SimMan 3G Mystic

Directions for Use

Laerdal

helping save lives

CONTENTS

SimMan 3G Help

Directions for Use

The *Directions for Use* includes comprehensive step-by-step instructions and illustrations for using *SimMan 3G*.

> *Note: The illustrations may vary slightly from product.*

Original Manufacturer's User Manuals

All separate user manuals and labeling from original manufacturers should be followed. The *SimMan 3G Directions for Use* does not replace or supersede those from the original manufacturer.

Software Help files

The software *Help files* are accessible from the *SimMan 3G* software *Help* menus.

For first-time Instructors:

- Instructor application: Auto Mode
- Patient Monitor for learners
- Voice Conference application
- Debrief Viewer

Additional features for Advanced Instructors:

- Instructor application: Instructor Mode
- Scenario Editor
- Handlers Editor
- Trend Editor

For System Administrators:

- Network configuration (WLAN setup)
- Profile Editor

Technical Assistance

For technical assistance, contact your local Laerdal Technical Service Center.

Web Downloads

Visit http://www.laerdal.com to download the latest Directions for Use and Software.

Regulatory Information

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC-ID: QHQ-212-00001

CE Laerdal Medical AS hereby declares that when carrying the CE-mark, this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Dispose of in accordance with local requirements and regulations.

Li-ion batteries should be recycled.
Li-ion

SimMan 3G Patient Manikin

For Advanced Clinical Simulation

SimMan 3G is an advanced patient simulation system that facilitates training of Basic and Advanced Life Support. The system allows the instructor to effectively assess the learner's individual and team skills based on a realistic clinical situation.

SimMan 3G allows observation and recognition of most vital signs. This is achieved through direct interaction with the manikin and observation of the manikin's status as viewed on the *SimMan 3G Patient Monitor PC*.

The SimMan 3G simulation system features include:

- An advanced configurable airway, comprised of adjustable lung compliance and resistance - allowing simulation of difficult airway management cases.

- Eyes that respond to light and react according to the clinical state of the manikin.

- Bleeding and Wound Modules are fed from an internal blood reservoir. An external Blood Fill Unit may be connected for extended bleeding cases.

- Simulated Secretions: Sweat, tears, froth, urine and ear fluids are fed from an internal fluid reservoir. An external Fluid Fill Unit may be connected for extended use.

- Focus on Quality CPR (QCPR): measurement and feedback according to the 2000 and 2010 Guidelines.

- Vascular Access (intra-osseous) via the tibia and sternum.

- Automatic Simulation Control based on pre-programmed and validated Patient Cases.

The Main Components of the SimMan 3G System:

SimMan 3G is an adult life-size wireless manikin, with internal battery power, internal air compressor and fluid reservoirs. Interventions by learners are registered by the system in the session log, and used for later debriefing.

Patient Monitor PC can be configured to replicate most patient monitors. The web-camera records video and sound from the simulation for use during the debriefing session. The *Patient Monitor PC* also doubles as a display for other functions, such as 12-lead ECG, X-ray images and lab results to view the patient's case history.

The Instructor PC controls the simulation. The headset allows the instructor to simulate interactive voice communication between the patient and the learner.

The simulation can run autonomously using pre-defined *Patient Cases*. The development of the patient's condition is pre-programmed and automatically responds according to the learner interventions.

Also included are PC software programs for creating and editing Scenarios, as well as an application for debriefing simulation sessions with video capture from a web-camera and the *SimMan 3G Patient Monitor PC*.

WLAN Communication

Communication between the *SimMan 3G* manikin and the laptop PCs is based on WLAN communication. The manikin and PCs can also be connected to a LAN cable network, and WLAN disabled.

Disclaimer

Use of the *SimMan 3G* patient simulation system to train personnel should be undertaken under supervision of suitably trained medical personnel with an understanding of educational principles as well as recognized medical protocols. As with all manikins or other such training devices there may be approximations, variations and inaccuracies in anatomical features and the physiological modeling. This being the case, Laerdal does not guarantee that all features are completely accurate.

Manikin Setup

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Spare Parts

It is important to follow the instructions below in order to maintain optimum performance and longevity of the manikin components.

General Manikin Handling

The *SimMan 3G* manikin should be operated by trained personnel only. Treat the *SimMan 3G* manikin as you would treat a real patient.

Hygiene

- To maintain manikin skins, wash hands before use and place the manikin on a clean surface.

- Wear gloves as required during simulation scenarios

- After using the fluid and/or blood system, follow the instructions in *Cleaning the Fluid* and *Blood System*.

- After using the SimMan 3G Wound Kit, remove glue residue from the manikin skin with Laerdal Medical Wipes.

- Use only Laerdal Airway Lubricant in the manikin's airway. Do not spray airway lubricant into the manikin. Lubricate tools only.

Prevent Stains on Manikin Skins

Avoid using colored plastic gloves, as they may cause discoloration of the manikin skin.

Do not use felt-tipped markers, ink pens, acetone, iodine or other staining medications near the manikin. Take care not to place the manikin on newsprint or colored paper. All staining may be permanent.

Transportation and Storage

SimMan 3G is heavy; ensure that the manikin is properly secured during transportation to prevent personal injury or damage to the product.

For storage - Flush the manikin's fluid system with a solution of 60% Isopropanol alcohol or 70% ethanol to inhibit algae. Follow cleaning procedure for fluid and blood system.

Anti-virus and Firewalls

The *SimMan 3G* manikin and PCs are not supplied with anti-virus programs. *Windows* firewall is activated by default. It is the customer's responsibility to protect the simulation system components from unauthorized access.

The manikin will revert to factory settings each time the power is switched off.

The customer should install all recommended Windows updates from Microsoft. General security measures should be taken before browsing the internet.

It is recommended that the SimMan 3G PC's are used only as manikin controllers. Downloading other software programs onto these machines may introduced unexpected errors.

File Security and Backup of Data

The customer is responsible for file security and backup routines for all simulation session data. All use and storage of simulation session data should be in accordance with local rules, regulations or laws, and is the sole responsibility of the customer.

The following precautions should be taken when using this product, to avoid personal injury or damage to the product.

General Manikin Handling

⚠ *Warning: Do not ventilate the manikin with oxygen enriched air or flammable gasses.*

- Do not introduce fluids into or onto the manikin (except as directed in the SimMan 3G Directions for Use) as this may damage the manikin and its components.

- Do not introduce humidified air into the system during ventilation.

- Never perform mouth-to-mouth rescue breathing on the manikin. The manikin's airways are not designed for cleaning or disinfection.

- Do not use the manikin if the internal tubing and cabling is disconnected.

- The manikin can be operated in wet, rainy, snowy, and misty conditions. The manikin should be clothed. Use the clothing provided or clothing of equal or greater protection. During heavy percipitation, the eyes should be protected by goggles and care should be taken to keep water out of the mouth. The manikin cannot be submerged in water and should not be left in standing water.

- Never use the SimMan 3G manikin in temperatures exceeding 40° C (104°F).

- The manikin should never be stored in temperatures below -15° C (5° F).

- The manikin will automatically shutdown if the battery temperature exceeds 60°C (140°F).

- Using a defibrillator in temperatures over 35° C (95° F) may cause overheating and shutdown.

- Do not use the manikin on soft mattresses and/or under heavy blankets. This may cause overheating and reduce the lifetime of the compressor.

Defibrillation Hazards

SimMan 3G allows for defibrillation in accordance with 2000 and 2010 international guidelines for CPR.

A conventional defibrillator may be used on the *SimMan 3G*. During live defibrillation, the defibrillator and manikin may present a shock hazard. All standard safety precautions must be taken when using a defibrillator on the manikin. *For more information, consult your defibrillator's Directions for Use.*

⚠ *Warning: Defibrillation must be performed on the defibrillator connectors only.*

To prevent overheating during defibrillation do not exceed a defibrillation sequence of 3 shocks in 45 seconds followed by 1 minute of CPR. After 30 minutes, cease all shocking for at least 15 minutes before starting a new sequence. Do not repeat this for more than a 4 hour period.

⚠ *Warning: The manikin must not come into contact with electrically conductive surfaces or objects during defibrillation.*

⚠ *Warning: Do not defibrillate the manikin in a flammable or oxygen enriched atmosphere.*

⚠ *Warning: In hot conditions, intensive defibrillation may cause thermal shutdown of the manikin.*

Take care to avoid spillage when using the manikin fluid systems while the manikin is under defibrillation.

To prevent torso skin electrode pitting, do not apply conductive gel or conductive defibrillation pads intended for patient use.

Pressing down too hard on the Defibrillation connectors during defibrillation may also cause arcing and pitting.

SimMan 3G will automatically shut down whenever it detects a significant increase in internal temperature. If automatic shutdown occurs, allow the manikin to cool down before resuming the training session. Open the torso skin to speed up the cooling process.

⚠ *Warning: Do not defibrillate the manikin when it is turned OFF or if it is not functioning normally.*

⚠ *Warning: Do not defibrillate the manikin if the torso skin is not in place.*

⚠ *Warning: Do not use automated chest compression machines on the manikin*

Mechanical or Electrical Hazards

⚠ *Warning: Avoid pinch hazards - Do not remove protective bushings from the manikin's joints or use the manikin without the external skins.*

⚠ *Warning: Avoid all sharp edges on the manikin to prevent personal injury.*

⚠ **Do not use the SimMan 3G manikin if:**
− Limbs are not attached to the torso
− Skins are torn or not properly fastened
− Internal or external cables, tubes or connectors are damaged.
− There is fluid leakage inside the manikin torso.
− There are unusual sounds indicating air leakage or mechanical damage.
− There are signs of electrical malfunction, such as an unresponsive manikin or unusual smell or smoke.

Battery Use

For more information see section: *Manikin Setup - Battery Use and Other Battery Warnings*, for more information on battery use and battery hazards, please see the battery manufacturer's *Directions for Use*.

Servicing the Manikin

A full service, including cleaning of the base board, should be performed at regular intervals.

⚠ *Caution: All servicing must be performed by qualified service personnel.*

Always perform a service:
− If liquids have been spilled in the manikin
− After use in dusty environments.

⚠ *Caution: Do not use cables or connectors showing visible damage.*

Transporting SimMan 3G

The *SimMan 3G* Simulation System consists of two cases for easy transport and storage; one for the manikin torso and one for the legs.

Each case has an extendable handle for increased mobility.
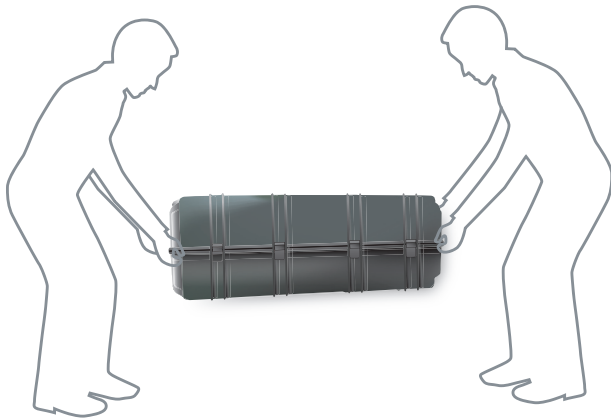
⚠ *Warning: The suitcases are heavy. Always use two people when lifting.*

📝 *The SimMan 3G System exceeds the weight allowance on most commercial airlines. Some parts may have to be transported separately. For more information on weight restrictions contact the relevant airline.*

Disassemble the legs from the torso and pack them into their respective cases before transportation or storage.

For instructions on how to disassemble the legs, see: *Manikin Setup - Attaching the left* and *Attaching the right leg.*

⚠ *Warning: The suitcases are heavy. Always ensure that they are firmly secured during transportation and storage so as not to cause personal injury or damage to the product.*

Please be aware that both cases appear identical. Each case contains compartments for all accessories.

Torso Case with foam inserts
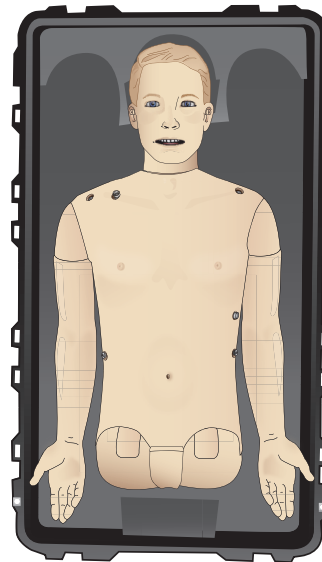
Leg Case with foam inserts
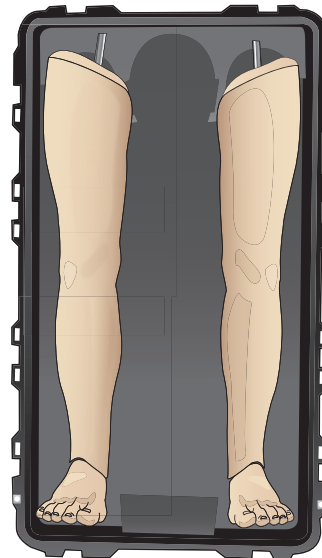
For more information on *SimMan 3G* accessories, see section: - *Spare Parts, Consumables & Accessories.*

SimMan 3G Overview

power panel

fluid fill panel

Air/CO$_2$ panel

🩸 Bleeding ports

⚪ Speakers

⚡ Defib Connectors

🔴 Pulses

Opening the Torso

Open the manikin torso for the following procedures:

Attaching or replacing limbs
- Attaching or dismantling the manikin legs and arms

- Exchanging default arms for trauma arms.

Maintenance tasks
- Changing the manikin batteries.

- Replacing the pneumothorax bladders, chest-rise bladders, lung bladders, IO modules and chest drain modules.

- Replacing the torso skin.

- Performing a general inspection.

- Removing WLAN adapter.

To open the torso skin
1   Unzip the zippers on the manikin's left shoulder and torso.
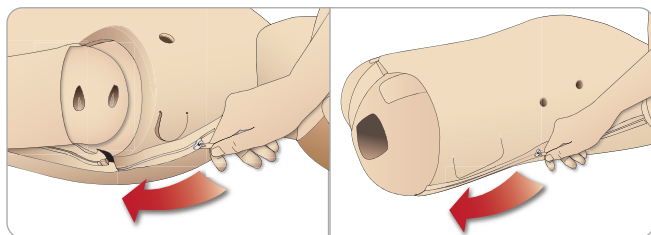
2   Remove the genitalia pad and release the skin flap from the pelvis.
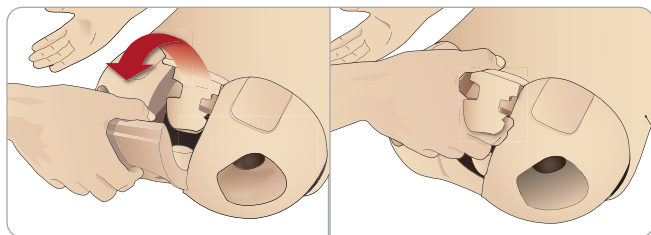
3   Fold the torso skin over to one side.
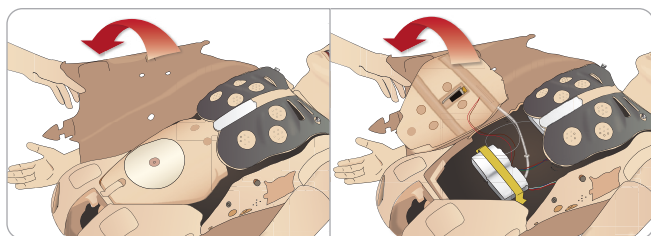
4   Open the stomach foam to one side, taking care not to tug on the connecting tubes and cables.

> *Note: DO NOT disconnect the tubes and cables connecting the stomach foam to the manikin.*

5   Replace the stomach foam and close the torso skin, perform steps 1- 4 in reverse.

Attaching the Left Leg

> *Note: Assemble the manikin on a large flat surface. Attach the left leg before the right leg.*

Open the torso to access the hip joint connectors. To open the torso follow steps 1 – 4, *Opening the Torso.*

1   Align the left leg bolt and cables with the pelvis socket.
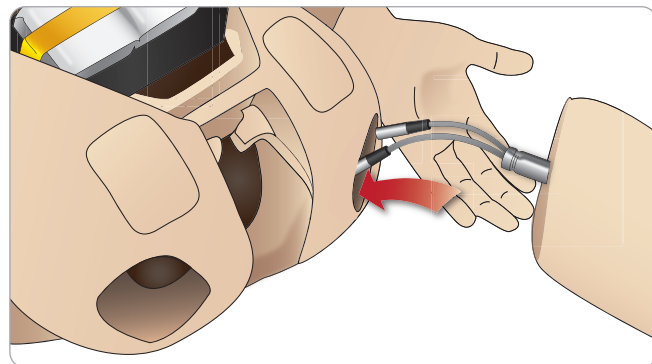
2   Feed the leg bolt and cables through the socket and into the torso. Do not pull the leg by the cables and/or tubes.

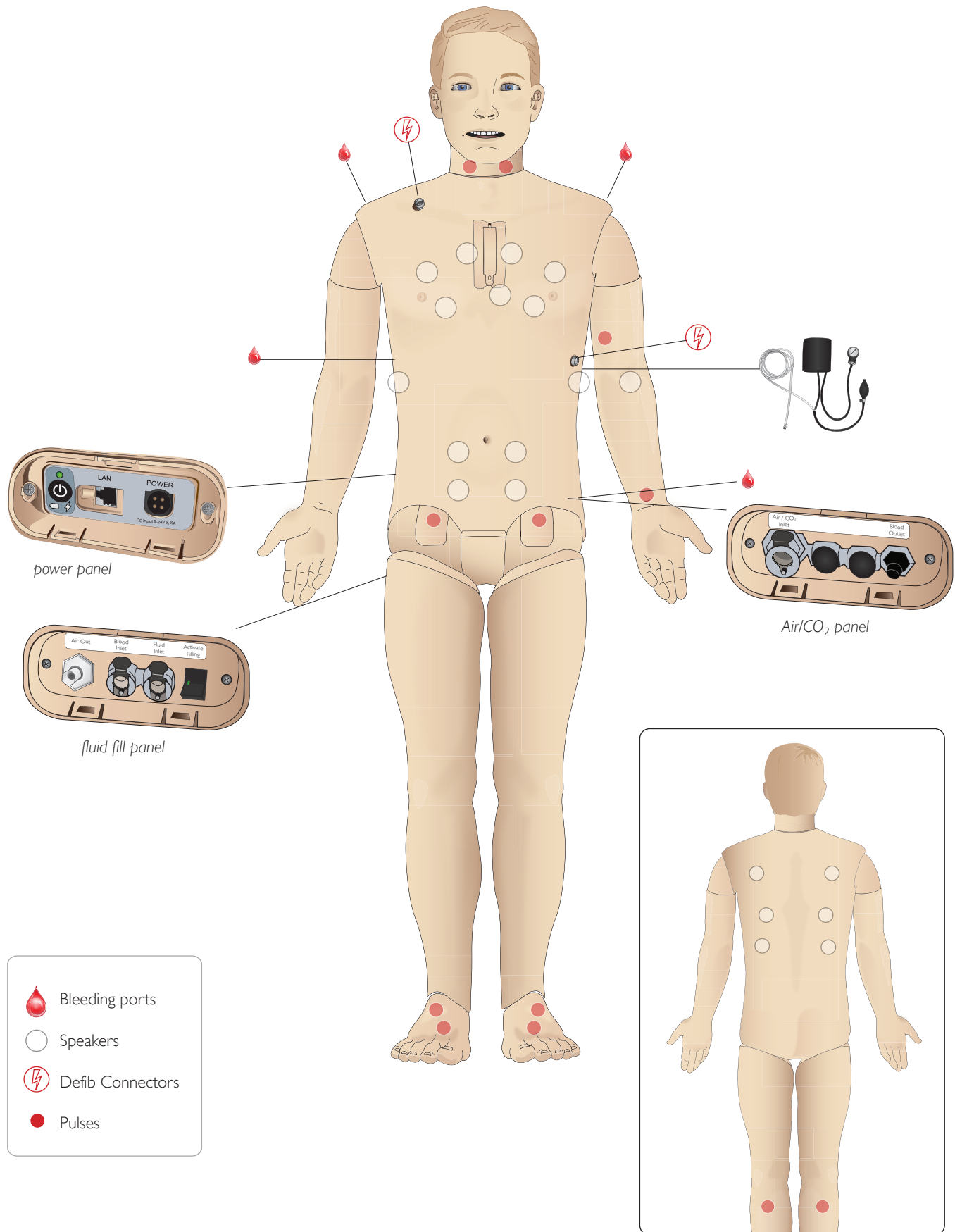3   Carefully push the leg in towards the pelvis to form a snug fit.

Hip joint connector with side slot for inserting cables and tubes (shown right)
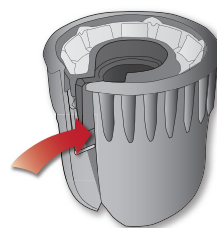
4   Position the connector rounded end facing downward. Place the leg cables and tubes into the side slot of the connector.

5   Slide the connector downwards along the tubes and cables and onto the leg bolt. Ensure that the nut and bolt are aligned, and that all cables and tubes are secured within the connector.

6   Screw the connector onto the leg bolt. Avoid twisting the tubes and cables. Tighten the connector so that the leg is able to rotate freely around the hip joint connector.
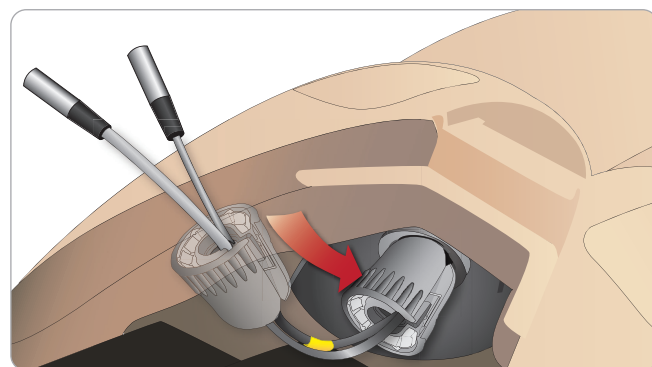
7   Connect the corresponding leg tubes and cables as shown in the following table:

Left Leg to Pelvis – Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
Left Pedal	Grey cable	black with silver coloured connector
Popliteal	Grey cable	black with silver coloured connector

Attaching the Right Leg

Please take the same precautions as when attaching the left leg.

1   Align the right leg bolt and cables with the pelvis socket. Feed the leg bolt and cabling through the pelvis socket.
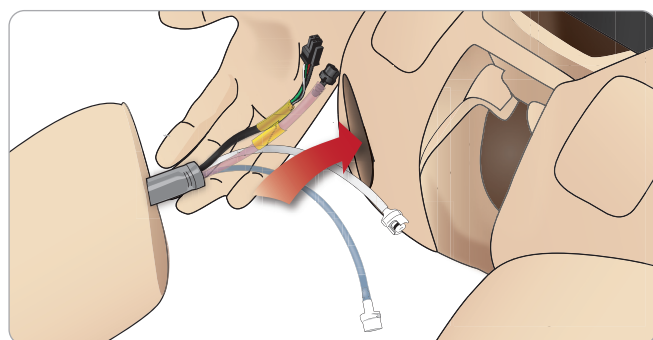
2   Carefully push the leg in towards the pelvis to form a snug fit.

3   Secure the cables and tubes in the connector. Screw the connector in place on the leg bolt.
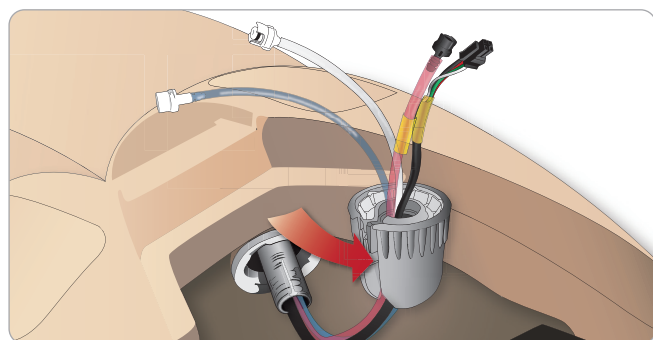
4   Connect the corresponding tubes and cables as shown in the table below:

Right Leg to Pelvis – Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
Blood Right leg	Transparent, red tube	Black twist and lock connector
Right leg	Black harness cable	Black rectangular connector, 4 lead
Fluid from leg	Tube, blue	White twist and lock connector
Air from leg	Colourless transparent tube	White twist and lock connector

Attaching the Left Arm

Open the torso as described in steps 1 - 4, *Opening the Torso*. *Follow the procedures listed below in reverse to detach the arms.*

1   Align the left arm axle with the shoulder socket.
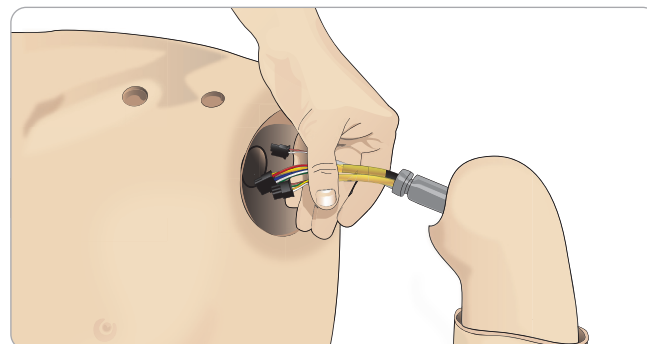
2   Ensure that the shoulder screw is loose enough to allow the arm axle to slide easily into place.

3   Feed the cables from the arm axle through the shoulder socket.

4   Carefully push the arm axle into the shoulder bracket, so that the axle is flush with the inside of the bracket.

5   Tighten the shoulder screw with the Allen wrench.
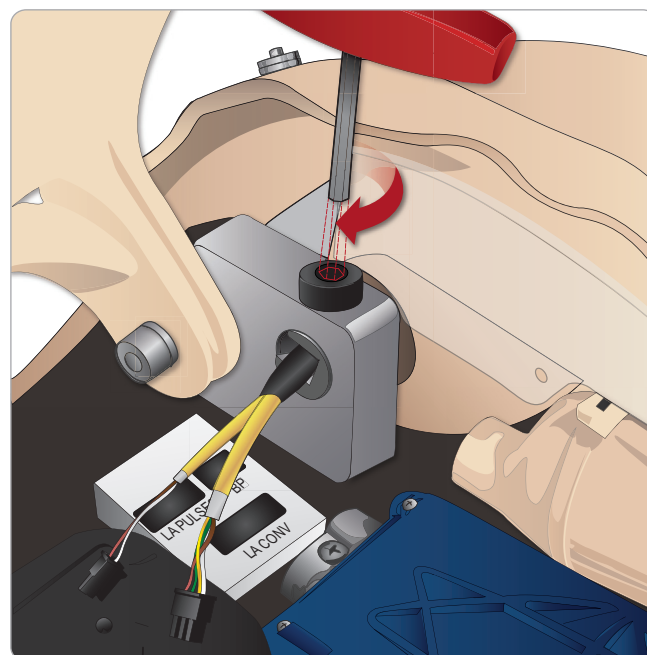
6   Connect the arm cables to the corresponding connection points in the torso.

Left Arm to Torso – Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
LA Pulses	Grey cable	Black rectangular connector, 6 lead
BP	Grey cable	Black rectangular connector, 2 lead

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Attaching the Right Arm

Open the torso as described in steps 1 - 4, *Opening the Torso*. *Follow the procedures listed below in reverse to detach the arms.*

1   Ensure the white Arm Adapter is in place. If not, fit the Arm Adapter into the hole in the arm bracket from inside the torso. Ensure that the flat edge of the adapter is facing the chest hinge.
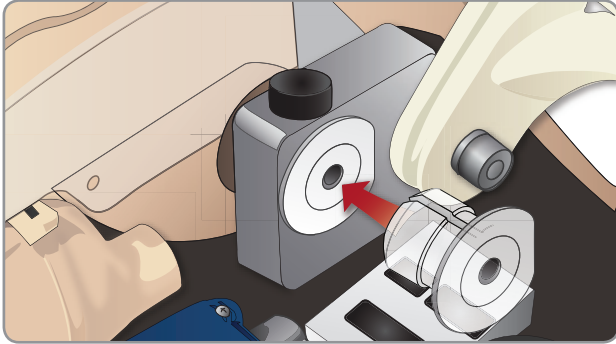
2   Feed the washer, then spring, then washer onto the bolt and feed through the arm.
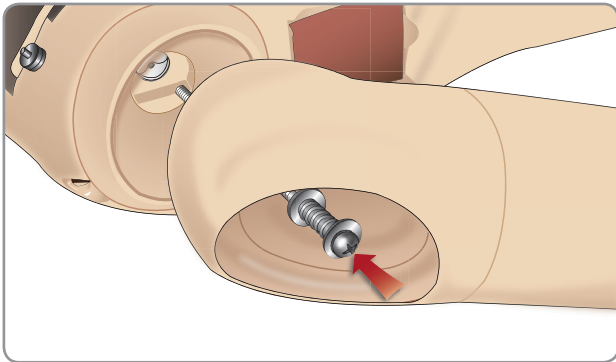
3   Tighten the screw with a Phillips head screw driver.

4   Replace the deltoid pad.

Inserting and Connecting the Batteries

Open the torso as described in steps 1 - 4, *Opening the Torso*, follow the procedures listed below in reverse to remove the batteries.

1   Release the battery clamp by unhooking the clips on either side.
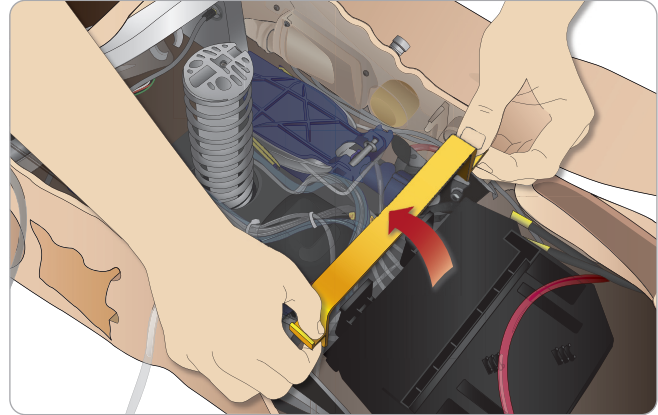
2   Insert both batteries into the battery tray.
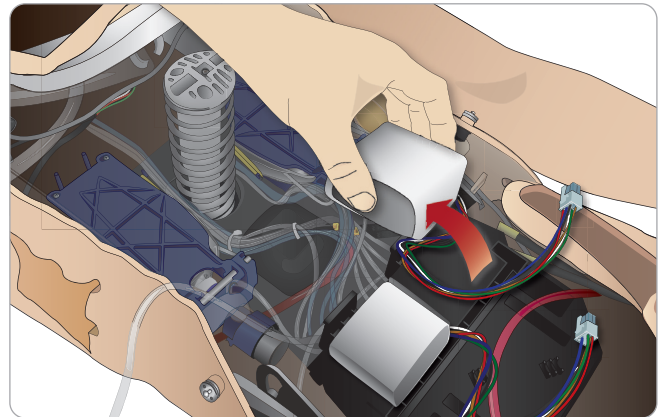
3   Snap the battery clamp back into place over the batteries.
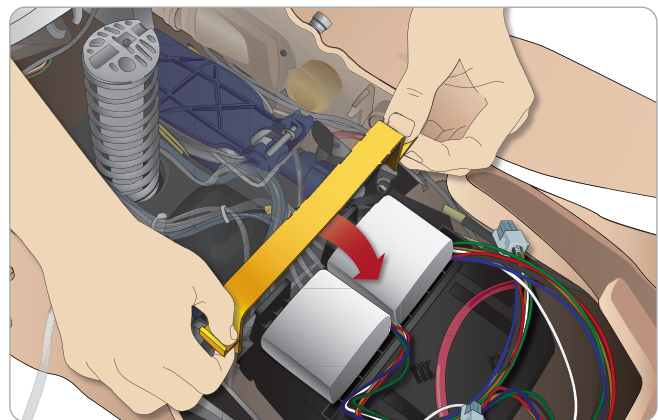
4   Connect the corresponding battery cables from the batteries to the torso.
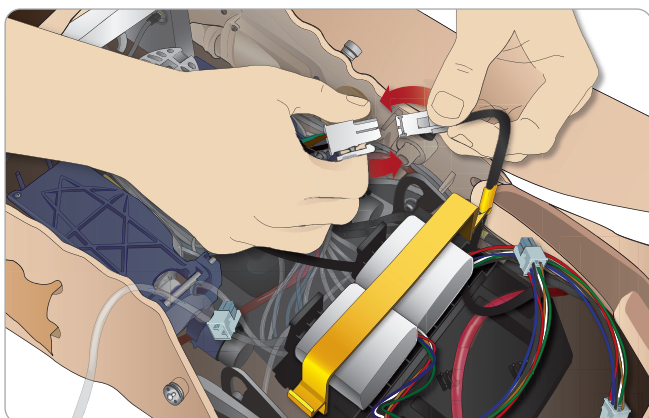
After connecting the batteries, connect the manikin to the external power supply (12V to 24V) while the manikin is OFF.

The batteries will charge if the manikin is ON and connected to and external power supply in the range of (20V - 24V)

Battery - Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
Battery 1	Black harness cable	Black rectangular connector, 6 lead
Battery 2	Black harness cable	Black rectangular connector, 6 lead

For more information on charging the batteries see section, *Manikin Setup, Battery Charging and Use.*

The Power Panel

The power panel is found on the right side of the manikin, under a loose skin flap. Lift the skin flap and pull out the protective cover.
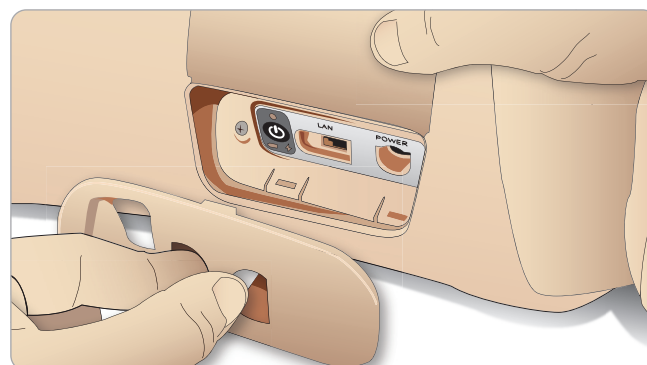
To ensure easy access, use the zippered clothing provided with the *SimMan 3G* manikin.
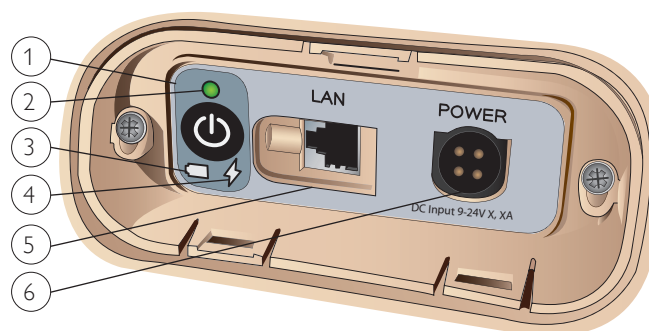
Power panel overview

1   Power ON / OFF button

2   Power status indicator

3   Battery status indicator

4   Charging status indicator

5   LAN network cable connector

6   External power supply connector

Power Panel LEDs Description

LED Color	Power Status	Battery Status	Charge Status
Red	Power save*	0% - 20%	Not charging**
Yellow	Start up	20% - 70%	Charging
Green	Running	70% - 100%	Charge almost complete***
No light	Off	Off	No charge****

* Blinking light
** One or both batteries missing, overheated, damaged or otherwise not able to charge
*** Not recommended to charge the batteries too long
**** No power input, batteries are charged.
Power Save is activated when ever manikin is paused.

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INSIDE THE MANIKIN

1   Connect the manikin to the external power supply with a power cord and plug that meets local specifications.
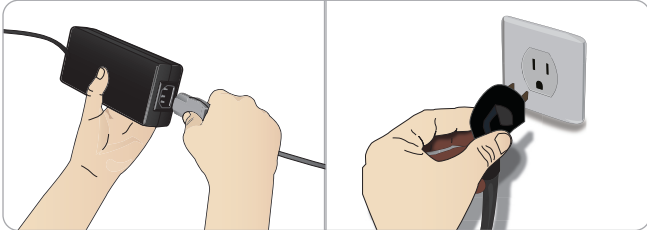
2   Plug the power supply into a wall outlet and connect the power cable to the power inlet on the manikin's power panel.
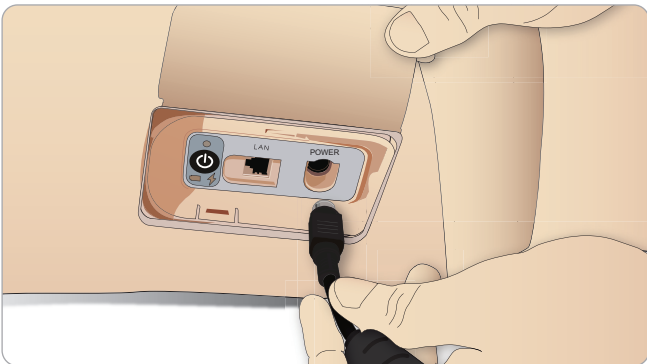
3   Press the ON button to power on the manikin.
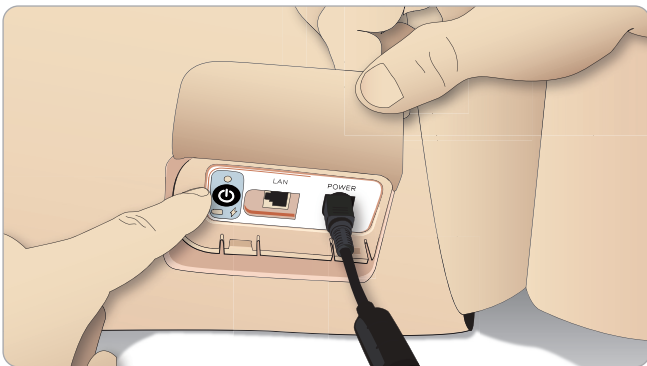
📋 Note: During start-up, the manikin's eyes will blink a couple of times and the power status indicator will show a yellow (start-up) light.

WITH AN EXTERNAL CHARGER

Charging batteries inside the manikin

1   Connect the manikin to the external power supply.

2   The battery indicator on the power panel shows the charge status of for the internal batteries.

External battery charging

The battery charger comes with 5 international plugs. Connect the appropriate plug to the charger:

1   Connect the charger to a power outlet and connect the manikin battery to the charger.
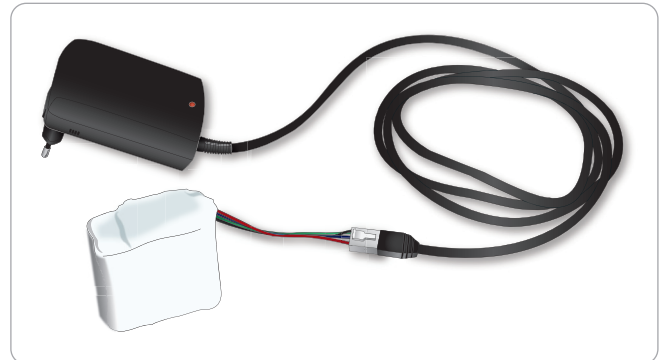
2   The indicator light on the battery charger shows charge status.

3   Battery charging time is approximately 3 hours.

The external battery charger should only be used with *SimMan 3G* batteries.

Charger light showing battery sign

Light Code	Light Color	Characteristic
Standby	Yellow	Steady
Pre-charge	Yellow	Normal Blink
Rapid charge	Green	Rapid
Maintain	Green	Normal Blink
Ready	Green	Steady
Wait	Alternating	Alternating
Error	Yellow	Rapid

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Battery Use

- Always use two SimMan3G batteries to power the manikin.

- Ensure that the batteries are properly connected.

- Charge the batteries regularly.

- Check LEDs on manikin's power panel for battery status.

• Change both batteries before the battery charge drops below 15% or the battery light indicator is red. This can be monitored in the technical status window on the Instructor PC.

• The manikin will automatically shut down if the battery temperature rises above 60°C (140°F) or the remaining charge falls below 6% on one of the two batteries.

View Battery Status via Instructor Application

When the AC battery symbol in the <Technical status> window is visible, the manikin is connected to an external power source.
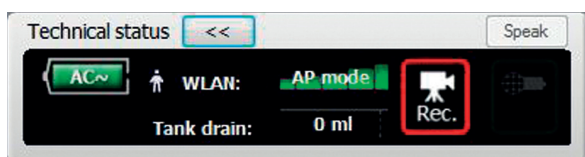
When the manikin is battery powered, the battery life indicator indicates the remaining battery life in minutes.

Changing batteries during a simulation session:

1 Press <Pause Session> on Instructor PC. Access the batteries as described in Section: *Manikin Setup Inserting and Connecting Batteries*.

2 Replace one battery at a time to avoid loss of simulation data.

Storage and transportation

- Never store fully charged batteries for longer than a month.

- Never store the batteries inside the manikin.

- Store batteries in a refrigerator i.e. temperature 0°C - 4°C (32°F - 40°F).

- The two manikin batteries can be transported in the manikin during air freight.

- When transporting spare batteries please contact the airline or freight company for the latest transport regulations.

Battery maintenance

- On approximately every 30th charge cycle, drain the battery completely before recharging. To drain the batteries run the manikin on both batteries until automatic shutdown.

- Expected battery life: 200 charge cycles.

- Only replace with Laerdal SimMan3G batteries.

Other Battery Warnings

⚠ *Warning: Do not run the manikin for more than 1 minute on a single battery.*

⚠ *Warning: If both batteries are removed while the simulation is paused, the manikin will shut down and simulation data will be lost.*

⚠ *Warning: Dispose of batteries in accordance with local regulations.*

⚠ *Warning: The external battery charger is for indoor use only.*

⚠ *Warning: The batteries should only be charged in temperatures ranging from 0 °C - 40°C (32 °F - 104 °F)*

⚠ *Warning: Inserting and connecting batteries incorrectly, short circuiting or exposure to fluids pose an explosion hazard.*

⚠ *Warning: Do not mistreat, disassemble or attempt to repair the battery.*

⚠ *Warning: Do not use the batteries if they are visibly damaged, malfunction or appear to leak electrolyte.*

⚠ *Warning: Take extreme care to avoid direct contact with electrolyte, hot or smoking parts. In case of the above, disconnect and remove the battery when it is judged safe to do so.*

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Preparing for Simulation

Unpack the laptop PCs and connect them to their respective power supplies to charge the batteries.

Instructor PC with Headset

Patient Monitor PC with Web-camera

SimMan 3G Manikin

1   Unpack the manikin torso and legs.
     Assemble the legs and torso as described in *Manikin Setup*.

2   Fill the bleeding and fluid system if necessary. See *Blood and Fluid System*.

3   Connect the manikin batteries and close the torso skin. See: *Inserting and Connecting Batteries*.

4   Connect the external power supply to the manikin to charge the manikin batteries. See: *Battery Charging and Use*.

5   Press the start button on the manikin. Wait until the manikin begins breathing before switching on the Instructor PC. Start the Instructor PC and connect the headset.

6   Start the Patient Monitor PC, if applicable, and connect the Web-camera to the USB port of the PC.

7   Start the Patient Monitor Application software, if applicable, attach the SPO2 probe to the patient monitor PC. See: *Starting the Patient Monitor Application*.

8   Start the Instructor Application software. The application will search for all available manikins. See: *Launching Instructor Application*.

9   Select a patient case in Auto Mode or pre-programmed scenario via Instructor Mode to start the simulation.

10   The simulation system is now ready for use. Power cables may be disconnected when batteries are charged.

> Note: Also refer to the Quick Setup Guide for detailed instructions on initial system setup.

SimMan 3G PCs

The *SimMan3G* simulation system includes one *Instructor PC* with the pre-installed *Instructor Application* and one *Patient Monitor PC* to simulate an actual patient monitor. The *Patient Monitor PC* runs the *Patient Monitor Application*.

ACTIVATING THE INSTRUCTOR SOFTWARE LICENSE

The Instructor Application license need only be activated once. Instructor computers shipped from Laerdal Medical will have a pre-activated license installed. Two spare licenses are provided for use on other computers. Should the software need to be re-installed, it is not necessary to reactivate the software license.

Activate the software via the Internet or select <Activate> using <other options> in the License key dialog box.

> The SimMan 3G software comes with 3 license keys. For more license keys please contact your local customer service office.

Activate the license manually by following the on-screen instructions.

Changes or updates of the computer hardware (e.g. new hard drive or mother board) may render the license invalid. Please contact your local Laerdal support for assistance for re-activating the license.

> Note: Should you experience problems re-activating the application license, contact your local Laerdal support for re-activation

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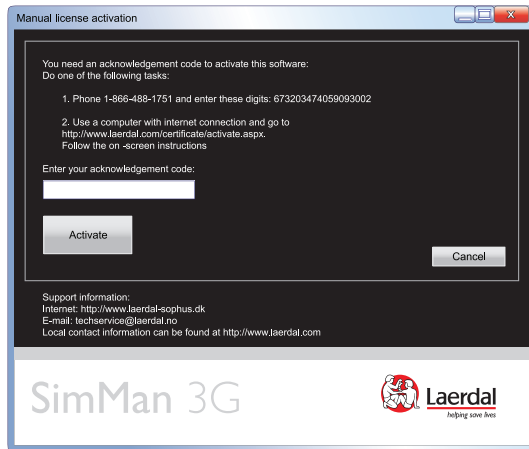
WIRELESS AND LAN CONFIGURATION

The SimMan3G Network Configuration Tool (SNCT) allows you to configure the network behavior of the SimMan3G manikin.

📄 *For more information on Wireless and LAN configuration, see the SimMan3G Network Configuration Tool Help file (Press the <F1> key on the PC keyboard).*

Configuring Your Network

The SimMan3G is equipped with a small router that provides WLAN connectivity. This router can be configured two ways: Either the manikin creates a wireless network (Access Point mode) or the manikin is hooked up to an already existing network (station/client mode). The mode of operation is selected by changing a switch on the router, located inside the manikin's pelvis.

Manikin created network (Access point mode) [default]

The default operation is AP, i.e. where manikin creates a wireless network. The switch on the router is set in AP mode. The manikin is set up to create a network called SimMan3G. WPA2/PSK-AES is the preferred security/encryption setting and also the default. The default preshared key is SimMan3G. This should however be changed with the SimMan 3G network configuration tool.

Connecting to an Existing Network

If you would like to connect your manikin and the Instructor PCs to an already existing network, please move the switch on the ro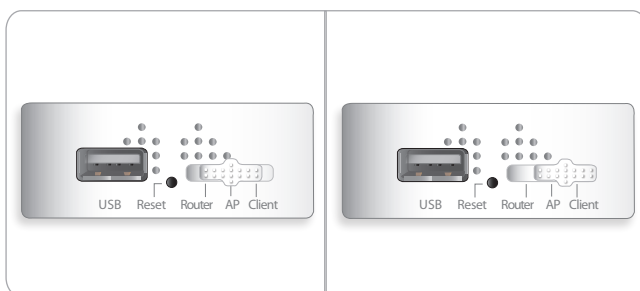uter to the client mode, ref picture above. Please use the SimMan3G Network Configuration Tool to enable connection to an already existing network.

Wired operation (disabling/enabling WLAN)

The wireless network may be disabled in AP mode. This can be achieved by using the SimMan3G Network Configuration Tool. When using manikin in environments where use of WLAN transmitters are prohibited: Contact your local service representative for instructions on how to turn off radio transmission.

Removing/Changing router

The router may be changed or removed. Turn off the manikin before doing so.
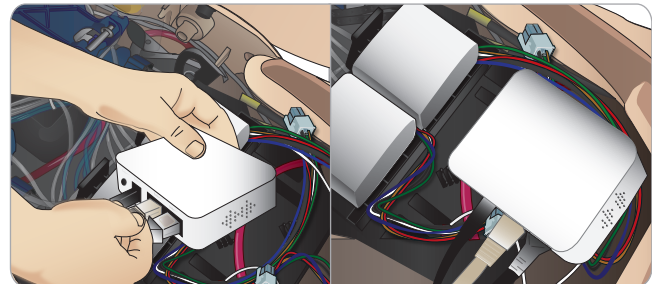
Open the pelvis and locate the router. Remove the two Ethernet cables and black power cable.

If you would like to operate the manikin without a router, then attach a through-adapter between the two Ethernet cables.

If you would like to install a new router, attach the power cable to the DC plug and the Ethernet cables back into the router again.

The Instructor PC

The Instructor PC uses the Instructor Application software to manage simulations. The Instructor Application runs in two modes:

- **Auto Mode**, for running pre-programmed, validated patient cases.
- **Instructor Mode**, for on-the-fly, customized patient scenarios.

Auto Mode Overview

For more information on software and system setup, please see the Help files:
Click Windows <Start> <All programs> <Laerdal SimMan 3G > <Documentation>

1 - COMMON LEARNER EVENTS

The <Common learner events> window lists all required events for a selected patient case. Clicking the events in the list records them in the Session Log, together with the time that each event was performed by the learner.
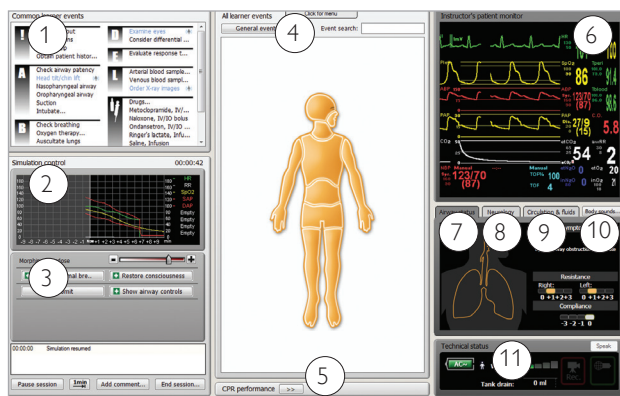All other events available to the learner can be found under the <All learner events>

2 - SIMULATION CONTROL GRAPH

The Simulation control graph illustrates the patient parameters in terms of past, current, and predicted future trends throughout the simulation.

3 - SIMULATION CONTROL PANEL AND SESSION LOG

The <Simulation Control> panel contains the main tools used in running the selected patient case. Parameters controlling the underlying pathology in the simulation can be monitored, and modified during a simulation session by using the <Simulation Control> panel. The <Session Log> records information about events in response to the patient case. This information is then made available in debrief files at the end of the simulation session.

4 - ALL LEARNER EVENTS

The <All Learner Events> menu is used to register all other available events, not listed under the <Common Learner Events>. Events can be registered in any of the following ways to the <Session Log>:

- Using the <General Events> button
- Using the <Event Search> function
- Using the clickable manikin figure

5 - PERFORMANCE

The <Performance> window shows the effectiveness of learner ventilations and compressions during the simulation.

Learner performance data can be viewed either as an average or in real-time.

The performance window, below the manikin figure, is minimized as default. Click the expand button to open the window.

6 - INSTRUCTOR'S PATIENT MONITOR

The Instructor's Patient Monitor shows the status of patient's vital signs throughout the simulation.

7 – AIRWAY STATUS

The Airway Status window shows the state of the patient's airway in a real-time animation with a list of symptoms.

Indicators also show the resistance of the left and right lungs, and total lung compliance.

Note: Ensure that you select the Airway Status tab.

8 - NEUROLOGY

<Neurology> - The Neurology status list shows information about the patient's position on the Glasgow Coma Scale and Visual Analog Scale.

The <Eyes> animation is a real-time representation of the status of the eyes of the patient/manikin and is shown when clicking on the Neurology tab.

9 - CIRCULATION & FLUIDS

<Circulation & Fluids> - Displays information about the health of the patient with regards to pulses, rate of bleeding, and secretions.

10 – BODY SOUNDS

Clicking the <Body Sounds> button calls up the <Body Sounds> dialog box. The dialog shows the current sound scheme and volume for each speaker attached to the various body parts: heart, bowel, and anterior/posterior view of the lungs.

11 - TECHNICAL STATUS

The Technical status window provides information about the technical status of the SimMan 3G manikin system, including battery life, wireless (WLAN) connection signal strength, blood tank drainage, communication channels in use and video recording.

Instructor Mode Overview

1 - COMMON LEARNER EVENTS

The <Common Learner Events> window typically lists the learning objectives specific for the current scenario. It also lists the learner events required to proceed from one scenario frame to another, as well as Learner events included in any rules from an active Handler. Clicking the events in the list records them in the Session Log, indicating the time that each event was performed by the learner.

All other events can be found in <All Learner Events>.

2 - SIMULATION CONTROL AND SESSION LOG

In Instructor Mode, the Simulation control is used in managing all pre-programmed aspects of the selected patient case:

Scenario progress
• Trends
• Handlers

The Session Log records information about patient responses and Learner events that occur during simulation. This information is then made available in debrief files at the end of the simulation session.

* For more information on Trends and Handlers, see section: *Customizing Scenarios.*

3 - ALL LEARNER EVENTS

The <All Learner Events> menu is used to register the events performed by learners during a simulation, and contains all events which can be registered. For easy access, the events necessary to treat the selected scenario correctly are listed in <Common Learner Events>.

4 - PERFORMANCE

The <Performance> window, below the manikin figure, shows the effectiveness of learner ventilations and compressions during the simulation.

Learner performance data can be viewed either as an average or in real-time. The window is minimized as a default. To view the full display, Click the <Expand> button to open the window.

5 - INSTRUCTOR PATIENT MONITOR

The <Instructor's Patient Monitor> shows the current physiological state of the simulation.
In Instructor Mode only, the patient monitor waveforms and parameters can be set directly by selecting and clicking the individual waveform or numeric parameter with the mouse pointer arrow.

6 - EYES

The <Eyes> window is used to configure the state of the eyes of the patient during simulation.

The Eyes animation is a real-time representation of the eyes of the Manikin. For more information on configuring the eyes see section: *Clinical Features.*
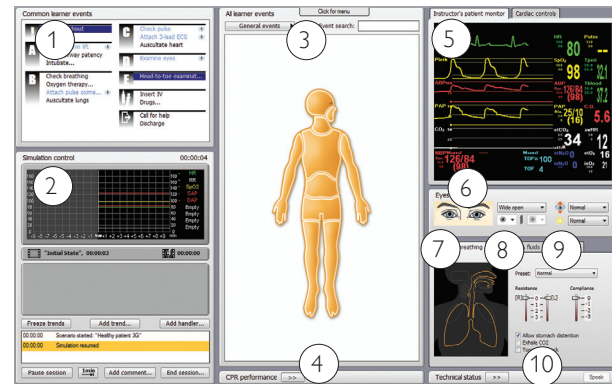
7 – AIRWAY / BREATHING

The <Airway / breathing> tab shows the airway/breathing status of the patient, and is used to configure these settings. For more information

on configuring the airway and breathing, see section: *Clinical Features.*

8 – CIRCULATION & FLUIDS

The settings of the <Circulation & Fluids> tab are used to control the secretion of fluids and blood from the Manikin during simulation.

If the <Airway / breathing> is hidden, click on the tab name to access the window. For more information on configuring fluids see *Clinical Features.*

9 – SOUNDS

The settings of the <Sounds> tab are used to control the body sounds and vocal sounds from the manikin.

To open the <Sounds> menu, click on the tab name. For more information on configuring sound settings see Clinical Features.

10 – TECHNICAL STATUS

The <Technical Status> window provides information about the technical status of the SimMan 3G manikin system, including battery life, wireless connection signal strength, blood tank drainage, communication channels in use and video recording.

3G View and Classic View

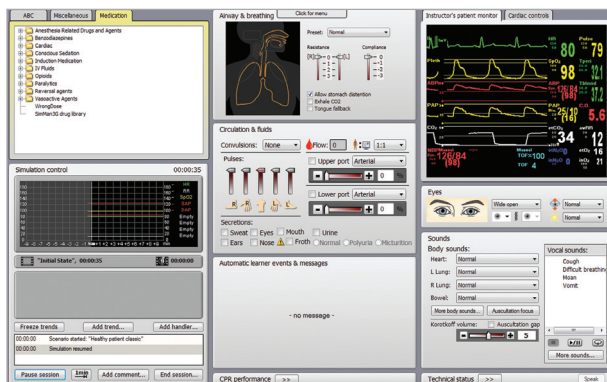There are two view options when running a simulation in Instructor Mode:

INSTRUCTOR MODE 3G VIEW

Scenarios made for SimMan 3G and will display the 3G view:
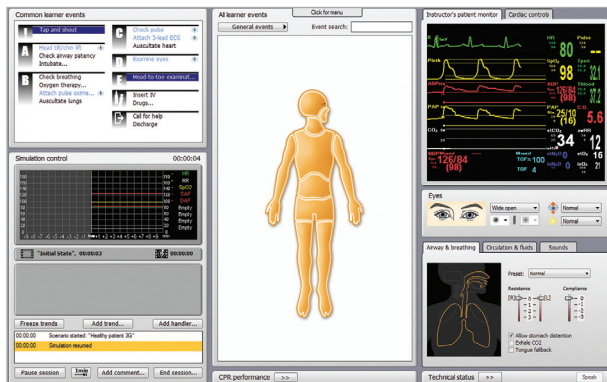
INSTRUCTOR MODE CLASSIC VIEW

Recommended for experienced users of older SimMan versions:

Classic view makes use of the Learner event libraries of previous SimMan versions; so that custom-made scenarios made with older SimMan software can be used seamlessly with SimMan 3G. Therefore SimMan Scenarios made before SimMan 3G will by default display the Classic view after conversion.

Opening an Auto Mode Patient Case

To start a simulation in Auto Mode:

1 Launch the <Instructor Application> on the Instructor PC.

2 Select the Manikin you wish to connect to and click 'OK'.
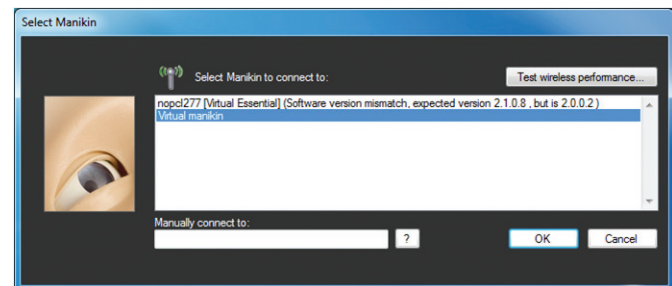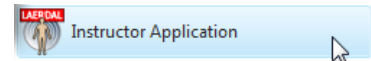
3 Click 'Start Auto Mode Patient Case'. This will open the Patient Case Library.

4 Browse the patient cases using the library menu on the left. The menus can be expanded and collapsed by clicking on the '+' and '–' buttons.
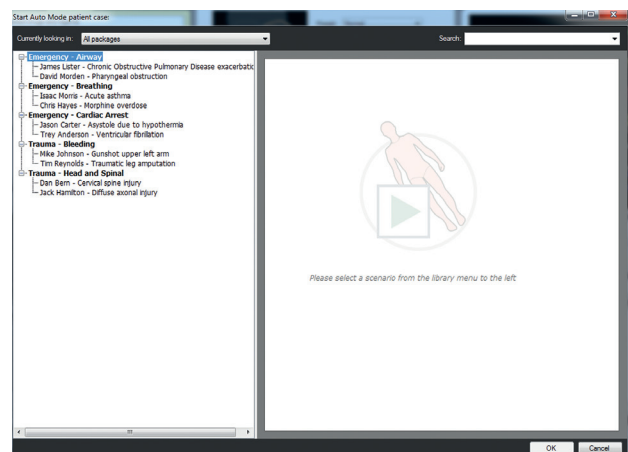
5 Choose a patient case and click 'OK'.

6 The patient case will open with the simulation being PAUSED. When you are ready to begin the simulation, press the spacebar. OR Click the 'Start session' button in the bottom left corner of the screen.

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NOTE: When a simulation is running, the 'Start session' button becomes the 'Pause session' button. Click this button at any time during a simulation to pause the session.

RUNNING A SESSION IN AUTO MODE

Launch the Instructor Application, open an Auto Mode patient case and start the session as described in *Opening an Auto Mode Patient Case*.

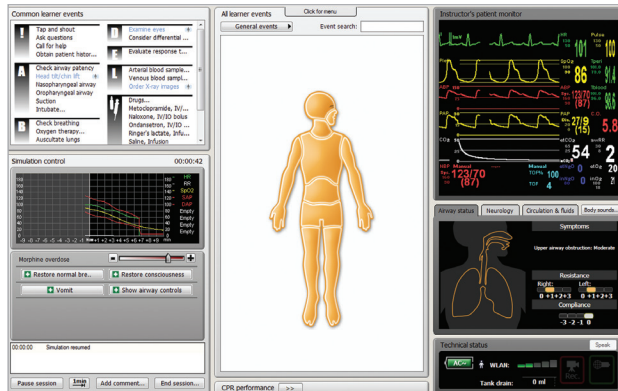## MONITOR AND ADJUST PATIENT PARAMETERS DURING SIMULATION

Throughout the simulation session, the instructor should monitor and control the patient's status as exhibited by the Manikin. The severity of symptoms can be modified using the master patient controls.

Move the appropriate slider to the left to decrease the severity of the symptoms exhibited by the Manikin, or to the right to increase severity. Click the appropriate restore button to restore the Manikin to its original state.

Patient status and simulation progress are displayed in the following areas:

The Simulation control graph shows the patient status in terms of past, current and predicted future trends throughout the simulation. The timer shows the time elapsed since the start of the simulation.

The Instructor's Patient monitor shows the patient's current vital signs and clinical parameters.

The patient status and the <Airway status> window provide at-a-glance data about the patient's current status.

MONITOR AND REGISTER LEARNER EVENTS DURING SIMULATION

As the learner responds to the patient case, the instructor should register Learner events as they are performed using the <Common Learner Events> list and/or the <Learner Events menu>.

Some events are registered automatically by the *SimMan 3G* manikin. These events are highlighted blue and are marked with a wireless manikin icon.

Common Learner Events

The <Common Learner Events> window lists the required events/learning objectives for the selected patient case. To register that a learner has performed an event, click the relevant item in the list.
A check-mark appears to the left of the item when it has been registered.

Learner Events Menu

The Learner events menu contains all Learner events. To register that a learner has performed an event using the Learner events menu:

- Click the relevant body part of the clickable Manikin figure and select the event from the drop down list.
  OR

- For events not specific to a particular anatomical area of the Manikin, click the <General Events> button and select the event from the drop down list.
  OR

- Search for an event using the Event search field, then select the event from the drop down list.

Session Log

All learner events added both automatically by the Manikin system and manually by the instructor are recorded in the Session Log. This information is available at the end of the simulation session in the debrief files.

To add a comment on learner performance to the Session Log, click the <Add Comment> button.

3 INTERACT WITH THE LEARNERS

Open the Voice Conference Application on the Instructor PC. Use the USB headset to listen in on the learners' communication with the manikin, and respond back through the microphone.

On request or when appropriate, provide Radiology, Lab results or background media files to the learners via the Learner's Patient Monitor using the <Transfer Media Files> menu.

END SIMULATION SESSION

When the simulation session is complete, click the <End Session> button.

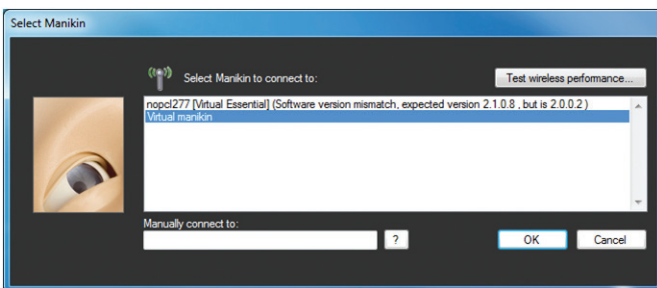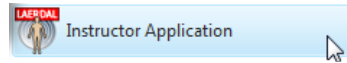## SAVE FILES AND DEBRIEF LEARNERS

Save the session log for later debriefing or documentation. Click <Debrief> to start the Debrief Viewer.

Opening an Instructor Mode Scenario

Use Instructor Mode to simulate isolated medical procedures. The Instructor Mode enables full manual control of all manikin features and parameters.

When setting up simulations manually using Instructor Mode, the user is responsible for the clinical accuracy of the simulation.

1   Click <Start> on from the Windows <Start> menu to launch the Instructor Application.

2   Select a manikin from the list to connect to and click <OK>. You may use the <Virtual manikin> entry if you want to run without connecting to a real manikin. This will start a manikin emulation program on your computer.

3   Click Start <Instructor Mode> Scenario. This will open the Scenario Library.

4   Browse the Scenarios using the library menu on the left. Click the desired scenario to select it and then press <OK> button. The chosen scenario will open with the session paused.

5   Start the simulation session when ready by pressing space bar on your keyboard OR click the <Start Session> button in the bottom left corner of the screen.

When a simulation is running, the <Start Session> button becomes the <Pause Session> button. Click this button at any time during a simulation to pause the session.

RUNNING A SCENARIO IN INSTRUCTOR MODE
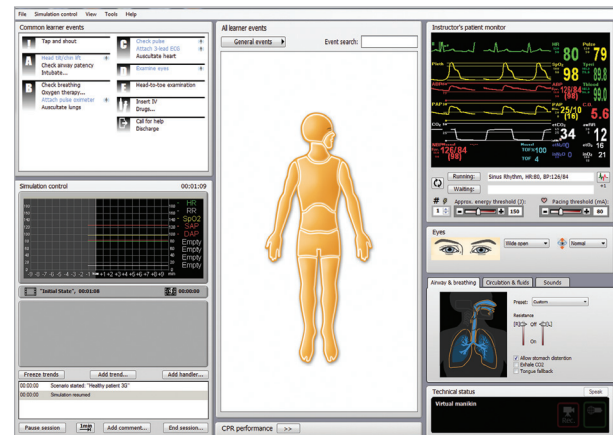
MONITOR AND CONTROL THE SCENARIO

The instructor should monitor and control the patient's status as represented by the manikin.

The Simulation control graph shows the patient status in terms of past, current and predicted trend lines. The timer in the top right corner shows how long the simulation has been running.

Depending on the scenario, pre-programmed trends become active and affect the predicted trend lines. The instructor can also add trends to the scenario, and can decide to freeze or delete active Trends. The trend lines will be updated accordingly.

ADJUST PATIENT PARAMETERS DURING SIMULATION

The Instructor's Patient Monitor shows the patient's current status. To manually adjust the patient parameters:

Click the individual graphs or numeric parameters. Pop-up menus allow the instructor to change the relevant parameters, OR
Hold cursor over a numeric parameter for 1 second. The selected parameter's background will go grey and the mouse pointer will change appearance, to indicate that the scroll wheel can be used to increase or decrease the value.

MONITORING AND REGISTERING LEARNER EVENTS

As the learner responds to the patient case, the instructor should register <Learner Events> as they are performed using the <Common Learner Events> list and/or the <Learner Events Menu>.

Some events are registered automatically by the SimMan 3G manikin. These appear with blue text and have a wireless manikin icon next to them.

INTERACT WITH THE LEARNER

Open the <Voice Conference Application> on the Instructor's PC. Use the headset to listen to the learners' communication and respond via the microphone.

END SIMULATION SESSION

When the simulation session is complete, click the <End Session> button in the bottom left of the Instructor screen.

SAVE FILES AND LAERDAL DEBRIEFVIEWER

Save the session log for later debriefing or documentation. Click <Debrief> to start the Debrief Viewer. For more information see section *The Laerdal Debrief Viewer.*

The Patient Monitor PC

The Patient Monitor PC can be purchased separately. The Patient Monitor PC has a touch-display and is used to run the Patient Monitor Application.

The Patient Monitor software emulates a real patient monitor as found in hospitals and ambulances. During a simulation, learners can observe and monitor changes in a patient's clinical status via the Patient Monitor software.

Video capture from the patient monitor display and the web-camera can be stored for use in the Debrief Viewer.

The Patient Monitor PC must be started and remain connected throughout the simulation, in order to record video and allow screen capture for debrief files.

STARTING THE PATIENT MONITOR APPLICATION

1   First click the Windows <Start> button, and then select the <Laerdal SimMan3G> program folder from the Windows programs list.

2   Select the Patient Monitor Application program in the <Laerdal SimMan3G> program folder. The Select manikin window will appear. Select a manikin in the list and click <OK>.

3   The Patient Monitor application will open in full screen mode.

4   If the SimMan3G program folder or the Patient Monitor Application program is not available on your computer, see the Patient Monitor Application - Troubleshooting section - in the SimMan3G Help files.

The Patient Monitor Interface
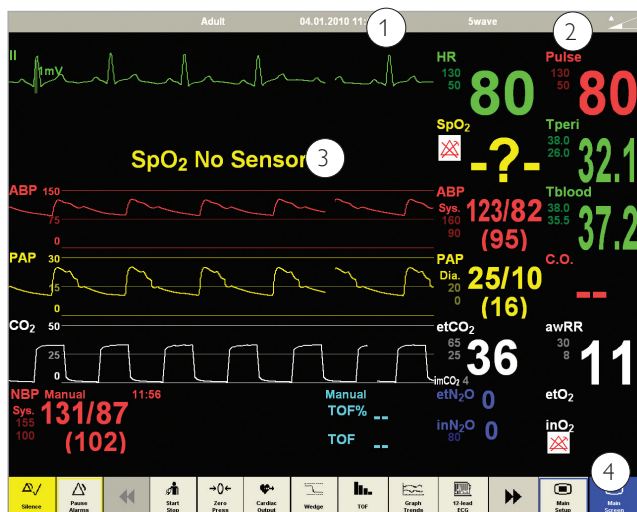
1 - TOP MENU
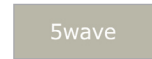
| 5wave | 1 - Press #wave in the top menu to view and change monitor display settings. |

Pressing the Alarm Volume icon on the top menu line opens the <Alarm Volume> menu.

2 - Parameters readout area. The learner may also edit scaling, alarm limits etc using this interface. Clicking the parameter of interest will present a menu with available options.
Some fields will only be available while appropriate sensors are connected to the Manikin.
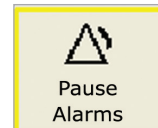
3 - BOTTOM MENUS

There are effectively two menus. Press the left or right arrow key to toggle back and forth.
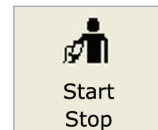
BOTTOM MENU 1 (IN ORDER FROM LEFT TO RIGHT):
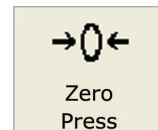
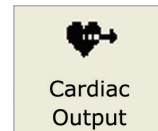Selecting the <Silence Alarm> button turns active alarm sounds OFF.

Selecting the <Pause Alarms> button turns all sound alarms off for 3 minutes.

The NBP Start begins inflation of the modified SimMan 3G blood pressure cuff. NBP details will register in the NBP section of the monitor.

<Zero Press> button opens a submenu from which you can select zeroing of the ABP, PAP or CVP transducers.

Cardiac Output generates a new reading of Cardiac Output. The C.O. details will be shown in the C.O. part of the Patient Monitor PC.

<The Wedge> button temporarily substitutes the PAP wave and numbered parameters with the WP wave and parameters. The wedge curve switches back automatically after 10-15sec.

The TOF <Train of Four> button generates a ew reading of the TOF state of the patient. The TOF details will be shown in the TOF part of the Patient Monitor PC.

Selecting the <Graph Trends> button opens the Graphical Trends window. By using the menu buttons, you can review the history of the available

Trend parameters.

12-lead ECG	Selecting the 12-lead ECG button generates a 12-lead ECG strip. Select <Print> to have this ECG strip printed on the default printer available from your Patient Monitor computer.

BOTTOM MENU 2

Bottom menu buttons in order from left to right:

QRS Volume	Selecting the <QRS Volume> button opens the <QRS Volume> menu, shown below. Select the desired volume (0-10).

Alarm Volume	Selecting the <Alarm Volume> button opens the <Alarm Volume> menu, shown below. Select the desired volume (0-10).

Radiology	Select the <Radiology> button to open the <Radiology> display. X-ray images which have been included in the current scenario are shown.

Media	Select the <Media> button to open the <Media> display. Select the <Close> button to close the Media display.

|	
Labs	Select the Labs button to open the Labs display. Select the <Close> button to close the <Labs> display.

Main Setup	Selecting the <Main Setup> button opens the <Main Setup> menu. Options in the <Main Setup> menu are identical to the similar options displayed on the Menu line.

|	
Main Screen	Selecting the <Main Screen> button enables an immediate return to the <Main Screen>, and cancels all submenus. Submenus can also be closed by selecting the "X" box of the submenu.

Transferring Media Files
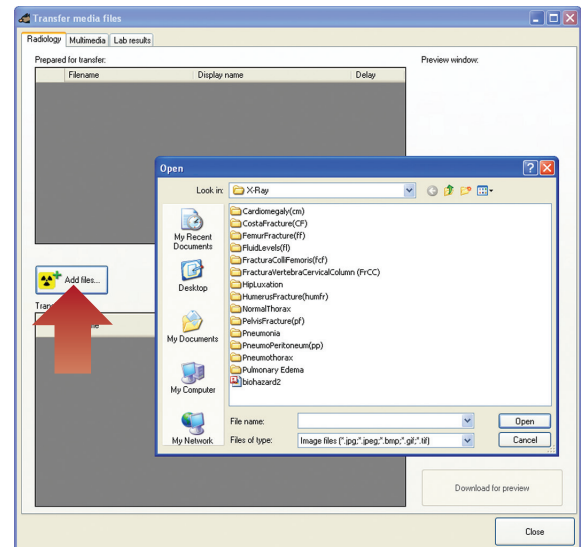
During a session, the Instructor can make media files available to learners. Media files include Radiology, Video and Lab reports.

To transfer media files to the learner's patient monitor:

1. In the Instructor Application, click <File> <Transfer media files>

2. The Instructor may upload any of the existing media files or browse to upload their own media files.

3. To add media files: Click <Add files> and browse to select a file.

4. The Instructor can upload as many media files as required.

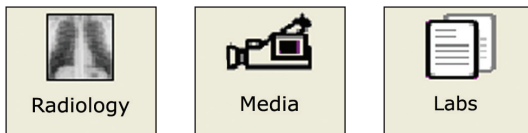5. The Instructor may wish to display the media file(s) immediately, or after a pre-selected time delay.

FOR A DELAYED DISPLAY:

Click the drop down menu icon below <Delay> to select a time delay.
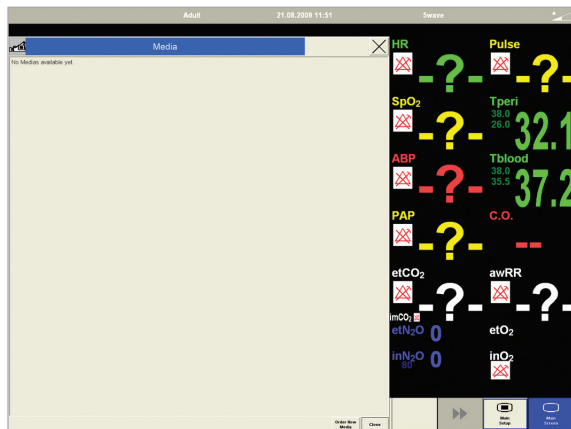

21
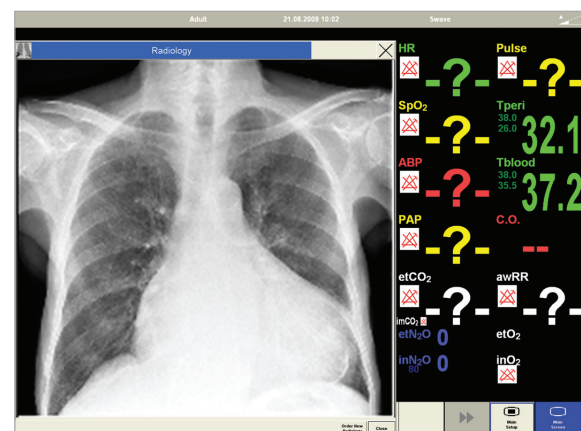
INSTANT DISPLAY:

Media files show immediately when transferred.

Radiology	Media	Labs

For an overview on patient monitor menus, see section System Setup - Patient Monitor Menus.

ORDERING RADIOLOGY, MEDIA OR LABS

The learner can order Radiology, Media or Labs by clicking on any of the relevant menus in the Patient Monitor Application.


1   Click <Order New > in the dialog box.

2   The system will then notify the Instructor of the order via the Instructor Application.

The learner may also click on any of the relevant menus to check if the Instructor has made any media files available for viewing.

The Laerdal Voice Conference Application

The Voice Conference Application is a tool for two-way vocal communication through the SimMan 3G and manikin. This function adds realism to simulation sessions by enabling vocal interaction between learners and the "patient".
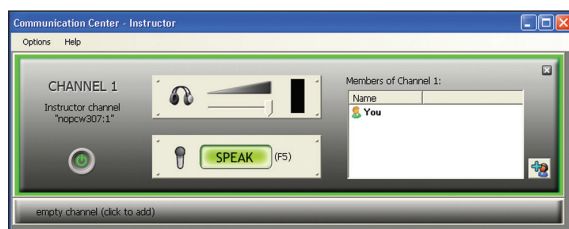
Both manikins have a built-in loudspeaker and microphone located in the head. When the Voice Conference Application is started on the instructor's computer, a voice communication channel is created to the connected manikin. Instructor channels, that allow voice conferences between instructors can be added.

Accessing the Voice Conferencing Application

The Voice Conference Application will launch automatically when connecting to a manikin.

The Voice Conference Application can also be accessed in two other ways:

1 From an Open simulation session (Instructor Application)

From the <Tools> menu, select <Voice Conf. App…>

2 From the Windows Start menu

1   Click the Windows <Start> button.

2   Select the <Laerdal SimMan3G> folder from the program list

3   Select the Laerdal Voice Conference Application program.

ON/ OFF BUTTON

Click the on/off button to activate or deactivate the communication channel.

MICROPHONE BUTTON SPEAK SPEAK

The connected microphone for the communication channel becomes active by clicking the <SPEAK> button or by pressing the F5 key on the keyboard.

The channel is outlined with green, to clearly identify when the microphone is active.

Keep the <SPEAK> button activated, by holding the control key <Ctrl> while pressing F5 or any of the other function keys if there are more channels.
On the tablet PC: Tap the <SPEAK> button in the technical status window to speak through the manikin.

> *Note: unless muted or deactivated, sound from all connected channels will be playing in the headphones/speakers at all times.*

LOUDSPEAKER OUTPUT VOLUME

Adjust the loudspeaker or headset volume for an individual channel with the volume slider. The volume bar indicates the received signal strength.

INSTRUCTOR CHANNELS

Click the empty channel bar to add an Instructor channel. This channel allows communication with other instructors who are connected to the network and have the Voice Conference Application active on their computer.
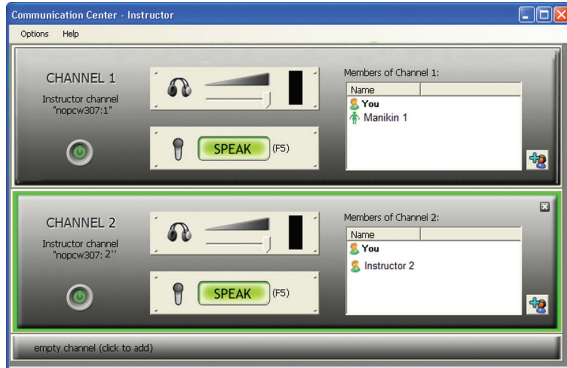
ADD MEMBERS

To add members to an Instructor channel, click the icon [icon]. Select from the available members in the list.
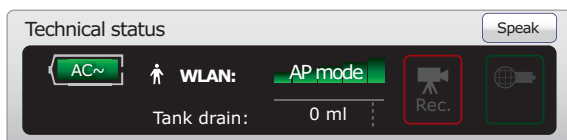
📝 *For more information on using the Voice Conferencing Application, see the Voice Conference software Help file.*

THE LAERDAL DEBRIEF VIEWER

The Debrief Viewer is a debriefing tool that allows you to open and review a saved simulation session.

The debriefing file consists of the following information logged during a simulation:

SESSION LOG

Data and events are recorded and time stamped throughout the simulation session. Instructor comments are included.

PATIENT MONITOR

Patient Monitor display can be recorded as a video file.

WEB-CAMERA

Video signals can be recorded.

MICROPHONE INPUTS

Voice and sound recording from the Web-camera's built-in microphone is recorded.
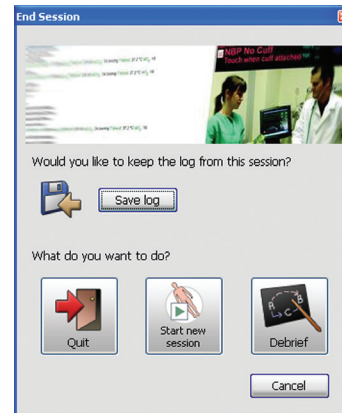
REVIEW COMMENTS

Comments can be edited or added to the <Session Log>, during review in the <Debrief Viewer>.

📝 *Note: The sources are all recorded to the same timeline and are always played back simultaneously.*

Accessing the Debrief Viewer

The Laerdal Debrief Viewer can be accessed in two ways:

1 - From the Instructor Application:
- Click <End Session>
- Click the <Debrief> icon in the <End Session> dialog box.
- The Debrief files from the session are then transferred and made available in the <Laerdal Debrief Viewer>

  Note: It is important to save the debrief files for later review.

2 - From Windows Start menu:
- Click the Windows <Start> button.
- Go <All Programs>
- Select the <Laerdal Debrief Viewer> program folder
- Click the <Laerdal Debrief Viewer> icon.

THE LAERDAL ADVANCED VIDEO SYSTEM (AVS)

The Laerdal AVS can be installed to allow high quality video taken from up to 4 video cameras during a simulation session and be viewed in the Laerdal Debrief Viewer.

📝 *Note: The Laerdal Advanced Video System is not included in the SimMan 3G package, but can be purchased from your local Laerdal Sales Company or representative.*

CUSTOMIZING SCENARIOS

SimMan 3G Scenarios can only be used in Instructor Mode. Scenarios can be created and edited using a set of editors:

- Scenario Editor
- Trend Editor
- Event Handler Editor

The Patient Monitor layout can be customized via the Scenario Editor. Select <Edit Monitor layout…> from the <Edit> menu.

Common Learner Events can be customized via the Scenario and Event Handlers Editors. Select <Open Common Learner Events Editor> from the <Edit> menu.

All of the above mentioned editors can be accessed through the Instructor Application's <Tools> menu, or directly through the Windows <Start> menu:

- Click the Windows <Start> button

- Select the <Laerdal SimMan3G> program folder

- Select the editor of your choice

Scenario Editor

The Scenario Editor allows you to define relationship between learner events and patient response by drawing lines in a simple graphical editor.
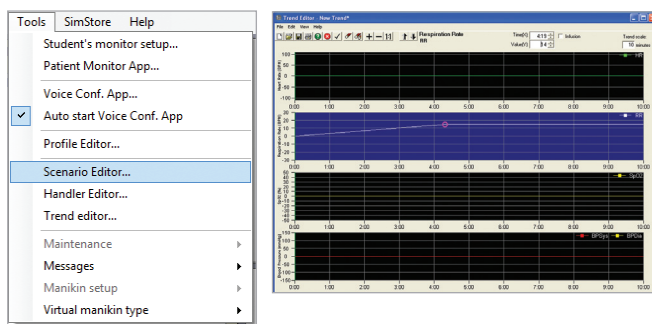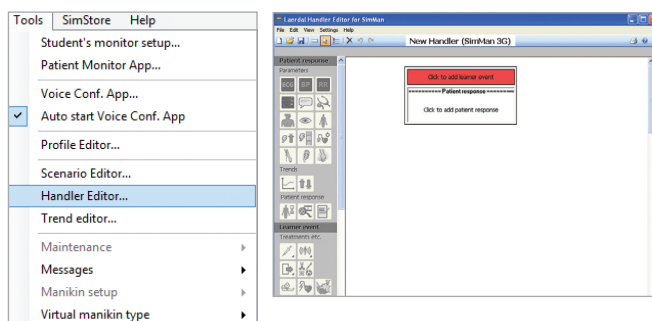

TRENDS

Trends are sets of physiological parameters pre-programmed to increase/decrease over time. They can be added to Instructor Mode Scenarios.

HANDLERS

Handlers are pre-programmed sets of actions and can be added to Instructor Mode Scenarios.

SIMMAN SCENARIOS TO SIMMAN 3G

SimMan Scenarios made with previous versions of the Scenario Editor must be converted to SimMan Scenarios in order to run and edit them.

To Convert SimMan Scenarios to SimMan 3G Scenarios:

Under <Tools> in the Instructor Application access the <Scenario Editor>, <Trend Editor> and <Handler Editor> respectively.

Create a backup copy of all old Scenarios prior to converting to SimMan 3G.

Launch the conversion wizard from the Scenario, Trend and Handler Editors as follows:

1   In each editor go <File> <Convert> <Old Scenarios>

2   Follow the instructions in the conversion wizard to convert Scenarios.

All old SimMan Scenarios will automatically be converted to a SimMan Classic style scenario, using the old event library.

We recommend that patient responses such as Eyes, Airway Resistance, be added manually to the updated Scenarios, to take full advantage of all new features in SimMan 3G.

Help Files

Software Help-files can be accessed as follows:
- Click the Windows <Start> button

- Select the <Laerdal SimMan 3G> folder from programs

- Select the <Documentation> folder

- Select the help file of your choice

Most applications will also display the corresponding Help file when pressing the <F1> key

Using the Internal Compressor

The *SimMan3G* manikin's chest movements, airway modes and fluid systems are driven by compressed air. The right leg contains a compressor and tank with separate reservoirs for clear and simulated blood fluids.

For extended periods or stationary use, it is recommended to connect to an external source of compressed air. This reduces wear on the internal compressor and extends battery life of the manikin.

For instructions on connecting an external compressor and adjusting compressor default settings see – *Connecting external Air and CO$_2$ Supply.*
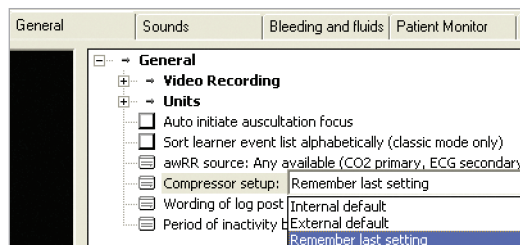
To avoid overheating and reduce wear

− If using the manikin in temperatures above 40°C (104°F), always allow the manikin to cool down between training sessions.

− If the manikin is placed in a bed, it should never be covered with a comforter, duvet or quilt as these prevent heat transfer from the manikin.

Turning the Internal Compressor OFF

Switch OFF the internal compressor to conserve the manikin batteries and reduce wear.

Turn OFF the internal compressor from the Instructor Application:
1 Select the <Tools> menu.

2 From <Manikin Setup>, click the Turn off internal compressor.

Changing Default Compressor Settings

Change default compressor settings via the Profile Editor.

1 Open the Profile Editor from the <Tools> menu in *Instructor Application.*

2 Select the <General> tab in the *Profile Editor.*

3 From the compressor setup option, choose the Internal or External compressor as default.
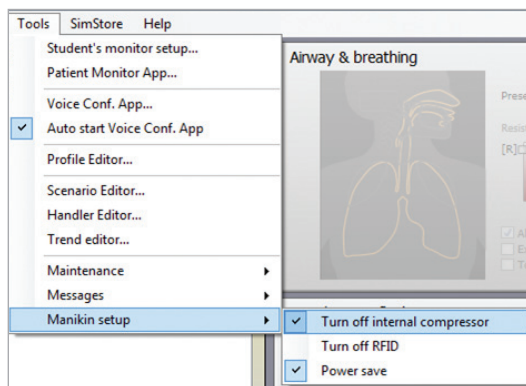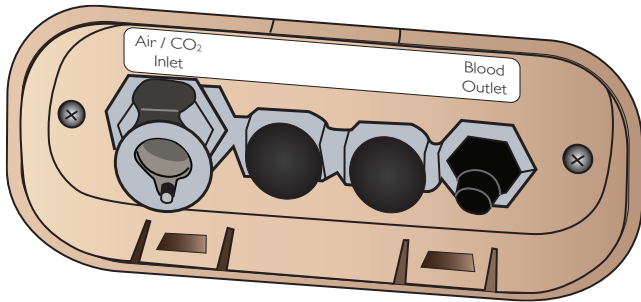
Air/CO2 Panel

The Air/CO2 panel is located on the left side of the torso. To access the panel, lift up the manikin skin flap and remove the protective covering. Connect external Air / CO_2.
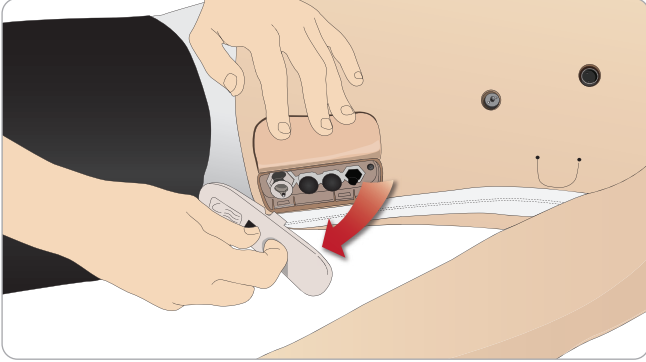
Air / CO_2 panel has 2 connection ports

Air / CO_2
Inlet
Blood
Outlet

Connecting External Air and CO_2 Supply

An internal compressor is located in the right leg of the manikin. It is recommended to use an external source of compressed air whenever the manikin is stationary over extended periods of use.

If the manikin is required to exhale CO_2, with each ventilation, connect external CO_2. Connect CO_2 only if the manikin is required to exhale CO_2 with each ventilation. Exhaled CO_2 can be detected with a real capnographic device. The manikin will only exhale CO_2 when a capnograph is registered as being connected to the system.

1   Connect a suitable CO_2 source to a Laerdal external compressor or regulator panel.

2   Connect a Laerdal double-lumen Air/CO_2 tube from the external compressor or regulator panel to the Air/CO_2 inlet on the panel.

For more information on external compressors and regulator panels compatible with SimMan 3G, contact your local Laerdal representative.

Blood and Fluid System

The manikin has two internal reservoirs, one for blood and one for fluids/secretions. *SimMan 3G* is also supplied with two fill units - one *Blood Fill Unit* for blood and one *Fluid Fill Unit* for fluids /secretions.

SIMMAN RIGHT LEG FILL PANEL

The right leg fill panel is located at the top of the right leg near the pelvis. The fill panel contains connectors for filling the blood and fluid reservoirs.

📄 *Note: Make sure the manikin power is on.*
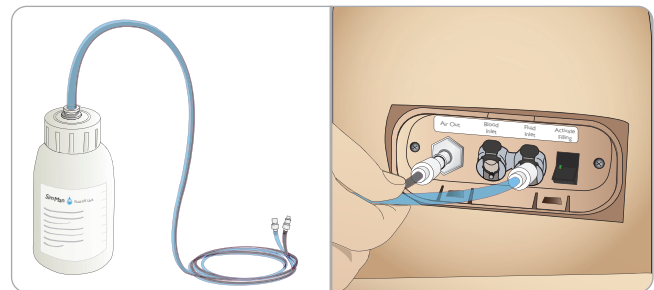
Fill Manikin Fluid Reservoir

📄 *Note: Roll the right leg skin down to expose the fill panel.*

1   Connect fluid fill unit tubes to the fluid and air connectors in the right leg panel.

2   Push the fill button on the panel. The button will light up and fluid will flow into the manikin.

3   When the flow stops, disconnect the fill unit.

4   Push the fill button on the panel. The light will go out.

📄 *Note: Disconnect tubes from the manikin before pushing the fill button. Pushing the button before disconnecting the tubes will initiate draining of the tank.*

Empty Internal Fluid Reservoir

1   Connect an <u>empty</u> fluid fill unit to fluid and air connectors in the right leg panel.

2   Fluid from the internal reservoir will drain into the bottle.

3   When the flow stops, disconnect the fluid and air connectors.

### Run Manikin with External Fluid

1   <u>Drain the internal reservoir.</u> Follow instructions for "Empty Internal Fluid Reservoir".

2   After draining the internal reservoir, fill the fluid fill unit and connect to the manikin.

3   Push the fill button on the panel. The button will light and fluid will flow into the manikin.

4   Charge the system for 60 seconds before starting simulation.

Manikin Setup

System Setup

Setup for Simulation

Clinical Features

Maintenance

Troubleshooting

Spare Parts

⚠️ *Warning: Connecting a full fluid fill unit to a manikin with a full internal reservoir will result in system overflow. Blood will drain out of the right leg. Repeatedly overflowing the system may damage the product.*

Fill Manikin Blood Reservoir

📝 *Note: Roll the right leg skin down to expose the fill panel.*
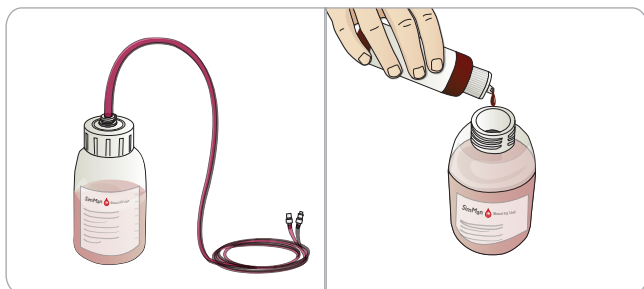
1   Connect blood fill unit tubes to the blood and air connectors in the right leg panel.

2   Push the fill button on the panel. The button will light up and blood will flow into the manikin.

3   When the flow stops, disconnect the fill unit.

4   Push the fill button on the panel. The light will go out.

📝 *Note: Disconnect tubes from the manikin before pushing the fill button. Pushing the button before disconnecting the tubes will initiate draining of the tank.*
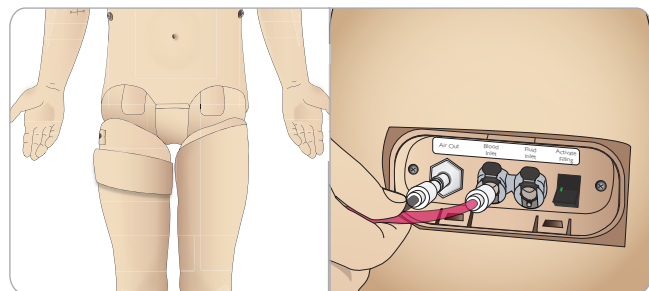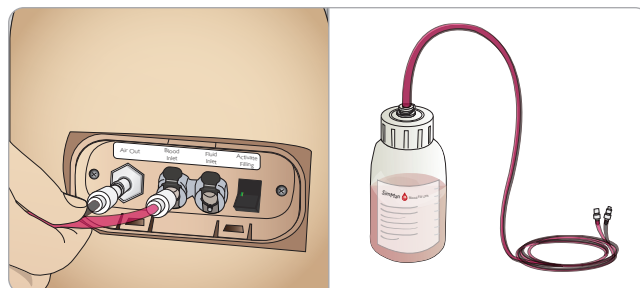

Empty Internal Blood Reservoir

1   Connect an __empty__ blood fill unit to blood and air connectors in the right leg panel.

2   Blood from the internal reservoir will drain into the bottle.

3   When the flow stops, disconnect the blood and air connectors.

4   **Mixing of Blood and Fluid**

To simulate clear fluids and secretions: Fill the *Fluid Fill Unit* with of de-ionized water (approx $^3/_4$ full) only and tighten the cap.

To mix simulated blood: Fill the *Blood Fill bottle* with de-ionized water. Add 5-10 drops of Laerdal Blood colored concentrate, mix and tighten the cap.
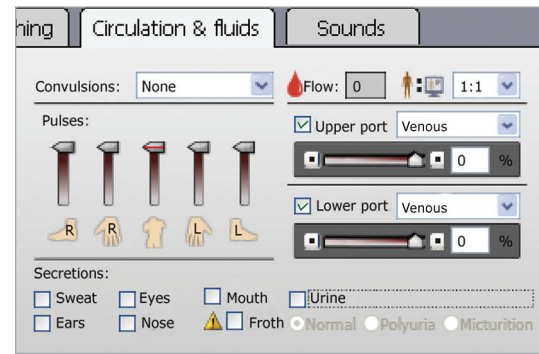

Run Manikin with External Blood

1   __Drain the internal reservoir.__ Follow instructions for "Empty Internal Blood Reservoir".

2   After draining the internal reservoir, fill the blood fill unit and connect to the manikin.

3   Push the fill button on the panel. The button will light and blood will flow into the manikin.

4   Charge the system for 60 seconds before starting bleeding simulation.

⚠️ *Warning: Connecting a full blood fill unit to a manikin with a full internal reservoir will result in system overflow. Blood will drain out of the right leg. Repeatedly overflowing the system may damage the product.*

Cleaning the Fluid and Blood System

After using the bleeding and or fluid system, the system must be cleaned to prevent residue from clogging the valves and tubes. Keep any wounds used connected while flushing the system with a cleaning solution.

1   Ensure the manikin power is on.

2   Ensure the manikin's internal reservoirs are drained. See Preparing the Internal Reservoirs for filling.

3   Fill a bottle with a 60% Isopropanol solution or 70% Ethanol solution.

4   Connect the bottle containing the alcohol solution to either the blood or fluid fill connector and air connector to fill the manikin with cleaning solution. Perform this action for both reservoirs. If the manikin will be stored for long periods of time or transported in freezing conditions, it is recommended to fill the reservoirs with one of thee recommended alcohol solution to prevent damage and preserve the integrity of the blood and fluid systems.
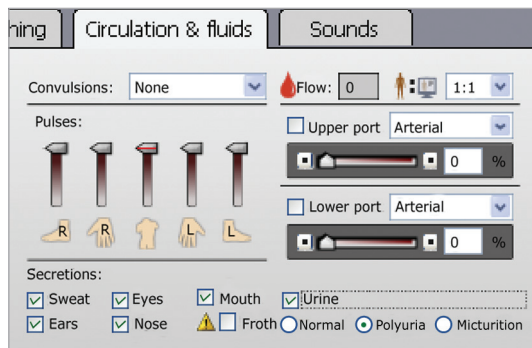
CLEANING THE FLUID SYSTEM

Note: To speed up the flushing process, follow the instruction for Unclogging Fluid Tubes.

1   From the Instructors application, open <Circulation and fluids> tab, check the Secretions box for urine, and then select polyuria. Check the Secretions boxes for Sweat, Ears, Eyes, Nose and Mouth.
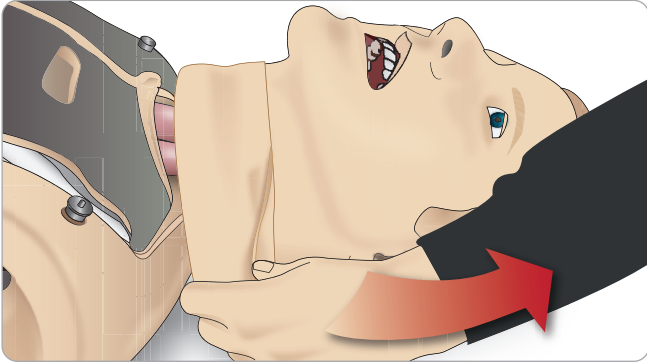

2   Allow the Fluid system to flush with the cleaning solution until the internal reservoir is empty.

3   When finished, uncheck all of the Secretions boxes.

CLEANING THE BLOOD SYSTEM

1   From the <Instructor Application>, open Circulation and fluids tab, check the boxes for Upper port and Lower port, then select Venous from the adjacent drop-down menus. Move the sliders (to the right) to maximum bleeding rates.

2   Allow the Bleeding system to flush with the cleaning solution until the internal reservoir is empty.

3   The blood system should be flushed repeatedly until the discharged fluids are clear.

4   When finished, uncheck all of the boxes (in the Instructors application).

Adjusting Fluid Flow

1   Remove the neck skin.
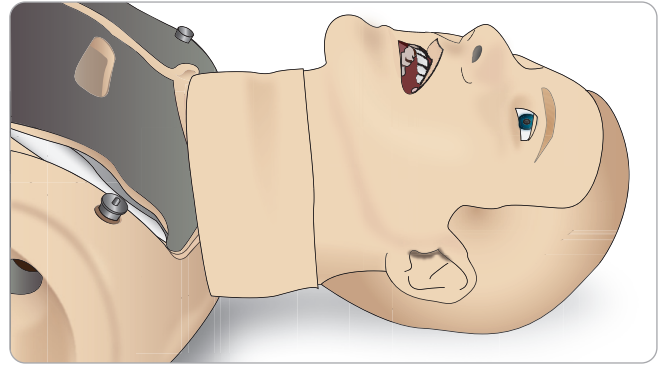

2   Locate the restrictor valves in the left and right clavicle area.
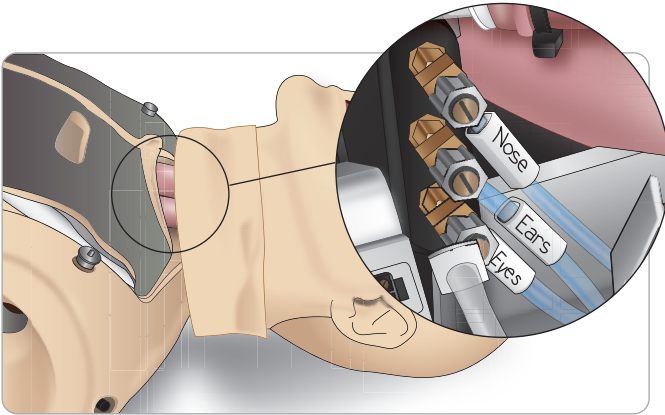
3   Activate secretion in the Circulation and Fluids Tab, then tighten or loosen the actual valve until desired flow rate is achieved.

📝 *Note: Do not unscrew completely. Please note that only slight adjustment should be necessary.*


Replace the neckskin.

Administering IV Fluids

To prevent clogging of the IV system, use only purified water to simulate IV drugs with SimMan 3G.

Acceptable types of purified water:

• Distilled water OR

• De-ionized water.

Priming the IV Arm System

1   Use a syringe to inject blood concentrate and 500 cc of water into an IV bag with tubing. This will serve as the blood source. Attach the "blood source" bag with IV tubing to one of the tubes exiting the manikin's arm.

2   Attach an empty bag with IV tubing to the second tube exiting the manikin's arm. This bag will serve as the collection reservoir.

3   Control the flow of blood from the arm, via the clamp on the collection reservoir tubing. Put the collection bag on the floor to allow the now closed system to gravity feed.

4   Hang the "blood source" bag from an IV pole and open the clamp to allow concentrate to flow through arm.
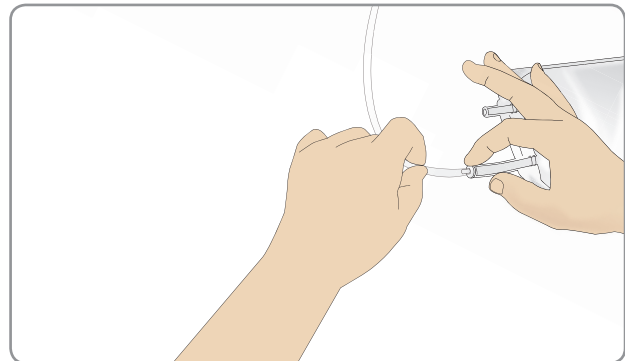
Cleaning the IV Arm

Flush the IV arm with warm water at the end of each day.

Connecting Wounds Kit

SimMan 3G comes with a wounds kit that includes 2 wounds and double-sided tape to attach wounds to the manikin skin.
Connect wounds to the bleeding ports on the manikin torso to simulate a bleeding patient.

1   Select a wound from the wound kit.
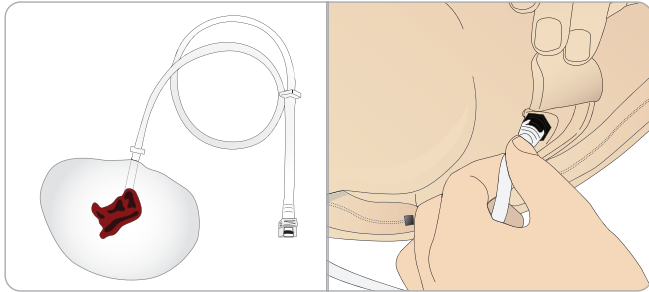
2   Connect the tube from the wound, to the nearest blood port.

There are four blood ports with twist and lock connectors, as Illustrated on the right.

— Ensure the area to which the wound will be attached is clean and dry.

— Apply adhesive tape to the back side of the wound.

— Remove the protective liner from the adhesive tape on the wound and fix it in the desired position on the skin.
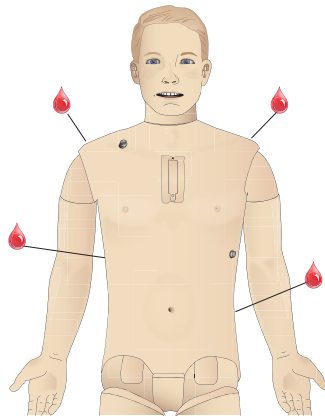
Removing Wounds

Flush all ports and tubes with 60% Isopropanol alcohol or 70% ethanol while the wounds are still attached. When the fluid runs clear, disconnect the tube from fluid outlet. After the wound is removed, any tape residue can be cleaned from the manikin skin with Laerdal Manikin Wipes.

Note: When removing Wounds from the blood ports, cover the manikin skin with a cloth to prevent staining.

Trauma modules can be purchased separately to replace default limbs to add realism to simulation.

Simulate Severe Bleeding

Start a Bleeding patient case from the *Instructor Application*
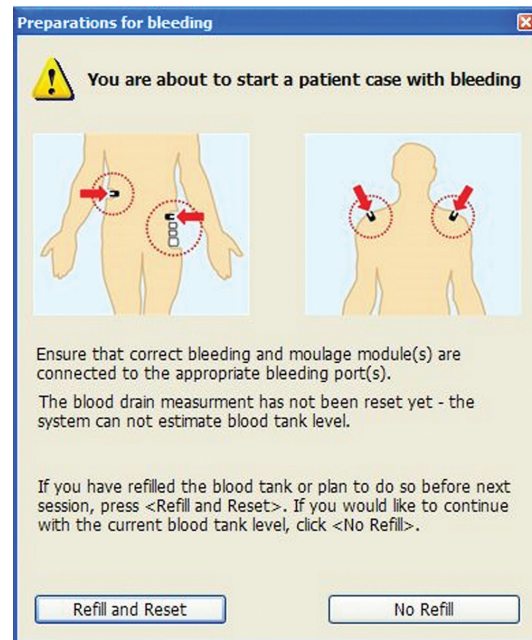
To extend bleeding patient simulations, a scale factor can be used.

Ensure, when the external Blood fill Unit is empty; replace it with another Blood fill Unit filled with simulated blood. Repeat this process for as many times as is necessary.

If the external fill unit runs empty, during a bleeding scenarios, air will be introduced to the blood system, causing inaccurate reading.
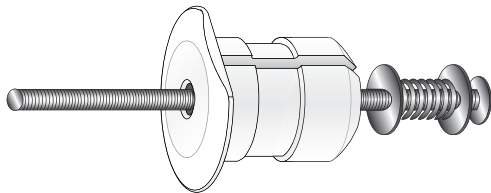
Attaching the Amputated Arms

1   Remove the right or left arm.

2   Open the Torso as described on page 7, steps 1-4.

3   If removing the right arm, remove the deltoid pad and unscrew the arm. Skip to step 8.

4   If removing the left arm, use the 8mm Allen wrench to loosen the shoulder bolt. Do not remove the shoulder bolt.
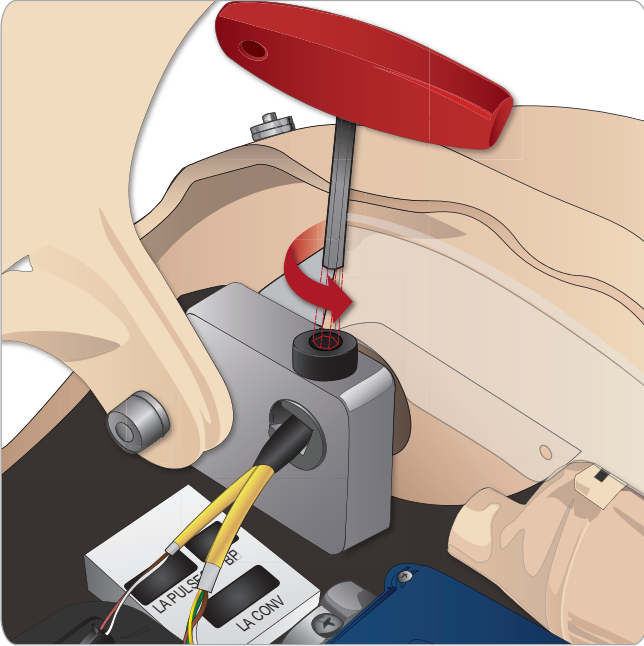
5   Unplug the cables and remove the arm.

📝   *The Arm Adapter and Adapter Screw are designed to attach the Amputated Arms to the manikin. The adapter is already installed in the right shoulder.*

6   Fit the Arm Adapter into the hole in the arm bracket from inside the torso. Ensure the flat edge of the Adapter is facing the chest hinge. Hand tighten the shoulder bolt.
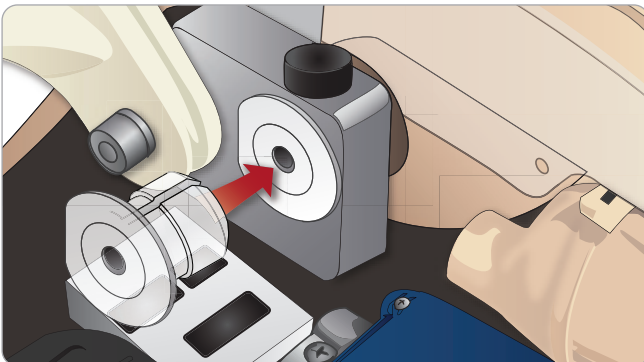
7   The Adapter is now in place and the Amputated Arm can be connected with the Adapter Screw.

8.   Thread the Adapter Screw through the Amputated Arm and align the screw with the hole in the Adapter.
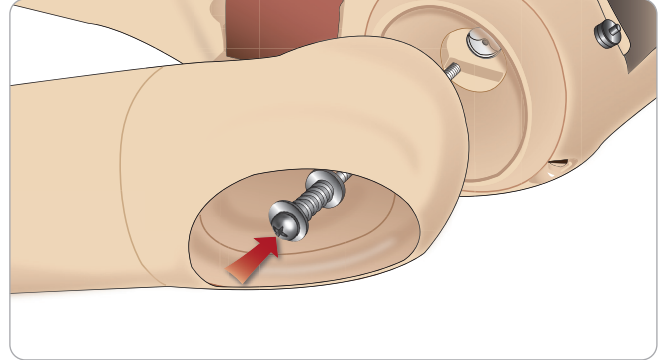
9.   Secure the Adapter with one hand from inside the torso. Screw the Adapter Screw using a Phillips head screwdriver.
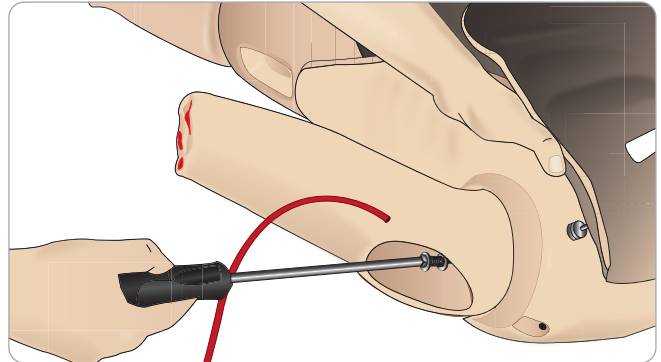
10.   Connect the red tube from the Amputated Arm to the nearest blood port on the torso.

⚠️   *Caution: Do not over rotate the arm. Over rotating may cause the red vinyl tubling to disconnect.*
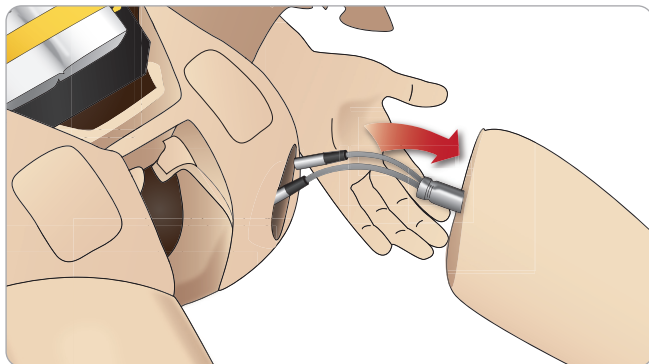
31
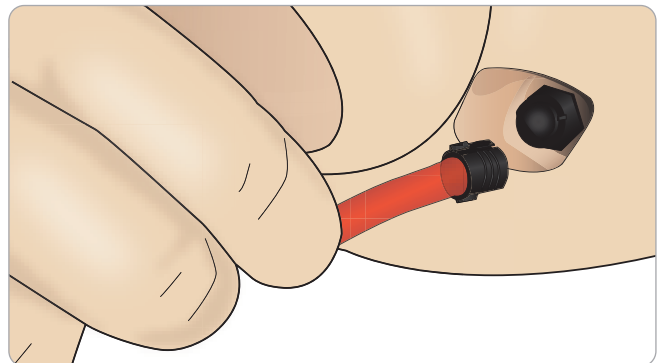
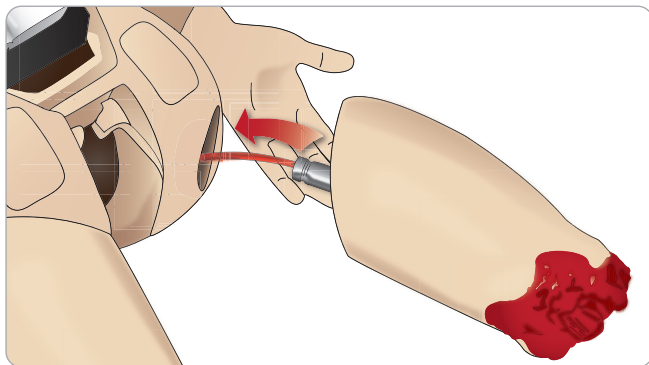## Replacing the Left Leg with the Amputated Thigh

1. Remove the SimMan 3G default leg. Open torso skin and stomach foam as shown in steps 1-4 on page 7.

2. Unscrew the hip joint connector. Remove the leg cables/tubes from the connector.
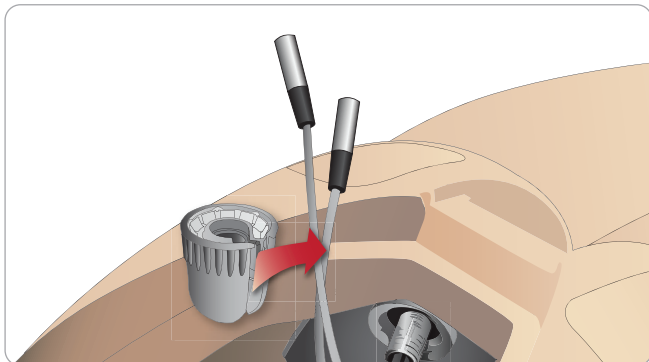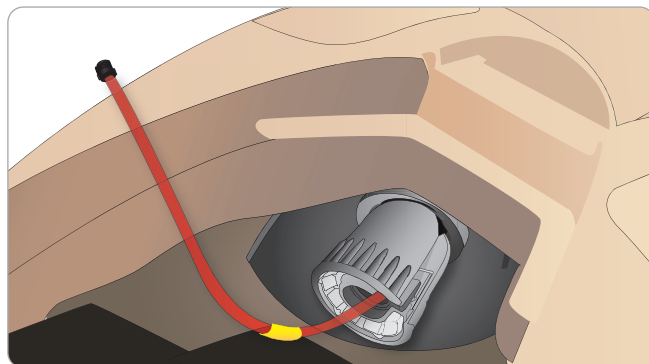

3. Carefully remove the left leg with cables and tubes.

4. Insert the Amputated Thigh with blood tube into the leg socket.

5. Insert the blood tube into the side slot of the connector. Screw the connector in place with one hand.

6. Connect the leg tube to the corresponding tube, as labelled inside the torso. Close the stomach foam and zip the torso skin back into place.
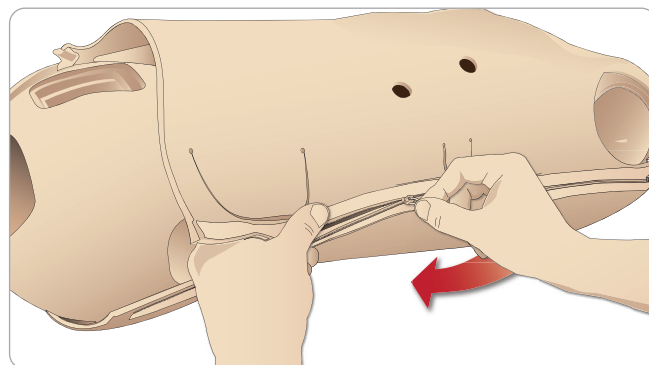
Installing the Amputated IM Thigh Skin

1. Position the Amputated IM Thigh Skin to the Amputated Thigh using the three landmarks of the the wounds as shown below.

Positioning Landmarks   Top

Side   Bottom

2.   Apply a liberal amount of baby powder to the inside of the skin and leg and pull the skin all the way up the Amputated Thigh.
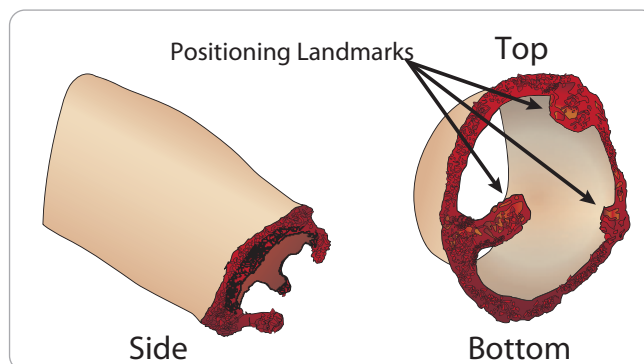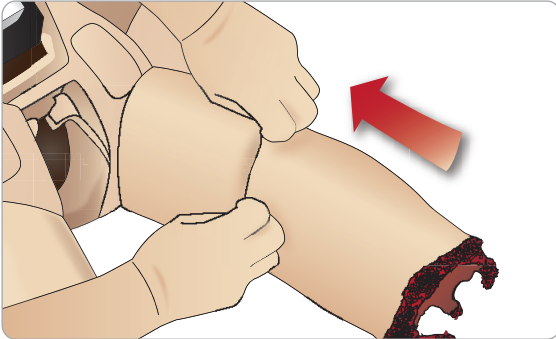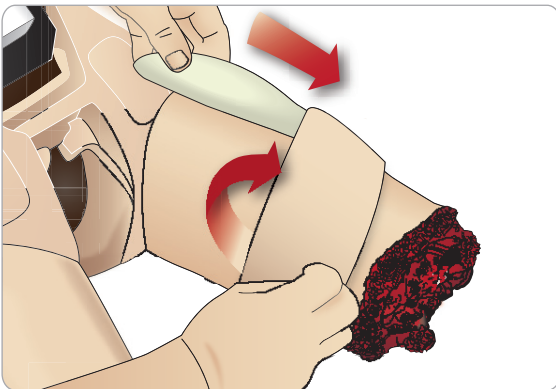

3   Fold the skin half way down and carefully insert the Foam IM Pad underneath the skin. The Foam IM Pad could tear if mishandled.

4   The foam IM Pad should sit 1" (2.5 cm) from the top edge of the Amputated Thigh. Fold the skin back up.
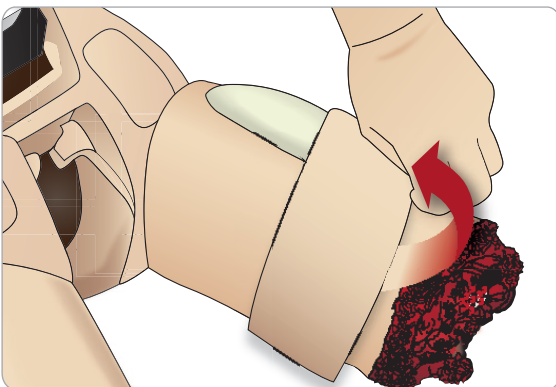
Installing the Amputated Lower Calf Skin

1   Access the ankle bolts by folding the skin up. Remove the ankle bolts using two Phillips head screw drivers.
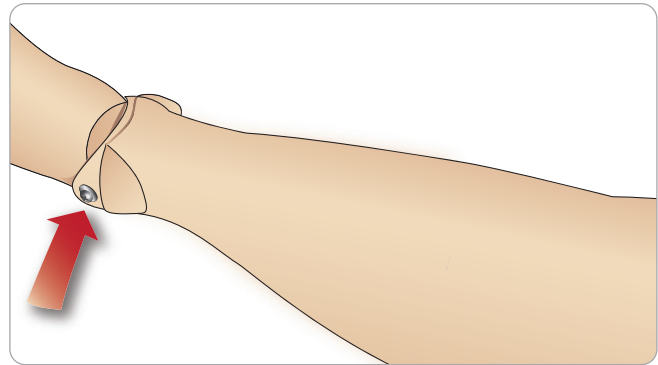
2   Carefully fold down the skin of the foot to expose the two pulse units. Disconnect both units and route the wiring out of the foot. Roll the wires together and store in the bottom of the ankle.
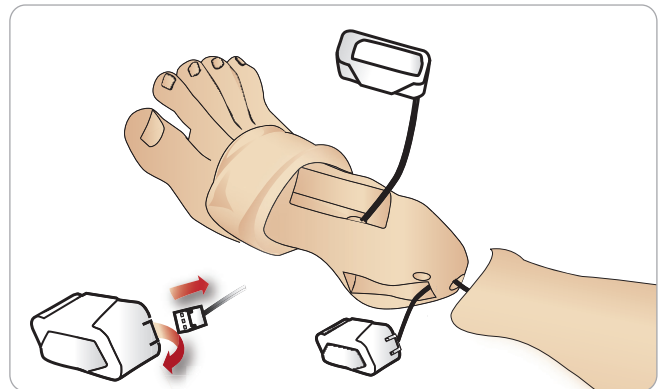
3   Apply a liberal amount of baby powder inside of the Amputated Lower Calf Skin and lower leg. While matching the contours of the skin to the calf, pull the skin up the manikin's lower leg untill it fits tightly.
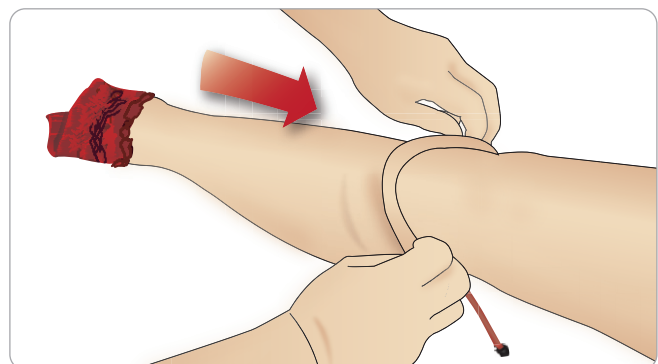
4   Connect the blood tubing to the blood port located on the manikin's right side.
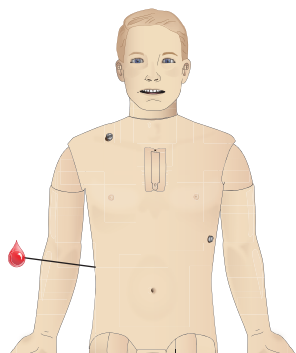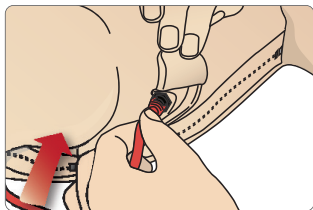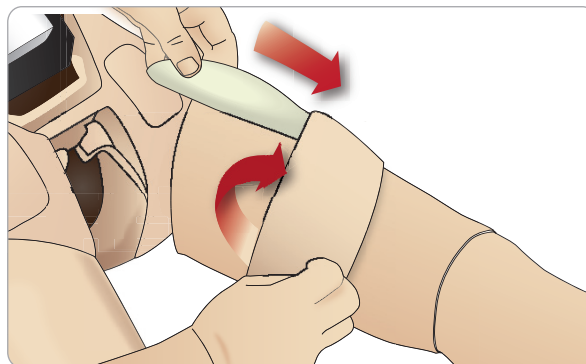
Installing Right and Left IM Thigh Skins

1   The dorsal side of each IM Thigh Skin is marked by either an "L" or "R". This marking should be aligned with the corresponding "L" or "R" on the upper dorsal thigh of the 3G manikin's leg.
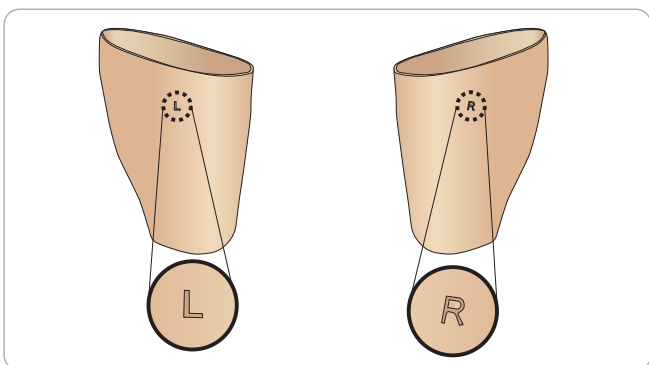

2   Apply a liberal amount of baby powder to the inside of the skin and leg and pull the skin all the way up until it is even with the top of the leg skin.

3   Fold the skin half way down and carefully insert the Foam IM Pad underneath the skin. The Foam IM Pad could tear if mishandled.


4   The Foam IM Pad should sit 1" (2.5 cm) from the top edge of the leg. Replace the skin.

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Connecting Defibrillation Adapter Plates

ADDING DEFIBRILLATION ADAPTER PLATES

The manikin torso is fitted with two stud connectors for defibrillator cables. Foam pads may be fitted around the defibrillator studs during the session as illustrated below:
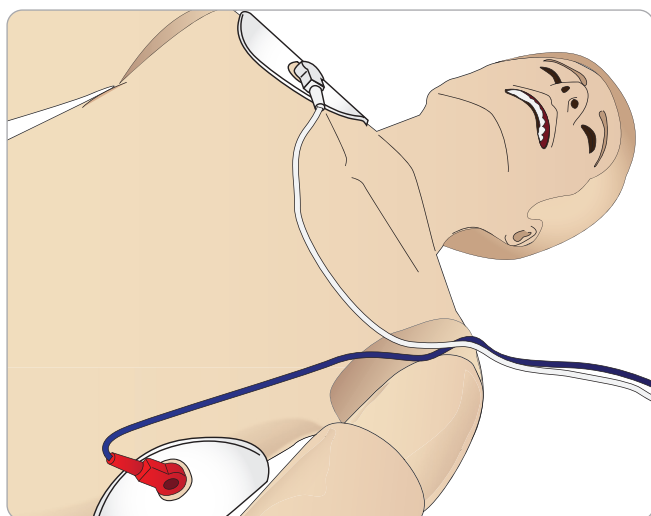
The defibrillator studs must be fitted in place before using a live defibrillator with defibrillation paddles or adhesive pads.
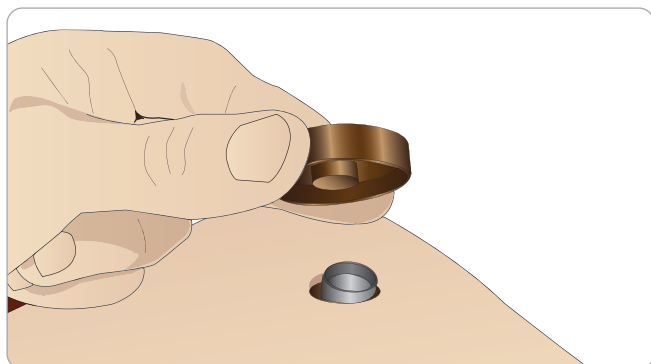
Press the adapter plates firmly into place.
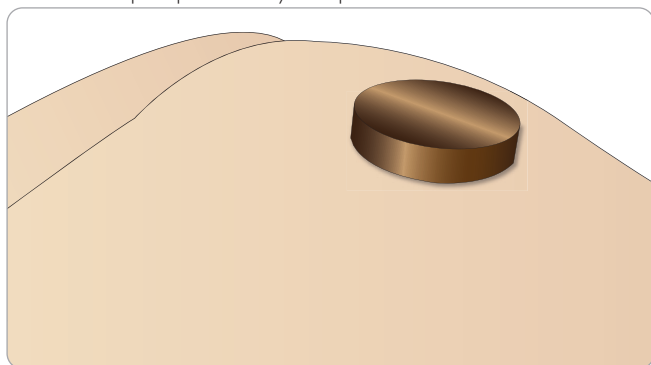
DURING DEFIBRILLATION

A conventional defibrillator may be used on SimMan 3G. During live defibrillation, the defibrillator and manikin may present a shock hazard. All standard safety precautions must be taken when using the defibrillator on the manikin.

Note: Defibrillation must be performed on the defibrillator connectors only.

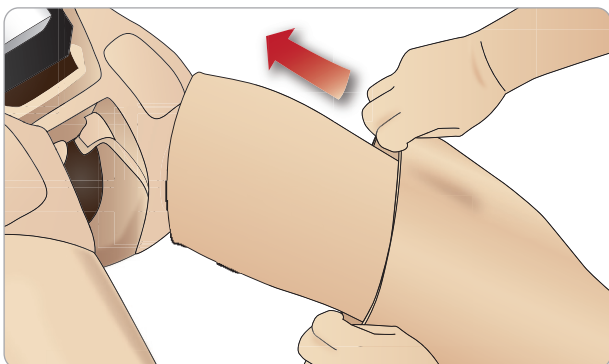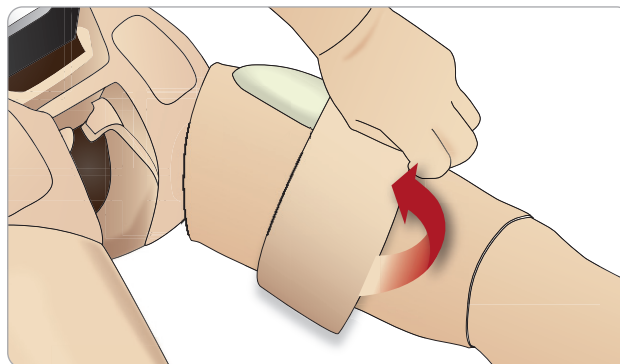To prevent overheating during defibrillation, do not exceed a defibrillation sequence of 3 shocks in 45 seconds followed by 1 minute of CPR.

After 30 minutes there must be at least 15 minutes with no shocking before starting a new sequence.

Note: Do not repeat this for more than a 4 hour period.

Caution: The manikin must not be in contact with electrically conductive surfaces or objects during defibrillation.

Caution: In hot conditions, intensive defibrillation may cause thermal shutdown of the manikin.

Special care should be taken when using the manikin fluid systems.

To prevent torso skin electrode pitting, do not apply conductive gel or conductive defibrillation pads intended for patient use.

Note: Do not defibrillate the manikin when it is OFF or if it is not functioning normally.

Note: Do not press too hard over the defibrillation adapters as this may cause arcing and pitting.

Note: Do not defibrillate the manikin without the torso skin.

A full service, including cleaning of the base board and its compartments should be performed at regular intervals.

Connecting the Blood Pressure Cuff

The manikin is delivered with a specially adjusted blood pressure cuff. Connect the tube to the white BP connector at the side of the manikin before use.

Calibrating the Blood Pressure Cuff

1   Select <Tools> <Maintenance> and choose <Calibrate BP...>
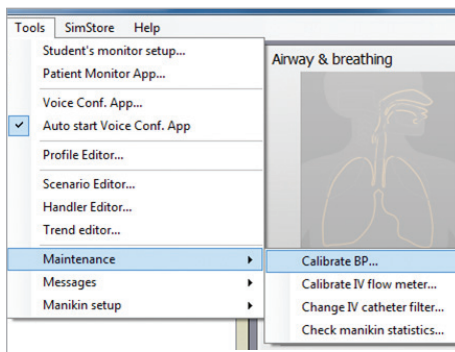
2   Follow the onscreen wizard instructions to perform the calibration.
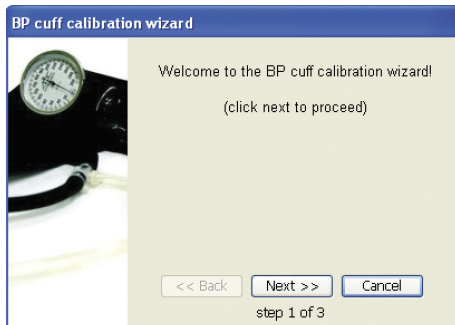
Connecting the SpO₂ Probe

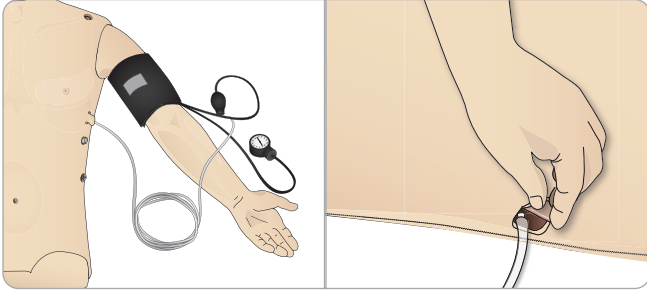The SimMan 3G SpO$_2$ probe is made up of a light diode and light sensor. When the beam between the diode and sensor is broken, the Patient Monitor Application registers that the SpO$_2$ probe is connected.

1   Connect the probe's USB plug to the Patient Monitor PC.

2   The probe can be placed on any suitable area on the manikin, Ensure that the probe is always firmly fixed in position.

Changing Genitalia Modules

The SimMan 3G is shipped with a neutral genitalia pad as default. The pad can be exchanged for a male or female genitalia pad with urine catheter to simulate urine flow and catheterization.

> 📝 Note: The manikin legs do not need to be removed before the genitalia pad can be replaced.

1   Remove the manikin's genitalia pad by gripping the pad at the top and pulling forward and down.
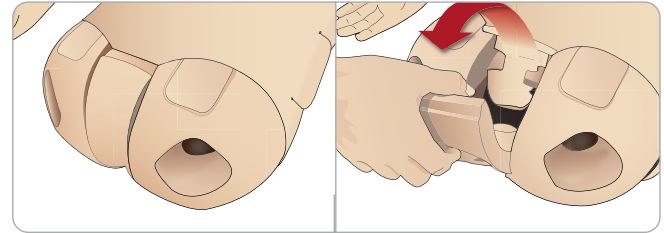
2   Disconnect any tubes or cables.

3   Connect the new genitalia module's urine tube and the catheterization sensor cable from inside the manikin pelvis to the urine bladder module.
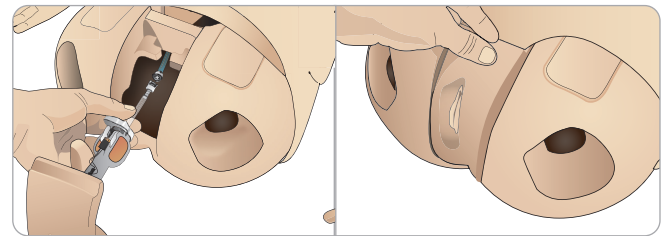
4   Place the new genitalia module back into the manikin's pelvis.

Inserting Urine Catheter

Always use a water based lubricant liberally when inserting a urine catheter.

Use the following catheter sizes:
Female genitalia – Foley 14Ch and Lofric 16Ch
Male genitalia – Foley 16Ch and Lofric 16Ch

Changing the Upper Dentures

The SimMan3G manikin comes with a set of soft upper teeth as default. The soft set may be replaced with a hard set of teeth.

1   Remove the teeth from the mouth.

2   Align the new set of teeth with the gums and push them back until the teeth engage and lock onto the gums.

3   Ensure that the new set of teeth is properly aligned with the gums before pushing them into place.

Replacing and Filling the IO Modules with Blood

The IO Pads supplied with SimMan Essential and SimMan Essential Bleeding are disposable parts meant for single use.

REPLACING AND FILLING THE STERNAL IO PAD WITH BLOOD
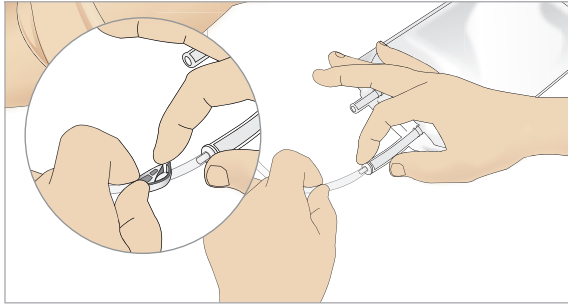
1   Attach the Sternal IO bag to the Sternal tube and close off the pinch clamp.
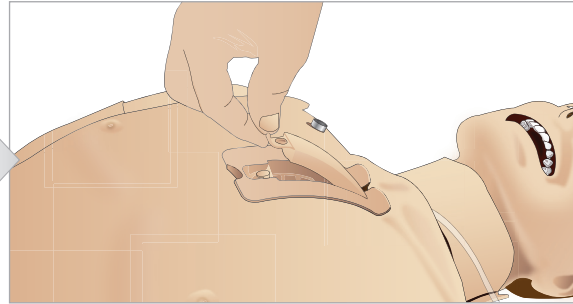
2   Remove the Sternal IO pad from the manikin chest.
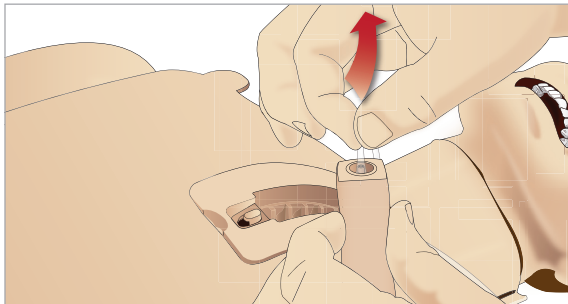
3   Remove the Sternal tube from the sternal pad.
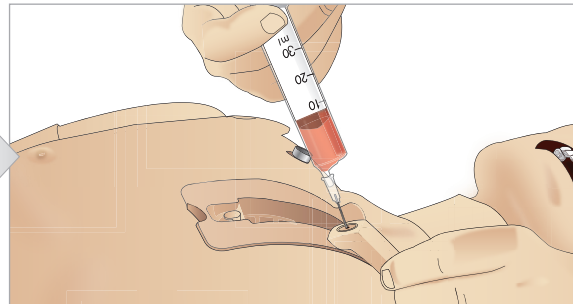
4   Fill the sternal IO pad with 7ml of blood. Ensure the pad is completely filled.
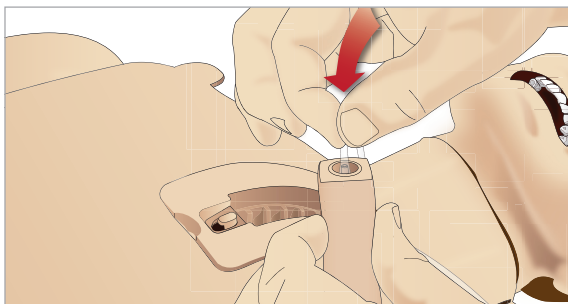
5   Reattach the Sternal tube to the Sternal IO pad.
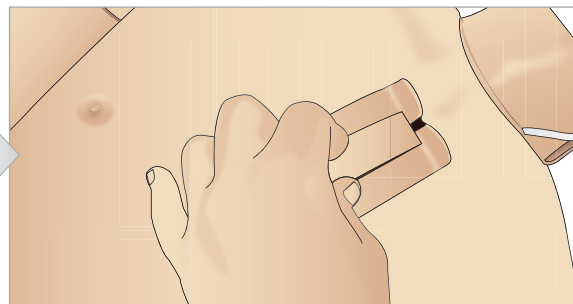
6   Place the Sternal IO unit in the Sternal Chassis. Slide the unit down and towards the neck, until it fits securely under the top edge of the chassis.

The following devices have been tested and are approved for use with the simulator:

• F.A.S.T 1 ™

• Jamshidi ® Illinois Bone Marrow Aspiration/Intraosseous Infusion Needle. 18 Ga. 9/16''(14mm) - 1½'' (38mm).

Note: In some cases you will not get any blood backflow when using the F.A.S.T 1 ™
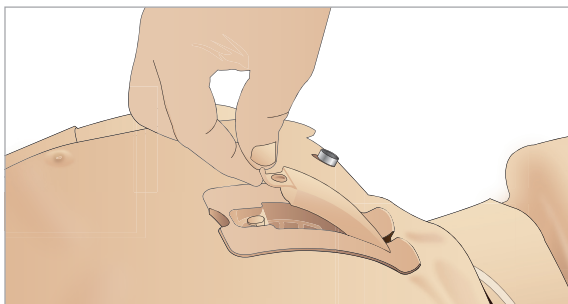
7   Reattach the sternal IO pad

The sternal IO is now ready for simulation.

Note: If bits of plastic from the module get stuck in the needle, flush the needle with fluid to dislodge the obstruction.

Replacing and Filling Tibial IO module with Blood
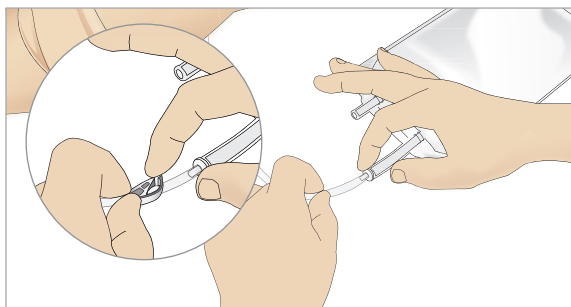
1   Attach the Tibial IO bag to the Tibial tube and close off the pinch clamp.
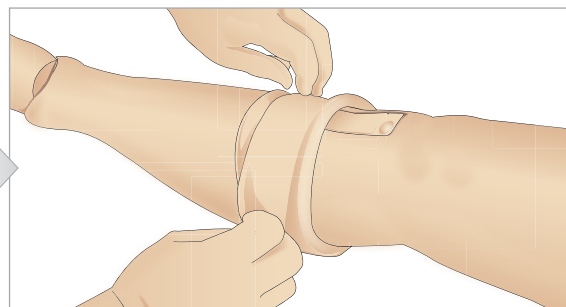
2   Roll the leg band, to expose the Tibial IO module.
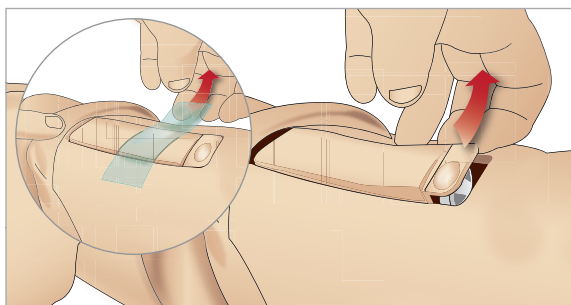
3   Remove the IO tape. Then remove the Tibial IO unit from the leg.
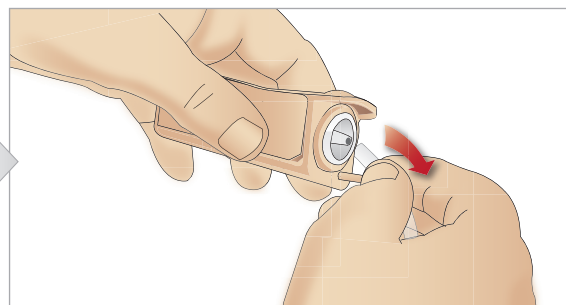
4   Remove the tube from the Tibial IO module.
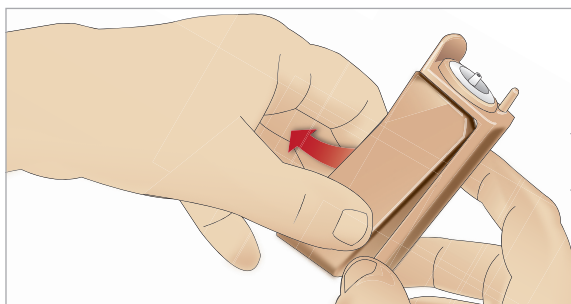
5   Remove the Tibial IO Pad from the Tibial IO chassis.
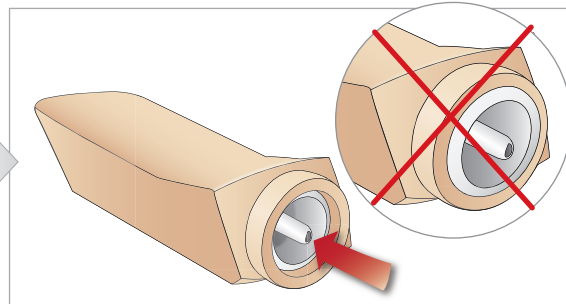
6   Before replacing the new Tibial IO, ensure that the nipple is retracted in the Tibial IO Pad.
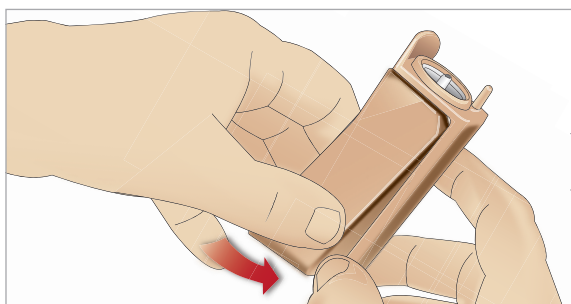
7   Fit the new Tibial IO pad into the chassis.
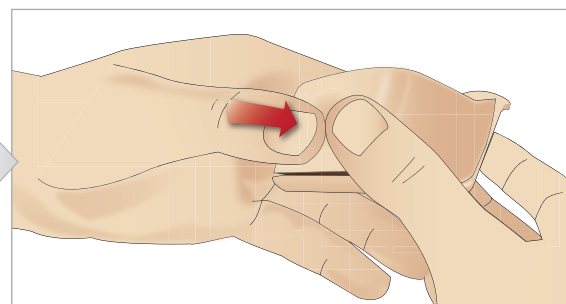
8   Secure the Tibial IO pad in place by pressing the rear of the pad with thumbs until the nipple moves forward and locks the unit in place.

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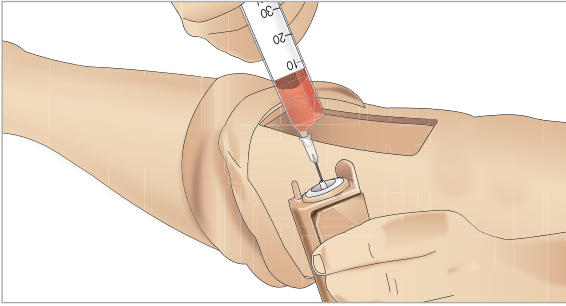
9   Fill the Tibial IO unit with 30 - 35ml of blood, ensure the Tibial Pad is completely full.
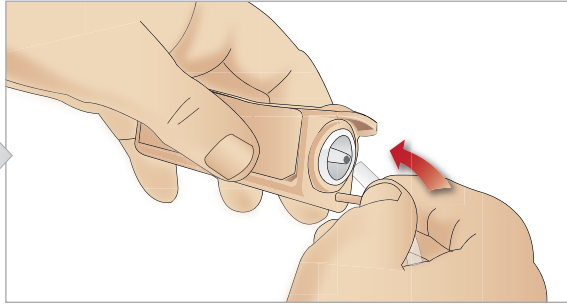
10   Connect the Tibial tube to the Tibial IO unit.
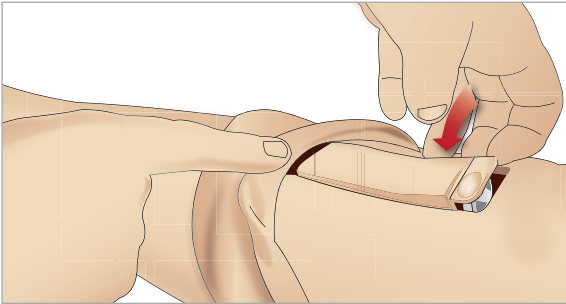
11   Replace the Tibial IO Pad and chassis, into the leg cavity.
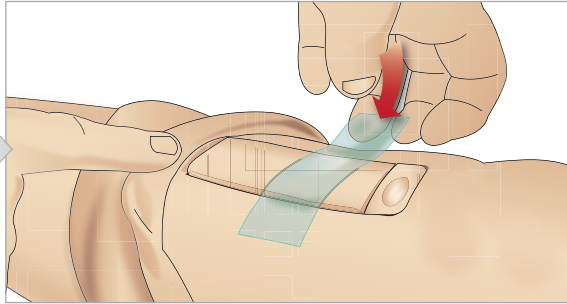
12   Affix the tape to keep the module in place.

Roll the leg skin up over the Tibial module. The Tibial IO is now ready for simulation.

The following devices have been tested and are approved for use with the simulator:
*   BIG Automatic Intraosseous Device

*   EZ-IO-G3, 15G x 1'', 1.8mm x 25mm

*   Jamshidi ® Illinois Bone Marrow Aspiration/Intraosseous Infusion Needle. 18 Ga. 9/16'' (14mm)-1 ½'' (38mm).

NOTE: In some cases, there will be no blood backflow when using the BIG Automatic Intraosseous Device

General

Main anatomical features

Dimensions (manikin only):   1800mm (l) × 550mm (w) chest (5. 90 ft × 1.80 ft)

Weight (patient manikin only): 38.5kg (85 lbs)

Weight (with clothes):   40 Kg (88 lbs)

Default male body with interchangeable genitalia pads

Configurable Anatomical Features

Genitalia

The manikin comes with a neutral genitalia pad as default. Pad can be changed for a male or female module, included with the *SimMan 3G* System. *See section, Changing the Genitalia*,

Teeth

Manikin comes with a set of soft teeth as default. These can be exchanged for a hard set of teeth, included with the *SimMan 3G* System. *See section, Changing upper dentures.*

Trauma Modules/Limbs

Left leg - amputation and bleeding module (optional accessory). Right leg - amputation and bleeding module (optional accessory). Left arm -amputation and bleeding module (optional accessory). Right arm - amputation and bleeding module (optional accessory) The *SimMan 3G* arm adaptor kit is used to connect the trauma arm modules.

Contact your local Laerdal representative to inquire about other trauma modules compatible with *SimMan 3G*.

Mobility of joints

Neck: movement can be on a 3-axis movement of head. Range of movement can be restricted. *See Airway section under Clinical features.*

Shoulders: 3-axis rotation
Lumbar: 1-axis
Hip joints: 3-axis rotation
Knees: 1-axis rotation
Ankles: 1-axis rotation

Do not remove protective bushings at shoulder or lower back. These are present to protect users from pinch points.

SimMan 3G Clothing

Included with the *SimMan 3G* manikin is a custom designed set of clothing – with full-length zippers designed for easy removal. Washing instructions are found on the label inside each article of clothing.

– Shirt, with side zippers

– Trousers, with full-length side zippers

– Boxer shorts underwear

– Belt

Simulated removal of the clothes

Unzip the full length zippers found along the seams of the manikin's clothing to simulate removal by cutting with a pair of scissors.

Airway Features

The airway is anatomically modeled as far as the bronchia.

The airways can be manipulated by a learner:
- Head tilt/Chin lift
- Jaw thrust w/ articulated jaw
- Cricoid pressure and manipulation
- Suctioning (oral & nasopharyngeal)

If the tongue fallback feature is enabled, head tilt is required to open the airways for mask ventilations. The manikin may be ventilated by normal and emergency methods;
- Bag-mask ventilation
- Orotracheal intubation
- Nasotracheal intubation
- Transtracheal intubation

Prior to using airway adjuncts, apply a small amount of *Laerdal Airway Lubricant* to the equipment. Do not spray lubricant directly into the airway.

The following equipment or methods are suitable to secure the manikin's airway:
- Laryngeal mask airways: The airways are designed for use with size #4, but size #5 may also seal correctly.
- Endotracheal tube intubation, size ID 7.5 - 8.5 is suitable, but using the smaller size reduces wear of the manikin's airways.

Use of a malleable stylet is recommended - make sure it does not extend beyond the ET tube.
- i-Gel
- Fiberoptic intubation
- Combitube (size small adult is suitable)
- Retrograde intubation
- Needle cricothyrotomy
- Surgical cricothyrotomy

The following manikin features indicate incorrect tube placement:
- Right main stem intubation – unilateral chest rise
- Stomach distention
- Lack of chest sounds, CO_2 exhalation (see *Breathing* section)

CONFIGURABLE AIRWAY FEATURES

Manikin features may be configured to present various airway Scenarios:
- The airway may be closed automatically or manually. There are four levels of resistance and compliance within the airway.
- Tongue edema - multiple levels
- Pharyngeal swelling
- Laryngospasm
- Decreased cervical range of motion
- Trismus
- Teeth - soft upper dentures may be replaced with a hard set of teeth for enhanced realism while practicing intubations.

During simulation, the following conditions can be set:
- Can't intubate / can ventilate
- Can't intubate / can't ventilate

The following information is automatically registered in the SimMan3G simulation session:
- Detection of proper head position.
- Jaw Thrust
- Pneumothorax decompression
- Ventilations
- Stomach distension

Instructor Mode Airway / Breathing Tab

The Airway / breathing tab shows the status of the patient's breathing and allows configuration of <Airway / breathing> settings.
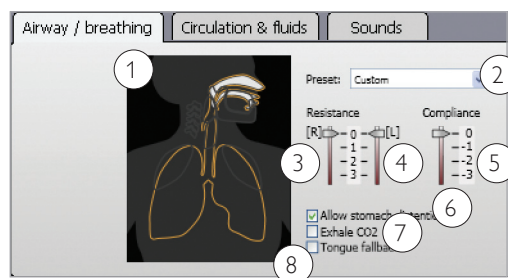
1 - Animation and Settings

The airway/breathing animation is a real-time movie of the airway/breathing status of the patient.

Healthy breathing with low resistance is shown by an inhalation in blue which then turns white.

Manikin Setup

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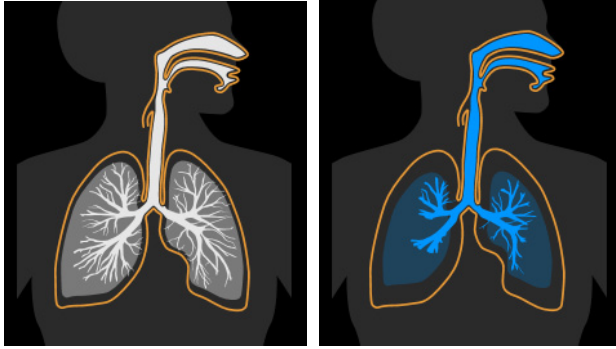
If the patient suffers from insufficient breathing the animation remains blue.

📝 *Note that the airway/breathing settings can be altered by clicking on the relevant area of the airway/breathing animation.*

When the mouse is hovered over the animation, the clickable areas become highlighted in grey and tooltip help is provided.

2 - Preset
Select one of the following from the dropdown menu:

– Normal

– Can't intubate / can ventilate

– Can't intubate / can't ventilate

3 - Right Lung Resistance
Select from 4 resistance levels from 0(Normal) - 3 (Extreme).

4 - Left Lung Resistance
Select from 4 resistance levels from 0(Normal) - 3 (Extreme).

5 - Total Lung Compliance
To set compliance for both lungs: select one of the 4 compliance levels 0(Normal) - 3 (Extreme).

📝 *Note: The lung compliance function cannot be changed while the manikin is being actively ventilated.*

6 - Allow Stomach Distention
Check or uncheck the box to activate stomach distention or uncheck the box to allow trapped air to exit.

7 - Exhale CO_2
Check or uncheck the box to enable or disable CO_2 exhalation. (Requires connection to an external CO_2 reservoir)

8 - Tongue Fallback
Check the box to simulate tongue fallback. Uncheck the box to disable this function. Tongue fallback symptoms will occur unless the head is tilted back or jaw thrust maneuver is applied.

Breathing Features

The *SimMan3G* can simulate spontaneous breathing:

⚠ *Warning: Do not ventilate the manikin with oxygen enriched air or flammable gasses.*

⚠ *Caution: Do not ventilate manikin lungs using humidified air.*

– Bilateral and unilateral chest rise and fall

– There are 4 compliance settings, from normal to extremely stiff

– There are 4 settings for airway resistance, from normal to extremely tight.

– Normal and abnormal breath sounds

– 5 anterior auscultation sites and 6 posterior auscultation sites

– Unilateral, bilateral and lobar breath sounds

– Oxygen saturation and phlethysmogram

– Cyanosis - indicated by blue lights on the lips

– CO_2 exhalation for use with third-party et CO_2 detectors (Requires connection to an external CO_2 reservoir)

Patient Monitor features - Breathing
– SpO_2

– Airway respiration rate (awRR)

– End-tidal CO_2 (etCO$_2$)

– End-tidal O_2 (etO2)

– inO_2

– pH

Lung specifications
– Max tidal volume: 1.2 liters

– Max tidal volume registered in the Instructor Application is 900ml. All volumes higher than 900ml will register as 900ml

– Max airway pressure: 80 cm H_2O

– Simulated stomach inflation starts from approximately 40cm H_2O airway pressure.

📝 *Note: Lungs are not intended for use with PEEP-valves.*

Pneumothorax
Tension pneumothorax with needle decompression can be performed at bilateral mid clavicle line, 2nd intercostal space. The pneumothorax bladders may be pierced +/-10 times, the pressure inside the bladder will drop after repeated puncturing.
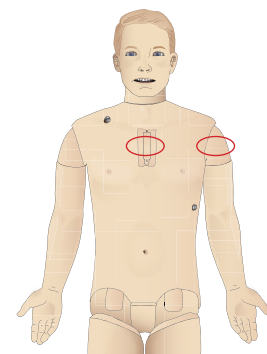
A 22 (or smaller) gauge needle is recommended for decompression of the chest. Using a smaller gauge needle increases the longevity of the chest skin and bladders.

However, a too small gauge prevents automatic detection of the decompression event in the simulation model.

Chest Tube Insertion
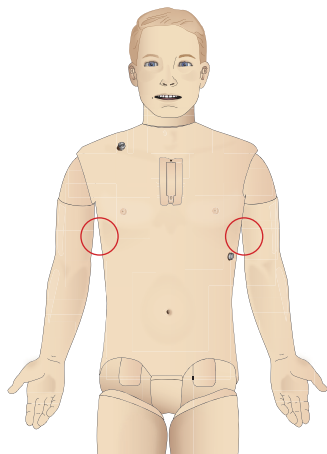
Chest tube insertion can be simulated, and exploration and cut can be made at left or right mid-axillary line at (4th and) 5th intercostals space.

Circulation

Cardiac features:
- Extensive ECG library, pulses from 0-220.

- Heart sounds - for every anterior location

- ECG rhythm simulation

- 12-lead ECG display

- Pacing

- Defibrillation and cardio version using live defibrillators

Defibrillation

- With live defibrillators: energy level and waveform model is registered by the manikin.

- The energy levels and number of shocks required for automatic conversion are set in each simulation Patient Case.

Defibrillation Studs
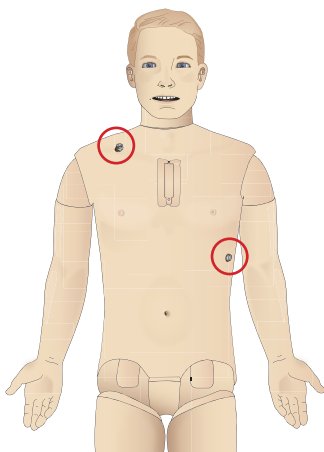
Circulation features
- BP measured manually by auscultation of Korotkoff sounds

- Carotid, brachial, radial, femoral, popliteal, dorsalis pedis, and posterior tibialis pulses synchronized with ECG

- Pulse strength variable with BP

- Pulses are synchronized with ECG when the instructor sets the pulse strength manually

- Pulse palpation is detected and logged

CPR
- Compliant with 2000 and 2010 Guidelines

- Compressions generate palpable pulses, blood pressure wave form, and ECG artifacts

- Realistic compression depth and resistance

- Detection of depth, release and frequency of compressions

- Real-time view of quality of CPR on the Instructor's PC

Patient Monitor features - Circulation
- ECG (12-lead) and heart rate (HR)

- Pulse

- NBP

- ABP

- PAP

- C.O.

Patient Monitor Features - Temperatures
- TPeri

- Tblood

ABOUT THE CIRCULATION & FLUIDS TAB
The settings of the <Circulation & fluids> tab are used to control the secretion of fluids and blood from the Manikin during simulation.

To open the <Airway / breathing> menu if it is hidden, click on the tab name.

Circulation Fluids Settings and Configuration
The possible circulation fluids settings and details of how to configure them are outlined below.
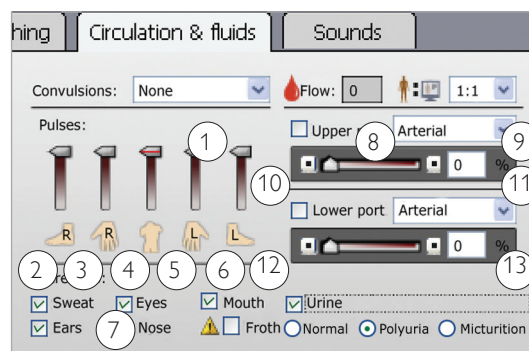
1 - Convulsions

Convulsions are not available in the Mystic configuration of the 3G manikins.

2 - 6 Pulses

Move the slider to the appropriate position. Moving the central slider (5) sets the overall pulse limit shown by the red line.

7 - Secretions

Check or uncheck the boxes to activate/deactivate secretions.
When froth is activated, all other secretions are deactivated to ensure correct fluid pressure.

Secretions (clear fluid)

− Sweat on forehead / diaphoresis

− Tears, both eyes

− Ears, both

− Nose, right side

− Mouth, right side

− Froth from mouth, right side.

− Urine output

Urine

Check the box for urine

− Normal

− Polyuria

− Micturition

Uncheck to disable urine.

Urine output

− Foley catheterization

− Urine (variable)

8 – Bleeding / Flow Rate

The number shown in the Flow box indicates the total bleeding rate for both upper and lower bleeding ports. Flow rate is shown in ml per min.

9 - Bleeding rate scale factor

1:1 to 1:10
To conserve blood from the manikin's internal reservoir, set a higher scale factor to scale down the manikin bleeding in relation to the blood loss presented on the Instructor screen.

10 - Upper Port Bleeding

Activate the checkbox to open the upper bleeding port open. Move slider to the left or click the '−' button to decrease bleeding rate. Move slider to the right or click the '+' button to increase bleeding rate.

11 – Connecting Wound Modules

Wound modules can be placed on the skin. Connect the wound modules to bleeding outlets. For information on wound setup see section: *Setup for Simulation - Connecting Wounds Kit.*

The percentage shown in the box indicates the valve opening. The percentage can also be entered by typing the desired percentage into the box.

12 - Select Upper Port Bleeding Type

Select bleeding type using drop down menu.
− Venous

− Arterial

13 - Lower Port Bleeding

To adjust lower port settings, follow instructions as stated under item 10.

The percentage shown in the box indicates the valve opening of the lower bleeding port. The percentage can also be entered by typing the desired percentage into the box.

14 - Select Lower Bleeding Port

Select bleeding type using drop down menu.

Bleeding

To allow the manikin to bleed realistically, the manikin has internal reservoirs for simulated blood. See the *Manikin Setup*.

The four bleeding ports and blood flow can be adjusted independently from the *SimMan 3G* Instructor Application:
Screenshots
− Upper / lower bleeding ports

− Venous / Arterial

− Works with various wound modules and moulage kits

Bleeding Treatment:

− Bandage

− Pressure point

− Tourniquet

− Surgical Clamps

Vascular Access:

− IV access (right arm)

− Intraosseous access (tibia and sternum)

Consumables and Spare Parts:

− Laerdal Artificial Blood Concentrate

− Fill Units

− Wound modules

− Replacement trauma arm / leg.
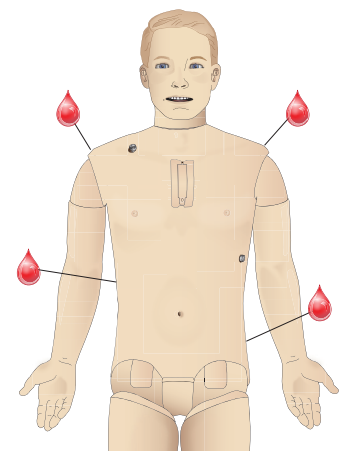
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Sounds

The settings of the <Sounds> tab are used to control the body sounds and vocal sounds from the manikin.
To view the <Sounds> menu click on the <Sounds> tab.

Sounds settings and configuration

Overview of Sound settings in Instructor Mode
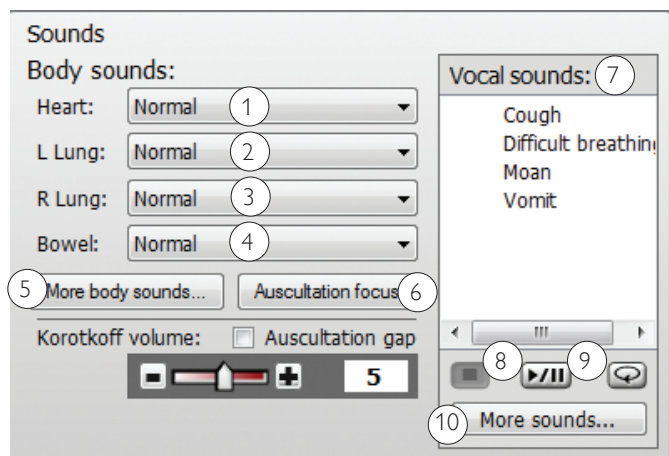
1 - Heart Sounds

Select one of the following from the dropdown menu:
- No Sound
- Normal
- Aortic Stenosis
- Mitral valve Prolapse
- Diastolic Murmur
- Combined aortic insufficiency and stenosis
- Pericarditis
- Systolic Murmur
- Aortic insufficiency

2-3 Left and Right Lung Sounds

Select one of the following from the dropdown menu:
- Normal
- Stridor
- Wheezes
- Crackles
- Basal crackles
- Bronchopneumonia
- Lower lobar pneumonia
- COPD exacerbation

4 - Bowel Sounds

Select one of the following from the dropdown menu:
- Normal
- Hyperactive
- Hypoactive

- Borborygmus
- Hypoactive postop
- Hyperactive diarrhea
- Hypoactive constipation
- Paralytic ileus

5 - More Body Sounds

Click the <Adv. Sounds Control> to open the sounds control popup. From here you can control sound settings and volume for each speaker.
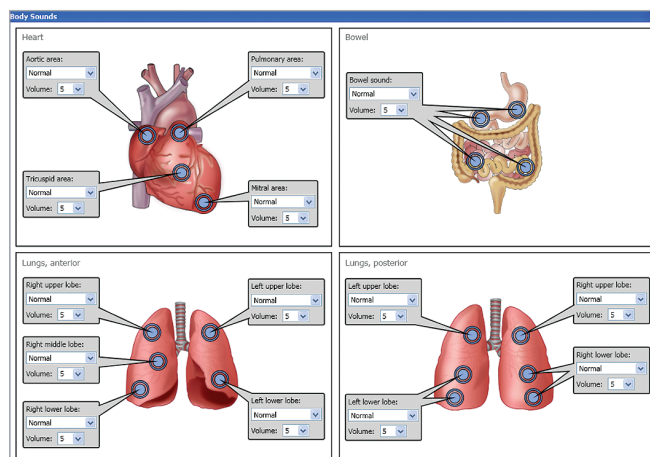
6 - Auscultation Focus

This will disable features generating mechanical noise in the manikin for 30sec. This includes stopping the compressor and preventing chest rise.

7 - Vocal Sounds

The manikin can vocalize sounds:
- Automatically, via playback of pre-recorded sound clips
- The instructor can communicate and interact directly through the loudspeaker in the manikin's head.

Select from the list of Vocal Sounds by clicking on the name.

8 - Controlling Sounds

Click the same button to <Play> or <Pause> sounds.

9 - Repeat Vocal Sounds

To loop selected sound, click <Loop sound vocals>. The loop symbol turns green when sound loop is activated.

10 - More Sounds

A wider selection of sounds can be selected from the <More Sounds....> button.

Eyes Settings and Configurations

The calculated Glasgow Coma Scale score for the Patient Case is displayed in the Instructor Application - Auto Mode. In Instructor mode, the following sources of information help the learner to judge the state of disability:

Eyes

- Blinking eyelids

- Eyelids: Open, closed and partially open.

- Eyelids can be opened for examination by the learner

- Pupil dilation: constricted, dilated or in between

- Pupillary accommodation

- Synchrony / asynchrony

- Normal and sluggish speed of response

1 - Right Pupil Size

Select one of the following settings from the drop down menu:
- Small

- Normal

- Large

2 - Link Pupil Sizes

Select either linked or unlinked by clicking on the link icon:
Linked   When the right pupil size is adjusted, the left also changes accordingly.
Unlinked   Right and left pupil size can be changed independently.

3 - Left Pupil Size

Select one of the following settings from the drop down menu:
- Small

- Normal

- Large

4 - Eyelid Status

Select one of the following settings from the drop down menu:
- Wide open

- Half open

- Closed

5 - Blinking Frequency

Select one of the following settings from the drop down menu:
When activated, these settings will change the blink pattern.
- Off

- Infrequently

- Normal

- Frequently

- 1 left

- 1 right

- 1 both

When activated, these settings will cause the manikin to blink one time.

6 - Light Sensitivity

Select one of the following settings from the drop down menu:
- Slow

- Normal

- None

- R Direct only/L None

- R None/L Direct Only

Drugs and IV

Drugs and drug concentrations can be registered manually by the instructor in the *SimMan3G* Instructor Application.

Manual Registration of Administered Drugs

To manually register when a learner has administered drugs to the manikin:

1   Click the relevant area of the manikin figure and select Drugs from the pop-up menu.

2   In the Register Drug dialog box, use the Select category drop down menu to filter drugs according to type. View the results in <Select Drug> window.

3   Use the Quick Search function to find specific drugs quickly and easily. Type the first letters of the drug name and choose a drug from the drop down list.

4   When a drug is selected from the <Select Drug> list, icons showing route of drug administration appear directly below the window. Select administration route by clicking the appropriate icon.

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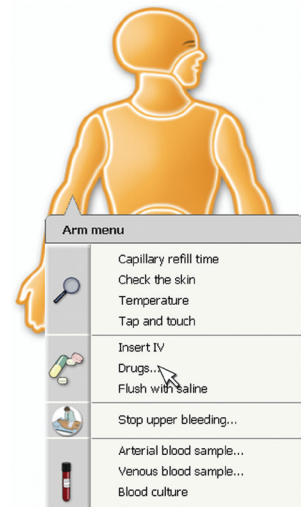
5   Change the dosage and concentration values under <Select concentration> and <Select amount>.   *SimMan 3G* has an extensive drug library with adjustable physiological responses.

Patient Monitor features – Drugs:
– Train-of-Four (TOF)
– in N_2O, et N_2O
– Anesthesia agents
– Lab reports

User-replaceable items, spare parts:
– IV catheter (US and International versions)
– IV fluid filter
– Intra-muscular pad

Vascular Access (IV and IO) Locations

Intraosseous access with needle insertion is possible through the sternum and left tibia. The IO pads may be punctured numerous times before being replaced.

To replace the IO modules see the please see the *Maintenance* section.

Caution: Do not inject fluids into these pads unless there are approved IO modules with fluid outlets in place.

Intra-muscular (IM) injection

There is a total of five intra-muscular (IM) injection sites. These are located on the right and left deltoids, the right buttock, and the left and right thighs.   The right buttock location is located under the torso skin. To install the left and right thigh IM skins see page 38.

Maintenance After Each Simulation Session

The following preventive measures are required to ensure longevity of the *SimMan3G* manikin.

IV-arm system

After each session where the IV-arm has been used, flush the IV arm with warm water.

Blood and fluid system (manikin power on)

After sessions where the blood and fluid system have been used, flush the reservoirs with 60% Isopropanol alcohol solution or 70% ethanol solution. See Cleaning the Fluid and Blood System.

Power off the manikin and PCs

Charge batteries if necessary.

Wipe the skin with a moist cloth

Wipe the skin with a moist cloth to remove stains. Remove wet clothes or linens. Glue residue from the wound module tapes may be removed with a moist cloth.

General clean-up

– Return manikin and PCs to original state

Single use modules

Based on the use of the manikin, replace modules that are spent or damaged:

– Cricothyrotomy: Crico-tape and neck-skin

– Chest drain module pleura

Multiple-use modules

– Fluid filter

– IV Arm

– Pneumothorax bladders

– IO-modules (tibia and sternum)

– Chest rise bladders

– Lung bladders

– Manikin skins (body, legs, arms)

Before Storage or Shipping

Flush the IV arm with warm water and let fully dry before storing.

Detach the manikin's legs from the torso and pack into the transport cases as illustrated in *Manikin Setup*.

Installing and Upgrading SimMan 3G software

SimMan 3G software comes pre installed.

INSTRUCTOR PC AND PATIENT MONITOR PC

1   Power on computer and ensure no SimMan 3G applications are running.

2   DO NOT uninstall the SimMan 3G software from your computer. Visit www.laerdal.com/download to download the latest version of SimMan 3G and Laerdal Debrief Viewer. Select SimMan 3G and press "Click to Download" then follow the on-screen instructions to install.

3   In the installation menu – click the <Install SimMan 3G Software> button once. This will start copying files to your computer.

> *Note: That the copying process takes approximately 2-3 minutes. Once the copying process is finished, please follow instructions in the installation wizard.*

MANIKIN UPDATE

⚠ *Caution: Do not switch OFF the manikin during the following. Never update the simulator over WLAN (wireless):*

> *Please note that the version shown in these screenshots is subject to change.*

1   Make sure you have installed the software on the Instructor PC as described in the previous section.

2   Turn off the WLAN.

3   Switch on the manikin. Restart the manikin if it has been in use. Do not start the Instructor Application or Patient Monitor Application.

4   Connect a network cable from the manikin to the Instructor PC. Allow 60 sec from the time the manikin starts breathing for a connection to be established.

5   Execute < Start><All Programs> <Laerdal SimMan 3G><Manikin Update>.
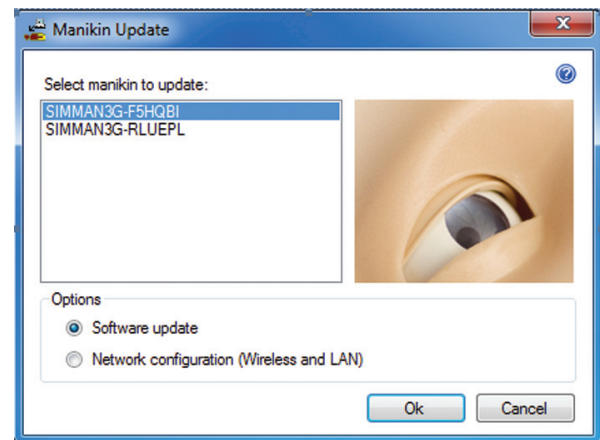
6   Identify your manikin in the <Select Manikin> dialog and select <Software update>, press <OK>.

7   The Manikin Update program will start identifying software versions currently installed. This will take about 2 minutes.
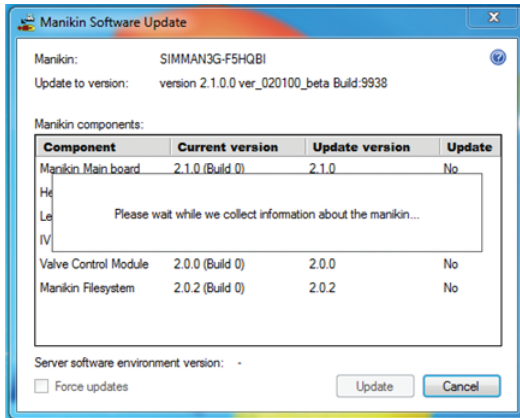
8   All programs and software versions are listed. The update status for each program is displayed under <Update>.
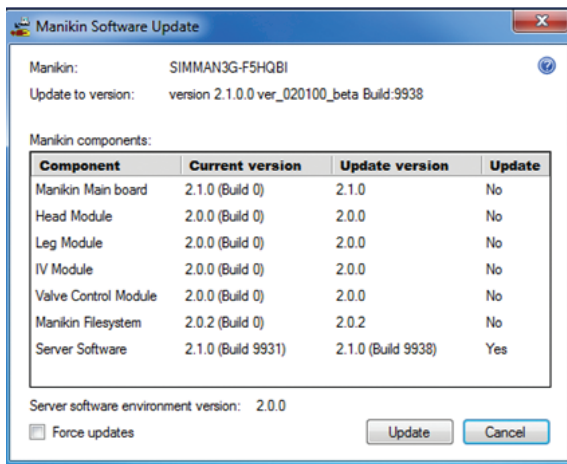
9   Click <OK> to begin updating the software.

10 Complete the update wizard.
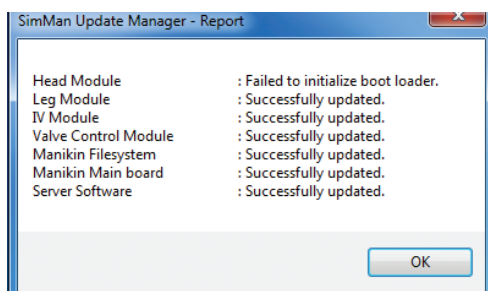
Note that some components might fail updating on first attempt. Please ignore this and allow the update process to continue.

The <SimMan3G> <Update Manager – Report> will show all updates and show which ones were performed successfully or failed.
•   Repeat from step 5 until all components are successfully updated.

•   Allow manikin time to save changes and reboot. Do not power off manikin until it starts breathing again.

TROUBLESHOOTING

1   Should the following message appear on the screen during the update, click <Yes> to continue the installing updates.
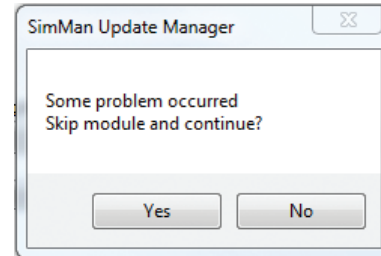
2   If a module fails to update, run the <Manikin Update> again. Should the same module fail repeatedly, check to see whether all internal wiring is connected and functioning properly.

ADVANCED VIDEO SERVER (AVS):
If you use an AVS with your SimMan system, please make sure that all components are updated with the latest software.

Replacing Crico Tape / Neck Skin

After creating an emergency airway through the cricothyroid membrane, replace the perforated membrane before starting a new simulation session.

1   Remove the neck skin (velcro fasteners behind the neck).
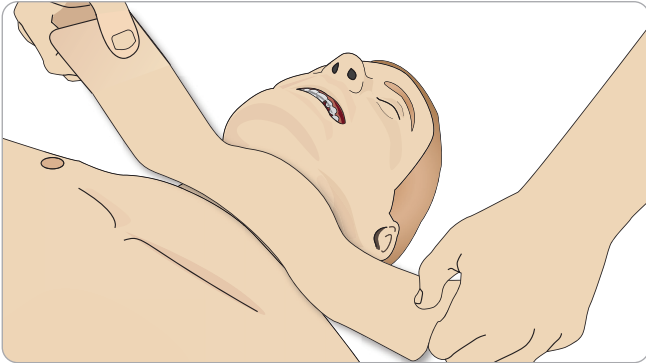
2   Remove the old strip of Crico tape.

3   Replace with a new Crico tape.
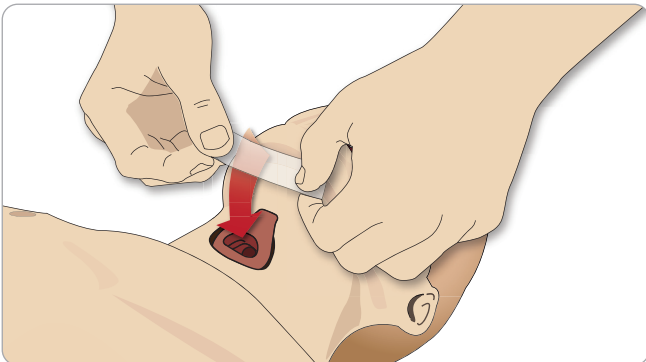
4   Ensure Crico-tape completely covers and seals the opening to prevent leakage while ventilating the manikin.
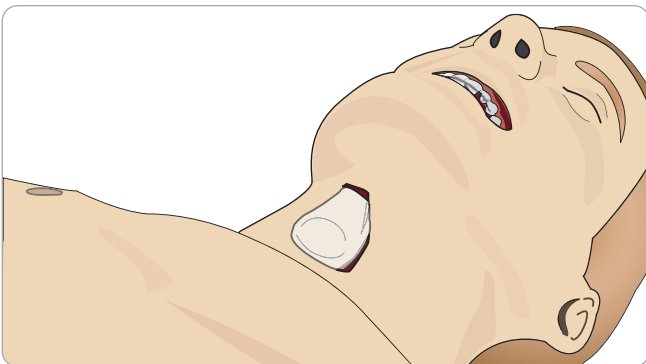
Replacing Chest Drain Pleura

The chest drain module's pleura skin should be replaced after each use.

1   Open the torso skin and remove the module from the chest.
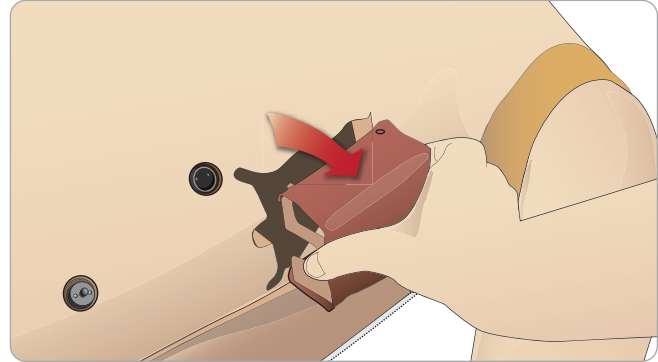
2   Remove the old pleura skin, and replace with a new skin and replace the module.
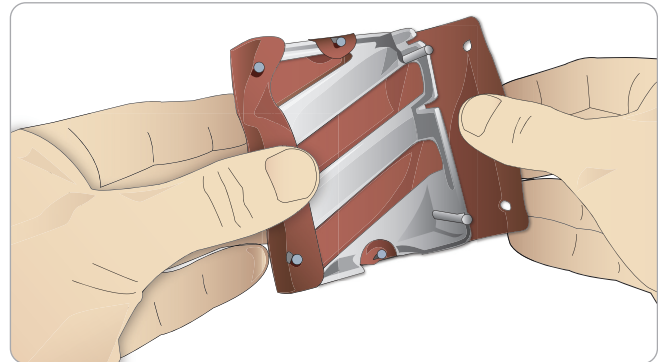
Replacing Pneumothorax Bladders

After multiple pneumothorax decompressions, the bladders may need replacement:

1   Open the torso skin to expose the chest plate. Lift the chest plate to reveal the pneumothorax bladders located in slots in the side of the chest plate assembly.

2   Slide out the used pneumothorax bladder.

3   Disconnect the tube and discard the old bladder.
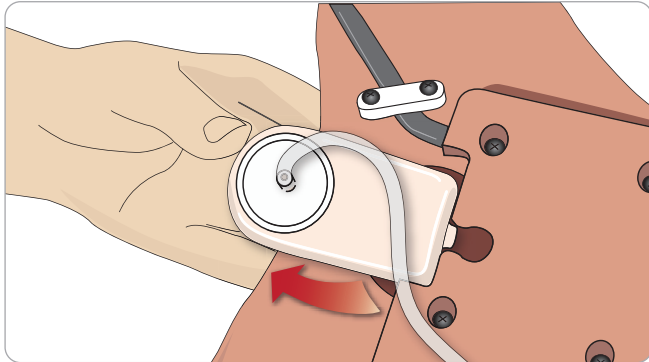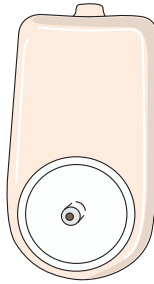
4   Insert the new bladder into the slot.

5   Reconnect the tube to the new bladder
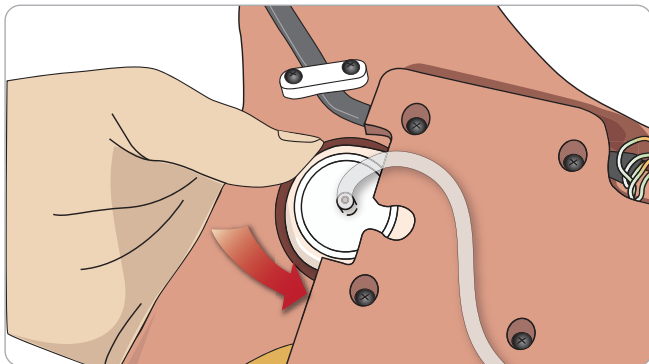
Replacing Chest Rise Bladder

If the chest rise bladders leak or are damaged:

1   Open the torso skin to expose the chest plate. There is one bladder on each side of the chest plate assembly.

2   Disconnect the tube from the bladder.
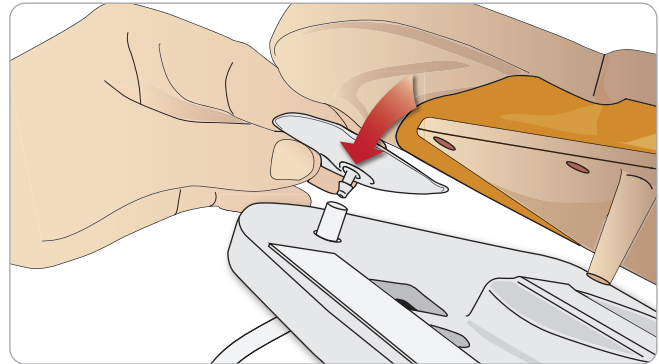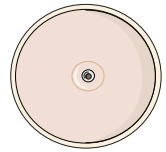
3   Discard the used bladder

4   Insert new bladder

5   Reconnect the tube to the new bladder

Left Leg to Pelvis – Tube Descriptions

Name/Label	Tube Color	Connector Description
Pneum L	Silicon	Barb connector
Pneum R	Silicon	Barb connector
Chest L	Silicon	Barb connector
Chest R	Silicon	Barb connector

IV Arm

A visual inspection should be performed after each use of the IV arm. If there is noticeable leakage from the veins or the skin is torn or damaged it is time to replace the IV arm. See page 12 for instructions on how to uninstall/install the IV arm. Contact your local Laerdal Representative for more information.

⚠ **Caution:** The internal veins are composed of latex.

Replacing Lung Bladders

If leaking occurs, the chest rise bladders (in the chest cavity) should be replaced.

1   Open the torso skin and put the stomach foam to the side.

2   Open the hinged chest plate upwards, to access the lungs.
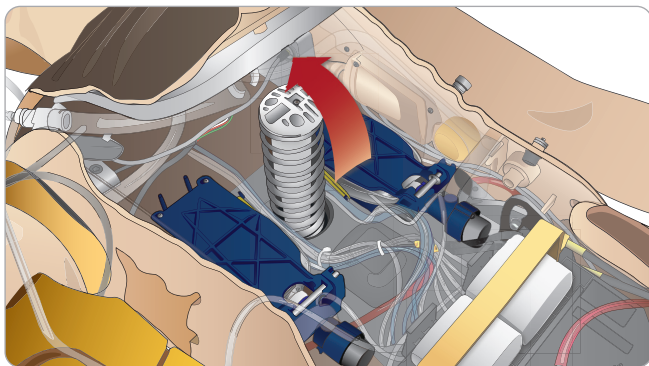
3   Remove the chest compression spring for easier access to the lungs.
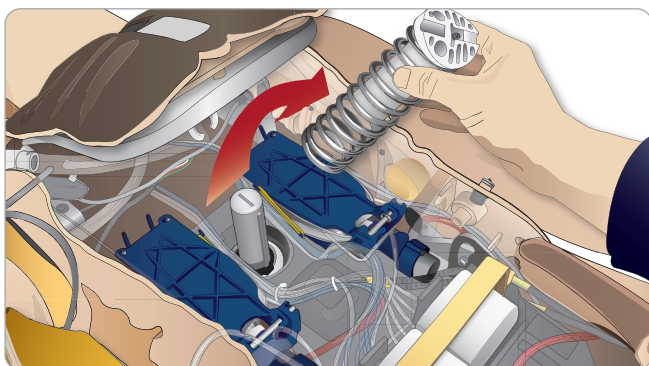
4   Unhook the yellow Lung Compliance bands from each side of the lung assembly.
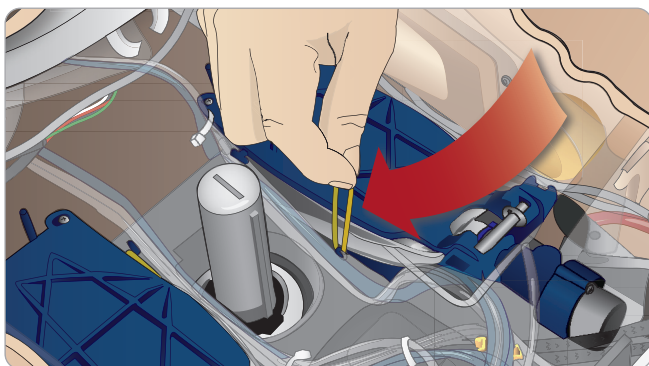
5   Open the hinged lung plate.

6   Pull the old lung out from its socket.
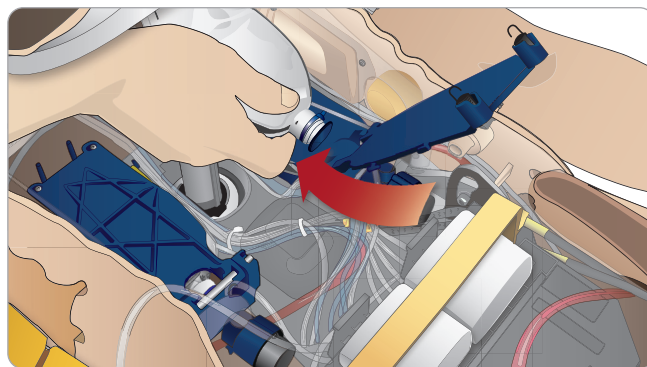
7   Reverse this process to insert a new lung.
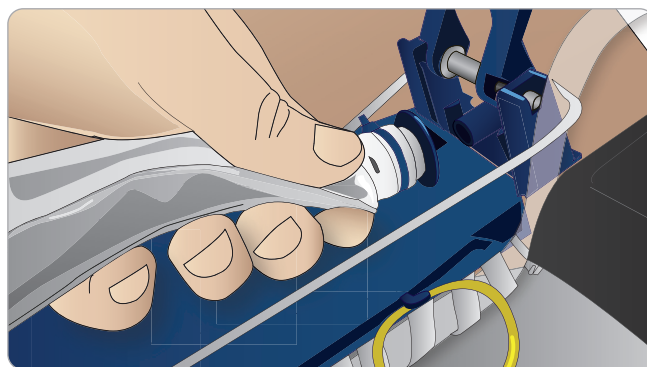
Note: Ensure that the compliance bands intersect between the two folds of the lung.

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Replacing Manikin Skins

The manikin skins may need to be replace if they become torn, perforated or stained.

1   Unzip and roll off the skin
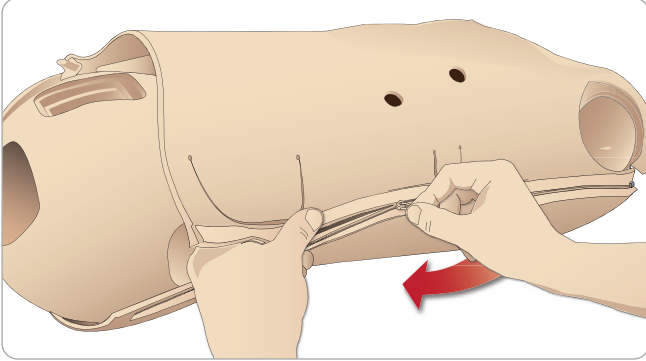
2   Applying powder to the inside of arm, torso and leg skins will help reduce friction and make replacing the skins easier.

To prevent the zippers from separating from the skin, make sure to properly position the skin halves and hold them together while zipping them closed.

Replacing Blood System Filter

If reduced blood flow is experienced, the filter may be clogged and needs replacement.

⚠ *Never run the manikin without filter.*
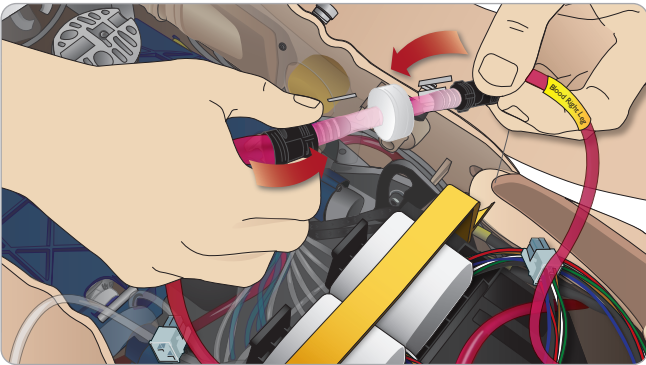
1   Turn off the manikin.

2   Remove genitalia with the catheterization assembly for easy access.

3   Disconnect the filter from the right leg and pelvis blood tubes and remove it.

4   Connect a new filter by reversing the steps above.

Troubleshooting

SYSTEM SETUP

Problem

- Lost data or total system failure (General System failure)

Solution

- Should system shutdown or all data is lost or corrupted; please contact your local Laerdal Service Center.

STABILITY AND CONNECTION IN MANIKIN CREATED NETWORK

Problem

- Connection between the Instructor Application and/or Patient Monitor and manikin is lost.

Causes

- Other software on PCs may interfere with our Instructor Application or Patient Monitor.

- Multiple network connections may interfere with transmissions between our software and manikin.

Possible Solutions

- Remove unnecessary software on PCs.

- Disable other networks.

STABILITY AND CONNECTION IN CLIENT MODE

Problem

- Connection between Instructor Application and Patient Monitor and manikin is lost.

Causes

- Manikin has been positioned where limited connectivity to external network exists.

- Other software on PCs may interfere with our Instructor Application and/or Patient Monitor.

Possible solutions

- Move manikin to improve connectivity to external network.

- Remove unnecessary software on PCs.

CHANGING MANIKIN WIRELESS NETWORK DISPLAY NAME

If operating more than one manikin, ensure that each manikin has its own unique SSID name. For more information see, section *Wireless and LAN configuration.*

VOICE CONFERENCE APPLICATION

Problem

- Sound from manikin to Instructor not working.

Possible Solutions

- Check that the microphone has not slipped out of place. Open the head skin zipper, located at the back of the head, enough to reveal the ears.

- Ensure that the microphone is positioned in the cup located towards the top of the ear with the black surface facing outwards.

VOICE CONFERENCE APPLICATION

Problem

- Instructor microphone not picking up sound.

Possible Solutions

- Unplug and re-plug the headset to your computer

- Ensure correct sound device is selected. In Voice Conference Application main menu, select <Options>, <Select Device>.

- Check volume settings in Windows. Ensure microphone is not muted.

THE DEBRIEF VIEWER

Problem

- Missing video capture - If the Web-camera does not record video for debriefing.

Possible Solutions

- Check that the web-camera's USB-cable is plugged into the Patient Monitor PC.

- Check the web-camera settings via the Profile Editor. Ensure settings match the web-camera setup.

- Ensure you use the correct profile file.

- Ensure that there is only one USB web-camera connected to the PC.

- The video recordings will be stored on the PC connected to the web camera. Ensure the computer connected to the web-cam is available when transferring to debrief.

Problem

- Patient Monitor video capture is not included in the debriefing.

Possible Solutions

- Check that the name of the Patient Monitor PC being used corresponds with the setting in the profile in use.

MANIKIN

Problem

- Unpredictable behavior

Possible Solutions

- Manikin malfunctions may be caused by loose cables, tubes or connectors. Open the torso and check if any items appear to have become disconnected or are leaking. See section: *Manikin Setup - Opening the Torso.*

- In case of fluid leakage, power off the manikin and contact Laerdal Technical Service.

Problem

- Identifying a single manikin if multiple manikins in network?

Solutions

- When checking the manikin's pulse, the <Select Manikin> dialog

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of the Instructor Application will indicate which manikin is pulse palpated.

AIRWAY CONTAMINATION
Problem
- Manikin airways have become contaminated from mouth-to-mouth rescue breathing

Solution
- Clean the outside of the manikin with manikin wipes. Clean the inside of the oral cavity with manikin wipes. Change the lung bladders; see: *Maintenance - Replacing Lung Bladders*.

  Note: The manikin airways are not designed for mouth to mouth rescue breathing or to be disinfected.

CHEST MOVEMENT
Problem
- No chest rise on manikin.

Solution
- Check that manikin is switched ON.
- Check that manikin is not in sleep mode due to inactivity. Reactivate the manikin.
- Check that awRR is not set to zero on Instructor Application (Patient Case or scenario)
- Check that airway complications like maximum air resistance or laryngospasm are not set.
- Check if the internal compressor is switched off. See: *Turning the Internal Compressor Off/On.*
- Check that any external compressed air source is switched off and that the air tube is disconnected from the manikin.
- The internal compressor may have overheated. Wait approximately 20 minutes for it to cool down. Remove blankets or covers from the manikin, open the torso skin to facilitate cooling.
- Chest-rise is set to bilateral (for example if ET-tube is inserted too far into the bronchia).
- Chest-rise bladder is leaking or tubing to chest-rise bladder is twisted, kinked or disconnected. Replace chest-rise bladder if it is leaking, see *Maintenance: Replacing Chest Rise Bladders*.
- Check air tubing for leakage; check that all connections are intact. Replacing tubing if necessary.
- Shallow chest movements and the internal compressor runs continuously. The internal compressor may be worn - contact Laerdal Technical Service.

BLOOD SYSTEM
Problem
- No blood flow

Solution
- Make sure that the internal reservoir is filled with fluid.

Problem

Too low flow.

Solution
- Clean the blood system
- Check the flow setting in the Instructor Application
- The blood system may need to be re-calibrated. Contact your local service representative.
- Replace filter

Problem
- Air when bleeding

Solution
- Bleed the blood reservoir empty and refill.

Problem
- Simulated blood is seen leaking from the back of the right leg during filling or when the manikin is turned off.

Solution
- The internal reservoir may need to be replaced. Contact your local service representative.

Problem
- Can't fill the blood reservoir

Solution
- The filter may be clogged. If so, order a replacement fill bottle.

MANIKIN LIMBS
Problems
- Lack of motion in the legs

Possible Solution
- Loosen and re-adjust the hip joint nuts on the inside of the pelvis. See "Manikin Setup" for details on how to attach the legs

LUNGS
Problem
- Lungs not functioning properly

Possible Solution
- Check that the Airway resistance is not set to maximum in the Instructor Application.
- Open the torso and chest plate. Check that the lungs are free to expand and are not restricted by any cables.
- Check that the lung bladders are properly connected, and that the tubes are not twisted.
- Check that the lung bladders are in a horizontal position and inserted correctly. Ensure that the lung compliance O-rings lie between the folds of the lung bladders.
- Check for flaws or ruptures in the lung bladders.
- Check that the two lung compliance O-rings are fitted correctly. Replace O-rings if they appear to be damaged.
- Check that there are no obstructions inside the manikin airways which may block air flow.
- If there is no change when adjusting lung compliance, contact Laerdal Technical Service.

- If there is no change in lung resistance, contact Laerdal Technical Service.

MECHANICAL NOISE DURING AUSCULTATION

In the Instructor Application, click <auscultation focus>.

BATTERIES

Problem

- Battery life is less than 150 minutes with healthy patient and fully charged batteries.

Possible Solutions

- Batteries may be old, (recommended lifetime is 200 discharge cycles). Insert new batteries.

- Compressor may not function properly; consult your local Laerdal Technical Services Centre.

PULSES

Problem

- Cannot feel pedal pulses

Possible Solutions

- Skin may be too tight over pulse units – readjust skin and reboot.

CLINICAL FEATURES – PNEUMOTHORAX BLADDERS

Problem

- Experience problems with pneumothorax bladders.

Solution
- Check tubing connection at base of the bladder to ensure that tubing has not been disconnected.

MANIKIN SHUTDOWN

Problem

- The manikin is unresponsive.

Solution
Press and hold the <ON/OFF> button for 10 sec to force the manikin to shutdown.

Main Specifications

Size, weight

Dimensions (manikin only): 1800mm (l) × 550mm (b) chest
(5.90 ft × 1.80 ft)
Weight (patient manikin only): 38,5kg (85 lbs)
Weight (with clothes) 40 Kg (88 lbs)

Manikin power

External power: Input voltage 24VDC, 6.25A
Internal batteries (two): Each 14.8V, 4.6Ah, Lithium-Ion

Only use the SimMan 3G external power supply and batteries.

Air & CO$_2$ Pressure

Internal air tank: Max 0.85 bar
External air connection: Max 1.4 bar
External CO$_2$ to manikin: Max 1.4 bar

Temperature Limits

Operating temperatures: +4 °C to 40 °C (39 °F to 104 °F)
Storage temperatures*: -15 °C to 50 °C (5 °F to 122 °F)

* Clean the blood and fluid systems as indicated prior to long term storage.

Environment - Manikin only

Relative humidity: 20% -90% (non-condensing)
DO NOT use outdoors in wet conditions.
Not tested with salt spray.

RF Communication

WLAN frequency ranges:
2.4 GHz WLAN, channels 1-11.
5 GHz WLAN, channels 36, 40, 44 and 48.
Operation range: 100 m (300 ft) outdoors.
RFID frequency ranges: 13.56 MHz
Operation range: < 0,2m

Material Chart for Manikin

Clothes: Cotton, Nylon
Skins and airways PVC (DEHP free)
External hard plastics: PP, PA, PC, PC/PET
Inner plastics: Silicone, TPU, TPE, PVC, Nitrile
PA, PA+GF, PC, ABS, POM, HDPE, PET, Latex

Metal components: Aluminum, Brass, Steel

Minimum Hardware Requirements:

- Core 2 Duo or better

- 1 GB RAM (2 GB recommended)

- 1GB hard disk space,

- 1024x768, 1280x800, 1280x1024 or better

- 16bit color resolution or better

- 100% DPI required

- Optical drive required for installation

Minimum Software Requirements

- Windows XP or Windows 7

- DotNet 3.5.1

Acceptable Fluids for Manikin

Cleaning Fluids
To clean the manikin's fluid system use one of the following:
- 60% Isopropanol alcohol

- 70% Ethanol

Simulated IV Fluids

Only use purified water to simulate IV fluids:

- Distilled Water
- Deionized Water

Spare Parts and Accessories

Catalogue Numbers

Substitute XX with the number for your local language version

Transport and Storage Cases

212-17950	Case soft, torso
212-18050	Case soft, legs
212-07150	Carry Case, Rugged

Manikin Parts

212-08850	SimMan 3G Mystic Manikin
212-11350	Arm bushing (left and right)
212-09650	Arm left, BP Arm complete
212-09050	Amputated Right Arm
212-07850	Amputated Left Arm
212-15050	Leg right, complete
212-16050	Leg left, complete
212-09950	Amputated Lower Right Calf
212-08150	Amputated Left Thigh
380460	Neutral Genitalia (default)
212-12050	Genitalia Kit with Urine Catheterization module
212-12250	Battery manikin, internal (pkg. 2)
212-12350	Thigh-joint connector
212-12450	Battery clip, manikin internal
212-12550	Panel cover (left and right)
381107	Soft Teeth
212-14250	Arm Adaptor SimMan/SimMan 3G
212-07650	Arm Adapter Screw

Power cords

260305	US cord
260306	EUR cord
212-18650	PC Power Pack (110-240V)
260307	UK cord
212-07050	External Battery Charger

PCs and Equipment

212-18250	Sleeve Instructors PC
212-094XX	Rugged Patient Monitor
212-18150	Sleeve Patient Monitor
212-091XX	Rugged Instructer PC
212-19650	Headset with microphone
245-96050	Webcam

SimMan 3G Clothing

212-17450	Shirt
212-17650	Boxer Shorts
212-17750	Belt
212-17550	Trousers

Fluid and Blood System Equipment

212-17150	Blood Fill Unit
212-18950	Fluid Fill Unit
300-00750	Blood Concentrate
210-20050	Wound Tape Kit
212-18550	Wounds Kit

Consumables

212-21050	Neck Skin Kit (6)
212-08950	Torso Skin, No ECG
212-09550	Arm right, IV arm complete
381402	Deltoid Pad
212-15150	Skin right, leg
212-26050	Skin left, leg
212-26250	Leg Skin Left Tibial IO
381106	Rigid Teeth
212-24150	Pneumothorax Bladder Set (pkg. 2)
212-24250	Pleura, chest drain (pkg. 20)
212-11050	Chest Rise Bladder (pkg. 4)
212-21150	SimMan 3G Cricothyroid Tape
250-21050	Airway Lubricant
212-24150	Pneumothorax Bladder Set (pkg. 2)
212-24250	Pleura, chest drain (pkg. 20)
212-24350	Sternal IO Unit (pkg. 4)
212-25250	IM Pad (Intra-muscular Gluteal Pad) (pkg. 4)
212-26150	Tibial IO Unit (pkg. 4)
212-11150	Lung Bag (pk. 2)
212-11250	Chest Drain Ribs Set (left and right)
212-25350	Inline Filter, Blood (pkg 5)
212-09150	Left IM Thigh Skin
212-09250	Right IM Thigh Skin
212-09750	Left Amputated Thigh IM Skin
212-09450	IM Foam Pad

Modified Clinical Accessories

| 212-17050 | SpO$_2$ probe with USB connector |
| 200-00550 | Cuff assy, Blood pressure |

Tool Kit

| 212-18350 | Repl. Tool Arm, Allen Key 8mm |

Support Material

| 212-01350 | Directions for Use |

SimMan 3G Software

| 212-19550 | License (1) Instructor Application |

Laerdal
helping save lives