

Tactical Casualty Care Simulator Suite



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Operative Experience, Inc.
500 Principio Parkway West, Suite 900
North East, MD 21901
Phone: 410-287-5748
E-mail: info@operativeexperience.com

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Tactical Casualty Care Simulator System

The Tactical Casualty Care Simulator (TCCS) system includes a set of five full-sized, ruggedized, soldier-form remotely-activated simulators for comprehensive Tactical Combat Casualty Care preparation, with wound patterns consistent with an IED detonation followed by an ambush. They are designed for training in pre-hospital patient care in wound management and hemorrhage control. Simulators are Soldier Strong™, but not indestructible, and should be treated as you would a combat casualty.

An iPad or Android tablet is provided but the simulator may also be run on any device with a browser and wireless capabilities.

Product Components

Each simulator comes with all the components needed to perform the associated trauma scenarios.

| | |
|---|----|
| Case with Casters | 1 |
| Tablet | 1 |
| Tablet Case | 1 |
| Vent Plugs (for washing) | 2 |
| Battery Pack <i>Li-ion Battery:18,5v 12,6Ah (233Wh, 7A rate) w/fuel gauge_ UN 38.3 Passed</i> | 2 |
| Battery Charger | 1 |
| Concentrated Simulated Blood (1 Gallon) | 1 |
| Hand Pump/Canister | 1 |
| Leg Band | 1 |
| Neck Bands | 3 |
| Repair Kits | 2 |
| Sternal Inserts | 10 |
| Humeral Caps Right (if applicable for the model) | 10 |
| Humeral Caps Left (if applicable for the model) | 10 |
| Head Set | 1 |
| Head Set Battery Rechargeable Li-polymer 3,7V 800mAh 3.0Wh 852934 | 2 |
| Head Set Battery Charger | 1 |
| Head Set Bag | 1 |
| Gym Shorts | 1 |

External Access

The simulators are designed for realism, with only a few seams or external access points:

- A skin slit with flap in chest for access to the sternal I/O insert
- Skin slit(s) with flap(s) at shoulders for access to the humeral I/O insert(s)
- A battery pack access compartment in the upper, inner left thigh
- A blood infusion port located on the underside of the penis

Caring for Your Simulator

Soldier Strong™ but not indestructible! Treat the simulator as you would a combat casualty.

Technical Support

Simulators must be serviced by qualified OEI technicians only.

To schedule service, contact:

Operative Experience Inc.
500 Principio Parkway West
Suite 900
North East, MD 21901

Phone: 410-287-5748

Email: support@operativeexperience.com

Lubrication

Glycerin or mineral oil should be used liberally for enabling the oropharyngeal, nasopharyngeal, and the emergency (surgical) airway on all models.

Use and Treatment

The simulators are durable and Soldier Strong™, but not indestructible. Boots or heel cups and pants/shorts must be worn to protect the skin if the body is dragged during field use. The simulator should be dragged by the shoulders only (and not by the arms or legs). The simulators are water-resistant, but not waterproof. Use the vent plugs to protect the electronics when cleaning the simulators or when using them in the rain or in a wet area. Because the ventilation openings are used to reduce the temperature on the electronics, remove the plugs when working in a dry area. The simulator may not operate correctly in certain extreme conditions. Only use the simulator in recommended conditions:

Temperature 0-50 degrees Celsius | Humidity: 15-95% | Altitude: up to 12,000 ft.

Cleaning

Simulators can be wiped clean with a simple solution of mild soap and water. Insert the vent plugs into the ventilation openings to protect the electronics when washing the unit.

Storage

Simulators should be dry, fluid free, and without clothes during long-term storage. See *Storing the Simulators* below. The blood flow system does not need to be flushed for overnight storage, but must be for long-term (one week or more) storage. See *Maintaining the Bleeding System* below.

Troubleshooting

User-troubleshooting is restricted to the functions described in this manual. Simulator electronics are inaccessible and should only be serviced by qualified OEI technicians. A breathing or bleeding failure is

generally resolved by charging or replacing the battery. See *Charging the Battery* and *Replacing the Battery* below. For minor tears in the skin, see *Repairing the Skin* below.

Understanding Your Simulator

Each of the five (5) full-sized, ruggedized, soldier-form remotely-activated Tactical Casualty Care simulators has specific features and wounds designed for comprehensive Tactical Combat Casualty Care preparation.

Common Features

Though each simulator has unique attributes, all have the following common features:

- Wireless Remote-Controlled Breathing and Pulsatile Bleeding
- Carotid Pulse
- Needle Decompression
- Emergency Airway
- Humeral Intraosseous
- Sternal Intraosseous
- Oropharyngeal Airway
- Nasopharyngeal Airway
- Wound Packing
- Tourniquet Application

Tactical Casualty Care Simulator 1

The Tactical Casualty Care Simulator 1 is a full-sized, ruggedized simulator for training on the treatment of gunshot wound (GSW) management. Wounds include:

- A GSW to the face causing hemic drowning
- A GSW to left upper arm, and
- Fragment wounds to the chest



Figure 1: Tactical Casualty Care Simulator 1 - Full Body from Above



Figure 2: GSW to Face Causing Hemic Drowning



Figure 3: GSW to Upper Left Arm



Figure 4: Tactical Casualty Care Simulator 1 - Side View (Showing Chest Fragment Wounds)

Tactical Casualty Care Simulator 2

The Tactical Casualty Care Simulator 2 is a full-sized, ruggedized simulator for training on the treatment of major vascular injury, GSWs and an open tib/fib fracture. Wounds include:

- A shrapnel injury to neck causing major vascular injury
- An oblique through-and-through gunshot wound to the right groin above the tourniquet line
- A gunshot wound (GSW) to the left thigh
- An open tibial/fibular fracture

Additional interventions available to the Tactical Casualty Care Simulator 2 include the use of a junctional tourniquet, fracture splinting, and needle decompression. When bleeding, this model has a femoral pulse (in addition to the carotid pulse available in all models).



Figure 5: Vascular Injury to Neck



Figure 6: The Tactical Casualty Care Simulator 2 - Full Body from Above



Figure 7: GSW to Left Thigh



Figure 8: Open Tibial/Fibular Fracture

Tactical Casualty Care Simulator 3

The Tactical Casualty Care Simulator 3 is a full-sized, ruggedized simulator for training on the treatment of traumatic amputation injuries. Wounds include:

- A traumatic amputation above the left elbow
- A traumatic amputation above left knee
- A traumatic amputation at the upper right thigh above the tourniquet line
- Burns, blast, and fragment wounds on the left side



Figure 9: The Tactical Casualty Care Simulator 3 - Full Body from Right Side

Additional interventions available to the Tactical Casualty Care Simulator 3 include the use of a junctional tourniquet. This model has a femoral pulse (in addition to the carotid pulse available in all models).



Figure 10: Full Body From Above



Figure 11: Traumatic Amputation of the Left Arm



Figure 12: Traumatic Amputation of the Right Leg

Tactical Casualty Care Simulator 4

The Tactical Casualty Care Simulator 4 is a full-sized, ruggedized simulator for training on the treatment of multiple traumatic gunshot wound (GSW) and amputation injuries. Wounds include:

- A traumatic amputation above the left elbow
- A traumatic amputation above the left knee
- A sucking chest wound (i.e., open pneumothorax)
- Burns to the left side of the face
- Fragmentation wounds



Figure 13: Tactical Casualty Care Simulator 4 - Full Body View from Above

Additional interventions available to the Tactical Casualty Care Simulator 4 include the use of a junctional tourniquet and needle decompression. This model has a femoral pulse (in addition to the carotid pulse available in all models).



Figure 14: Open Pneumothorax and Traumatic Amputation of Left Arm

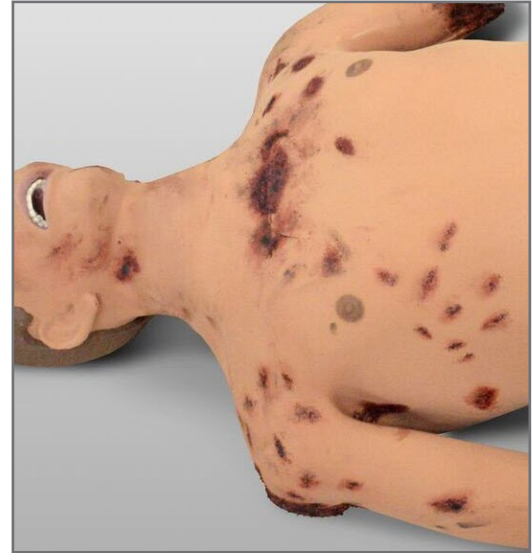


Figure 15: Fragmentation Wounds

Tactical Casualty Care Simulator 5

The Tactical Casualty Care Simulator 5 is a full-sized, ruggedized simulator for training on the treatment of abdominal wounds with evisceration and other traumatic injuries. Wounds include:

- An open abdominal wound with evisceration
- A traumatic amputation above right wrist
- A deep avulsion of the posterior proximal right thigh

Additional interventions available to the Tactical Casualty Care Simulator 5 include external bowel evisceration treatment (clamping and covering only).



Figure 16: Tactical Casualty Care Simulator 5 with Traumatic Injuries Right Side

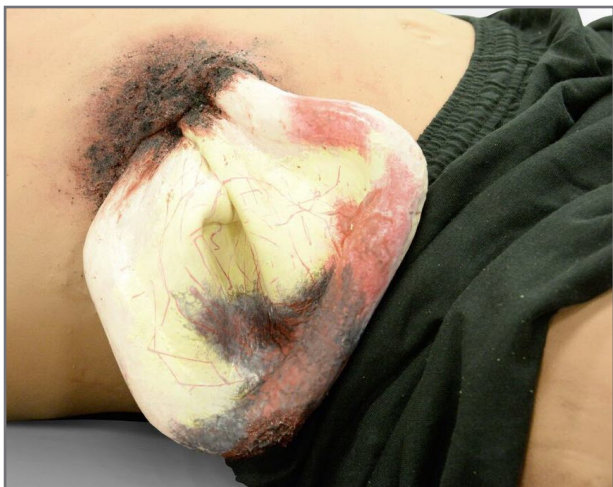


Figure 17: Bowel Evisceration



Figure 18: Deep Avulsion Right Thigh

Understanding the Tablet

The tablet is used to start and stop the simulation, control the features and provide a log with a record of the simulation. Alternative devices can be used when the Operative Experience software has been installed.

Configuring the Tablets

Prior to their first use, the tablet should be configured with the OEI Application, which can be downloaded from the App Store (for iOS devices such as the iPad) or the Google Play Store (for Android devices). For additional information on how to install the software, visit the Operative Experience Support page (<https://operativeexperience.com/support/>), which has links to pages with detailed information about downloading and installing applications.



Figure 19: Operating the Simulator

Downloading from the Apple App Store

For all iOS devices, the App Store is a default application on your screen. You'll need an Apple ID to download and install the OEI application using either the App Store (or iTunes®).

1. Click the App Store icon to go to the store's page.
2. Use the Search field (i.e., the field with the magnifying glass) and enter OEI Sim or Operative Experience as your search criteria.
3. Select the OEI APP and click **Get**.
4. Click **Install**.

You can also access the application by going directly to <http://appstore.com/oeisim>.

Downloading from the Google Play Store

For most Android devices, the Play Store is a default application on your screen. To download

1. Click the Play Store icon (or go to <https://play.google.com/store>) to go to the store's page and select **Apps**.
2. Use the Search field (i.e., the field with the magnifying glass) and enter OEI Sim or Operative Experience as your search criteria.
3. Click the OEI APP icon.
4. Click **Install**.

You can also access the application by going directly to <https://play.google.com/store/apps/details?id=com.operativeexperience.oeiapp>.

Configuring the Wireless Connection

When you first configure the wireless connection (or, if the tablet's Wi-Fi doesn't recognize the simulator network) clicking the shortcut icon opens a page with a field for the Simulator IP.

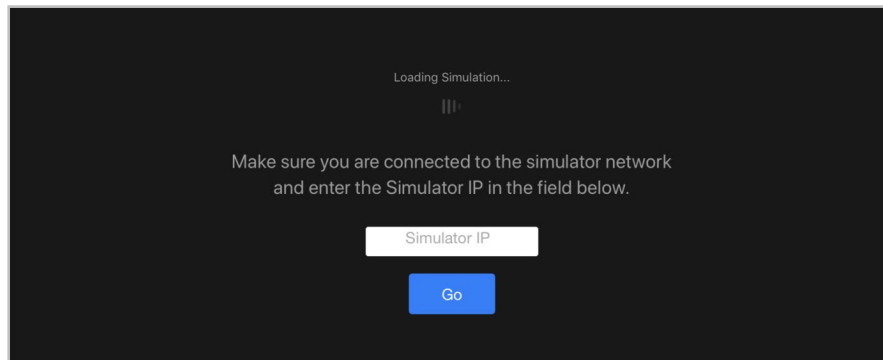


Figure 20: Configuring the Simulator's Wi-Fi Connection

1. Enter the IP address of 10.42.0.1 for the simulator. The IP address is **always** 10.42.0.1.
2. Click **Go** (or press **Enter**).

The OEI Sim application appears.

Connecting to the Simulator

Once you've powered on the tablet, you need to adjust your Wi-Fi settings so the device can be connected to the simulator using the simulator's IP address.

1. Make sure the simulator is turned on by holding down the button on the back of the neck for approximately two seconds or until the blue light comes on.
2. On your tablet's Wi-Fi settings, select the simulator's network, indicated by TCCS and the simulator's serial number (TCCS-XXX). For example, a simulator with the serial number of 002 has a wireless network of TCCS-002.
3. Enter the password of *oeiadmin*.
4. Once the wireless connection has been established, click the shortcut icon for the simulator to open the OEI Sim application.



Figure 21: The Shortcut Icon

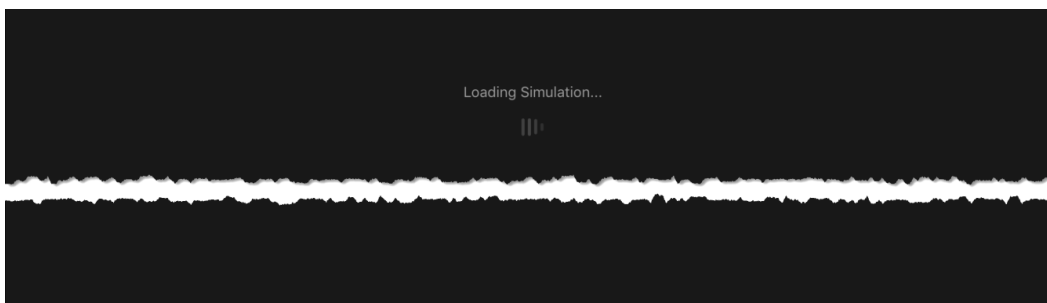


Figure 22: Loading the Simulation Application

The OEI Sim Application

When you activate the application, the main screen appears, displaying the seven panels of OEI Sim application.

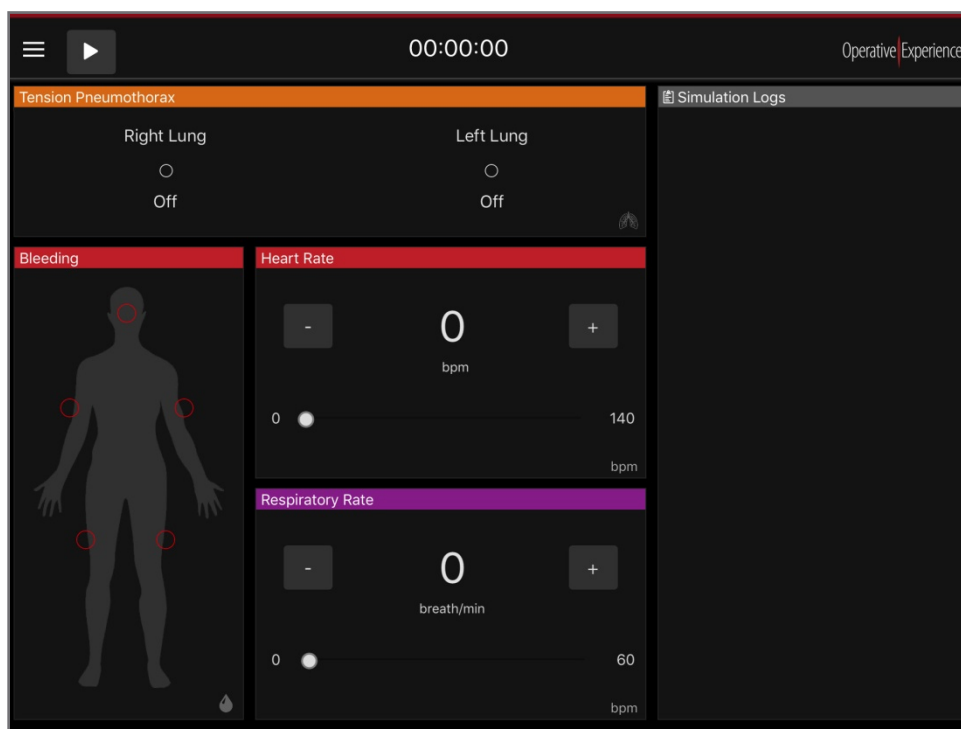


Figure 23: The Tablet's Main Screen

The panel at the top contains the primary operating controls, the five panels on the left and center allow you to set the various physiological features, and the panel on the right displays an active log of the simulation.

The Operational Panel

At the top of the main screen the uppermost panel displays the **Menu** button, the **Play/Stop** button, and a clock recording the time of the simulation.

Selecting the **Menu** button opens a menu with five options related to system operation.

- The **Instructor** option is activated by default, giving the tablet operator control of the simulator and displaying the Main Screen.
- Selecting the **Sim Logs** option opens a page with a history of the simulation logs and the messages logged for each of these simulations.
- Choosing the **Settings** option displays a page with controls to set the **App Color**, **Bleeding** location (i.e., Head or Torso), and the **Language** (**English** is selected by default). **System Update** files are also uploaded and installed using this option.
- Clicking the **Diagnostics** option opens a page with the basic **Product Information** as well as all **System Diagnostics**. If necessary, the **Shutdown Simulator** or **Reboot Simulator** functions can be initiated from this page.
- The **About** option opens a page with the basic details of the system.

Navigation between these pages is available from the menu. For example, you can return to the Main Screen from the **Settings** page by selecting the **Instructor** option.

To the right of the menu is the **Play/Stop** button. When you first activate the Tablet, the **Play** button is visible. Once you click **Play**, the **Stop** button appears during the simulation.



Figure 25: The Play and Stop Buttons

Clicking the **Stop** button stops the simulation. A warning box appears to verify that you wish the simulation to end.

The clock in the center of the uppermost panel displays the runtime for the simulation. The clock begins when play is clicked and is stopped when the simulation ends by clicking the **Stop** button.

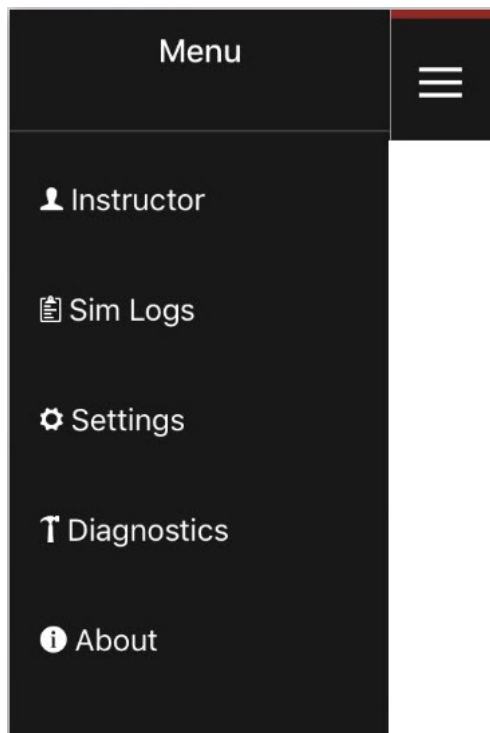


Figure 24: The Menu

The Physiological Controls

Beneath the Operational Panel are five panels on the center and left that provide the Physiological Controls.

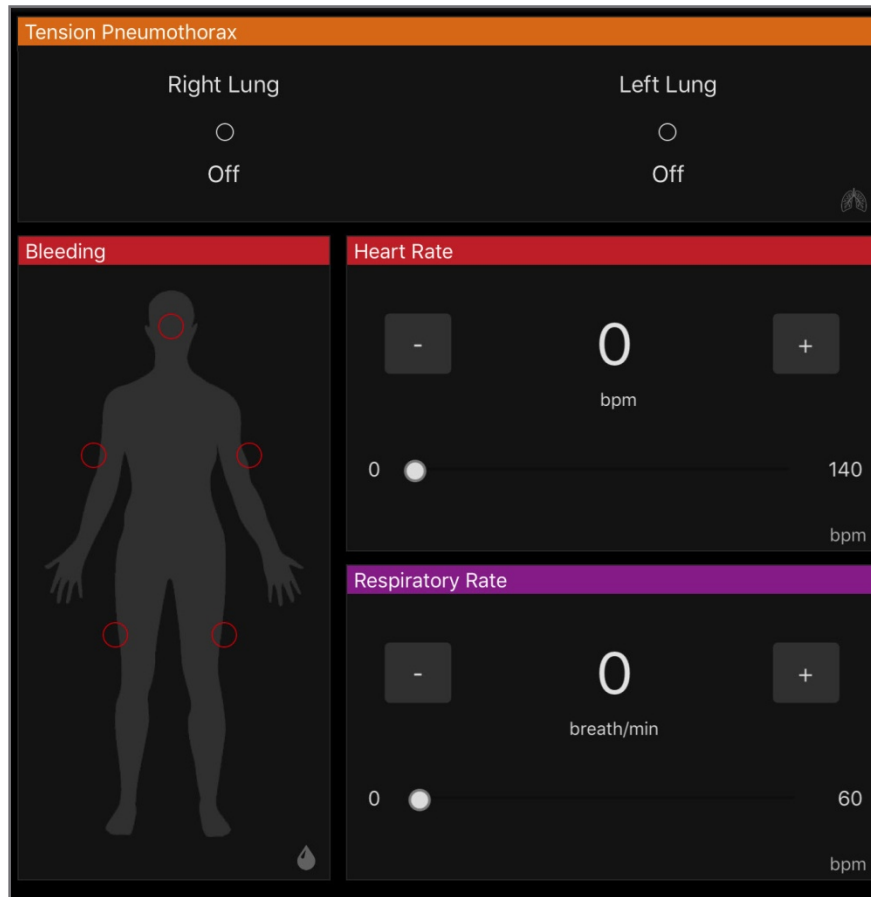


Figure 26: The Physiological Controls

These controls interact with the simulator to provide learners with the experience you establish for them by setting bleeding, heart and respiratory rate, and the presence of a tension pneumothorax.

The Tension Pneumothorax Control

The control for **Tension Pneumothorax** provides you with the ability to simulate a tension pneumothorax with the **Right Lung**, **Left Lung** or both. By default, the controls are set to **Off**.



Figure 27: The Tension Pneumothorax Control

Once a lung is selected, the display beneath that lung shows a green circle and reads, “On.”

The Bleeding Control

Five bleeding sites on the simulator are controlled by setting each site to “on” by clicking the empty red circle for that site. By default, the sites are set to “off.”

The location of the upper central bleeding site is either in the Head or Chest, depending on your selection on the Settings page (see *Modifying Settings* below). By default, the Head is selected as shown in the image to the right.

Once a bleeding site is selected, the red circle for that site becomes filled and the pulsatile bleeding begins from that location on the simulator.

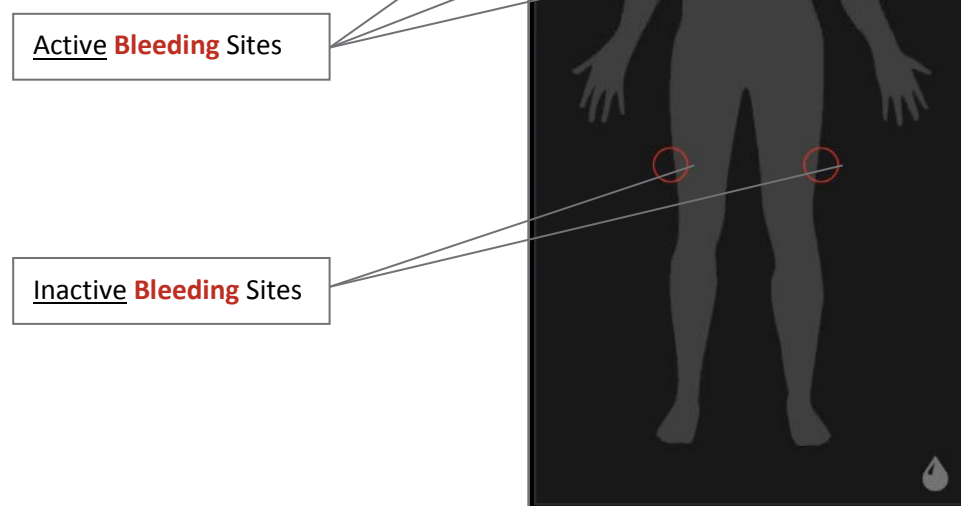


Figure 28: The Bleeding Control

The Heart Rate Control

Heart Rate can be set from 0 to 140 bpm (beats per minute) using the slider bar or by using the minus (-) the plus (+) controls on either side of the reading.

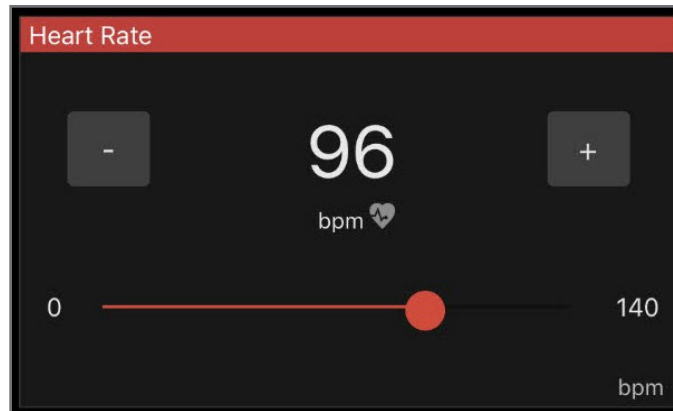


Figure 29: The Heart Rate Control

The heart rate can be changed during the simulation “on the fly.”

The Respiratory Rate Control

Respiratory Rate can be set from 0 to 60 bpm (breaths per minute) using the slider bar or by using the minus (-) the plus (+) controls on either side of the reading.

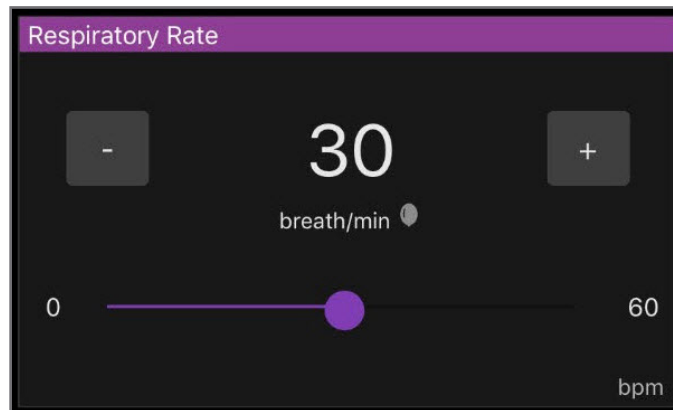


Figure 30: The Respiratory Rate Control

The respiratory rate can be changed during the simulation “on the fly.”

When applying a bag valve mask (BVM) for assisted ventilation, the respiratory rate must be set to zero (0) for chest excursion to be demonstrated and the intervention recorded in the log.

The Head Position Control (Available Only on Older Models)

If your simulator has the head positioning feature available in older models **Enabled**, you may set the simulator’s head position to face **Right**, **Center** (upward), or **Left** selecting one of these three options

under **Head Position**. The position of the head can be changed during the active simulation, displaying head movement as a vital sign. Simulators without head positioning may have the head set manually.

Viewing the Simulation Logs

The panel on the right displays a list of the setting changes along with a timestamp recorded for each change. As the Physiological Controls are used in the simulation, a scrollable list actively updates, displaying the new setting. In addition, interventions of Needle Decompression and assisted ventilation (i.e., BVM application) are recorded in the log as they are applied and registered by the sensors.

To view the simulation logs, select the **Sim Logs** option from the **Menu** to open the Simulation Logs page, which is comprised of two columns. On the left of the page is a list of all the **Simulation Sessions**. Selecting a simulation session displays all the messages recorded for that session under **Simulation Log Messages** in the right column.

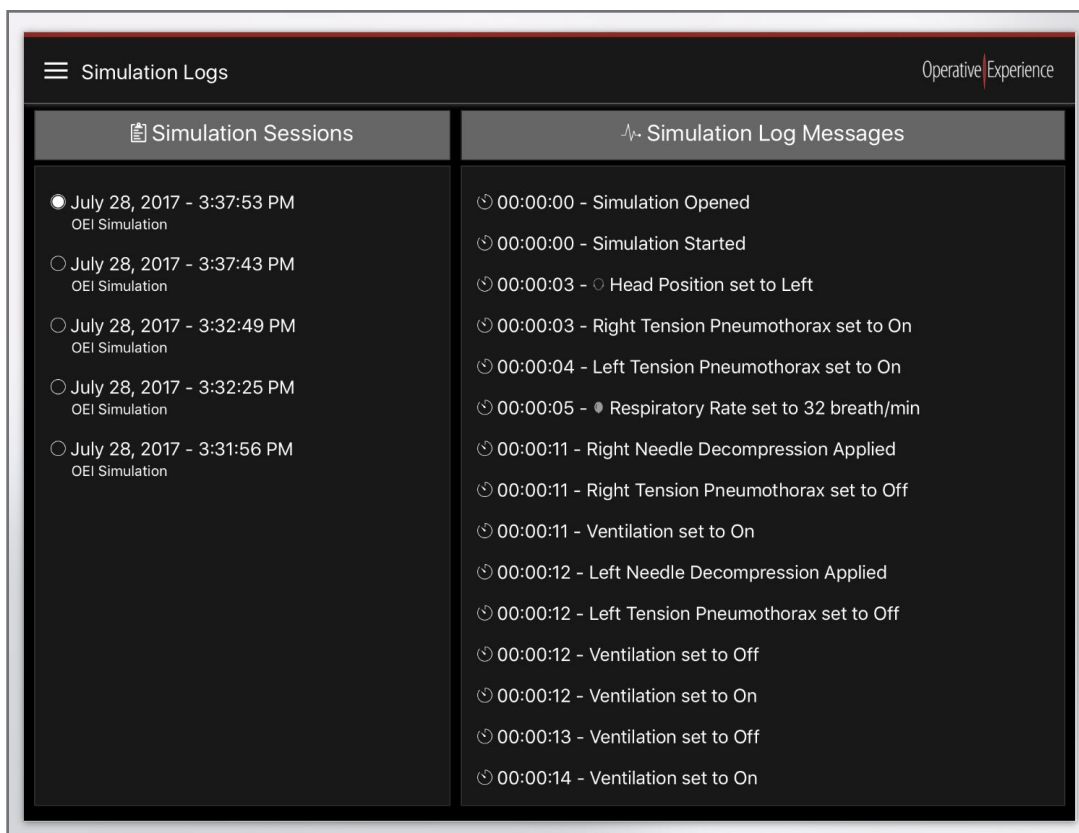


Figure 31: The Simulation Logs Page

The most recent simulation session appears at the top of the left column.

The **Simulation Log Messages** column begins at the top with the initial opening of the simulation at 00:00:00.

When either of the lists is too long to be shown on the page, you're able to scroll to view additional entries.

Modifying Settings

Select the **Settings** option from the **Menu** to open the Settings page.

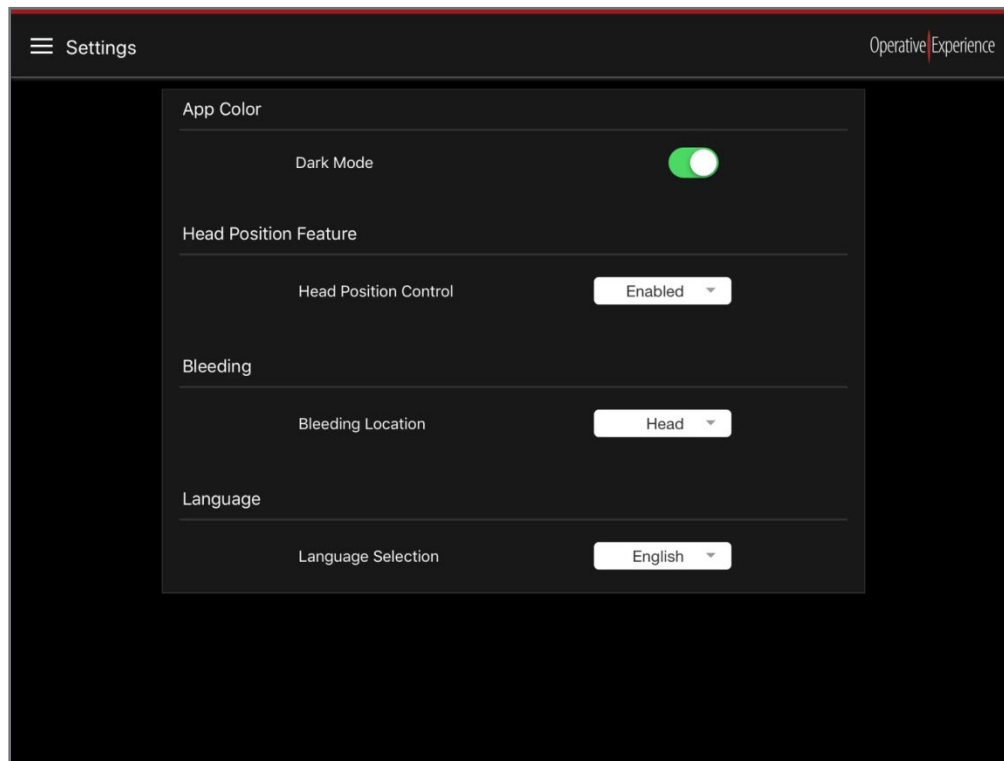


Figure 32: The Settings Page

The Settings page is comprised of four panels:

- **App Color** – Turn the **Dark Mode** on or off by toggling the control to the right for “on” (which displays a green background or to the left for “off” (which displays a white background, shown *below*).
- **Head Position Feature** – Using the drop-down menu, where available the head position feature can be **Enabled** to activate or **Disabled** to turn off the feature.
- **Bleeding** – Select a **Bleeding Location** of either the **Head** or **Chest**. This site is then available on the Bleeding panel for selection during the simulation.
- **Language** – Choose a **Language Selection** from the drop-down menu. **English** is selected by default. Currently, Spanish and Chinese are also available, and more languages are to be added in future updates.

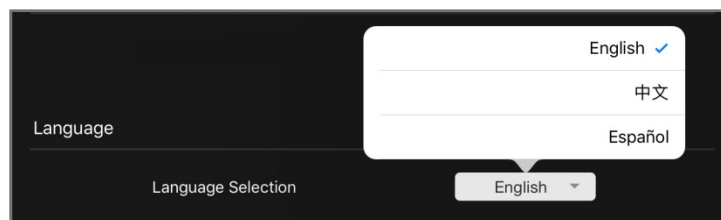


Figure 33: Selecting a Language

Below is an example of the screen with the **Dark Mode** set to “off.”

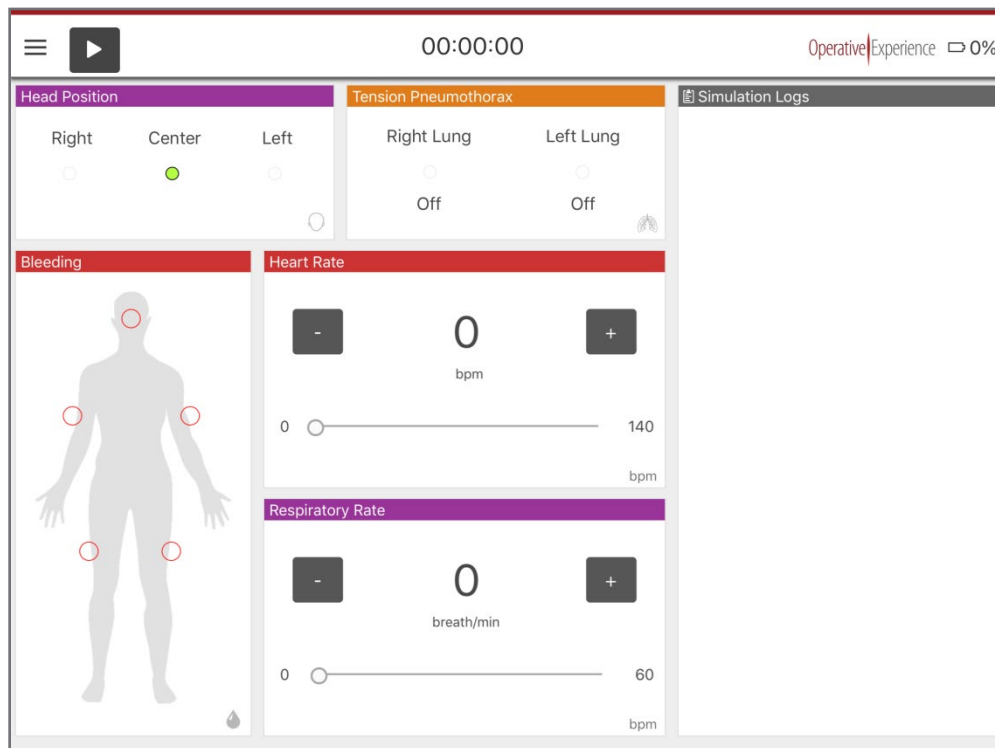


Figure 34: Alternative Screen with the Dark Mode Off

Examining Diagnostics

Select **Diagnostics** from the **Menu** to open the Diagnostics page, which is comprised of two panels.

The upper panel contains Product Information and shows your simulator's **Product Type**, the firmware version used in running the system, and the version of the software on the tablet.

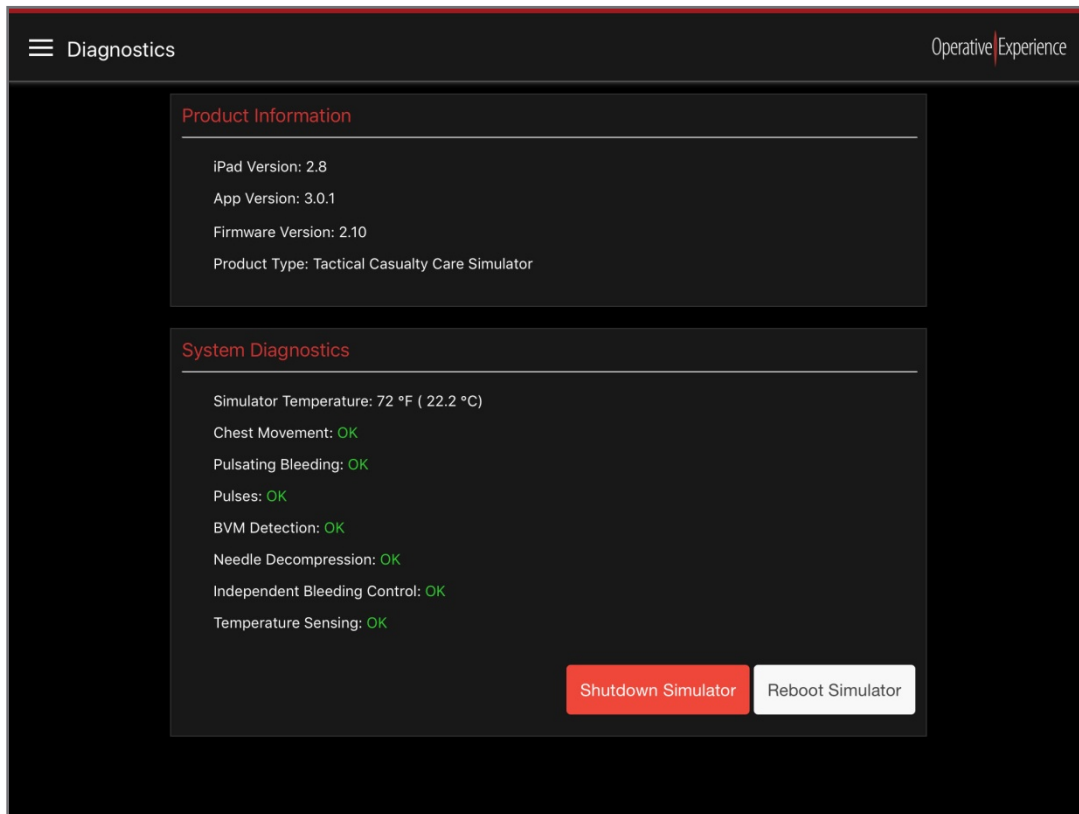


Figure 35: The Diagnostics Page

The lower panel displays the System Diagnostics. In addition to displaying the Simulator Temperature, eight additional systems are shown with their operational status. Properly functioning systems display an **OK** status.

When a system is not functioning properly, a **Failed** status appears to its right.

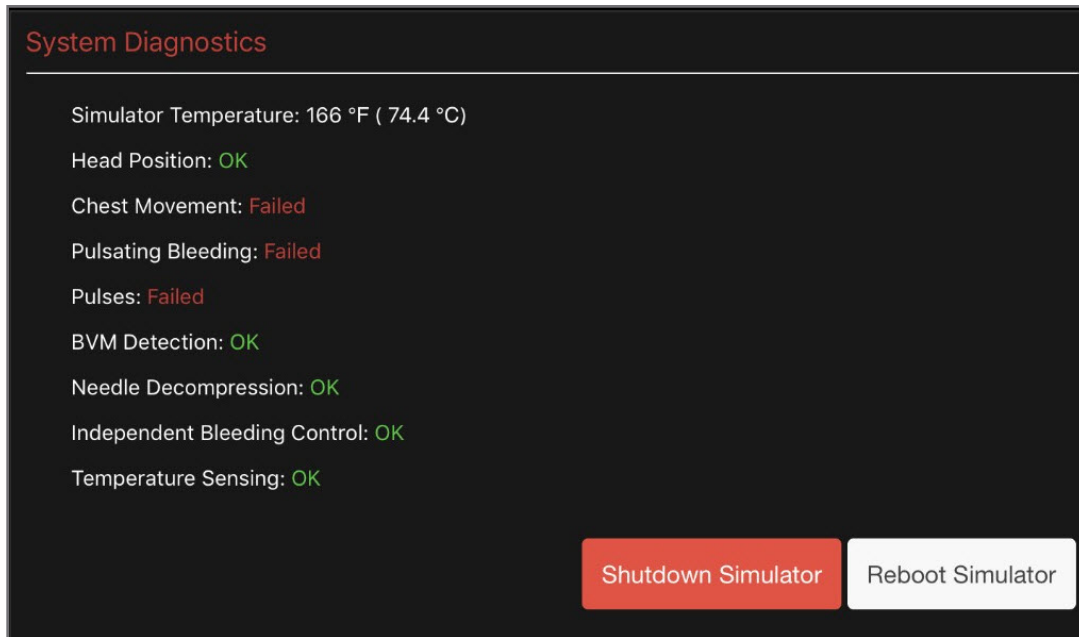


Figure 36: System Diagnostics Showing System Failures

When systems are failing, such as in the example above where the simulator is showing a temperature of 166°F, you should use the buttons on the System Diagnostics page to shutdown the simulator, or, in some cases, reboot the simulator to reset the systems.

Clicking the **Shutdown Simulator** or **Reboot Simulator** button opens a message box requesting your verification of the shutdown or reboot.

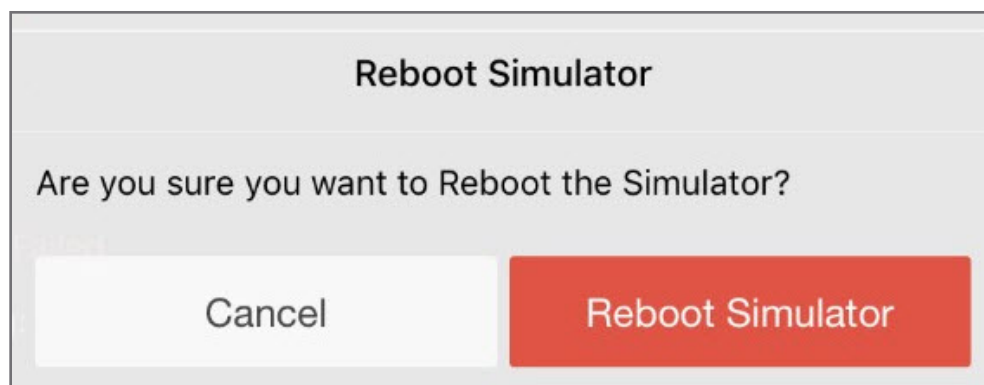


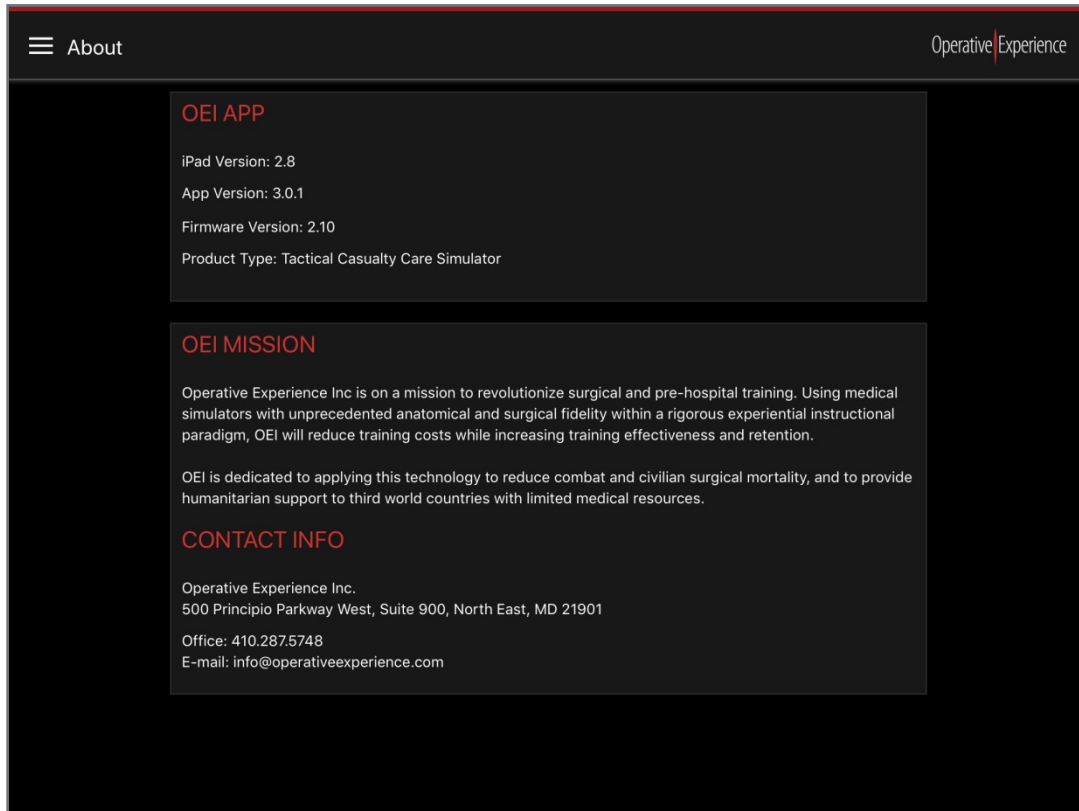
Figure 37: Reboot Simulator Verification Message

Click the **Reboot Simulator** or **Shutdown Simulator** button on the message to complete the action.

Viewing the About Page

Select **About** from the **Menu** to open the About page, which is comprised of two panels.

In addition to the OEI Mission Statement, this page identifies your product and provides you with basic information about the versions of the software and firmware you're running, as well as contact information for Operative Experience.



Operating Your Simulator

Prepare your simulator by filling the hand held pump reservoir with blood, and then use the tablet to prime and operate the simulator.

Adding Blood to Your Simulator

Before operation, infuse the simulator with blood using the hand pump. A pre-mixed gallon of simulated blood is included with the simulator with instructions on its use. Contact Operative Experience Customer Support (support@operativeexperience.com) for additional blood supplies.

To infuse the simulator with blood:

1. Turn the simulator off. If the simulator has been in use, stop all blood flow prior to infusing, or pressure lock may occur and blood hose coupling will not engage.
2. Fill the reservoir on the hand pump with simulated blood.
3. Lift the penis and extend the blood fill port.
4. Attach the blood fill hose by snapping onto the blood fill port on the simulator located under the penis. (Be sure the hose nozzle is free of debris.)
5. Lock the handle on the hose.
6. Retract the handle and pump approximately 15 to 20 times in intervals of three to five times until blood expels out the overflow attached to the hose on the hand pump.



Figure 39: Blood Infusion Port



Figure 40: The Hand Pump

Operating the Headset

The wireless two-way headset operates at a maximum distance of 100 meters (328 feet), providing the means to speak and listen through the simulator. The wireless remote communication system automatically links with the simulator upon startup, indicated by a solid blue light above the headset's volume control.

When linkup does not occur, the light above the volume control blinks on and off. Should this happen, press and hold the blinking light for about five (5) seconds to connect the headset with the simulator.



Figure 41: The Headset

Using the Tablet to Control the Simulator

Once you're familiar with the materials in Understanding the Tablet presented above, you'll be able to use the tablet to control the simulation.

To control the simulator with the tablet:

1. Power on the simulator by holding down the button on the back of the neck for approximately two seconds or until the blue light comes on.
2. Infuse the blood using the steps described in *Adding Blood to Your Simulator* above.
3. Power on the tablet.
4. Connect the tablet to the simulator's Wi-Fi (see *Connecting to the Simulator* above).
5. Start the OEI Sim application.
6. Using the OEI SIM APP set those Physiological Controls appropriate to begin the simulation (remembering that not all controls are needed for every simulation).
7. Once the battery display is visible on the right upper corner of the tablet, press **Play** to begin the simulation.
8. During the simulation adjust those Physiological Controls appropriate to the scenario:
 - a. Add a **Tension Pneumothorax**.
 - b. Turn **Bleeding** sites on or off.
 - c. Adjust the **Heart Rate**.
 - d. Adjust the **Respiratory Rate**.
9. Press **Stop** to end the simulation.
10. Click **Yes** on the dialog box that appears requesting verification that you wish to end the simulation.
11. Power down the simulator by holding down the button on the back of the neck for approximately four seconds. The blue light flashes on and off momentarily before turning off.

All the settings and adjustments you make during the simulation are displayed in the **Simulation Log** and remain in the history stored on the Simulation Logs page.

Troubleshooting During Operation

When errors occur, warning boxes appear providing you with information regarding the problem.

When encountering a simulation hardware error, first attempt to correct the problem by rebooting the simulator. Click the **Reboot Simulator** button on the dialog box to reboot. You can also go the Diagnostics page where more information is available and reboot from there as well. Click **Yes** on the verification message to complete the process.

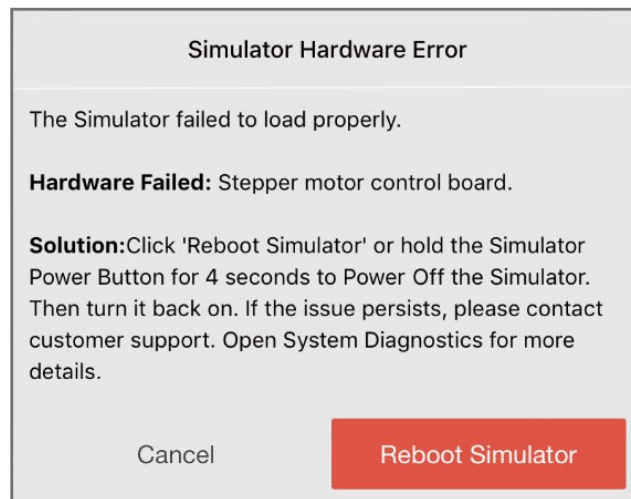


Figure 42: The Simulator Hardware Error Message

You can also power off the simulator by holding the Simulator Power Button for four (4) seconds before turning the simulator back on.

If you receive a **Simulator High Temperature Warning**, shut down the simulator immediately by clicking the Shutdown Simulator button or by holding the Simulator Power Button for four (4) seconds. Click **Yes** on the verification message to complete the process. Let the simulator cool before turning it back on.

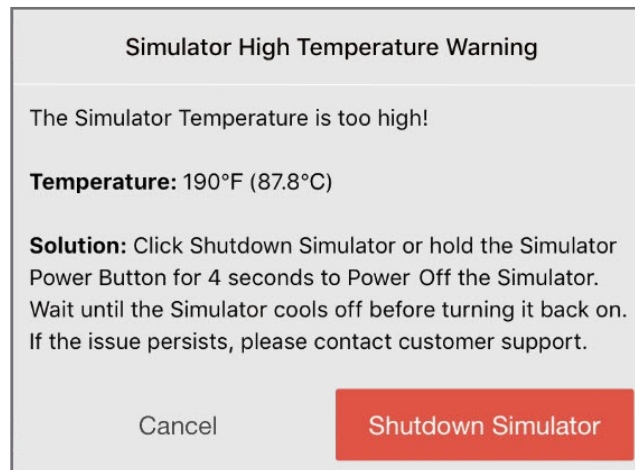


Figure 43: The Simulator High Temperature Warning

Contact Customer Support (support@operativeexperience.com) should these issues persist.

Shutting Down the Simulator

1. Press the **Stop** button to discontinue the simulation.
2. Confirm the simulator is not breathing or pulsing.
3. Close the OEI Sim application.
4. Turn off the simulator by holding down the button on the back of the neck for approximately four seconds. The blue light flashes on and off momentarily before turning off.

Removing the Simulated Blood

Blood can be left in the body for short periods of time (up to one week) but should be removed if a longer period of storage is expected.

To remove the blood prior to long-term storage:

1. Turn the simulator on by holding down the button on the back of the neck for approximately two seconds or until the blue light comes on.
2. Activate the tablet and connect to the simulator.
3. Using the tablet, turn all bleeding sites to **On** to activate the blood flow until the bleeding stops.

Flushing the System

Should you wish to flush the system:

1. In the hand pump, mix one (1) capful of an antibacterial additive such as Germaben® II-E for every gallon of water.
2. Run this mixture through the simulator until the tank is empty and the water is no longer discharged from the simulator.

Storing the Simulator

When not in active use, prevent accidental damage by keeping the simulator in the Storage Case. (See *Storing the Simulators* below.)

Performing Interventions

Each simulator is designed for training for multiple types of injuries.

Emergency Airway

Two removable tracheas are included with the simulator. When practicing with the Emergency Airway use the insert with the open trachea rings and then place tape over them to simulate the cricothyroid membrane. Additionally, a replaceable, multi-use neck band enables the practice of performing surgical emergency airway procedures on all of the Tactical Casualty Care Simulators.



Figure 44: The Emergency Airway

Each band should enable six to eight applications. After each use, rotate the band to move the incision site away from the trachea.

Carotid Pulse

All Tactical Casualty Care Simulators have a carotid pulse, which can be adjusted using the Heart Rate control.



Figure 45: All Tactical Casualty Care Simulators have a Carotid Pulse

Humeral Intraosseous

Each simulator (except models with upper arm amputations) enables non-infusing practice in humeral intraosseous on the right and left humerus.



Figure 46: Humeral Intraosseous

When the humeral cap becomes worn through several uses and the needle does not stick firmly due to multiple holes in close proximity, the cap can be replaced. See *Replacing the Humeral Cap* below.

Sternal Intraosseous

Each simulator enables non-infusing practice in sternal intraosseous with a replaceable sternal insert. The FAST1® Intraosseous Infusion System (FAST 1 Sternal IO) is recommended.



Figure 47: Sternal Intraosseous Location

When the sternal insert becomes worn through several uses and the needle does not stick firmly due to multiple holes in close proximity, the insert can be replaced. See *Replacing the Sternal Insert* below.

Needle Decompression

Each simulator enables needle decompression using a 14 or 10-gauge needles applied in the mid-clavicular areas of the chest.

With proper needle insertion, pressure is relieved in the chest cavity, the “lung” re-inflates, and normal chest functions begin. Note: there is not a noticeable expulsion of air.

When the skin becomes dimpled from multiple punctures, the skin can be repaired. See *Repairing the Skin* below.

Oropharyngeal Airway

All simulators can be treated by applying an oropharyngeal airway and using a bag valve mask (BVM) to provide assisted ventilation.



Figure 48: Oropharyngeal Airway

Airway devices such as the King airway and the i-gel[®] airway can be inserted.



Figure 49: Inserted King Airway



Figure 50: Inserted i-gel Airway

Nasopharyngeal Airway

A nasopharyngeal airway can be applied to all simulators.



Figure 51: Nasopharyngeal Airway

Wound Packing

Gauze and pressure-dressing materials can be applied to the deep bleeding wounds on all simulators to absorb blood and control bleeding.



Figure 52: Wound Packing

Tourniquet Application

With **Bleeding** on, CAT (Combat Application Tourniquet) and SAM Junctional Tourniquets can be applied to control hemorrhaging at the appropriate sites on those simulators with amputated limbs.



Figure 53: Tourniquet Application

Fracture Splinting

The wound pattern available with the Tactical Casualty Care Simulator 2 provides the opportunity to apply a splint to a fractured lower right leg.



Figure 54: Location of Fracture

Head Movement (Available Only on Older Models)

For those simulators with Head Movement, the head can be turned “on the fly” to the right or left by using the tablet’s controls after first enabling the Head Movement feature on the Setting menu. By default and for those simulators without Head Movement, the head faces upward.

Maintaining Your Simulator

Emptying/Cleaning the Bleeding System

Periodically flush the bleeding system by activating the blood flow until the bleeding stops and then infusing the body with a mixture of water and Germaben® II-E (one capful for every gallon of water) to prevent algal/fungal growth.

Replacing the Emergency Airway

A replaceable, multi-use neck band enables practice in providing an emergency airway. Each band should enable six to eight applications. After each use, rotate the band to move the incision site away from the trachea.

To replace the band:

1. Stretch and pull the used band over the head. This band can be discarded or repaired (see *Repairing the Skin* below).
2. Apply glycerin or lubricant to the trachea.
3. Stretch and pull the new band over the head.
4. Position the band over the trachea in the track provided.



Figure 55: The Emergency Airway Neck Band



Figure 56: Exposed Trachea without Neck Band



Figure 57: New Neck Band in Position

Replacing the Sternal Insert

The sternal insert used for non-infusing practice in sternal intraosseous can be replaced at the user's discretion when the needle does not stick firmly due to multiple holes in close proximity.

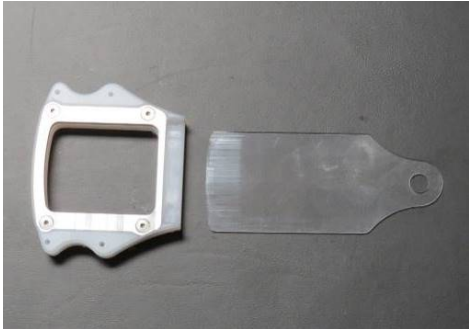


Figure 58: Sternal Mechanism - Top View

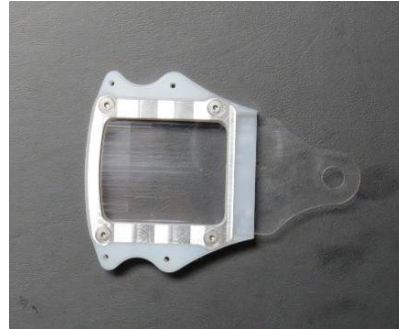


Figure 59: Sternal Mechanism with Insert - Top View



Figure 60: Sternal Mechanism - Horizontal View



Figure 61: Sternal Mechanism with Insert - Horizontal View

The mechanism is accessed through a slit in the skin just below the sternum. For replacement, insert one finger and gently pull the skin toward the head to expose the insert. Slide the insert toward the abdomen to remove. Once the mechanism has been removed, insert the replacement flat into the slot. Replace the mechanism by sliding gently back into place until seated.



Figure 62: Sternal Slit



Figure 63: Replacing Sternal Insert

Replacing the Humeral Cap

The humeral cap insert used for non-infusing practice in humeral intraosseous is replaced at the user's discretion when the needle does not stick firmly due to multiple holes in close proximity.

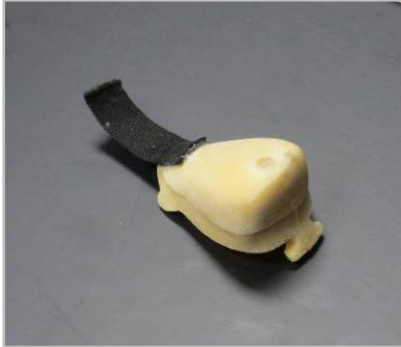


Figure 64: Humeral Cap Insert



Figure 65: Humeral Cap Insert with Tabs



Figure 66: Notched Humerous



Figure 67: Humeral Cap Insert with Tabs

To access the humeral cap, roll the simulator onto its side, insert your fingers and gently open the slit located behind the shoulder. Detach the Velcro® strap and remove the used humeral cap. Insert the replacement, apply slight tension down the humerus, and attach the Velcro strap to secure the tension.



Figure 68: Accessing the Humeral Cap



Figure 69: Humeral Cap Replacement

Repairing the Skin

Over time, the sites for needle decompression and sternal and humeral I/O needle insertion will become dimpled.

To repair:

1. Gather all materials necessary:
 - Manufacturer-Supplied Silicone Repair Kit
 - Acetone
 - Disposal Cup or Piece of Cardboard
 - Two (2) Small Hobby Sticks for Mixing and Application
 - Paper Towels
2. Clean the area to be repaired using acetone and paper towels by spreading the holes open and wiping. Scrubbing is not necessary. (91% Isopropyl Alcohol can be used if acetone is not available; however, acetone promotes better adhesion of silicone.)
3. Mix together a small amount of the silicone repair material.
 - a. Remove the small plastic tip from the two-part dispensing syringe.
 - b. Add a small amount of both components in equal parts to your cup or cardboard and stir together well.
 - c. Using the replacement provided, replace the cap on the silicone repair material dispenser once the necessary amount of material has been dispensed.



Figure 70: Skin Repair Supplies



Figure 71: Cleaning for Skin Repair

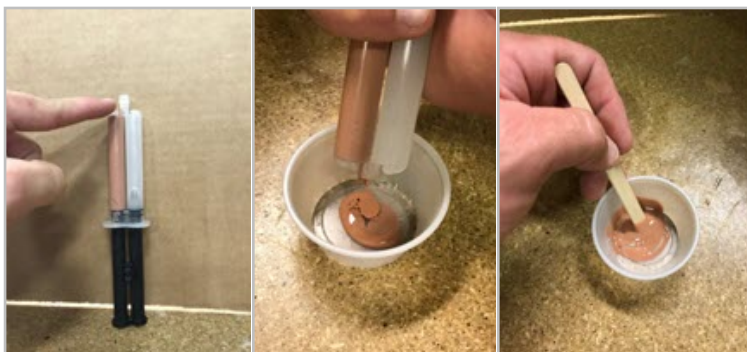


Figure 72: Remove Plastic Tip

Figure 73: Add Repair Materials

Figure 74: Mix



Figure 75: Replacement Cap

Figure 76: Cap Replaced

4. Apply the repair material to the punctured area using one of the hobby sticks. Spread the area in need of repair and apply the mixture. After spreading the repair material, close the repaired area, forcing out any excess mixture.



Figure 77: Spread the Area

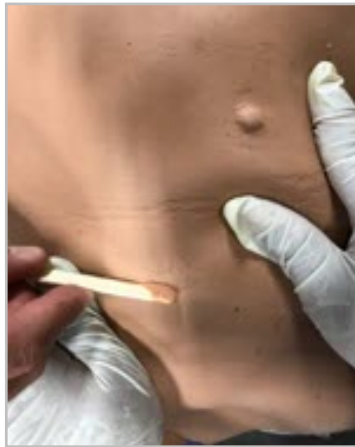


Figure 78: Apply the Mixture



Figure 79: Close the Area

5. Apply a small amount of acetone to a paper towel (so that the towel is nearly dry and acetone is not dripping from the towel) and **very gently** wipe down the repaired area to remove any excess material. Pushing hard could force out the material that was just applied.



Figure 80: Wipe with a Small Amount of Acetone

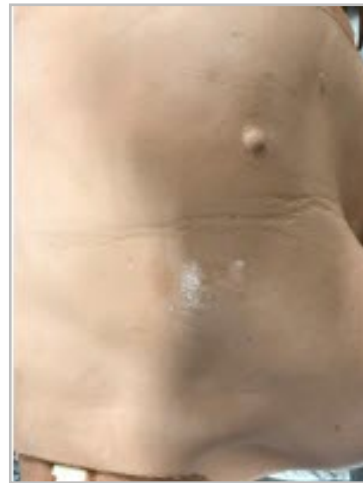


Figure 81: Let Dry for Two Hours

6. Let the repair dry for approximately two (2) hours before using the simulator.

Charging/Replacing the Battery Pack

Simulators are powered by a replaceable, rechargeable, silicone-encased Li-ion 18.5V/12.5A battery pack. For temperature management, the simulators use trickle charge batteries with temperature sensors.

A fully charged pack enables continuous breathing for up to 3.5 to 4.0 hours. To extend battery power during training, turn off breathing between brief training applications; power off the simulator during longer training breaks.

The battery pack is located in a concealed compartment in the inner, upper left thigh. For access, find the seam and slide the skin cover up or down to reveal the compartment. Remove the cover to access the battery

Removing and Installing the Battery Pack

The battery pack should be removed from the simulator during storage and recharging.

To remove the battery pack move the skin cover on the upper left thigh to open and pull the pack from the compartment to access the connector. Detach the connector and remove the pack.

To install the battery pack, reverse this process, moving the leg band on the upper left thigh to access and open the compartment. Then, attach the pack to the connector, and after resetting the pack in the compartment, close the compartment and replace the leg band.

Charging the Battery Pack

Battery packs should only be charged with the charger included with the simulator or otherwise provided by OEI. It takes eight (8) hours to fully charge the trickle charge batteries. The batteries should not remain connected to the charger longer than 14 hours.

To charge a battery pack:

1. Place the charger on a flat surface.
2. Remove the battery pack from the simulator.
3. Connect the battery pack to the charger.
4. Plug into a standard electrical outlet. The red light indicates charging.
5. Charge the batteries for 6 to 8 hours (or overnight). The indicator light turns green when the batteries are fully charged.
6. Disconnect the batteries from the charger when fully charged.

Upgrading the Simulator's Firmware

Requirements

- A laptop or a desktop computer with Wi-Fi capability
- Administrator access to the laptop or desktop computer
- Access to the Internet
- An internet browser supported by the application:
 - Chrome: 63.x.x or higher
 - Firefox: 54.x or higher
 - Safari: 11.x.x or higher
 - Edge: 41.x or Greater

WARNING: Make sure all devices, such as the tablet, are disconnected from the simulator before beginning. Once the computer is connected to the simulator, any additional device could corrupt the system and make the simulator unusable.

Procedure

1. Connect the computer to the Internet.
2. Open your browser and go to www.operativeexperience.com/support to download the latest firmware software OEI file (e.g., OEI_Update_3.0.1.oei) for your simulator.
 - Select the Software Downloads and Updates tab
 - Under the name of the update (e.g., Simulator Firmware 3.0.1), click **Download**.
 - Follow your computer's prompts to complete the download process.

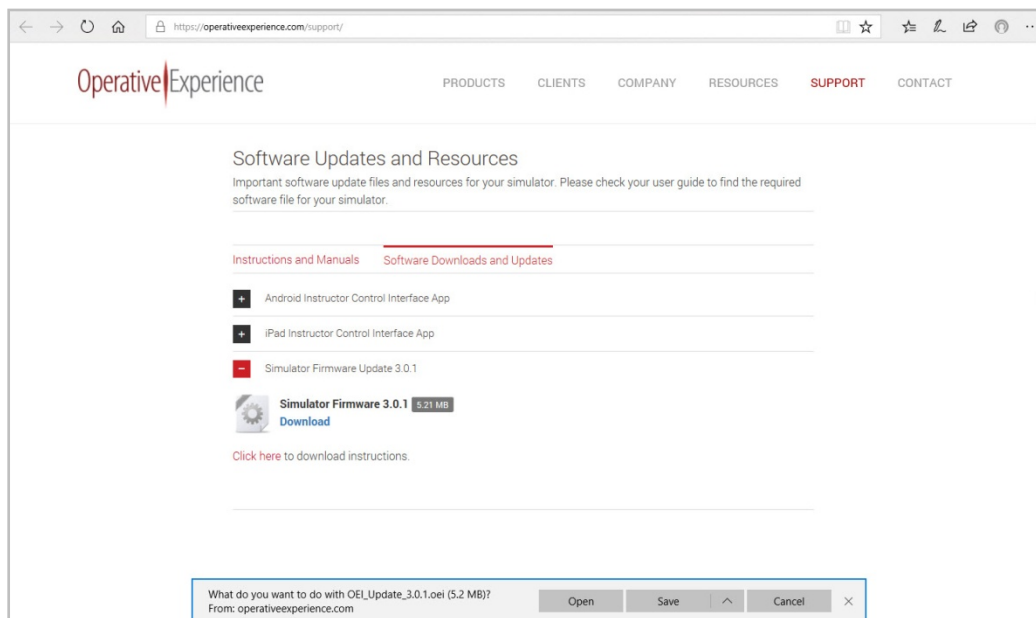


Figure 82: Downloading the Update File

3. Power up the simulator.
4. After verifying that no device is connected to the Simulator Network, use your computer's network settings to select the Simulator Network. (Your computer is no longer connected to the Internet.)
5. In the browser's URL field, type: <http://10.42.0.1>.

The main screen of the OEI Sim application appears.

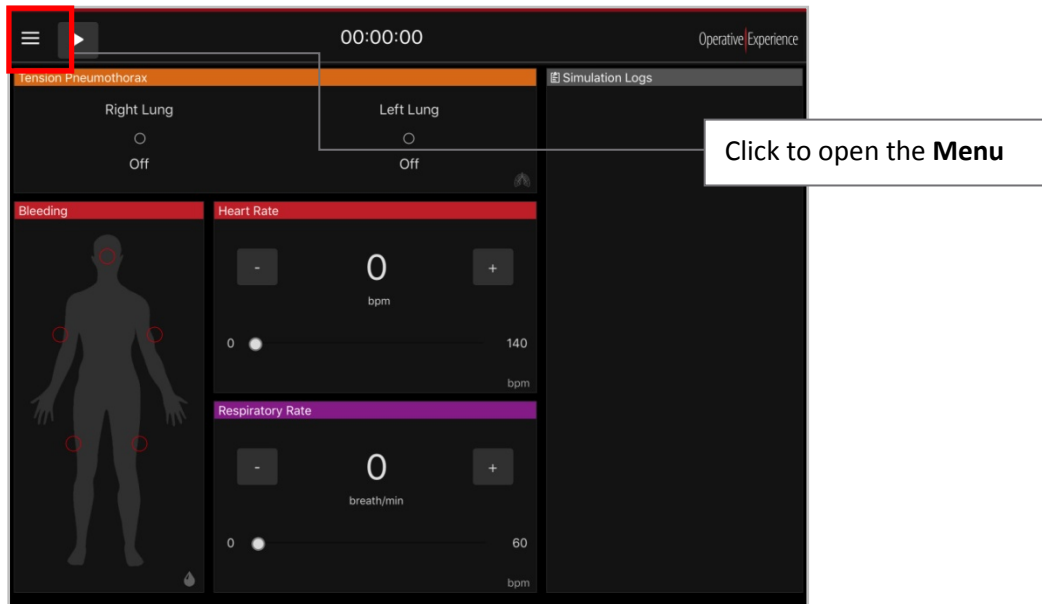


Figure 83: Open the Menu on the OEI SIM APP

6. Open the **Menu**, and select **Settings**.

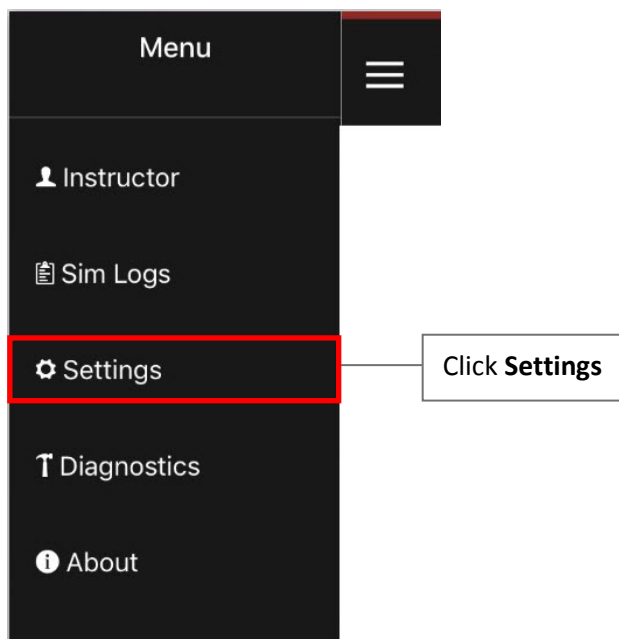


Figure 84: Click Settings

The Settings screen appears.

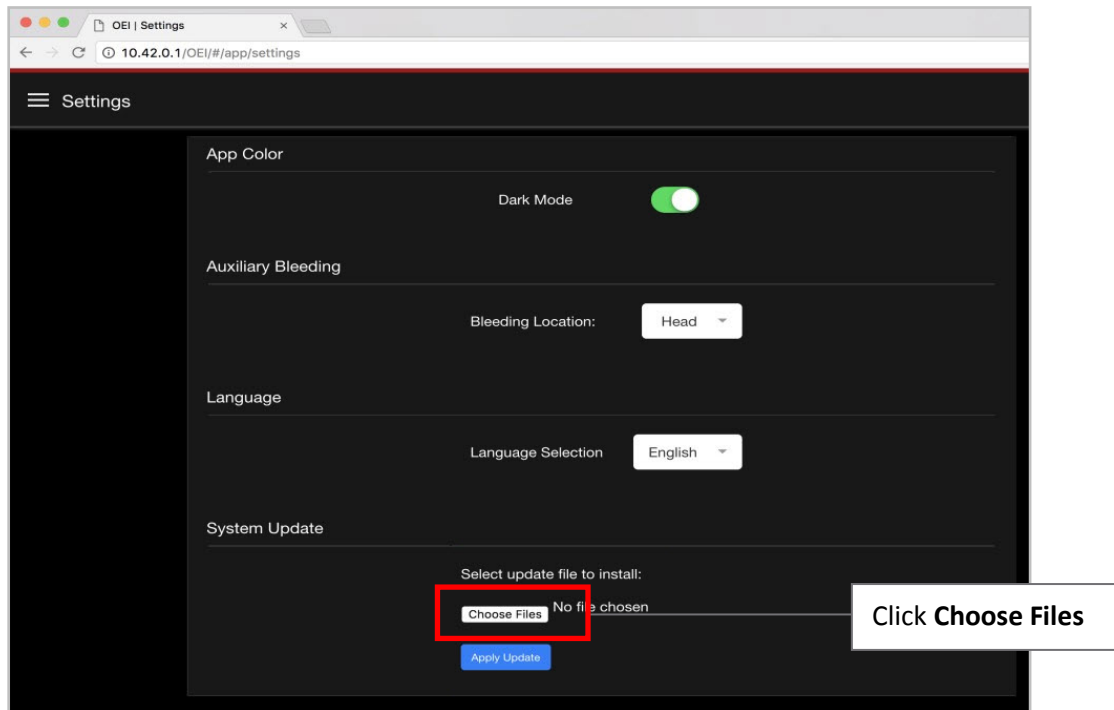


Figure 85: Click the Choose Files Button

7. Click the **Choose Files** button.

The File Picker (for Macs) or File Explorer (for PCs) appears.

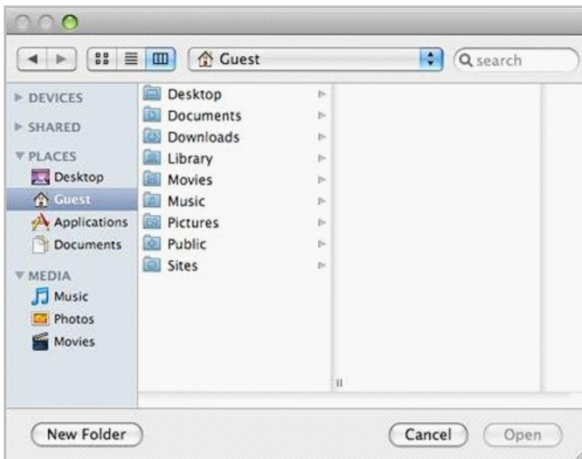


Figure 86: Searching for a File (Mac OS)

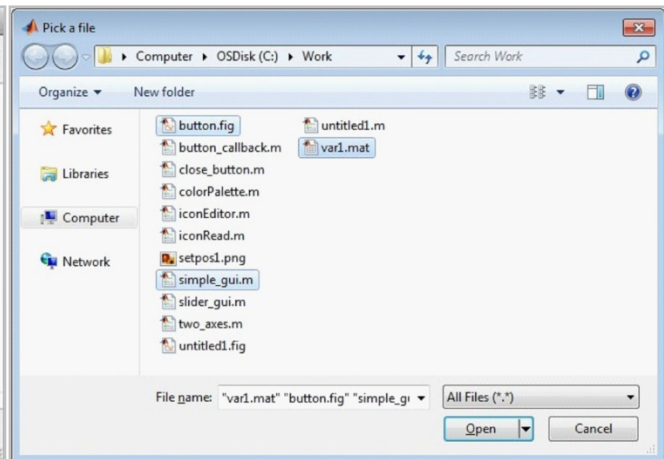


Figure 87: Searching for a File (Windows)

8. Locate and select the downloaded file.

Once you've selected the file, the file name appears on the Settings screen.

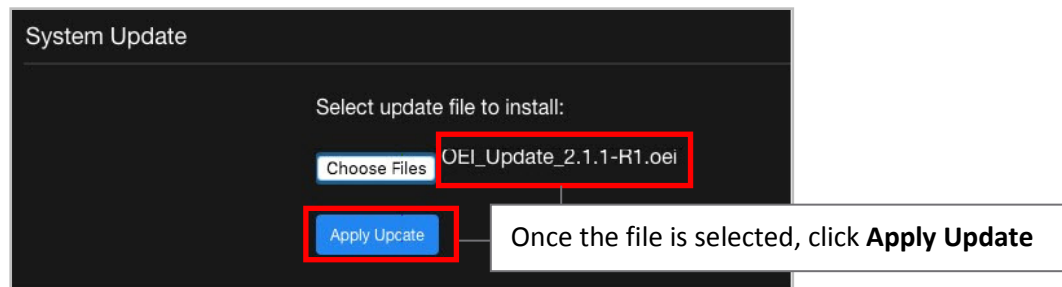


Figure 88: Click Apply Update

9. Click **Apply Update**.

After the Update process begins, the Connection Error message appears.

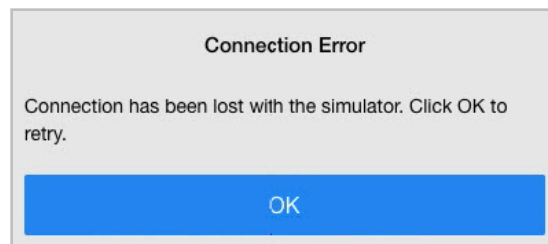


Figure 89: Click OK on the Connection Error Message

10. Click **OK**.

When the update has completed, the simulator restarts, and a screen appears reminding you to reconnect to the simulator.

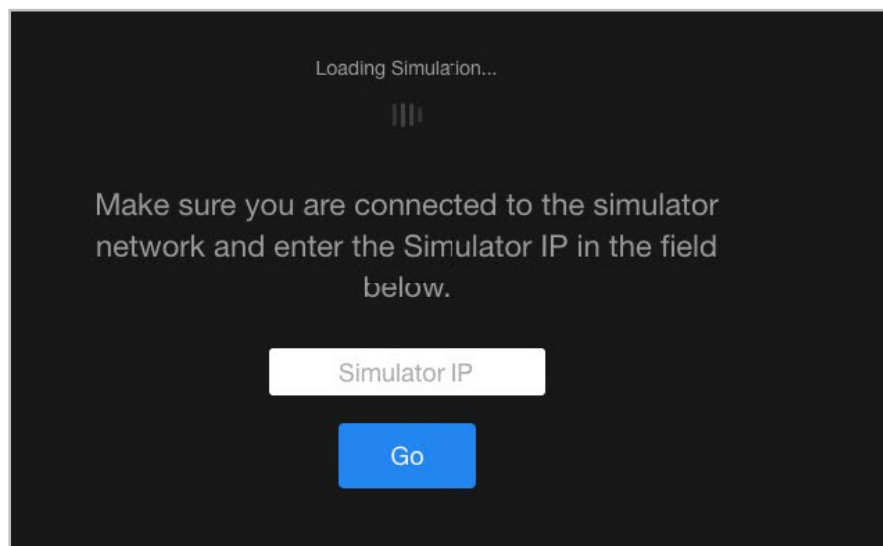


Figure 90: The Emergency Airway Neck Band

11. In your computer's settings, verify that you're still connected to the Simulator Network.

12. Enter the **Simulator IP** (10.42.0.1) and click **Go** to reconnect to the simulator.

The OEI SIM APP appears.

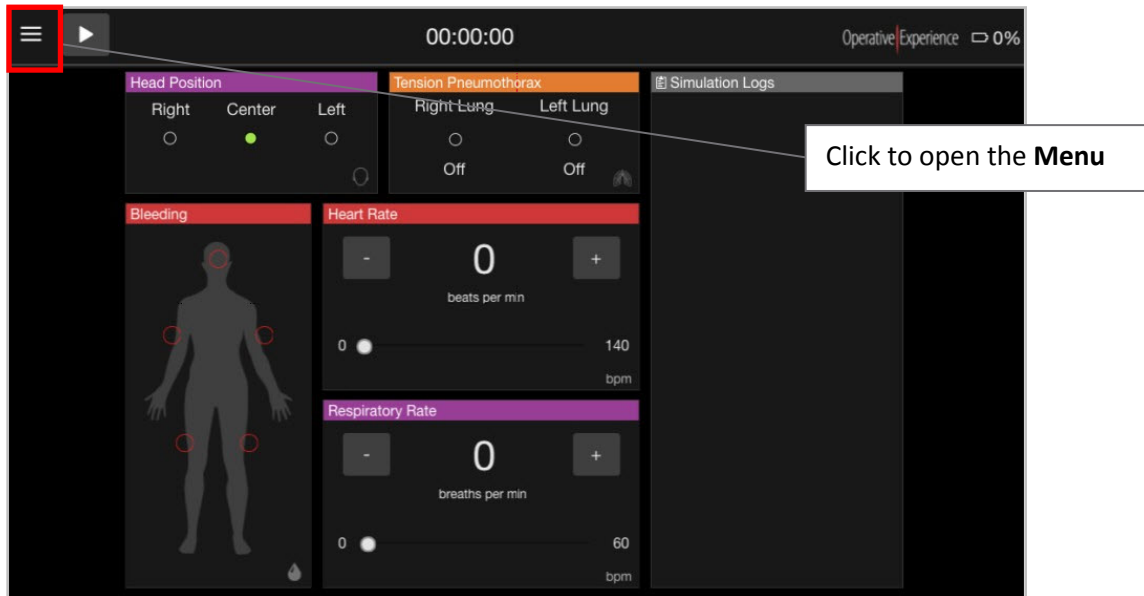


Figure 91: Open the Menu on the OEI SIM APP

13. Open the **Menu** and click **About**.

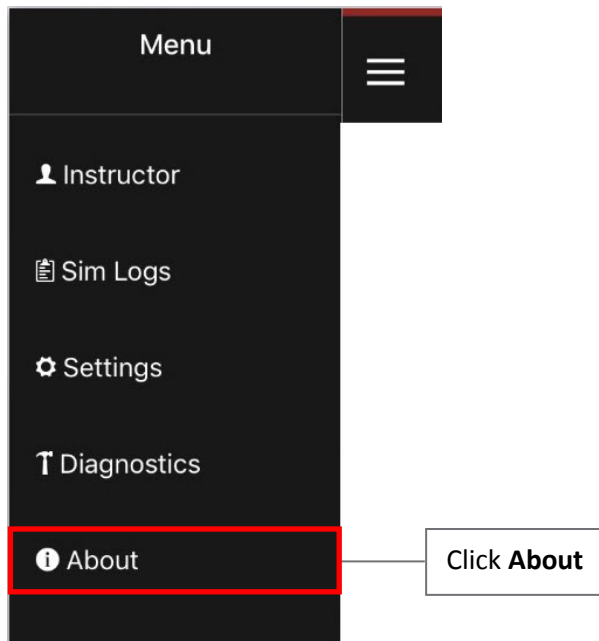


Figure 92: Select About

The About screen appears, displaying the current version of the application under **OEI APP**.

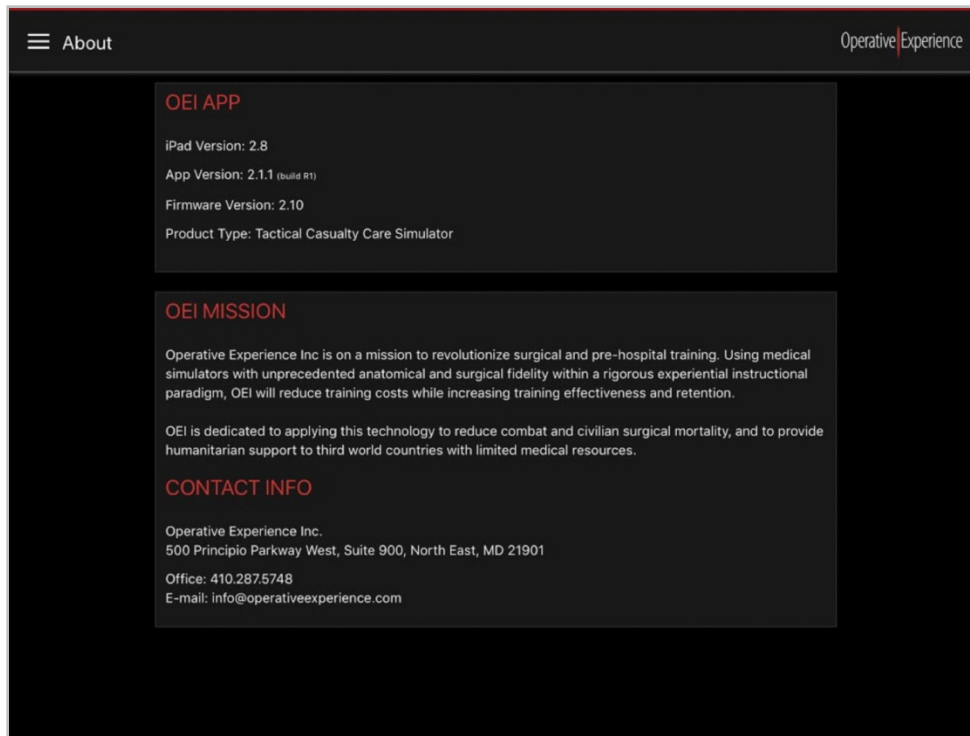


Figure 93: Verify Versions on the About Page

14. Verify that the configuration is current and the product type is correct by reviewing the following:

- **App Version**
- **Firmware Version**
- **Product Type**

15. Once you've verified that you're running the updated version, close the Internet Browser and disconnect the computer from the Simulator Network.

16. Start your tablet for operation of the simulator.

17. Join the Simulator Network and start the OEI Sim application.

18. Using the About screen on your tablet's OEI SIM App, verify that the application is running the correct version.

Storing the Simulators

Simulators are delivered in custom, wheeled, stackable storage cases.

Storage and Transportation Instructions

- Simulators should be dry, fluid free, and without clothes during long-term storage.
- Battery packs should be removed from the simulator. See *Removing the Battery Pack*.
- The Velcro straps should be applied by NOT TIGHTENED as this can wear down the moulaged areas.
- Secure all latches.
- The storage cases should NOT BE STACKED more than TWO high.
- Simulators should be stored in a dry environment. Recommended storage temperature is between -20 and 55 degrees Celsius.

Using the Storage Base for Transport

Cases are inverted with a gurney-like base to field-carry or classroom-carry the simulator. Simulators must be secured with the Velcro straps during transport.

The drainage valve in the corner of the base can be opened for the removal of fluids. Cases can be cleaned with a mild soap and water.