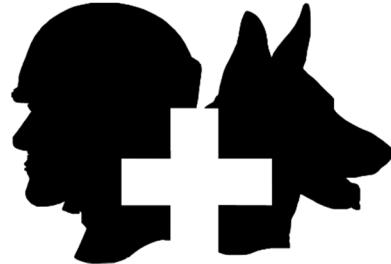


TRAUMA F/X®

Improving Survivability



AIRWAYPLUS LIFECAST (APL)

AirwayPlus Lifecast (APL) User Guide

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TRAUMA F/X®
Improving Survivability

TraumaFX®

AirwayPlus Lifecast (APL) Upper Body

TraumaFX Customer Service

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Chapter 1

Chapter 1: Introduction

About the AirwayPlus Lifecast Upper Unit

The TraumaFX® AirwayPlus Lifecast (APL) Upper unit is a ruggedized upper body medical simulator that takes realism to the next level by helping trainees learn how to treat and perform interventions on patients suffering from traumatic upper body and airway injuries. The APL is covered in lifelike synthetic skin and includes a simulated rib cage and sternum. Students learn to find realistic anatomic landmarks to execute critical patient treatment without relying on marked indicators. The APL helps teach responders to perform life-saving tasks such as maintaining a patient's airway, needle chest decompression, cricothyroidotomy, intraosseous infusion, and chest tube insertion. The APL is designed for rugged use in realistic training environments. To ensure proper operation, do not subject the APL upper body to unnecessarily harsh treatment. Care for the APL as you would a live patient. Also, careful preventive maintenance and frequent after-use inspection is essential to ensure the service life of your APL(s). Please review Chapter 5: After Use Care of this user guide, which outlines the standard preventive maintenance required under the terms of the APL limited warranty.

The TraumaFX® APL is unparalleled in ruggedness and durability. The APL was designed specifically for use in tough outdoor terrains, and features articulating shoulders, and realistic, reinforced silicone arms. It can be carried, dragged, and transported in a variety of vehicles and aircraft. The APL can withstand nearly any weather condition, making it ideally suited for real world simulation training for Tactical Combat Casualty Care (TCCC) and Combat Lifesaver training courses.

The APL is a multi-purpose training simulator that can function as a stand-alone skills station or be connected to any TraumaFX® lower unit for use in training lanes. The APL's simulated injury and intervention sites allow for multiple uses with cost-effective replacement components available.



Item Checklist

The components listed below are required to set up and operate your APL upper unit and come standard with each TraumaFX® APL purchase. Optional components may or may not be included – check your order or packing lists to determine if any optional components were purchased.

Standard Components

APL Upper Body



Multi-Use
Cric Skin x 2 and Cric
Saddle x 2



1 Gallon Blood Paste
(Coagulated)

Single-Use Cric
Skin x 10 and Cric
Saddle x 2



Needle D Skin Plug
(Left & Right) x 2

Infusible Manubrium x1
with Membranes x 10



Non-Infusible
Manubrium x 1

Manubrium
Skin Plug x2



Chest Tube Skin Plug

INTRODUCTION

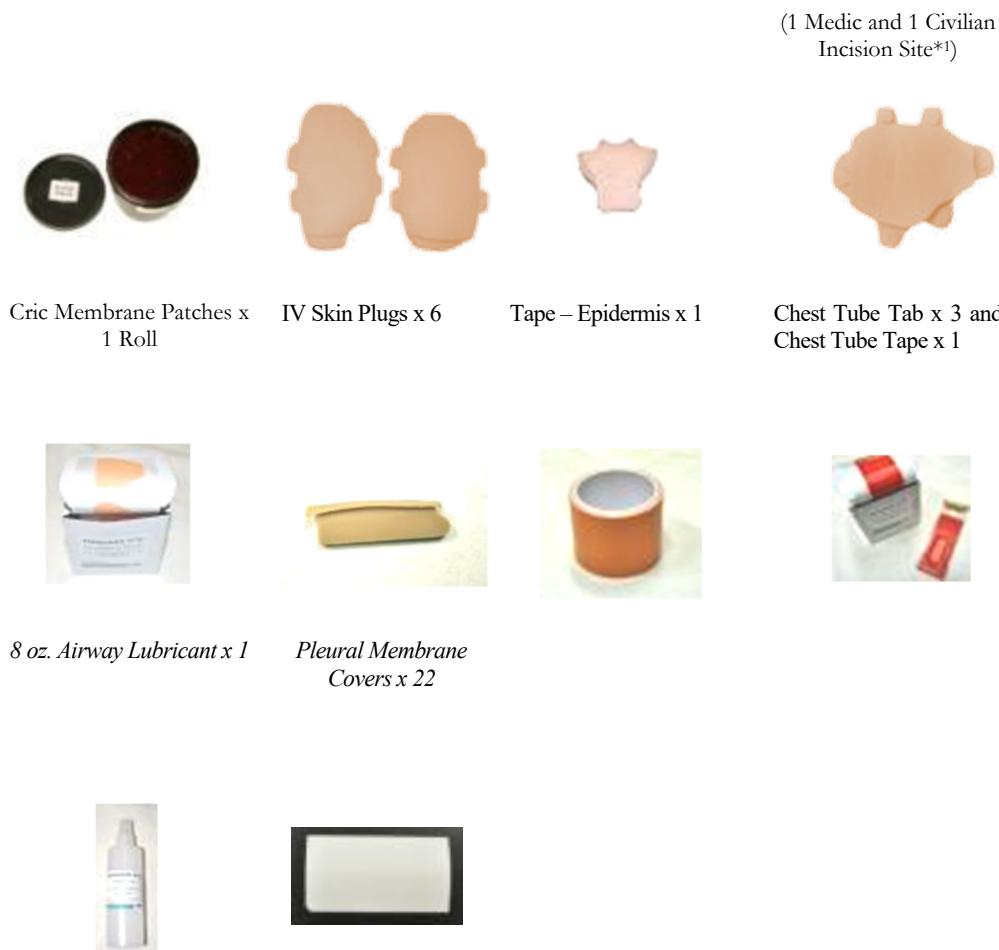


Figure 1

Other standard components not shown

- User Documentation

Optional Components, Features, or Accessories

- Multiple Amputation Trauma Trainer (MATT)®
- MATT Ace Lower Body Trainer
- Packable Hemostatic (HEMO) Trauma Trainer
- Clinical Response Lower (CRL)
- Emergency Medical Trauma Trainer – Active Shooter Lower (EMITT-ASL)
- Emergency Medical Trauma Trainer – Tactical Medical Lower (EMITT-TMU)

*¹ The Chest Tube skin plug comes equipped with two incision sites. The medic incision site is located at the 6th and 7th intercostal rib space, and the civilian incision site is located in the middle of the 6th rib.

- Severed Leg with Boot (Left or Right)
- Flesh Chunks (3)
- Injured Hands

Special Notes and Cautions

Read all TraumaFX instructional manuals before attempting to assemble, install, or operate the AirwayPlus Lifecast (APL) Upper Body or accessories.

After Use Care

The APL is designed for rugged use in realistic training environments. To keep the APL working optimally, careful preventive maintenance and frequent after-use inspection will extend the service life of the APL and is required under the terms of the limited warranty. Please read Chapter 5: After Use Care detailing the tasks to perform at the end of every training session, such as cleaning the APL and replacing skin plugs when needed.



Water Resistance and Cleanup

DO NOT SUBMERGE THE APL UNDER WATER.

The APL is water resistant, but is not waterproof. With water only, carefully wash the APL with a soft, wet cloth or sponge after each use. Vigorous scrubbing of the skin can result in permanent damage. If the APL is used with any TraumaFX simulated blood products, the simulated blood should be washed out of clothes within 24 hours to avoid staining; pre-treatment of stains and vigorous cleaning will usually remove simulated bloodstains.



System Weight

APL manikins are designed to replicate the weight and feel of a live human patient. Use caution and proper procedures when lifting or carrying the trainer or cases.



Treatment

TREAT THE APL AS YOU WOULD A HUMAN PATIENT.

Though highly ruggedized, do not subject the APL to severely damaging conditions; users must treat the APL as they would a human patient. Failure to do so can void the APL limited warranty.



Storage

APL body(s) and accessories should be stored in a cool, dry place.



Compliance

If the APL is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Chapter 2

Chapter 2: AirwayPlus Lifecast Upper Body Features

This section describes the highly realistic features of the APL that contribute to the unique training experience the APL Upper Body provides. The APL contains the following features:

- Made of lifelike, wrap-around silicone skin with self-healing intervention sites
- Manually rotatable pinpoint or dilated pupil to cue for Traumatic Brain Injury (TBI), overdose, or nerve agent
- Simulated nasal airways
- Simulated oral airway cavity with teeth and tongue for use with King LT-D or other esophageal airways
- Upgraded cricothyroidotomy with larynx and single and multi-use replaceable skin plugs
- Intubatable head for endotracheal intubation with realistic range of motion at the jaw and neck
- Infusible Intraosseous trainer for use with any Intraosseous (I/O) infusion system, with replaceable manubrium membranes
- Bilateral needle decompression (3 $\frac{1}{4}$ " 14 gauge needle) sites with responsive pleural membranes and replaceable skin plugs
- IV insertion training site
- Articulating shoulders that provide full arm rotation
- Reinforced silicone arms that allow natural elbow movement and provide for a soft grip during casualty training scenarios
- Oximeter hands for placement of an oximeter during training
- Multi-use, suturable chest tube insertion site with replaceable skin plug (suturing degrades multi-use capability)
- Gunshot entrance and exit wounds
- Optional interchangeable hands (e.g. Injured Hands)
- Optional abdominal evisceration

Ruggedized, Realistic Synthetic Skin

The outer skin of the APL is designed to provide the “look-and-feel” of real skin and incorporates simulated injuries for added realism in trauma training. The skin is very rugged, but must be maintained regularly to ensure longevity. APL’s simulated skin is made of a proprietary silicone compound and features realistic wounds.

Composition

The APL’s skin is made of a silicone-based compound that requires cleaning with water. This simulated skin covers the APL trainer. The internal structure of the APL’s upper body is composed of a heavy-duty anodized aluminum frame that is surrounded by a ruggedized core and layered with realistic silicone-based skin. This construction results in a high-fidelity look and feel with exceptional durability that allows the APL to be carried or dragged on many surfaces such as outdoors or flooring commonly found in buildings.

Cautions and Care



APL is water resistant, but not water proof. When washing the APL’s outer skin, use a soft wet cloth or sponge after each use with water only. Do not use ink or marker on the APL for medical notations.

AirwayPlus Lifecast Upper Body Overview

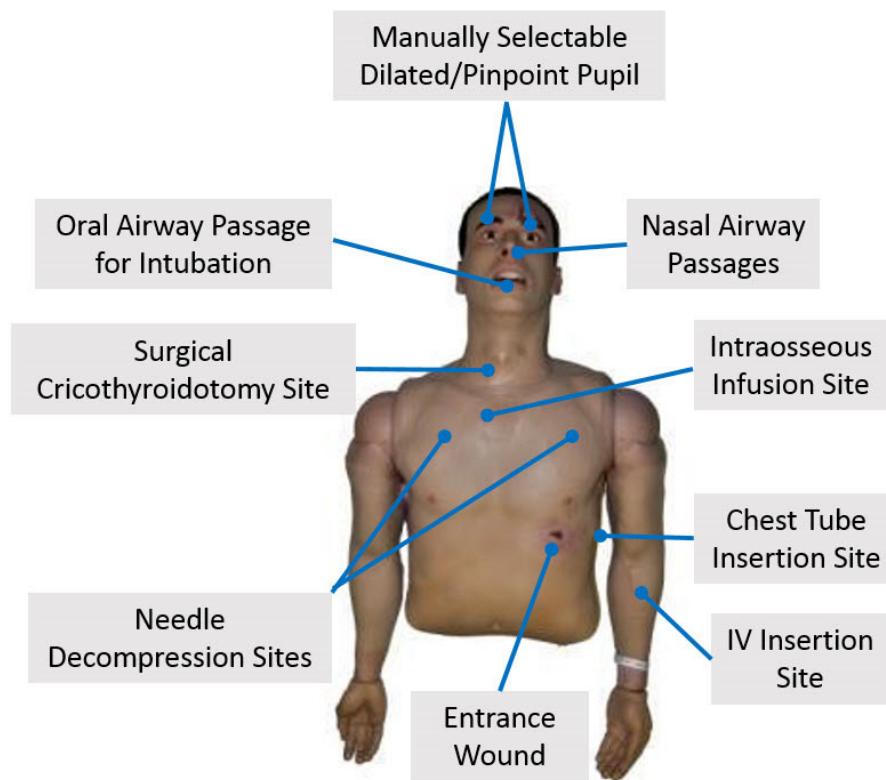


Figure 2

**Note - Skin Plugs and Posterior Gunshot Exit Wound Not Shown*

Chapter

3

Chapter 3: Getting Started



Read all TraumaFX manuals before attempting to assemble, install, or operate the AirwayPlus Lifecast (APL) Upper Body or accessories.

Notes on General Use and Care

The APL is designed for rugged use in realistic training environments. To ensure proper operation, care for the unit as you would a live patient by not subjecting the APL to unnecessarily harsh treatment. Also, careful preventive maintenance and frequent after-use inspection is essential to ensure the service life of the unit(s). Please review Chapter 5: After Use Care, which outlines the after use care required under the terms of the APL limited warranty.

Attaching an Optional TraumaFX® Lower Unit to the APL

A popular option is to use a ruggedized TraumaFX lower body with an APL upper body to help trainees practice how to treat patients suffering from traumatic lower body injuries. These bodies were designed to easily attach together and to quickly enable rapid battery replacement during training exercises.

1. **Fold back** the upper unit chest fascia to expose the quick connect system (Figure 3).
2. **Bring the Lower and Upper units together** and line up one side of the Upper quick connect with the corresponding Lower unit quick connect (Figure 3).
3. **Insert** the cotter pins into the bracket holes (Figure 4) on both sides of the unit.
4. **Pull down** chest fascia to cover the space between the upper and lower units.



Figure 3



Figure 4

Inserting APL Standard Components and Skin Plugs

Inserting the Manubrium and Manubrium Skin Plug

Insert the manubrium into the manubrium skin plug. Insert the manubrium with skin plug into the sternal recess by matching the ball and socket joints (Figure 5). Adjust the skin plug edges as needed to eliminate “seams.”

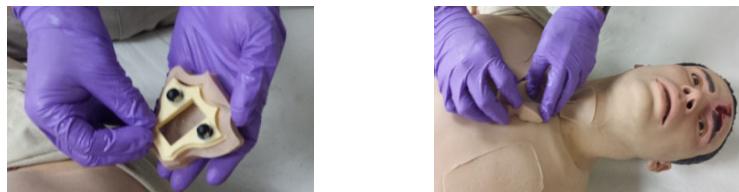


Figure 5

*****Please Note:** The APL is equipped with the infusible manubrium from the factory. To replace the infusible manubrium membrane, slide the ‘used’ polycarbonate membrane out of the infusible manubrium, and slide a new membrane into the guides.

Inserting the Multi/Single Use Cric Skin Plug

With the APL, users have the option to use a multi-use or single use cric skin plug. The multi-use cric skin has an insertion incision already present, and can be used for numerous training rotations. The APL’s single use cric skin allows the trainee to make the insertion incision, and is a single use item.

The APL is equipped with two multi use Cric ‘Saddles’ and two single use. These allow for pre-assembly of cric tape and cric skin into the saddle and replacement of the entire system into the neck ‘cage’. This system may prove especially useful for single use cric skins although replacement of cric tape membrane and single use cric skin while cric saddle is still in neck will work as well.

For easy insertion, tilt head up and physically pull up at the top of the neck opening while placing cric saddle assembly into neck opening (Figure 6). For easy removal, place fingers on one side of cric saddle and press in to release retaining clips on the bottom of the saddle.



Figure 6

Inserting the Pleural Membrane

Insert the pleural membrane so the edges are under the tabs in the pleural membrane recess, and gently depress pleural membrane until it ‘snaps’ into place, as shown below in (Figure 7).



Figure 7

Inserting the Needle “D” Skin Plugs

Insert the left or right needle “D” skin plug into the matching side recess. Ensure all tabs are securely in place under the skin, and adjust the skin as needed (Figure 8).

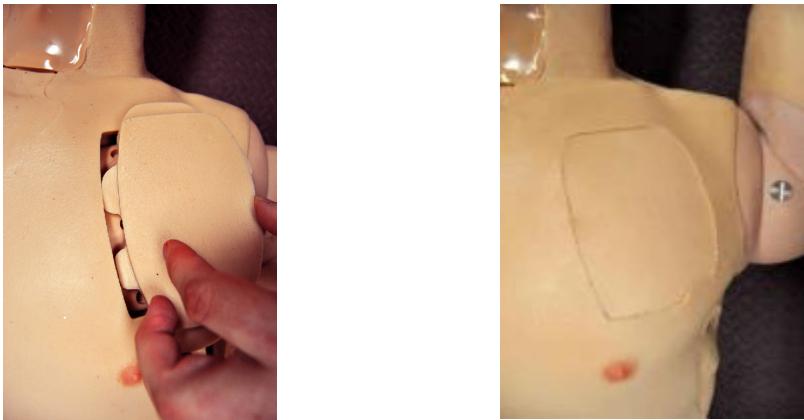


Figure 8

Inserting the Chest Tube Skin Plug

Insert the chest tube skin plug into the matching side recess, align the rivets to the corresponding holes located in the core, depress rivets into holes until completely inserted, and adjust the skin as needed (Figure 9).

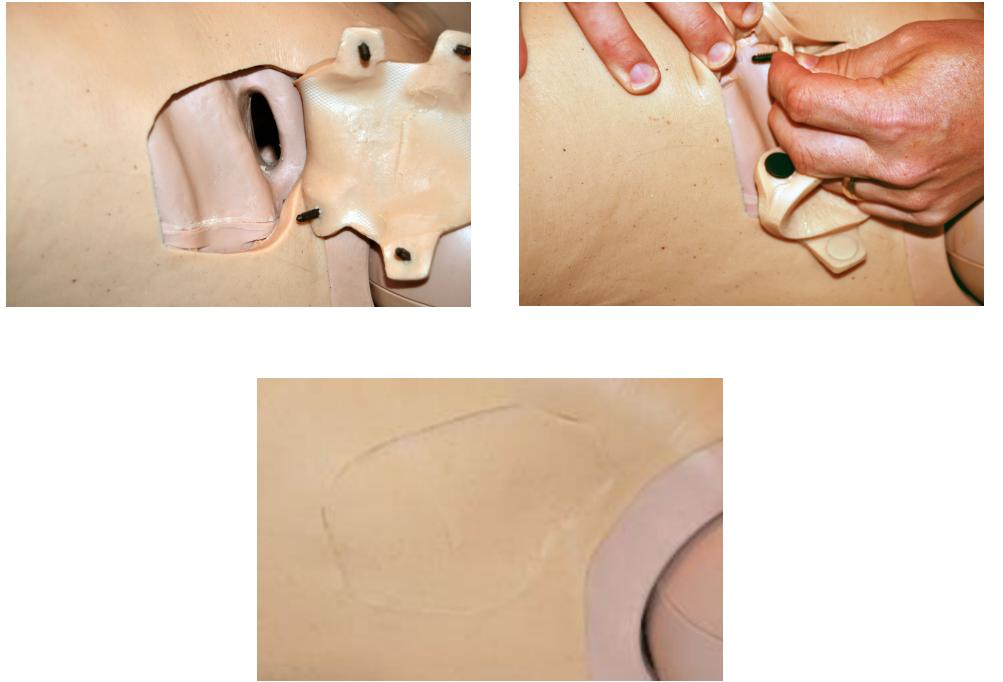


Figure 9

***The Chest Tube skin plug comes equipped with two incision sites. The medic incision site is located at the 6th and 7th intercostal rib space, and the civilian incision site is located in the middle of the 6th rib.

Insert the chest tab by lining up the chest tab with the adjacent slot near the left areola (Figure 10).

The chest tube tab tape has a limited number of uses, and will require replacement. Remove the red tape from the chest tube tab, and replace it in like fashion with the chest tube tab tape provided with the unit.



Figure 10

Inserting the IV Insertion Skin Plug

Insert the IV insertion skin plug (Figure 11) by lining up the holes and pressing the IV Insertion Skin Plug into the IV recess located at the left forearm. Adjust the skin plug edges as needed to eliminate “seams.”



Figure 11

Chapter 4

Chapter 4: Operating the AirwayPlus Lifecast Upper Body

This chapter describes the APL's operational and simulated training features.

Simulated Nasal Airway

The *Simulated Nasal Airway* provides for nasopharyngeal intubation into the nostrils to facilitate opening and maintaining a clear airway (Figure 12).



Figure 12

Simulated Oral Airway

The *Simulated Oral Airway* cavity with teeth and tongue provides for pharyngeal intubation, and facilitates opening and maintaining a clear airway for mechanical ventilation (Figure 13). This simulated airway can be used with King LT-D or other esophageal airways.

The Simulated Oral Airway provides trainees with a flexible neck and jaw to perform endotracheal intubation.

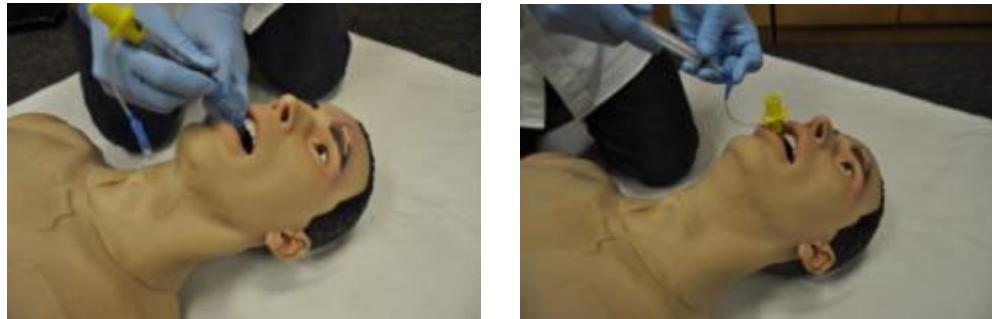


Figure 13

Simulated Cricothyroidotomy Site

The *Simulated Cricothyroidotomy Site* is a multi-use training site that allows for the palpation of landmarks to properly identify and locate the larynx (Figure 14). Additionally, this site allows trainees to create an incision through the skin and cricothyroid membrane for airway intubation. A cricothyroidotomy is generally required during certain life threatening conditions where nasopharyngeal or pharyngeal intubation is unfeasible such as with severe facial trauma, cervical spine trauma, or severe chemical inhalation injuries. This site uses replaceable, single or multi-use skin plugs to accommodate repeated simulations.

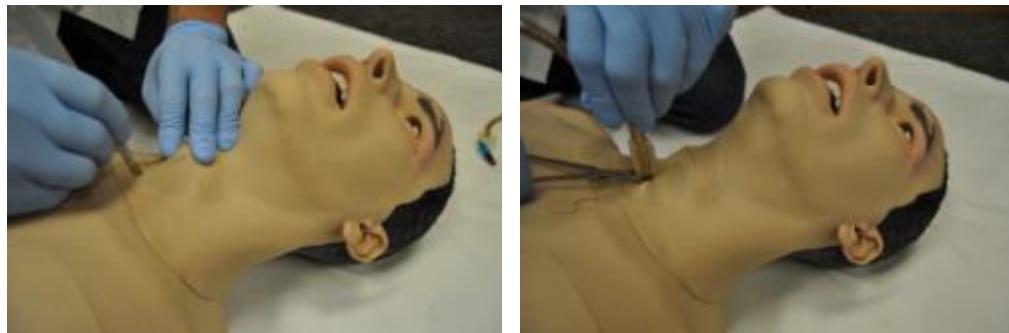


Figure 14

Simulated Infusible Intraosseous Site

The *Simulated Infusible Intraosseous Site* allows trainees to palpate the sternal notch for proper placement and insertion of any Intraosseous (I/O) infusion introducer (Figure 15). I/O infusion provides immediate, vascular access for fluid and medication infusion for victims experiencing shock and trauma, and allows trainees to rapidly, safely and reliably administer sternal I/O infusions. The intraosseous training site uses a multi-use, infusible manubrium with replaceable membranes to accommodate repeated simulations.



Figure 15

***the APL is also equipped with a non-infusible manubrium.

Simulated Needle 'D' (3 $\frac{1}{4}$ " 14 gauge) Site

The *Simulated Needle 'D' Site* provides trainees with palpable landmarks at the ribs to locate the correct needle decompression site and fully insert the decompression needle (Figure 16) to relieve pneumothorax caused by physical trauma to the chest such as a blast injury. This site uses reusable and replaceable needle 'D' skin plugs to accommodate repeated simulations.



Figure 16

Simulated Chest Tube Site

The *Simulated Chest Tube Site* provides trainees with palpable landmarks at the ribs to allow trainees to locate the correct chest tube insertion site and insert a chest tube to relieve pneumothorax or hemothorax (Figure 17). Once the chest tube is inserted, trainees can practice securing the chest tube with various suturing techniques used to keep the chest tube in place. This site uses a reusable and replaceable chest tube skin plug to accommodate repeated simulations.



Figure 17

*****Optional Abdominal Evisceration Site**

The optional Abdominal Evisceration site provides trainees with the ability to learn proper procedures when dealing with abdominal eviscerations (Figure 18).



Figure 18

Chapter 5

Chapter 5: After Use Care



To keep the APL operating as designed, the following preventive maintenance actions must be completed after each training session.

These easy to perform maintenance actions will help ensure the APL (or APL-AE) remains in peak operating condition for each training session:

1. Wipe down the APL carefully with a soft, wet cloth or sponge after each use with clean water only. Blood stains should be washed out of clothes within 24 hours to avoid staining; pre-treatment of stains and vigorous cleaning will usually remove blood stains.
2. If the skin of the APL is cut, then clean the cut with alcohol or with a silicone-approved cleaner that does not leave a residue. Allow the cut to thoroughly dry. Repair the cut using a silicone adhesive such as Sil-Poxy© by Smooth-On which is available for sale from TraumaFX. Allow all repairs to fully cure prior to use.



Water Resistance and Cleanup

DO NOT SUBMERGE THE APL UNDER WATER.

The APL is water resistant, but is not waterproof.

Chapter

6

Chapter 6: Repair & Troubleshooting

How to Repair the APL Skin

The APL skin is very rugged, but is not impervious to accidental damage from cuts or tears from sharp objects or from physical abuse just like human skin is vulnerable. Regular maintenance will ensure its longevity. The APL skin is made of a silicone compound that can be easily repaired using a silicone adhesive, such as “Sil-Poxy”, which is specifically made for repairing silicone cuts and tears. Do not use adhesives, such as “Super Glue” as it will damage the skin.

1. Thoroughly clean cut or tear with water followed by rubbing alcohol.
2. Thoroughly dry the skin surface (Figure 19).
3. Generously spread Sil-Poxy inside and over the cut or tear (Figure 20).
4. For a cut, pinch the cut back together.
5. For a tear, replace the skin flap. Apply tape/medical bandage if necessary to hold together until the Sil-Poxy cures.
6. Gently and immediately wipe off excess Sil-Poxy with a tongue depressor, or finger (Figure 21). ***Do not wipe off with a cloth or like material. Do not let excess sit.***
7. Allow the Sil-Poxy to cure at least 8 hours before the skin is used. Once cured, the repaired cut or tear should be difficult to see.

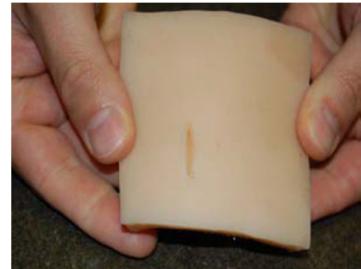


Figure 19



Figure 20



Figure 21

Troubleshooting

Issue	Actions
Skin appears cut or torn	<ul style="list-style-type: none"> ▪ See Chapter 6: How to Repair the APL Skin of this User Guide.
Loose H-Bar at the quick connect waist plate	<ul style="list-style-type: none"> ▪ Periodically check the H-Bar attachment bolts and mounting hardware located at the unit waist plate, and tighten as needed with an adjustable wrench.
Skin plugs will not stay in place or appear damaged from multiple simulation use	<ul style="list-style-type: none"> ▪ Replace with a new skin plug. For replacement skin plugs, please contact your account representative 800-200-7465 or customer support at MATTSSupport@traumafx.net
Cric Box skin channel is blocking placement of the cric skin	<ul style="list-style-type: none"> ▪ Ensure the cric box skin channel is clear of any foreign debris or dirt. ▪ If debris is found, clean the channel with a cotton tipped applicator to clear the skin plug channel.
Receiving less than adequate resistance on needle chest decompression	<ul style="list-style-type: none"> ▪ Replace the pleural membrane. For replacement pleural membranes, please contact your account representative 800-200-7465 or customer support at MATTSSupport@traumafx.net

Additional Support

Customer Service and Support

For other troubleshooting issues not identified above, please contact TraumaFX Technical Support at MATTSSupport@traumafx.net or 1-800-200-7465.



Appendix A – AirwayPlus Lifecast Technical Specs

AirwayPlus Lifecast Upper Body with case

Weight: 69 lbs

Dimensions (in case): 50x25x15

Square Footage Requirements (storage): 3 – 6 Square feet

Electrical: None

Water, Heating, and HVAC Requirements: Water is required to wash unit.

Indoor or Outdoor Use

Altitude Rating: Altitude up to 2000 m

Temperature Rating: Temperatures between 32°F and 104°F (0°C to 40°C)

Humidity Rating: Maximum relative humidity 80% for temperatures up to 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C)

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