

SimMan 3G

Directions for Use



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SimMan 3G Help

Directions for Use

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

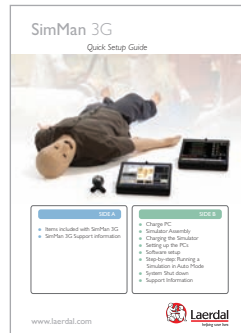
Original Manufacturer's User Manuals

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.

Quick Setup Guide

The *Quick Setup Guide* is an illustrated step-by-step guide for initial assembly and setup of the *SimMan 3G* system. The *Quick Setup Guide* also includes an overview of spare parts, consumables and accessories for *SimMan 3G*.

Quick Setup Guide (212-19250)



Quick Reference Guide

The *Quick Reference Guide* is a pocket-sized booklet to aid learners with daily setup and use of *SimMan 3G*.

Quick Reference Guide (212-19350)



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
- DebriefViewer

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

 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.

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, respond to light and react according to the clinical state of the manikin.
- RFID Technology for automatic recognition of drugs and airway devices.
- Auto-measurement of volume and concentration for drugs and IV fluids.
- 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.
- Convulsions simulate seizures or small hand movements.
- 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 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 de-briefing.

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.

Global Warranty

See the Laerdal Global Warranty, or see www.laerdal.com

Patents Pending

US and International patents pending.

Country of origin - *SimMan 3G* is made in Norway

Printed in Norway

Manufactured by Laerdal Medical AS

Tanke Svilandsgate 30
P.O. Box 377
4002 Stavanger
Norway

Important

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.
- Where gloves as required during simulation Scenarios
- After using the fluid and/or blood system, flush the system with a solution 60% Isopropanol alcohol or 70% ethanol.
For cleaning instructions see Section Setup for Simulation, 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.

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.

Environment

In cold conditions open the condensation valve on the back of the manikin's right leg and wait until the manikin has reached room temperature before starting up the manikin.

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 - Fill the manikin's fluid system with a solution of 60% Isopropanol alcohol or 70% ethanol to inhibit algae.

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 important and recommended *Windows* updates from Microsoft. General security measures should be taken before browsing the internet.

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.

Cautions and Warnings

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


General Manikin Handling

- 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.
- Never use the *SimMan 3G* manikin outdoors in wet conditions, as this pose a shock hazard or damage the manikin.
- 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° C).
- Using a defibrillator in temperatures over 35° C (95° F) may cause overheating.

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.

The ECG connectors are designed exclusively for ECG monitoring and must not be used for defibrillation. Defibrillation on the ECG connectors will damage the internal electronics of the manikin and may cause personal injury.


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. (Try to illustrate this point and a scale factor). 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:** Avoid use in all flammable environments. For example high levels of pure oxygen, should be avoided during defibrillation.

 **Warning:** Ensure good ventilation if concentrated oxygen is used near the manikin.

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


 **Warning:** The manikin torso must always be kept dry. Allow the manikin to acclimate before defibrillating. Sudden changes in temperature (moving the manikin from a cold environment to a warm environment and vice versa) may result in, condensation collecting on the base board and pose a shock hazard.


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 and its compartments 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.

Internal Compressor Servicing

The internal compressor should be serviced every 12 months under normal operating conditions.

Shorten the servicing period to 6 months if it is used for more than 20 hours per week or in temperatures at, or in excess of 25 °C (77 °F) for extended periods.

For more information on the internal compressor, see section: *Setup for Simulation - Using the Internal Compressor*,

Manikin Setup

Transporting SimMan 3G

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



Each case has an extendable handle and may be stacked onto the integrated wheel frame for increased mobility.



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.

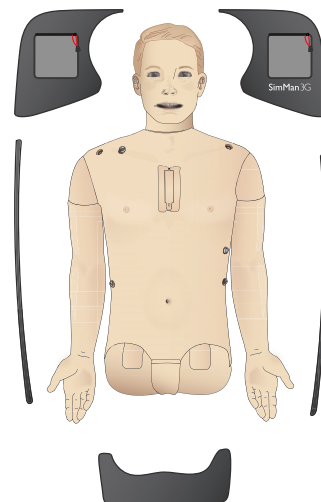
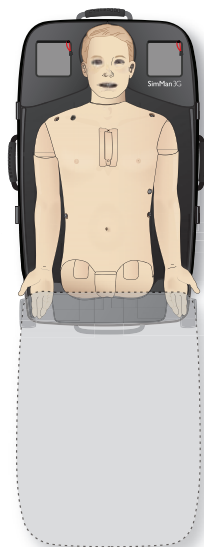
For instructions on how to disassemble the legs, see sections: *Manikin Setup - Attaching the left and Attaching the right leg.*



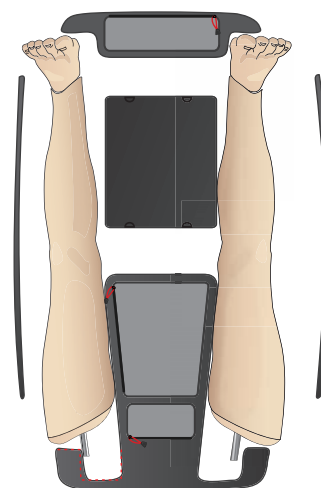
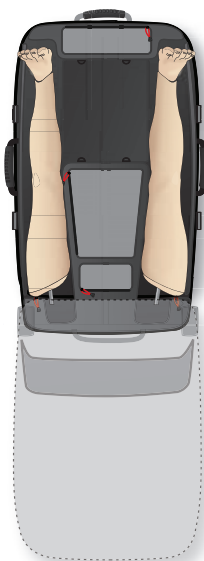
Warning: The suitcases are heavy. Always ensure that they are firmly secured during transportation and storage so as not to cause personal injury or damage to the product.

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

Torso Case with foam inserts

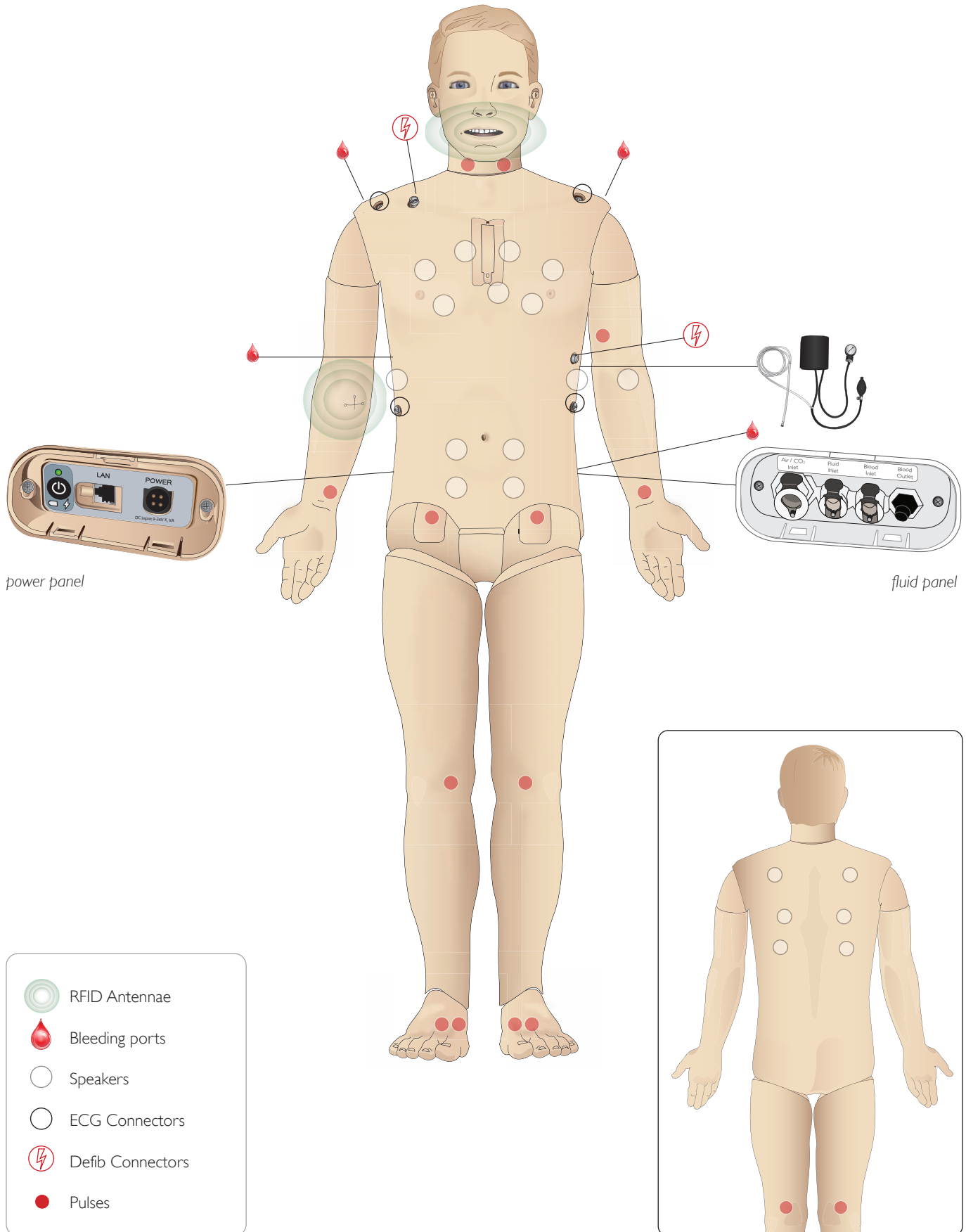


Leg Case with foam inserts



For more information on SimMan 3G accessories, see section: - *Spare Parts, Consumables & Accessories.*

SimMan 3G Overview



Opening the Torso

Open the manikin torso for the following procedures:

Attaching or replacing limbs

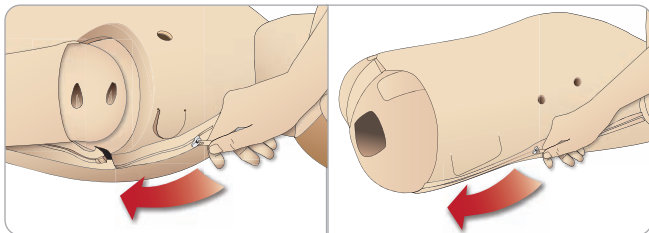
- Attaching or dismantling the manikin legs and arms
- Exchanging default arms for optional IV or trauma arms.

Maintenance tasks

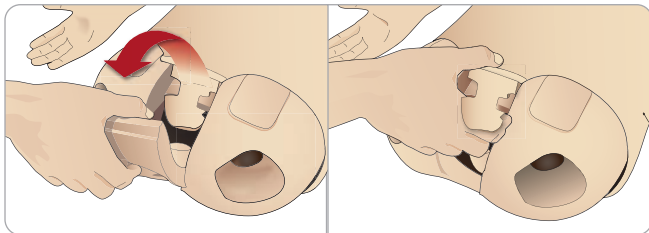
- Changing the manikin batteries.
- Replacing the pneumothorax bladders, chest-rise bladders, lung bladders, IO modules and chest drain modules.
- Replacing the torso skin.
- For general inspection.
- Removing WLAN adapter.

To open the torso skin

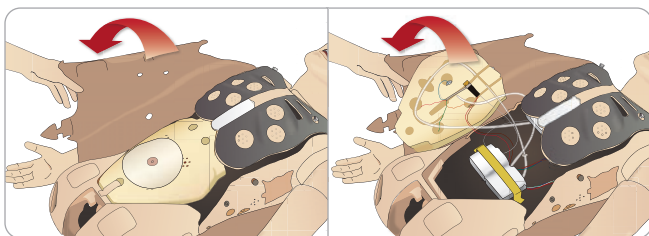
1. Unzip the zippers on the manikin's left shoulder and torso.




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.*

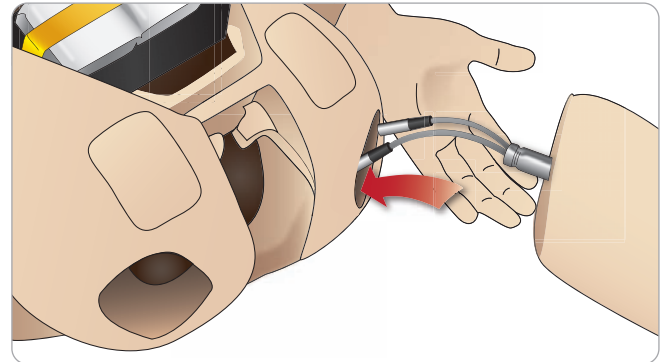
5. Replace the stomach foam and close the torso skin, perform steps 1- 4 in reverse.

Attaching the Left Leg

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

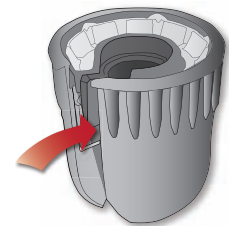
Open the torso to access the hip joint connectors. To open the torso follow steps 1 – 4, *Opening the Torso*.

1. Align the left leg bolt and cables with the pelvis socket.

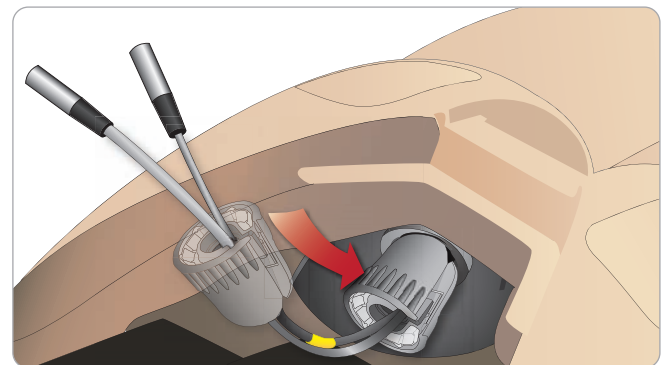


2. Feed the leg bolt and cables through the socket and into the torso. Do not pull the leg by the cables and/or tubes.
3. Carefully push the leg in towards the pelvis to form a snug fit.

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:

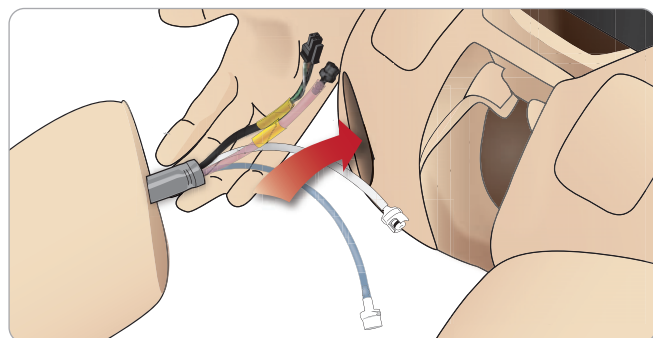
Left Leg to Pelvis – Cable and Tube Descriptions

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

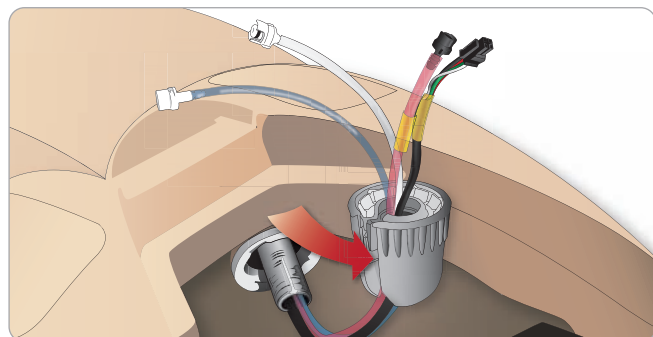
Attaching the Right Leg

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 leg 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:

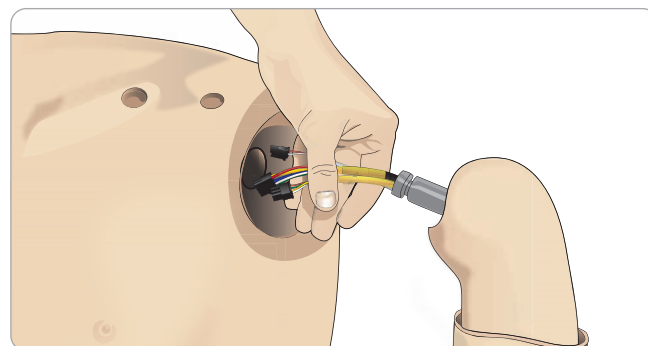
Right Leg to Pelvis – Cable and Tube Descriptions

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

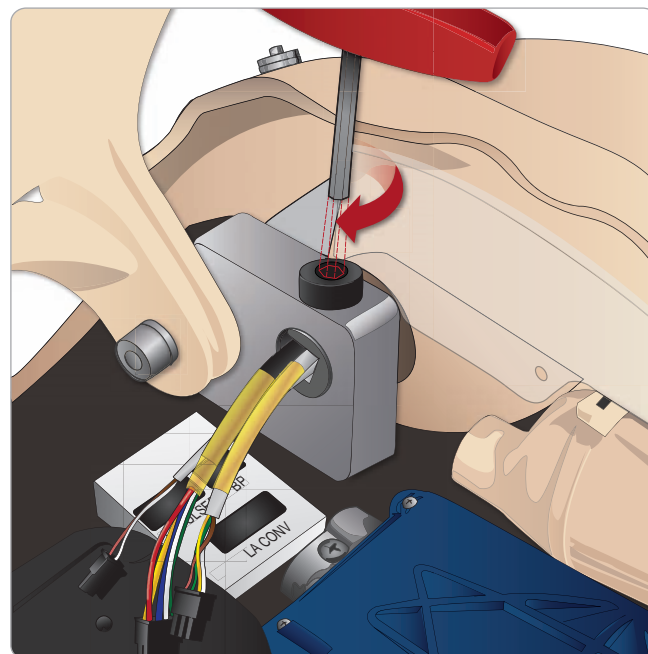
Attaching the Left Arm

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.

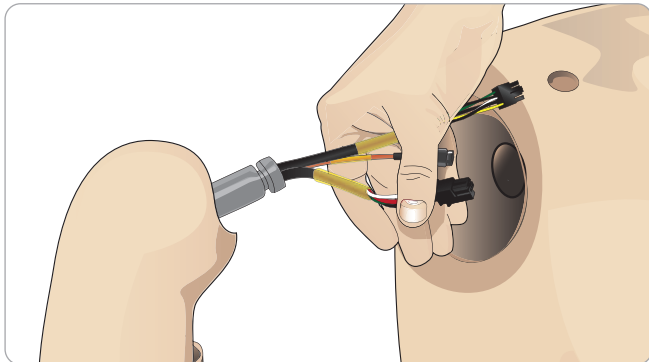
Left Arm to Torso – Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
LA Pulses	Grey cable	Black rectangular connector; 6 lead
BP	Grey cable	Black rectangular connector; 2 lead
LA Conv	Black harness cable	Black rectangular connector; 8 lead

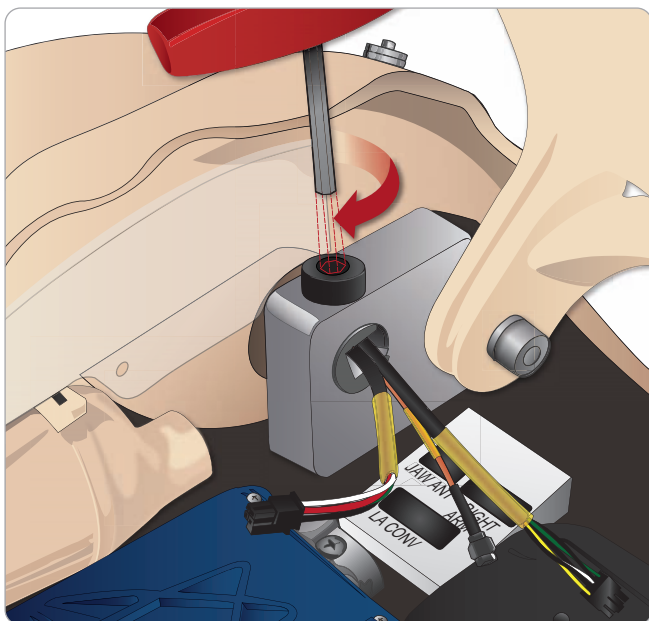
Attaching the Right Arm

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

1. Align the arm axle with the shoulder socket.



2. Feed the cables from the arm axle through the shoulder socket.
3. Push the axle into the bracket until it is flush with the inside of the bracket.
4. Tighten the shoulder screw with the Allen wrench.



5. Connect the corresponding cables as shown below.

Right Arm to Torso – Cable and Tube Descriptions

Name/Label	Tube/Cable Color	Connector Description
Right Arm	Black harness cable	Black rectangular connector; 4 lead
Jaw Ant	Co-ax copper metallic	Round silver connector
To LA Conv	Black, insulation	Black rectangular connector; 8 lead

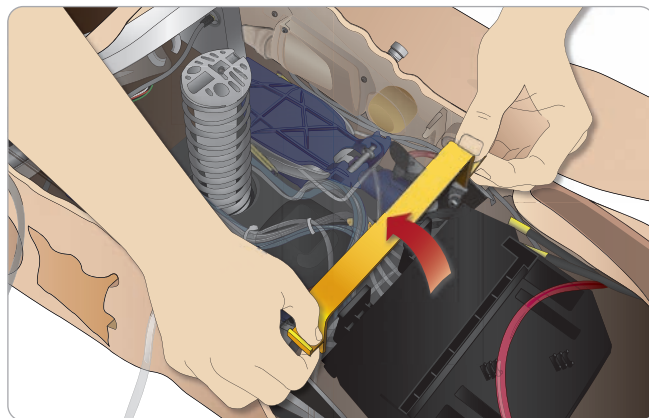
Attaching the Trauma Module or IV Arm

Please see the instructions supplied with the Arm adapter kit for information on attaching the Trauma Module or IV Arm.

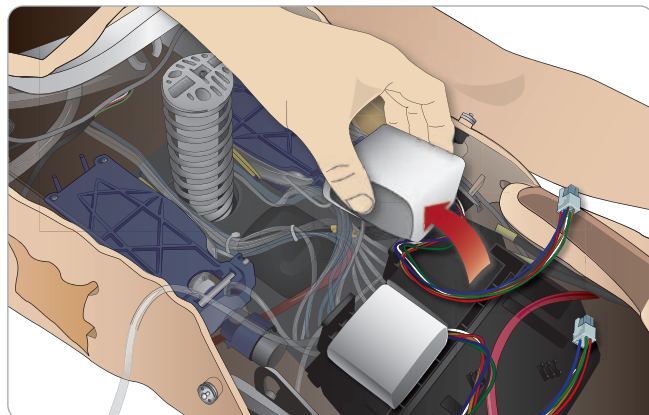
Inserting and Connecting the Batteries

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

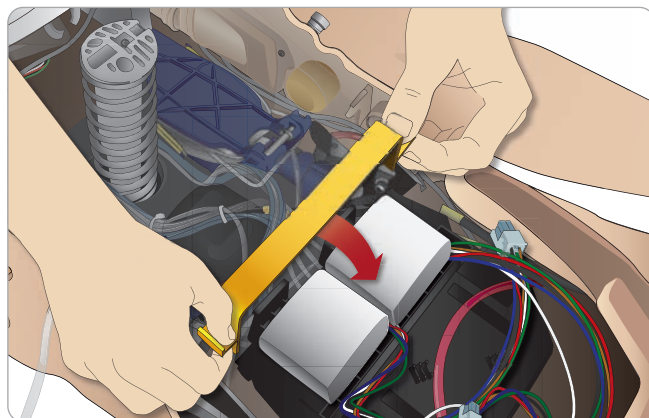
1. Release the battery clamp by unhooking the clips on either side.



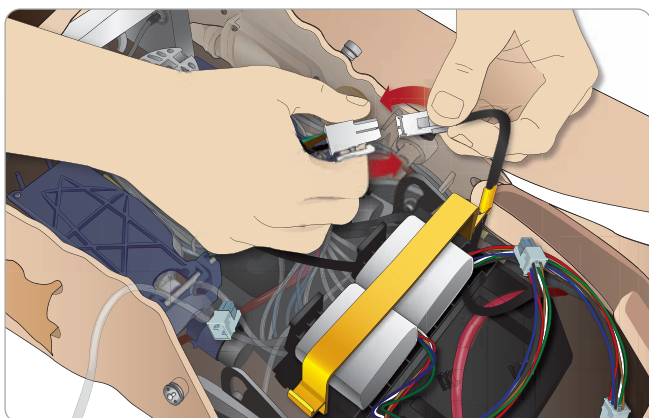
2. Insert both batteries into the battery tray.



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 an external power supply in the range of (20V - 24V)

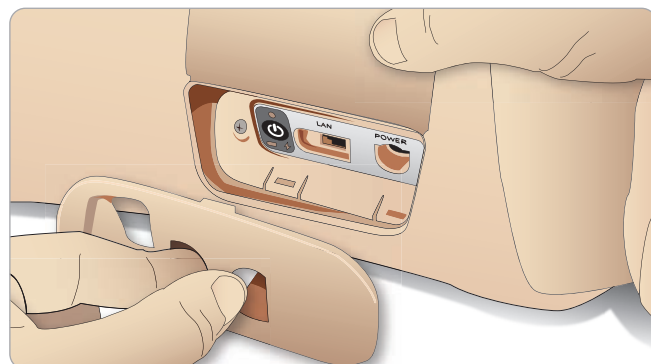
Battery - Cable and Tube Descriptions

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

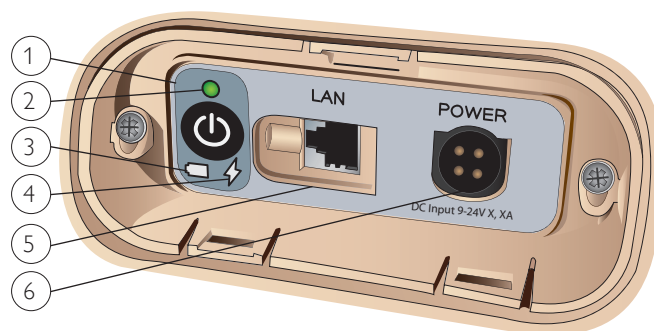
For more information on charging the batteries see section, *Manikin Setup, Battery Charging and Use.*

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

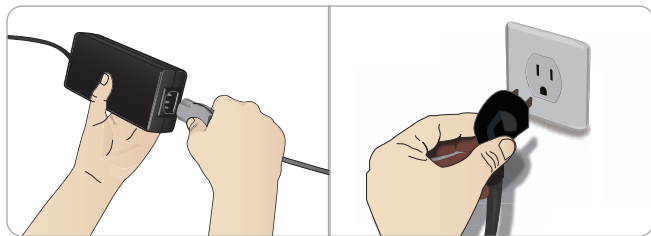
LED Color	Power Status	Battery Status	Charge Status
Red	Power Status*	0% - 20%	Not changing**
Yellow	Start up	20% - 70%	Charging
Green	Running	70% - 100%	Charge almost complete***
No light	Off	Off	No charge****

* 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.

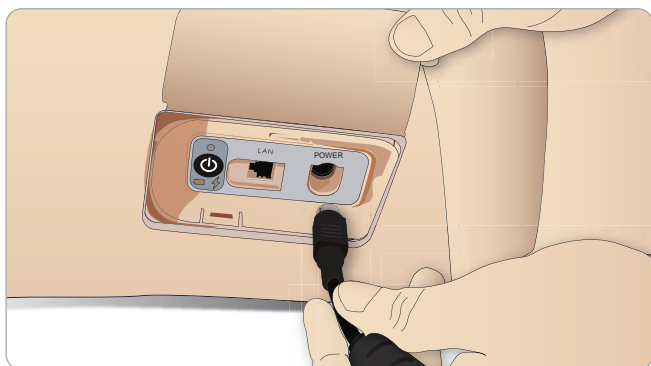
Manikin Setup

Charging the Batteries inside the Manikin

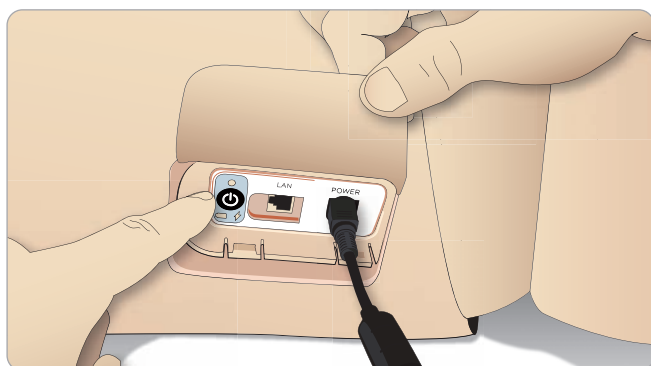
1. Connect the manikin to the external power supply with a power cord and plug that meets local specifications.



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.

Charging Batteries with External Charger

Charging batteries inside the manikin

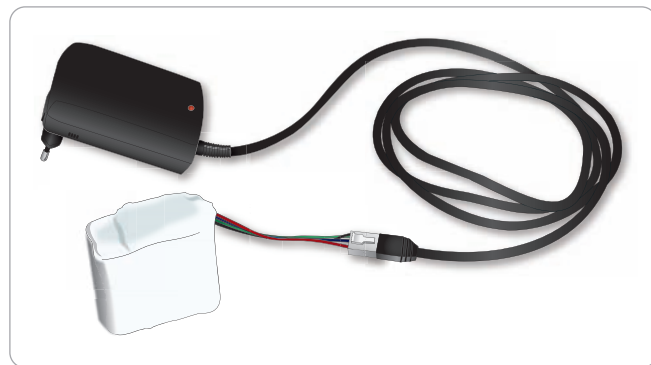
1. Connect the manikin to the external power supply.
2. The battery indicator on the power panel shows the charge status of for the internal batteries.

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

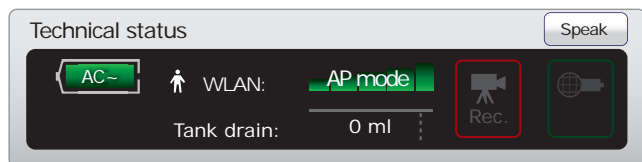
Light Code	Light Color	Characteristic
Standby	Yellow	Steady
Pre-charge	Yellow	Normal Blink
Rapid charge	Green	Rapid
Maintain	Green	Normal Blink
Ready	Green	Steady
Wait	Alternating	Alternating
Error	Yellow	Rapid

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: 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 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 the batteries are removed while the simulation is paused, the manikin will shut down and simulation data will be lost.
- ⚠ Warning: Dispose of the battery according to 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.

For more information on battery use and battery hazards, please see the battery manufacturers' *Directions for Use*.

RFID Tag Setup

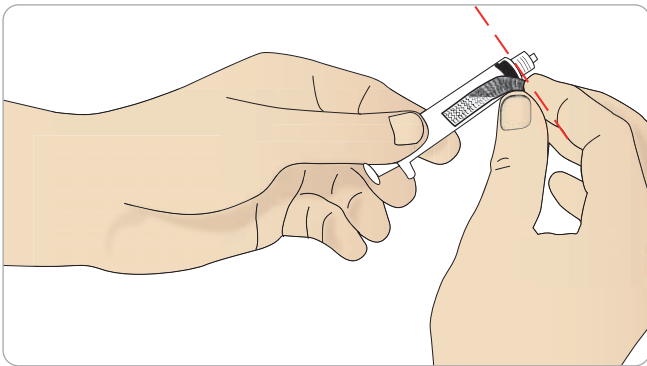
The *SimMan 3G* RFID (Radio Frequency Identification) system, features two antenna locations. One in mouth and another in the right arm. Whenever a RFID tagged device comes within range of the antenna, it is automatically registered by the system. For automatic drug recognition to function, ensure that all syringes or devices carry an RFID tag.

RFID tagging Syringes / Airway devices

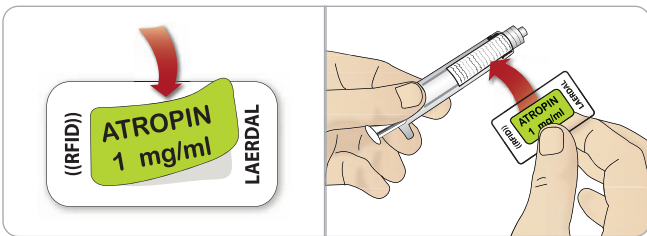
The RFID tags come as part of the *SimMan 3G Drug and Airway tag Kit*. Tags are pre-printed with information to identify drugs, drug concentration or device names.



1. Attach a strip of Velcro to the syringe or airway device of your choice.



2. Place the RFID sticker over the RFID sticker and attach it to the Velcro.



Note: When tagging syringes with drug tags, ensure that the tag is attached as close to the end of the needle end as possible.

Note: When tagging other devices, attach the tag to the part of the device that would be in close proximity to the manikin.

You can choose to use your own drug labels on the RFID tags. Ensure that the drug identification and concentration is consistent with that of the RFID tag's coding.

Using RFID Tags

See the *Instructor Mode* help file for more information on how drugs and drug concentrations can be registered manually by the instructor.

RFID tag use for Airway Devices

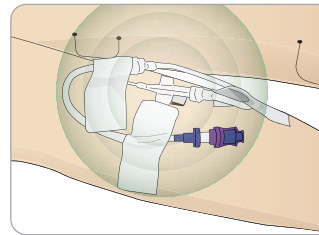
For reliable RFID recognition in the mouth region, ensure that the RFID tagged device is brought within range of the antenna. The range of the antenna in the mouth is 10cm.

IV Setup for RFID recognition

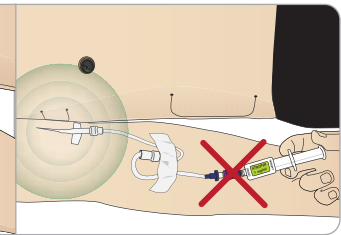
Use your own equipment to set IV extension tubing keeping in mind that the point of insertion must be within range of the RFID antenna, located around the IV port. If the point of insertion of the IV fluid is out of range of the antennae the administered drugs will not be registered.

See the correct and incorrect IV setup for *SimMan 3G*, US catheter below:

Correct



Incorrect



It may take some seconds before the RFID tag is registered.

Note: Only allow one RFID device at a time to come within range of the antenna. Only one RFID device can be registered at a time.

Preparing SimMan 3G 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 under the *Manikin Setup* section.
- 2 Connect and fill all Bleeding ports and modules if necessary. Fill the urine bladder if necessary.
- 3 Connect the manikin batteries and close the torso skin. See section: *Inserting and Connecting Batteries* for further instructions.
- 4 Connect the external power supply to the manikin to charge the manikin batteries. See section: *Battery Charging and Use*.
- 5 Close the condensation valve on the back of the manikin's right leg. See section: *Opening the Condensation Valve*.
- 6 Switch on the manikin. Wait until the manikin begins breathing before switching on the Instructor PC.
- 7 Start the separate Patient Monitor PC if applicable and connect the Web-camera to the USB port of the PC.
- 8 Start the Patient Monitor Application software. The SpO₂ USB probe can also be connected to the Patient Monitor PC. See section: *Starting the Patient Monitor Application*.

- 9 Start the Instructor PC and connect the headset.
- 10 Start the Instructor Application software. The application will search for all available manikins. See section: *Launching Instructor Application*.
- 11 Select a patient case in Auto Mode or pre-programmed scenario via Instructor Mode to start the simulation.
- 12 The simulation system is now ready to start the simulation. 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.

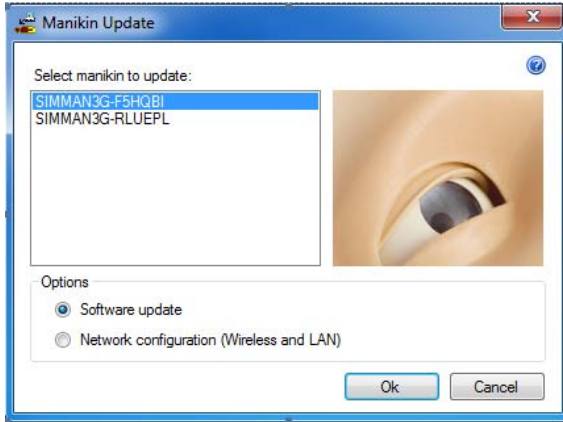



Changes or updates of the computer hardware (e.g. new hard drive or mother board) may render the license invalid. Please contact your local Laerdal support for assistance for re-activating the license.

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

Wireless and LAN configuration

The Manikin Update program has functionality to configure the network behavior of the SimMan 3G manikin.



 *For more information on Wireless and LAN configuration, see the Manikin Update Help file (Press the <F1> key on the PC keyboard).*

TO ACCESS THE NETWORK CONFIGURATION:


Select the <Wireless and LAN configuration> radio button, then click <OK>.

The network configuration window will then be displayed. This window always contains the following information and configuration options.

- Manikin Computer name - Set the manikin computer name.
- Operation mode - Choose one of the following modes:
 - 1 **Access point mode.** Configures the manikin adapter as a software access point which client computers can connect to. This is the default configuration of the manikin.
 - 2 **Station mode – External.** Configures the manikin so that it connects to an external wireless network/router. The client computers should connect to the same external wireless network. Recommended when using the Laerdal AVS system.
 - 3 **Station mode – Adhoc.** Creates or connects to an adhoc wireless network, where the client computers and the manikin are connected to each other.

Each configuration option is described in the sections below:

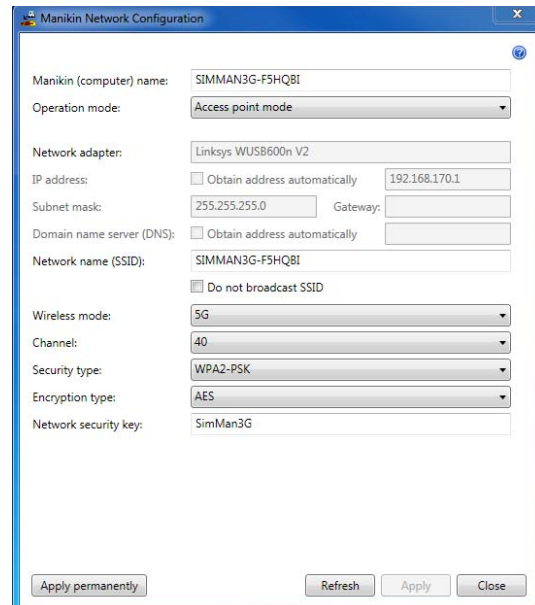
- **Network adapter.** Displays the description of the network adapter on the manikin. If this field is empty the manikin adapter is not in place or is incompatible with the network configuration software. Open the stomach of the manikin and ensure that the wireless adapter (a two inch black memory-key sized USB device) is in place.
- **Show configuration file retrieved from manikin.** Enabling this will show the full XML configuration file for the network configuration. This contains more information than when it is not enabled, but care should be taken if applying changes directly in the XML file.
- **Apply permanently.** The “Apply permanently” button will save all changes since last manikin restart to the manikin hard drive. This includes any previous network configuration changes. Please make sure that the manikin has been restarted immediately before changing the network configuration and clicking the “Apply permanently” button.

 *Warning: Please be sure to have a working manikin configuration when using this button, since it otherwise might be impossible to get it working again without a Laerdal service technician.*

- **Refresh.** Retrieves the current manikin network configuration. This is only needed if the network configuration changes by other means than this program.
- **Apply.** Applies the network configuration changes to the manikin in a non-permanent way. Thus if the manikin is restarted the changes will be reverted.
- **Close.** Closes the program.

1 ACCESS POINT MODE

Configures the manikin adapter as a software access point which client computers can connect to.



Note: It is not possible to turn off the WLAN radio in Access Point Mode. To turn off the WLAN radio use Station Mode - External or Station Mode - adhoc.

Settings:

- **IP address.** The static IP address of the manikin network adapter. This value cannot be changed in access point mode. Contact support if it is absolutely required that this value is changed. The manikin has a DHCP server which is configured to the IP address 192.168.170.1, giving connected computers IP addresses in the range 192.168.170.100-254.
- **Subnet mask, Gateway, Domain name server (DNS).** These values are not changeable in access point mode.
- **SSID.** Name of the access point. This is the name that will show up in the Windows network connections "Connect to a network" (Windows Vista) or "View available wireless networks" (Windows XP).
- **Hide SSID.** Enabling this will make the access point name invisible from client computers. If enabled the clients must type the access point name and security details manually in order to connect.
- **Country region code.** This is the list of channels available in your country region. This value cannot be changed and must adhere to your regional regulations, see http://en.wikipedia.org/wiki/List_of_WLAN_channels for more information.
- **Wireless mode.** Defines which 802.11 protocols should be supported by the access point. There are several possible combinations of A, B, G, and N protocol settings to choose from. Which one to choose depends on the network adapters installed on the client computers. The recommended settings are "802.11 AN mixed" if you want to use the 5GHz band, or "802.11 BGN mixed" if you want to use the 2.4GHz band.
- **Channel.** The wireless channel/frequency to transmit on (this is the same channel that the Laerdal Connection Manager changes). The list of available channels will depend on the wireless mode. Note that this list might contain channel values which cannot be used by the specific manikin network adapter in use. Which channels are allowed depends on each adapter and in which country the adapter has been bought. If a non-valid value is set then the actual access point channel will not be changed. In 5G wireless mode channel 36, 40, 44, and 48 are always selectable. Use wireless scanning tools like inSSIDer (<http://www.metageek.net/products/inssider>) on the Instructor PC to verify channels and obtain information about which other wireless networks that might interfere with the manikin wireless network.
- **Security type.** Defines the security when clients establish connections to the access point. Can be Open, Shared, WPA-PSK, WPA2-PSK, or WPA-PSK/WPA2-PSK. The recommended setting is WPA2-PSK.
- **Encryption type.** Select encryption algorithm to use for the wireless communication. Can be AES, TKIP, or BOTH (both AES and TKIP). The recommended setting is AES.
- **Network security key.** The password to enter for a client to connect to the access point.

For more information on Station Mode - External and Station Mode - Adhoc, see the Manikin Update Help file.

Disabling / Enabling WLAN

When using manikin in aircraft or other environments where use of WLAN transmitters is prohibited: Contact your local Laerdal representative for instructions on how to turn off radio transmission.

The Instructor PC

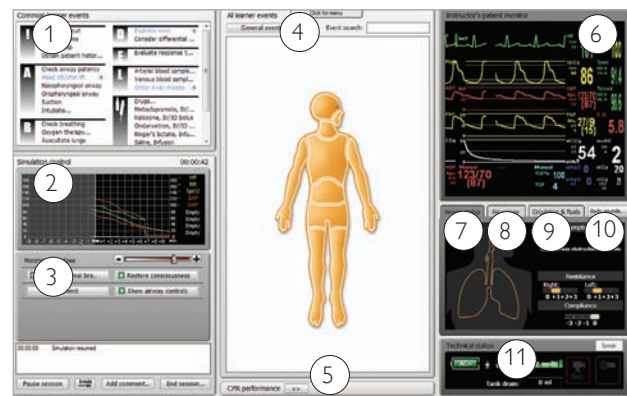
The Instructor PC uses the Instructor Application software to manage simulations. The Instructor Application runs in two modes:

- **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, secretions and convulsions.

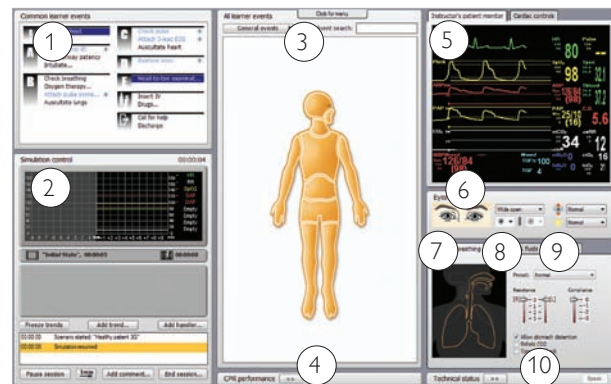
10 – BODY SOUNDS

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. Convulsions are also controlled from the <Circulation & fluids> tab.

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

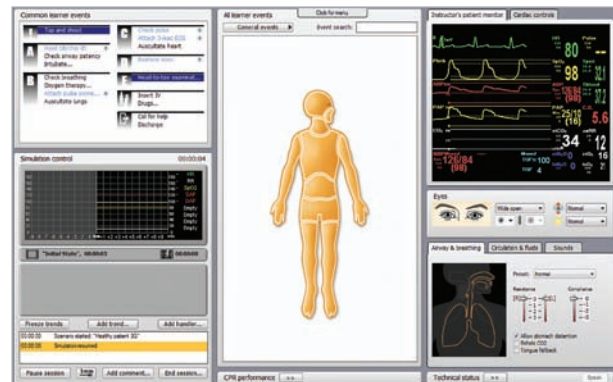
The <Technical Status> window provides information about the technical status of the SimMan 3G manikin system, including battery life, wireless connection signal strength, blood tank drainage, communication channels in use and video recording.

3G View and Classic View

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

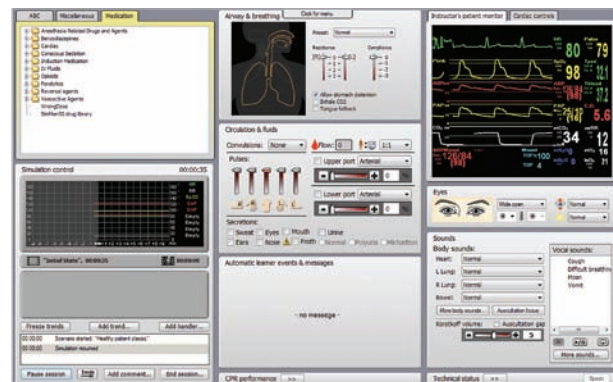
INSTRUCTOR MODE 3G VIEW

Scenarios made for SimMan 3G and will display the 3G view:



INSTRUCTOR MODE CLASSIC VIEW

Recommended for experienced users of older SimMan versions:

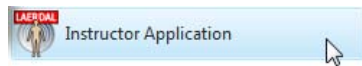


Classic view makes use of the Learner event libraries of previous SimMan versions; so that custom-made scenarios made with older SimMan software can be used seamlessly with SimMan 3G. Therefore SimMan Scenarios made before SimMan 3G will by default display the Classic view after conversion.

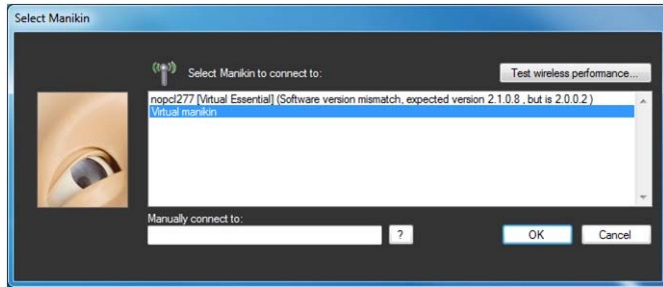
Opening an Auto Mode Patient Case

To start a simulation in Auto Mode:

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



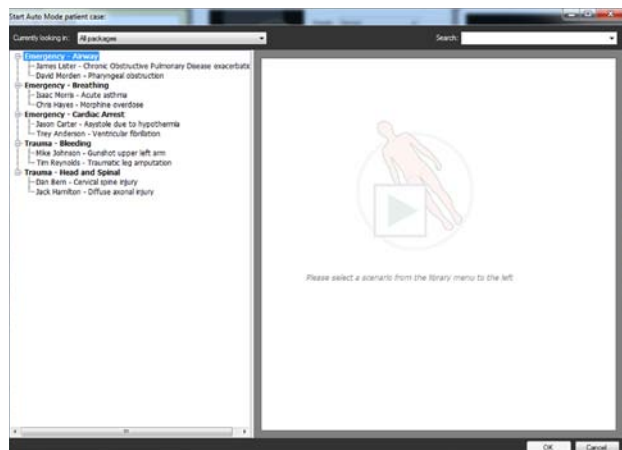
- 2 Select the Manikin you wish to connect to and click 'OK'.



- 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.



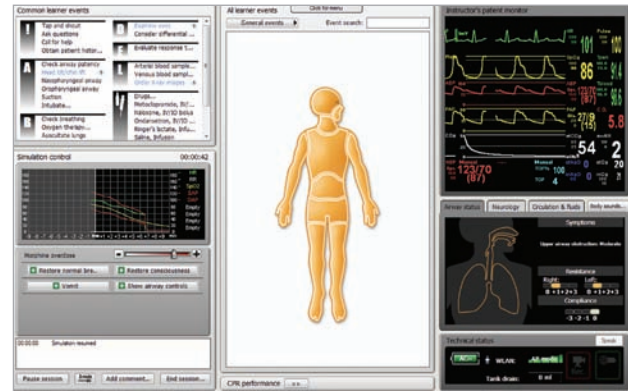
- 5 Choose a patient case and click 'OK'.
- 6 The patient case will open with the simulation being PAUSED. When you are ready to begin the simulation, press the spacebar. OR Click the 'Start session' button in the bottom left corner of the screen

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.

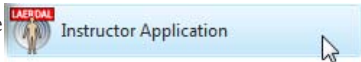
SAVE FILES AND DEBRIEF LEARNERS

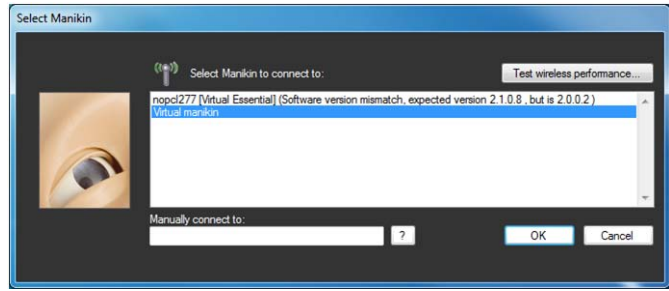
Save the session log for later debriefing or documentation. Click 'debrief' to start the DebriefViewer.

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.



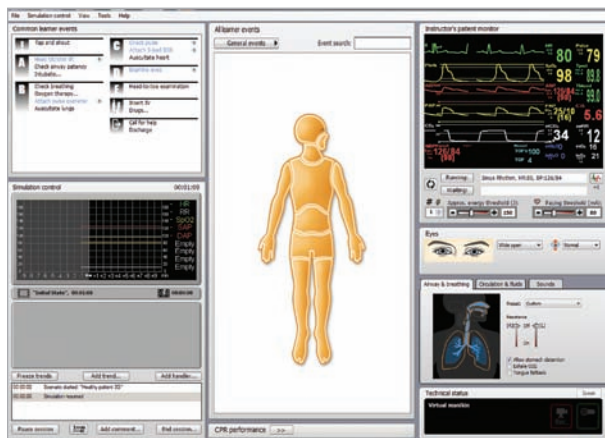
- 3 Click Start <Instructor Mode> Scenario. This will open the scenario Library.



- 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.

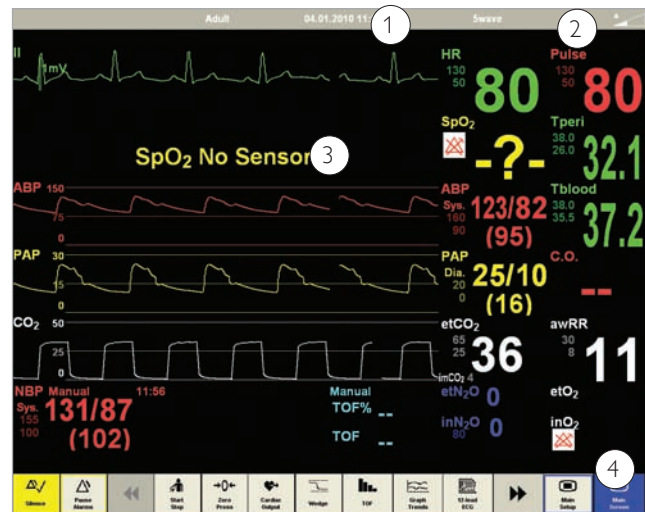
Video capture from the patient monitor display and the web-camera can be stored for use in the DebriefViewer.

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



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):


- 

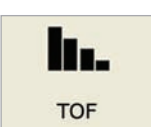
Selecting the <Silence Alarm> button turns active alarm sounds OFF.
- 


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 new reading of the TOF state of the patient. The TOF details will be shown in the TOF part of the Patient Monitor PC.
- 

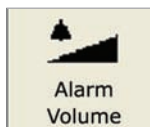
Selecting the <Graph Trends> button opens the Graphical Trends window. By using the menu buttons, you can review the history of the available Trend parameters.
- 


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.

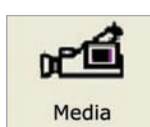
BOTTOM MENU 2

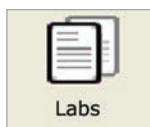
Bottom menu buttons in order from left to right:


- 

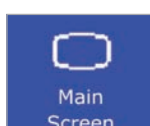
Selecting the <QRS Volume> button opens the <QRS Volume> menu, shown below. Select the desired volume (0-10).
- 

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

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

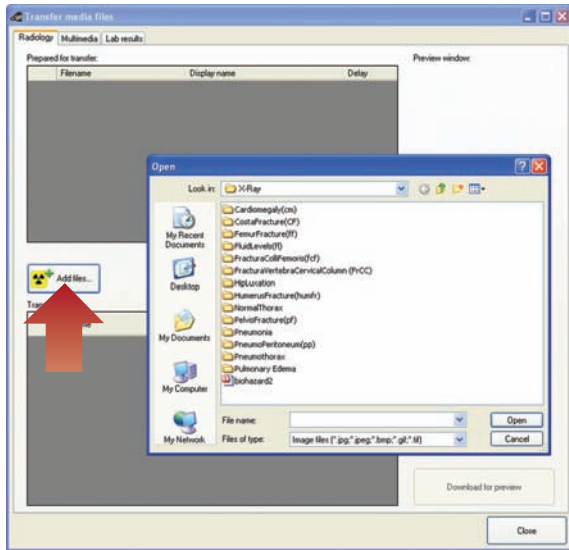
Select the <Media> button to open the <Media> display. Select the <Close> button to close the Media display.
- 

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

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.
- 

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



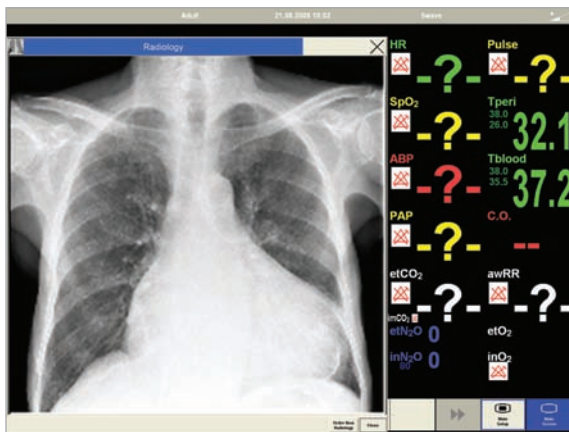
During a session, the Instructor can make media files available to learners. Media files include Radiology, Video and Lab reports.

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.

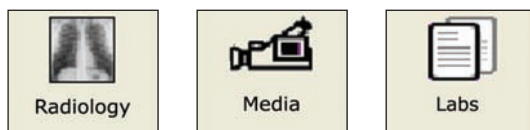
FOR A DELAYED DISPLAY:

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



INSTANT DISPLAY:

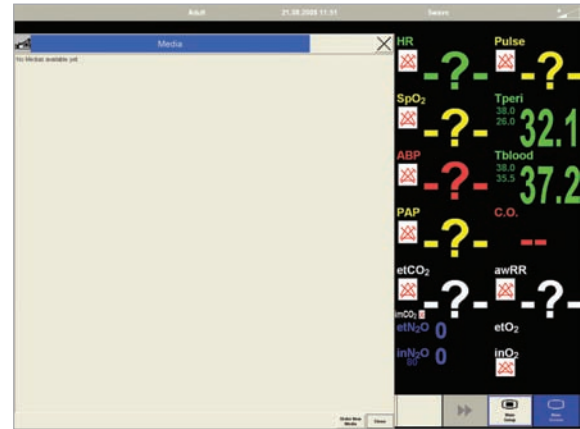
Media files show immediately when transferred.



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 VIDEO CONFERENCING APPLICATION

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

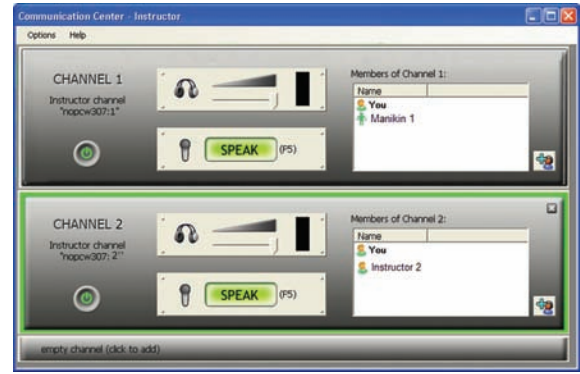
The Voice Conference Application can also be accessed in two other ways:

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

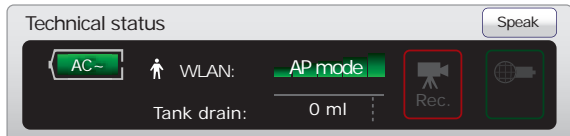
Click the on/off button to activate or deactivate the communication channel.



MICROPHONE BUTTON

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 . 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 from a Web-camera connected either to the Instructor's computer or the Patient Monitor computer

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 DEBRIEFVIEWER

The Laerdal DebriefViewer 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 DebriefViewer>

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 DebriefViewer> program folder
- Click the <Laerdal DebriefViewer> 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 DebriefViewer.

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

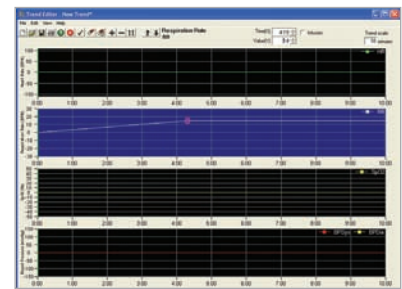
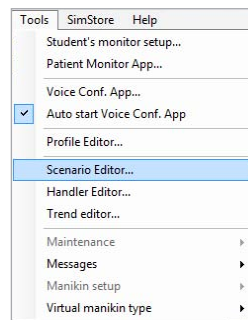
Editor> from the <Edit> menu.

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:

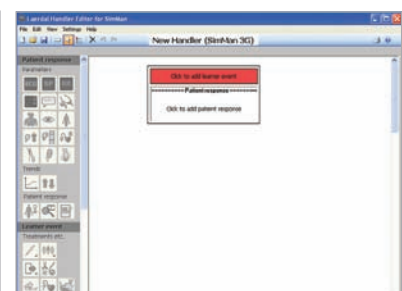
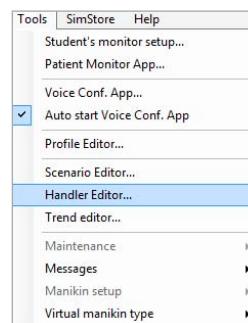


TRENDS

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 built-in compressor and air tank. The tank stores compressed air and contains separate reservoirs for clear and simulated blood fluids.

The manikin's compressor is activated automatically when the air pressure in the tank falls below a preset pressure level. 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 section – *Connecting external Air and CO₂ Supply*.

- Do not leave the manikin with pressurized air in the system.
- Drain the compressor tank of condensation after daily use.
- When not in use, leave the condensation valve, on the back of the manikin's right leg, OPEN.

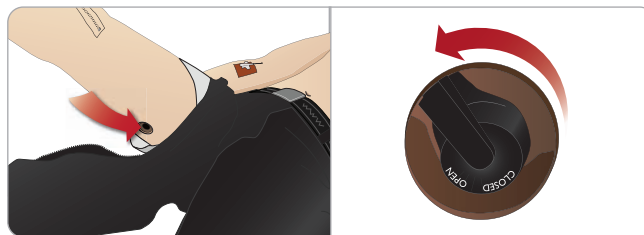
To avoid overheating and reduce wear

- 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.

Opening the Condensation Valve

When the internal compressor is in use, ambient air will condense inside the air tank.

- Open the condensation valve, on the back of the manikin's right leg after use or during transport and storage.



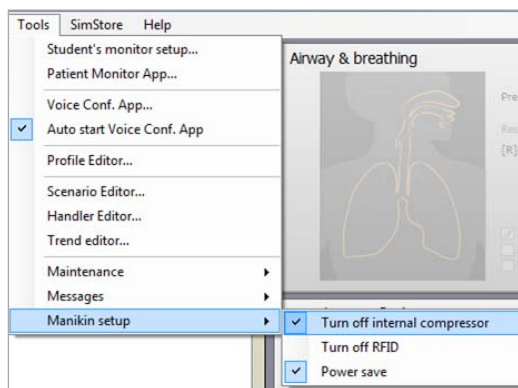
- To drain condensation from the air tank, ensure that the manikin leg is in a horizontal position.
- Fluid may leak underneath the manikin. Leave the condensation valve open until next use. Remember to close the condensation valve before starting the next training session.

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:

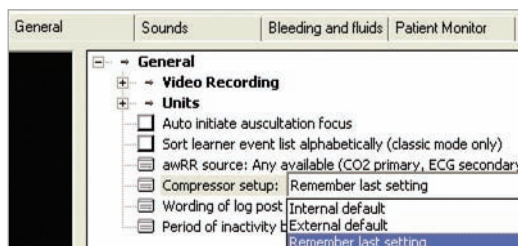
1. Select the <Tools> menu.
2. From <Manikin Setup>, click the Turn off internal compressor:



Changing default Compressor Settings

Change default compressor settings via the Profile Editor:

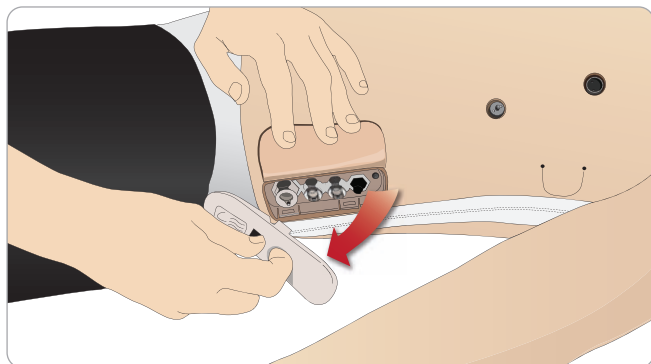
1. Open the Profile Editor from the <Tools> menu in *Instructor Application*.
2. Select the <General> tab in the *Profile Editor*.
3. From the compressor setup option, choose the Internal or External compressor as default.



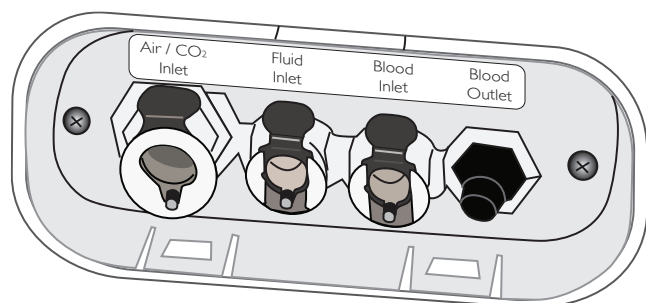
Setup for Simulation

Air/CO₂ and Fluid Panel

The Air / CO₂ and Fluid Panel are found 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 / CO₂ and fluids to the inlets.



Air / CO₂ and Fluid Panel has 4 connection ports



Connecting External Air and CO₂ 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 CO₂ with each ventilation, connect external CO₂.

Connect CO₂ only if the manikin is required to exhale CO₂ with each ventilation. Exhaled CO₂ can be detected with a real capnographic device. The manikin will only exhale CO₂ when a capnograph is registered as being connected to the system.

1. Connect a suitable CO₂ source to a Laerdal external compressor or regulator panel.
2. Connect a Laerdal double-lumen Air/CO₂ tube from the external compressor or regulator panel to the Air/CO₂ 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

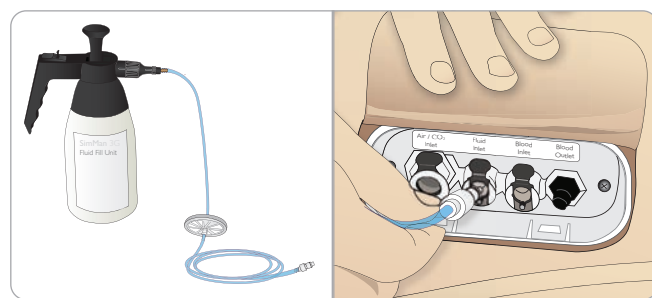
The manikin has two internal reservoirs, one for blood and one for fluids/secretions. SimMan 3G is also supplied with two fill units - one Blood Fill Unit for blood and one Fluid Fill Unit for fluids /secretions.

Preparing the Internal Reservoirs for Filling

Note: Make sure the manikin power is on and the condensation valve, on the back of manikin's right thigh, is CLOSED.

Internal Fluid Reservoir

1. Loosen the cap of the Fluid Fill Unit to let air in, (do not remove).
2. Connect the tube from the Fluid Fill Unit to the Fluid inlet on the manikin panel.



3. Press the thumb lever on the Fluid Fill Unit. When no more fluid/air runs out into the Fluid Fill Unit release the thumb lever.
4. Disconnect the tube from Fluid inlet.

Internal Blood Reservoir

1. Loosen the cap of the Blood Fill Unit to let air in, (do not remove).
2. Connect the tube from the Blood Fill Unit to the Blood inlet on the manikin panel.

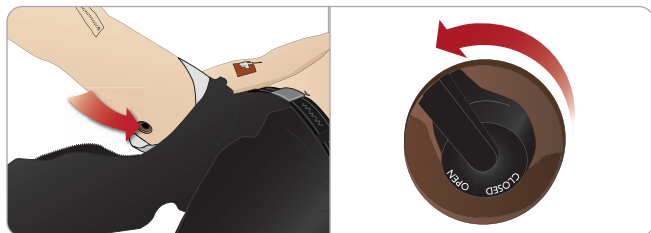


3. Press the thumb lever on the Blood Fill Unit (when no more blood/air runs out into the Blood Fill Unit, release the thumb lever)
4. Disconnect the tube from Blood inlet.

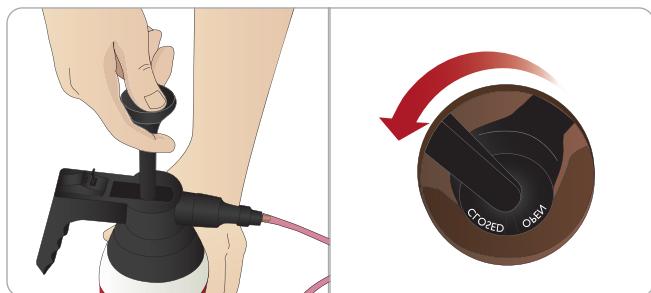
Filling the Internal Reservoirs Fluid

Fill the Fluid Fill Unit with 900ml of liquid and tighten the cap.

1. OPEN the condensation valve, releasing the static pressure in the manikin's tank.



2. Connect the tube from the Fluid Fill Unit to the Fluid inlet on the manikin panel.
3. Pressurize the Fluid Fill Unit by pumping the handle 15-20 times.
4. Press the thumb lever until locked in place to release liquid into the manikin.
5. Wait approximately 2 minutes or until 200ml of the liquid has transferred to the manikin. Refer to the scale on the outside of the Fluid Fill Unit. If the fluid rate slows down, pump the handle additional times.



6. When the manikin's reservoir is full (200ml), unplug the tube from the Fluid inlet.
7. CLOSE the condensation valve.

Filling the Internal Reservoirs with Blood

1. Fill the Blood Fill Unit with 900ml of blood and tighten the cap. See section *Mixing of Blood and Fluid*.
2. OPEN the condensation valve, releasing the static pressure in the manikin's tank.
3. Connect the tube from the Blood Fill Unit to the Blood inlet on the manikin panel.
4. Pressurize the Blood Fill Unit - pump the handle 15-20 times.
5. Press the thumb lever until locked in place to release blood into the manikin.
6. Wait approximately 2 minutes or until 400ml of the blood has transferred to the manikin. Refer to the scale on the outside of the Blood Fill Unit. If the fluid blood rate slows down, pump the Unit 'handle additional times.
7. When the manikin's reservoir is full (400ml), unplug the tube from the Blood inlet.
8. CLOSE the condensation valve.

Topping up the internal Reservoirs between Sessions

The manikin can be topped up with fluid/blood between training sessions.

To do this, follow the instructions for filling above.

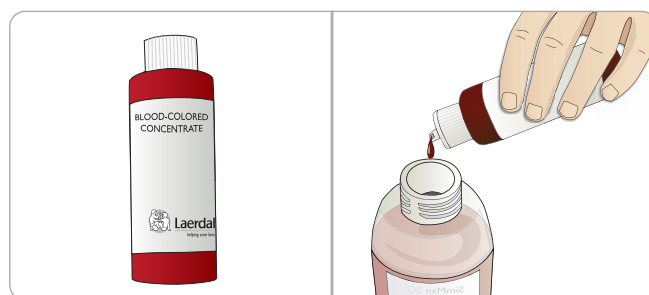
Avoid this method during sessions/Scenarios as it will disturb the air functions of the manikin.

Mixing of Blood and Fluid

To simulate clear fluids and secretions: Fill the Fluid Fill Unit with 900ml of de-ionized water only and tighten the cap.

To simulate froth: Fill the Fluid Fill Unit with 900ml of de-ionized water. Add one drop of liquid soap. Mix the solution gently to avoid foaming and tighten the cap.

To mix simulated blood: Fill the Blood Fill Unit with 900ml of de-ionized water. Add 5-10 drops of Laerdal Blood colored concentrate, mix and tighten the cap.



Using Blood Fill Units for severe bleeding and secretions

Note: This procedure will not fill the internal reservoirs in the manikin.

1. Attach the full Blood and Fluid Fill Units to the Blood inlet and Fluid inlet respectively.
2. Pressurize the Fill Units by pumping the handles 15-20 times.
3. Press the thumb lever until locked in place to release blood/fluids into the manikin.
4. If the fluid rate slows down, pump the handle additional times.
5. When the Fill Units are empty, replace with full Fill Units for as many times as necessary.

Draining of Fluids and Blood reservoirs

After Using the Fluid/Blood system, drain any excess fluids from the internal reservoirs.

1. Ensure the manikin power is on and the condensation valve is CLOSE.
2. Unscrew the caps of the Fill Units, leaving the cap in the Fill unit to prevent leakage.
3. Connect the tube from the Fluid Fill Unit to the Fluid inlet and the tube from the Blood Fill Unit to the Blood inlet.
4. Press the thumb levers to lock in place. When no more fluid/ blood runs into the Fill Units, remove the tubes from the Fluid inlet and Blood inlet.
5. Proceed to cleaning the Fluid and Blood systems.

Cleaning the Fluid and Blood system

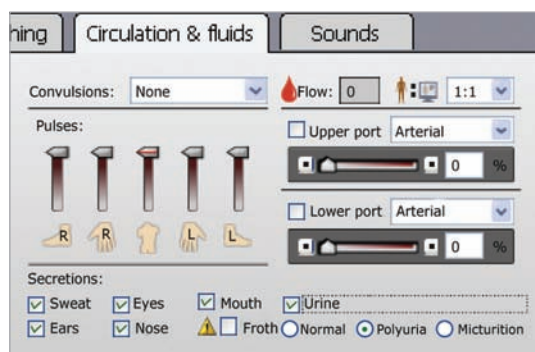
After using the bleeding and or fluid system, the system must be cleaned to prevent residue from clogging the valves and tubes. Keep any wounds used connected while flushing the system with a cleaning solution.

1. Ensure the manikin power is on and the condensation valve is closed.
2. Ensure the manikin's internal reservoirs are drained. For instructions on *Draining the Fluids and Blood reservoirs*. See the above instructions.
3. Fill a Fill Unit with a solution of 60% Isopropanol or 70% Ethanol.
4. Connect the Fill Unit to the manikin's Blood inlet and Fluid inlet respectively and fill the manikin's internal reservoirs with the solution.

Cleaning the Fluid System

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

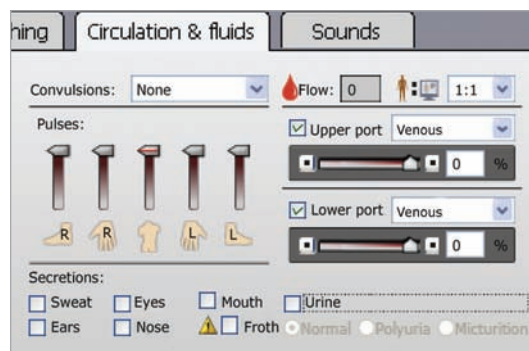
1. From the Instructors application, open Circulation and fluids tab, check the Secretions box for urine, and then select polyuria. Check the Secretions boxes for Sweat, Ears, Eyes, Nose and Mouth.



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

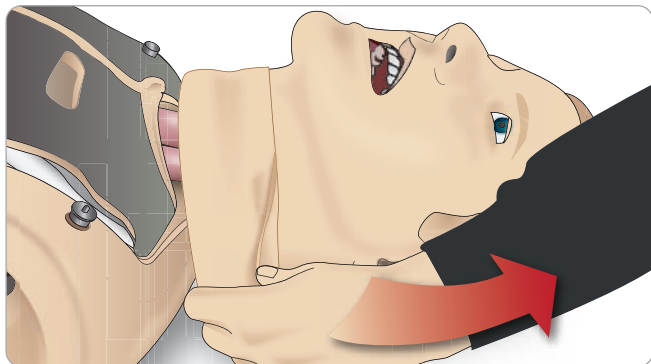
1. From the Instructors application, open Circulation and fluids tab, check the boxes for Upper port and Lower port, then select Venous from the adjacent drop-down menus. Move the sliders (to the right) to maximum bleeding rates.



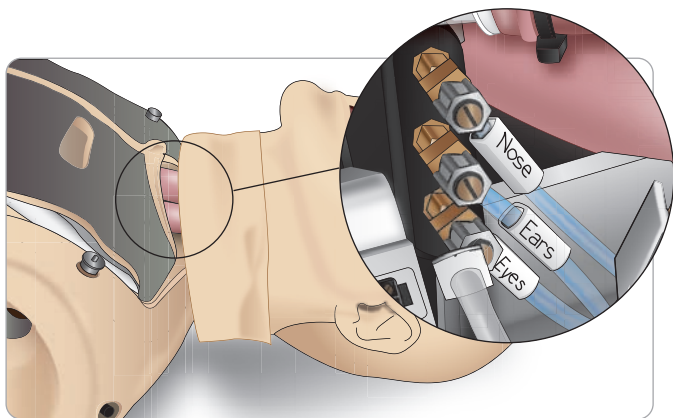
2. Allow the Bleeding system to flush with the cleaning solution until the internal reservoir is empty.
3. The blood system should be flushed repeatedly until the discharge fluids are clear.
4. Remove Wounds, if applicable.
5. When finished, uncheck all of the boxes (in the Instructors application).

Adjusting Fluid Flow

- 1 Remove the neck skin.



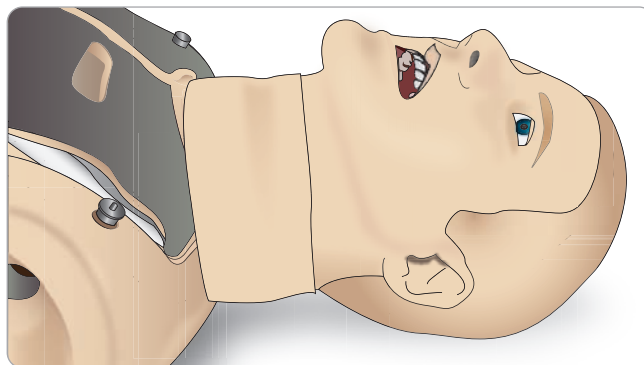
- 2 Locate the restrictor valves in the left and right clavicle area.



3. Activate secretion in the Circulation and Fluids Tab, then tighten or loosen the actual valve as until desired flow rate is achieved.



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

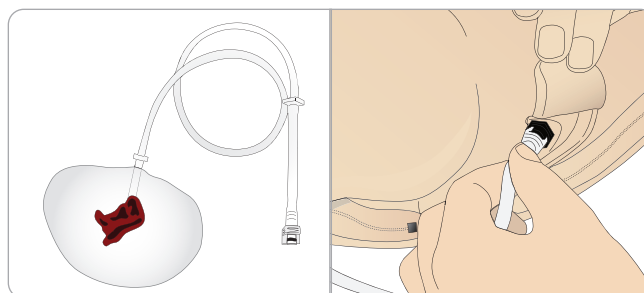


- 4 Replace the neckskin.

Connecting Wounds Kit

SimMan3G 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.

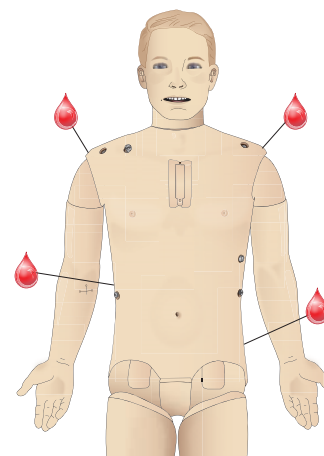
1. Select a wound from the wound kit.



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.




Setup for Simulation

Removing Wounds

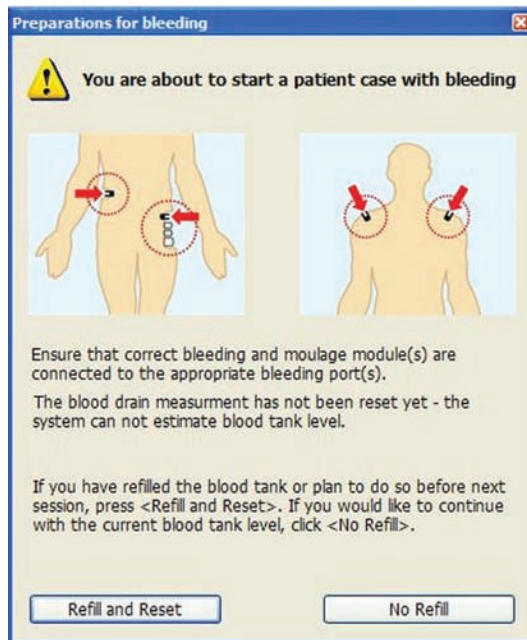
Flush all ports and tubes with 60% Isopropanol alcohol or 70% ethanol while the wounds are still attached. When the fluid runs clear, disconnect the tube from fluid outlet. After the wound is removed, any tape residue can be cleaned from the manikin skin with Laerdal Manikin Wipes.

 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.

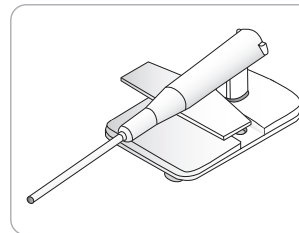
 If the external fill unit is not refilled during a severe bleeding patient case, the manikin status may be inaccurate.



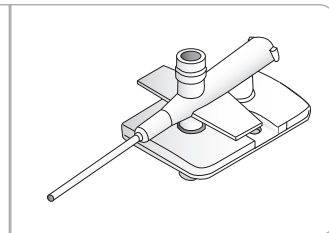
The IV Catheters

The right IV arm comes with a US catheter type as default. This can be replaced with an international catheter type (commonly used in Europe) with an extra flush port.

US Catheter



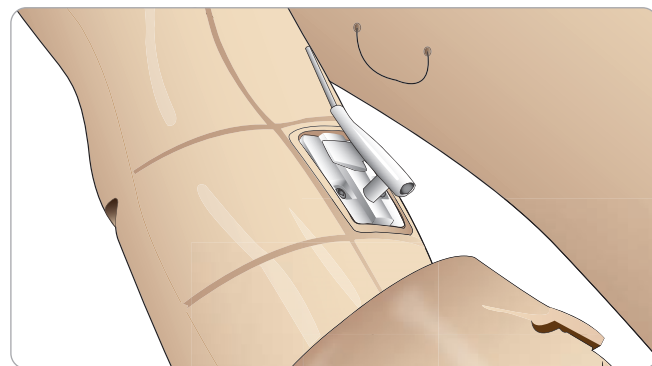
International Catheter



Note: remove arm skin before changing the catheter. Use caution when handling the manikin skins.

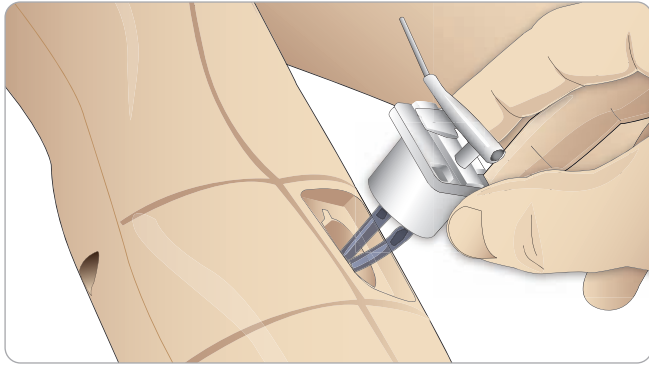
Changing IV Catheters

1. Unzip and fold down the IV arm skin to expose the IV catheter module.



2. Using a #4 Phillips screwdriver; unscrew the two screws of the module and pull the IV module out of the arm.

Setup for Simulation

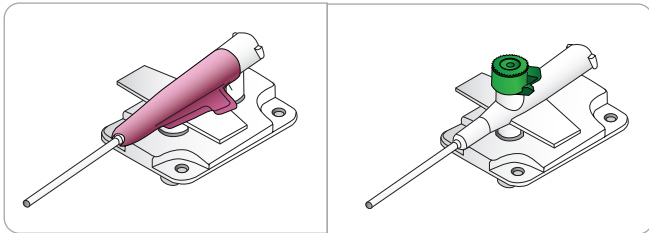


3. Disconnect the two fluid tubes from the IV module
4. Discard the old module and insert it into the IV arm.
5. Fasten the two screws and zip the skin back into place.

Identifying IV catheter sizes

The IV modules come with colored IV caps for US and International IV modules. This simulates different catheter sizes.

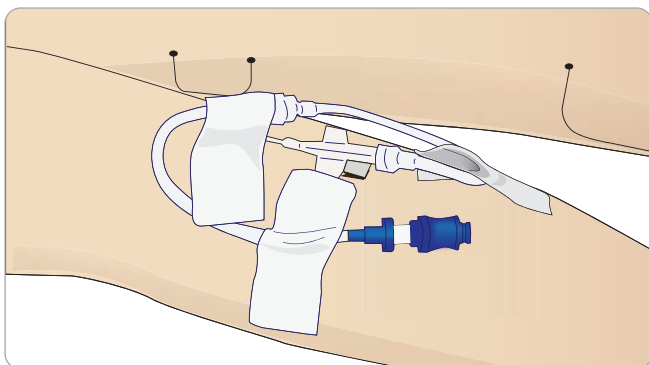
US IV caps International IV caps



US IV Catheter Setup

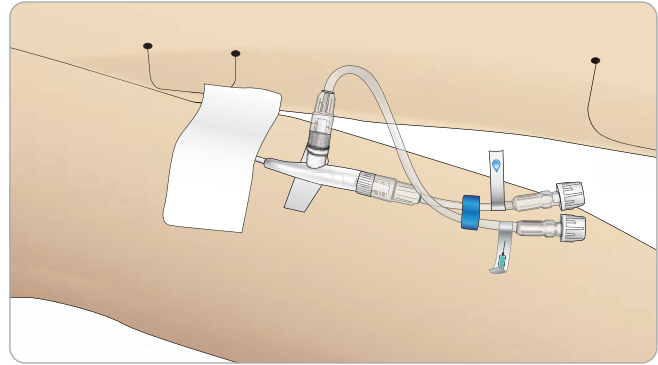
Setup for drug administration

To administer simulated drugs using the RFID system, the SimMan 3G US IV catheter comes with one inlet for drug administration.



Setup for IV drip and drug administration

To simulate an IV drip, connect the international catheter and tube setup as seen below.



The drip port may also be used with fluids other than distilled water while only purified water should be used in the injection port. For more information on connecting the US IV drip catheter, contact your local Laerdal Service centre.

For more information on connecting the US IV drip catheter, contact your local Laerdal Service centre.

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

It is essential to prime the IV arm before first session each day. Before administering any simulated drugs and to prevent backflow, inject purified water in a continuous stream into the IV system.

Major movement/transportation of the manikin can result in air pockets introduced in the IV system and additional priming required.

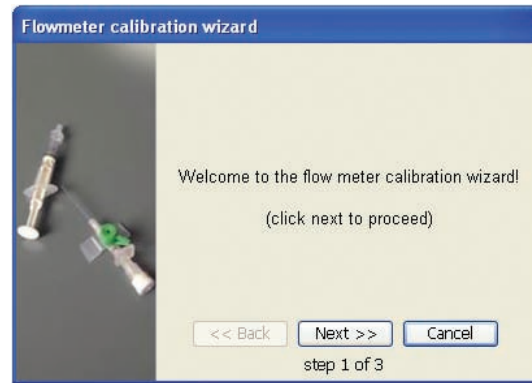
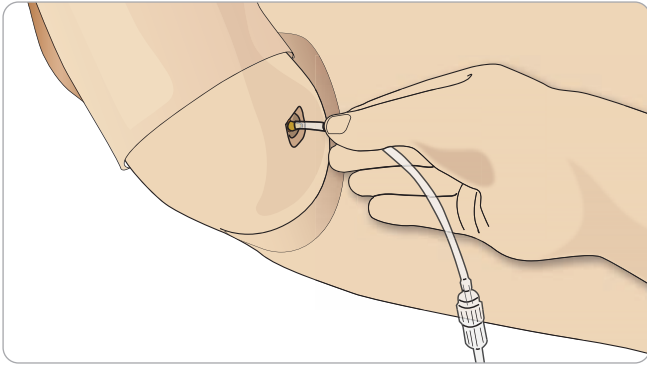
Draining excess IV fluid

The IV fluid system is an open system. IV fluids are drained as they are administered.

Before each Session

1. Attach the IV overflow tube to the fluid drain under the manikin's right arm.
2. Allow excess fluid to drain into a container during the simulation.

Setup for Simulation



Cleaning the IV Arm

Arm each session or day of use always flush the IV Arm with 60% isopropanol or 70% ethanol.

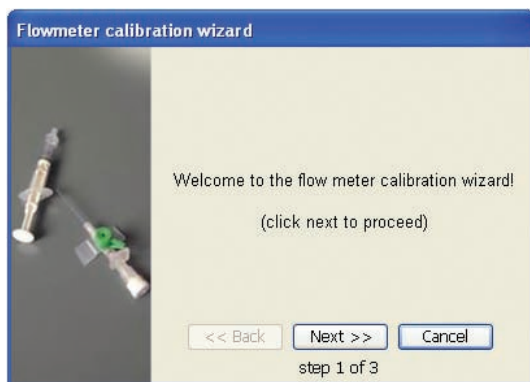
The manikin should always be powered on when injecting fluids into the IV arm. Do not apply force when administering drugs to the IV arm.

Fill a syringe with alcohol and administer it through the IV catheter.

Calibrating the IV Arm Flowmeter

To calibrate the flow meter in the IV arm:

1. Click on the <Tools>, <Maintenance> menu in the Instructor Application, then select the <Calibrate IV flow meter...> option.

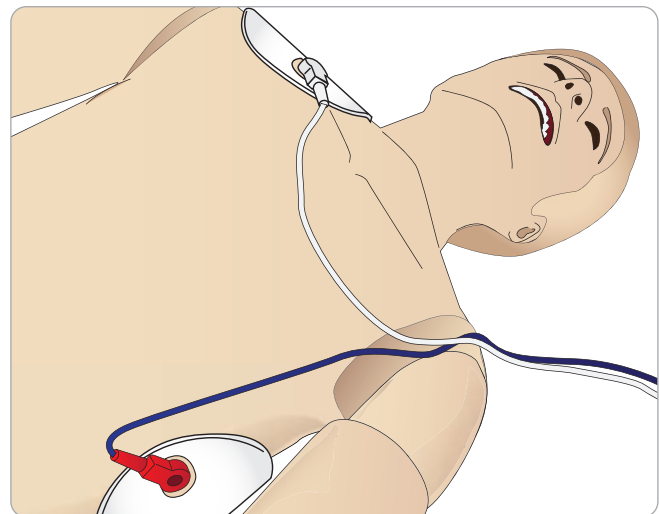


2. Follow the on screen instructions in the *Flowmeter calibration wizard*.
3. A confirmation message will appear if the calibration was successful.

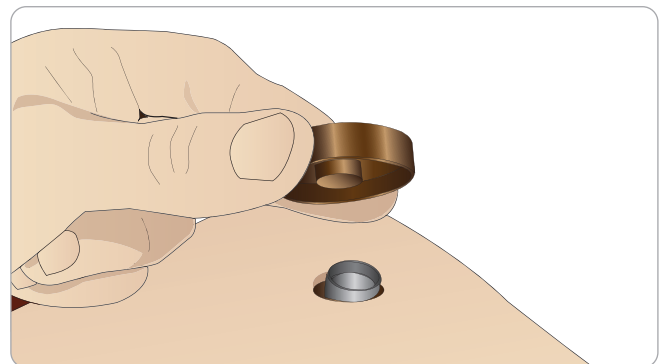
Connecting Defibrillation Adapter Plates

Adding Defibrillation Adapter Plates

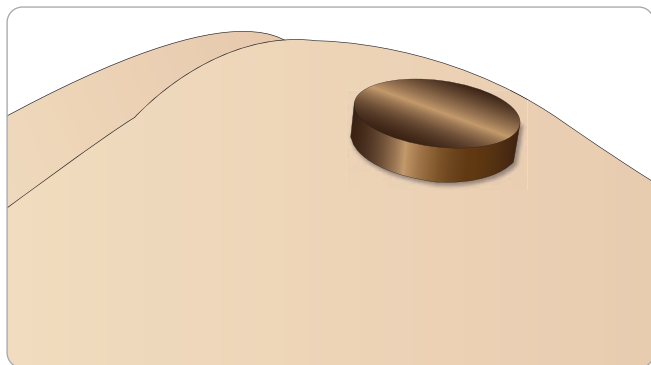
The manikin torso is fitted with two stud connectors for defibrillator cables. Foam pads may be fitted around the defibrillator studs during the session as illustrated below:



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 the *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.

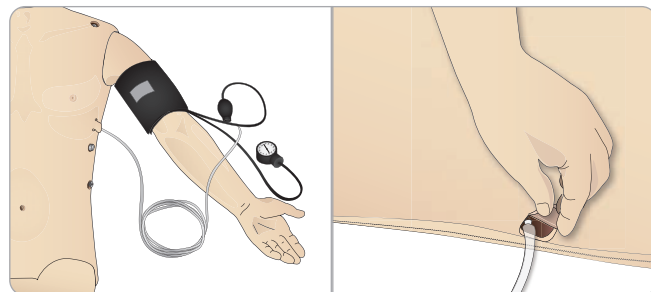
Note: Do not press too hard over the defibrillation adapters as this may cause arcing and pitting.

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.

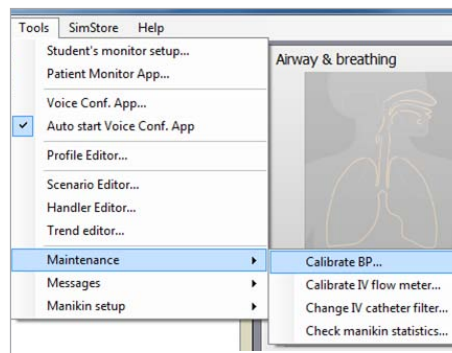
Connecting the Blood Pressure Cuff

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.

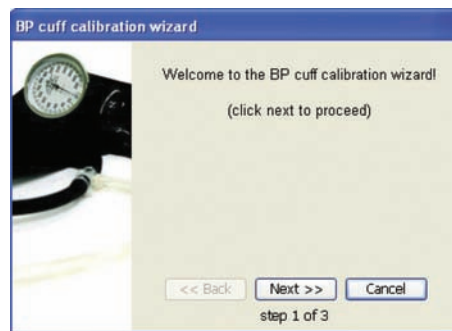


Calibrating the Blood Pressure Cuff

1. Select <Tools> <Maintenance> and choose <Calibrate BP...>

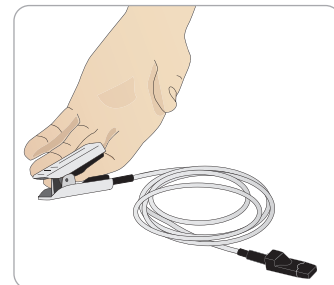


2. Follow the onscreen wizard instructions to perform the calibration.



Connecting the SpO₂ Probe

The *SimMan 3G* SpO₂ 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 SpO₂ 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.

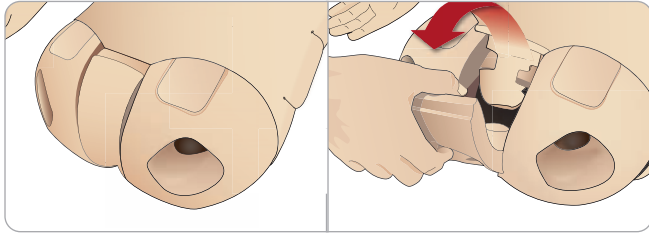
Setup for Simulation

Changing Genitalia Modules

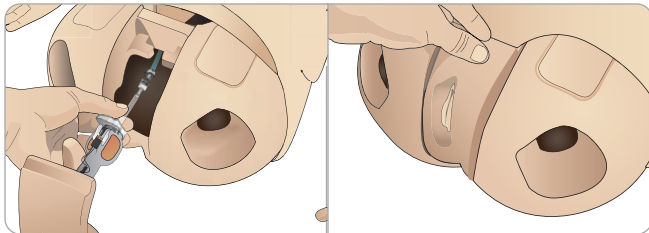
The SimMan 3G is shipped with a neutral genitalia pad as default. The pad can be exchanged for a male or female genitalia pad with urine catheter to simulate urine flow and catheterization.

 *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

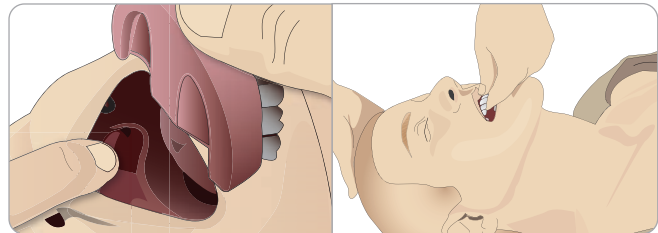
Always use a water based lubricant liberally when inserting a urine catheter.

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.

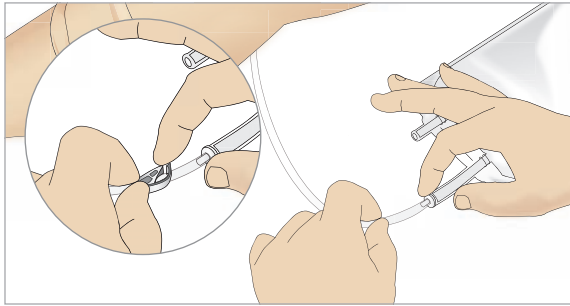
1. Remove the teeth from the mouth.
2. Align the new set of teeth with the gums and push them back until the teeth engage and lock onto the gums.
3. Ensure that the new set of teeth is properly aligned with the gums before pushing them into places.



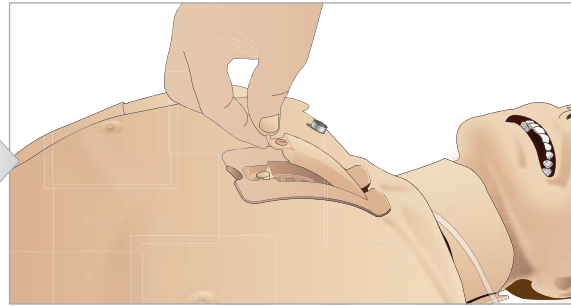
Replacing and Filling the IO Modules with Blood

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

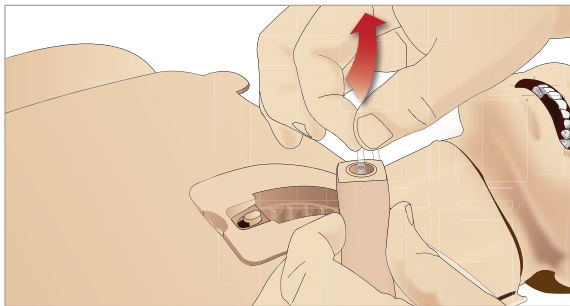
REPLACING AND FILLING THE STERNAL IO PAD WITH BLOOD



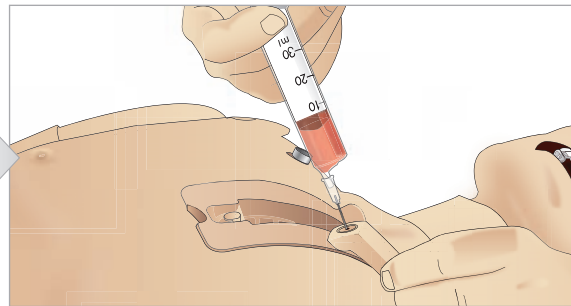
1 Attach the Sternal IO bag to the Sternal tube and close off the pinch clamp.



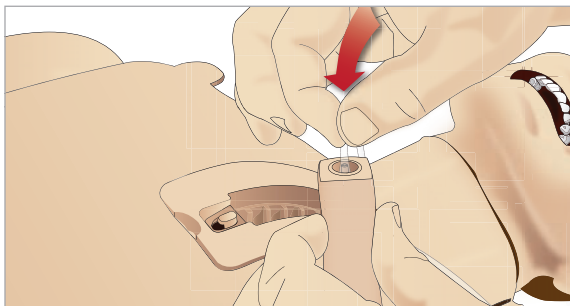
Remove the Sternal IO pad from the manikin chest.



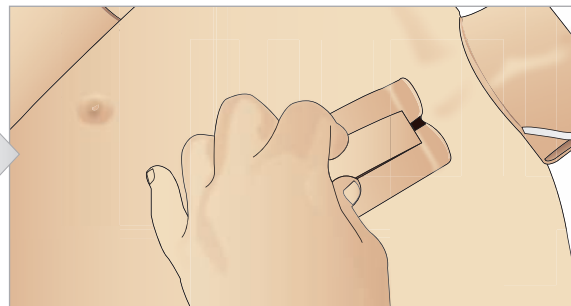
2 Remove the Sternal tube from the sternal pad.



3 Fill the sternal IO pad with 7ml of blood. Ensure the pad is completely filled.

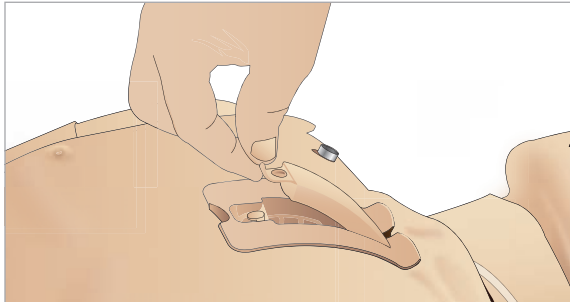


4 Reattach the Sternal tube to the Sternal IO pad.



the unit down and towards the neck, until it fits securely under the top edge of the chassis.

5 Place the Sternal IO unit in the Sternal Chassis. Slide



6 Reattach the Sternal IO pad.

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).

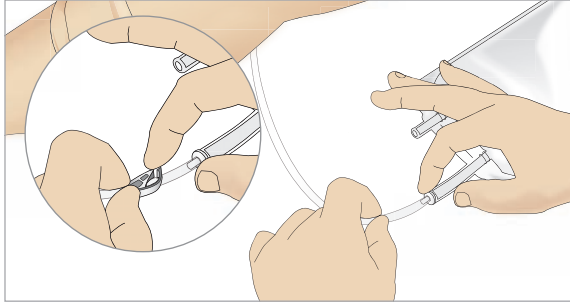
Note: In some cases you will not get any blood backflow when using the F.A.S.T 1™

The sternal IO is now ready for simulation.

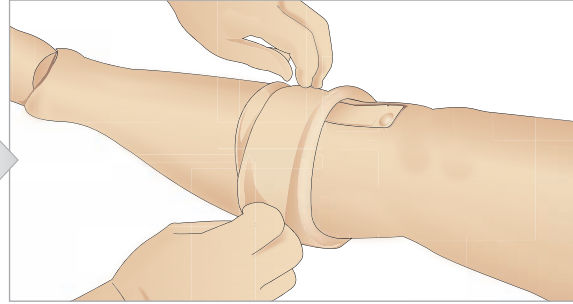
Note: If bits of plastic from the module get stuck in the needle, flush the needle with fluid to dislodge the obstruction.

Setup for Simulation

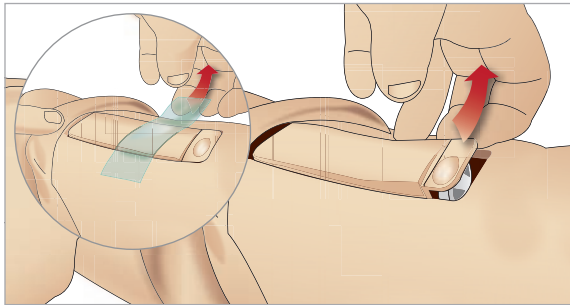
REPLACING AND FILLING TIBIAL IO MODULE WITH BLOOD



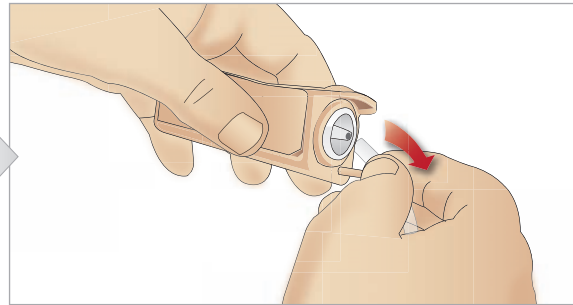
1 Attach the Tibial IO bag to the Tibial tube and close off the pinch clamp.



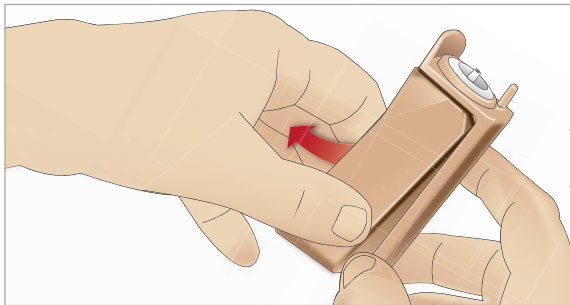
2 Roll the leg band, to expose the Tibial IO module.



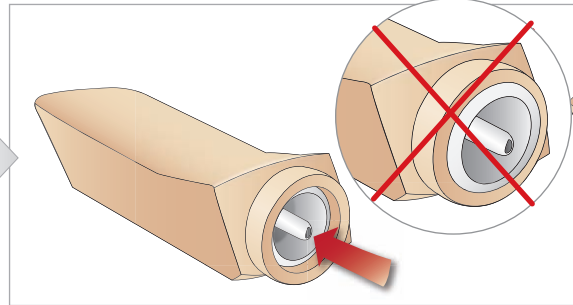
3 Remove the IO tape. Then remove the Tibial IO unit from the leg.



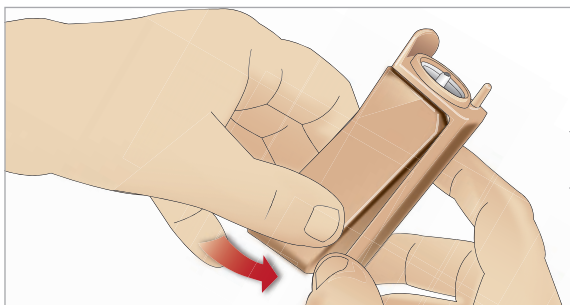
4 Remove the tube from the Tibial IO module.



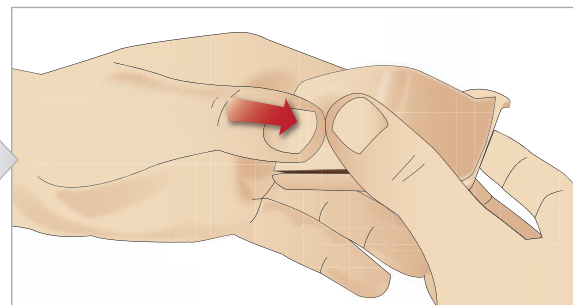
5 Remove the Tibial IO Pad from the Tibial IO chassis.



6 Before replacing the new Tibial IO, ensure that the nipple is retracted in the Tibial IO Pad.



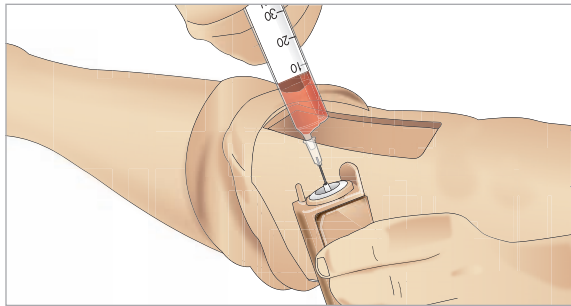
7 Fit the new Tibial IO pad into the chassis.



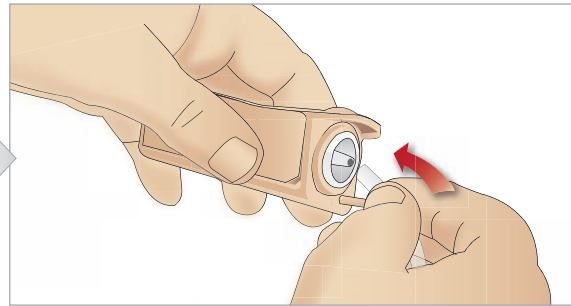
the pad with thumbs until the nipple moves forward and locks the unit in place.

8 Secure the Tibial IO pad in place by pressing the rear of

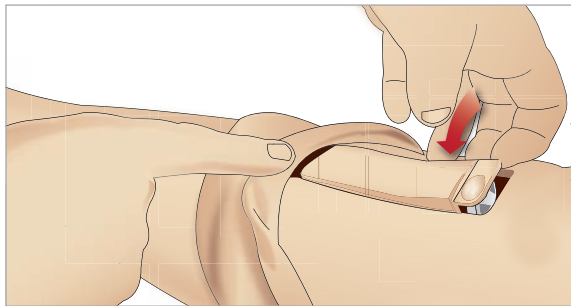
Clinical Features



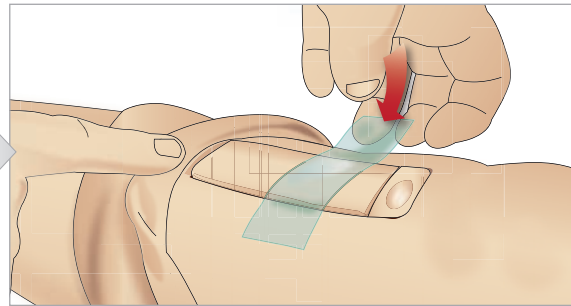
9 Fill the Tibial IO unit with 30 - 35ml of blood, ensure the Tibial Pad is completely full.



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 1/2" (38mm).



Note: In some cases you will not get any blood backflow when using the BIG Automatic Intraosseous Device

Clinical Features

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 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 enquire 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

Elbows: Fixed, no mobility


Wrists: 3-axis rotation

Thumbs: Free mobility

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, CO₂ 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.

The *SimMan3G* can also be connected to third part respiratory manikins. Contact your local Laerdal representative for more information.

During simulation, the following conditions can be set:

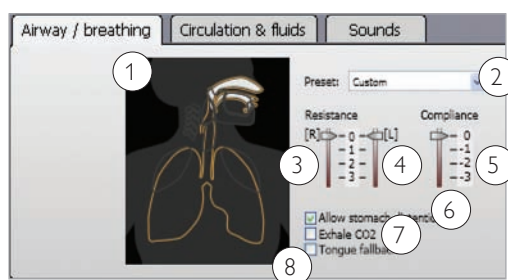
- Can't intubate / can ventilate
- Can't intubate / can't ventilate

The following information is automatically registered in the *SimMan3G* simulation session:

- Detection of proper head position.
- Intubation device used (if fitted with RFID tag)
- 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.

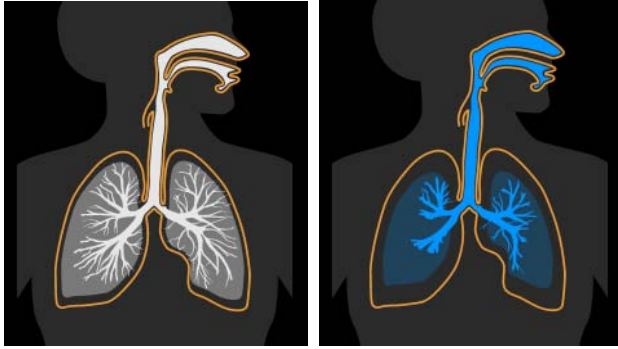


1 - Animation and Settings


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.

Clinical Features



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 CO₂

Check or uncheck the box to enable or disable CO₂ exhalation. (Requires connection to an external CO₂ reservoir)

8 - Tongue Fallback

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

Breathing Features

The *SimMan3G* can simulate spontaneous breathing and can be connected to ventilators or used with assisted ventilations:

- Bilateral and unilateral chest rise and fall
- Variable lung compliance:
 - There are 4 compliance settings, from normal to extremely stiff
- Variable airway resistance (right/left): 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 plethysmogram
- Cyanosis - indicated by blue lights on the lips.
- CO₂ exhalation for use with third-party et CO₂ detectors (Requires connection to an external CO₂ reservoir)

Patient Monitor features - Breathing

- SpO₂
- Airway respiration rate (awRR)
- End-tidal CO₂ (etCO₂)
- End-tidal O₂ (etO₂)
- inO₂
- pH

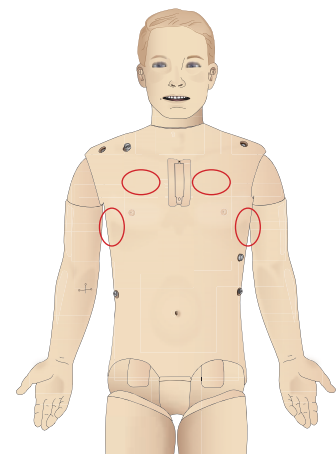
Lung specifications

- 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 H₂O
- Simulated stomach inflation starts from approximately 40cmH₂O airway pressure. 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

User-replaceable items, spare parts:

- Lung bladders
- Chest-rise bladders
- Pneumothorax bladders
- Pleura skin
- Torso skin
- Cricoid tape
- Neck skin

For instructions on how to replace the above mentioned items, see the Maintenance Section.

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

Circulation

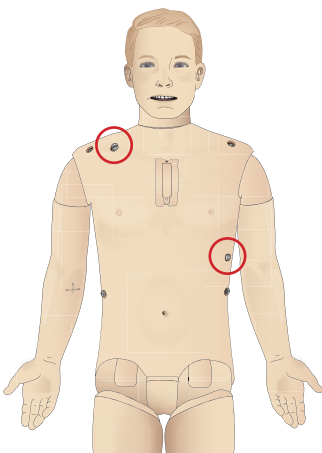
Cardiac features:

- Extensive ECG library, pulses from 0-220.
- Heart sounds - for every anterior location
- ECG rhythm monitoring (4-connector, 3-lead ECG)
- 12-lead ECG display
- Pacing
- Defibrillation and cardio version using live defibrillators

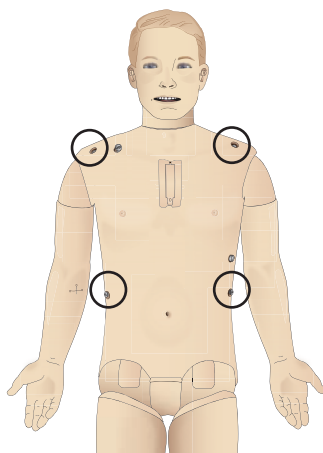
Defibrillation

- 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



3-Lead ECG 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

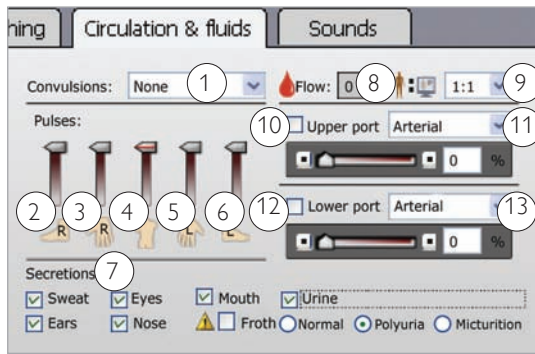
About the Circulation & fluids tab

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

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 in the table below.



1 - Convolutions

Select convulsions using the drop-down menu:

- None
- Tonic
- Tonic-Clonic

Convolutions

Convolutions may be seen in both hands.

- Seizure/Fasciculation

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
- Ears, both
- Nose, right side
- Mouth, right side
- Froth from mouth, right side, when soap has been mixed into the fluid reservoir
- Urine output

Urine

Check the box for urine

- Normal
- Polyuria
- Micturition

Uncheck to disable urine.

Urine output

- Foley catheterization
- Urine (variable)

normal
polyuria
none

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* section.

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

Screenshots

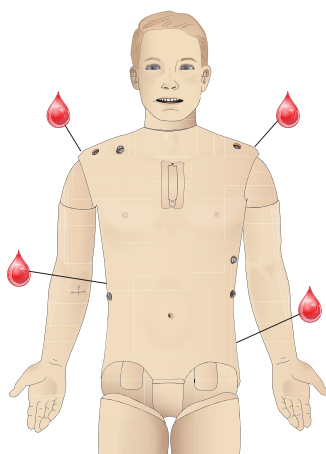
- Upper / lower bleeding ports
- Venous / Arterial
- Works with various wound modules and moulage kits

Bleeding Treatment:

- Bandage
- Pressure point
- Tourniquet
- Surgical Clamps

Vascular Access:

- IV access (right arm)
- Intraosseous access (tibia and sternum)
- Drugs - use of Automatic Drug Registration System (identifies drug & measures dose) and pre programmed drug responses.



Consumables and Spare Parts:

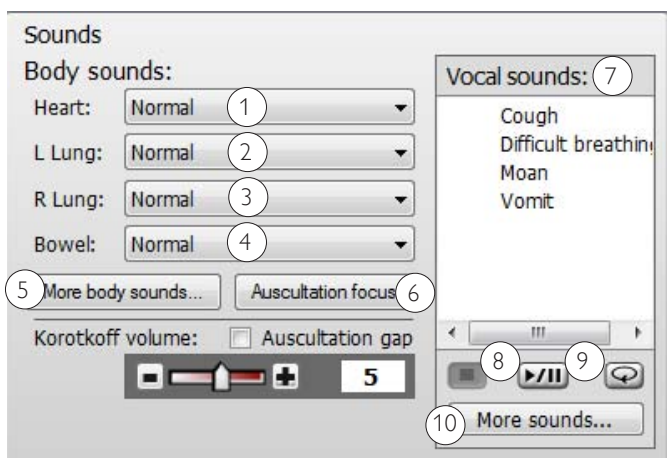
- Laerdal Artificial
- Fill Units
- Wound modules
- Replacement trauma arm / leg.

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

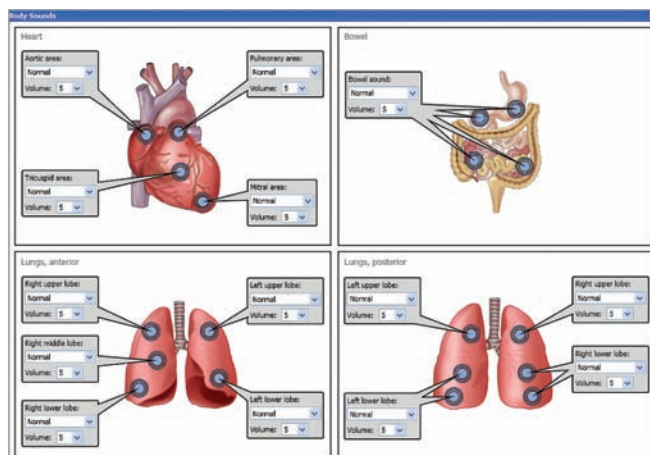
4 - Bowel Sounds

Select one of the following from the dropdown menu:

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

5 - Adv. Sounds Control

Click the <Adv. Sounds Control> to open the sounds control popup. The sound settings and volume for the 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.

Clinical Features

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:

- Off - 1 left
- Infrequently - 1 right
- Normal - 1 both
- Frequently

6 - Light Sensitivity

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

- Slow
- Normal
- None
- R Normal/L None
- L Normal/R None

Drugs and IV

There are two RFID antenna locations in the manikin. One situated in the mouth and the other in the right IV arm. When RFID tagged syringes and airway devices come within range of the antennas, they are automatically registered by the system. The IV arm antenna registers drug type and concentration.

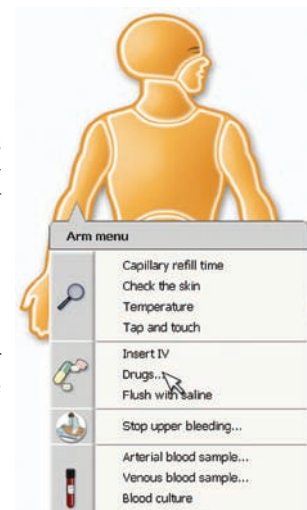
The RFID antenna in the mouth can also be used to register RFID tags used for drugs administered into the sternum IO module. Always ensure that the RFID tag comes within range of the antenna.

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

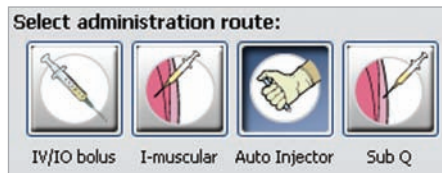
Manual Registration of Administered Drugs

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.



- 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.
- 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.
- 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.



- Change the dosage and concentration values under <Select concentration> and <Select amount>.

SimMan 3G has an extensive drug library with automatic or adjustable physiological responses. The system is able to identify many pre-registered RFID tags.


The IV arm can be set up with a US or International-type catheter; see section: *Changing IV Catheter Type*.

Patient Monitor features – Drugs:

- Train-of-Four (TOF)
- in N₂O, et N₂O
- Anesthesia agents
- Lab reports

User-replaceable items, spare parts:

- IV catheter (US and International versions)
- IV fluid filter
- Intra-muscular pad

 The manikin comes with a kit of RFID tags. Additional kits are available for purchase.

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

The right buttock has a pad under the torso skin, for training intra-muscular injections. Do not inject fluids into this pad.

Maintenance after each Simulation Session

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

After Every Simulation Session

IV-arm system (manikin power on)

After each session where the IV-arm has been used, flush the IV arm with 60% Isopropanol alcohol or 70% ethanol. See section, *Cleaning the IVArm*.

Blood and fluid system (manikin power on)

After session where the blood and fluid system have been used, flush the manikin's fluid reservoirs as described in *Manikin Setup - Filling the Manikin's Fluid Reservoirs*.

Power off the manikin and PCs

Charge batteries if necessary.

Drain condensation from the air tank

Open the condensation drain valve on the back of the right leg.

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
- Collect all RFID tags and prepare them for next session.

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-catheter filter
- IV-catheter
- 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 and fluid systems with 60% Isopropanol alcohol or 70% ethanol. Open the drain valve on the manikin's right leg.

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

Installation 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 Un-install any previous versions of SimMan 3G software. Use the Windows Control Panel or select: <Start> <All Programs> <Laerdal SimMan 3G> <Uninstall SimMan 3G>. Follow the on screen instructions to uninstall.
- 3 Insert the Laerdal SimMan Essential software DVD and allow auto-run. If auto-run is disabled on your computer; please manually execute the <autorun.exe> file on the DVD. Follow the on screen instructions to install.
- 4 In the installation menu – click the <Install SimMan 3G Software> button once. This will start copying files to your computer.
- 5 If necessary, insert the Laerdal DebriefViewer DVD and follow the on screen instructions to install.

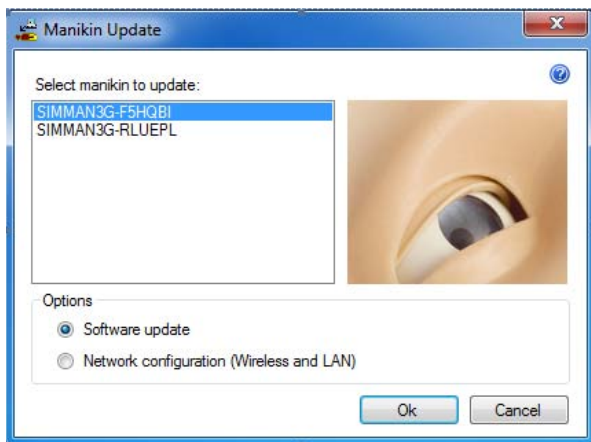
Note: That the copying process takes approximately 2-3minutes. Once the copying process is finished, please follow instructions in the installation wizard.

MANIKIN UPDATE:

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

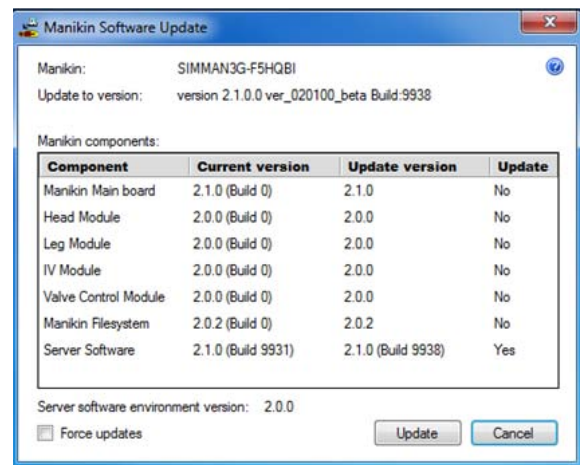
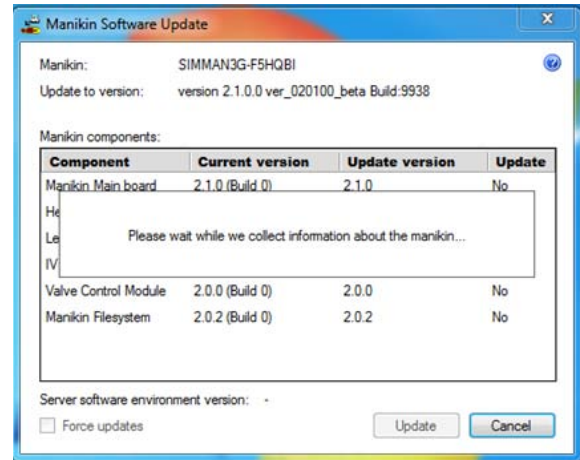
Please note that the version shown in these screenshots is subject to change.

- 1 Make sure you have installed the software on the Instructor PC as described above.
- 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 manikin starts breathing, for a connection to be established.
- 5 Execute < Start><All Programs> <Laerdal SimMan 3G><Manikin Update>.

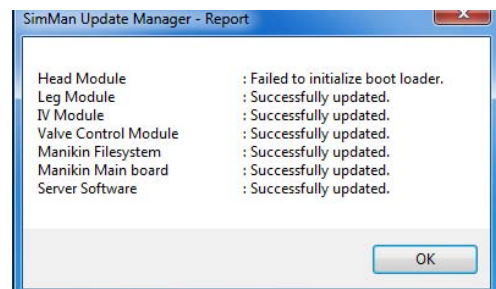


- 6 Identify your manikin in the <Select Manikin> dialog and select <Software update>, press <OK>.

- 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.



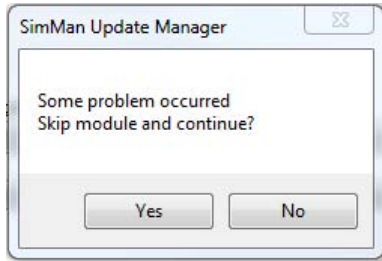
Note that some components might fail updating on first attempt. Please ignore this and allow the update process to continue.

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

- Should the following message appear on the screen during the update, click <Yes> to continue the installing updates.



- 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.

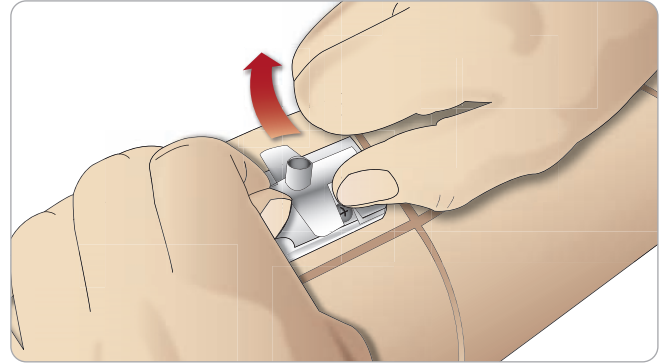
ADVANCED VIDEO SERVER (AVS):

If you use an AVS with your SimMan Essential system, please make sure that all components are updated with the latest software.

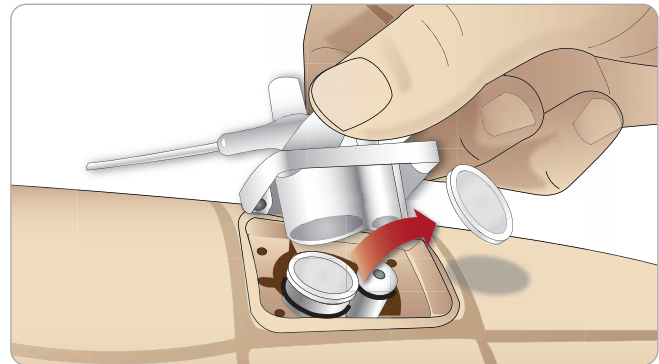
Replacing IV Arm Catheter / Filter

Replace the IV catheter module if it is damaged or when injecting fluids, resistance is high.

- Unzip and fold down the IV arm skin to expose the IV catheter module
- Using the no. 4 Phillips screwdriver; unscrew the four screws of the module and pull the IV module out of the arm.



- Lift the IV catheter up and out, exposing the recess where the filter is located.



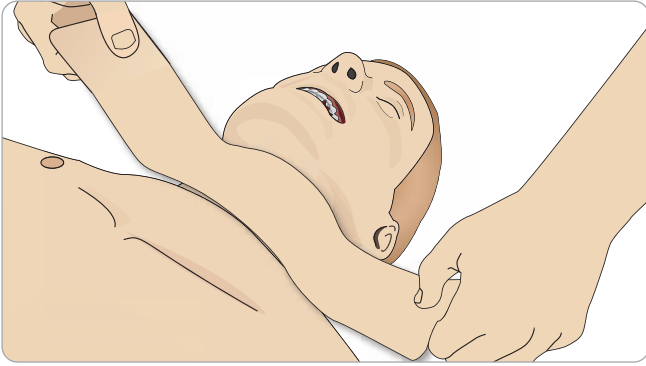
- Lift the IV filter out of the place and replace with a new one.

Maintenance

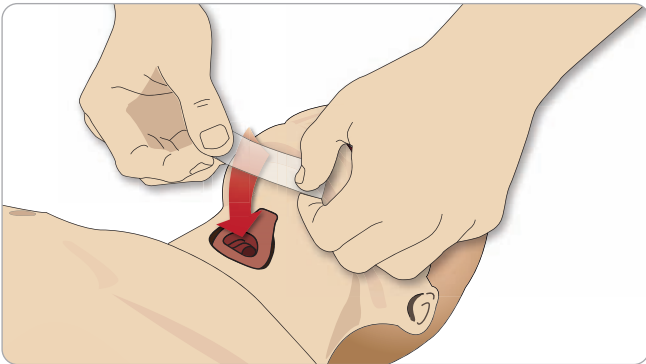
Replacing Crico Tape / Neck Skin

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

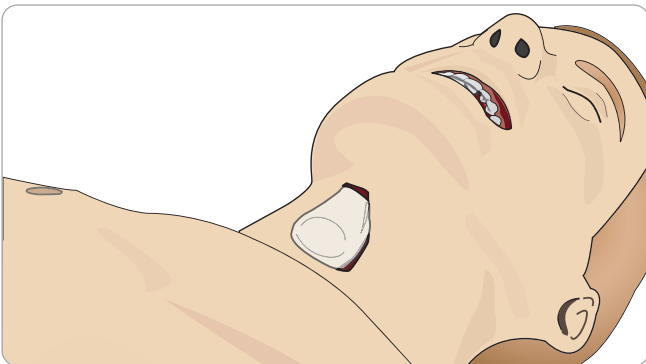
1. Remove the neck skin (velcro fasteners behind the neck).



2. Remove the old strip of Crico tape.
3. Replace with a new Crico tape.



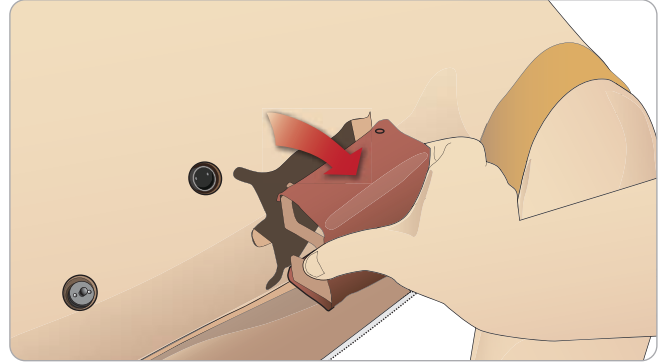
4. Ensure Crico-tape completely covers and seals the opening to prevent leakage while ventilating the manikin.



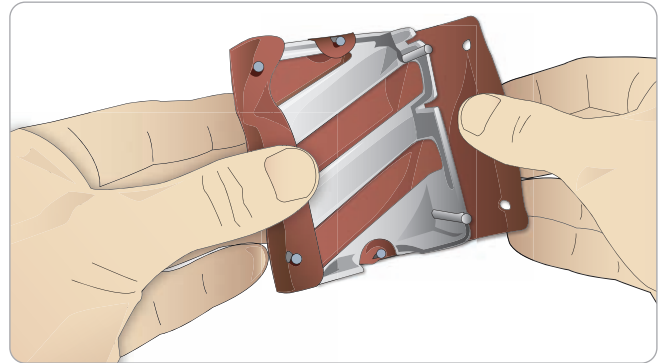
Replacing Chest Drain Pleura

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

1. Open the torso skin and remove the module from the chest.



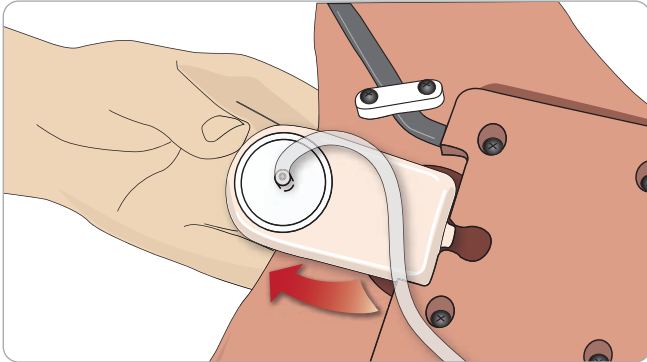
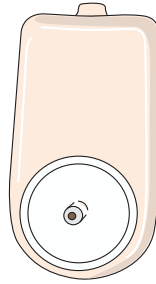
2. Remove the old pleura skin, and replace with a new skin and replace the module.



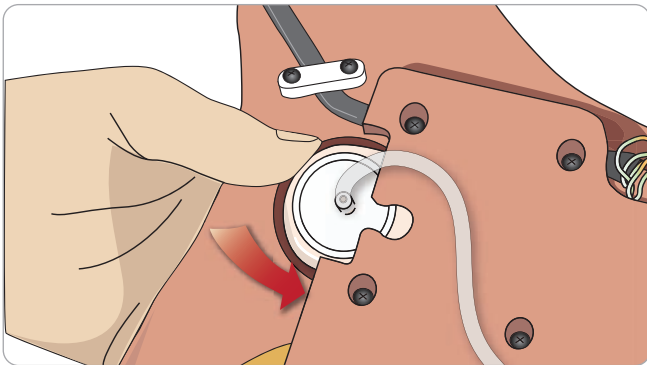
Replacing Pneumothorax Bladders

After multiple pneumothorax de-compressions, 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 old pneumothorax bladder.
3. Disconnect the tube and discard the old bladder.

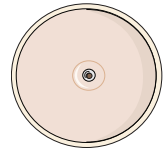


4. Insert the new bladder into the slot.
5. Reconnect the tube to the new bladder

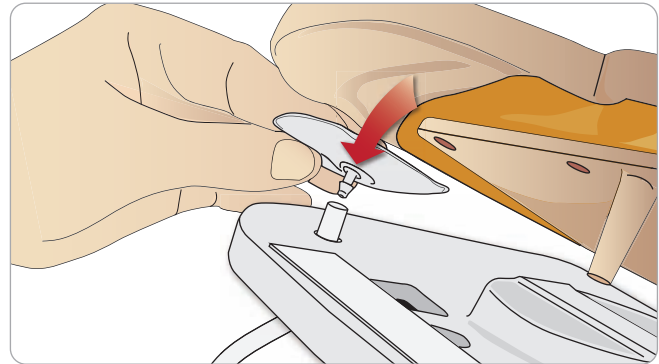


Replacing Chest Rise Bladder

The chest rise bladders located in the lower end of the chest plate may break after a while. These are easily replaced.



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 old bladder
4. Insert new bladder
5. Re-connect 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

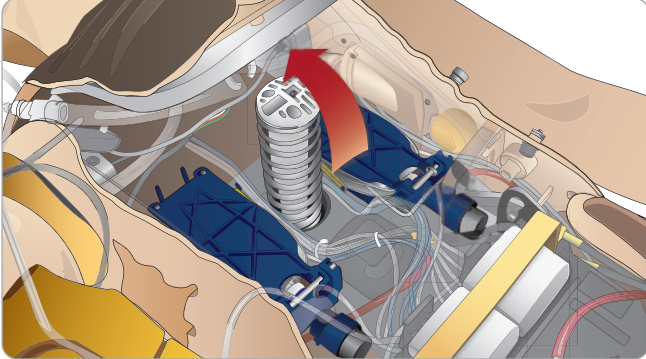
Maintenance

Replacing Lung Bladders

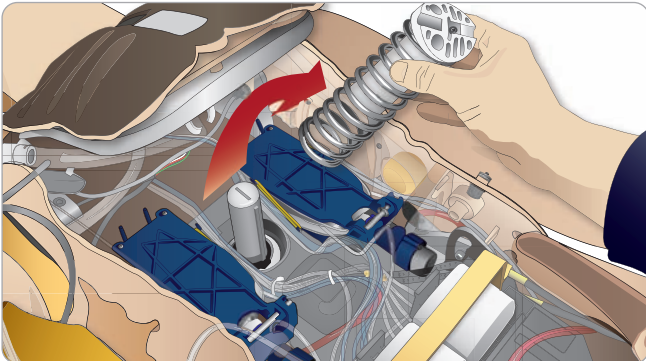
If leaking occurs, the chest rise bladders (in the chest cavity) should be replaced.



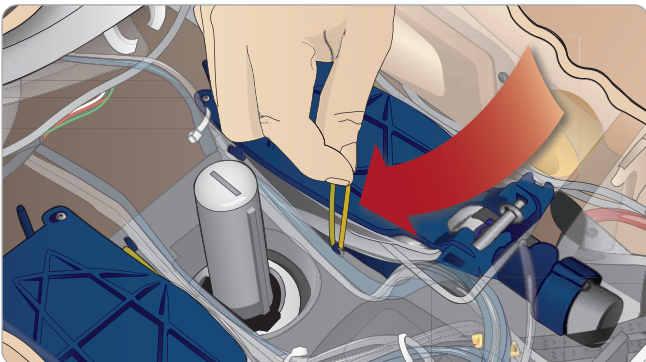
1. Open the torso skin and put the stomach foam to the side.
2. Open the hinged chest plate upwards, to access the lungs.



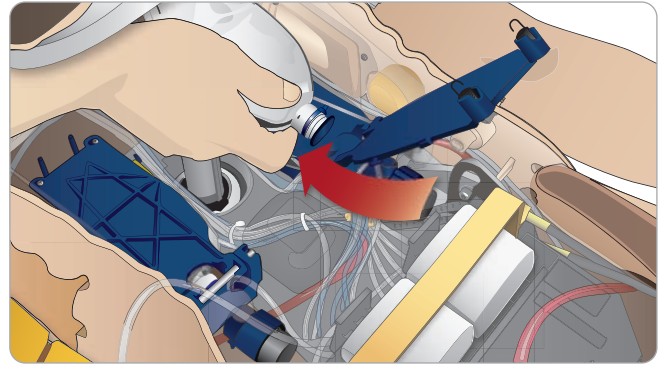
3. Remove the chest compression spring for easier access to the lungs.



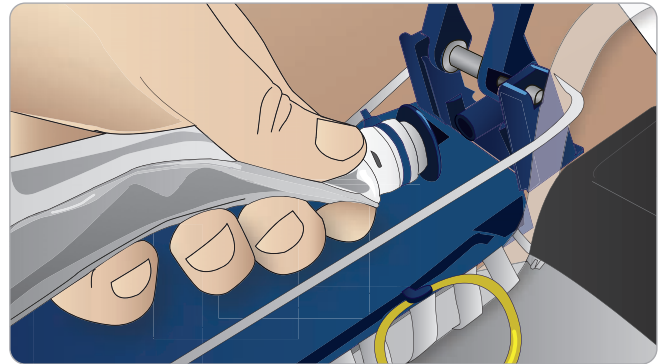
4. Unhook the yellow Lung Compliance bands from each side of the lung assembly.



5. Open the hinged lung plate.
6. Pull the old lung out from its socket.



7. Insert the new lung reversing this procedure.

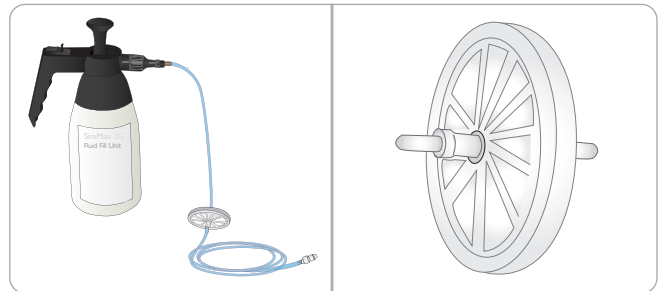


 Note: Ensure that the compliance bands intersect between the two folds of the lung.

Replacing Fluid Fill Unit Filters

When the filling process slows down under high pressure, the fluid filters in the Fluid Fill Unit must be replaced.

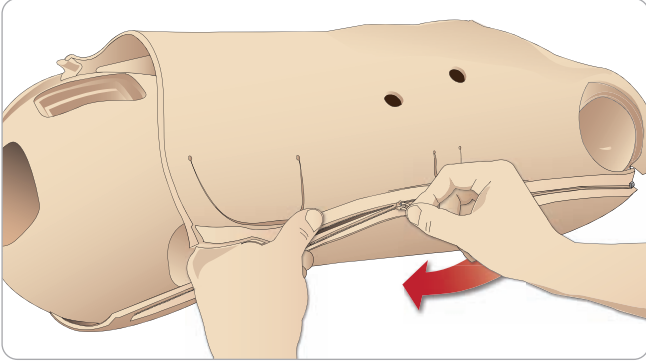
1. Disconnect tubing.
2. Remove filter
3. Attach new filter and reconnect tubing onto the Fluid Fill Unit.



Replacing Manikin Skins

The manikin skins may need replacement if they have torn, are perforated or stained.

1. Unzip and roll the skin off.



2. Powder the inside of arms, torso and legs to reduce friction while replacing the manikin skins.

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

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.

WLAN STABILITY AND PERFORMANCE:

Problem

Connection between the PCs and the manikin is frequently lost.

Causes

- The WLAN signal might interfere with other radio traffic or noise.
- E.g. WLAN and Bluetooth networks, wireless telephones, microwaves etc.

Possible Solutions

- Change WLAN channel see section: Changing WLAN settings.
- Place manikin closer to the PCs. Avoid solid barriers which may block the signal between the manikin and PCs.
- Windows includes power management features. Configure the WLAN for Maximum performance. Some WLAN adapter drivers come with their own power management settings.
- When the manikin is stationary, consider using a LAN network between manikin and PCs.
- Change to external router.
- Use Laerdal Connection Manager to locate the best channel.

WLAN CONNECTION

Problem

- The manikin works via LAN cable, but not with WLAN connection.

Possible Solutions

- First test WLAN using another computer, to rule out computer related malfunction.
- Check that WLAN has been enabled on the PC
- > Check that all relevant settings are set to enable WLAN
- > Check that WLAN is not disabled by the driver.
- Check that the WLAN dongle is set up with the correct TCP/IP settings. Default is using DHCP (Obtain an IP address automatically).
- WLAN adapter drivers and utilities may come equipped with features that allow intelligent control of the radio. These features may automatically shut down the adapter. This occurs typically after the computer has been in sleep or hibernate mode. It may be necessary to disable such features. Consider removing OEM utilities all together. Use Windows built-in features instead.

WLAN CONNECTION

Problem

- WLAN Connection is lost.

Possible Solutions

- Bad Reception or connectivity when running a network of manikins. Ensure that the WPA security keys are not the same on all manikins (**channel and passphrase**).

If WLAN is functioning on the PCs and you are unable to connect to the manikin via wireless connection, this indicates a problem with the WLAN dongle in the manikin.

- Check network settings using Manikin Update utility. See section *Wireless and LAN configuration*.
- As a last resort you may restore the manikin to factory defaults. Contact your local Laerdal customer support.

If the manikin is identifiable on the wireless settings of the PCs, but cannot be connected to, the problem could be related to the software security keys.

- SimMan Essential uses WPA authentication as default. The default password is SimMan3G.
- Should a problem arise with the WLAN profiles, please delete the existing WLAN profiles for the manikin and try reconnecting to the manikin.

Check the wireless connection between the manikin and the PCs:

- Make sure that the manikin and the PC are ON.
- From the PC, Run command prompt: shortcut Windows-button + R, type cmd and press enter.
- Typing: ping -t 192.168.170.1 (with wireless connection), 192.168.169.2 (with cable connection). The same numbers apply for all manikins.
- Error messages are generated if connection is missing. Retry or contact Laerdal support.

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?
- When checking the manikin's pulse, the <Select Manikin> dialog 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 section: *Maintenance - Replacing Lung Bladders*. 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.
- Ensure that the condensation valve is closed. See section: *Opening the Condensation Valve*.
- 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 section: *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 be overheated. Wait approximately 20 minutes for it to cool down.
- 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 section: Replacing Chest Rise Bladders*.
- Check air tubing for leakage; check that all connections are intact. Replacing tubing section if leaking.
- Shallow chest movements and the internal compressor runs continuously. The internal compressor may be worn - contact Laerdal Technical Service.

BLOOD SYSTEM

Problem

- Signs of simulation blood leaking from condensation valve when open.

Solution

- Blood reservoir may be torn and must be replaced. Contact Laerdal Technical Service.

BLEEDING FUNCTION

Problem

- Bleeding bags are leaking - Blood from the condensation valve on the back of the manikin's right leg.

Solution

- It is recommended to suspend use of the manikin immediately. Contact your local Laerdal Technical Service centre.

Troubleshooting

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 section: Manikin Setup - Attaching 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>.

BLOOD FILLING

Problem

- Filling the blood reservoir takes longer than usual.

Possible Solution

- Replace the filters on the fill unit filling tube.

Problem

- Can't fill blood reservoirs.

Possible Solution

- Open drain valve while filling.

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 – re-adjust 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 shutdown the manikin.

Main Specifications

Size, weight

Dimensions (manikin only): 1800mm (l) x 550mm (b) chest
(5.90 ft x 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 & CO₂ Pressure

Internal air tank: Max 1.4 bar
External air connection: Max 1.4 bar
External CO₂ 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)

* Requires that the fluid tanks and system is filled with 60% Isopropanol or 70% EtOH

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 - 64,149 - 165.
Operation range: 100 m (300 ft) max.
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,
Epoxy-Polyurethane

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

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

212-00050	SimMan 3G Manikin - Standard Version
212-11350	Arm bushing (left and right)
212-13050	Arm right, IV arm complete
212-14050	Arm left, BP Arm complete
212-15050	Leg right, complete
212-16050	Leg left, complete
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

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
212-090XX	Instructor PC, 12"
212-18150	Sleeve Patient Monitor
212-092XX	Patient Monitor, 12"
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

212-17250	External Blood Refill Unit
212-17350	External Fluid Refill Unit
300-00750	Blood Concentrate
212-25050	Inline Blood / Fluid Filter (pkg. 4)
210-20050	Wound Tape Kit
212-18550	Wounds Kit

Drugs and RFID Tags

210-70050	Drug / Airway Tag Kit
212-17850	Sleeve Medication / Airway Tags
212-23150	IV Filter (pkg. 6)
212-23250	Velcro hooks for RFID base
212-23350	Vial Kit (5 × 10ml & 5 × 20ml)
212-13450	Lock Kit for catheter; International (4 sets of 2)
212-13550	Lock kit for catheter; US (4 sets of 2)
212-13650	IV Catheter, luer lock, male (pkg. 40)
212-13250	IV Catheter with lock, US version (one port)
212-13350	IV Catheter with lock, International version (two ports)

Consumables

212-21050	Neck Skin Kit (6)
212-24050	Torso Skin
212-24450	Torso Skin Sternal IO
212-13150	Skin right, arm
212-14150	Skin left, arm
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 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)

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
212-18450	Repl. Tool, IV filter; Screwdriver Pozzi no. 1

Support Material

212-19150	Directions for Use
212-19250	Quick Reference Guide, booklet
212-19350	Quick Setup Guide, poster

SimMan 3G Software

212-19550	License (1) Instructor Application
212-30050	SimMan 3G Patient Cases, sample Package
212-19750	SimMan 3G Installation DVD

