Gaumard®
Simulators for Health Care Education

Trauma HAL® S3040.50

Point of Injury and Emergency Field Care Patient Simulator

User Guide

Trauma Hal® S3040.50 is an interactive educational system developed to assist a certified instructor. It is not a substitute for a comprehensive understanding of the subject matter and not intended for clinical decision making.

User Guide 17.5.1

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1. Introduction

1.1 Specifications

Height: 70″ (177.8 cm)

Power Input: 100-240 VAC, 50/60 Hz, 2A
Power Output: 13 VDC, 9.2 A

1.2 Care and Maintenance

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

> **WARNING: 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.**

General

- Ball point pens, ink, and markers permanently stain the skin.
- Do not wrap this or any other Gaumard product in newsprint.
- Marks made with ballpoint pens, ink or marker cannot be removed.
- Replacement parts are available from Gaumard Scientific or from your Distributor

IV Arm

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

- 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.
- Always purge with clean water and then drain the vein reservoirs at the end of the simulation session. Doing so will retard the formation of mold and prevent clogging of the system.

- We recommend flushing veins with 70:30 solution of clean water to isopropyl alcohol (IPA) at least once per month to prolong the life of the vasculature.
- When the arm skin and/or veins require replacement, refer to the "Consumables" section of this guide. For more information regarding the replacement of veins and other consumable items please contact customer service.

Operating Conditions

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

Storage Conditions

- Store Simulator in a cool, dry place. Extended storage should be between 32-85 degrees Fahrenheit (0-29 Celsius). Other temperatures will cause the simulator to soften and slowly warp
- Humidity: 40%-60% (non-condensing)
- Do not stack or store heavy materials on top of the carton.

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

- Do not store the simulator with a discharged battery. It is good practice to re-charge the battery at the end of every simulation session. In addition, make sure the battery is re-charged at least once every 2 months even if the simulator is not being used; otherwise permanent loss of capacity might occur because of self-discharge

Procedures

- Do not attempt to intubate without lubricating the airway adjunct with **mineral oil** lubricant. Failure to lubricate the device will make intubation very difficult and is likely to result in damage to the simulator.
- Mouth to mouth resuscitation without a barrier device is not recommended, as it will contaminate the airway.
- Treat the simulator with the same precautions that would be used with a **real** patient.
- Only replace trauma limbs when Trauma Hal is powered off or in standby mode

Cleaning

- The simulator should be cleaned with a cloth dampened with diluted liquid dish washing soap.
- Remove all traces of any lubricant.
- Do not clean with harsh abrasives.
- Do not use povidone iodine on the simulator.
- Dry thoroughly.
- The simulator is “splash-proof” but not water-proof. Do not submerge or allow water to enter the interior of the simulator.

Electrical Therapy

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

ECG and Electrical Therapy Warnings

- Defibrillation is only allowed on the large sternum and apex sites.
- Only deliver electrical therapy when the simulator is fully assembled, dry, and undamaged.
- Make sure the defibrillation patches on the simulator are in good condition, including removing any and all gel residue on the defibrillation patches from previous use(s).
- It is a good practice to remove gel residues after every use. Failure to do so will leave behind a film of electrode gel that hardens causing arcing and pitting.
- Do not re-use the gel-adhesive pads. Do not leave them on for next day use.
- Use hard paddles or wet-gel pads preferably.
- Avoid using solid-gel pads since they present higher risk of burning the simulator’s skin.
- Gel pads have a shelf life. Make sure they are not expired to avoid arcing.
- Make sure the simulator is not in contact with any electrically conductive surfaces.
- Use the simulator only in a well-ventilated area, free of all flammable

gases.
- NEVER attempt to service or modify any of the electrical connections, especially those between conductive skin sites and the internal electronics.
- Discontinue use if any wires are found exposed with damaged insulation.
- Real medical products, especially electrodes, sometimes use powerful adhesives that can be difficult to remove. A gentle, degreasing cleanser may be needed.
- 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, Trauma HAL S3040.50's skin can be burned.
- Should dark traces appear on the conductive patches due to gel residue or previous arcing, use a pencil eraser to remove the traces and then clean with alcohol.
- DO NOT SCRATCH the conductive patches with abrasive objects; doing so will cause irreversible damage to the conductive sites and subsequently cause arcing.

CO2 Safety and Warning Checklist

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

2. Overview

2.1 Features

Neurologic Response

- Preprogrammed speech responses

Airway

- Oral and nasal intubation
- Use an ET tube or LMA
- Realistic airway with teeth, tongue, epiglottis, and vocal cords
- Multiple airway sounds synchronized with breathing
- Program airway complication: laryngospasms
- Surgical airway
- Tracheal suctioning (fluids)

Breathing

- Spontaneous breathing
- Independent left or right lung sounds synchronized with breathing
- Bilateral lung expansion with realistic chest rise an fall
- Ventilation may be assisted using BVM, ETT, or LMA
- Programmable unilateral chest rise
- Needle decompression at second intercostal sites
- Chest drain sites
- Ventilation is measured and logged
- Gastric distension with excessive BVM ventilation
- Unilateral chest rise with right main stem intubation

Circulation

- Bilateral carotid, femoral, radial, and pedal pulses
- **Radial pulse can be disabled independently to simulate hypotension**
- Blood pressure auscultation in right arm with modified BP cuff
- Korotkoff sounds audible between systolic and diastolic pressures
- Bilateral IV training arms
- Intraosseous access at right tibia
- Intramuscular injection sites in deltoids and quadriceps for placement exercises

Cardiac

- Depth of chest compressions are measured and logged in cm or inches
- Effective compressions generate palpable pulses
- Conductive skin regions allow for ECG monitoring with real equipment
- Deliver up to 360 joules of real energy to skin patches
- Heart sounds may be auscultated and are synchronized with ECG
- Defibrillate and pace using real devices

Gastrointestinal

- Esophageal/gastric suctioning
- Gastric distension with excessive BVM

Trauma

- Left arm and left leg trauma limbs with bleeding
- Pressure sensors control bleeding at the trauma sites and in the groin wound site
- Automatic filling blood reservoir

Options

- Streaming Voice
- CO2 Exhalation
- 12-Lead ECG (MI model + ECG designer)
- Virtual Monitors

2.2 Terminology

Facilitator

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

Provider

A person participating in the simulation as a healthcare provider.

3. Equipment Setup

3.1 Unboxing

The simulator is shipped partially assembled.
Remove the simulator from the blue case with the assistance of at least two persons. Rest the simulator on a patient table capable of supporting the weight of a real adult patient.

3.2 Package Contents

- Trauma Lower Left Leg
- Trauma Lower Left Arm
- Left and Right Healthy arms (installed)
- Lower Right I/O Leg
- Lower Left Leg
- I/O Leg Filling Kit
- 7 Spare Bones for I/O Leg
- Blood Concentrate
- Mineral Oil
- IV Filling Kit
- External Blood Bag
- Talcum Powder
- Needle Decompression Sites
- BP Cuff
- Healthy Groin Insert
- Left Groin Wound
- Surgical Trachea Kit

3.3 Leg Assembly

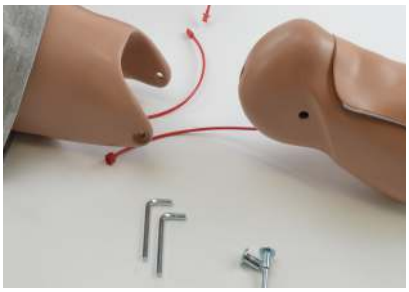
Healthy Leg

Follow the steps below to install the healthy lower legs.

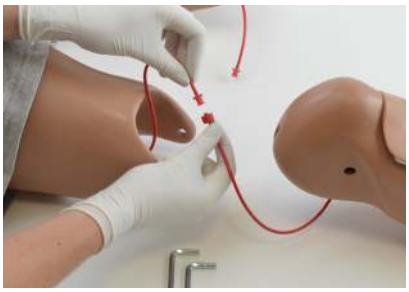
> **Remove the legs when transporting Trauma Hal inside the protective case.**

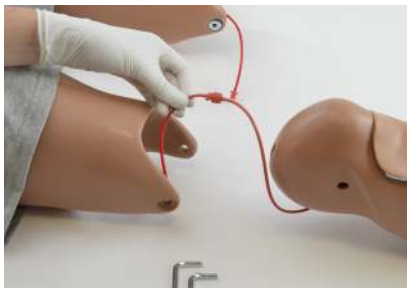
1. Remove the fixed bolts from the knee joints using the hexagonal wrench included.

2. Align the healthy limb



3. Connect the red pulse line as shown.





4. Tuck the red pulse line into the lower leg.

5. Replace the bolt

6. Use the two provided hexagonal wrenches to secure the knee bolt without over tightening.

Battery

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

To connect the internal battery leads:

1. Locate the connectors on Trauma Hal's right side.

2. Gently lift the right corner on the chest skin

3. Connect the battery clip.

4. Slide battery leads inside the cavity.

5. Insert the skin's placement pin into the guiding hole located on the Velcro

6. Press the skin in place

7. Connect the battery charger in the charging port and then into the wall outlet

Battery Life

Once the battery is fully charged, the simulator can be operated on battery power for up to 8 hours.

To display the battery level, the UNI® software must first establish a connection with the simulator. For more information about the battery indicator, refer to “Working with UNI®” section.

> **WARNING: Do not store the simulator with a discharged battery. It is good practice to re-charge the battery at the end of every simulation session. In addition, re-charged the battery at least once every 2 months even if the simulator is not being used; permanent loss of capacity might occur because of self-discharge.**

3.4 Initializing the Simulator

Communicate wirelessly with Trauma Hal® using an RF signal.
To start the simulator with the RF module, follow the steps below:

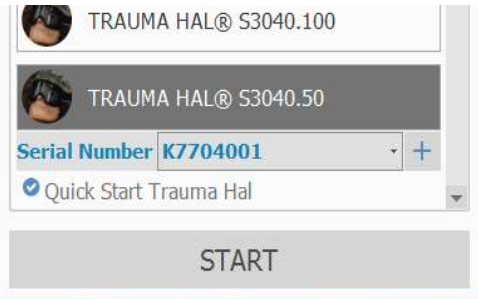
1. Plug the RF module into the tablet PC

2. Turn on the tablet PC

3. Double-click the UNI software

4. Verify Trauma Hal®'s serial number

5. Select "Start"



Trauma Hal® will establish a connection in less than a minute.

4. Working with Trauma HAL® S3040.50

4.1 Airway

Nasal and Airway Intubation

Trauma Hal's airway can be intubated orally using endotracheal tubes and nasally using a nasogastric tube or nasopharyngeal tube. The simulator also allows providers to use a LMA. In addition, anatomical landmarks on the simulator permit the completion of the Sellick's maneuver.

Lubricate the tools used in these exercises to ensure easy insertion and avoid damage to the simulator.

Procedure	Recommended Device Size
Intubation (Blade size)	Miller 4 or MAC 3.5
LMA	Size 4 or 5
Nasal Intubation	8 Fr catheter
Oral Intubation	ETT 7.0 or 7.5

Intubation and ventilation of the esophagus leads to visible gastric distension.

WARNING: Manually lubricate the ET tube prior to performing an intubation exercise.

Do not spray mineral oil directly into the mouth or the airway.

Mouth to mouth resuscitation without a barrier device is not recommended as it may contaminate the airway.

Airway Complications

Use the software controls to enable laryngospasm and make intubation more difficult.

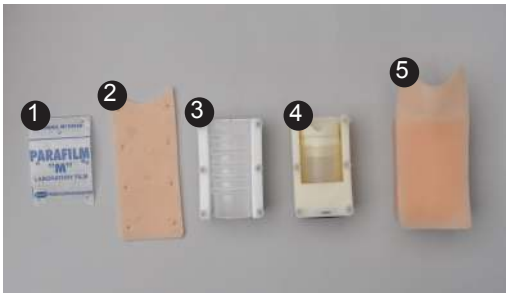
Airway Sounds

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

Surgical Airway

Trauma Hal includes two replaceable surgical airway inserts. The inserts allow users to perform tracheostomy or cricothyrotomy procedures with real medical equipment. The surgical inserts feature anatomical landmarks. Also, a simulated cricothyroid membrane, and trachea skin cover are provided.

A separate ventilation insert is pre-installed, which is designed to maintain a tight air seal during ventilation and intubation exercises. The insert also contains palpable landmarks used for surgical exercises. The ventilation insert may also be used for a one-time surgical exercise. Interchange the airway inserts as needed.

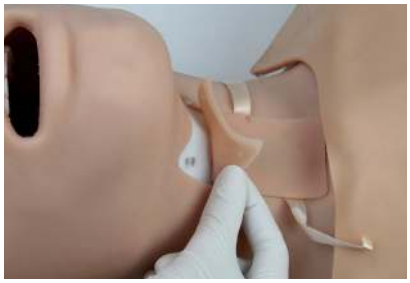


① Simulated cricothyroid membrane
② Trachea skin cover
③ Surgical trachea assembly
④ Surgical cricoid insert
⑤ Ventilation insert

Installing Surgical Cricoid Insert, Cricoid Membrane, and Skin

To install the surgical cricoid insert and the cricothyroid membrane:

1. Remove the ventilation airway insert by pulling the edges over the pins



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

3. Adjust the ribbons to accommodate the surgical neck insert

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

5. Remove the paper cover from the simulated cricothyroid membrane

6. Place the simulated cricothyroid membrane onto the insert and secure it by stretching the precut holes around the pins as shown below

7. Place the trachea skin cover over the assembly inserting the holes around the 4 pairs of pins.

The surgical assembly is ready to perform cricothyrotomy procedures.

Installing the Surgical Trachea Assembly

Surgical trachea assembly includes:

1: Surgical trachea base
2: Surgical trachea insert

1. Place the surgical trachea insert inside the trachea base

2. Remove the trachea skin cover from the simulator

3. Remove the surgical cricoid insert and place the surgical trachea insert instead.

4. Reattach the skin cover over the assembly and secure it by stretching precut holes the around the pins.

Trachea skin cover, cricothyroid membrane, and surgical trachea insert are consumable items.

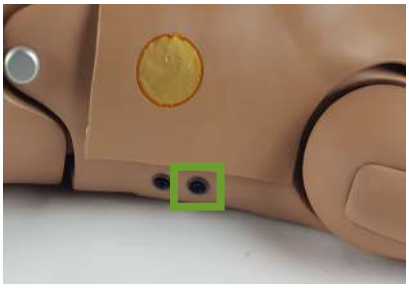
Tracheal Suctioning

Practice tracheal suctioning procedures on Trauma Hal. Follow the instructions below to prepare the airway for suctioning and to drain the fluid.

1. Fill a syringe with up to 25 mL of fluid
2. Insert the fluid into the mouth of the simulator using a funnel or the syringe
3. Perform the suctioning procedure

After the procedure, remove excess fluids in the airway.

1. Locate the drain port on the left side of the simulator



2. Connect the drainage hose to the port. Then connect the syringe to the hose.

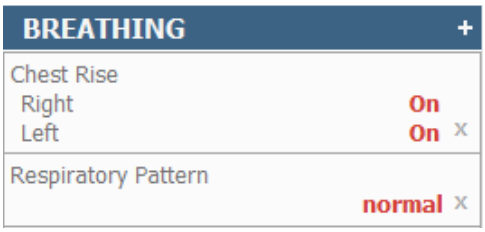
3. Suction the remaining fluid

4.2 Breathing

Chest Rise

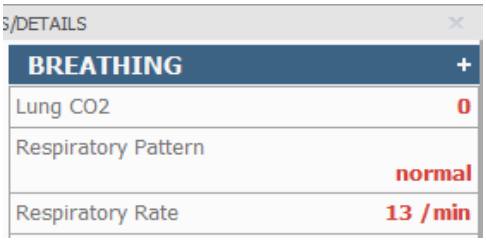
Bilateral chest rise and fall is automatic. Use the software controls to adjust the breathing rate and the inspiratory percentage.

Unilateral chest rise simulates tension pneumothorax. Use the software control to disable lungs independently.



Breathing Patterns

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



Lung Sounds

Left and right lung sounds are available: normal, wheezing, inspiratory squeaks, and crackles. These sounds are synchronized with the breathing patterns.

Ventilation

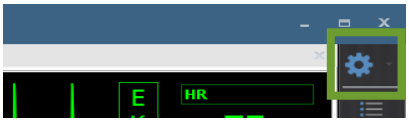
Practice BVM techniques using an adult sized mask having a thick seal.

Ventilate via endotracheal tube with manual or mechanical ventilation.

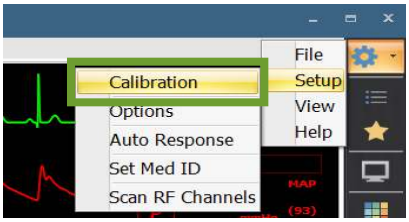
Ventilation Calibration

Complete the ventilation calibration process before using the ventilation feature for the first time.

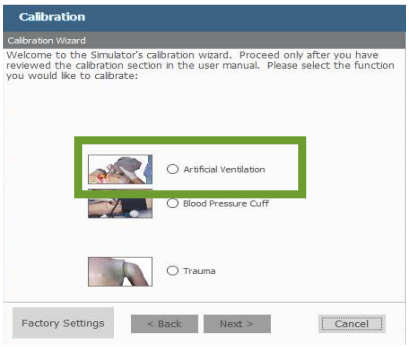
1. Tap the gear icon on the upper-right corner of the screen.



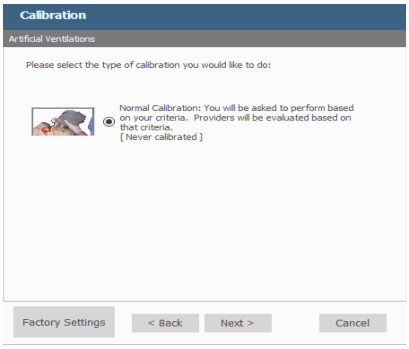
2. Select Setup>Calibration



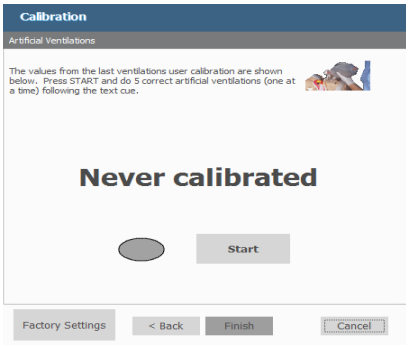
3. Click "Artificial Ventilation" and click "Next".



4. Select "Normal Calibration" and click "Next"

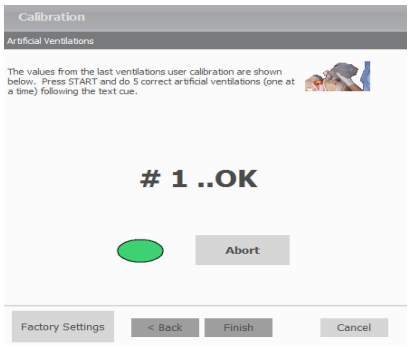


5. Click "Start" to proceed



6. When prompted, perform a ventilation

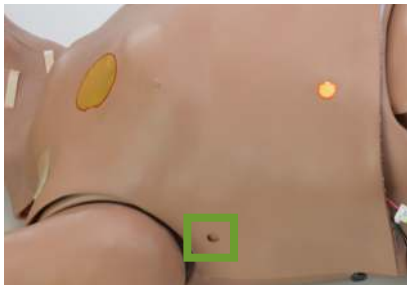
The oval in the calibration window will turn green to indicate the ventilation has been accepted.



7. Perform 4 more ventilations when prompted. Click "Finish" when all 5 ventilations have been completed

Hemothorax Sites

Bilateral chest drain sites located in the 5th intercostal space allow for Pneumo or hemothorax exercises.



Lubricate the device before inserting.

Feature	Recommended Device Size
Hemothorax	32 Fr

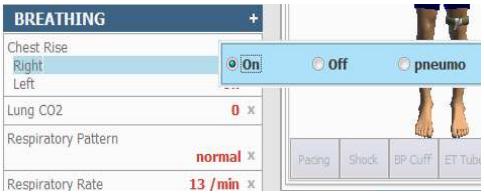
WARNING: Use the hemothorax sites for placement exercises only. Do not introduce fluid to the hemothorax sites.

Needle Decompression

Needle decompressions sites are located bilaterally at the 2nd intercostal space.

The lung must be in the disabled state before it can be treated with a decompression needle.

Manually activate the lungs using the software controls in "Chest Rise".



Feature	Recommended Device Size
Needle Decompression	22 gauge

After several punctures, it is necessary to change the decompression insert. Follow the steps below:

1. Turn off the simulator
2. Carefully lift the chest skin

3. Set the chest skin to the side or resting on the abdomen

WARNING: Be careful not to pull the cables from the chest skin.

4. Lift the medial end of the insert

5. Carefully pull the other end of insert out

6. Roll the o-ring up

7. Disconnect the decompression insert and discard

Keep the o-ring for later uses.

8. Connect the replacement insert

9. Begin to roll an o-ring down until it is tight around the connector

10. Push the connector back into the ribcage

11. Insert the other end into the ribcage

Real CO2 Exhalation (Optional)

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

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

Instructions for Use

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

To install a new CO2 cartridge:

> **WARNING: Always verify that the CO2 cartridge is by empty disconnecting the white tube behind the right knee and depressing the valve.**

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

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

3. Screw in a new CO2 cartridge into the harness adapter.

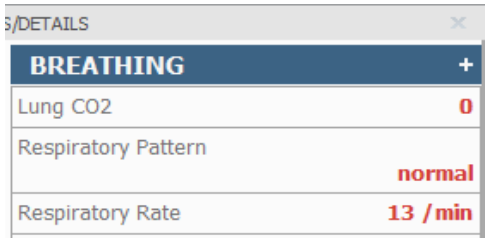
The harness adapter will puncture the CO2 seal as the cartridge is tightened. The cartridge will feel cool to the touch when the seal is broken. Continue to tighten the CO2 cartridge until is hand tight.

> **WARNING: Do not unscrew the cartridge once the seal is broken.**

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

Adjusting CO2 Output

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



The graph below outlines the duration of CO2 output for each of the programmable CO2 levels.

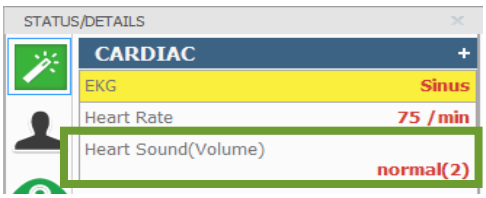
CO2 Level	Approximate kPa	Approximate duration (in minutes) of CO2
0	0	
1	1.7	125
2	2.8	110
3	3.9	75
4	4.7	55
5	5.5	45
6	6	35
7	6.7	30
8	7.3	25
9	7.7	25
10	8.5	20

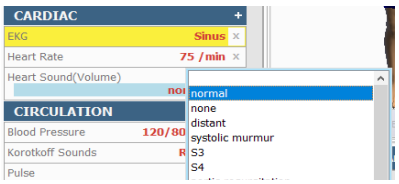
4.3 Cardiac

Heart Sounds

HAL generates audible heart sounds (normal, distant, systolic murmur, S3 and S4) which are tied to a user defined heart rate and selectable rhythms.

Use the software controls to change the heart sound type and volume level.





Compressions

Realistic chest cavity allows students to experience the correct force needed to perform proper chest compressions.

Depth of chest compressions are measured and logged in cm or inches.

Proper chest compressions during CPR result in palpable carotid pulses.

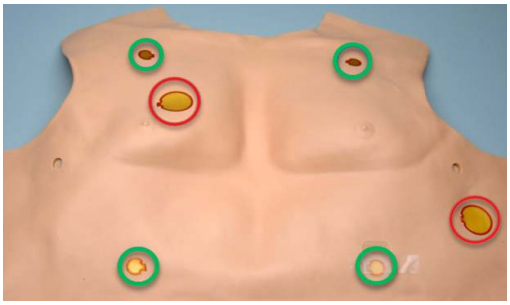
ECG Monitoring and Electrical Therapy

Trauma Hal is equipped with conductive skin sites that allow the attachment of real electrodes and defibrillator pads. This feature permits the user to track cardiac rhythms and events with their own equipment just like with a human patient.

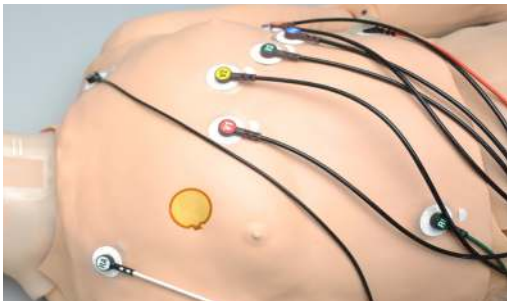
Trauma Hal can be shocked or paced with real energy for cardioversion, defibrillation and pacing drills. AED will display the simulator's ECG, analyze his cardiac rhythm and advise action.

> **WARNING: Defibrillation is only supported on the large sternum and apex sites circled RED below. Do not deliver a shock to ECG electrode sites on the shoulders or waist marked GREEN. The warranty does not cover damage to the simulator caused by applying electrical therapy to the ECG sites.**
>
> **For exercises that incorporate real electrical therapy of any kind, always follow the safety guidelines and operating procedures outlined in the medical device manufacturer documentation.**

4 Lead Chest Skin



12 Lead Chest Skin (Optional)

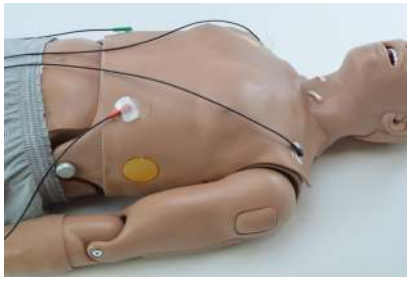


Instructions for Use

1. Turn on the simulator. Refer to the Equipment Set-Up section.

2. Place the electrode patches on the ECG sites

3. Connect the ECG lead wires on the ECG sites.

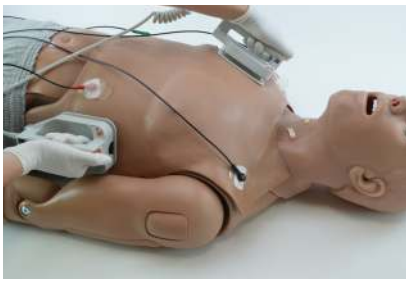


4. Turn on the ECG monitor.

Electrical Therapy

Put Trauma Hal in a shockable rhythm using the software controls.

Deliver up to 360 Joule of real energy to the patches.



WARNING: Review the Care and Cautions before defibrillating Trauma Hal.

Trauma Hal detects when a shock has been delivered.

Select whether to convert the current rhythm to a normal sinus rhythm.

4.4 Circulation

Palpable Pulses

Trauma Hal is equipped with multiple automatic pulse sites that operate continuously. Pulses are located bilateral carotid, radial, femoral, and pedal.




Pulses are synchronized with the ECG and dependent on blood pressure.

Programmable Blood Pressure

Programmable blood pressure can be read on the right arm using a sphygmomanometer. In addition, users can auscultate the Korotkoff sounds programmed by the software.

Setup

1. Wrap the cuff around the right upper arm

> **Calibrate the BP cuff before measuring blood pressure.**

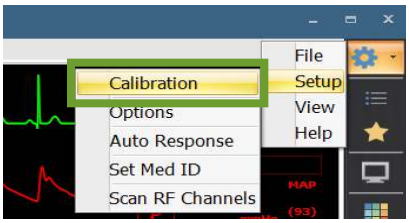
Blood Pressure Calibration

Before starting the calibration process, place the blood pressure cuff on the simulator as it would be placed as instructed above.

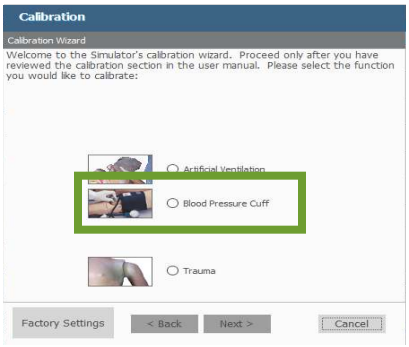
To calibrate the blood pressure feature using the tablet:

1. Tap the gear icon on the upper-right corner of the screen.

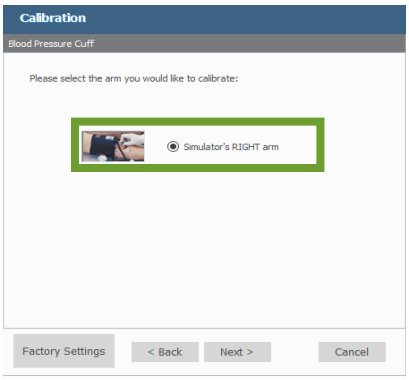
2. Select Setup>Calibration



3. Click "Blood Pressure Cuff" and click "Next".

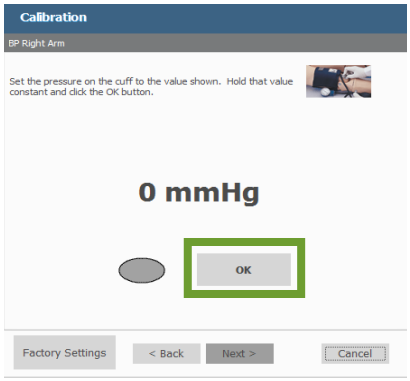


4. Select "Simulator's RIGHT arm" and then "Next" in the calibration window to begin

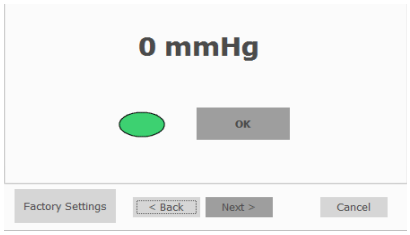


5. Set the pressure on the BP cuff to 0 (i.e. cuff valve open) as prompted by the calibration wizard.

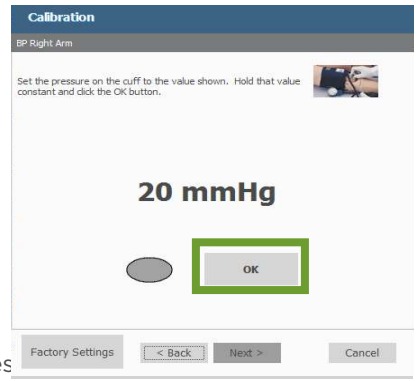
6. Click "OK" when the gauge reads 0 mmHg.



The oval will turn green and move on the next value.



7. Set the pressure on the BP cuff to 20 mmHg as prompted by the wizard and then Click “OK” to record.

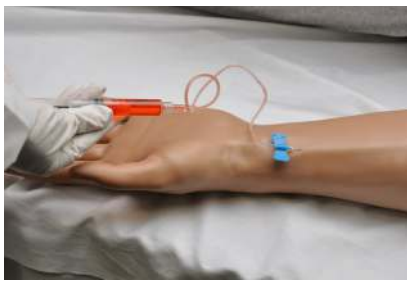


8. Continue increasing the BP cuff pres prompt and recording the pressure intervals.

9. At the end of the calibration, click “SAVE” to accept and close the calibration wizard.

Intravenous Extremities

The HAL is equipped with bilateral IV training arms that can be used for bolus or intravenous infusions as well as drawing fluids.



WARNING: Do not attempt to fill IV system without the drain hose in place.

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

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

There is also an antecubital venous access at the elbow bend in both arms.

Instructions for Use

Locate the fill syringe with tubing and the drain tube with a clamp

1. Connect the drainage to the black port on the arm

2. Fill the syringe with the desired fluid

3. Connect the syringe with tubing to the white port

4. Depress the syringe until all air has been pushed from the IV system and fluid runs from the drain

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

Cleaning the Vasculature

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

To clean and dry the IV arm:

1. Power on the simulator
2. Fill the filling syringe with 70% isopropyl alcohol
3. Connect the fill syringe and the drain tube to arm

4. Flush the vasculature with 70% isopropyl alcohol solution.

5. Fill the filling syringe with air and purge the clean water to dry the vasculature.

Replacing the Elbow Venous Line

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

To change the venous line, follow the instructions below:

1. Detach the elbow skin cover

2. Roll the black ring from the white connector

3. Pull each side of the vein from the white connector

4. Remove the other side of the vein

5. Remove the black rings from the vein and set aside for later use

6. Connect one side of the vein to the white connector

7. Roll the black rings on the replacement vein

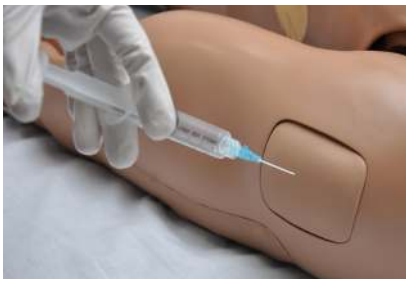
8. Connect the other side of the vein and roll the rings back around the connectors

9. Place the skin cover back in place. Ensure that the vein is secure inside the canal.

Intramuscular Injection Sites

IM sites on both deltoids and quadriceps for placement exercises.

WARNING: Do not inject fluids into the intramuscular sites.



Intraosseous Access

I/O access is used for the infusion of fluids, blood and/or drugs directly into the bone marrow of the tibia or other large bone. Setting up an intraosseous access line is an invasive procedure that can be simulated with Trauma HAL.

The following procedure describes how to use the I/O access feature:

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

2. Gently remove both halves of bone, starting with the lower half

3. Locate the I/O Fill syringe and adapter and fill the syringe with fluid

4. Fill the upper and lower half of tibia with fluid.

5. Replace tibia bone in the leg.

6. Re-attach the tibia cover.

7. Palpate the tibial tuberosity.

8. Perform the I/O exercise.

WARNING: Always drain and flush the reservoirs after every simulation.

4.5 Gastrointestinal

Gastric Distension

Trauma Hal will display gastric distension with excessive BVM ventilations.

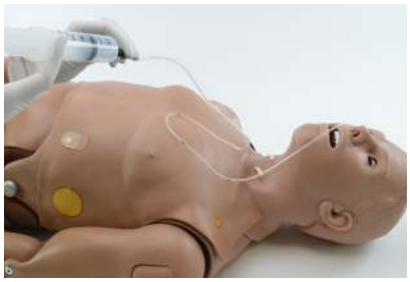
To release the air, press down on the stomach bag.

Gastric Suctioning

1. Lubricate a size 8 Fr catheter

2. Insert the NG tube

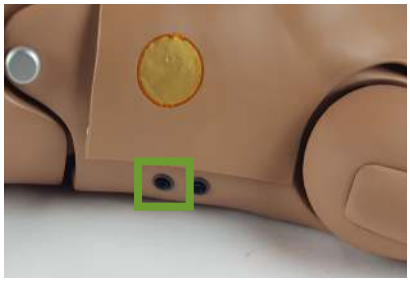
3. Fill the stomach using a syringe or funnel



> **The stomach has a maximum capacity of 100 mL.**

To drain the fluid from the stomach,

1. Connect the drain hose to the port



2. Connect the syringe to the hose and suction the fluid out

4.6 Trauma

Trauma Leg Assembly

1. Remove the knee bolts using the hexagonal wrench

2. Separate the healthy leg from the upper leg

3. Disconnect the red pulse line

4. Connect, turn, and lock the clear fluid hose

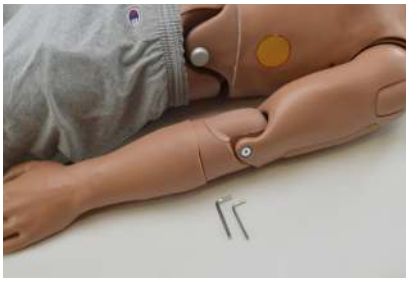
5. Tuck the disconnected pulse line into the upper leg

6. Position the trauma leg into the knee joint

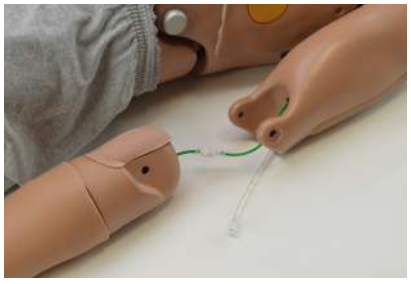
7. Use the hexagonal wrenches provided to secure the knee bolt without over tightening

Trauma Arm Assembly

1. Remove the elbow bolt using the hexagonal wrench



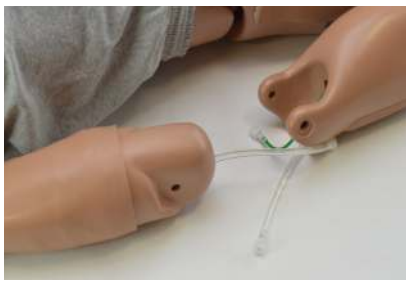
2. Separate the healthy arm from the upper arm



3. Disconnect the green pulse line

4. Set the healthy arm aside

5. Align the trauma limb with the upper arm and



6. Connect the clear hose

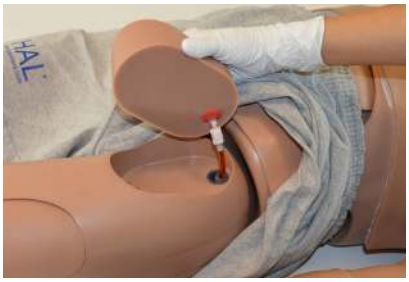
7. Tuck the pulse line and the fluid hose into the upper arm

8. Insert the elbow joing

9. Insert the bolt and use the hexagonal wrench to secure the joint

Changing the Groin Wound Insert

1. Gently lift the wound insert out of the cavity



2. Turn and unlock the connector of the fluid line

3. Tuck the fluid line into the cavity

4. Place the healthy insert inside the cavity

Filling the Fluid Reservoir

> **The simulator must be turned on and connected to the UNI software during the filling procedure.**

The internal reservoir holds **1.5 liter** of simulated blood. To fill the reservoir, follow the steps below:

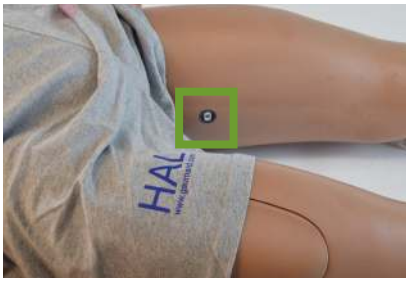
1. Ensure that the flow valve on the external blood bag is closed

2. Fill the external blood bag with simulated blood using a syringe or funnel

3. Open the flow vavle and purge the air from the line

4. Close the flow valve when fluid begins to exit

5. Locate the reservoir port on the inner left thigh



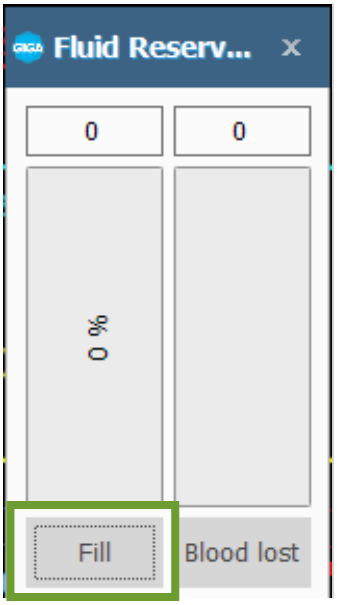
6. Connect the blood bag hose to the fill port

7. Hold the blood bag at least 2 feet above Trauma Hal's reservoir

8. Open the flow valve

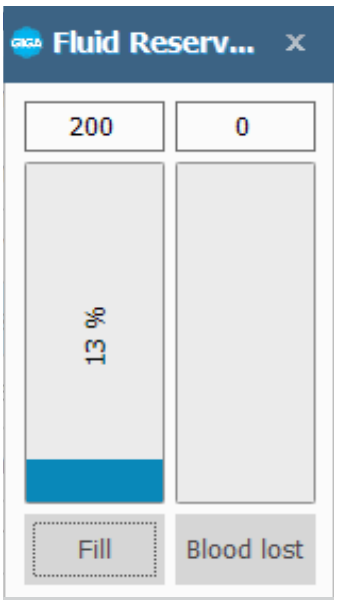
9. In the UNI software, select the "Fluid Reservoir" icon

10. Select "Fill" in the "Fill Reservoir" window



The reservoir will automatically stop filling when the capacity is reached.

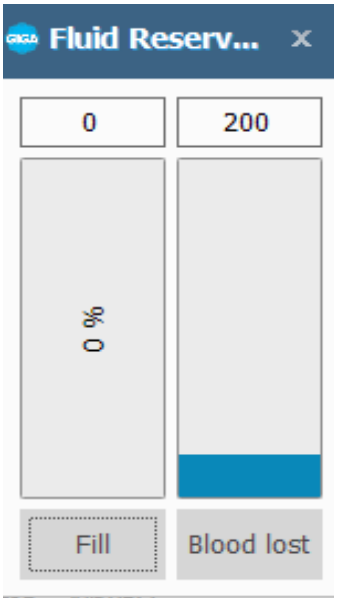
Alternately, the filling process can be stopped manually by clicking "Stop".



11. Disconnect the blood bag from the filling port

For continuous blood flow, add more blood to the external blood bag and leave it connected to the fill port.

As the wound and limbs bleed, the "Fluid Reservoir" window will update how much fluid is lost and how much fluid is in the reservoir.



Wound Site

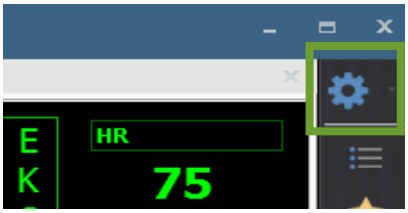
Pressure sensors are located at the groin wound and femoral artery. Trauma Hal is packaged with a healthy insert and an extra groin wound insert.

Pack the wound site with gauze to stop the bleeding.

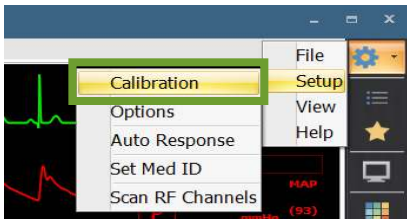
Calibrating the Wound Site Threshold

Calibrate the amount of pressure needed to stop the bleeding on the femoral artery.

1. Click the gear in the upper right corner of UNI

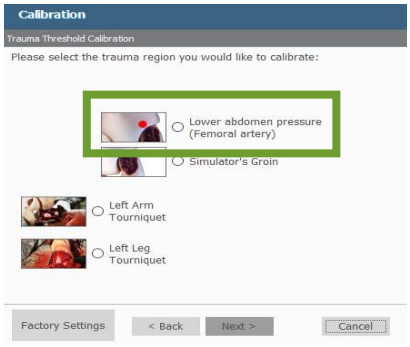


2. Select Setup>Calibration



3. In the Calibration window, select "Trauma" then click "Next"

4. Select "Lower abdomen pressure" and click "Next"

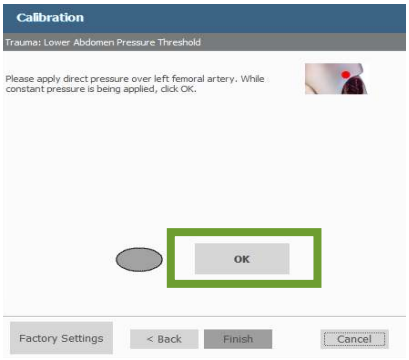


> **Calibrate the femoral artery and groin pressure separately.**

5. Apply constant pressure with your hands or knees to the femoral artery

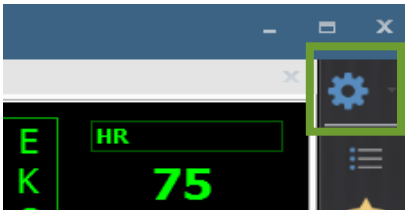
6. While pressure is applied, click "OK" in the calibration window

7. Once the oval turns green, click "Finish"

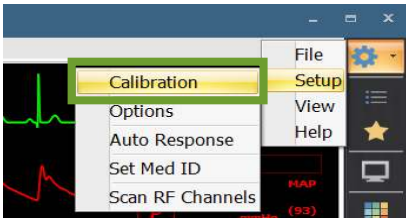


Calibrate the amount of pressure needed to stop the bleeding on the groin site.

1. Click the gear in the upper right corner of UNI

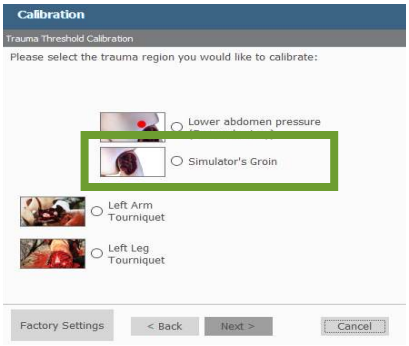


2. Select Setup>Calibration



3. In the Calibration window, select "Trauma" then click "Next"

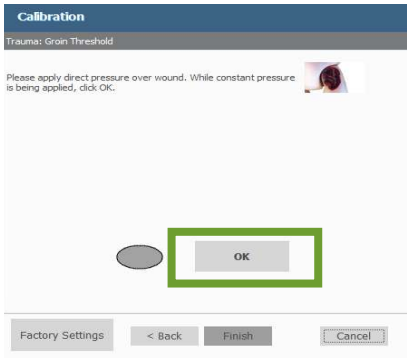
4. Select "Simulator's Groin" and click "Next"



5. Apply constant pressure to the groin wound

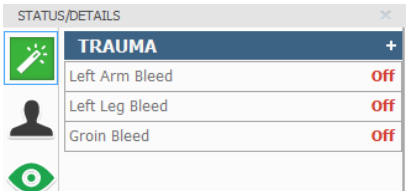
6. While pressure is applied, click "OK" in the calibration window

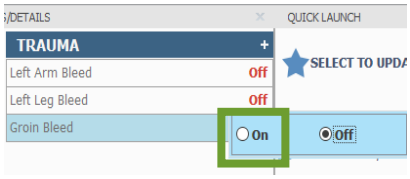
7. Once the oval turns green, click "Finish"



Activating Groin Wound Bleeding

Use the software controls to activate the bleeding.

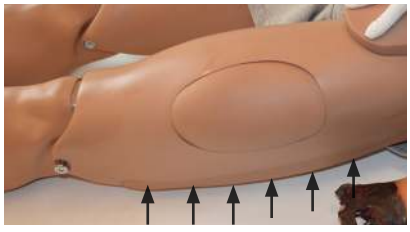




Left Leg

The healthy left leg can be interchanged with a trauma limb. Reference section 4.6 Trauma Leg Assembly to install the leg.

The blood flow is dependant on the heart rate and blood pressure. To stop the bleeding, apply a tourniquet over the sensor or on the lower limb.

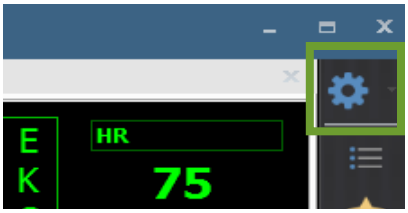


Tourniquet Sensor

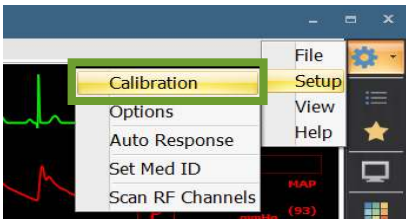
Calibrating the Left Leg Tourniquet Threshold

Calibrate the amount of pressure needed to stop the bleeding on the left leg.

1. Click the gear in the upper right corner of UNI



2. Select Setup>Calibration



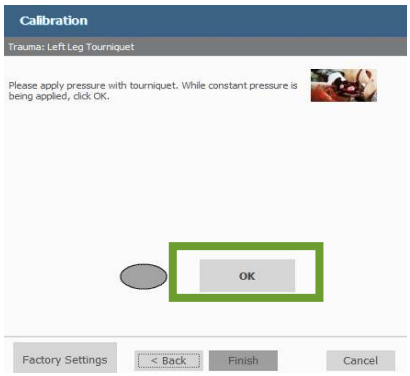
3. In the Calibration window, select "Trauma" then click "Next"

4. Select "Left Leg Tourniquet" and click "Next"

5. Apply constant pressure with the tourniquet

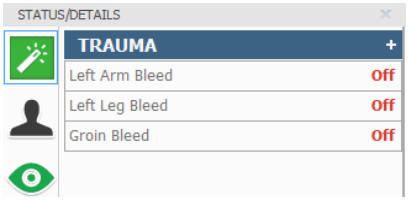
6. While pressure is applied, click "OK" in the calibration window

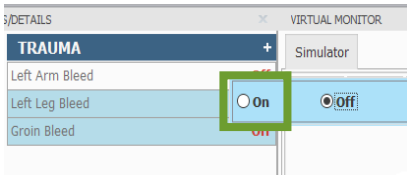
7. Once the oval turns green, click "Finish"



Activating Left Leg Bleeding

Use the software controls to activate the bleeding.

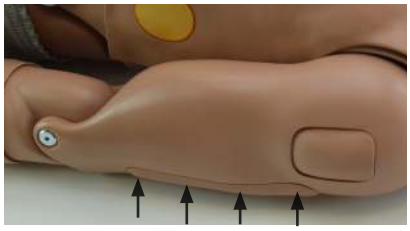




Left Arm

The healthy left arm can be interchanged with a trauma limb. Reference section 4.6 Trauma Leg Assembly to install the arm.

The blood flow is dependant on the heart rate and blood pressure.. To stop the bleeding, apply a tourniquet over the sensor or on the lower limb.

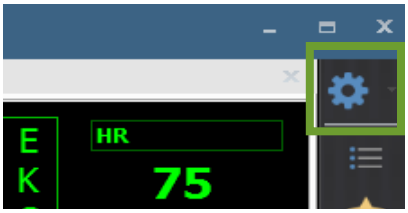


Tourniquet Sensor

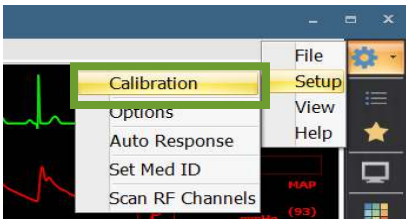
Calibrating the Left Arm Tourniquet Threshold

Calibrate the amount of pressure needed to stop the bleeding on the left arm.

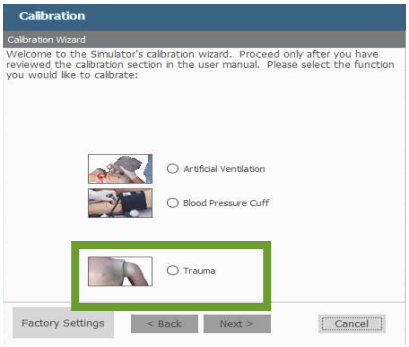
1. Click the gear in the upper right corner of UNI



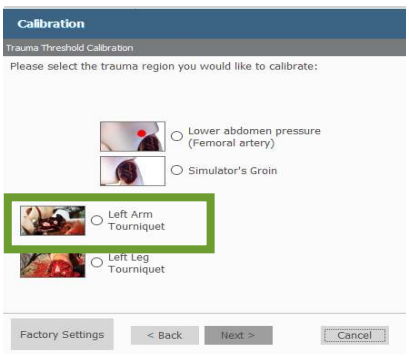
2. Select Setup>Calibration



3. In the Calibration window, select "Trauma" then click "Next"

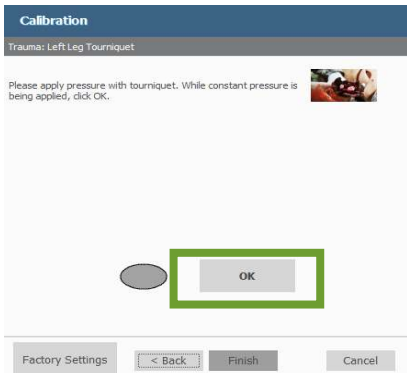


4. Select "Left Arm Tourniquet" and click "Next"



5. Apply constant pressure with the tourniquet

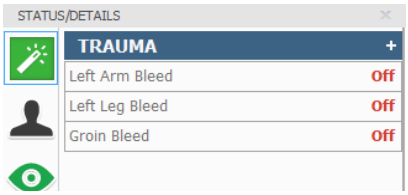
6. While pressure is applied, click "OK" in the calibration window

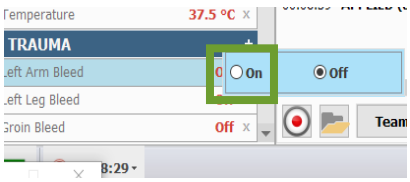


7. Once the oval turns green, click "Finish"

Activating Left Arm Bleeding

Use the software controls to activate the bleeding.





Draining the Fluid Reservoir

It is recommended to drain the fluid reservoir after every simulation. Follow the steps below for proper drainage procedures:

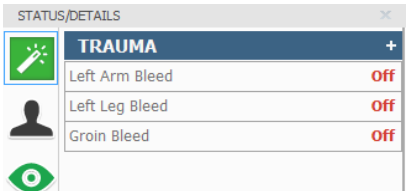
1. Turn on the simulator

2. Connect a syringe with fill tube to the fill port

3. Suction the remaining fluid from the reservoir

4. Fill the syringe with 30:70 mix of isopropyl alcohol and water. Connect the syringe and fill the reservoir with the solution

5. Use the software to activate bleeding



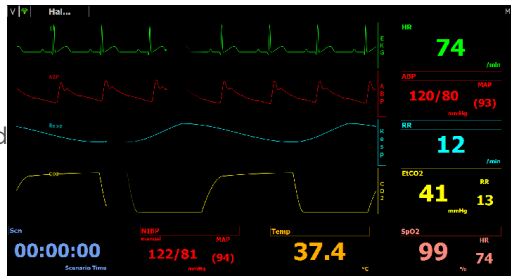
6. Allow the limbs to bleed the solution out

7. Suction the remaining fluid

5. Other

5.1 Virtual Vital Signs Monitor (Optional)

The Gaumard Virtual Vital Signs Monitor simulates vital sign monitoring equipment. The vital signs are synchronized through a wireless connection between the facilitator's laptop and the virtual monitor.

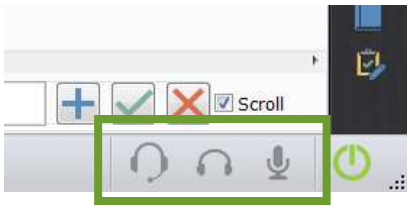


Each trace can be customized independently; users can set alarms, time scales, boundaries and grid options. In addition, it allows the facilitator to display lab reports, x-rays and other files on the Virtual Monitor screen for use by the provider. For information on how to setup Gaumard Monitors with UNI, please refer to the Appendix.

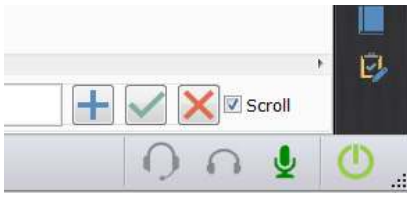
5.2 Streaming Audio (Optional)

Use the feature to speak as the simulator's voice and listen to the participant's reply.

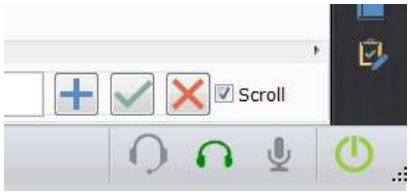
Connect the headset to the tablet. In UNI, locate the streaming icons in the lower right of the screen.



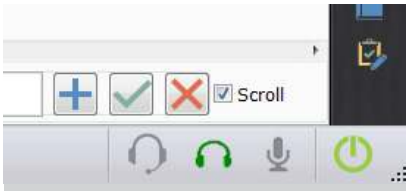
Select the microphone icon to talk as the simulator's voice.



Select the headset to listen to the participant's reply.



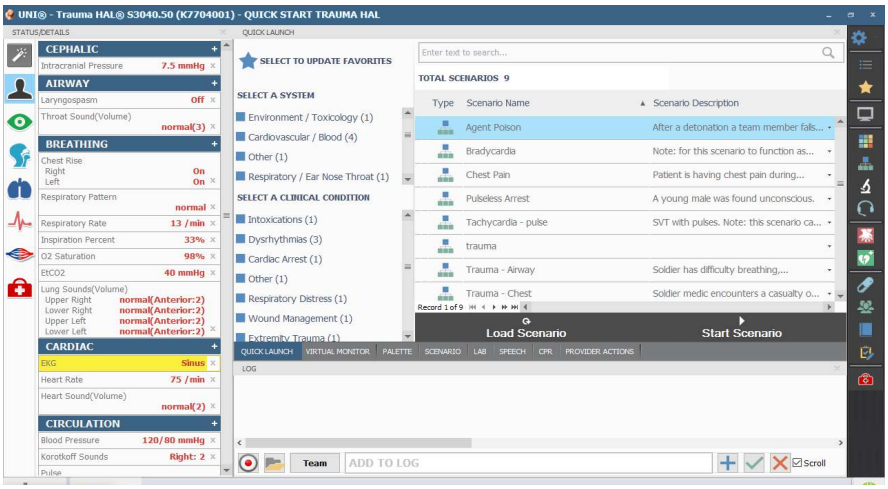
Select the headset and microphone icon to listen and talk simultaneously.



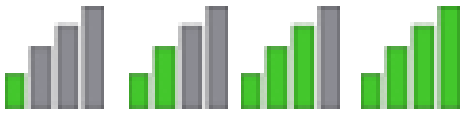
5. Working with UNI®

5.2 UNI Interface

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



Connection Status



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

Battery Indicator

The battery status indicator updates as the backup battery in the simulator is used. The exclamation mark indicator is shown when there is no communication with the simulator and the program cannot retrieve battery information from the simulator.

When the battery icon is depleted, the simulator is set to STAND-BY mode automatically to protect the simulator's internal components.

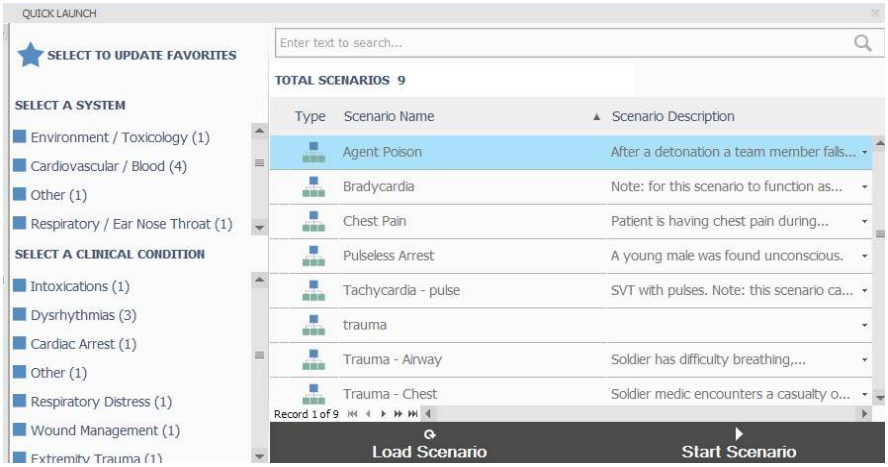
Internal battery duration is approximately 8 hours.

Power/Stand By

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

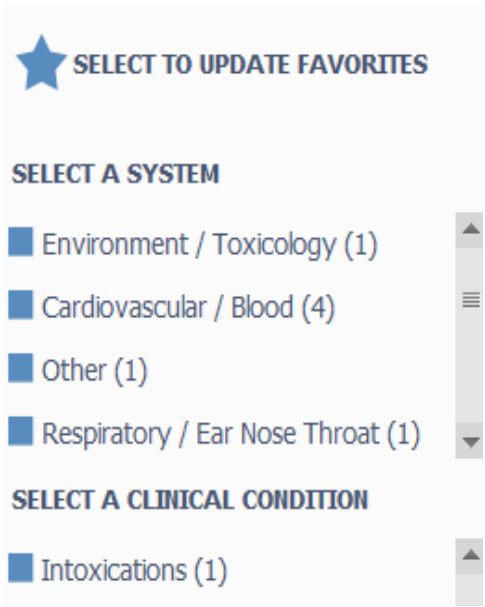
5.3 Quick Launch

The UNI interface opens up showing the quick launch page for the scenarios. This page is used to easily access the preprogrammed scenarios saved on each profile.

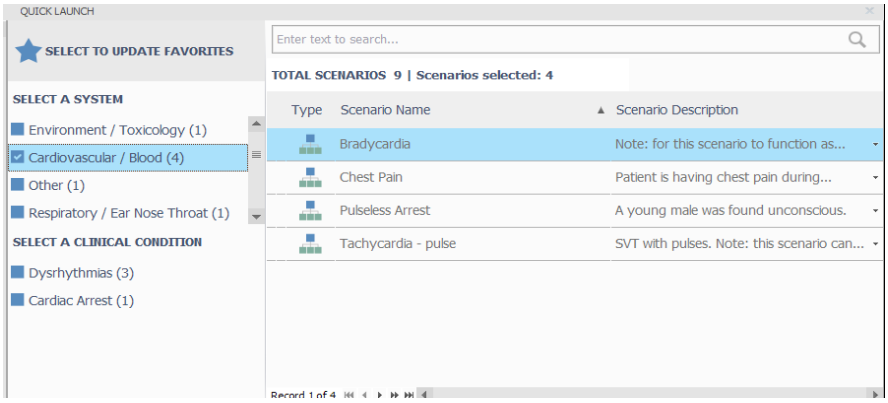


Clinical Condition

The scenarios are categorized by clinical condition to the left of this page; i.e. shoulder dystocia, cord prolapse, etc.

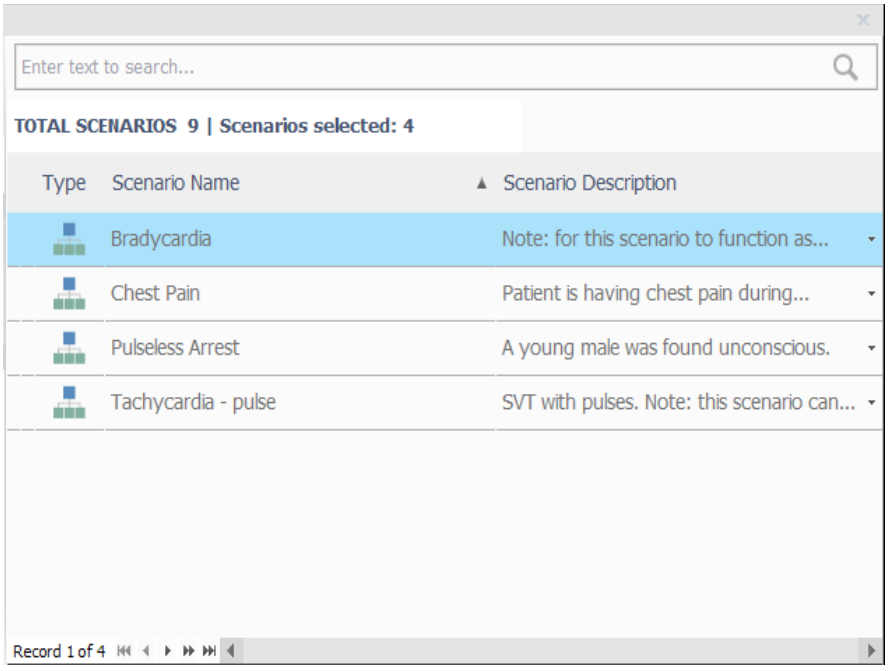


Notice that one or more scenario types can be selected at the same time and the list of scenarios on the right will display only the scenarios included in the selected categories.

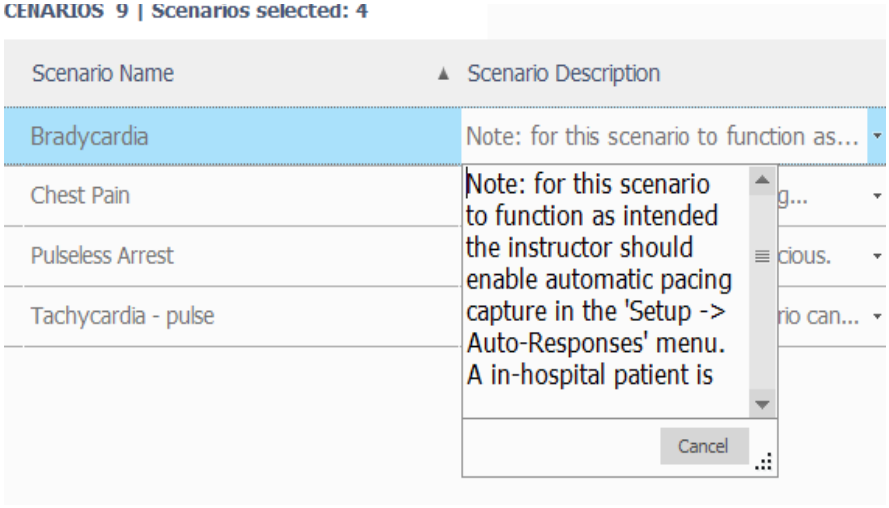


Selecting the Scenario

Click on one of the scenarios listed to highlight it and the scenario can either, be started immediately or loaded.



Click on the drop down arrow to the right to read a scenario description.



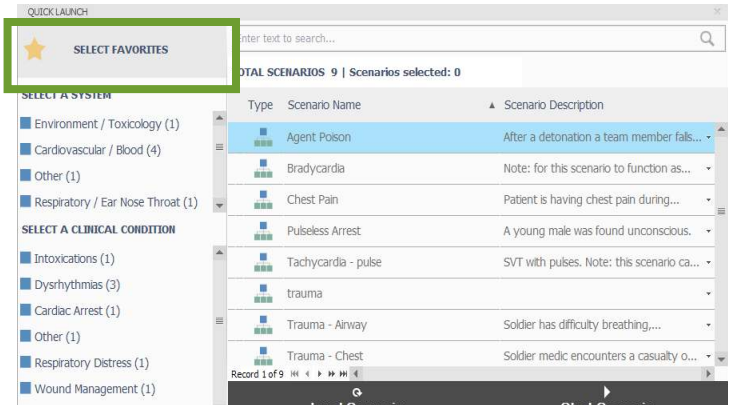
Clicking “Start Scenario” loads the appropriate scenario and starts it playing without the user having to do anything else with the control computer.

Notice that the position of the fetus should be selected before clicking “Start Scenario”.

> **Prepare the simulator for delivery before activating quick launch scenarios. For complete information refer to the “Working with Simulator” section.**

Favorites

The “Favorites” feature allows users to reduce the number of scenarios highlighted to those within the categories that will be used most frequently.

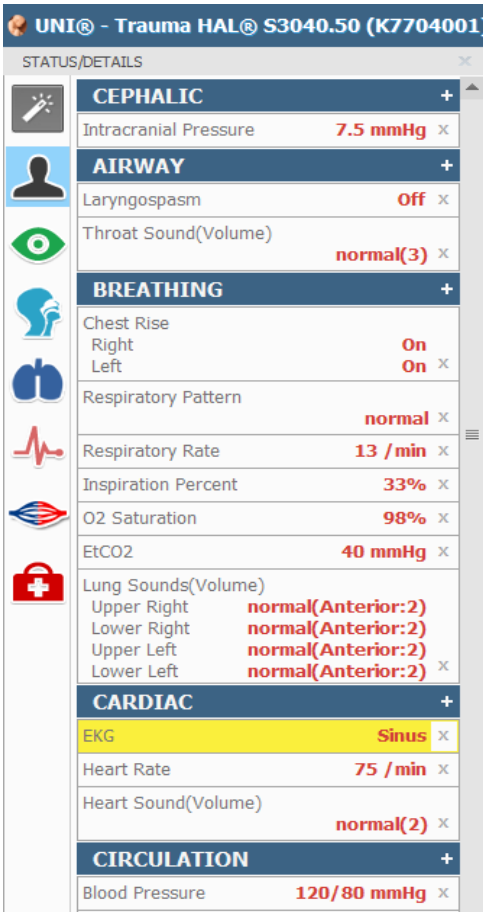


Enable the “Favorites” feature by clicking the star icon. Then select the categories or scenario types to be stored under this feature.

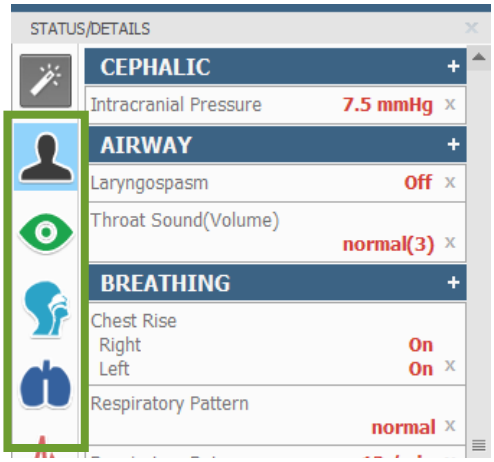
5.4 Status/Details Controls

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

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



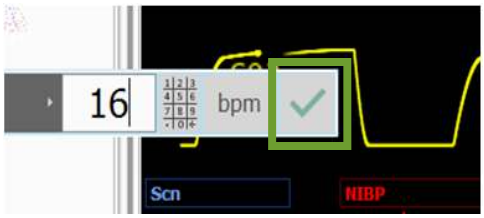
Separate the features by region by clicking one of the icons on left.



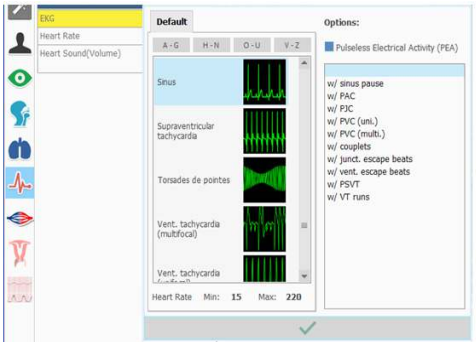
Changing Vital Signs

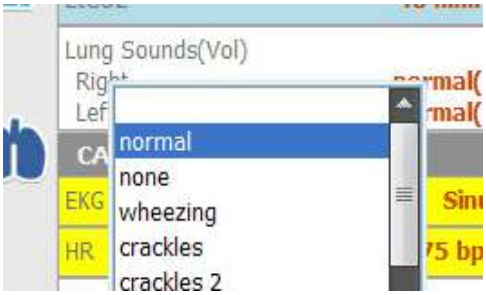
To adjust numerical values click the slider control. (e.g. heart rate, blood pressure, respiratory rate, etc.).

Alternatively, use the key-board for manual entry and click the green checkmark to confirm the change.

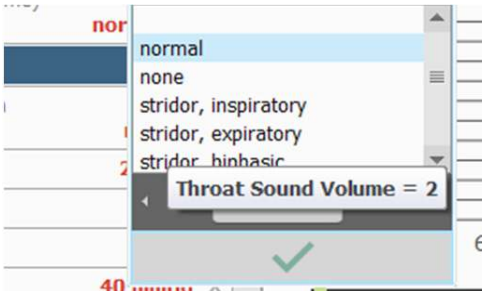


To change patterns, sounds, and rhythms, click on the specific control to display the library (e.g. EKG rhythms, heart and lung sounds, respiratory patterns, etc.)





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

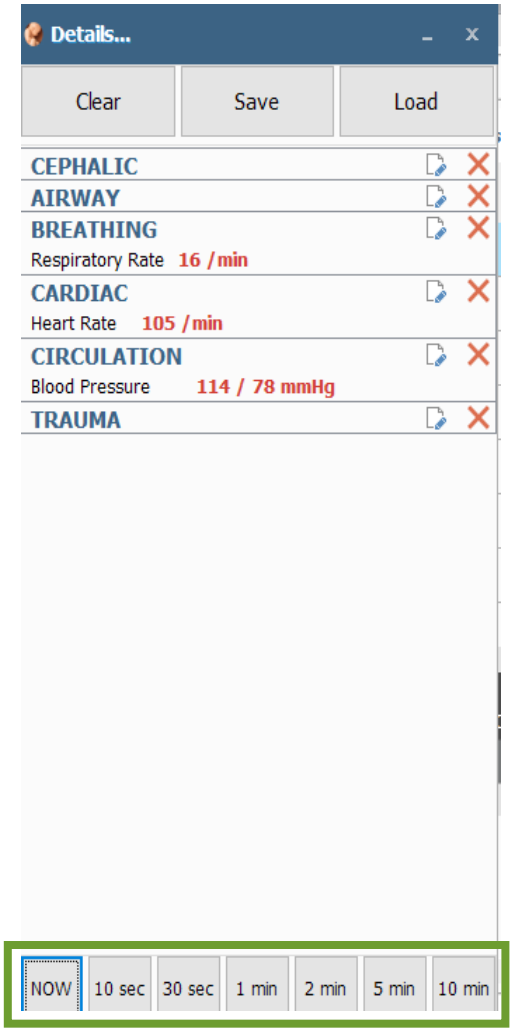


Applying Changes

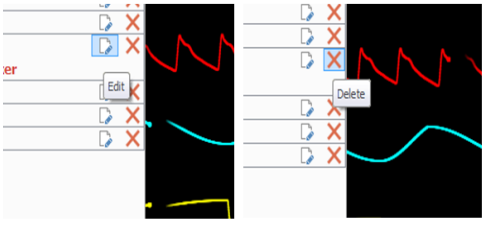
No changes will be made to the simulator's condition until the new settings are submitted using the "Apply" panel.

After the list of changes is created, click "NOW" to update the vital signs instantly.

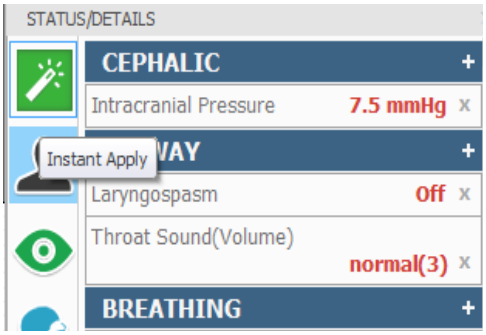
Alternatively, click a trending timer to update numerical vital sign parameters (e.g. heart rate, blood pressure) gradually.



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



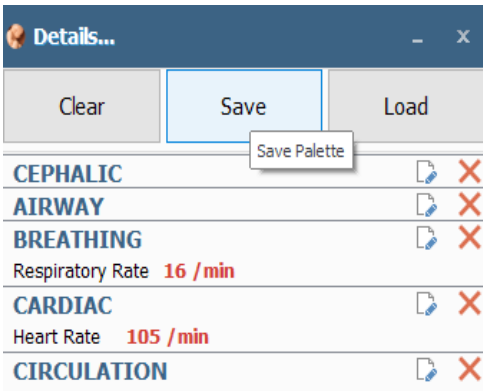
Enable the “instant apply” option and click the control to change the vital sign to a new value without the need to use “Apply” panel. Vital signs undergoing change blink yellow.



Creating Palette Items

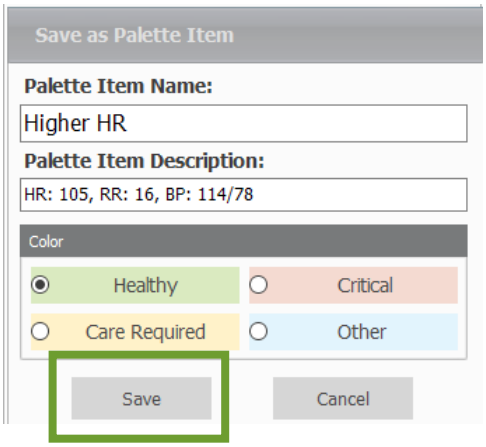
A palette item stores one or more vital sign settings into a single loadable object. Use a palette item to update a set of vital signs quickly.

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

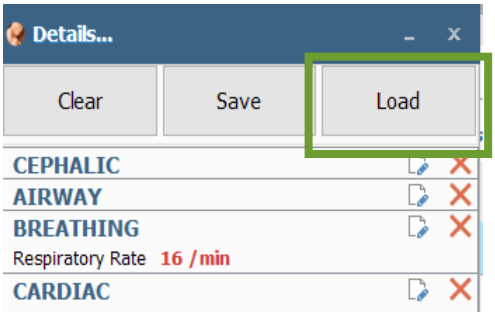


Enter a name for the palette, a description, and choose color code.

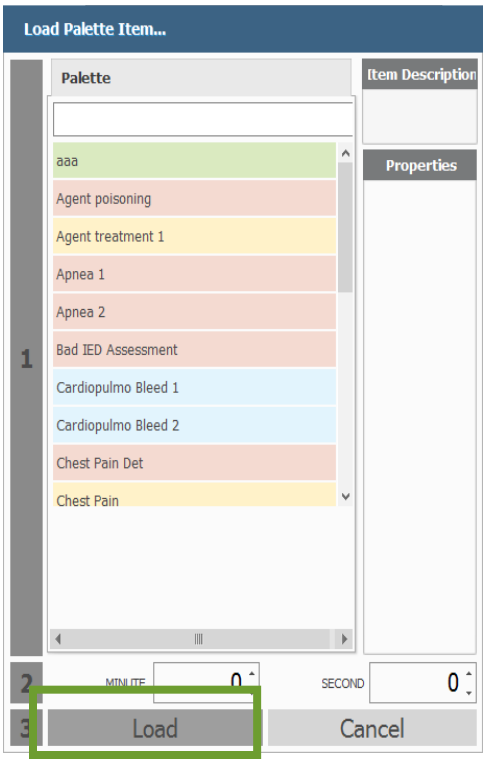
Click “Save” to create the new palette Item. Palette items are stored in the active profile.



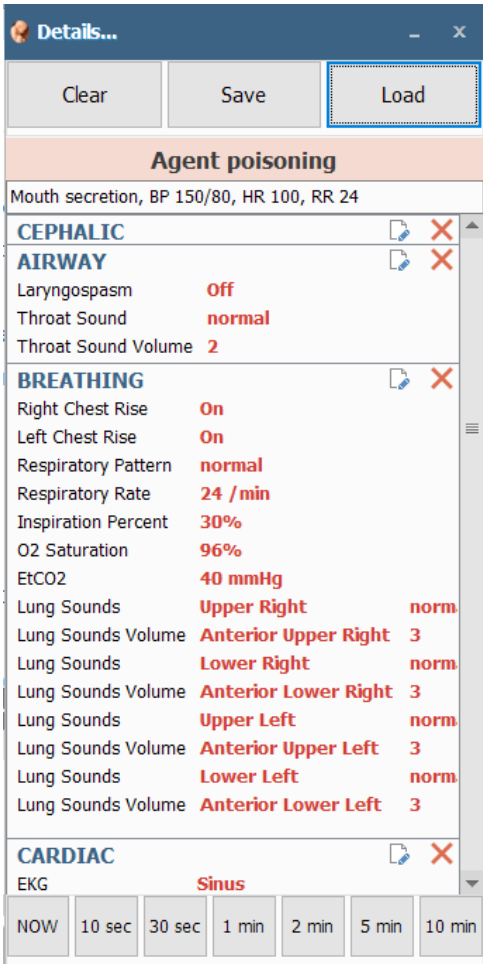
When the palette is needed, click the Load button to select the palette from the library.



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



Click the "Apply Now" option to submit the changes.



6. Virtual Monitor Setup (Optional)

A patient virtual monitor is an optional purchase with Trauma Hal®.
Follow the steps below in order to activate this feature:

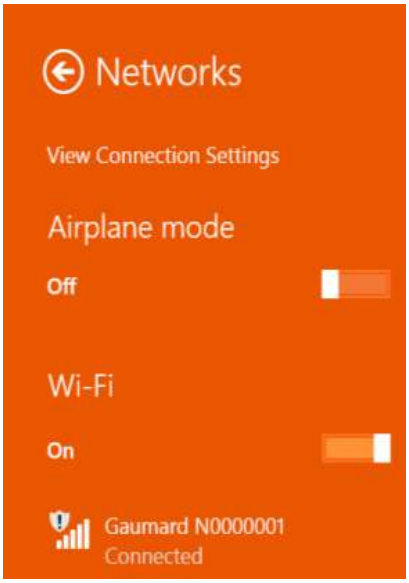
1. Add Velcro® to TPLink router and VM.

2. Connect Router to USB power supply.

3. Open the Wireless Network Connection on the Monitor Tablet and connect to the default network, which name will be (GaumardSimulatorSerialNumber).

4. (Example) GaumardN0000001

5. Open the Wireless Network Connection on the simulator control computer and connect to the same network name (GaumardN0000001)

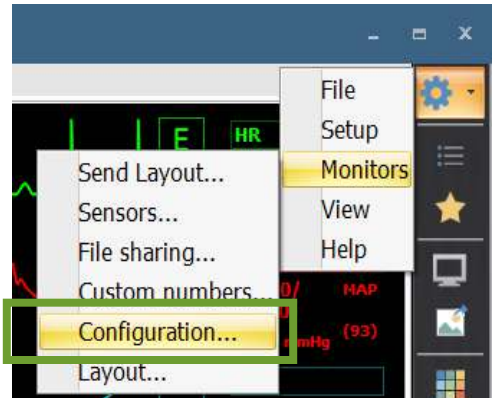


Configure the Vital Signs Broadcast

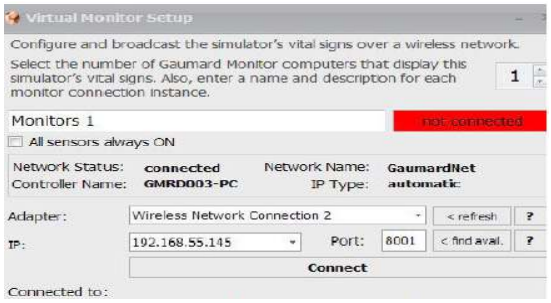
Complete next steps to configure the transmission of the vital signs information, after the wireless connection is established between both computers.

1. Start the UNI control software on the control computer.

2. On the UNI menu bar, click the Gear> Monitors> Configuration.



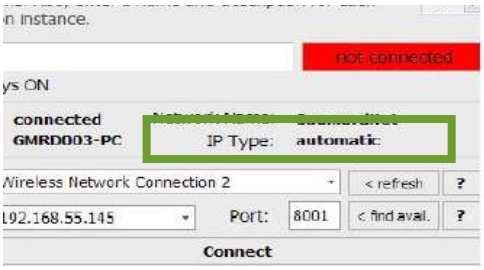
3. The “Virtual Monitor Setup” window is displayed.



4. Set the adapter to “Wireless network connection” or “WIFI”.

5. Verify that the IP Type is set to automatic.

6. Write down the “IP Address” and “Port number”.

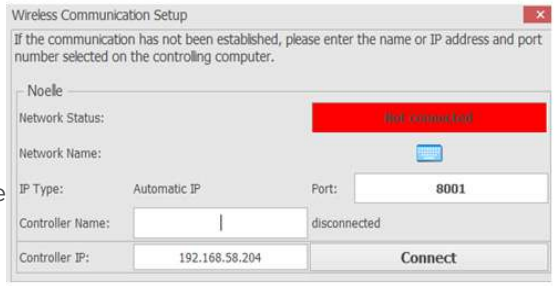


7. Click “Connect” to broadcast an outgoing connection.

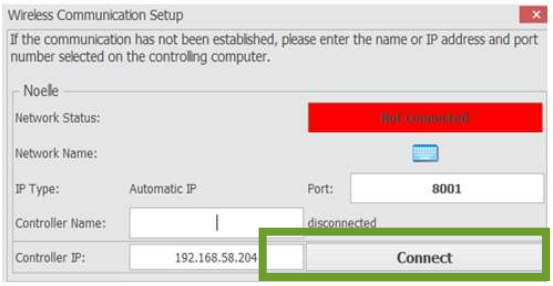
8. Start the Gaumard Monitors software on the virtual monitor PC.

9. Click the “V” menu in the top left corner, and then select “Comm Setup”.

10. Enter the IP Address from the UNI software and verify the port number.



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



7. Appendix

7.1 Scenarios

	SCENARIO	DESCRIPTION
1.	Anthony	77-yr old man is found pulseless and apneic.
2.	Bradycardia	Note: for this scenario to function as intended the instructor should enable automatic pacing capture in the 'Setup -> Auto-Responses' menu. A in-hospital patient is diagnosed with Bradycardia and requires immediate attention.
3.	Brent	55-year old male complains of substernal chest pain radiating to the jaw. Patient is diaphoretic, trembling, and has a waxing and waning mental status.
4.	Christian	18-yr old college freshman calls EMS after taking a caffeine preparation prior to exams. He is short of breath and says that his heart is "beating fast and funny."
5.	Darrell	65 year-old complains of dizziness and shortness of breath. He has a history of emphysema and does not know how much "breathing medicine" he has taken. During the interview, his eyes roll back and he slumps in his seat, unresponsive. (No peripheral IV sites are available.)
6.	Evan	72 year-old is found tachycardic and tachypneic. He is disoriented and barely responsive. Patient's wife says that he has both heart and lung trouble and that they have been unable to afford his medicine in the past month. (After "apnea" item, facilitator should set scenario auto-response to pacing to "none" to simulate loss of capture.)

7.	Frank	50 year-old found at home complains of weakness and fatigue. He is conscious and alert but slightly short of breath. An empty bottle of digoxin sits on his bedside table. (He will claim not to have taken any in several days. Pharmacological rate control will only be effective briefly.)
8.	Gerard	35 year-old man calls for help at local restaurant after onset of alarming respiratory symptoms. (Patient experiencing allergic reaction to food, asthma attack, or exposure to inhaled toxin.)
9.	Pulseless Arrest	A young male was found unconscious.
10.	Tachycardia - pulse	SVT with pulses. Note: this scenario can progress directly to the Pulseless Arrest scenario. To do so, load "Pulseless Arrest" after stopping this scenario while on Node 2.

7.2 More about Scenarios

Thinking In Terms of Palette Items

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

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

Smart Scenarios

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

1. How will the scenario begin?

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

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

There is one point that can cause confusion and warrants further explanation. It is an extension of the above discussion of partial states. The issue is best illustrated through the following example:
Suppose that you are creating a Palette Item to start your scenario. In this case, you have decided that the patient will be apneic. The question is, "How should the lung sounds be set?"

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

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

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

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

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

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

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

3. Assume that providers will do the right thing.

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

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

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

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

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

and it will be possible to choose the response on a case-by-case basis.

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

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

7.3 Troubleshooting

Communication/Power Issues

Communication with the simulator cannot be established or signal strength is weak

Battery is discharged	Minimize the distance between simulator and the tablet. Should not be over 10 meters away
Controlling computer is too far away from simulator	Minimize the distance between simulator and the tablet.
Attempting to communicate with a different simulator	Configure UNI to connect to the simulator by serial number.
RF module is not detected by the controlling PC	Restart the controlling PC

Miscellaneous Issues

CPR is not detected

Ventilations are not detected	Set the respiratory rate to zero. Re-calibrate

Trauma

The wound site or limbs don't bleed

Fluid reservoir level is not detected	Empty the hemorrhage reservoir. Click the menu icon, then click "Calibration," "Factory Settings", then "Reset Fluid Reservoir"
Fluid reservoir is low	Refill fluid reservoir. Follow Section ”Filling the Fluid Reservoir”
Tourniquet pressure not detected	Follow the calibration procedure for the area
Blood pressure is below the pulse threshold	Bleeding is blood pressure and heart rate dependent. Ensure the simulator’s heart rate is above 0.

7.4 Replacing Common Consumables

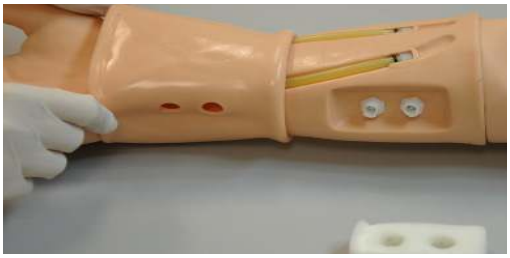
> **WARNING: Vein tubing contains latex which may cause allergic reactions. Users allergic or sensitive to latex should avoid contact. Discontinue use of this product and seek medical attention if an allergic reaction occurs.**

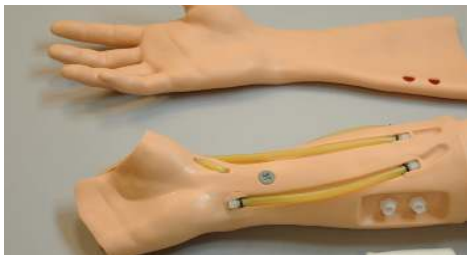
To replace the vein used in the lower right arm, follow the instructions listed below:

1. Attach the drainage tube to the drainage port on the lower arm of the simulator, and purge the system.

2. Gently heat the arm skin

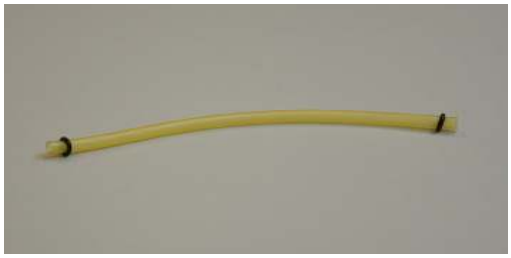
3. Pull back the skin from the lower arm and remove it completely.



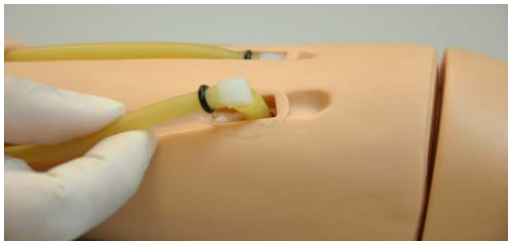


4. To replace the anterior veins of the arm, gently pull out the veins from each white connector as shown below.

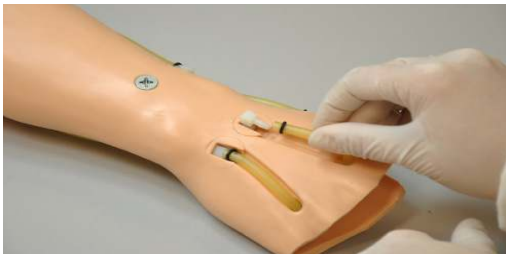
5. Remove both black rings on the tubes and place them on the replacement veins



6. Insert the replacement veins to each white connector, and secure the veins with the black rings.



7. To replace the dorsal vein of the hand, gently pull out the vein from the white connectors.



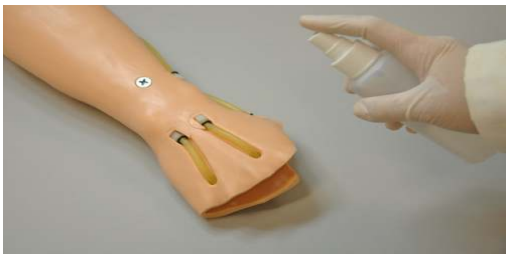
8. Once removed, attach one end of the replacement vein to one of white connectors as shown.

9. Feed this vein through the hole. You may use a hemostat to help you pull out the vein

10. Attach the other end of vein to the second white connector, and secure both ends of the vein with the black rings.

11. Heat the skin.

12. Apply small amounts of mineral oil on the lower arm to aid the skin placement.



13. Pull the skin over the arm.

7.5 Trauma Hal Features

FEATURES	S3040.50
TACTICAL PROTOCOLS	
Care under fire	●
Tactical evacuation	●
Decontamination	●
Tactical field care	●
ANATOMY	
Age	Adult
Palpable landmarks including ribs and xiphoidal process	●
Ruggedized, articulating joints for dragging or carrying	●
Water Resistance	Spray
NEUROLOGIC RESPONSE	
Preprogrammed speech responses	●
Streaming Voice	O
AIRWAY	
Programmable airway sounds	●
Airway complication: laryngospasms	●
Surgical tracheotomy/cricothyrotomy airway	●
Realistic airway with teeth, tongue, epiglottis, and vocal cords	●
Articulating neck and jaw for head tilt / chin lift/ jaw thrust	●
Oral and nasal Intubation (ETT, Supraglottic Airway, King LT®)	●
Tracheal suctioning (fluids)	●
RESPIRATORY	
Spontaneous chest rise	●
Bilateral lung expansion with bag valve mask ventilation	●
Ventilations are measured and logged	●
Programmable unilateral chest rise	●
Needle decompression	●
Anterior upper and lower lung sounds	●
Bilateral chest drain	●
Real CO2 exhalation	O
Unilateral chest rise with right mainstem intubation	●
CIRCULATORY	
Bilateral intravenous training arm	●
Measureable BP using real sphygmomanometer	●
Spontaneous pulses (Automatic using internal compressor)	●
Bilateral carotid	●
Bilateral radial	●
Bilateral femoral	●
Bilateral pedal	●
Femoral artery pressure sensor	●
Intraosseous access at right tibia	●
Bilateral intramuscular injection sites in quadriceps & deltoids	●

CARDIAC	
eCPR™ Compression depth and rate measured and logged	●
Effective compressions generate palpable pulses	●
Defibrillate and pace using real devices	●
Heart Sounds	●
12-Lead ECG (MI model + ECG designer)	O
4-Lead ECG	●
GASTROINTESTINAL	
Esophageal / gastric suctioning	●
Gastric distension with excessive BVM	●
TRAUMA	
Trauma limbs with bleeding	●
Bilateral trauma arm	Left only
Bilateral trauma leg	Left only
Groin trauma wound with pressure sensor	●
Healthy lower arms and legs	●
Automatically filling blood reservoir	1.5 Liter
POWER	
Wireless communication	(up to 900ft)
Internal battery	●
Battery life (hours)	8
OTHER	
Software	UNI®
Controller	Tablet
Mobile patient monitor	O
Rolling travel case	●

9. Warranty

9.1 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 property clean the Gaumard product; and
  - Damage resulting from a repair or attempted repair of the Gaumard product by anyone other than Gaumard or a Gaumard representative.

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

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

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

- Any waiver or amendment of this warranty must be in writing and signed by an officer of Gaumard.
  - In the event of a perceived defect in material or workmanship of the Gaumard product, the first purchaser must:
  - 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.

9.2 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.

10. Contact Gaumard

10.1 Contacting Technical Support

Before contacting Technical Support you must:

1. Have the simulator's serial number
2. Have access to the simulator for possible troubleshooting as needed

Technical Support:

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

10.2 General Information

Sales and Customer Service:

E-mail: sales@gaumard.com
USA: 800-882-6655
INT: 01-305-971-3790
Fax: 305-667-6085

Post:

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

Office Hours:

Monday-Friday, 8:30am - 7:30pm EST

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