



# Aging Gracefully: Basic Simulator Maintenance

# Introductions

PROUD TO SERVE YOU, AND YOUR LAERDAL EQUIPMENT

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What is wrong with this scenario?



# Objectives

By the end of this course, you will be able to:

- Identify your manikin with serial number
- Connect, control, maintain, update and troubleshoot your manikin
- Understand functionality of simulation equipment
- Know what to use and how to clean your manikin
- Understand basic networking concepts
- Get hands on experience with connecting, troubleshooting, updating and maintaining Laerdal equipment

# Locating Laerdal Directions for Use (DFU)/ User Guide

- All Laerdal documentation may be accessed via <http://www.laerdal.com/downloads>.
- This site link will display a list of all our current products, in alphabetical order.
- Once a product is selected, the available downloads for the selected product will populate.
- Directions for Use (DFU) and User Guides will be on the top of the list.
- This document may be viewed via a .PDF viewer, or downloaded and saved.
- Can be saved to a flash drive, Laerdal PC, work PC or mobile device (tablet/phone) for easy access.
- This document can also be searched by pressing Control + F on the keyboard, and typing in what you would like to search for.
- There will be download links to documents that go further in depth at the end of this presentation.

# Identifying Your Cables

- RS232, VGA, HDMI, DVI, USB-B, USB-A, MICRO-USB, RJ11, RJ45, Vital-Sim to Linkbox Adapter, Linkbox to Vital-Sim Adapter, Serial to USB adapter
- Not all cables work with our products.
- Extended cabling can be detrimental to connectivity.
- Latency, a common delay.



# LLEAP Overview

- You will learn how to open the LLEAP software, and what the tabs are
- You will learn how to open the Instructor Application, and what the network manager is
- What is the difference between the LLEAP network manager, and the Windows network manager?



# Basic Networking

- To verify connectivity, the network connection can be checked on the bottom right hand corner of Windows.
- What is an IP Address? What is the subnet mask? Why do these matter?
- If you are connected to the proper network, but cannot see the manikin, open the command prompt. What command do I use? – Ipconfig & Ping
- We will demonstrate network and sharing center, how to determine if DHCP or a static IP is enabled. Demonstrate how to set a static IP, and explain the reasons why this would be recommended (Simview, SessionViewer used, stability of IPS, PMPC on network etc.)
- We will explain what a loopback address is (127.0.0.1), and why our equipment cannot use this.
- We will explain the difference between home, public and work networks. And why we need a “trusted” network.



# Simpad & Linkbox Connectivity

- We will demonstrate how to connect Simp pad and Linkbox to the Simlink network, and manikin (this side up cable). Explain what could occur with an improper connection.
- We will go over Linkbox battery connectivity, how it charges, correct connection to Linkbox (proper port). Go over life expectancy of battery and correct storage of unit.
- We will go over Simp pad charging tendencies, power options and recommended storage.
- We will go over the Simp pad interface. What options are available, and how to get to them.
- We will go over how to update the Simp pad and linkbox (Flash drive & Micro USB cable). Not all Micro USB cables work!

# Connecting SimMan 3G to LLEAP

- We will demonstrate LLEAP and connect to SimMan 3G via LLEAP Network manager
- We will demonstrate the Instructor Application for a LLEAP SimMan 3G
- We will demonstrate how to update the SimMan 3G via LLEAP as can the Simpad and Linkbox.
- We will go over 3G battery procedures as well as how to properly connect and disconnect the batteries. We will explain the life expectancy and charging protocols.

# Audio & Media Files

- We will demonstrate how to create a .WAV file in the LLEAP audio maker. We will demonstrate how to add this file to the LLEAP file structure, and demonstrate how it works.
- We will demonstrate how to convert this file, and add to the Simpad file structure via site link (<http://cdn.laerdal.com/downloads/f2965/SimPadAEInstall.exe>). We will demonstrate how this file works.
- We will demonstrate how to connect a microphone to the LLEAP software, and demonstrate use with the SimMan 3G. We will demonstrate how to connect a microphone to the Simpad, and demonstrate use with SimJunior.
- We will explain how to add media/radiology etc. files into LLEAP, and display on the Patient Monitor.

- Pictures
  - \*.jpg
  - \*.jpeg
  - \*.bmp
  - \*.gif
  - \*.tiff
- Documents
  - \*.htm
  - \*.html
  - \*.txt

## Media File Types

- Video
  - \*.avi
  - \*.mpg
  - \*.mpeg
  - \*.wmv
- Audio
  - \*.wav



# Equipment Maintenance

# What should I check before powering on?

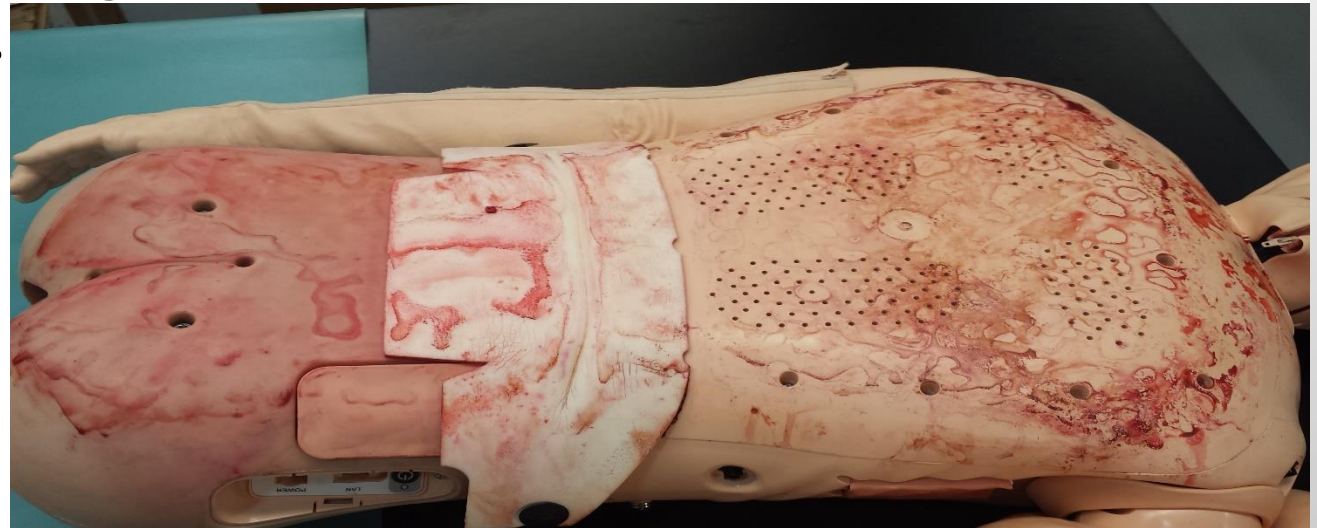
- Verify your manikin power connection and charge. If running mobile, verify that the batteries are connected.
- If disassembled, verify that the compressor leg is connected properly.
- Verify correct connection of Linkbox to manikin.
- On SimMan 3G, verify all connections are tight to the internal router.
- If all connections are verified, power on equipment.

# What should I check when class is complete?

- Make sure the session is fully closed out on the Simpad or the LLEAP software.
- If IV arm or fluids were used, flush the arm to clear out all residual fluids. (Explain proper solutions) – DEMO
- If anything was placed on the manikin, clean the manikin with the appropriate solution (Explain proper solutions) – DEMO
- Once complete, power off the manikin, linkbox, Simpad or Instructor PC. Disconnect any charging cables if manikin is to be left dormant overnight. If unit needs to charge, is recommended to have charge, but once complete unit will have to be disconnected to maintain battery integrity.

# Recommended Monthly Maintenance

- Flush fluid and blood system. This should be done after each use, but monthly is recommended as well because the system will degrade if fluids are not utilized.
- Verify chest rise and lung bladders. Verify units are not leaking. Any leaking air will tax the compressor, and could cause unit damage, and shorten life expectancy.
- Verify that there is not fluid in the airway of the manikins. Especially if intubations are done on the manikin. If excessive lubricant is used, disconnect the stomach distention tube and clean out the excess lubricant/fluid.
- Verify that the defibrillation posts are tight on the manikin. Over time these can loosen up, and should be tightened.



# Where to Find Part Numbers

- The Directions for Use (DFU) for each manikin will have a part synopsis for commonly replaced parts on the last page.
- Go over SimJunior and SimMan 3G product pages as examples
- We will explain difference between consumables, accessories, parts and licenses
- Provide examples of common issues/replaceable parts (IE: SimMan 3G Genitalia ripping, ripped thumb and arm skin on SimMan 3G, defibrillation and ecg posts, how to replace hand, Simjunior arm and neck cradle, Jr, compressor leg).
- We will go over NewB, Mom and Jr consumable parts that may be issues but easily replaced.
- If part number is not on the product page, the parts catalogue may be viewed here: <http://www.laerdal.com/us/doc/883/2015-Parts-Catalog-and-2012-Product-Catalog>.



# Basic IV Arm Maintenance

- We will demonstrate to flush the SimMan 3G, and SimJunior arms
- How do I know if my IV arm needs to be re-skinned and re-veined?
- The dos & don'ts of IV arm usage
- Distilled VS. Mineral/Tap Water/Saline & Medications
- Re-Skin and Re-Vein arm with students at station
- We will show examples of the results misuse can cause.



# Manikin Cleaning

- Approved solutions to clean your Laerdal equipment.
- Spray bottle of 70% isopropyl alcohol for cleaning skins.
- Talcum powder and isopropyl to remove sticky residue from skins.
- Baby powder when completed to rejuvenate the skin as alcohol alone will dry out the skin.
- Inexpensive way for experimentation without ruining your manikin skins.  
Recommendation: save an old one from a Preventative Maintenance!

# Fluid System/Airway Maintenance (3G)

- We will demonstrate how to flush both the fluid and blood systems (referencing the DFU, and directions on the fluid bottle).
- Approved flushing solutions.
- What is the difference between ethanol, de-ionized water, bleach and isopropyl alcohol in regards to flushing my manikin's system?
- How do I check the airway on my 3G and SimJR for airway lubricant?
- We will demonstrate on how to clean the airway tubing, as excessive airway lubricant or pooling residue can damage manikin.

# Blood Pressure

- We will demonstrate how to properly connect the blood pressure cuff and utilize unit
- We will show how to calibrate the cuff within LLEAP, and Simpad.
- We will demonstrate how to use auscultation focus, and how this affects listening for the blood pressure. – This feature is not available on the Simpad Control Unit.
- We will demonstrate how to adjust volume of korotokoff sounds.



# Troubleshooting Basics

# I Cannot See My Manikin

- This part will be hands on with our class!
- Using what we have gone over, we have setup a few basic connectivity issues to review with you and see what the connection issue may be!

# What to do if your manikin has no chest rise and fall?

- The SimMan 3G and the Simpad both have a power saver mode that will initiate after periods of inactivity.
- The Simpad will have to be turned back on, but the 3G may have a pulse point depressed in order to wake it.
- LLEAP 5.4.0 allows you to do this from the software, and if an issue occurs a simple reboot of the manikin will resolve the issue.
- Simpad & LLEAP manikins capable of chest rise and fall will not “breathe” until session is started.
- We will demonstrate how to verify your compressor leg is attached, and what to check when using an external compressor.



# How to verify your software version

- We will demonstrate how to find your software version in LLEAP, and Simpad/Linkbox software
- Updates are released bi-annually and will always be made available on the website, or LLEAP updater software.

Laerdal Simulation Home





# Serial Number Locations

- Where is my manikin serial number?
- We will demonstrate the serial number wrist bands.
- We will demonstrate where the serial number for 3G and Junior can be located.

# No Resistance When Ventilating 3G

- Start at the cricoid, and move to the bronchial tree to verify integrity.
- Follow the esophagus to stomach and verify connections.
- Follow bronchial tree to lung bladders and verify connectivity.
- Verify lung bladders inflate and do not deflate unless released.
- Verify no leaks within any of the assemblies.
- Activate lung resistance to verify that it may not be the lung bladders.
- Will demonstrate replacing the lungs within the SimMan 3G.

# Simpad/Linkbox Updates & Connectivity

- We will demonstrate how to force update SimJunior simulator using the Simp pad and Linkbox.
- Only the manikins listed can be forced updated, and not the MegaCode Kelly, Nursing Anne or others as they do not have a board capable of updating.
- We will demonstrate resetting the Simp pad and linkbox to the Simlink network via Simp pad settings and the LLEAP Application.

# SimMan 3G Network Configuration

- We will show you how to use the network configuration tool within LLEAP to reset internal router, and configure access point mode.
- We will demonstrate the Network manager of LLEAP
- We will demonstrate how to seamlessly swap from AP mode 3G network to Simlink and connect to Junior using this network manager.

# Pulse Issues & 3G Head Skin

- We will show how to access the mechanical pulses
- We will show how to swap pulses to test if issue is module or the position
- We will explain how the module works
- We will show explain how to access femoral pulse units
- If a small piece of your skin is damaged, it may be patched using Loctite. The fastest drying Loctite the better. If this doesn't work, the skin will have to be replaced.
- If using super glue or Loctite, make sure you have gloves on, and protective glasses. Follow all recommended safety guidelines the manufacturer has listed!
- We will demonstrate and explain mic covers on manikin headskins. If these come loose, they can be re-attached with Loctite!

# When All Else Fails...

- Contact technical support for assistance with your Laerdal Equipment
- We can be reached at 1-800-648-1851 EXT 5596. We are available from 8AM-8PM EST Mon-Fri, and 10AM-6PM EST Saturdays.
- We can also be reached via email at [US-TechSupport@laerdal.com](mailto:US-TechSupport@laerdal.com). Your email will be responded to within 24 hours!
- Please be ready to provide your units serial number, and a synopsis of the issue that is occurring.

# Support Material

- All material supporting what this presentation has covered, as well as some extras may be downloaded from the following link:  
<https://www.dropbox.com/sh/oan4vua73g64lgs/AACwk3nLC6SgDDoLNloCWsuPa?dl=0>.
- LLEAP Tutorial videos may also be viewed here:  
<http://www.laerdal.com/us/LLEAP/Tutorials>.