

Tactical Hemorrhage Control Trainer (THCT)

Operative | Experience

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Tactical Hemorrhage Control Trainer

The Tactical Hemorrhage Control Trainer is a full-sized, life-accurate, remotely-activated simulator designed for point-of-injury, tactical medicine. Ultra-realistic and fully mobile, it is ideally suited for training rapid assessment and treatment of trauma injuries associated with active shooter, disaster and terrorist incidents.

Product Components

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

Case with Casters	1
Humeral and sternal I/O replacements	10
Battery Pack NIMH 12V 3.8Ah 45.6 (Wh)	2
Battery Charger	1
Concentrated Fake Blood (1 Gallon)	1
Hand Pump/Canister	1
Leg Band	1
Neck bands	3
Repair Kits	2
Key Fob Bleeding Controller	2
Gym Shorts	1

External Access

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

- 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. Tissues and joints are designed to replicate human patients. Proper use and treatment promotes proper long-term functionality. The simulators are water-resistant, but not waterproof.

Cleaning

Simulators can be wiped clean with a simple solution of mild soap and water.

Storage

Simulators should be dry, fluid free, and without clothes during long-term storage. See *Storing the Simulator* 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 *Emptying/Cleaning 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 bleeding failure is generally resolved by charging or replacing the battery. See *Charging/Replacing the Battery Pack* below. For minor tears in the skin, see *Repairing the Skin* below.

Understanding Your Simulator

The Tactical Hemorrhage Control Trainer is a full-sized, ruggedized, soldier-form remotely-activated simulator for rapid assessment and point-of-injury hemorrhage control featuring multiple injuries, including gunshot wounds, stab wounds and crushing injuries.



Figure 1: The Tactical Hemorrhage Control Trainer

Common Features

The Tactical Hemorrhage Control Trainer has the following features:

- Wireless Remote-Controlled
- Needle Decompression
- Oropharyngeal Airway
- Nasopharyngeal Airway
- Wound Packing
- Humeral I/O
- Sternal I/O
- Tourniquet Application

Operating Your Simulator

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

Adding Blood to Your Simulator

Before operation, infuse the simulator with blood using the hand pump. A gallon of concentrated fake 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. Retract the handle and pump periodically until back-flow check valve on handle emits fluid. This will be an indicator that your reservoir is full.



Figure 2: Blood Infusion Port



Figure 3: The Hand Pump

Using the Key Fob to Control the Bleeding

Your simulator comes equipped with a remote control “key fob” controller to turn on/off the non-pulsatile bleeding system.

To control the bleeding with the controller:

1. Power on the simulator by pressing the latching illuminated switch on the back of the neck. A blue light will appear on the back of the simulator's neck when powered on.
2. Infuse the blood using the steps described in *Adding Blood to Your Simulator* above.
3. To operate the simulator blood control once the system has been powered on use the supplied key fob. To start the bleeding depress and hold the upper button (the button directly under the fob light). Release the button to stop the bleeding.
4. Replacement of the key fob battery may be necessary over time. This can be done by simply removing the two (2) screws on the back of the key fob and carefully separating the key fob housing. Inside you will find two (2) small lithium powered watch batteries. When replacing batteries be sure to replace with identically numbered batteries.



Figure 4: Using the Key Fob

Shutting Down the Simulator

Turn off the simulator by pushing in the latching illuminated button on the back of simulator's neck. As soon as you push the button the blue illuminated light will go dark and power will be discontinued.

Removing the Blood Mixture

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 pushing the latching switch on the neck of the simulator. You will see a blue light when power is applied.
2. Using the key fob controller, turn the bleeding **On** to activate the upper and lower body 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 after Use

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

Performing Interventions

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

Needle Decompression

Supports needle decompression techniques using a 14-gauge needle.



Figure 5: Needle Decompression

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

Humeral Intraosseous

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



Figure 6: 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 7: 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.

Oropharyngeal Airway

Supports oropharyngeal airway techniques using a bag valve mask (BVM) for assisted ventilation.



Figure 8: Oropharyngeal Airway

Nasopharyngeal Airway

A nasopharyngeal airway can be applied to the simulator.



Figure 9: Nasopharyngeal Airway

Wound Packing

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



Figure 10: Wound Packing

Tourniquet Application

With Bleeding on, standard and junctional tourniquets such as the CAT (Combat Application Tourniquet) and SAM Junctional Tourniquet can be applied to control hemorrhaging at the appropriate sites on the simulator.

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.

Repairing the Skin

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

To repair:

1. Gather all materials necessary:
 - a. Manufacturer-Supplied Silicone Repair Kit
 - b. Acetone
 - c. Disposal Cup or Piece of Cardboard
 - d. Two (2) Small Hobby Sticks for Mixing and Application
 - e. 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 11: Skin Repair Supplies



Figure 12: Cleaning for Skin Repair



Figure 13: Remove Plastic Tip



Figure 14: Add Repair Materials



Figure 15: Mix



Figure 16: Replacement Cap



Figure 17: 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 18: Spread the Area



Figure 19: Apply the Mixture



Figure 20: 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 21: Wipe with a Small Amount of Acetone



Figure 22: Let Dry for Two Hours

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

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 23: Sternal Mechanism - Top View

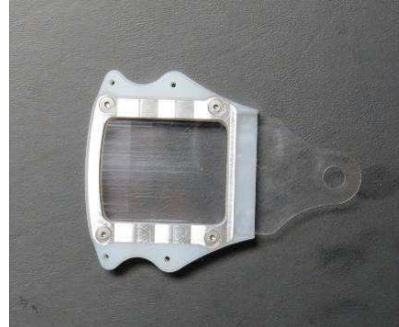


Figure 24: Sternal Mechanism with Insert - Top View



Figure 25: Sternal Mechanism - Horizontal View



Figure 26: 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 27: Sternal Slit



Figure 28: Replacing Sternal Insert

Charging/Replacing the Battery Pack

Simulators are powered by a replaceable, rechargeable, silicone-encased battery pack. For temperature management, the simulators use trickle charge batteries with temperature sensors.

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 skin cover 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 skin.

Charging the Battery Pack

Battery packs should only be charged with the charger included with the simulator or otherwise provided by OEI. It takes 3.5 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 3.5 to 4 hours (or overnight). The indicator light turns green when the batteries are fully charged and the charger goes into a dormant mode to keep from overcharging.
6. Disconnect the batteries from the charger when fully charged.

Storing the Simulator

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 and Installing the Battery Pack* above.
- The 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.

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.



Figure 29: Gurney-Like Storage Base Used for Transport