SimJunior™

Directions for Use

Laerdal
helping save lives

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Introducing SimJunior

SimJunior is a realistic, life-size pediatric patient simulator designed to be used for the education of individuals or teams of healthcare professionals from multiple medical disciplines.

The SimJunior Simulator comes completely assembled. There is no need to assemble parts of the manikin.

For details on preparing SimJunior for simulation, go to "Manikin Setup" section.

SimJunior is available in:

-- Standard 232-000XX
-- Advanced with Standard Peripheral Kit 233-100XX
-- Advanced with Complete Peripheral Kit 233-000XX

Note: XX denotes language versions. Additional configuration options are available. For more information, contact your Laerdal representative.

SimJunior Help

Directions for Use (DFU)

Step-by-step instructions and illustrations for using the SimJunior Simulator.

Original Manufacturer's User Manuals

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

SimJunior Quick Setup Guide

Step-by-step guide for setup of the SimJunior simulation system.

VitalSim Directions for Use (DFU)

VitalSim Directions for Use provides instructions for using the VitalSim Control Unit and the Remote Control with SimJunior.

Software Help Files

The software Help files are accessible from the SimJunior software Help menus. Help topics include:

- Instructor Application Interface
- Debrief Viewer
- Scenario Editor
- Handlers Editor
- Trend 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 SimJunior Software.

Access the SimCenter website for information on additional products, accessories, and courseware. SimJunior Advanced comes with a SimCenter Welcome Kit which includes a voucher to redeem free relevant scenarios on SimStore. Visit www.mysimcenter.com to learn more.

SimCenter
Making Simulation Easier

Regulatory Information

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.
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.

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

Dispose of in accordance with local requirements and regulations.

Li-ion batteries should be recycled.

Li-ion

Disclaimer

Use of the SimJunior patient simulation system to train personnel should be undertaken under supervision of suitably trained technical or 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 Booklet, or see www.laerdal.com.

Country of origin - SimJunior is made in USA.

Laerdal Medical

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226 FM 116
Gatesville, Texas 76528, USA

General Manikin Care

Follow the instructions below to maintain optimum performance and longevity of the manikin and its components.

General Care

To maintain manikin skins, wash hands before use and place the manikin on a clean surface. Laerdal recommends to:

- Use gloves during simulation scenarios. 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. Staining may be permanent.
- Clean manikin skins with mild soap and water.

Do not attempt to perform the following techniques on this manikin due to the inability to properly sanitize the airway:

- Mouth-to-mouth/mouth-to-mask ventilation
- Insertion of simulated vomit or fluids for suctioning
- If a training session involves the use of fluids in the IV arm, drain the arm immediately following the training session.
- Use only Laerdal Airway Lubricant, and apply sparingly.
- Rinse, clean, and dry manikin component modules.
- Fold the torso skin back and powder the inside of the torso skin to decrease friction. Do not spill powder into manikin chest cavity.

Environment

In cold conditions, wait until the manikin has reached room temperature before starting up the manikin.

To avoid overheating and reduce wear:

- When using in temperatures above 40°C (104°F), always allow the manikin to cool down between training sessions.
- When using in a bed, manikin should not be covered with heavy bedding which prevents heat transfer from the manikin.

General Manikin Handling

Take the following precautions to avoid personal injury or damage to the product:

- Introduce fluids into the manikin only as directed in this document as this may damage the manikin and its components.
- Lubricate the oral and nasal airways with the lubricant provided prior to inserting any instrument, tube, or airway device. Also lubricate instruments and tubes prior to use.
- Do not introduce humidified air into the system during ventilation.
- Do not use the manikin if the internal tubing and cabling is disconnected.
- Never use the SimJunior manikin outdoors in wet conditions, as this may pose a shock hazard or damage the manikin.
- Using a defibrillator in temperatures over 35° C (95° F) may cause overheating.

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

⚠ **Caution Latex:** This product contains Natural Rubber latex, which may cause allergic reactions when in contact with humans.

Defibrillation Hazards

SimJunior allows for defibrillation.

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

1. Read and follow all safety and operating instructions provided with your defibrillator and associated equipment.
2. Follow defibrillation protocol by avoiding contact between the external paddles and any of the electrode sites while defibrillating. A load of up to 300 joules can be delivered.
3. Failure to follow safety measures could result in injury or death.

For more information, consult your defibrillator's original user manual.

⚠ **Warnings:**

- When performing defibrillation, use the defibrillator connectors or the zap plate mounted on the manikin's chest. Do not use the ECG connectors which are designed exclusively for ECG monitoring. Defibrillation on the ECG connectors will damage the internal electronics of the manikin and may cause personal injury.
- Do not defibrillate the manikin when it is turned OFF or if it is not functioning normally.

To prevent overheating during defibrillation, do not exceed a defibrillation sequence of 3 shocks in 45 seconds followed by 1 minute of CPR. After 30 minutes, cease all shocking for at least 15 minutes before starting a new sequence. Do not repeat this for more than a 4 hour period. Also, do not provide more than 2 x 300 defibrillator discharges per minute.

⚠ **Warnings:**

- The manikin must not come into contact with electrically conductive surfaces or objects during defibrillation.
- Avoid use in all flammable environments. For example, high levels of pure oxygen should be avoided during defibrillation. Ensure good ventilation if concentrated oxygen is used near the manikin.
- The manikin torso must always be kept dry.
- Allow the manikin to acclimate before defibrillating. Sudden changes in temperature may result in condensation collecting on electronic components, which could pose a shock hazard.
- 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.
- Do not defibrillate the manikin if the torso skin is not in place.

Mechanical or Electrical Hazards

Do not use the SimJunior 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 in or on the manikin.
- 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.

⚠ **Warning:**

- Avoid pinch hazards - Do not use the manikin without the external skins.

Battery Use and Maintenance

- Always use battery approved to power the SimJunior, VitalSim Unit, and Remote Control.
- Ensure that the batteries are properly installed. Inserting and connecting batteries incorrectly could cause a short circuit.

⚠ **Warnings:**

- Dispose of batteries according to local regulations.
- The external battery charger is for indoor use only.
- The manikin battery should only be charged in temperatures ranging from 0 °C - 40°C (32 °F - 104 °F)
- Do not mistreat, disassemble, or attempt to repair the battery. Do not use the batteries if they are visibly damaged, malfunctioning, or appear to be leaking.
- Take extreme care to avoid direct contact with electrical, hot or smoking parts. In case of a leaking battery, disconnect and remove the battery when it is judged safe to do so.
- Exposure to fluids pose an explosion hazard.
- On every 30th charge cycle, drain the battery completely before recharging. To drain the battery, run the manikin on battery power until automatic shutdown.
- Only replace with a Laerdal SimJunior battery.

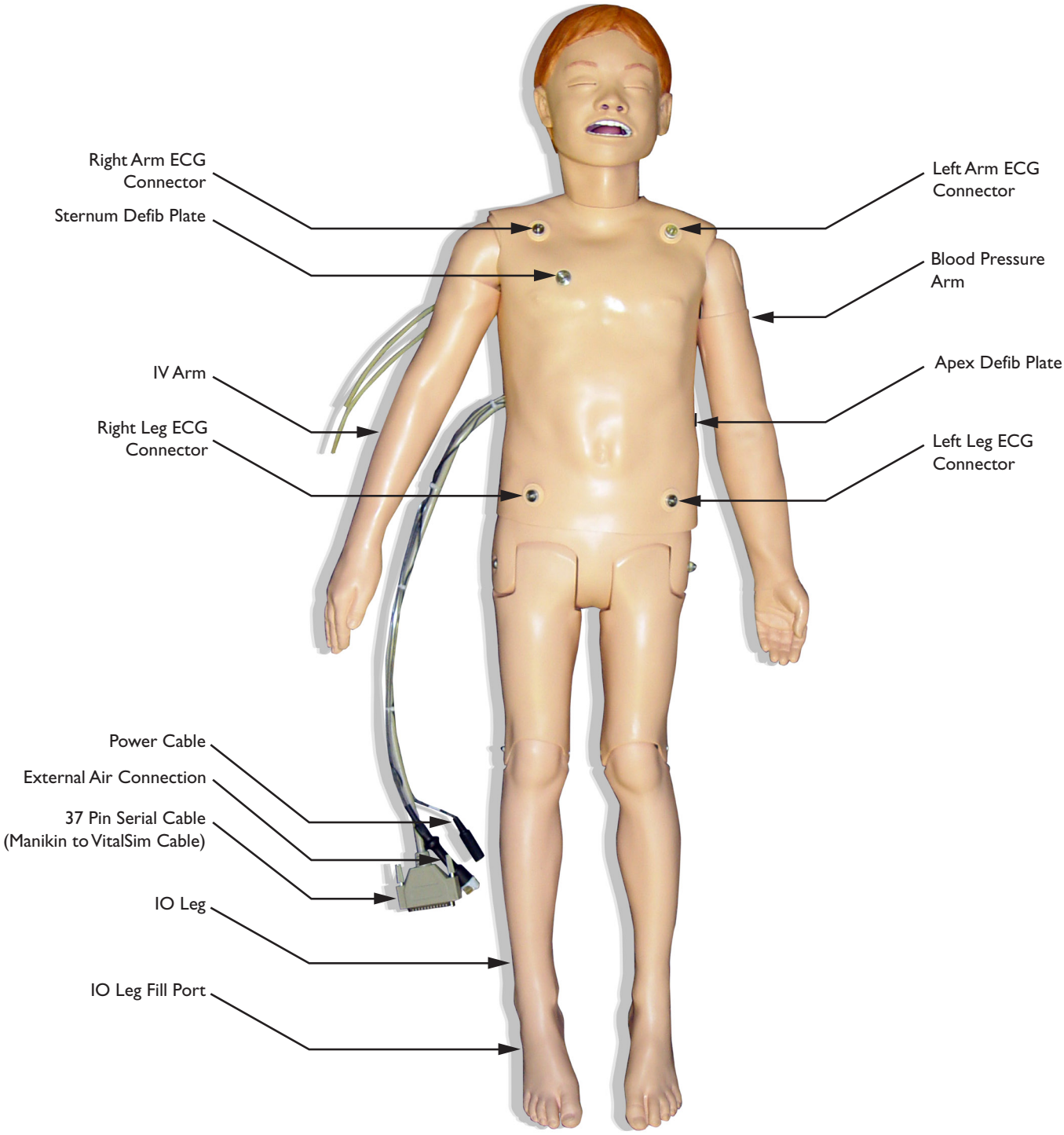
Storage and Transportation

- Never store fully charged batteries, for longer than a month.
- The manikin battery can be transported in the manikin during air freight.
- When transporting spare batteries, contact the airline or freight company for the latest transport regulations.

⚠ **Warning:**

- The SimJunior manikin and accessories are heavy when combined in the carrying case. Always ensure that SimJunior is firmly secured during transportation and storage to prevent personal injury or damage to the product.

SimJunior Simulator



SimJunior Simulator

SimJunior facilitates interactive training of life-saving skills and responds to clinical intervention, instructor control, and pre-programmed scenarios for effective practice of diagnosis and treatment of a patient.

With spontaneous breathing, airway control, voice, sounds, ECG, and other clinical features, SimJunior is a fully functional pediatric simulator. SimJunior allows observation and recognition of most vital signs, which enables the instructor to assess the student's skills based on a realistic clinical situation.

SimJunior Features

- Realistic airway for simulation of difficult airway management, oral, and nasal intubation.
- Observable breathing.
- Cardiac features, including defibrillation and cardioversion.
- Eyes with interchangeable pupils (normal, dilated, or constricted).
- Convulsions to simulate seizures.
- Chest compressions.
- Vascular access.
- Normal and abnormal heart, breath, and bowel sounds.
- Automatic Simulation Control based on pre-programmed and validated patient scenarios.

Simulations can run autonomously using scenarios. The development of the patient's condition is pre-programmed and automatically responds according to the student interventions.

Overall Dimensions

Length / Width (manikin only): 48 in x 9.84 in (120 cm x 42.5 cm)
Weight (manikin only): 25 lbs (11.36 kg)

SimJunior Clothing

SimJunior comes with custom designed clothing with Velcro openings for easy removal. Washing instructions are found on the clothing label.

- Shirt
- Shorts
- Boxer Shorts

General Clinical Features

Airway Features

The airway is anatomically correct to the trachea. The airway can be manipulated by:

- Head tilt/chin lift.
- Jaw thrust with articulated jaw.
- Cricoid pressure and manipulation.
- Suctioning (oral and nasopharyngeal)

The manikin may be ventilated by normal and emergency methods;

- Bag-mask ventilation
- Orotracheal intubation
- Nasotracheal intubation

Prior to using airway devices, lubricate with Laerdal Airway Lubricant.

The following equipment or methods are suitable to secure the manikin's airway:

- Laryngeal mask airways (size #2.5).
- Endotracheal tube intubation (size ID 4.5 cuffed, 5.5 uncuffed).

Use of a malleable stylet is recommended. Make sure it does not extend beyond the ET tube.

The following manikin conditions indicate incorrect tube placement:

- Right main stem intubation – unilateral chest rise.
- Stomach distention.
- Lack of chest sounds (see Breathing section).

Manikin features may be configured to present various airway scenarios:

- Tongue edema - normal, medium, maximum levels.
- Lungs open or closed.

Breathing Features

SimJunior can simulate spontaneous breathing with visible chest rise and fall and variable breathing rates. The breathing is generated by an enclosed air compressor in the manikin's right thigh.

- Bilateral chest rise and fall with spontaneous breathing.
- Unilateral chest rise and fall with right mainstem intubation during ventilations.
- Unilateral and bilateral lung sounds.
- Normal and abnormal breath sounds.
- Variable respiration rate (0-60 breaths per minute).
- Anterior auscultation sites (4).

The left lung and right lung can be closed independently or together to create a partial or complete airway obstruction. The SimJunior manikin can also be used with assisted ventilations.

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

Circulatory Features

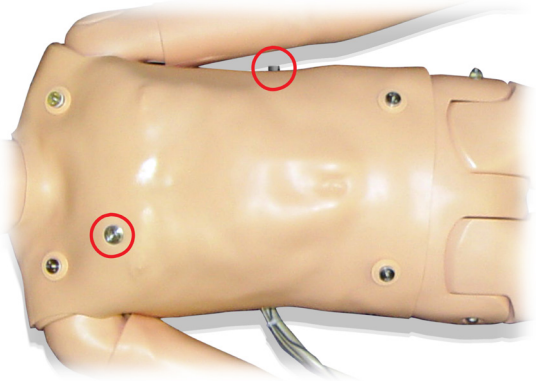
Cardiac:

- Extensive ECG library, pulses from 0-200.
- Heart sounds - anterior location (1).
- ECG rhythm monitoring (4-connector, 3-lead ECG).
- 12-lead ECG display (SimJunior Advanced only).
- Pacing.
- Defibrillation and cardioversion using live defibrillators.

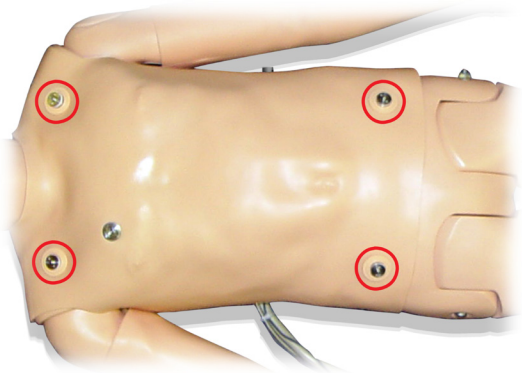
Defibrillation:

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

Defibrillation Studs



3-Lead ECG Studs



Blood Pressure and Pulses:

- BP measured manually by auscultation of Korotkoff sounds.
- Bilateral carotid pulse.
- Central pulses can be set to Normal, Weak, Absent.
- Radial/Brachial pulses can be set to Normal, Weak, Absent.
- Carotid, brachial, radial, pulses synchronized with ECG.
- Pulse strength variable with BP.
- Pulse palpation is detected and logged.

CPR Features

- Compliant with 2010 Guidelines.
- Compressions generate palpable pulses, blood pressure wave form, and ECG artifacts.
- Realistic compression depth and resistance.
- Detection of depth and rate of compressions.

Vascular Features

IV Access:

IV access is possible on the right arm and hand. The IV arm can be set up for IV insertion, infusion, and bolus into:

- Peripheral veins of the forearm.
- Antecubital fossa and dorsum of the hand.

For use of an optional catheter, see your local Laerdal representative.

Intraosseous Access (IO):

Access for IO infusion is possible:

- Tibial Tuberosity (right)
- Medial Malleolus

Note: SimJunior does not have intra-muscular (IM) injection sites. Do not attempt to perform IM injections.

Sound Settings for SimJunior

SimJunior supports multiple sites for auscultation and recognition of heart, lung, stomach, and bowel sounds. SimJunior also allows you to set vocal sounds.

For information on setting sounds for SimJunior, see the sections:

- SimJunior Standard System.
- SimJunior Advanced System.

VitalSim Control Unit

The VitalSim Control Unit connects to the manikin and enables the SimJunior manikin to simulate a variety of clinical and emergency care situations.

SimJunior Standard Simulations are controlled by the VitalSim Remote Control device.

SimJunior Advanced Simulations are controlled with either the Instructor PC or the VitalSim Remote Control device.

Note: The Instructor PC and Remote Control **cannot** be used simultaneously.

The VitalSim kit includes a CD with PC software supporting scenario and log functions. The software will run on Windows XP and Windows 7.

The VitalSim can be connected to the PC through the USB connector. Through this connection, scenarios made on the PC can be downloaded to the VitalSim for execution. Also, software updates can be downloaded. Logs generated and saved on the VitalSim can be uploaded to the PC for review, printing, and permanent storage.

The software functions are documented through Help functions and documents residing on the CD.

Note: Refer to the VitalSim DFU for details about operating the VitalSim Control Unit and the Remote Control.

After setting up the VitalSim Control Unit and the manikin, connect the VitalSim to the manikin with the 37-pin Serial Cable (manikin connection cable).

1. Press the On/Off button once to turn the VitalSim Control Unit ON.
2. Press the On/Off button again to turn the VitalSim Control Unit OFF.
3. If the VitalSim Control Unit has contact with the Remote Control, the indicator light glows a steady green. At this point, the system is ready for use.
4. If the VitalSim Control Unit does not have contact with the Remote Control, the indicator light will blink green. Check the connections and the batteries to determine the cause of the problem.

Note: If the VitalSim Control Unit battery needs to be replaced, the indicator light will blink, alternating between green and red.

VitalSim Package Contents

Introduction to SimJunior Standard

The SimJunior Standard includes:

- Manikin and soft carrying case
- SimJunior Quick Setup Guide
- VitalSim Control Unit Package
- Blood Pressure Cuff
- Set of Consumables
- Operating Software
- SimJunior Directions for Use (DFU)

Setup Summary

See below illustration "Setup of SimJunior Standard."

1. **Connect the VitalSim Control Unit**

- Connect the VitalSim Control Unit's power supply to a wall outlet.

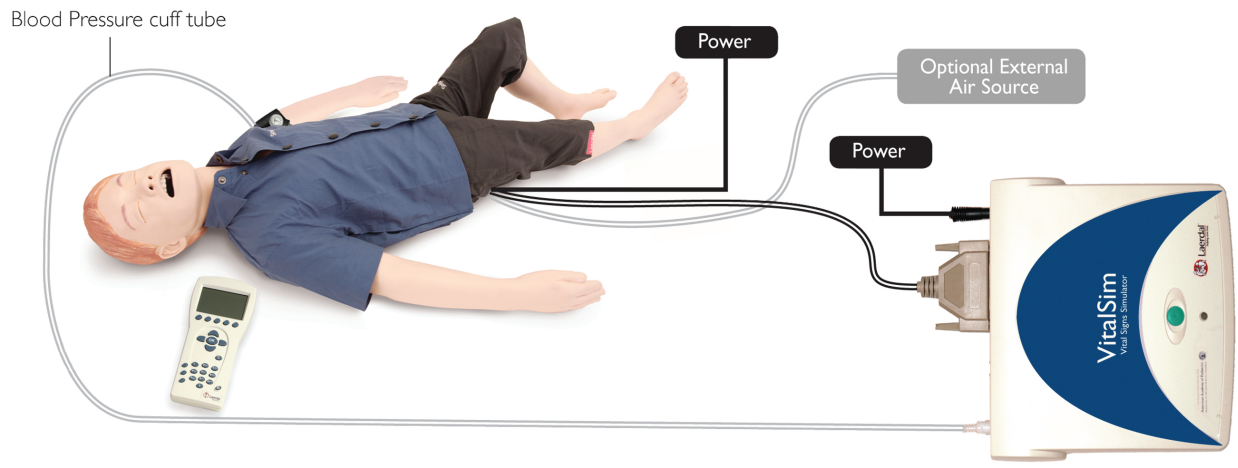
2. **Connect the Manikin to the VitalSim Control Unit**

- Connect the 37-Pin Serial Cable (Manikin to VitalSim Cable) to the VitalSim Control Unit.
- Place the Blood Pressure cuff on the left arm of the manikin if desired.
- Connect the clear tubing from the Blood Pressure cuff to the VitalSim Blood Pressure connector on the back of the VitalSim Control Unit.

3. **Connect the Manikin to a power supply.**
4. **Power on the VitalSim Control Unit.**
5. **The simulation system is now ready to use. Power cables may be disconnected when batteries are charged.**
6. **Prepare the Manikin and its components as needed for specific simulations. See the section: Manikin Setup for Simulation.**

Note: If you are using an existing VitalSim Control Unit instead of one ordered with the SimJunior Simulator, upgrade the software for the new SimJunior features. See the section, Maintenance: Installing and Upgrading SimJunior Software.

Setup of SimJunior Basic



Along with the VitalSim Control Unit, the SimJunior Standard System is configured and controlled via a Remote Control. The Remote Control provides menus and options with a display screen as illustrated in the VitalSim DFU.

Remote Control

This portion of the SimJunior DFU describes screens and features unique to the SimJunior Standard simulator.

The SimJunior VitalSim kit includes a DFU. Read the VitalSim DFU for details about operating the VitalSim Control Unit and the Remote Control prior to operating SimJunior.

Once the SimJunior manikin has been connected to the VitalSim Control Unit, power on the VitalSim Control Unit and Remote Control. The VitalSim Control Unit will automatically detect the connected manikin and set the parameters to the default values.

Note: During start-up, the manikin's head will shake to indicate a power-on self test.

Main Display Elements

The Remote Control main screen shows the current overall status of the manikin, and allows for modification of parameters.

The main display is divided into functional areas and a Quick Execution function line (see image below). Information is provided on patient status parameters and use of functional controls.

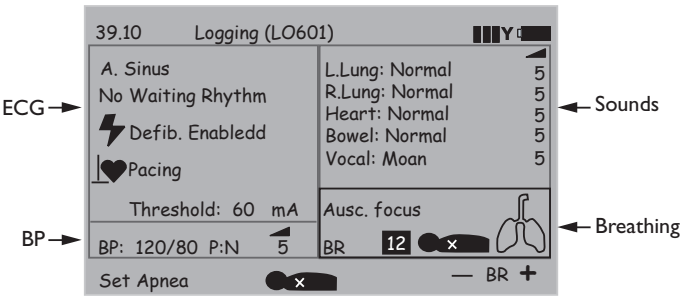
Use the navigation keys to move the selection box to the desired functional area of the display. When the selection is complete, press OK to activate the new selection and return to the main display.

To cancel the selection, press C to return to the main display with the previous setting unchanged.

Remote Control Setup Menu

To activate the Setup menu:

1. Power on the Remote Control.
2. Press the <**Menu**> key.
3. Navigate to a function on the left using the navigation keys.

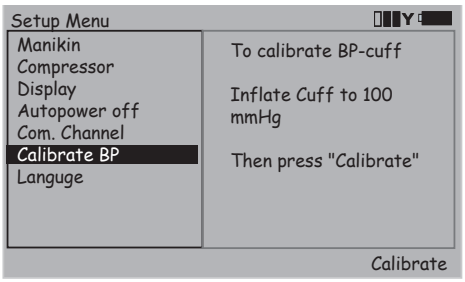


4. Select a function.
5. Press OK to save.
6. Change the appropriate parameters.

Note: Press the **C** key to return to the Main menu without and discard any changes made.

Calibration of Blood Pressure

To ensure correct measurements of simulated BP, the sphygmomanometer used with the cuff needs to be calibrated to the pressure sensor in the SimJunior system.



1. Press the Menu key.
2. Scroll down to the Calibrate BP function.
3. Inflate the blood pressure cuff to 100 mmHg.
4. Press the Calibrate quick execution key (lower right corner of screen) as the pressure is held at exactly 100 mmHg.

Airway and Breathing Parameters

On the main display, use the navigation keys to select the Breathing functional area, which shows the current breathing rate and lung closure state.

Set Breathing Rate

Use the navigation keys to select the Breathing functional area.

Use the < **+** > and < **-** > quick execution keys to change the breathing rate, or enter the breathing rate directly with the numeric keys.

The breathing rate can be set between 0 and 100 breaths per minute. Breathing rate is automatically set to 0 if BP is 0.

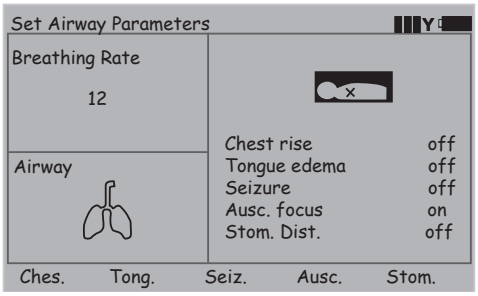
Press the <**Shift**> key (up arrow key) to reveal the alternative quick execution functions.

Set Airway Parameters Menu

When the Breathing functional area is selected, Press <**OK**> to open the Set Airway Parameters menu. Use the left/right navigation keys to select the functional area, and then use the quick execution functions to change settings of the parameters.

Turn Compressor Off with Remote Control

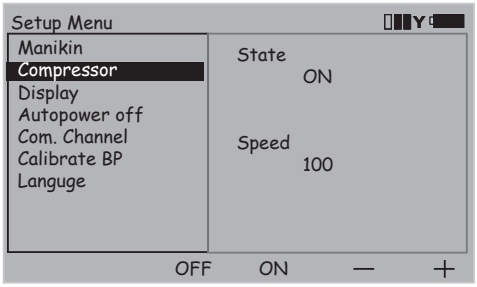
With the Remote Control (SimJunior Standard System), navigate to



the Setup Menu. This menu lists Compressor.

1. Select <**Compressor**>. The Quick Execution keys display the Off option.
2. Press the Quick Execution key for Off.

The display to the right of the menu should show the compressor is Off.



Introduction to SimJunior Advanced

SimJunior Advanced includes

- Manikin and soft carrying case
- SimJunior Installation Guide
- VitalSim Control Unit Package
- Operating Software for the VitalSim Control Unit
- Instructor Laptop PC
- Touchscreen Patient Monitor (Complete Peripheral Kit Only)
- USB Webcam
- USB Hub
- Blood Pressure Cuff
- Set of Consumables
- Operating Software for the Instructor PC
- SimJunior Directions for Use (DFU)
- SimJunior Advanced comes with a SimCenter Welcome Kit which includes a voucher to redeem free relevant scenarios on SimStore.

Instructor PC

Touchscreen Patient Monitor

Web Camera

Instructor PC controls simulations. It includes 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 Patient Monitor.

Patient Monitor can be configured to replicate most patient monitors. It 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.

Web Camera records video and sound of the simulation for use during the debriefing session.

Setup Summary

Note: Refer to the *SimJunior Quick Setup Guide* for detailed instructions on initial simulator setup.

1. Start the Instructor PC

- Connect the mouse and power supply to the computer and power ON.
- Make sure that the SimJunior simulator icon is displayed on the Instructor PC desktop

2. Install the USB hub

- Connect Power to the USB hub.
- Connect USB hub to Instructor PC

3. Connect the Patient Monitor Cables

- Put aside the software CD that comes with the monitor. DO NOT INSTALL software CD.
- Route the cables through the Patient Monitor stand and connect them to the corresponding outlets located at the bottom of the screen.
  - -- Video cable
  - -- USB cable
  - -- Audio cable (blue mini jack with single wire)
  - -- Power cable
  - -- Secure the cables using the strain reliefs.
- Connect power cable to a wall outlet and power ON the Patient Monitor.

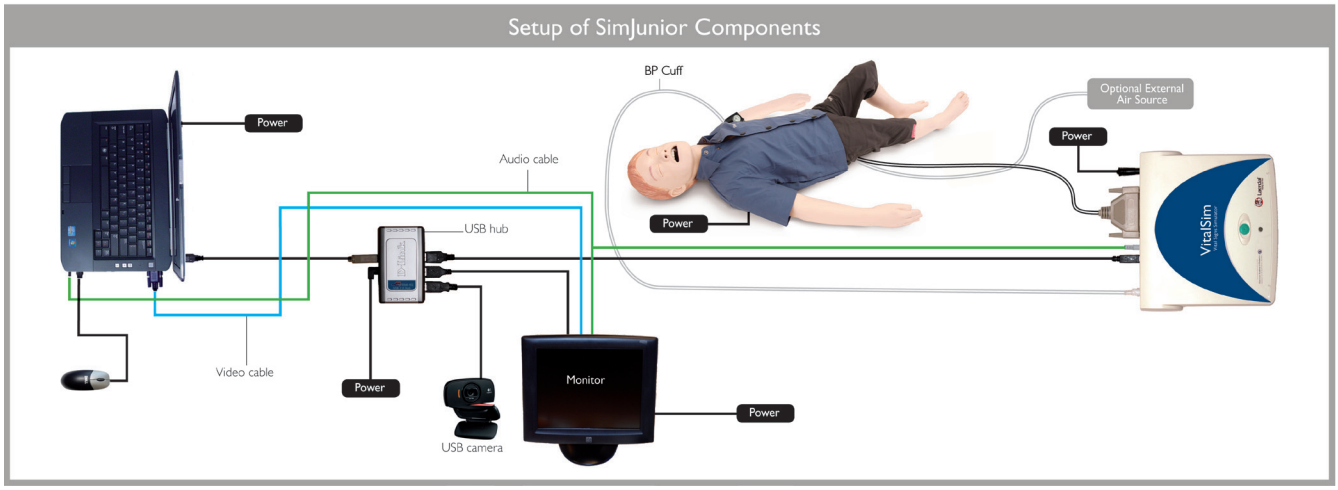
4. Connect the Patient Monitor video cable and 3-way audio cable (black mini jack with double wire) to the Instructor PC.

IMPORTANT: Do **NOT** connect the USB cable to the Patient Monitor yet.

5. Set Up the Instructor PC for Extended Desktop Display to Support the Patient Monitor.

- Right click on the instructor PC desktop
- In the drop down menu select <**Screen Resolution**>
- In the <**Multiple Displays**> option, select <**Extend these displays**>.
- Click <**Apply**>.
- The Instructor PC (display 1) should have a resolution of 1600 x 900.
- The Patient Monitor (display 2) should have a resolution of 1280 x 1024.
- Click <**OK**>.

6. Connect the Patient Monitor to the USB Hub.



7. Calibrate the Touchscreen Patient Monitor.

- Double-click on the Elo logo in the system tray in the lower right corner of the screen.
- Click the <**Align**> button on the dialog box that appears.
- If target indicators first appear on the Instructor PC screen, press <**Esc**>, or wait until they appear on the Patient Monitor.
- When the target indicator appears on the Patient Monitor, touch each target as it changes position.
- When the ELO Touchscreen dialog box appears, touch the green "check box" button.
- Click <**OK**>.

8. Connect the USB Camera to the USB hub.

9. Connect the VitalSim Control Unit.

- Connect the USB cable from the VitalSim Control Unit to the USB hub.
- Connect the audio cable (white mini jack with single wire) to the VitalSim Control Unit.
- Connect the power cable to the Control Unit and power source.

10. Connect the Manikin to the VitalSim Control Unit.

- Connect the 37-Pin Serial Cable (Manikin to VitalSim Cable) to the VitalSim Control Unit.
- Place the Blood Pressure cuff on the left arm of the manikin.
- Connect the clear tubing from the Blood Pressure cuff to the VitalSim Blood Pressure connector on the back of the VitalSim Control Unit.
- Connect the Manikin to a power supply.
- Power on the VitalSim Control Unit.

The simulation system is now ready to use.

Prepare the Manikin and its components as needed for specific simulations. See the section: Manikin Setup.

Instructor Software License

Instructor PC is shipped from Laerdal Medical with a pre-activated license installed.

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.

Instructor PC

The Instructor PC uses the Instructor Application software to manage simulation scenarios. The instructor can pause a scenario at any time and run the simulation in manual (on-the-fly) mode, customizing the patient parameters as needed:

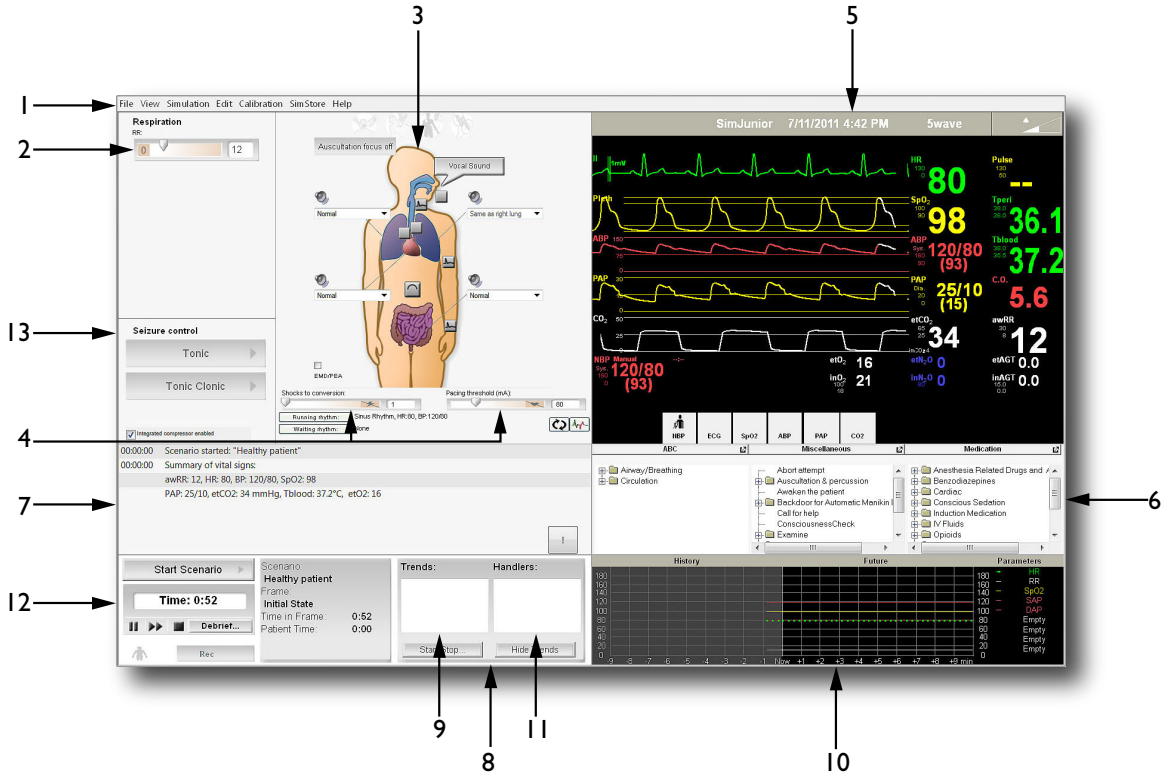
For more information on software and system setup, see the Help files:

1. Click Windows <Start> <All programs>.
2. Select <SimJunior Instructor Application >.
3. Select <SimJunior Help File>.

Instructor PC Application Screen Overview

The Instructor PC application screen provides functional areas for viewing and controlling patient clinical features.

1. Program Menu Bar
2. Respiratory Control
3. Simulator Sounds, Airway, and Circulation Controls
4. Defibrillation and Pacing Control
5. Instructor Monitor Control
6. Event Windows
7. Debrief Log
8. Trend and Handler Control
9. Running Trends
10. Trend Window
11. Running Handlers
12. Scenario Control
13. Seizure Control



1. Program Menu Bar
2. Respiratory Control
3. Simulator Sounds, Airway, and Circulation
4. Defibrilation and Pacing Control
5. Instructor Monitor Control
6. Event Windows
7. Debrief Log
8. Trend and Handler Control
9. Running Trends
10. Trend Window
11. Running Handlers
12. Scenario Control
13. Seizure Control

Description of Functions:

1. Program Menu Bar

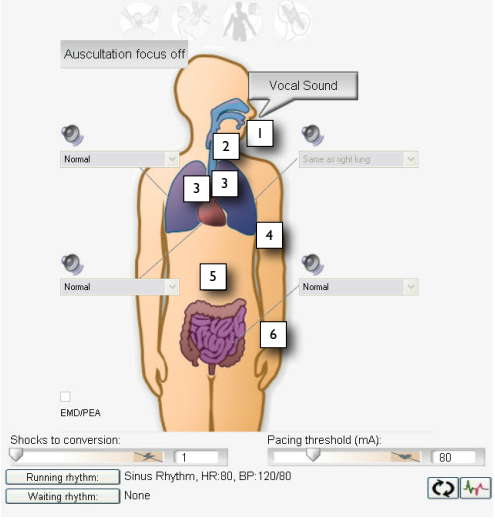
- Open and edit file.
- Set up and configure the patient monitor and the simulator.
- Access additional application such as the Scenario Editor.

2. Respiration and Seizure Control

- Adjust the simulator's respiratory rate.
- Start and stop different types of seizures.

3. Simulator Sounds, Airway, and Circulation

- View and set body sounds for lungs, heart, stomach, and bowel.
- Set vocal sounds. (View sound volume by clicking on the speakers displayed next to the area you want to configure).
- Set lung function (on/off) and pulse function (central, radial, and brachial).
- Set tongue edema and stomach distention.



1. Tongue Edema
2. Carotid Pulse
3. Blocked Airway
4. Brachial Pulse
5. Stomach Distention
6. Radial Pulse

Note: View and configure additional sounds with the <**Edit**> menu located at the top of the screen.

4. Defibrillation and Pacing Control

– View and control shocks to conversion and pacing threshold.

Click the Running rhythm button to exchange the running rhythm and waiting rhythm. Click the Extrasystole button to insert an extra systole into the running rhythm.

5. Instructor Monitor Control

– View status of patient's vital signs throughout the simulation.

The patient monitor waveforms and parameters can be set directly by selecting and clicking the individual waveform or numeric parameter with the mouse.

6. Event Windows (3)

– Contains checklists of events relevant for the simulation. An Event is an action (or behavior) exhibited by the learner.

7. Debrief Log

– Shows all activities performed during the simulation.

8. Trend and Handler Control

– Trends permit physiologic changes over a period of time.

– Trends box allows the instructor to start and stop trends.

– Event Handlers (optional) enable Events to trigger simulator responses.

– Handlers box allows the instructor to hide trends.

9. Running Trends

– Window displays running trends. Use the <**Start/Stop**> button to open the **Trend and Handler Control** dialogue box and make changes, select Trends or Handlers, and start or stop both Trends and Handlers.

10. Trend Window

– Window displays the simulation control graph, which illustrates the trend in patient parameters of past, current, and predicted future trends throughout the simulation.

11. Running Handlers

– Window displays currently running handlers. Use the <**Hide Trends**>button to hide or show trends

12. Scenario Control

– To start, pause, or halt scenarios. This section also contains the Debrief button, which will end the current scenario and allows debriefing.

13. Seizure Control

– Tonic (2-3 seconds)

– Tonic Clonic (1 minute)

Running a Scenario

– Click <**Start**> to launch the Instructor Application.

– Click <**Start Scenario**>. This will open a list of scenarios.

– Select and open.

– Click <**Play**> button to start.

Note: <**Pause**> button changes to <**Play**> button when the scenario is paused.

The <**Pause/Play**> button is located below the <**Start Scenario**> button. When a simulation is running, click this button to pause the session.

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. Hold the cursor over a numeric parameter for 1 second, the selected parameter's background will turn to grey and the mouse pointer will change appearance, indicating that the scroll wheel can be used to increase or decrease the value.

Stop Simulation Session

When the simulation session is complete, click the **Stop** button < ■ > below the <**Start Scenario**> button.

Debrief Log

The Debrief Log records information about patient responses and Learner events that occur during simulation. Events can also be added manually by the instructor. This information is then made available in debrief files at the end of the simulation session.

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

Save Files and Laerdal Debrief Viewer

Save the Debrief Log to archive and/or review later. Click <**Debrief**> to start the Debrief Viewer. For more information, see The Laerdal Debrief Viewer section of this manual.

Patient Monitor

The optional Patient Monitor has a Touchscreen display and is used to run the Patient Monitor Application.

The Patient Monitor software simulates a real patient telemetry monitor .

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

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

Patient Monitor Interface

1. Top menu

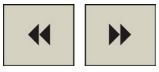
Press <**5wave**> in the top menu to view and change monitor display settings.

Press to open Alarm Volume.

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

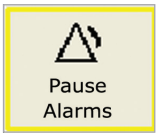


There are two bottom menus. Press the left or right arrow key to toggle back and forth between Bottom Menu 1 and Bottom Menu 2.

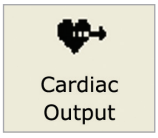
Bottom Menu 1 (in order from left to right):

Press the left double-arrow key to display Bottom Menu 1.

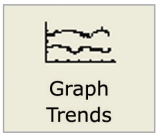
Selecting the <**Silence Alarm**> button turns active alarm sounds OFF.



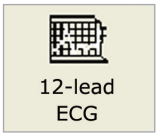
Selecting the <**Pause Alarms**> button turns all sound alarms off for 3 minutes.



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.



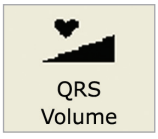
Select the <**Graph Trends**> button to open and review.



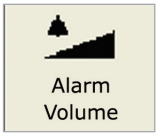
Selecting the 12-lead ECG button generates a 12-lead ECG strip. Select <Print> to request this ECG strip be printed. The request will display on the Instructor Application.

Bottom Menu 2 (In Order from left to right)

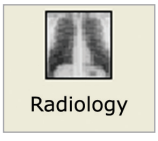
Press the right double-arrow key to display Bottom Menu 2.



Select the <QRS Volume> button to open and adjust volume (0-10).

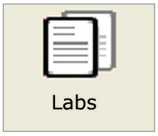


Select the <Alarm Volume> button to open and adjust volume (0-10).



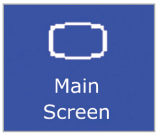
Select the <Radiology> button to open X-ray images which have been included in the current scenario.

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



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

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



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

Importing and Adding Media Files

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

Import Media Files

To import media files to make them available for the simulation sessions:

1. In the Instructor Application, click <**File**>.
2. Click <**Import Media Files**> in the drop-down menu. The Instructor may import any of the existing media files or browse to select a personal media file.

Add Media Files

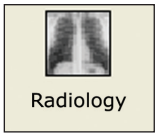
To add media files:

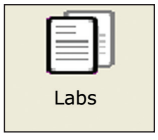
1. In the Instructor application, click <**File**>.
2. Click <**Add Media Files**> in the drop-down menu.
3. Browse to select a file.

The Instructor can import and add as many media files as required.

Instant Display:

Media files show immediately when transferred.





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. Ensure that the main menu is displayed.
2. Click on the appropriate Radiology, Media, or Labs button.
3. Click <**Order New**> in the dialog box.
4. 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.

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 time line and are always played back simultaneously.

Accessing the Debrief Viewer

The Laerdal Debrief Viewer can be accessed in two ways. :

1 - From the Instructor Application:

- Click the Stop button < ■ >.

  The Stop button is located under the Time display.
- Click the <**Debrief**> button in the <**Start Scenario**> dialog box.
- The Debrief files from the session are then transferred and made available in the <**Laerdal Debrief Viewer**>.

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

2 - From Windows Start menu:

- Click the Windows <**Start**> button.
- Select <**All Programs**>.
- Select the <**Laerdal Debrief Viewer**> program folder.
- Select <**Laerdal Debrief Viewer**>.

The system displays the Debriefing window for the session.

Laerdal Advanced Video System (AVS)

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

Note: The Laerdal AVS is not included in the SimJunior package but can be purchased from your local Laerdal Sales Company or representative.

Customizing Scenarios

SimJunior 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.

1. Select the <**Edit**> menu (located at the top of the Instructor Application screen).
2. From the drop-down menu, select <**Scenario Editor**>.
3. The New Scenario (SimJunior) window opens. Select <**Edit**> from the menus shown at the top of the window.
4. From the drop-down menu, select <**Edit Event Menus**>.

All of the SimJunior editors can be accessed through the Instructor Application's <**Edit**> menu, or directly through the Windows <**Start**> menu:

1. Click the Windows <**Start**> button.
2. Select <**Programs**>.
3. Select <**SimJunior Instructor Applications**>.
   The following list appears:
   Scenario Editor
   SimJunior Help file
   SimJunior Instructor Application
   SimJunior Program Update
   Trend Editor
4. Select an editor.

Scenario Editor

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

Trends

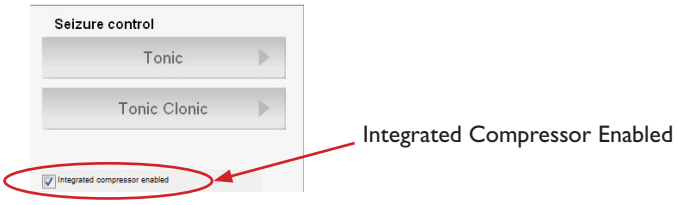
Trends are sets of physiological parameters pre-programmed to increase/decrease over time.

Handlers

Handlers are pre-programmed sets of events linked to actions.

Turning the Internal Compressor OFF

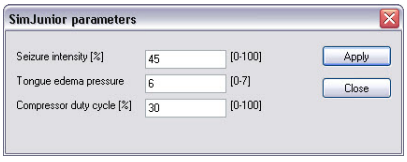
If you are using an external compressor, turn off the internal compressor by unchecking the box next to the <**Integrated Compressor Enabled**> option in the patient status panel.



Changing Settings During Simulation

The Internal Compressor, Tongue Edema, and Seizure can be adjusted during the simulation by accessing the **SimJunior Dialog Menu**. Any changes made in this window will not effect the default settings of the manikin.

1. In the Instructor Application click <**Edit**> in the Program Menu Bar.
2. Select <**Start SimJunior Dialog**> in the drop down menu.
3. Increase or decrease to desired values.
4. Click <**Apply**>.



Note: Compressor can only be set at 30-50%. Set compressor at 30% to minimize internal noises and better simulate shallow breathing. Set compressor at 50% to maximize breathing density.

Changing Default Setting

Note: Once the new default settings are saved, the new parameters will become the start up default for future sims.

Internal Compressor

You can configure the RPM setting for the internal compressor. From the Instructor Application:

1. Select the <**Edit**> menu in the Instructor Application.
2. Select <**Configuration**> from the drop-down menu.
3. The Configuration - Default program settings window is displayed. Click the <**Compressor RPM**> option under <**Target Values**>

Tongue Edema

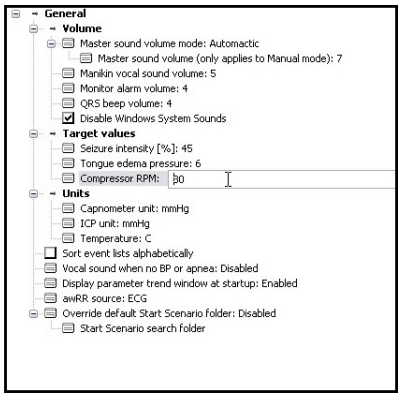
From the Instructor Application:

1. Select the <**Edit**> menu in the Instructor Application.
2. Select <**Configuration**> from the drop-down menu.
3. The Configuration - Default program settings window is displayed. Click the < **Tongue edema pressure**> option.

Seizure

From the Instructor Application:

1. Select the <**Edit**> menu in the Instructor Application.
2. Select <**Configuration**> from the drop-down menu.
3. The Configuration - Default program settings window is displayed. Click the < **Seizure intensity** > option.



Help Files

Software Help-files can be accessed as follows:

1. Click the Windows <**Start**> button
2. Select <**Programs**>.
3. Select <**SimJunior Instructor Applications**>.
4. Select the <**SimJunior Help File**>.

Preparing for Simulations

After the SimJunior manikin is prepared and all applicable interactive units (Remote Control or Instructor PC and Patient Monitor) are configured and made ready for use, final preparations may need to be performed before SimJunior is ready to run simulations.

Final simulation preparations include the following activities:

- Changing Settings for the Internal Compressor
- Connecting an External Compressor
- Preparing the Intraosseous leg
- Administering IV Fluids
- Draining Excess IV Fluid
- Cleaning the IV Arm
- Connecting Defibrillation Adapter Plates
- Connecting the Blood Pressure Cuff
- Changing the Pupils

Using an External Compressor

The external compressor connects to the clear tube found in the cable bundle exiting the right side of the manikin.

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

Preparing the IO Leg

The manikin's right leg is designed for practicing intraosseous infusion skills. Anatomy of the right leg includes knee, tibia, tibial tuberosity site, and medial malleolus site. The right leg comes with IV tubing and one IV bag for use as a reservoir during infusion.

Additional equipment needed:

- IV bag and administration set.
- Simulated blood concentrate.
- 35cc syringe and 16-gauge intraosseous needle.

To fill the IO leg and prepare it for use:

1. Raise the leg vertically.

2. Open the plug at the heel.
3. With a syringe, fill the bone with approximately 240 to 250 cc of simulated blood..
4. Attach tubing connected to an IV reservoir bag. (Use roller clamp to open or close the line as needed in order to relieve pressure build-up.)
5. Close off tubing that runs into the reservoir bag so that simulated blood will remain in the bone for aspiration.
6. When the reservoir bag is filled, discontinue infusion and replace with empty bag.

Before storing the manikin:

– Detach the IV line and reservoir from the foot.
– Allow all fluid to drain.
– Store leg unplugged to allow it to air dry.

Note: Do not use saline solution. It may cause deterioration of the leg. Use distilled or de-ionized water to avoid buildup of minerals.

Administering IV Fluids

The right IV arm supports training for IV drug administration, IV insertion, infusion, and bolus into peripheral veins of forearm, antecubital fossa, and dorsum of the hand.

Use 20 to 22 gauge needle for IV simulation. To prevent clogging of the IV system, use only distilled or de-ionized water to simulate IV drugs.

Draining Excess IV Fluid

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

Before each session:

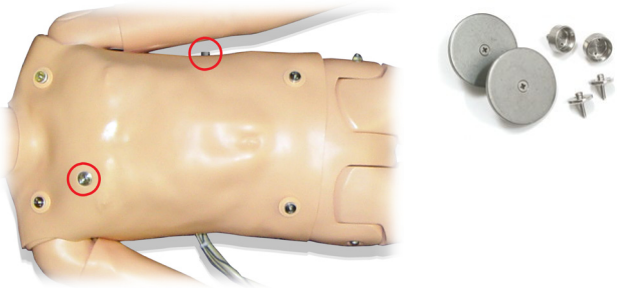
1. Attach the IV overflow tube (in the manikin's right arm) to an overflow container (such as an IV bag).
2. Allow excess fluid to drain into a container during the simulation..

Cleaning the IV Arm

Clean the IV arm after each session or day of use by flushing the IV Arm with 60% isopropanol or 70% ethanol.

Installing Defibrillation Adapter Plates

The manikin torso is fitted with two stud connectors for defibrillator cables. Before attempting defibrillation, you must unscrew and remove the defibrillator stud covers.



Two defibrillation adapter plates are packaged with the manikin. The defibrillator adapter plates must be fitted in place before using a live defibrillator with defibrillation paddles or adhesive pads. Screw the adapter plates firmly into place.

During Defibrillation

A conventional defibrillator (not included) may be used on the SimJunior. 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.

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

⚠ **Warnings:**

- Defibrillation must be performed on the defibrillator connectors only.
- Do not press too hard over the defibrillation adapters as this may cause arcing and pitting.
- Do not defibrillate the manikin without the torso skin in place.

Connecting the Blood Pressure Cuff

The manikin is delivered with a customized blood pressure cuff. Connect the tube to the white BP connector on back of the VitalSim Control Unit before use.

Note: The speaker for the Manikin's blood pressure is located in the left antecubital fossa, shown below circled. The radial and brachial pulses are located in the rectangular areas.

Calibrating the Blood Pressure Cuff with Instructor PC

1. Select <**Calibration**> from the menu.
2. Select <**Calibrate BP..**> from the drop-down menu.
3. Follow the on screen wizard instructions to perform the calibration.

Calibrating the Blood Pressure Cuff with Remote Control

To calibrate the blood pressure cuff with the SimJunior Standard System Remote Control:

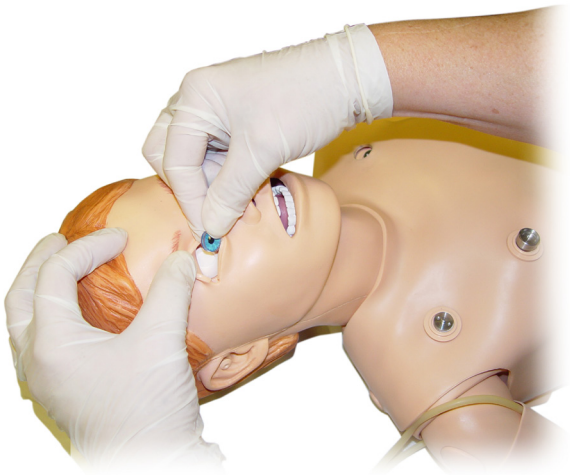
1. Navigate to the Setup Menu.
2. Select <**Calibrate BP**>.
3. Follow the instructions displayed on the screen.

Changing the Pupils

SimJunior is delivered with normal pupils installed in the eyes. A separate kit containing plastic pupil inserts (constricted and dilated) comes with SimJunior.

To change the pupils:

1. Carefully open the eyelids wide, taking care not to tear the manikin face skin.
2. Using the suction cup tool provided in the kit or with the edge of your fingernail, carefully remove the pupil from the eye.
3. Replace the pupil with the desired insert, using the suction cup tool or by gently pressing in place.



Maintenance After Each Simulation Session

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

- Return manikin and PC to their original condition.
- Power off the VitalSim Control Unit and PCs.
- Charge batteries if necessary.
- Flush the IV-arm system and drain the IO leg (leave the plug in the bottom of the IO leg open).
- After each session where the IV-arm has been used, flush the IV arm with 60% Isopropanol alcohol or 70% ethanol.
- Wipe the skin with a moist cloth.
- Remove wet clothes or linens.
- Remove tape residue with a moist cloth or rubbing alcohol
- Based on the use of the manikin, replace modules that are consumed or damaged.
- Replace cables or connectors showing visible damage.
- Servicing should be performed by qualified personnel at regular intervals.

Always perform a service:

- If liquids have been spilled in or on the manikin.
- After use in dusty environments.

For information on and spare parts, see section: Spare Parts and Accessories.

Before Storage or Shipping

- Flush the IV arm with 60% Isopropanol alcohol or 70% ethanol. Open the drain valve on the bottom of the manikin's right foot.

Installing and Upgrading SimJunior Software

SimJunior software comes pre-installed. If you need to reinstall or upgrade the SimJunior software, perform the following steps.

1. Power on computer and ensure no SimJunior applications are running.
2. Uninstall any previous versions of SimJunior software. Use the Windows Control Panel to access Add/Remove programs.
3. Select SimJunior and click <**Uninstall**>.
4. Insert the Laerdal SimJunior software DVD and allow auto-run. If auto-run is disabled on your computer, manually execute the <autorun.exe> file on the DVD. Follow the on screen instructions to install.
5. In the installation menu, click the <**Install SimJunior Software**> button once. This will start copying files to your computer.

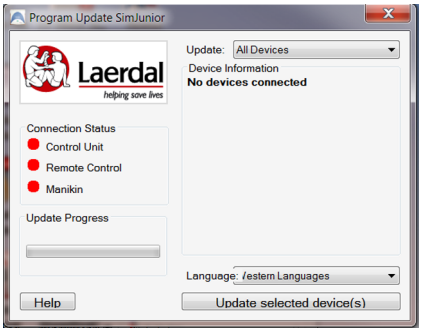
Note: The download process takes approximately 2-3 minutes. Once the copying process is complete, follow instructions in the installation wizard.

SimJunior Software Program Update (VitalSim Software Update):

Caution: Do not power OFF the VitalSim Control Unit during the following procedure.

Note: The version shown in these screen shots is subject to change.

1. Make sure you have installed the software on the Instructor PC as described in the section: Installing and Upgrading SimJunior Software.
2. Power on the VitalSim Control Unit. Do not start the Instructor Application or Patient Monitor Application.
3. Connect the USB cable between the VitalSim Control Unit and the Instructor PC.
4. Navigate to < **Start**><**All Programs**>.
5. Select <**SimJunior Instructor Application**>, <**SimJunior Program Update**>.



6. Select the devices to be updated from the Update drop-down menu.
7. The Simjunior Program Update application will start identifying software versions currently installed.
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.

The SimJunior Update Manager Report displays all updates. It also designates those that were performed successfully and those that failed.

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

Opening the Torso

Open the manikin torso to perform procedures, such as:

- Attaching or replacing limbs
- Changing the manikin battery
- Replacing the chest-rise bladder and lung bladder
- Replacing the torso skin
- For general inspection

⚠ **Warning:** Open the torso from left to right, gently unhook the skin. Do not pull hard to lift the manikin skin, this could damage the chest cables.

1. Unhook torso skin holders on left side of the torso and each shoulder.

2. Fold the torso skin over to the right side.
3. Disconnect the Defibrillation connector cable.

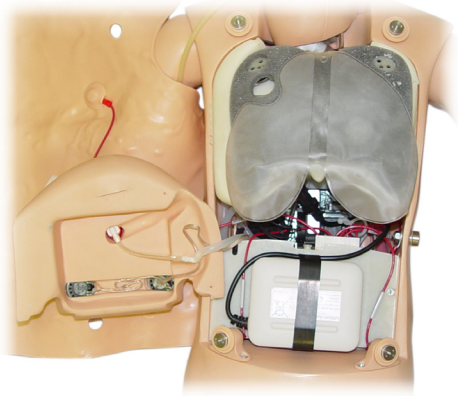
4. The Defibrillation connector cable must be disconnected at the right side of the manikin below the chest form.

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

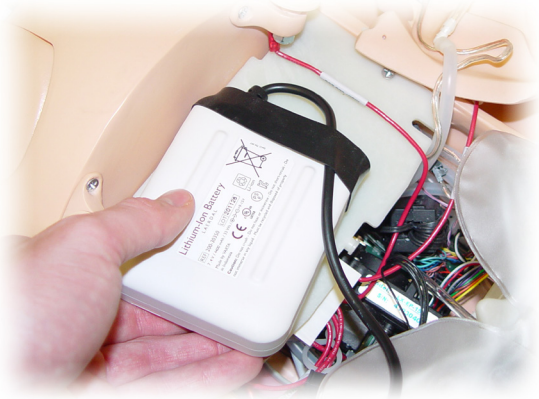
5. Replace the torso skin by performing steps 1- 4 in reverse.

Replacing the Manikin Battery

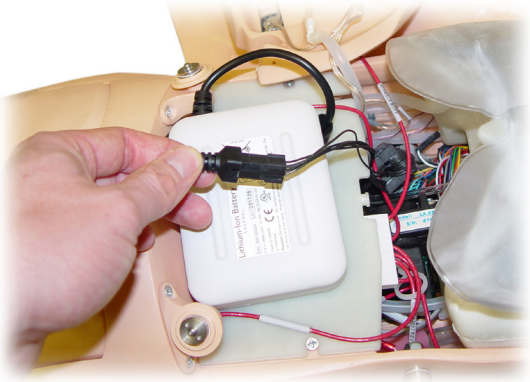
1. Open the manikin torso.



2. Slide the battery out of the battery strap.



3. Pull the battery power connection up from inside the manikin. Unhook the battery power connection.



4. Lift the battery out of the manikin.
5. Replace the charged battery or install a new Laerdal approved SimJunior battery.
6. Connect the battery to the manikin.
7. Replace the torso skin.

Charging the Manikin Battery

The manikin battery charges itself as it is operated. If necessary, the manikin battery can be charged using an optional external power adapter.

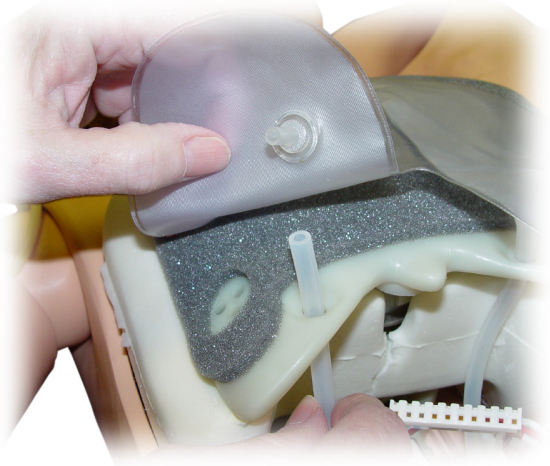
1. Power down the manikin via the VitalSim Control Unit.
2. Remove the manikin battery from the manikin.
3. Connect an approved external battery charger (with a power cord that meets local specifications) to the bottom of the manikin battery. Connect the battery charger's power cord into a wall outlet .

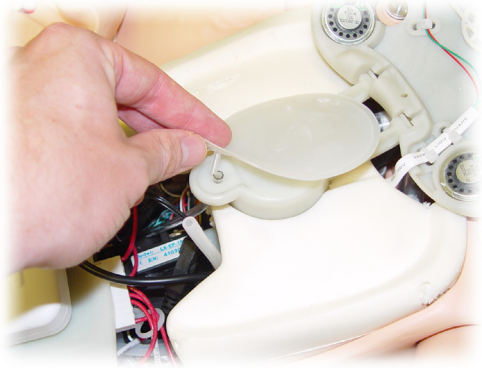
4. When the battery has finished charging, replace the battery in the manikin.

Replacing the Chest Rise Bladder

The chest rise bladder is located in the lower end of the chest plate, centered under the lungs.

1. Open the torso skin to expose the chest plate. See the section: Opening the Torso.
2. Disconnect the clear tubing from the lung bladder and remove the lung bladder. For details on removing the lung bladder, see the section: Replacing the Lung Bladder.





3. Disconnect the clear tubing from the chest rise bladder.
4. Discard the old bladder
5. Insert new bladder
6. Re-connect the tubing to the new bladder.
7. Close the torso and replace the torso skin.

Replacing the Lung Bladder

If leaking occurs, the lung bladder (in the chest cavity) should be replaced.

1. Open the torso skin.
2. Disconnect the clear tubing from under each side of the lung bladder. Refer to step 2 illustration in "Replacing the Chest Rise Bladder."
3. Disconnect the lung bladder clip from the top center of the lung bladder.

4. Gently pull the top center portion of the lung bladder up from its socket.
5. Reverse process to install the new lung bladder.

Replacing Manikin Skins

The manikin skins may need to be replaced if they are torn, perforated, or stained.

Torso Skin:

To replace the manikin torso skin reference "**Opening the Torso**" section

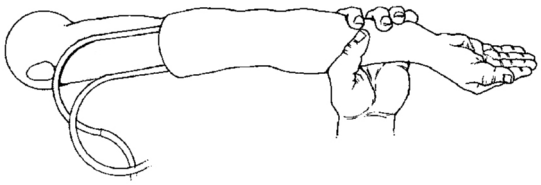
Arm Skin:

To replace the manikin arm skin:

1. Remove the old manikin arm skin by working it down over the arm and hand or *cut the skin.

⚠ **Warning:** *Do not puncture or cut the mandrel arm.

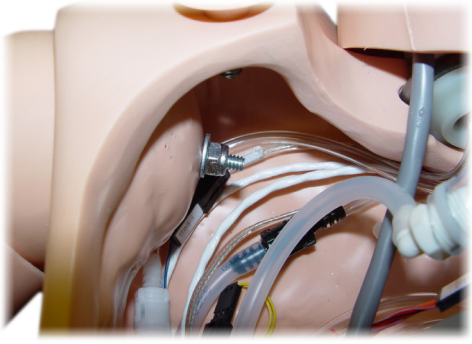
2. Discard old skin.
3. Lubricate inside of new arm skin with mild liquid detergent mixed with water.
4. Lubricate (or lather) mandrel with a mix of mild liquid soap and water.
5. Slide manikin hand into skin.
6. Work skin over fingers (as with a glove).
7. Work skin up, over the arm mandrel.



Replacing the Right IV Arm

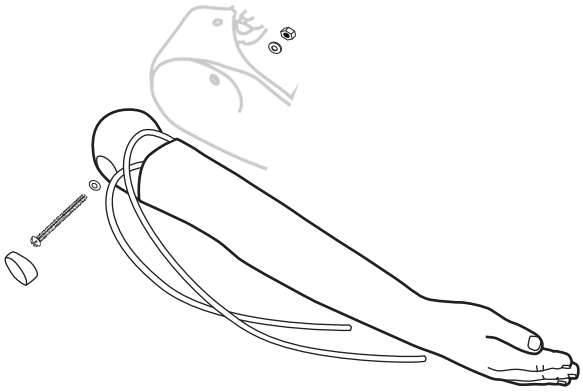
Open the torso reference "**Opening the Torso**" section.

1. Remove old arm by unscrewing the bolt holding the arm to the manikin's shoulder.



2. Ensure that the shoulder screw is loose enough to allow the arm axle to slide out easily.
3. Discard the old arm according to specified guidelines.

To attach the new arm:



1. Ensure that the shoulder screw is loose enough to allow the arm axle to slide easily into place.
2. Connect the arm to the corresponding connection points in the torso.
3. Carefully push the arm axle into the shoulder bracket, so that the axle is flush with the inside of the bracket.
4. Tighten the shoulder screw with an Allen wrench.

Replacing the Right IO Leg

To detach the right lower leg:

1. Ensure that any fluid in the leg has been drained.
2. Remove old IO leg by unscrewing the bolt holding it to the thigh.
3. Slide the IO lower leg out from the thigh.
4. Discard the old IO leg according to specified guidelines.

Reverse above process to attach the new IO leg.

System Setup

Problem

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

Possible Solution

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

The Debrief Viewer

Problem

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

Possible Solutions

- Check that the web camera's USB-cable is plugged into the USB hub.
- 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 webcam 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.
- On the Instructor PC application main menu, click <Edit>. Select Video Recording Configuration. Ensure that "Use web camera" is checked.

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.

Airway Contamination

Problem

- Manikin airways have become contaminated from mouth-to-mouth rescue breathing.

Possible Solution

- Clean the outside of the manikin with manikin wipes. Clean the inside of the oral cavity with manikin wipes. Change the lung bladder; see section: Maintenance - Replacing Lung Bladder.

Chest Movement

Problem

- No chest rise on manikin.

Possible Solutions

- Check that power to manikin is ON.
- Check that awRR is not set to zero on Instructor Application (Patient Case or scenario).
- Check that Manikin's Cardiac is set to a perfusing rhythm.
- Check that airway complications like maximum air resistance or laryngospasm are not set.
- Verify that the Integrated Compressor Enabled box is checked on the Instructor Application screen. See section: Turning the Internal Compressor Off.
- Check that any external compressed air source is switched off and that the air tube is disconnected from the manikin.
- The internal compressor may 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 Bladder.
- 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.

Lungs

Problem

- Lungs not functioning properly

Possible Solutions

- 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 bladder is properly connected, and that the tubes are not twisted.
- Check that the lung bladder is in a horizontal position and inserted correctly.
- Check for flaws or tearing in the lung bladder.

- 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>.

Pulses (Radial and Brachial)

Problem

- Cannot feel pulses

Possible Solutions

- Skin may be too tight over pulse units – re-adjust skin and reboot.
- Ensure blood pressure is set to at least 60 systolic.
- Ensure compressor is ON.

Note: If the radial pulse is set below 60, peripheral pulses may disappear.

Manikin Shutdown

Problem

- The manikin is unresponsive.

Solution

1. Power off the VitalSim Control Unit.
2. Turn the Remote Control off.
3. Exit any SimJunior software on the optional Instructor PC and the Patient Monitor.
4. Then restart everything.

If the manikin is still unresponsive, contact your Laerdal representative.

Overall Dimensions

Length / Width (manikin only): 48 in x 9.84 in (120 cm x 42.5 cm)
Weight (manikin only): 25 lbs (11.36 kg)

Manikin Power

External power:	Input voltage 9VDC, 1.5A
Internal battery:	7.4V, 4.4Ah, Lithium-Ion

Only use approved *SimJunior* external power supply and batteries.

Air Pressure

Internal air tank:	Max 6 psi
External air connection:	Max 16 psi

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)

Environment - Manikin only

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

RF Communication

Operation range: 10 m (30 ft) max.

Material Chart for Manikin

Clothes:	Cotton, Nylon
Skins and airways:	PVC
External hard plastics:	PVC, ABS
Inner plastics:	Silicone, TPU, PVC, Nitrile ABS, POM, Nylon + GF Epoxy-Polyurethane
Metal components:	Aluminum, Brass, Steel

⚠ *Caution Latex: This product contains Natural Rubber latex, which may cause allergic reactions when in contact with humans.*

Minimum Computer 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

Cleaning Fluids

To clean the manikin use one of the following:

- 60% Isopropanol alcohol
- 70% Ethanol
- Mild solution of liquid soap and water

IV Fluids

Only use distilled or deionized water to simulate IV and IO fluids.

Catalogue Numbers

Substitute XX with your local language version number. Contact your local Laerdal Customer Service Representative for more information.

231-01150	Pediatric Full Body Soft Case
232-05350	SimJunior Hard Case
210-05250	Peripherals Hard Case
5527	Laerdal Warranty
232-11950	SimJunior Advanced SW CD & License Key
232-11951	SimJunior Advanced License Key (1)
232-05050	SimJunior Manikin Only (Light)
200-100XX	VitalSim Complete
225-091XX	Peripheral Kit Standard No Patient Monitor
225-090XX	Peripheral Kit Advanced With Patient Monitor
232-01250	SimJunior Internal Battery (1)
200-10550	AC Adapter (Multi)
245-950XX	Patient Monitor
245-980XX	USB Hub
245-96050	Webcam
232-00150	Shirt
232-00250	Shorts
232-00350	Boxer Shorts
300-00750	Red Simulated Blood
220-00250	IV Bag-500ml
270-00250	IV Bag Transfer Set
232-03950	Chest Rise Bladder
375-70150	Pediatric Skin/Vein Set (Light)
200-03050	Pupil Inserts Kit (Blue)
200-03050B	Pupil Inserts Kit (Brown)
375-71001	Right IV Arm
232-01150	Left BP Arm
232-00450	BP Arm Skin
231-00101	Pediatric IO Leg Kit
231-00750	Pediatric Right IO Leg (Light)
232-00950	SimJunior Chest Skin
232-00750	SimJunior Lung Bag
250-21050	Airway Lubricant 45ml
276-15550	Liquid Detergent
277-00150	Baby Powder
232-00650	SimJunior Blood Pressure Cuff
05-10100	Zoll Defibrillator Connector
05-10000	Physio-Control Quick Combo
945004	Philips Defibrillator Connector
232-19050	Directions for Use
232-00550	Quick Setup Guide
277-00001	Pediatric Trauma Wound Set (Light)

Please contact your local Laerdal Customer Service Representative for more information on ethnic spare parts and accessories.

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Laerdal
helping save lives