherwise made available by Gaumard to End User currently or in the future.

1.4 "Gaumard Software" means the object code form of computer programs and Gaumard Documentation owned by Gaumard or its licensors and

licensed to End User in accordance with this EULA. Gaumard Software includes (a) computer programs embedded in firmware in the Gaumard Equipment; (b) computer programs embedded in a separate medium (such as CD or flash drive) for use in conjunction with the Gaumard Equipment; (c) computer programs downloaded or received via mail from Gaumard; (d) computer programs used on servers storing or processing data related to the Gaumard Products; and (e) computer programs used to create and manage a network for the Gaumard Equipment, interface with the components of the Gaumard Equipment, manage and compute location information related to the Gaumard Equipment, and monitor health of the Gaumard Equipment.

2. Software License and Restrictions.

2.1 License. Subject to End User's compliance with the terms and conditions of this EULA, the Gaumard Sales Terms and Conditions, the Purchase Order, and the Gaumard Cares Service Plan Agreement, Gaumard grants End User a non-exclusive, non-transferable (except as otherwise set forth herein), personal license to execute and use the Gaumard Software for End User's internal purposes, but only so long as the Gaumard Software is installed on the Gaumard Product on which it was originally installed. End User may not, directly or indirectly, sell, sublicense, display, timeshare, loan, lease, distribute, or create derivative works of the Gaumard Software.

2.2 Ownership. All rights, title, and interest in and to the Gaumard Software, and any derivative works thereof, whether created by Gaumard, End User, or a third party, will remain at all times solely and exclusively owned by Gaumard. Nothing in this EULA or the Purchase Order will be construed to grant End User any rights of any kind with respect to the Gaumard Software, except as expressly set forth in this EULA.

2.3 Reverse Engineering and Other Restrictions. End User will not, and will not allow any third party to, tamper with, modify, decompile, disassemble, derive the source code of, reverse engineer, or attempt to obtain the internal design of the Gaumard Software or Gaumard Products for any purpose whatsoever (collectively, "Restricted Acts"). If applicable law permits End User to take any of the Restricted Acts notwithstanding the previous prohibition, and End User wishes to take any Restricted Act notwithstanding the previous prohibition, End User will first provide Gaumard with thirty (30) days prior written notice. Gaumard may terminate this EULA at any time during such notice period without liability arising from such termination. The parties agree that all information needed for interoperability is available from Gaumard in accordance with applicable government directives.

2.4 Updates. From time to time Gaumard may develop new versions or updates for the Gaumard Software that may be made available to the End User as agreed under the terms of the Gaumard Sales Terms and Conditions, Gaumard Purchase Order documents, Gaumard Warranty documents, or Gaumard Cares Service Plan documents. Unless otherwise agreed to by Gaumard, End User sHAL®l be responsible for installing the provided new versions or updates for the Gaumard Software.

2.5 Proprietary Notices. End User agrees to maintain and reproduce on all copies of the Gaumard Software, any names, logos, copyright notices, trademarks, other proprietary markings, and legends that appear on the Gaumard Software.

2.6 Control of Duplication. End User will not, nor will it allow any third party to, circumvent the protection controlling the duplication or use of the Gaumard Software, for example and without limitation, any software lock controlling the number of copies End User may make of the Gaumard Software.

2.7 No Source Code. End User acknowledges and agrees that its rights under this EULA do not include rights to source code. In its exercise of the rights granted under this EULA, End User agrees not to take any action that would result in any requirement to disclose or make available to other parties the Gaumard Software in source code format.

2.8 Certification. Upon thirty (30) days written notice to End User from Gaumard, End User shall certify End User's compliance with the restrictions and obligations in this EULA. Such requests will not occur more frequently than once per calendar year. If End User has used the Gaumard Software in violation of this EULA, End User sHAL®l, in addition to any other remedies Gaumard may have, pay Gaumard additional fees for the excess use according to Gaumard's then-current price list and policies, plus a late payment charge of one percent (1.0%) per month (or the highest amount allowed by applicable law, if lower) for each month of excess use from the date of initial excess use.

2.9 Privacy and Recordings. End User will comply with all applicable laws, rules and regulations related to privacy, publicity and data protection related to use of the Gaumard Products. End User shall not use the Gaumard Software to record or collect personal data from any person in violation of End User's policies or privacy statements. End User shall receive express consent from all persons recorded by the Gaumard Software sufficient for End User's use, storage, and distribution of such recordings.

3. Term and Termination

3.1 Term. This EULA commences on the Effective Date and continues perpetually, unless terminated earlier in accordance with the terms hereof.

3.2 Termination for Cause. This EULA is automatically terminated by Gaumard if the other party materially breaches this EULA, the Gaumard Sales Terms and Conditions, the Purchase Order, or the Gaumard Cares Service Plan Agreement. In addition, Gaumard may terminate this EULA if (a) End User becomes insolvent or makes an assignment for the benefit of End User's creditors; or (b) a receiver is appointed or a petition in bankruptcy is filed with respect to End User and such petition is not dismissed within thirty (30) days.

3.3 Effect of Termination. Upon the termination of this EULA for any reason, all licenses granted in Section 2 above will immediately cease and terminate. Upon termination, End User will immediately cease using the Gaumard Software.

3.4 Survival. Sections 3 through 6 will survive the termination of this EULA.

4. Confidential Information; Trademarks.

4.1 Confidential Information. End User acknowledges and agrees that the Gaumard Software is confidential information and contains trade secrets of Gaumard. End User agrees to (i) hold the Gaumard Software in the strictest confidence, (ii) not disclose the Gaumard Software to any third party for any purpose, and (iii) use at least the same security measures as End User to protect its own confidential and trade secret information but no less than reasonable measures to protect the confidentiality of the Gaumard Software. End User agrees and acknowledges that any breach of the provisions regarding ownership or confidentiality contained in this Agreement shall cause Gaumard irreparable harm and Gaumard may obtain injunctive relief without the requirement to post a bond as well as seek all other remedies available to Gaumard in law and in equity in the event of breach or threatened breach of such provisions.

4.2 Trademarks. End User may not use Gaumard's trademarks, logos, service marks, or names in press releases, web sites, marketing, or other forms of public materials without the prior written consent of Gaumard. All use of the Gaumard trademarks and all goodwill associated with them will inure solely to the benefit of Gaumard.

5. Disclaimer; Limitation of Liability; Infringement Indemnification

5.1 Warranty and Disclaimer. For a period of twelve (12) months from the Effective Date, Gaumard will (a) provide all updates to the Software that are made available generally, and (2) use reasonable efforts to fix or provide a workaround for any Gaumard Software defect or bug which prevents operation in substantial conformity with the Gaumard Documentation. Other than the above, the Gaumard Software is provided "as- is," with no express or implied warranties of any kind, including the warranties of merchantability, fitness for a particular purpose, or non-infringement.

5.2 Limitation of Liability. THE TOTAL LIABILITY, IF ANY, OF GAUMARD TO END USER OR ANY THIRD PARTY FOR ALL DAMAGES BASED ON ALL CLAIMS, WHETHER ARISING FROM BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE, INDEMNITY, STRICT LIABILITY, TORT, OR OTHERWISE, ARISING FROM THE GAUMARD PRODUCTS IS LIMITED TO ONE HUNDRED DOLLARS. IN NO EVENT WILL GAUMARD BE LIABLE TO END USER OR ANY THIRD PARTY FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL, OR PUNITIVE DAMAGES, INCLUDING BUT NOT LIMITED TO, LOSS OF REVENUES, LOSS OF PROFITS, OR LOSS OF DATA, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

5.3 Infringement Indemnification. Gaumard will, as further described below, indemnify, defend, and hold End User harmless, at its expense, against any claim or suit brought by a third party against End User alleging that any Gaumard Software furnished under this EULA infringes the United States patent, trademark, copyright or other intellectual property right of a third party. Gaumard will pay all settlements entered into or damages finally awarded, including attorneys' fees and costs, based on any such claim or suit; provided that End User gives Gaumard prompt written notice of such claim and gives Gaumard information, reasonable assistance ,and sole authority to defend or settle the claim. In defense or settlement of the claim, Gaumard may obtain for End User the right to continue using the Gaumard Software, replace or modify the Gaumard Software so that it becomes non-infringing, or, if such remedies are not reasonably available, grant End User a refund for the associated Gaumard Products (depreciated over three years) and accept their return. Gaumard will not have any liability if the alleged infringement is based upon (a) the use or sale of the Gaumard Software in combination with other products or devices not furnished by or approved by Gaumard; (b) the use of the Gaumard Software in a manner for which they were not designed as described by the Gaumard Documentation; (c) any modification of the Gaumard Software not performed by or authorized by Gaumard;

(d) any use of Gaumard Software by End User after End User learns of such allegation of infringement; or (e) any failure by End User to utilize a non-infringing version of the Gaumard Software made available by Gaumard along with notice that such update is non-infringing. The obligations set forth in this Section 5.3 are Gaumard's sole obligations, and End User's sole and exclusive remedy, for the Gaumard Software infringing third party intellectual property rights.

6. Miscellaneous.

6.1 Binding Effect; Assignment. This EULA will be binding upon, and inure to the benefit of, End User's and Gaumard's respective permitted successors and permitted assigns. Neither party may assign or transfer this EULA or any of the rights, privileges, duties or obligations under this EULA without the prior written consent of the other party, except that either party may assign this Agreement to any entity controlled by, controlling, or under common control with such party at such time, as well as in connection with the sale, transfer, merger, or acquisition, whether by operation of law or otherwise, of substantially all of the assets of such party. In addition, if End User transfers the Gaumard Product on which the Gaumard Software is installed to a third party, End User may assign this EULA to such third party, provided that the third party agrees in writing with Gaumard to be bound by this EULA.

6.2 Notices. Any written notice required by this EULA will be deemed made (a) when delivered by personal service, (b) one (1) business day after being sent by recognized international overnight courier service (such as FedEx), or (c) when received, if sent by certified or registered mail, postage prepaid, return receipt requested. Any such notice given to a party shall be sent to the addresses on the attached Purchase Order. By giving to the other party written notice thereof, the parties hereto and their respective permitted successors and assigns will have the right from time to time to change by written notice their respective addressee or address for notices.

6.3 Applicable Law. The validity of this EULA and the rights, obligations and relations of the parties hereunder shall be construed and determined under and in accordance with the substantive laws of the State of Florida. All disputes arising under or related to this EULA shall be resolved exclusively in the State or Federal Courts located in Dade County, Florida. The parties consent to the jurisdiction and venue of such courts and waive any claims as to inconvenient forum. The judgments of such courts may be enforced in any court of competent jurisdiction.

6.4 Export Control. End User will not export or re-export the Gaumard Software, including any technical data, except as authorized and permitted by, and in compliance with, the laws and regulations, including but not limited to all export and re-export laws and regulations, of the United States.

6.5 Severability. If any provision of this EULA is invalid or unenforceable in any circumstances, it will be interpreted as much as possible to reflect the intent of the parties, and its application in any other circumstances and the remaining provisions of this EULA will not be affected thereby.

6.6 Entire Agreement. This EULA constitutes the entire agreement and understanding of the parties relating to the subject matter thereof. This EULA supersedes all prior written and oral agreements and all other communications between End User and Gaumard (or a Gaumard distributor) regarding the subject matter hereof. No contradictory terms and conditions of any purchase order, invoice, or other document issued by End User relating to the subject matter of this EULA shall be binding, unless agreed by the parties.

6.7 Waiver of Breach. No waiver by a party of any breach of this EULA will constitute a waiver of any other breach of the same or other provisions of this EULA. No waiver by a party will be effective unless made in a record signed or otherwise authenticated by an authorized representative of such party.

6.8 Relationship of the Parties. The parties are independent contractors. Nothing in this EULA or in the activities contemplated by the parties will be deemed to create an agency, partnership, employment or joint venture relationship between the parties. Neither party will have any responsibility nor liability for the actions of the other party except as expressly provided in this EULA. Neither party will have any right or authority to bind or obligate the other party in any manner or make any representation or warranty on behalf of the other party. This EULA is made and entered into for the sole protection and benefit of Gaumard, its licensors and suppliers, and End User, and no other person or entity shall be a direct or indirect beneficiary of or shall have any direct or indirect cause of action or claim arising from this EULA.

ACKNOWLEDGMENT

By installation of this software, you acknowledge that you have read and understand the foregoing and that you agree to be bound by its terms and conditions. You also agree that this agreement is the complete and exclusive statement of agreement between the parties and supersedes all proposed or prior agreements, oral or written, and any other communications between the parties relating to the license described herein.

7.3 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:

- Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product;
- Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to properly clean the Gaumard product;
- 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. However, third-party products are covered by the warranties provided by the respective third-party manufacturers and such warranties are transferred from Gaumard to purchaser upon purchase of the Gaumard product. Defects in third-party products are covered exclusively by the warranties provided by the third-parties. Gaumard does not provide any warranty, express or implied, with respect to any third-party products. Please contact the third-party manufacturer for information regarding the availability of extended warranties for third-party products.

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:
- Contact Gaumard and request authorization to return the Gaumard product. Do NOT return the
- Gaumard product to Gaumard without prior authorization.
- 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.

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 we offer a range of service plans through our Gaumard Cares program. For more information about Gaumard Cares service planes please contact customer service.

7.4 CONTACT TECHNICAL SUPPORT

Before contacting Technical Support, please make sure to have the following:

1. Your simulator's serial number
2. Access to the simulator for possible troubleshooting as needed

Technical Support

Email: support@gaumard.com
USA: 800-882-6655
INT: 01-305-971-3790

7.5 GENERAL INFORMATION

Sales and Customer Service

E-mail: sales@gaumard.com
USA: 800-882-6655
INT: 01-305-971-3790
Fax: 305-252-0755

Post

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

Office Hours

Monday-Friday, 8:30am - 7:30pm EST (GMT-5)

Always dispose of this product and its components in compliance with local laws and regulations.

Gaumard.com | Worldwide +1.305.971.3790 | Toll-Free USA & Canada
1.800.882.6655 | Fax: 305-252-0755 | sales@gaumard.com

MADE IN THE U.S.A.

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