

Self-directed Phlebotomy learning



# Virtual Phlebotomy

## Directions for Use



SIM-003-W00 rev B



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# Virtual Phlebotomy

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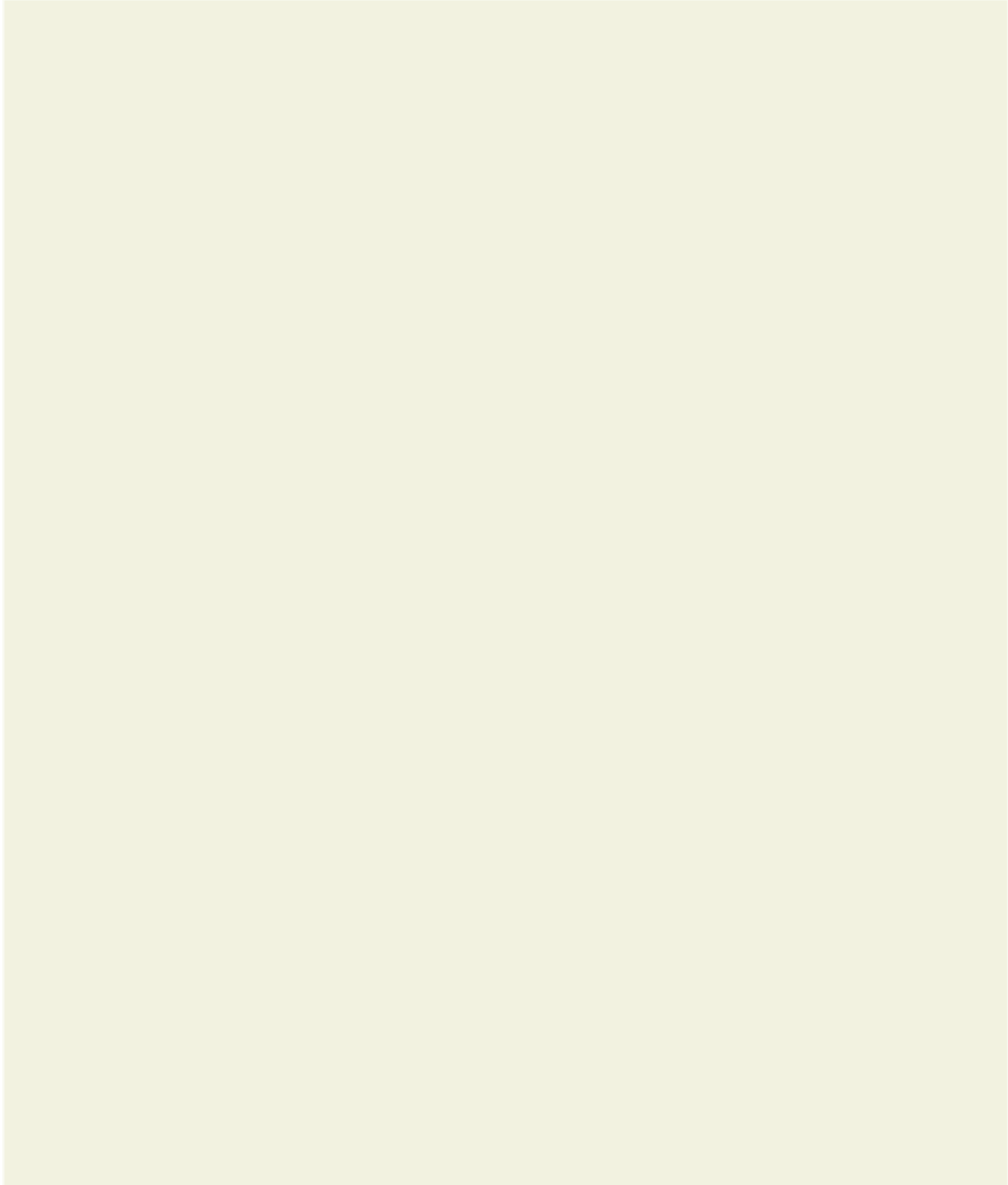
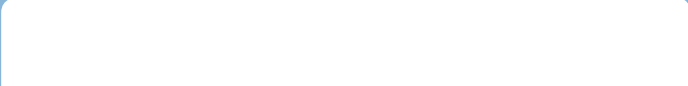


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# Virtual Phlebotomy

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## Introduction

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## I INTRODUCTION

Virtual Phlebotomy is a Self-Directed Learning System for training the cognitive and psychomotor skills of venous blood specimen acquisition for accurate laboratory analysis.

Virtual Phlebotomy conforms to all relevant standards and guidelines developed by the Clinical and Laboratory Standards Institute (CLSI) and the Occupational Safety and Health Administration (OSHA). To ensure that Virtual Phlebotomy is appropriate for your training needs, a host of instructor configurable options allow the system to be configured to local guidelines, local protocols, and the needs of your specific learner community.

Virtual Phlebotomy serves as an alternative to the human arm while retaining all of the elements necessary to a realistic learning experience, except the risk. The training system provides phlebotomy education and hands-on skills practice, allowing learners to practice the procedural, cognitive and motor skills of phlebotomy.

Advanced 3-D graphic animation and state-of-the-art force feedback technology provide the learner with a true-to-life feel for all aspects of the phlebotomy procedure including vein palpation, needle manipulation, skin and vein puncture, tube attachment, exchange and inversion, venipuncture site pressure application and dressing, and needle removal. The simulator includes an extensive spectrum of patient models, case scenarios tailored to specific learning objectives, pathophysiologic reactions, and complications.

At the heart of the learning process is the comprehensive assessment of performance, competency review mechanisms, and a complete competency training curriculum.

Novices will find that with every simulation, they will learn from their mistakes, complications, and the automated assessment, remembering critical steps and improving their performance; while more expert practitioners will be surprised by the scope and realism of the simulation, and its ability to accurately reproduce important training elements of the procedure.

This Directions for Use is to be used only as a reference for the system, as the simulator provides a 'System Tutorial' video, a 'Procedural Training' video, 'Help' screens, and guiding messages that can stand on their own for tutoring the student in how best to use the simulator.

## Introduction

### **I.1 This Manual includes:**

- The Learning Objectives for this product, to serve as a guide both for instructors and students to make best use of the training benefits offered by the Virtual Phlebotomy Self-Directed Learning System.
- Instructor benefits, student benefits and a comprehensive feature list.
- Directions for setting up the system, including the equipment included with product and the 'care' of the haptic device. This section includes the Quick Start Set-Up guide, also included as a fold-out with the product packaging.
- The Quick Start Reference guide, which provides the trainee with rapid directions for use of the Virtual Phlebotomy simulator and haptic device.
- An instructional manual for using the Virtual Phlebotomy simulator for both the student and instructor.
- A simple overview of the debriefing, competency training, and competency review functions of the Virtual I.V. product.
- A frequently asked questions guide for addressing any problems encountered with the product
- Customer support contact information.



# Virtual Phlebotomy

Directions for Use

## **Benefits, Learning Objectives and Features**

# Virtual Phlebotomy

Directions for Use



## 2 BENEFITS, LEARNING OBJECTIVES AND FEATURES

Virtual Phlebotomy allows students to practice and instructors to train in a risk-free environment, while maintaining the stress of a real world procedure through complete visual and tactile realism. This simulator trains a broad range of cognitive and psychomotor skills in phlebotomy based on a diversity of patient case scenarios and 3D anatomical models, from pediatric to geriatric, that encompass the variability of human anatomy and physiology.

Virtual patients respond with physiological reactions based on your interaction with virtual anatomy, virtual equipment, the force feedback device, and the specific case scenario. Bleeding, bruising, vein engorgement, vein collapse, vein compromise and vein rolling, are just some of the pathologies and obstacles encountered throughout learning. A host of other complications force the learner to respond appropriately and add depth and realism to the learning experience.

### 2.1 Learning Objectives

- Overcome initial discomfort and fear associated with performing phlebotomy.
- Includes all of the relevant learning and training objectives of the CLSI (Clinical Laboratory and Standards Institute) venous specimen acquisition guidelines.
- Students must select proper tubes for the tests requested, apply them in the proper order of draw, cleanse the site properly with the proper antiseptic, identify the patient, and perform all of the steps critical to every venipuncture.
- Simulates and trains all critical steps and skills of Phlebotomy; from patient identification, to specimen acquisition, to proper specimen handling and labeling.
- Standard Precautions and infection control
- Patient identification and interaction
- Site and vein selection
- Necessary equipment selection, and proper equipment usage
- Site preparation for specific tests
- Venous access with a multi-sample needles
- Specimen tube selection and usage
  - o Correct Tube/Additive Selection
  - o Correct order of draw

### Benefits, Learning Objectives & Features

- Pressure application and puncture site dressing
  - Correct order of Draw
  - Proper site cleansing technique
  - Specimen compromise
  - Proper specimen mixing
- Common and rare complications and how to deal with them.
  - Learn the feel of the procedure including palpating veins, needle insertion and feeling the “pop”, attaching the specimen tubes, applying pressure, dressing the puncture site, stretching the skin to stabilize the vein, and removing the needle.
  - Exposure to a variety of patient anatomies, patient cases and complications, force the learner to learn the procedural variations necessary to successfully complete the specimen acquisition procedure.
  - Exposure to less common, more advanced, specimen acquisitions such as blood cultures and specimens requiring special cleansing techniques.
- Perform differential diagnosis of patient cases, related to acquisition of venous blood specimens in different areas of the arm and hand.
- Learn proper hand position for performing the procedure for venous access, specimen acquisition and venipuncture site dressing.
- Perform appropriate bevel orientation and angle of insertion during multi-sample needle stick.
- Progress through a tiered hierarchy of ever more difficult patient cases, ranging from beginning student through advanced practitioner.
- Recover from complications such as vein collapse in the elderly and accidental arterial sticks.
- Learn the importance of complications such as nerve involvement by actually penetrating nerves; producing an audible response from the patient.
- Learn realistic equipment behavior, such as vacuum loss in a specimen tube if attaching a tube to the tube holder when needle is outside the skin.

#### 2.2 Benefits for the instructor

- Allows instructor to train, and learner to practice, the actual procedure with complete realism in an environment that is risk-free to the patient, learner and instructor.
- Because Virtual Phlebotomy is fully self-directed, the instructor can leverage his classroom lectures and direct interactions with the students by allowing students to practice the procedure on their own time with comprehensive assessment.
- Extensive assessment evaluates each step of the procedure while competency review structures allow the instructor to obtain a comprehensive understanding of student’s progress, specific strengths and specific weaknesses.

- Metrics-based debriefing of student performance facilitates effective feedback and guidance to students.
- Simplifies training and skills sustainment with an engaging training environment.
- Configurable options align training to local guidelines and protocols and adjust the training curriculum to correspond to the needs, requirements and capabilities of the learners.
- Exposes students to real-world cases and situations.
- Presents the student with a customized training experience adjusted to their needs and performance level.
- A comprehensive phlebotomy procedure training video and a system tutorial video introduces the learner to the system allows the learner to start using the system and learning phlebotomy almost immediately with minimal instructor oversight.
- Printable debriefings allow students to document their progress.
- Full integration with the Laerdal Competence Management System allows remote instructor oversight and education management.

### 2.3 Benefits for the student

- Unlimited practice of common and rare patient cases.
- Progression through a tiered hierarchy of cases of increasing difficulty.
- Learn and practice needle procedures through interaction with life-like patient anatomy in real-world scenarios.
- Select “Practice Cases” for quick play that is not recorded or “Competency Training” for more structured procedural simulations and performance tracking.
- Track your progress as you progress through competency training.
- Learn and review proper I.V. insertion procedures, anatomy and physiology with dynamic simulations and tutorials.
- Extensive assessment evaluates each step of the procedure from Patient Identification, to Tube Labelling and provides video tutorials for each incorrect step, allowing students to understand their errors, learn from their mistakes, and improve skills with every case scenario
- Automated debriefing identifies critical and non-critical errors, and provides videos and animations depicting ideal performance and possible complications.
- Comprehensive phlebotomy procedure training video covers the complete process of phlebotomy by venous access, including complications, (how to avoid and deal with them), causes of pre-analytical errors, etc.

### Benefits, Learning Objectives & Features

- Printable debriefings allow students to document their progress.
- Full integration with the Laerdal Competence Management System allows students to remotely review progress and understand problem areas.

#### 2.4 Overall Features

- Conforms to and trains all of the protocols, guidelines and procedure steps developed by CLSI (Clinical Laboratory and Standards Institute) and OSHA (Occupational Safety and Health Administration) for a complete understanding of phlebotomy for safe venous specimen acquisition and accurate laboratory results.
- 57 Unique Case Scenarios focus on specific learning objectives
- Over 20 case scenario and site specific simulation variables add realism and variability to the simulation
- Case scenario specific debriefings provide accurate and relevant post-procedure feedback.
- 27 practice cases with previews of the patient arm can be accessed directly.
- 3 Level Competency Training with cognitive tests and remediation
- More advanced levels include additional complications such as vein collapse and provide less guidance on proper tube selection and draw order.
- Cognitive questions follow training guidelines for novice and expert users.
- 29 unique patient models range in age from pediatric to geriatric and encompass the variability of human ethnicity, anatomy and physiology.
- Each model presents different challenges and characteristics in the context of phlebotomy.
- 4 available vein access sites per patient including the left and right antecubital, and the left and right Dorsal Hand (including Medial Wrist).
- A 3D interactive Anatomical Viewer presents pronated and supinated arm models that can be selectively dissected to reveal underlying anatomical structures to provide comprehensive and intuitive learning of relevant anatomy.
- A comprehensive phlebotomy procedure training video covers the complete process of phlebotomy by venous access; including patient and site preparation, proper procedure, complications, causes of pre-analytical errors, etc.
- A system tutorial video trains the learner to use the Virtual Phlebotomy system.
- The Competency Review structure records student progress during competency training and provides insight into learner training progress.
  - View individual case scenarios and cognitive test debriefings.
  - Print individual case scenarios and cognitive test debriefings.
  - View a learning curve for learner competency training.

- o Focus on the last 10, 25, or 50 cases to understand current problems areas.
- o Identify specific skill weaknesses across a number of completed cases.

## 2.5 Simulation Features

- Force feedback (Haptic) simulation allows users to feel the “pop” of venipuncture, as well as the sponginess of veins when palpating.
- Skin and vein puncture forces depends on the model and the case scenario, as well as the location and size of the vein.
- Vein palpation strength depends on the size and depth of the vein, as well as the model and specific case scenario.
- Veins that are not visible may still be palpable.
- Over two dozen pieces of equipment and a number of procedure steps specific to phlebotomy add depth, understanding, and a sense of immersion to the simulation experience:
- Hand washing and gloves are included for proper aseptic technique.
- Different gauges of multi-sample needles must be chosen based on the site and the specific case scenario requirements.
- Tubes with different additives must be attached in the proper draw order.
- A tube tray is provided to store your empty tubes and acquired specimens.
- Sharps, Bio-Hazard and Trash Containers can be selected for proper equipment disposal.
- Three different site cleansers must be used appropriately for the case scenario and specimen being acquired; Chlorhexidine Wipe, Alcohol Wipe, Povidine Iodine swab.
- Site must be properly dressed with either an adhesive dressing or tape and gauze.
- 12 different tubes (6 different additives, 2 draw sizes) with configurable colors for specific additives.
- A Pop-Up tube reference chart identifies the tests, and appropriate tubes, tube order, and tube additives.
- Correct equipment behavior and equipment failure simulation
  - o Tourniquet application engorges the distal veins.
  - o Apply pressure to the site with gauze while removing the needle.
  - o Vacuum loss if specimen tube is attached to needle when needle is outside the skin.
  - o Tube fill rate depends on the case scenario.
  - o Applying a warm compress to the site will engorge the veins if applied for long enough.
- Proper Tube mixing; learner must invert the specimen tubes for proper mixing.
- Tube labeling includes specific handling and labeling instructions for each specimen.

### Benefits, Learning Objectives & Features

- Asking the patient to make a fist realistically engorges the veins.
- Variable vein blueness and visibility, depending on the case scenario.
- Check patient identification and if they followed physicians orders.
- Pre-existing conditions including in-place equipment force learners to use alternate, less optimal sites for venous access.
- Complications
  - Bruises appear as a result of mistakes made during venous access and continue to grow until pressure is applied.
  - Accurate simulation of vein collapse in elderly patients. The simulation allows you to recover from vein collapse by attaching a short draw tube or reapplying the tourniquet.
  - Accurate simulation and assessment of nerve penetration. Patients respond with an audible exclamation when nerve involvement occurs.
  - Prolonged bleeding for patients on anti-coagulant therapy requires the learner to apply pressure to the haptic device until bleeding stops.
  - Accidental sticks of the artery produce redder blood, faster fill, prolonged bleeding and can be submitted as samples. Pulsing arteries can actually be felt during palpation.
  - Inserting a large needle into a small vein will cause vein compromise, bruising and swelling.
  - Needle probing (excessive movement during insertion) causes bruising.
  - Veins roll when the skin is not stretched to anchor the vein.

#### 2.6 Usability Features

- The user can navigate to different sites, gather equipment and view the case scenario while performing the procedure.
- A Haptic Device Interact icon tells you when and how to interact with the haptic device during the procedure.
- An automatic tube attachment option will automatically attach tubes from the tube tray to minimize mouse clicks.

#### 2.7 Debriefing/Assessment Features

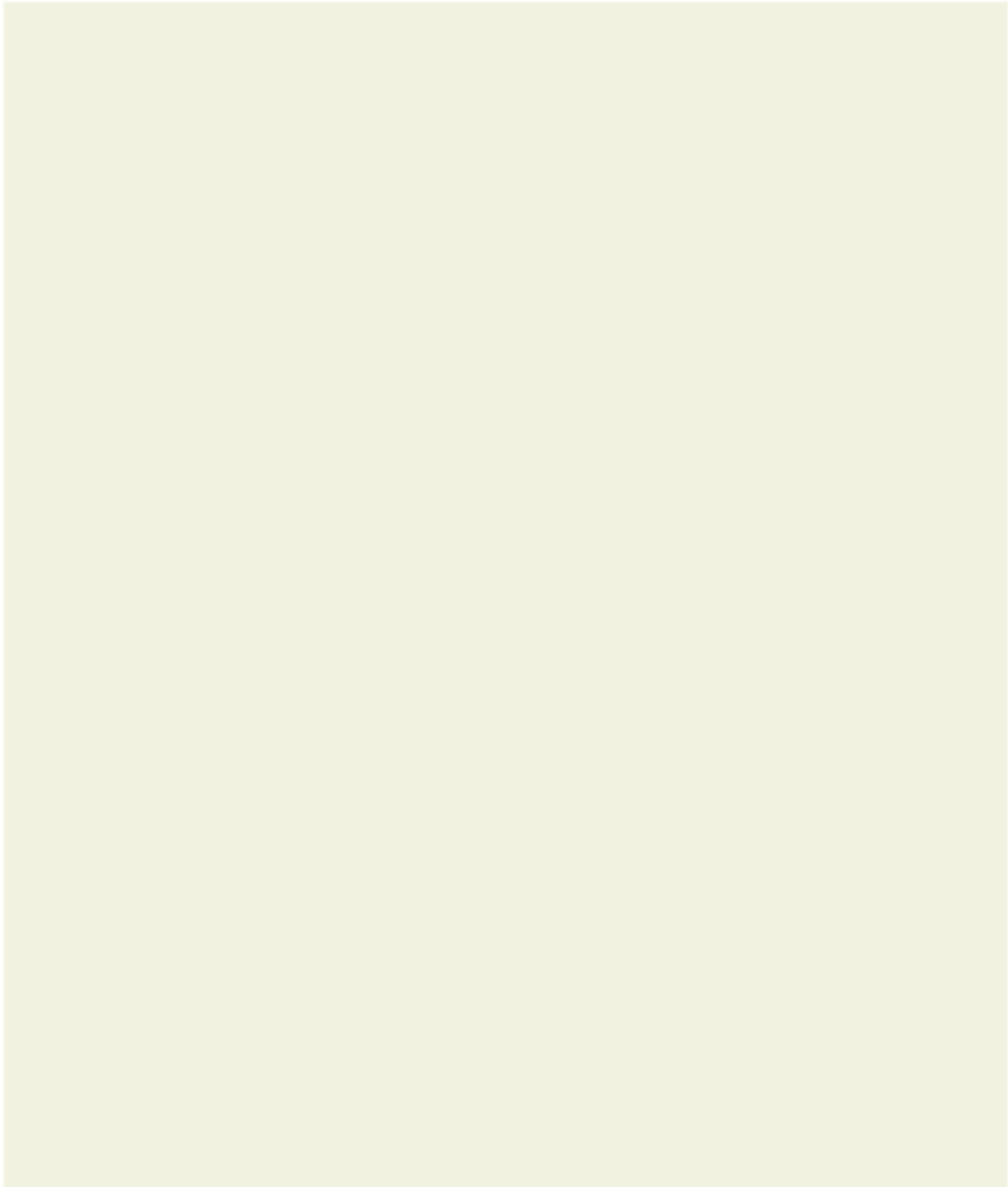
- Debriefing ensures the learner performs the procedure correctly, or is negatively assessed.
- Printable debriefings allow students to document their progress.
- Assessment of equipment usage, complications and procedure tasks.
- Subcutaneous animations for venous access attempts and training videos for all errors.
- Fully integrated with the Laerdal Competence Management System.



## Setting up the system

# Virtual Phlebotomy

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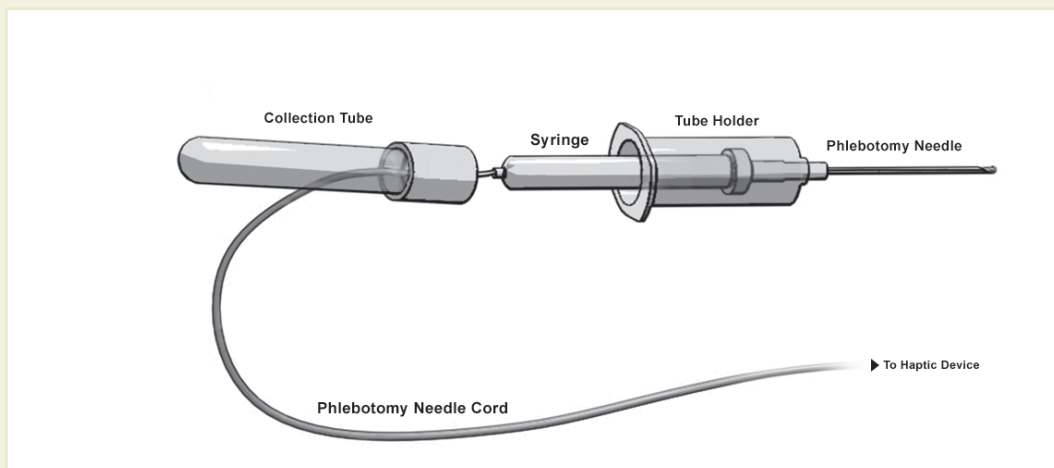
### 3 SETTING UP THE SYSTEM



#### WARNING

Precautions when using the haptic device

- The haptic device is a precise and sensitive instrument. To ensure proper working order, please handle with care.
- Dropping the haptic device, bending the needle; or other abuse may render the device inoperable.
- To ensure proper functionality, calibrate the haptic device as required.
- Although the needle is blunt, it can still cause injury if used in an improper manner. Be careful and always replace them in the needle holder after use.
- Before starting the procedure, make sure that the needle is completely removed from the device and that the specimen tube is completely removed from the needle. Here is a schematic of the needle / specimen tube configuration:



- After completing procedure, remove the needle from the device **CAREFULLY** and **SLOWLY**

### Setting up the System



#### **WARNING**

#### **Precautions when using the haptic device**

- The Virtual Phlebotomy™ Self-Directed Learning System has been designed to work on the computer supplied with the product. The computer is an integral part of the system. It will not work on other computer platforms, because of its requirements for very specific, high speed graphics capabilities. Do not attempt to install and run this software on any other computer other than that which has been provided by the manufacturer.
- No software should be installed on the computer supplied with the Virtual Phlebotomy™ Self-Directed Learning System, except for those products supplied by the manufacturer of the software.
- Running any program, such as anti-virus software, on the computer supplied with the simulator, may cause the Virtual Phlebotomy™ Self-Directed Learning System to crash or slow the simulation to an unstable condition. This is a dedicated computer and should not be used for other purposes, except those explicitly stated by the software manufacturer.

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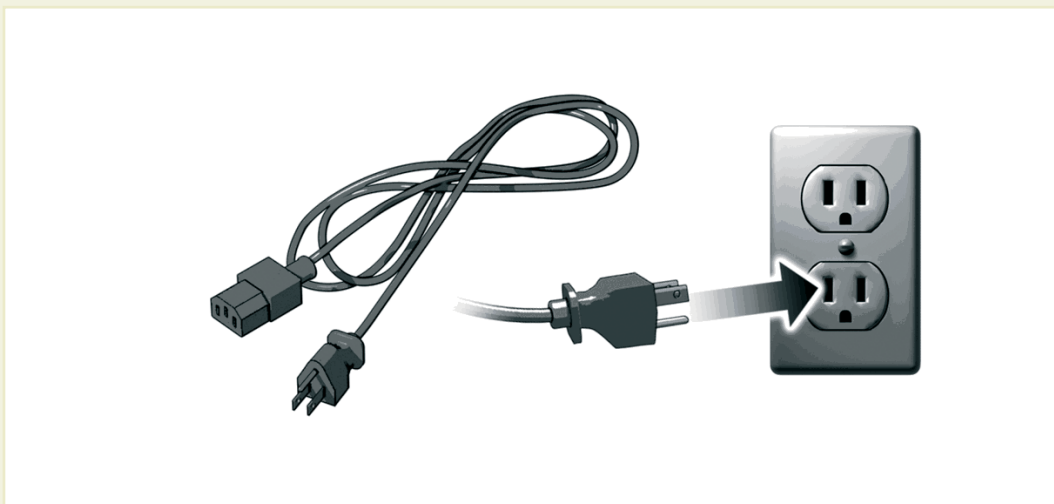
## Setting up the System

**This diagram, also available as a fold-out set of instructions that is included in the Virtual Phlebotomy™ packaging, explains the order of unpacking and installation of the simulator. Special attention should be paid to unpacking the haptic device and plugging in the cables in the correct order and placement.**

*(1) Set-up and turn on the computer as indicated by the manufacturer:*



*(2) Plug in the power cord of the haptic device into the wall socket, but do not connect to haptic device:*



### Setting up the System

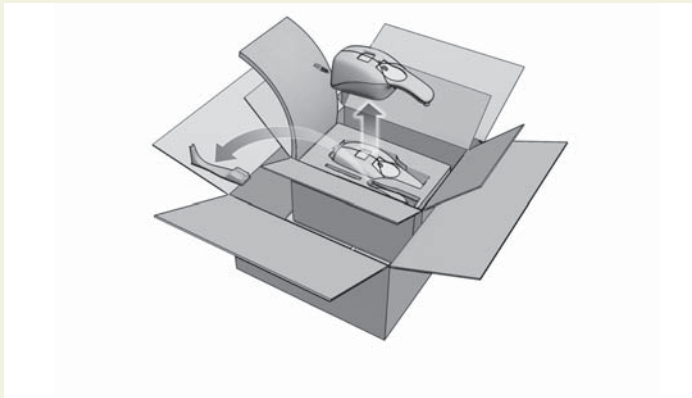
(3) Plug in the USB cord of the haptic device into the computer, but do not connect to haptic device:



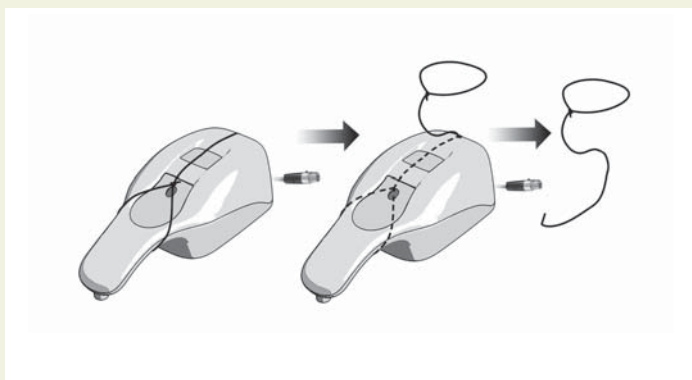
#### WARNING

Do not discard your packing materials or shipping restraint. You will need these to move/transport your device.

(4) Remove the haptic device and needle holder from the packaging:



(5) Completely remove the restraining strap carefully from the haptic device:

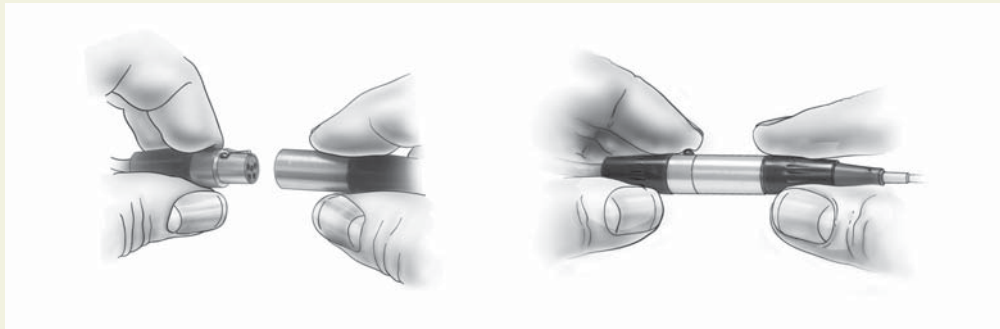


# Virtual Phlebotomy

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## Setting up the System

(6) If the needle is not already attached to the haptic device, remove the haptic device needle from the software packaging and plug it into the connector at the back of the haptic device.

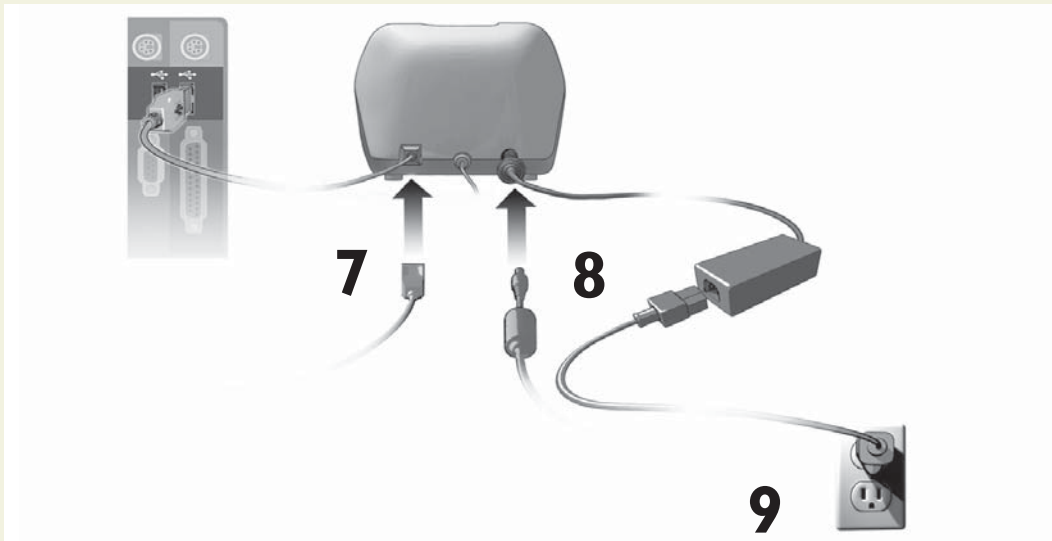


# Virtual Phlebotomy

## Directions for Use

### Setting up the System

Plug the (7) USB cord and (8) Power Cord into the back of the haptic device. (9) Plug the power cord from the wall socket into the power brick. The haptic device, which has been pre-calibrated by the manufacturer, is now ready to use with the simulator:



(10) The completed, set-up Virtual Phlebotomy™ Self-Directed Learning System. Note the location of the haptic device directly in front of the monitor.





# Virtual Phlebotomy

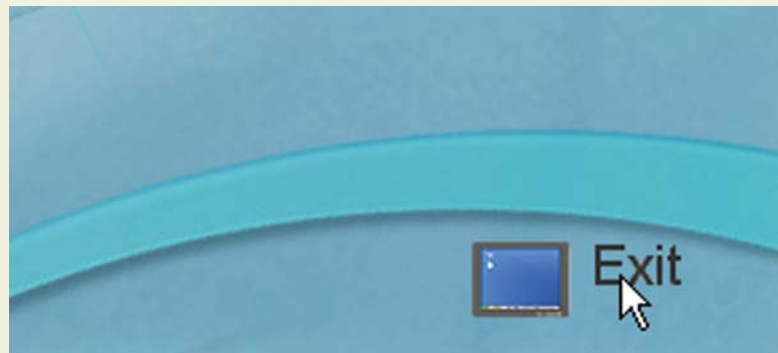
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## Setting up the System

(11) Before using the software, you will first need to obtain license keys for the modules you have purchased.

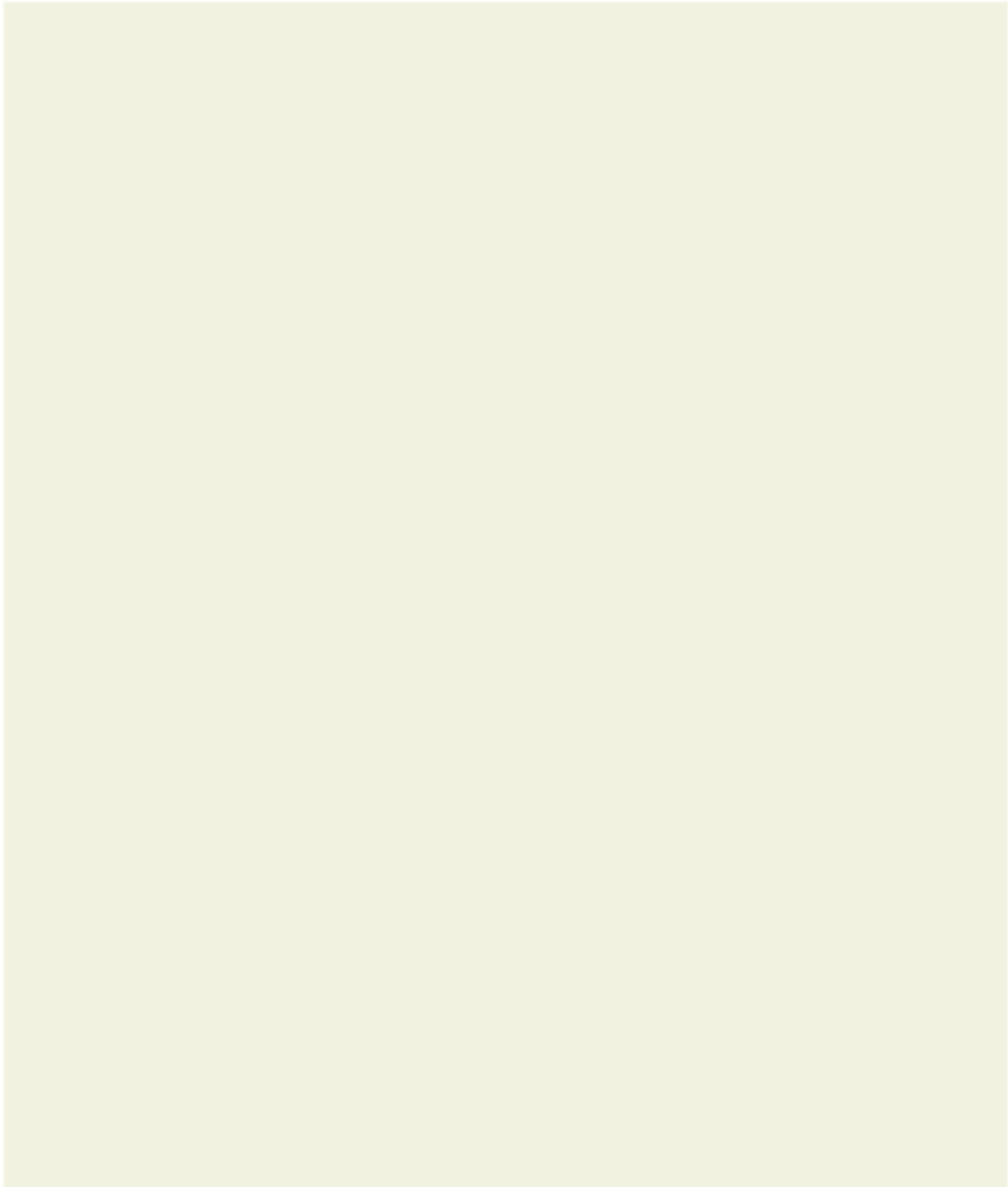
(11.1) Exit the Boot Screen.

(11.2) Contact your laerdal representative or customer service agent to obtain the license module key.



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# Virtual Phlebotomy

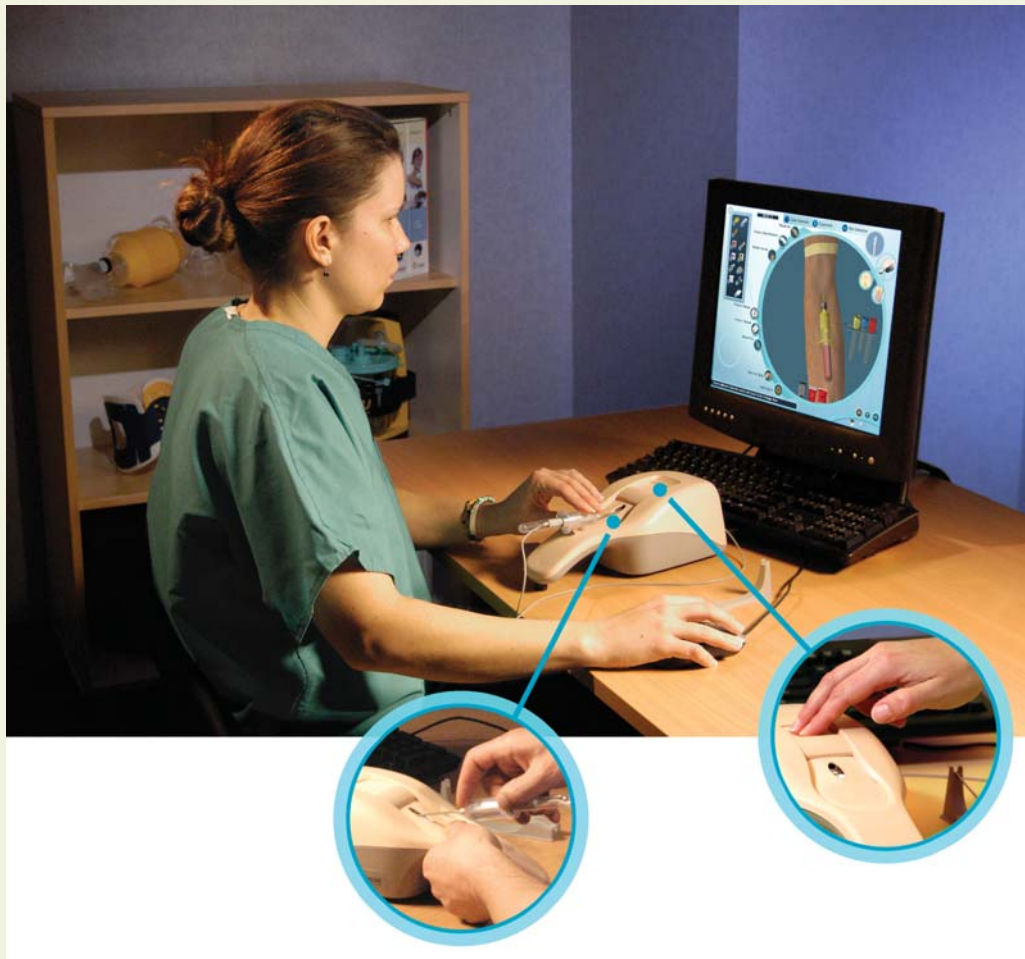
Directions for Use

## Quick start user guide

### QuickStart User Guide

#### 4. QUICK START USER GUIDE

This guide provides the trainee with a quick path through the application, based on the use of the Practice Case mode. It is expected that the beginning student will either have had a class in Phlebotomy and/or have watched the System Tutorial and Procedure Training videos to understand the Virtual Phlebotomy Self-Directed Learning System and the procedure.



### QUICK START GUIDE

Turn on the computer. To start the application, click on the **Virtual Phlebotomy** section of the **Boot Screen Menu**.



#### I. Logging In

Once started, log onto the application with one of two default users:

**Username:** demouser1

**Password:** password

**Username:** demouser2

**Password:** password

Login as **Administrator** to access Instructor features and create accounts:

**Username:** Administrator

**Password:** <Provided on the information sheet inside your desktop computer, or by Laerdal Technical Service at 1 (800) 431-1055 EXT. 5596. This password will always work, even if you change the Administrator password.>

Read further instructions to learn how to create new user accounts.

## QuickStart User Guide

### 2. Main Menu

This screen presents a menu of options, including:



- **Competency Training Mode:** A progressive, tiered hierarchy of case studies and required skills that ranges from novice (Level 1) to expert (Level 3).
- **Practice Cases:** Individual cases can be tried from all of the levels.
- **Anatomical Viewer:** This module presents a three-dimensional (3D) model of the arm that can be used to identify structures and learn anatomy.
- **Procedure Training:** This video introduces the beginning student to the techniques and skills required for venous specimen acquisition.
- **System Tutorial:** This video shows the trainee how to use the Virtual Phlebotomy simulator system.
- **Competency Review:** This module shows the trainee record of performance.

# Virtual Phlebotomy

Directions for Use

## QuickStart User Guide

### 3. Select Practice Cases

Select the level of difficulty, medical specialty and the case you would like to practice. When you select a particular case, a preview of the patient arm is displayed. Click the right arrow on the navigation toolbar to go to the selected case.



### 4. Read Case Scenario

The text presents an overview of the case, a preview of the patient arm and the required tests. In the novice levels, there are highlights presented as yellow bullet points. Advance to the next screen by selecting the right arrow at the bottom right of the screen.



### QuickStart User Guide

#### 5. Site Selection

Choose from left or right arms and the most appropriate site for cannulation based on the case scenario.



#### 6. Equipment Selection

Click on the items that you want to collect to perform the procedure, based on the case scenario. These items will appear in the equipment toolbar on the left hand side of the screen and will be available for use in the specimen acquisition procedure. Once all necessary equipment has been selected, advance to the simulation screen by clicking the right arrow.





## 7. Simulation Screen

This screen provides the basis for performing the cannulation procedure. It shows an arm of the patient described in the case. The arm can be rotated by clicking the middle mouse wheel and moving the mouse, and zoomed by scrolling the middle mouse button.



### Overview

The equipment you have selected appears in the equipment toolbar at the left of the screen. You can use any of these pieces of equipment at any time by clicking on the corresponding icon.

At the top of the screen are 3 buttons that allow you to review the case scenario (Case Scenario), select more equipment (Equipment), or select a different site for catheterization (Site Selection). You can select these throughout the procedure.

Certain procedural steps can be performed by clicking on the corresponding icons. These icons are located around the left periphery of the circular simulation window.

At the bottom of the simulation window are three disposal containers (trash can, sharps container and bio-hazard bag). Dispose of equipment into the appropriate receptacle once it has been used.

### QuickStart User Guide

## 8. Debriefing

The top of the Debriefing screen shows your total score, the procedure and tourniquet times, whether you have successfully completed the procedure, the case level, and other information. The rest of the Debriefing screen displays the Venous Access Events, Critical Errors, and Non-Critical Errors.



Venous Access events present general subcutaneous animations of what occurred during your venous access attempts. Click on the movie icon next to the venous access event to view the animations.

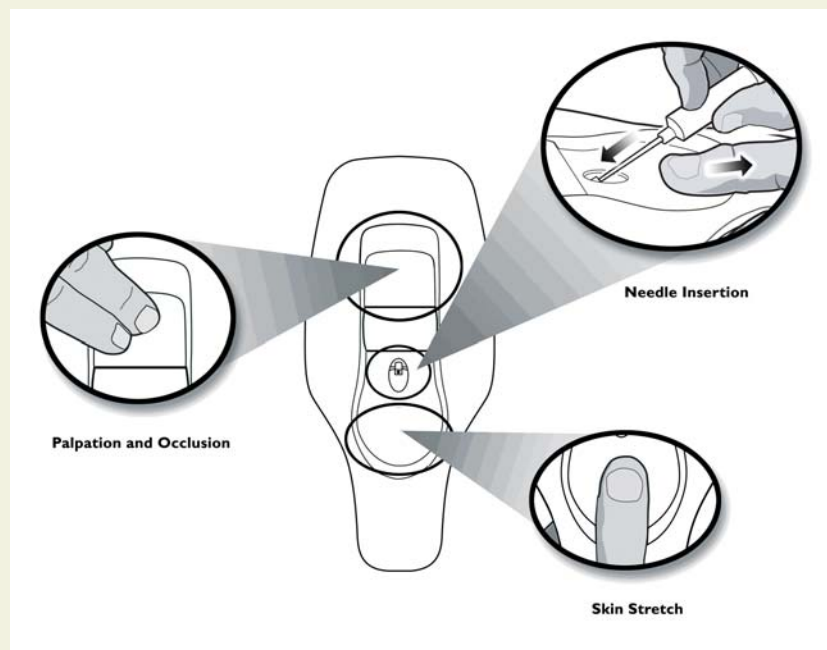
Positive and Negative critical and non-critical assessment headings and specific assessment errors are displayed below the venous access events.

Clicking on the movie icon next to a negative assessment heading will play a short vignette describing how to perform the relevant portion of the procedure correctly. Once you have reviewed your debriefing advance to the next screen.

## 5. USING THE HAPTIC DEVICE

### 5.1 Using the Haptic Device

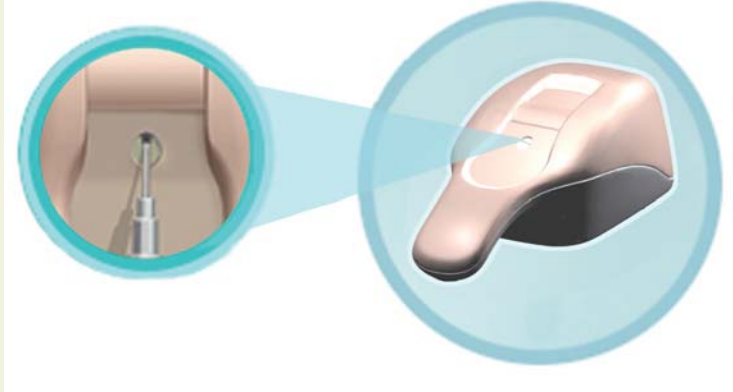
The haptic device simulates the basic elements of phlebotomy. It supports tasks such as palpation, pressure application, skin stretch and needle insertion. The next few pages show the basic ways to manipulate the haptic device during the procedure.



The following schematic depicts the various parts and functions of the haptic device, shown from above. The device should always be placed on a flat, level surface.

### Using the Haptic Device

**When it is time to insert the needle into the haptic device, this icon will appear:**



**When it is time to palpate in the palpation area of the haptic device, this icon will appear:**



**When it is time to attach the specimen tube to the needle, this icon will appear:**

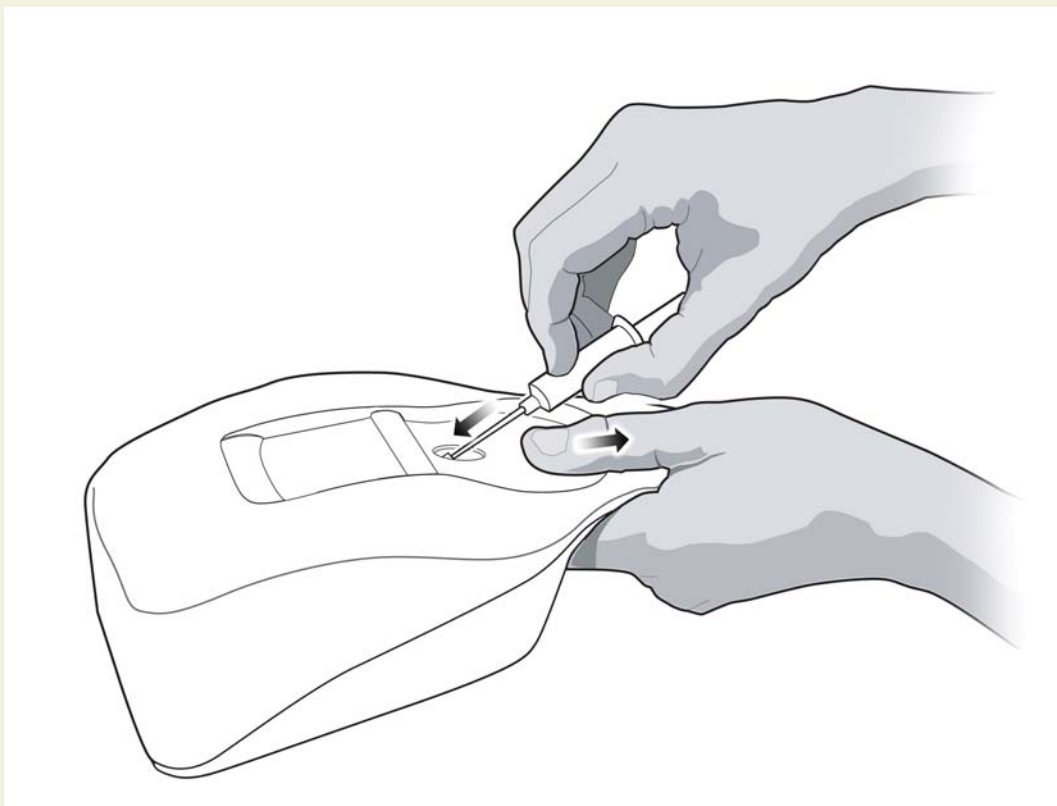


#### 5.2 Needle Insertion and Skin Stretch

The handle is gripped using the hand, and the thumb can be used to stretch the skin during the procedure. The needle is inserted into the receptacle. Initially, the learner will feel a slight tug as the device engages the needle.

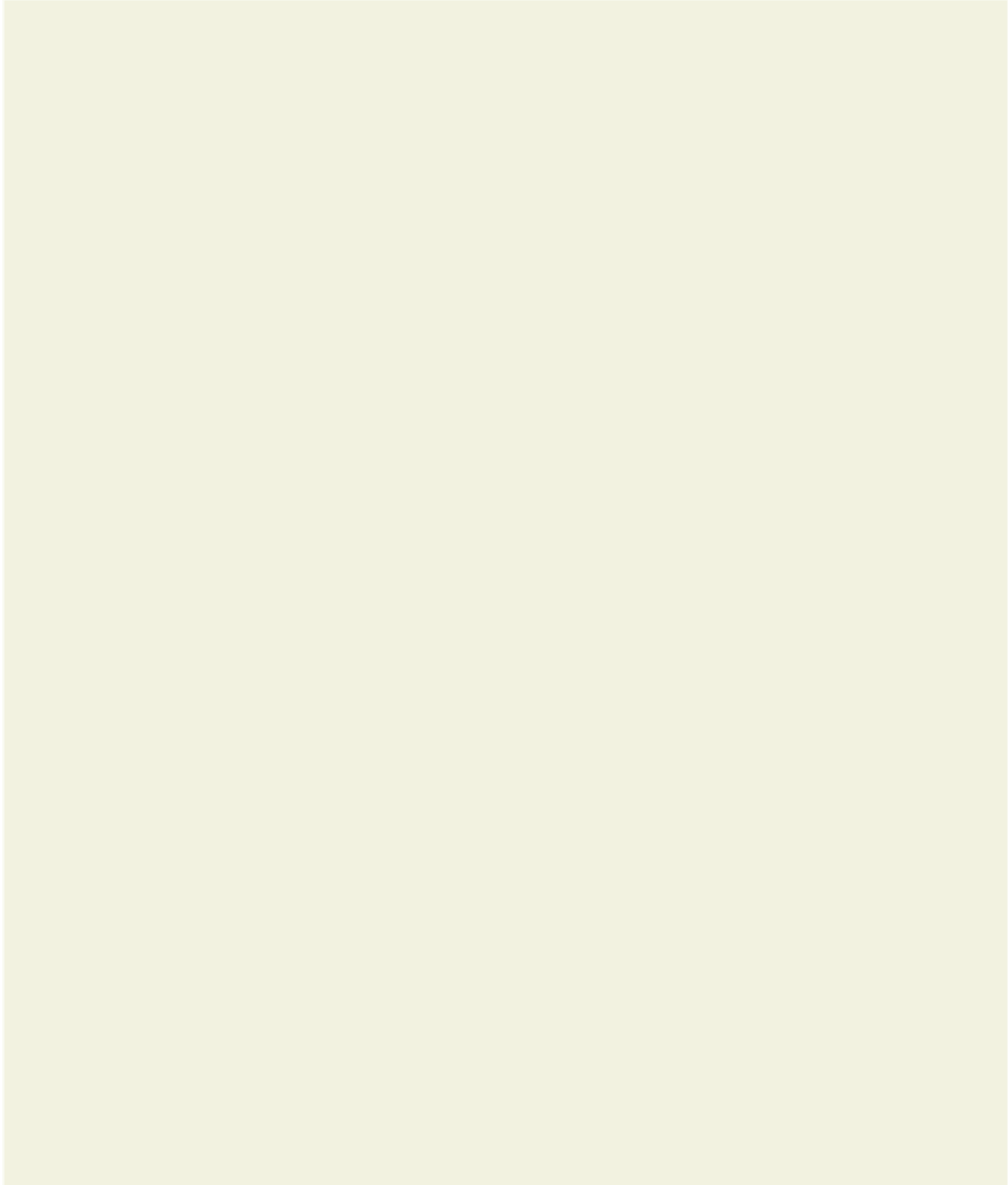
Note: Once the needle engages the haptic device, the simulated needle on the screen will illuminate and you will hear a sound; this means you may proceed with needle insertion.

The force feedback provided to the learner depends on the patient being cannulated, the case scenario, the actual stick, and any complications. In some cases the learner will feel a stick through both skin and vein, in other cases the vein, or even the skin puncture may be more or less prominent. The forces associated with venous access are subtle at times, and the force feedback device simulates these subtle cues and sensations.



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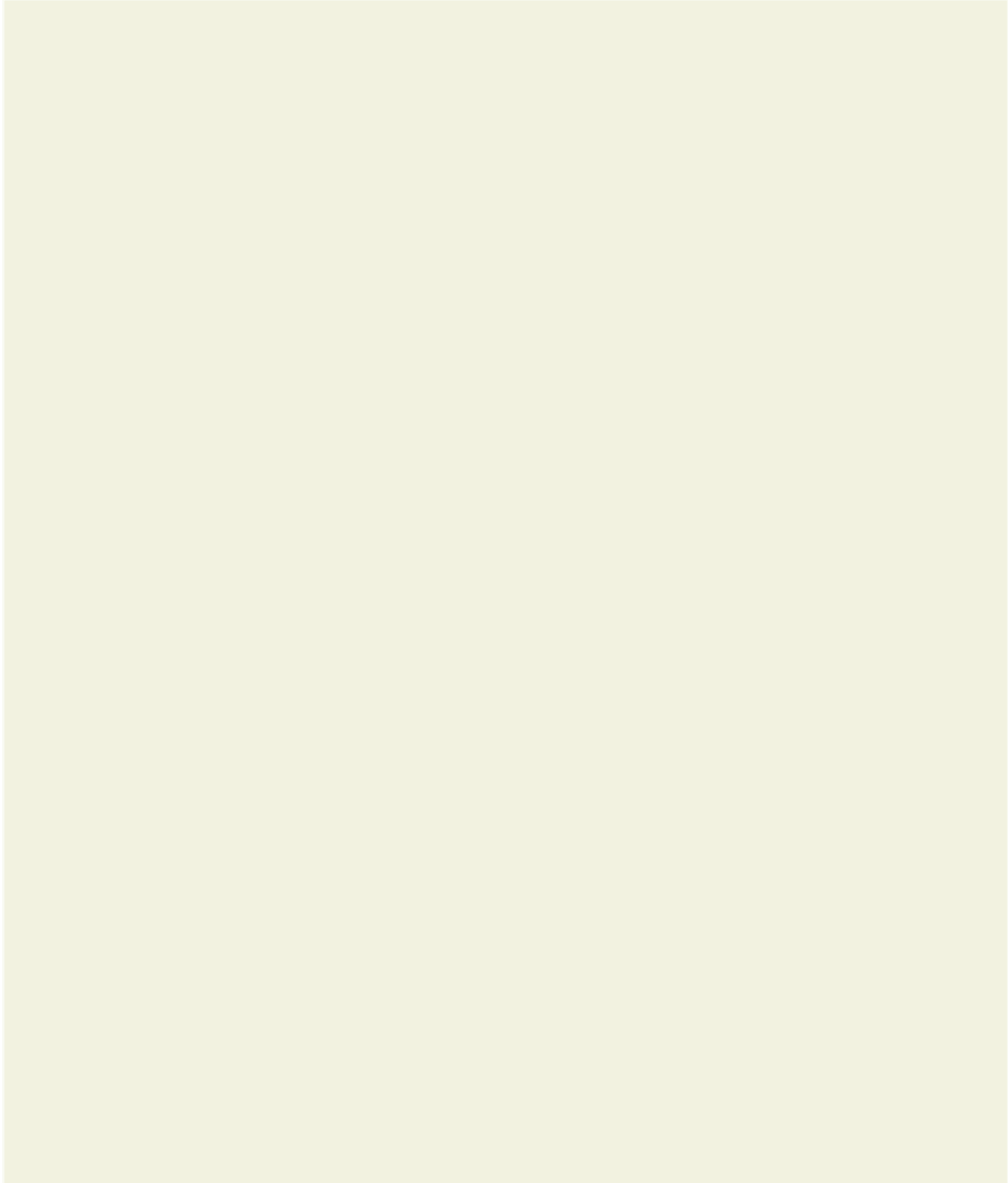
# Virtual Phlebotomy

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## System overview

# Virtual Phlebotomy

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#### 6.1 Software Overview

The Virtual Phlebotomy Self-Directed Learning System software consists of two distinct parts:

- (1) The basic menus screens, which present the case scenario, provide assessment of performance, and support many other functions; and**
- (2) The simulation training sequence that enables interaction between the trainee inserting the needle and the three-dimensional (3D) model of the arm, (Described in the Quick Start Chapter)**

The following section describes the Basic menu screens (Section 6.2), while the Training Sequence is covered in Chapter 7.



#### **WARNING**

**Precautions when using the simulation software**

- The Virtual Phlebotomy Self-Directed Learning System has been designed to work on the computer supplied with the product. The computer is an integral part of the system. It will not work on other computer platforms, because of its requirements for very specific, high speed graphics capabilities. Do not attempt to install and run this software on any other computer other than that which has been provided by the manufacturer.
- No software should be installed on the computer supplied with the Virtual Phlebotomy Self-Directed Learning System, except for those products supplied by the manufacturer of the software.
- Running any program, such as anti-virus software, on the computer supplied with the simulator, may cause the Virtual Phlebotomy Self-Directed Learning System to crash or slow the simulation to an unstable condition. This is a dedicated computer and should not be used for other purposes, except those explicitly stated by the software manufacturer.

### System Overview

#### 6.2 Basic menu screens

To start the application, click on the Virtual Phlebotomy section of the boot screen.



This will initially bring up a loading screen, immediately followed by the Introductory Screen (see below) and prompt the trainee to enter their user name and password. Please note that these accounts need to be created by the System Administrator (usually the Instructor – see section called 'Administration' below).

#### Login

This screen prompts the trainee to enter user name and password. Click the check button to move to the next screen, or the No button to remove the Login pop-up screen. Press the Virtual Products button to return to the Boot screen to Virtual I.V. and Infant Virtual I.V.



### System Icons

There are a number of navigation icons that are found at the bottom right of the screen. The icon will change color when activated by a mouse click. In other cases, icons will become grey if they are not available. See the 'System Tutorial' video within the application for more detailed information.

Examples of these icons and their definitions are shown on the pages below.

### Navigation Icons



**Right arrow: Proceed to the next screen**

**Back arrow: Return to Previous screen**



or



**Help for Current Screen**



**Inactive Icon: Icons that appear grey are not available.**



**Exit the application to the Virtual Products Boot Screen**



**Return to the Main Menu**

## System Overview



**Log Off the current user or Instructor**



**Information about Virtual Phlebotomy**

### Interface Icons



**Yes, Accept, Save**



**No, cancel**



**Make Active / Inactive**

### Simulation and Debriefing Icons



**Haptic Device Available**



**Haptic Device is Not Available**



**Insert Needle into Haptic Device Indicator**



**Palpate Haptic Device Indicator**



**Specimen Tube Attachment**

# Virtual Phlebotomy

Directions for Use

## System Overview



**View case scenario**



**Learn how to orient the site**



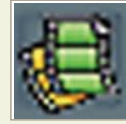
**Select equipment**



**Case scenario level indicator**



**Change site for insertion**



**Movie available.  
Click to play movie.**



**Wash Hands**



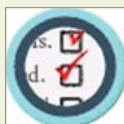
**Inform Patient**



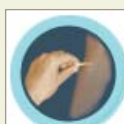
**Palpate Site**



**Make Fist**



**Patient Status**



**Warn of Stick**



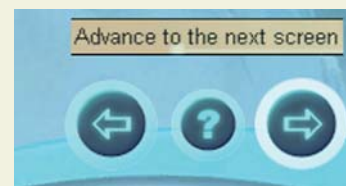
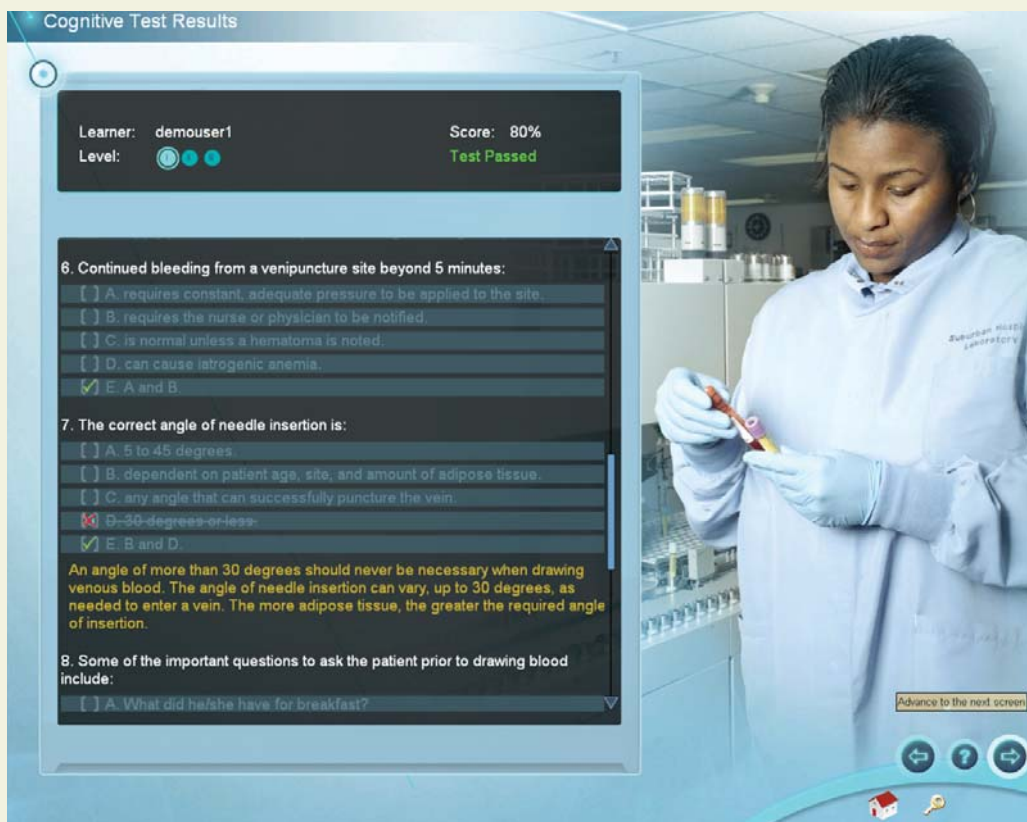
**Patient Identification**

## System Overview

### 6.3 Navigation and Training Aids

#### Tool Tips

By moving the mouse over any navigation or administration icon, a small pop-up “Tool Tip” will appear, providing a brief explanation of that item. An example is presented here:



# Virtual Phlebotomy

Directions for Use

## System Overview

### Information Box

At the bottom of many screens, there is a rectangular box that prompts the trainee on how to proceed. An example is presented here:



Select required equipment and advance to next screen.

### System Overview

#### Help Screens

Most screens in the Virtual Phlebotomy Self-Directed Learning System have help screens that explain the functionality of the screen.

The help screen is activated by clicking on the help button (question mark) located on the lower right corner of the screen:

An example help screen is shown here, with call-outs showing the various components of the menu screen. Use the scroll bar, or scroll the middle mouse button to view the complete help screen.





# Virtual Phlebotomy

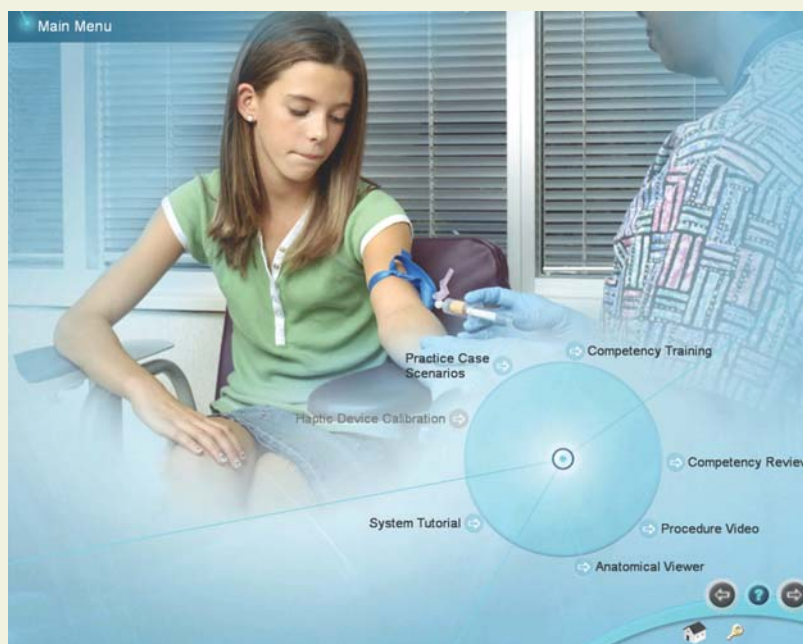
## Directions for Use

### System Overview

#### Main Menu screen

This screen presents a menu of options, including:

- **Competency Training:** A progressive, tiered hierarchy of case studies, cognitive tests, and required skills that ranges from novice (Level 1) to expert (Level 3).
- **Practice Cases:** Individual cases can be tried from all of the levels.
- **Anatomical Viewer:** This module presents a three-dimensional (3D) model of the arm that can be used to identify structures and learn anatomy.
- **Procedure Training:** This video introduces the beginning student to the techniques and skills required for venous specimen acquisition.
- **System Tutorial:** This video shows the trainee how to use the Virtual Phlebotomy simulator system.
- **Competency Review:** This module shows that trainee record of performance.



For the beginning trainee, it is important to view both the Procedure Training and System Overview videos to understand how to perform both proper venous specimen collection and to best use the Virtual Phlebotomy Self-Directed Learning System.

### System Overview

#### Procedure Training video

This screen presents the procedural video demonstrating:

1. Introduction to Phlebotomy
2. Standard Precautions and Patient Assessment
3. Factors Affecting Laboratory Results
4. Environment and Equipment
5. Tube Selection and Specimen Collection
6. Vein Selection and Site Preparation
7. Venipuncture Procedure
8. Complications and Difficult Draws

This video is divided into chapters, allowing the learner to select the section they wish to view by clicking on the appropriate section. There is also a video slider, allowing the trainee to choose a specific place in the video for review.

It is highly recommend that the beginning student watch the video in its entirety before attempting the simulation.

There are play/pause and stop buttons in the video player.



#### System Tutorial video

This screen presents the System Tutorial video which is divided into the following chapters:

1. Introduction to Virtual Phlebotomy
2. System Overview
3. Training Types
4. Performing the Procedure
5. Debriefing
6. Competency Review
7. Conclusion
8. For the Instructor

This video allows the learner to select the section of the video they wish to view by clicking on the appropriate section. There is also a slider, allowing the trainee to choose specific place in the video they would like to review. There are also play/pause and stop buttons in the video player.



### System Overview

#### Anatomical Viewer

The Anatomical Viewer allows the learner to view and identify anatomical structures in the arm and hand. The arm can be positioned in either a pronated or supinated position by selecting the corresponding buttons. To zoom in and out of the arm model, roll the middle mouse button. To re-orient the arm in a different position, click and hold the middle mouse button and move the mouse.

Structures can be revealed through the selection and de-selection of different tissues, including:

- Skin
- Nerves
- Arteries
- Bones
- Veins
- Muscles and Connective Tissue



For identification, move the mouse cursor over the anatomic structure and its name will appear in the text box at the lower left of the screen.

#### Competency Review screen

The Competency Review screen presents your competency accomplishments in a concise and intuitive format.



#### Selecting the number and types of cases for review

Select the number of cases to display by clicking on one of the buttons under the "Show Cases" heading on the left of the screen.

#### Viewing average user scores and progress

There are different ways to review the user's general progress:

If the administrator has configured the Virtual Phlebotomy system to save practice cases, then additional filters will be presented to view competency training and practice cases independently, or together.

Clicking on the "Level Averages" tab will display a graph of the cognitive test and skills (case scenario) averages at each level of difficulty.

## Competency Review

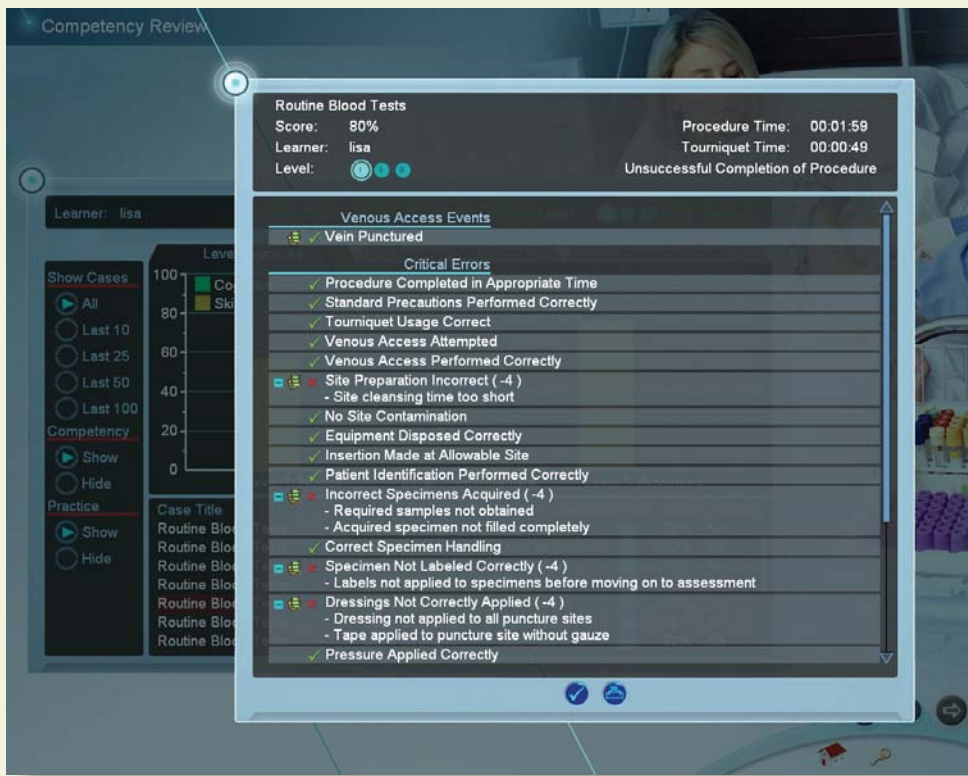
Clicking on the “Average Skill Scores” tab will display a list of critical and non-critical assessment errors, the ratio of the times you performed that category correctly, and a list of specific skill errors and how frequently they were performed in-correctly.

Clicking on the “Progress” graph tab will display a graph of the score on all of the **selected cases** and cognitive tests in a scatter plot.

### Viewing specific case scenario and cognitive test debriefings

Click on the specific case scenario or cognitive test at the bottom of the screen to view the associated debriefing.

Once the specific case scenario is accessed, the trainee is able to display the assessment in html format for printing by clicking on the print icon at the bottom of the case scenario pop-up.



### Sorting

The case scenarios and cognitive tests can be sorted by clicking the column headings.

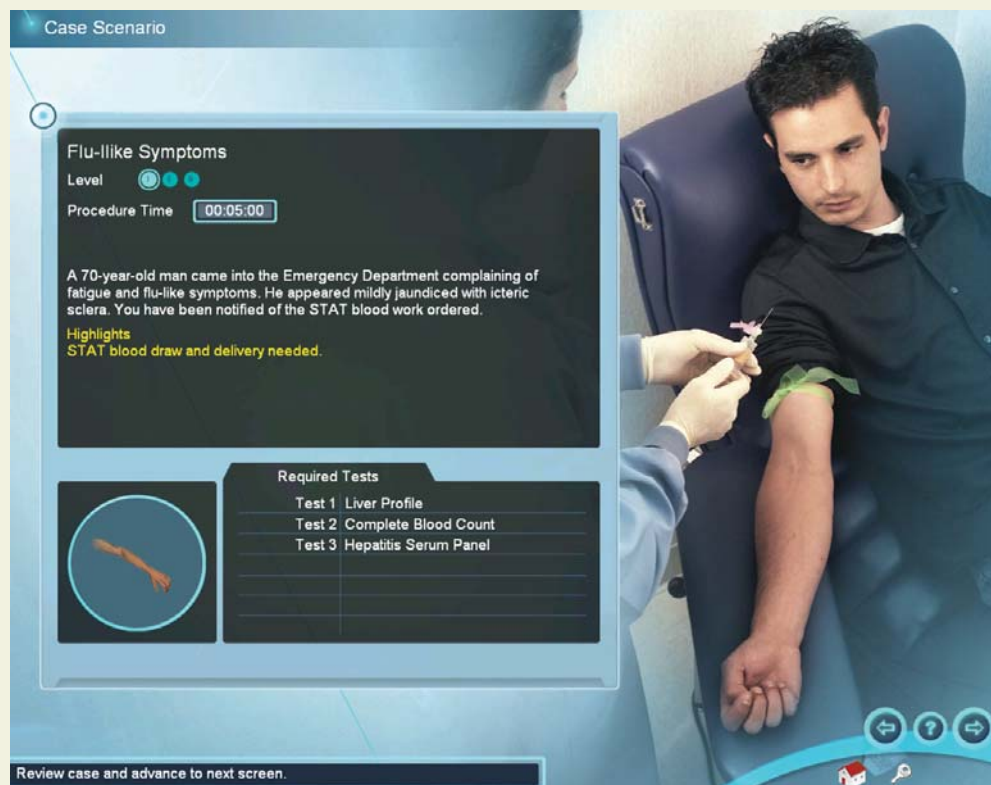
## 7 TRAINING SEQUENCE

The trainee has the option of selecting either Practice Cases (see Section 4, 'Quick Start Guide' for a rapid run-through) or Competency Training Mode. In either case, the learner will be presented a case scenario.

### Case Scenario screen

The patient scenario contains information vital to the trainee's successful performance of the subsequent venous specimen acquisition procedure. Read the paragraph, required tests and look at the bulleted hints below to ensure that you select the correct equipment specific to the case presented.

The cases become more difficult as you progress in Competency Training Mode from Level 1 to Level 3. Highlights (marked as yellow text) are not provided at advanced levels.

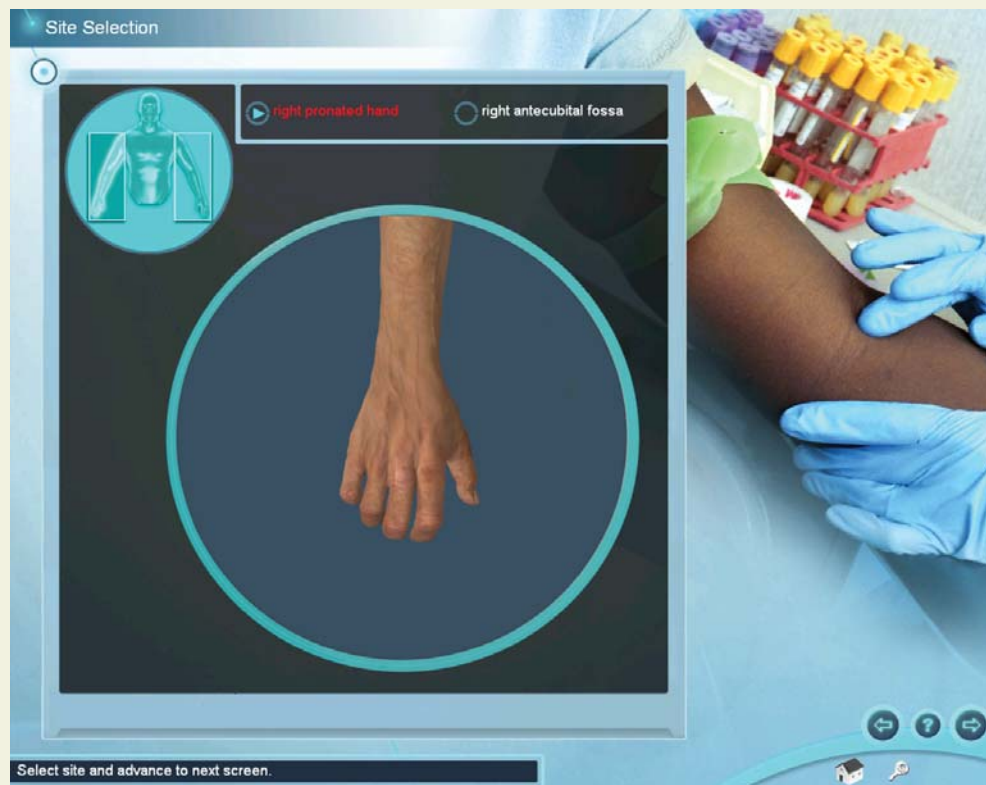


### Training Sequence

#### Site Selection

This screen allows you to select the specific venous access site. First select from left or right arms, then select between the antecubital fossa or pronated wrist.

Based on the information presented in the preceding Case Scenario, choose the site which is most suitable for venipuncture. Once the trainee has chosen a site, click on the right arrow to advance to the **Equipment Selection Screen**.





#### Equipment Selection

This screen presents the inventory of equipment that can be used in the simulation. Holding the mouse over an item will present the trainee with a brief description of the corresponding piece of equipment. To select an item, click on that item and it will appear on the Equipment toolbar on the left hand side of the screen. The trainee may click on an item multiple times, and the quantity of that piece of equipment will appear in parentheses after the item on the Selection list. To deselect an item, click on the "x" at the upper right of the equipment in the tray.

After choosing the equipment, click on the right arrow to advance to the Simulation screen. It is possible to return to the Equipment Selection screen at any time during the procedure.



A reference chart for proper specimen tube selection can be accessed by clicking the Reference Chart icon.

### Training Sequence

#### Simulation Screen and Performance of the Intravenous Procedure

The Simulation component of the Virtual Phlebotomy Self-Directed Learning System allows the trainee to perform the specimen acquisition procedure by interacting with the software and using the haptic device. All of the items chosen from the Equipment Selection screen will appear on the left side of the screen and be available for use in the procedure.

You can review the case scenario, select more equipment, or change sites by clicking on the three icons at the top of the screen. Note: you will not be allowed to perform venous access outside the selected site. To perform venous access outside the currently selected site, select a different site by clicking the Site Selection button. If not already done, remove the needle from the haptic device, and completely detach the specimen tube from the multi-sample needle before beginning the procedure. To zoom in and out of the arm model, scroll the middle mouse button. To orient the arm differently, click and hold the middle mouse button and move the mouse around.

Messages will appear in a box at the lower left of the screen to guide you in the use of the system. To select a piece of equipment, click on the toolbar on the left side of the screen. Most items must either be placed on the arm, or disposed of in either the metal trashcan, bio-hazard bag, or sharps container. Specimen tubes can be placed into the specimen tray. Specimen labels must be attached to specimen tubes in the tray or disposed.

Certain items, such as the tourniquet, gauze, needle, specimen tube, etc. can be removed by clicking on them.



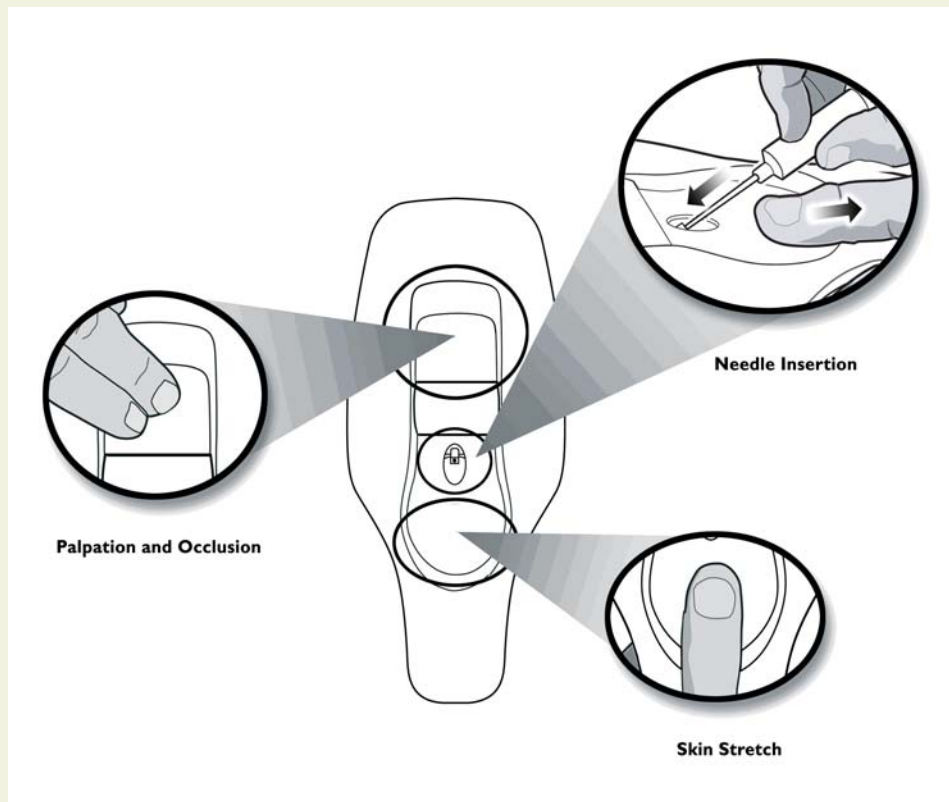
# Virtual Phlebotomy

Directions for Use

## Training Sequence

**The haptic device contains three (3) separate regions: (1) The top of the device is for vein palpation and pressure application, (2) The middle of the device is for needle insertion, and (3) The bottom of the device is for skin stretch:**

An icon of the haptic device appears in the upper right corner and will show you when and how to interact with the haptic device. To begin the procedure, the specimen tube must be completely removed from the multi-sample needle.



**\*\* Special note: Under no circumstances should any needle other than those supplied with the Virtual Phlebotomy Self-Directed Learning System ever be used with the haptic device.**

The tourniquet can be placed on the arm to enhance vein engorgement. However, be aware that the trainee is negatively assessed if the constricting band is left on the arm for too long.

### Training Sequence

To use a multi-sample needle and tube holder, select the appropriate gauge from the inventory on the left side of the screen and move it to the arm. A target cursor will appear on the arm. Locate the insertion point on the arm with the target cursor; click and the needle will appear. Insert the multi-sample needle/tube holder combination into the needle insertion receptacle located in the middle of the haptic device. A slight tug will be felt as the needle is engaged by the haptic device. After engagement, the transparent needle on the screen will be highlighted. The position of the bevel will also appear in the circle next to the arm.



To palpate the arm, select the Palpation button on the top left of the Simulation Screen. Move the palpation fingers to a location on the arm, click the mouse and feel the vein using the top part of the haptic device. To palpate a new location on the arm, move the cursor and click a new location. The palpation fingers are automatically removed when you select another piece of equipment, or click the palpation button a second time.

All Body Substance Isolation (BSI) techniques should be followed. These may include the use of gloves and goggles, which can be selected and deselected by clicking on the corresponding icon.

The insertion site can be prepared using the cleansing supplies in the inventory. All items must be disposed of properly, either in the trashcan, biohazard bag or the sharps container.

# Virtual Phlebotomy

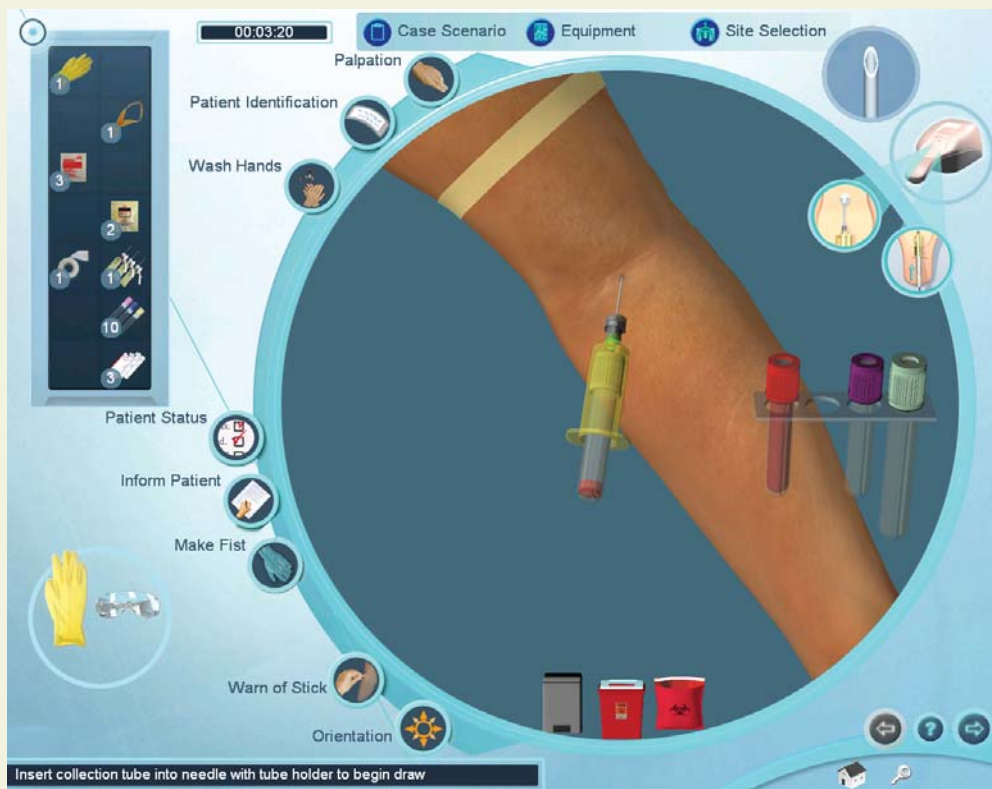
## Directions for Use

### Training Sequence

Depending on the patient case, it may be more or less difficult to correctly insert the needle. During needle insertion, stretching the skin at the bottom part of the haptic device should assist in securing the vein for insertion. 29 different arms supplied with the Virtual Phlebotomy Self-Directed Learning System, ranging from pediatric to geriatric, and including rolling veins, fragile veins and arms and hands with difficult-to-penetrate skin.

The appropriate angle for needle insertion is 10-30 degrees.

In some cases, the learner will perform the procedure in an incorrect fashion, resulting in bleeding, bruising or swelling that will appear on the arm.



Use equipment by clicking on the equipment toolbar at the left. All pieces of equipment are prepared and ready to use.

A number of procedure tasks appear along the left edge of the round window. It is necessary to perform some of these tasks to successfully complete the procedure.

### Using the Haptic Device

To insert the needle, palpate, apply pressure or stretch the skin, perform the function on the haptic device in the corresponding area.

### Training Sequence

**Needle insertion:** To perform the needle insertion, select a needle with vacuum tube holder from the toolbar. Move the needle cursor to the desired location on the site and click. Then, insert the real needle with vacuum tube holder into the haptic device.

**Note:** Before performing the needle insertion, it is necessary to engage the haptic device needle in the haptic device. Insert the needle into the Needle Insertion Point on the haptic device until the needle on the screen lights up. You will feel a small tug and hear a sound when the haptic device engages.

**Applying Pressure:** Once you have selected the gauze and applied it to the arm, you can apply pressure to it by pressing the palpation/pressure application area of the haptic device.

Click on the palpation icon to turn palpation on. A palpation finger will attach to the cursor. Move fingers to the simulation window, click on the site to locate the palpation point. To turn palpation off, click on palpation or select another piece of equipment.

### Equipment Use: Specific

To select a specimen tube click on the specimen tube icon in the toolbar. A selection of 6 long draw and 6 short draw tubes will appear. Click to select the specific tube. Once selected, the tube can be placed in the tube tray at the right of the simulation window, or directly into the multisample needle with tube holder. If automatic tube selection is configured by the administrator, empty tubes in the tube tray will be automatically attached to the multisample needle starting with the left most tube.

To select a multisample needle, click on the multisample needle with tube holder icon in the toolbar. A selection of 3 different gauge needles will appear. Select the appropriate gauge needle and move cursor over site. A target will appear. Click to locate needle insertion point. The bevel position will be displayed in a circular inset at the top right of the screen.



### Training Sequence

To select and use a label, click on the label icon in the toolbar. A selection of all labels available for this case will appear. Select the label to apply. A menu will appear allowing you to mark the label with different handling and labelling instructions. Mark the label as appropriate for the case by clicking in the circle next to the corresponding text. Click the check mark once you have marked the label. The label will then attach to your cursor. Click the label on the corresponding collection tube to apply.

To apply tape or dressing, click on the corresponding icon, move to site and click on desired location.

To apply a warm compress to the arm, click on the corresponding icon in the toolbar, and click on a location on the arm. The warm compress will take a few seconds to have any effect.

To use gauze and apply pressure to the site, click on the gauze icon in the tool tray. If a needle is on the arm, the gauze will appear above the puncture site. If no needle is on the arm, then click at the location you wish to apply the gauze. Apply pressure to the gauze pad by pressing down in the palpation/pressure application area of the haptic device.

To place the tourniquet, click on the corresponding tool bar icon, move to arm and click on desired location.

To use an alcohol wipe, povidon iodine swab or chlorhexidine wipe, click on the corresponding icon on the toolbar and move to the desired site on the arm. Once at the desired site, click, hold and move the mouse to cleanse the site. Release mouse button when cleansing is complete.

#### **Procedure Tasks: Specific**

To palpate, identify the patient, wash your hands, confirm that the patient followed physicians orders, ask the patient to make a fist, inform the patient of the procedure, warn the patient of the stick, or view a video about site orientation, click on the corresponding icon on the left edge of the simulation window.

**Once you have completed the procedure, advance to the next screen to review your performance.**

### Training Sequence

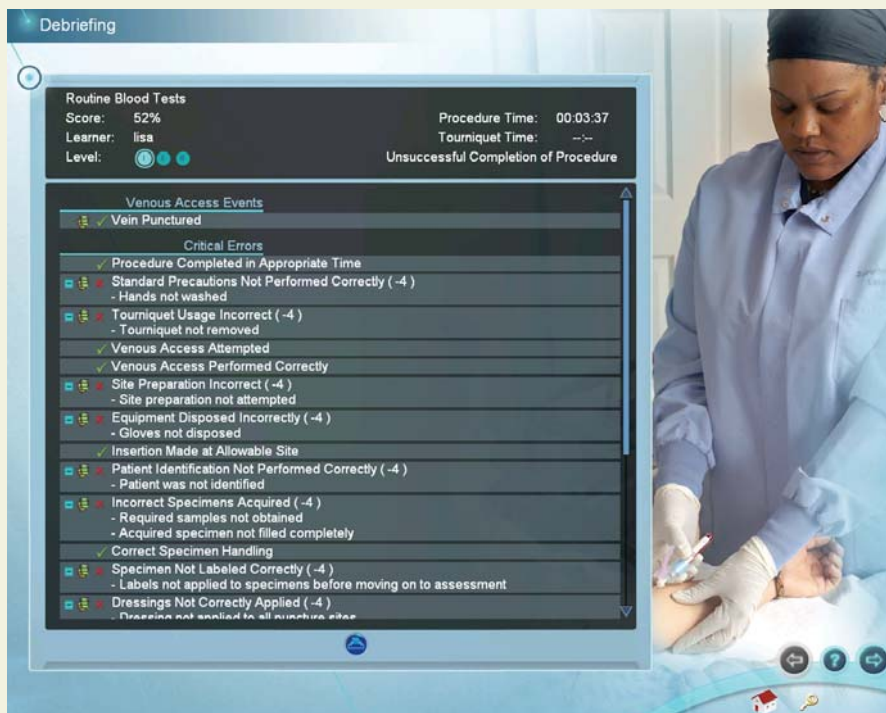
#### Debriefing

Following the procedure, the learner will be assessed as to how well he or she performed the procedure. To view the debriefing screen, push the advance button after performing the procedure. The assessment is divided into Venous Access Events, Critical and Non-Critical errors. Critical errors are vital to proper performance of the procedure. Depending on the configuration chosen by the administration under Training / Simulation Options, a quantitative score may be displayed. This Overall Rating may be high, but the trainee can still fail the procedure if Critical errors were made. The total time of the procedure, as well as the time the constricting band was placed on the arm is timed.

For some Critical and Non-Critical errors, a movie icon will appear next to the error. Clicking on that error will display a video showing the proper way to perform that sub-task of the procedure.

Clicking on the Venous Access event video shows the trainee an “under-the-skin” view of what occurred during cannulation. For example, if the angle of insertion was too steep, the video will display the consequences of a steep insertion.

From the debriefing screen, the learner is able to display the assessment in html format for printing by clicking on the print icon at the bottom of the screen. If the trainee is in Competency Training Mode and succeeds at the procedure, then the next case or a qualification test will be automatically presented when the trainee advances to the next screen. If the trainee fails the procedure, he or she may be presented with the same case scenario, a different case scenario, the procedure training screen, or with a remedial case scenario with hints to help the trainee better understand proper procedure.





# Virtual Phlebotomy

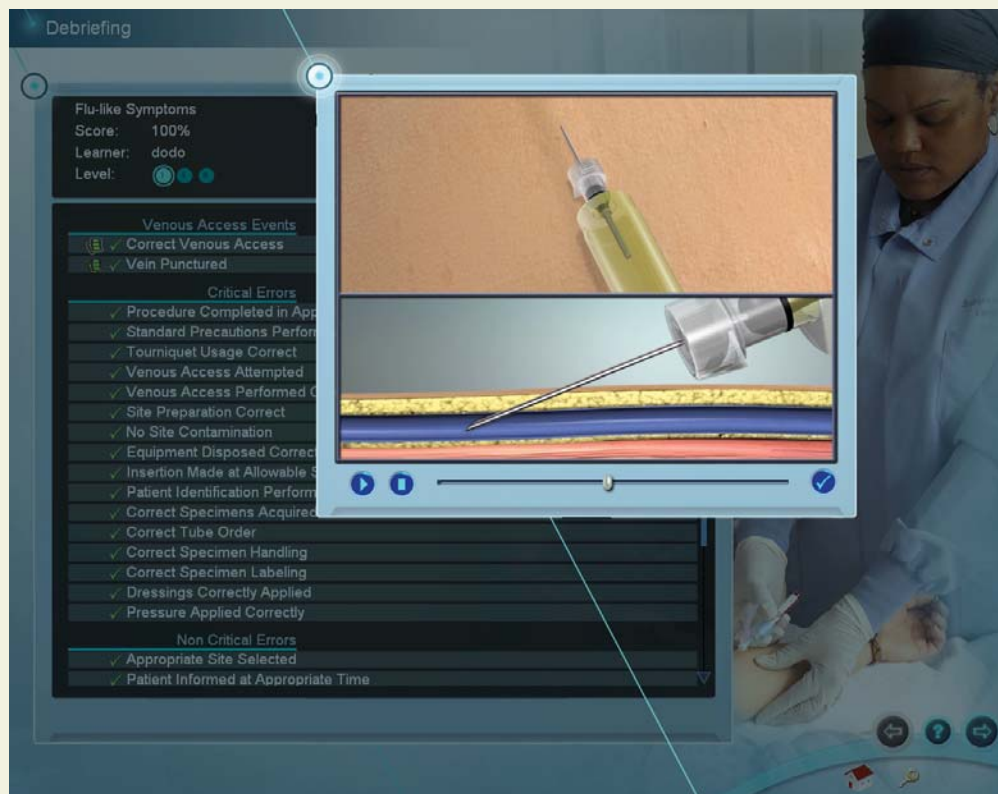
Directions for Use

## Training Sequence

### Cannulation Event Animations

These generic animations display a record of the learner's performance in terms of the angle of needle insertion, lateral or direct needle placement, vein behavior (rolling), nerve involvement and vein puncture (vein present, vein punctured through, etc.), and whether the trainee performed the venous access correctly. The animation is controlled using standard video control buttons.

An example is presented here:



## Training Sequence

### Remediation Case Scenario

If the student fails the procedure, a remediation case with red hints may appear following advancement from the Debriefing screen.

An example Remediation Case Scenario is presented here:



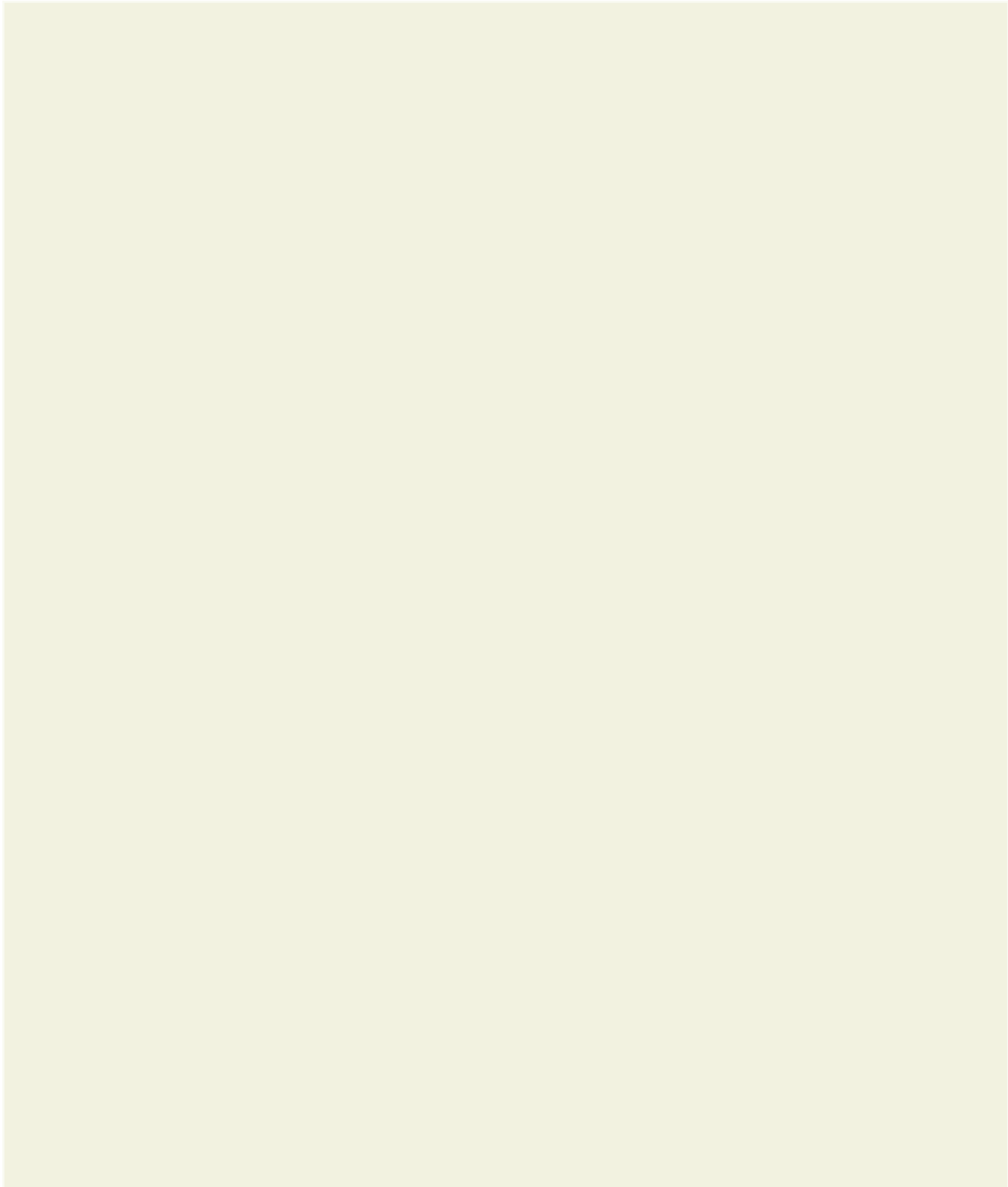
# Virtual Phlebotomy

Directions for Use

## Administration

# Virtual Phlebotomy

Directions for Use



### **8 ADMINISTRATION**

There are certain features only available to the instructor. These features are accessed by logging in as:

Username: Administrator

Password: <Provided on the information sheet inside your desktop computer, or by Laerdal Technical Service at 1 (800) 431-1055 EXT. 5596>

## Administration

### Instructor Main Menu

Once logged in, you can:

- (1) View an instructional video on Virtual Phlebotomy instructor functionality;
- (2) Manage user accounts (Account Management);
- (3) Configure the simulation based on local protocols and preferences (Configuration);
- (4) Calibrate the haptic device which occasionally requires calibration (Haptic Device Calibration);
- (5) Change the Instructor password (Change Instructor Password). Note: The password originally provided on the information sheet inside your desktop computer or by Laerdal Technical Support will always allow work, even if you change the Instructor password.



### Learner Competency Review

The screenshot displays the 'Learner Competency Review' interface. At the top, a table lists learners with their names, classes, levels, skill percentages, and cognitive percentages. The learner 'lisa' is highlighted in red, indicating she is selected for review. Below this, the interface shows 'Learner: lisa' and 'Level: [Progress Indicators]'. The main area is divided into sections for 'Show Cases', 'Critical Errors', 'Competency', and 'Practice'. The 'Critical Errors' section lists specific errors such as 'Procedure Completed in Appropriate Time (9/10)' and 'Standard Precautions Performed Correctly (4/10)'. The 'Practice' section contains a table of case scenarios with their respective scores and pass/fail status.

Name	Class	Level	Skill	Cognitive
demouser1	Demo Users	[Progress Indicator]	0%	0%
<b>lisa</b>		[Progress Indicator]	<b>65%</b>	<b>65%</b>
admin		[Progress Indicator]	0%	0%

Case Title	Type	Medical Condition	Level	Score	Passed
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	72%	No
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	76%	No
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	80%	No
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	55%	No
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	52%	No
Routine Blood Tests	Case Scenario	Out-Patient	[Progress Indicator]	60%	No
Flu-like Symptoms	Practice Case	Emergent	[Progress Indicator]	52%	No

Selecting a learner for review

Click on a learner at the top of the screen to review that learner's progress. Different learners can be selected for review at any time.

### Administration

#### Selecting the number and type of cases for review

Select the number of cases to display by clicking on one of the buttons under the “Show Cases” heading on the left of the screen.

Selectively filter the competency training and practice cases for review. The information in the competency review will change accordingly. Remember that depending on the configuration setting, user practice cases may not be stored.

The screenshot displays the 'Learner Competency Review' interface. At the top, a table shows learner performance:

Name	Class	Level	Skill	Cognitive
demouser1	Demo Users	1	0%	0%
lisa		2	85%	85%
admin		3	0%	0%

Below this, the 'Learner: lisa' section shows 'Level: 2'. The main area is divided into three tabs: 'Level Averages', 'Average Skill Scores', and 'Progress Graph'. The 'Average Skill Scores' tab is active, showing a list of 'Critical Errors' with their respective completion percentages and details:

- [90%] Procedure Completed in Appropriate Time (9/10)
  - Procedure Took Too Long to Complete (1/10)
- [40%] Standard Precautions Performed Correctly (4/10)
  - Gloves not used (1/10)
  - Action taken before washing hands (5/10)
- [10%] Tourniquet Usage Correct (1/10)
  - Tourniquet not removed (5/10)
  - Tourniquet left on too long (2/10)
  - Insertion made without tourniquet (2/10)
  - Insertion made too close to tourniquet (1/10)
- [100%] Venous Access Attempted (10/10)

At the bottom, a 'Practice' table lists individual case scenarios:

Case Title	Type	Medical Condition	Level	Score	Passed
Routine Blood Tests	Case Scenario	Out-Patient	1	72%	No
Routine Blood Tests	Case Scenario	Out-Patient	2	76%	No
Routine Blood Tests	Case Scenario	Out-Patient	3	80%	No
Routine Blood Tests	Case Scenario	Out-Patient	4	55%	No
Routine Blood Tests	Case Scenario	Out-Patient	5	52%	No
Routine Blood Tests	Case Scenario	Out-Patient	6	60%	No
Flu-like Symptoms	Practice Case	Emergent	7	52%	No

#### Viewing average user scores and progress

There are different ways to review the user's general progress:

- Clicking on the “Level Averages” tab will display a graph of the cognitive test and skills (case scenario) averages at each level of difficulty.
- Clicking on the “Average Skill Scores” tab will display a list of critical and non-critical assessment errors, the ratio of times you performed that category correctly, a list of specific skills and how often those skills were performed in-correctly.
- Clicking on the “Progress Graph” tab will display a graph of the cognitive test and skill (case scenario) scores for the shown cases.



#### Sorting

The learners and case scenarios can be sorted by the column headings.

#### Viewing specific case scenario and cognitive test assessments

Click on the specific case scenario or cognitive test at the bottom of the screen to view the associated assessment.

Once the specific case scenario is accessed, the instructor is able to display the assessment in html format for printing by clicking on the print icon at the bottom of the case scenario pop-up.



## Administration

### Account Management



Click on the column labels to sort the accounts by name, class, specialty, level, average skill score or average cognitive score.

If you will be using multiple Virtual Phlebotomy machines and would like to configure them in a connected Local Area Network, you will need to install Laerdal Competence Management System, version 1.8.

This will allow students to log into any Virtual Phlebotomy machine and transfer their user histories between machines.

If you experience significantly long log-on times, we recommend installing a Laerdal Competency Management System.

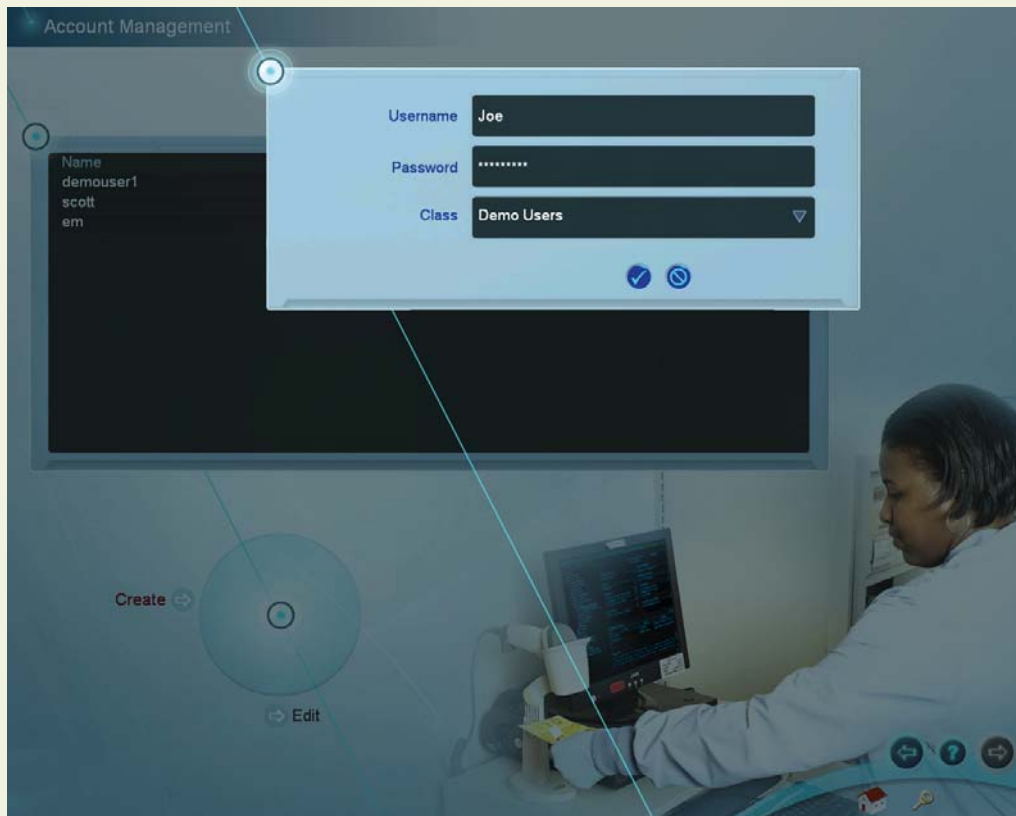
**Note:** Do not use the Virtual Phlebotomy account management and learner competency review functionality after installing a Laerdal Competence Management System.

# Virtual Phlebotomy

Directions for Use

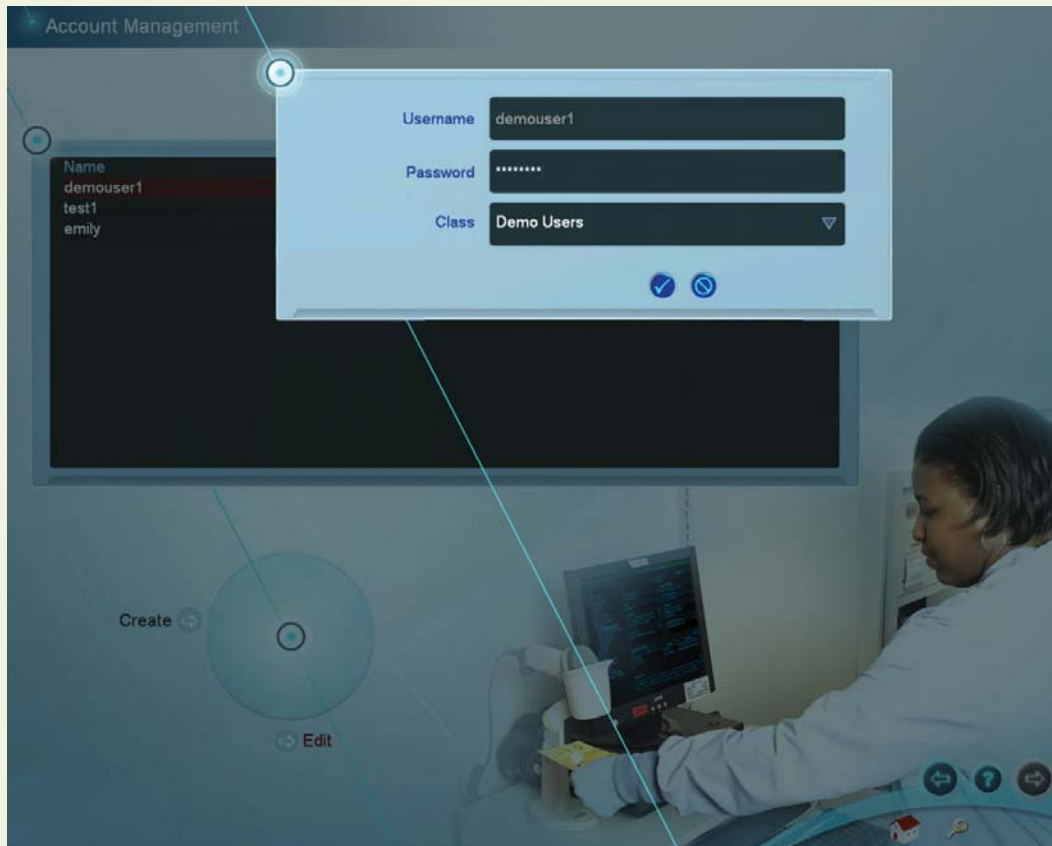
## Administration

I. Click on create to add a new learner.



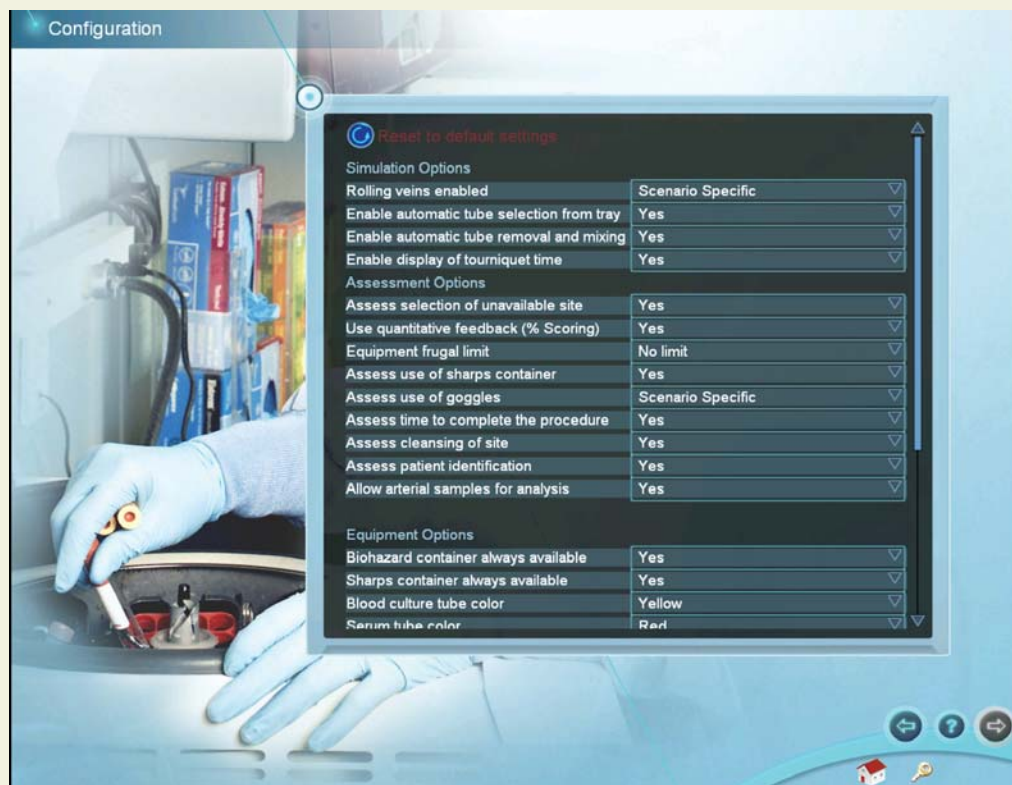
## Administration

2. Select a learner and click edit to edit the learner's password, career and class.



#### Configuration

Select the configuration settings to correspond to local protocols and desired system operation.

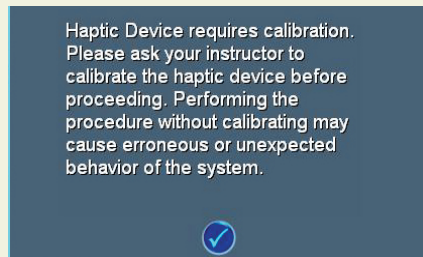


Click the “Reset to default settings” button to restore the original settings for all configuration options.

## Administration

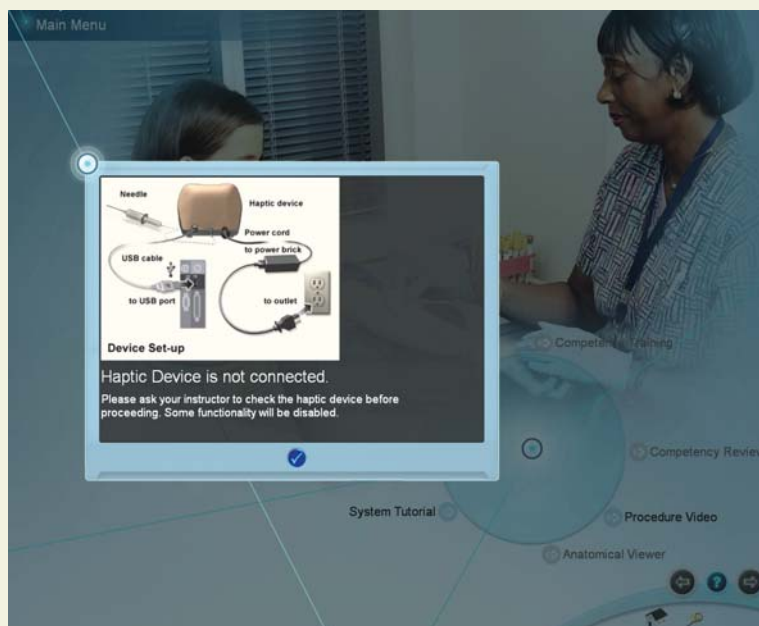
### 8.1 Calibration of the Haptic Device

When the haptic device requires calibration, a message will appear on the screen which looks like this:



It is important to calibrate the device at regular intervals as prompted by the system, or the system will “drift”, potentially causing erroneous measurements.

In cases where the haptic device is not connected or does not initialize properly, the following screen will appear. Make sure that the device is properly connected, and that the proper needle is attached. Rebooting the system and disconnecting and reconnecting the power cord to the device will usually fix this problem. The initialization screen is shown below:



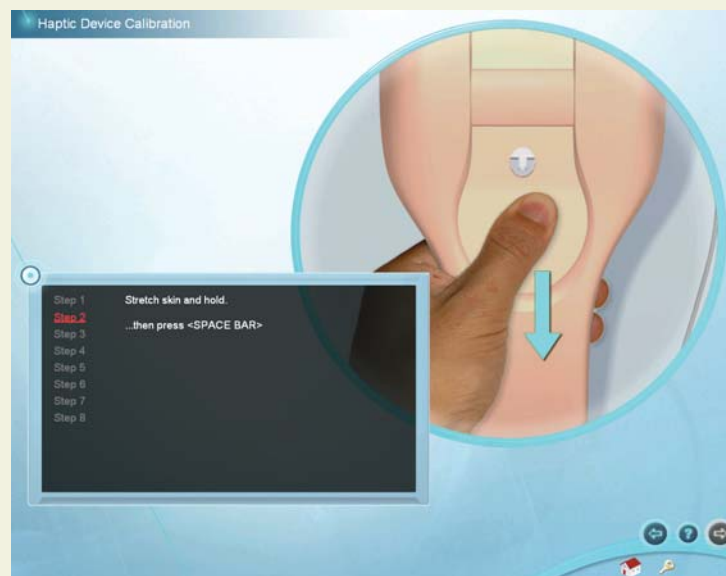
# Virtual Phlebotomy

## Directions for Use

### Administration

The following pages show the series of menu screens that will lead the instructor through the calibration process.

These menu screens show the steps of the calibration sub-routine. Follow instructions as prompted on the screens.



## Administration

Preparing the needle / specimen tube assembly for calibration:





# Virtual Phlebotomy

Directions for Use

## Administration

Lateral calibration:



## Administration

Vertical calibration:



# Virtual Phlebotomy

## Directions for Use

### Administration

This screen indicates that the device has been successfully calibrated.



The screen below indicates that the device has not been successfully calibrated, and the calibration routine should be performed again. If problems persist, click on the show calibration error button to determine at which step calibration failed and the corresponding error code. If calling Laerdal Technical Support, please provide the error code.



### Administration

#### **Network Configuration**

**Connect multiple Virtual Phlebotomy™ systems to a local or global area network by installing a Laerdal Competence Management System, version 1.8 and following the accompanying instructions. This will link multiple systems and allow students and instructors to access and review achieved competencies over the internet.**

#### **Change Instructor Password**

**Note: The password originally provided on the information sheet inside your desktop computer, or by Laerdal Technical Service at 1 (800) 431-1055 EXT. 5596 will always work, even if you change the Instructor password.**

## **Packing up the system**

### Packing up the System

## 9 PACKING UP THE SYSTEM



### WARNING

Precautions when packing and moving the haptic device

- The haptic device is a precise and sensitive instrument. To ensure proper working order, please handle and pack with care.
- Be certain to replace the shipping restraint before moving the device.
- Dropping the haptic device, bending the needle, or other abuse may render the device inoperable.
- To ensure proper functionality, calibrate the haptic device after moving.
- Although the needle is blunt, it can still cause injury if used in an improper manner. Be careful when handling.

# Virtual Phlebotomy

Directions for Use

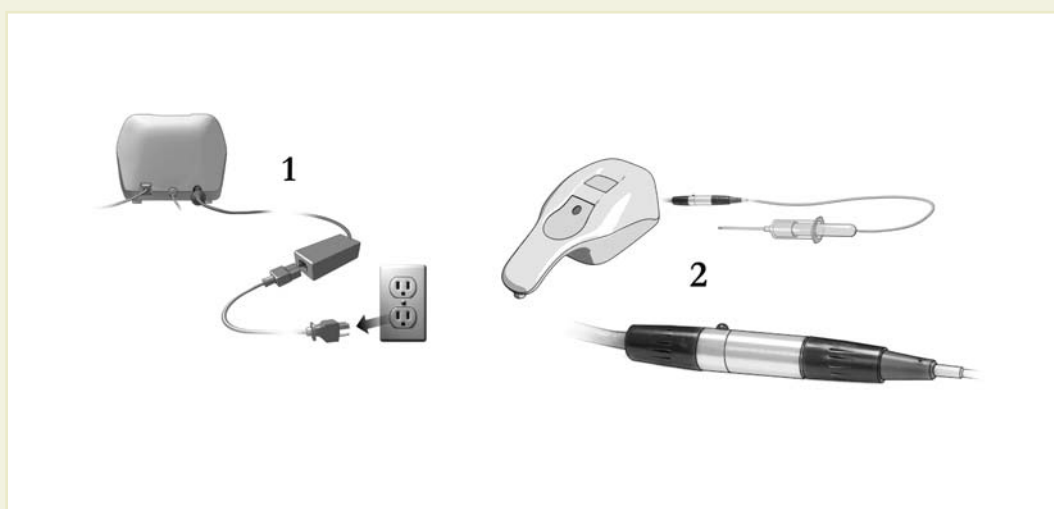
## Packing up the System

**This series of diagrams is also available as a fold-out set of instructions that were included in the Virtual Phlebotomy™ packaging. It explains the order of packing the simulator. Special attention should be paid to unplugging the cables and packing the haptic device.**

*(1) Shut down the computer as indicated by the manufacturer:*

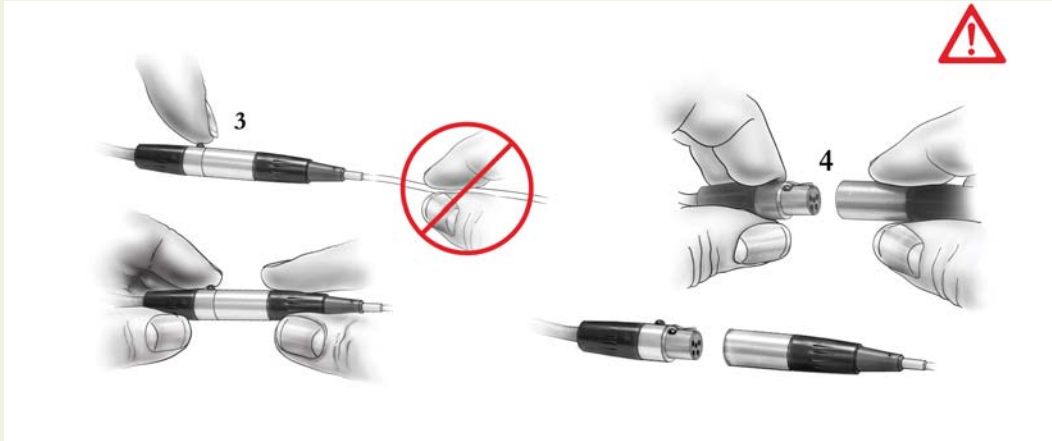


*(2) Unplug the power cord of the haptic device from the wall socket:*

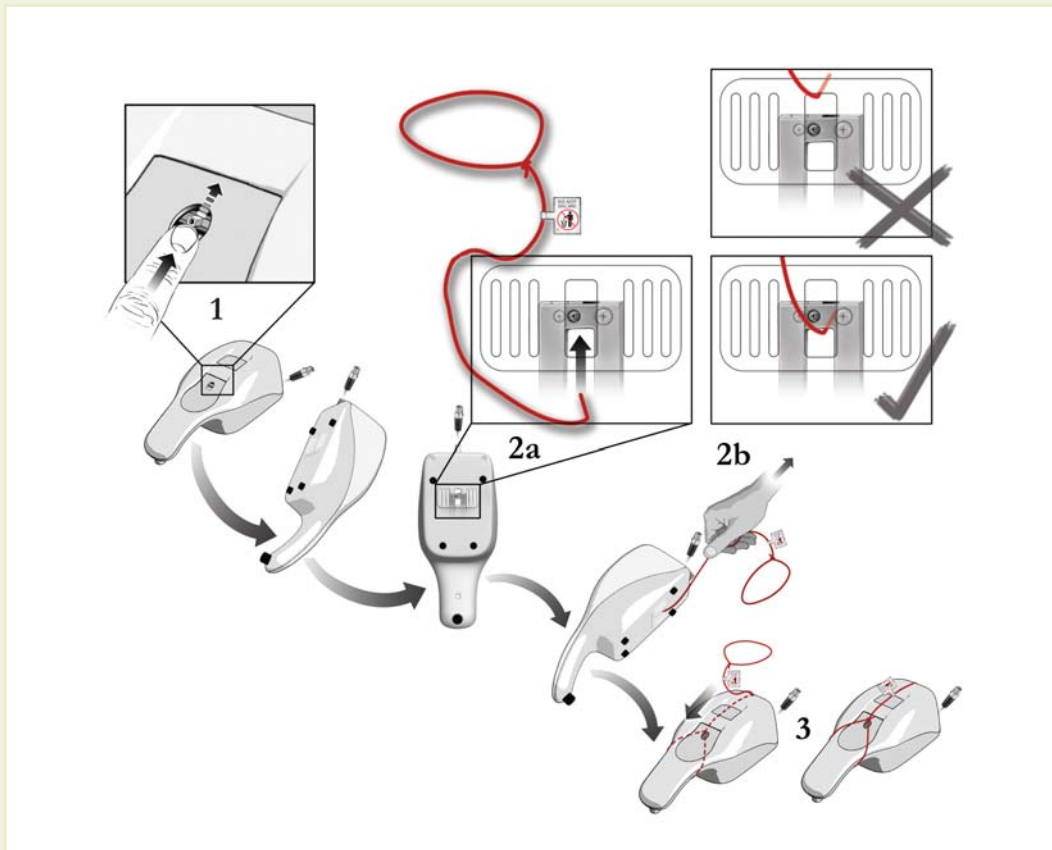


## Packing up the System

(3) Carefully unplug the needle from the haptic device:



(4) Place the restraining strap on the haptic device:



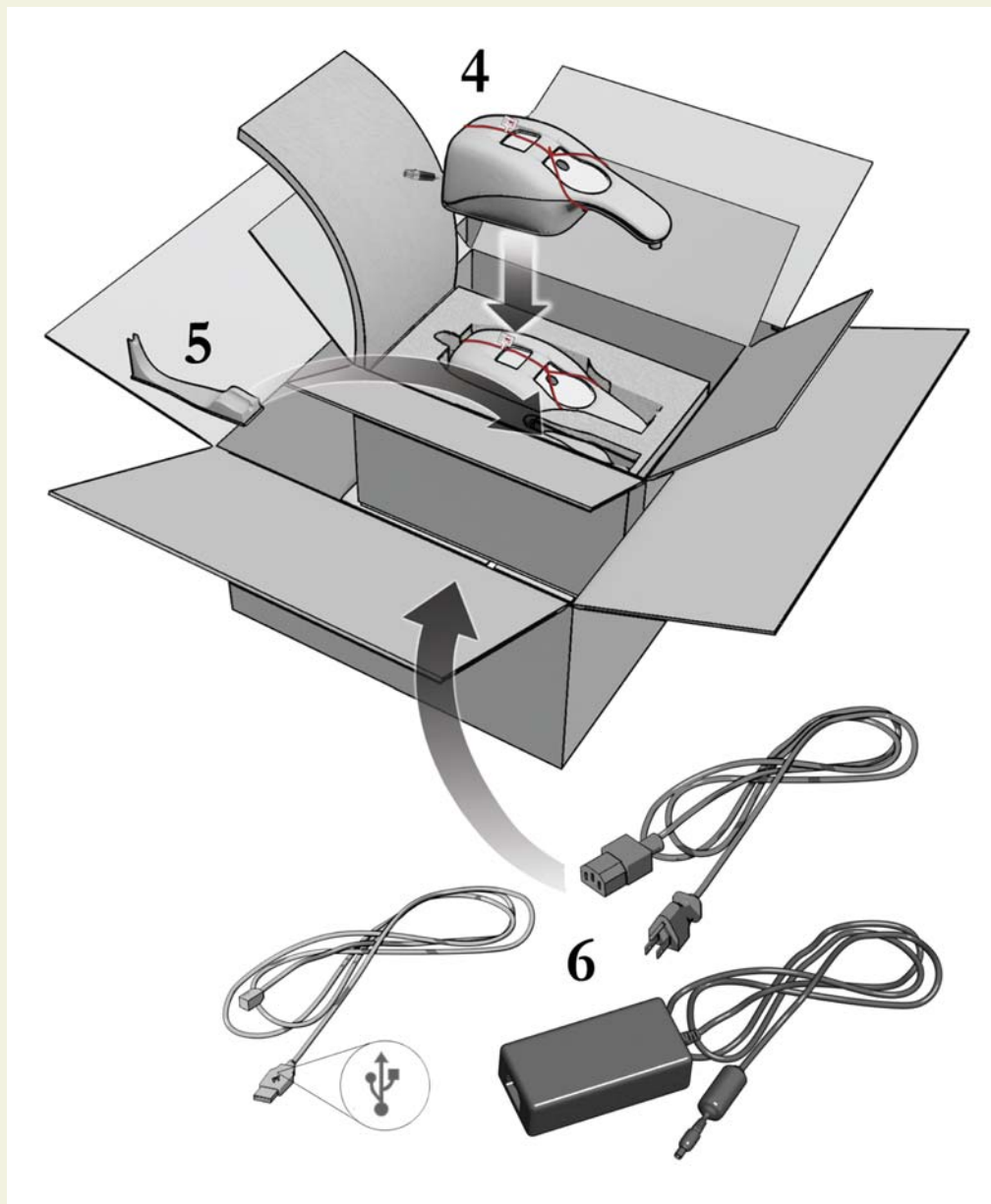


# Virtual Phlebotomy

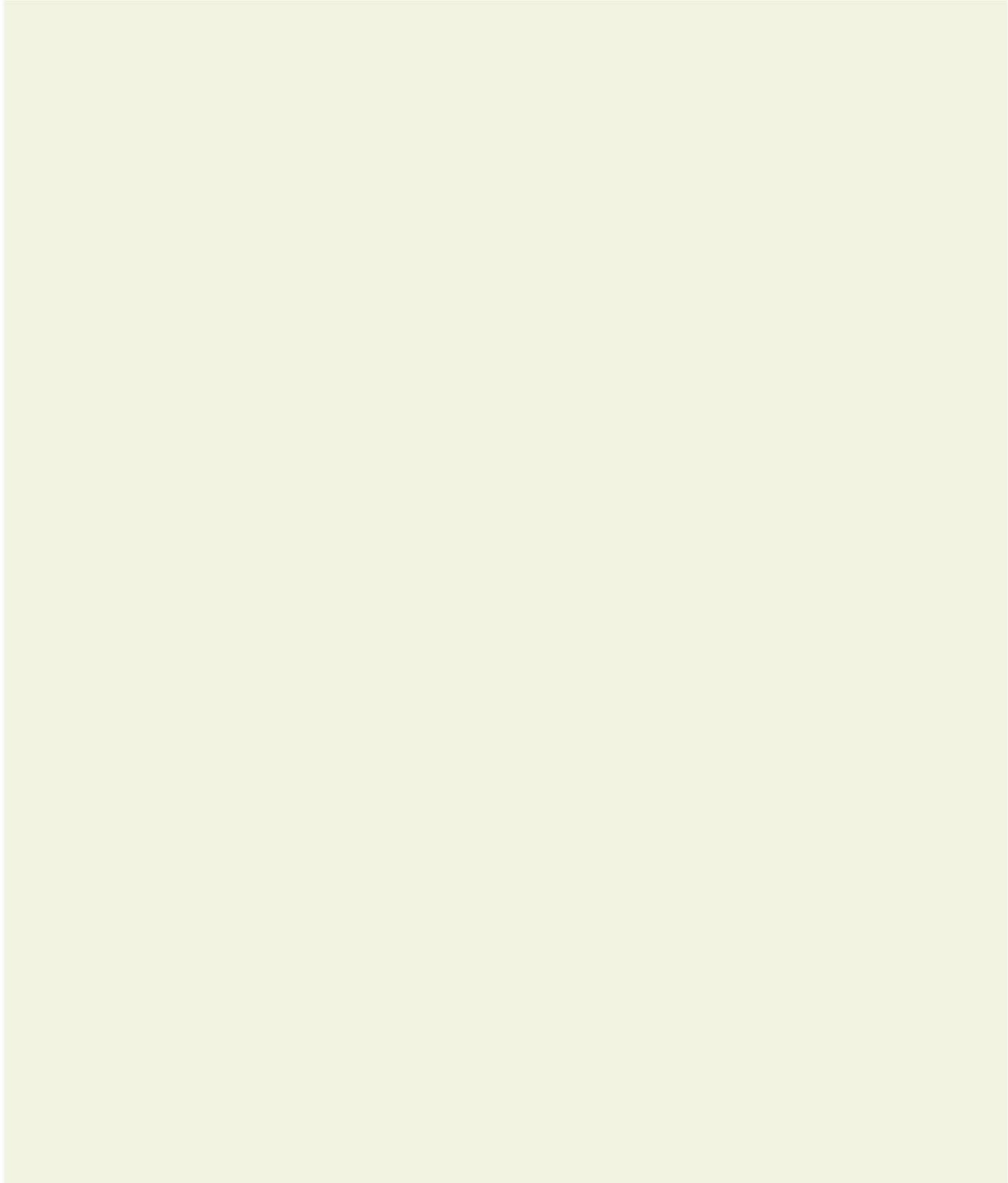
Directions for Use

## Packing up the System

(5) Carefully place the haptic device and tools in the original packaging:



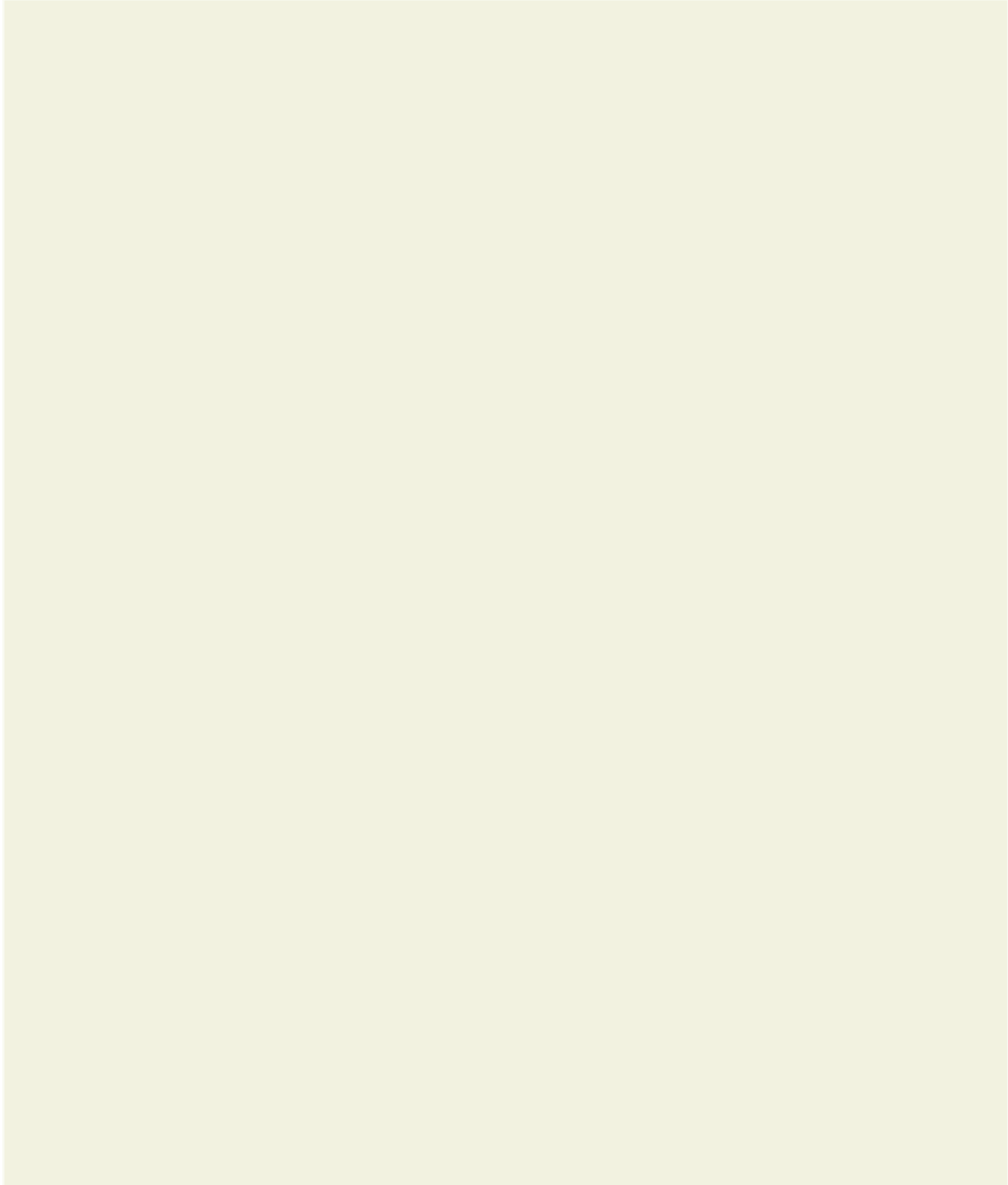
## Packing up the System



## Frequently asked questions

# Virtual Phlebotomy

Directions for Use



## 9 FREQUENTLY ASKED QUESTIONS (FAQ)

### 1. Is there some kind of an introduction that shows me how to use this product?

The System Overview Video, accessible from the Main Menu Screen, will show you how to use the product, as well as the text in this user manual. To access the Main Menu login as:

Username: demouser1 or demouser2

Password: password

### 2. Can the instructor select specific supplies and configure the training standards?

Yes, in the Administrator Module, certain supplies and assessment features are configurable.

### 3. Our local standards of practice do not call for, or restrict the use of certain items that available on the equipment screen or are required for successful completion of the procedure, such as the use of goggles or application of iodine to the arm.

Many options are configurable by the instructor using the Configuration section of the Instructor module. By turning specific assessment items on or off, it is possible to tailor the system to train to your local protocols.

### 4. I am experiencing long log on times, is there anything I can do?

Yes, the log on times become long when there are too many users with too many records stored locally. Set up a connection to the Laerdal CMS. This will allow you to permanently store all users on the server to better manage a large number of users and reduce long log on times. Since users are stored on the server, some users may not appear on the local Virtual Phlebotomy system. To retrieve the "local" user's information, simply log on to a Virtual Phlebotomy Simulator as that user.

### 5. Why can't I continue to palpate the vein as I'm inserting the needle?

Proper I.V. insertion technique specifies simultaneous skin stretch and insertion. Thus, unless you have a helper, simultaneous skin stretch, palpation and insertion would require more than two hands. However, if you do palpate, you will palpate approximately ½" proximal to the insertion site.

### 6. Is there audio feedback... like the patient saying something or making a noise when I stick him?

Although there are no environmental sounds, some user interactions do produce audio feedback. For example, patient nerve involvement will trigger an audible response from the patient.

### FAQ

#### **7. Why does the arm rotate when I click to palpate or insert the needle?**

In order to improve the ease of use of the simulator, the arm is oriented automatically under many circumstances. This aligns the image on the screen and the haptic device for an immersive and realistic insertion.

#### **8. Will the cleansing agents wet and taint the skin?**

Yes, like in actual patients, there will be a time period in which topical agents will remain and evaporate, depending on the nature of the solution applied to the arm.

#### **9. Will the patient bruise and bleed?**

Yes, under most conditions, if the procedure has been performed to elicit this problem, as in an actual patient. Inserting and removing the needle will cause the patient to bleed. To stop bleeding, apply gauze to the puncture site and then apply pressure in the haptic device. The coagulation time for the patient depends on the case scenario. It will take longer for patients on blood-thinning medications to stop bleeding even when pressure is applied.

#### **11. Will a hematoma and/or ecchymosis form if I stick through or blow a vein?**

Yes, under most conditions, if the procedure has been performed to elicit these problems, as in an actual patient.

#### **12. Can I put together a Phlebotomy Start Kit so I don't need to select my supplies before each stick?**

Not in the current product. However, future upgrades may feature this option. Understanding which tubes, cleansers, needles, etc. will be required for each case scenario is an important training objective.

#### **13. Why do I need to select a sharps container? There is one on the wall in every room where I work.**

An option can be configured in the Administrator module to make the sharps container always available. The goal of the standard configuration is to reinforce the concept that sharps, contaminated gloves and other items must be disposed of in a circumscribed fashion. We realize that, in some places, hospitals may actually have multiple disposable containers - for example, needles and gloves may be disposed of in different hazard containers. However a cognitive training goal of this product is to reinforce the notion in the trainee's mind that potentially contained or dangerous items must be disposed of in a selective manner.

#### **14. Is there some way to mark the selected needle entry point? I lose the spot when I prep the skin.**

As with an actual patient, there is no way to mark the point of insertion.

**15. Is there a lateral transparent view so I can see my angle and depth of entry?**

No, currently there is no real-time display of angle and depth of entry. Future versions may feature this capability, but for training purposes, it was felt that, since this is not available while performing the procedure on an actual patient, it was not a preferred method of training the technique. Also, this type of real time coaching jeopardizes the ability to evaluate student performance and objectively advance the student through the course of study. Sub-cutaneous animations are available on the debriefing screen and explain, schematically, what occurred during insertion.

**16. Although the user “Jimi” and the password “Hendrix” was not active, I could not create a user with the same username and password. Is this a feature or a bug?**

This will occur if you are connected to a server in a local area network configuration and such a user currently exists, or has previously been deleted.

**17. Will the debriefing tell me what I did correctly and give me more specific information about what I did wrong?**

Yes, the assessment screen shows video, animations and textual information about errors and the way to achieve proper performance of the procedure.

**18. Can the student print out the debriefing?**

Yes. Students and instructors can print out specific case scenario and cognitive test debriefings from two locations: the debriefing screen and the competency review screen when a specific debriefing is accessed. Installation of a Laerdal Competence Management system will allow you to print additional information.

**19. Can the debriefing report be downloaded into a database?**

Yes, this capability is available if the product is part of the Competence Management System (CMS) that can be ordered as an adjunct to the product.

**20. Can I access the student performance database from my office computer over a network?**

Yes, this capability is available if the product is part of the Competence Management System (CMS) that can be ordered as an adjunct to the product.

**21. I keep getting the message “Remove the Specimen Tube from the device”, even though I have already performed that function. What do I do?**

This may be an indication that the device requires calibration. If you do this 3 times, you will get a message asking you to automatically calibrate the sensor. Completely remove the specimen tube

### FAQ

from the needle, and click “Auto-Calibrate.”

**22. I have installed other software on the computer, and the simulator either slows down, crashes or disables the haptic device. What do I do?**

No software should be installed on the computer supplied with the Virtual Phlebotomy™ Self-Directed Learning System, except for those products supplied by the manufacturer of the software. Other software, such as anti-virus programs, may run on the machine in the background, severely limiting the performance of the simulator. The best solution is to never install such software in the first place, turn it off or delete it once it has been installed. An alternative solution, if you are required to run anti-virus software, is to increase the memory on your machine. Contact Laerdal Technical Service for further guidance.

**23. In the Simulation Screen, I inserted a needle through someone’s finger, although the needle appears to completely penetrate the finger, the Haptic device pushed the needle almost completely back out.**

It is possible to over-power the device. In some cases, you may hit a bone and the device will not respond correctly with forces required to penetrate it. This is a limitation of the system.

**24. The needle stays in the arm although it has been withdrawn from the device. What is going on?**

This will happen if you pull the needle out “too quickly”. This is a limitation of the hardware and is un-avoidable. Thus, you should always remove the needle from the haptic device slowly. Jerking the needle out of the patient is dangerous. Jerking the needle out of the device may cause unexpected behavior or device failure. If the needle gets left inside the arm on the Simulation Screen, you can also throw away the virtual needle and select a new needle and the device will reset.

**25. Sometimes, when I attach the specimen tube I do not get any return, but when I chose a different specimen tube, it fills. What is happening?**

If you have previously attached a specimen tube while the multi-sample needle was outside the skin, the specimen tube vacuum will dissipate. Therefore, when you attach the tube, it will not fill.

**26. At Level 3, the labels are not colored; how do I know which tubes to use?**

The administrator can configure the system not to show colored labels at the expert level. A specimen tube pop-up reference chart is available on the equipment screen and can be used to identify the proper tube for the required tests. The labels should be attached to the proper tube, for the proper test.

**27. The patient will not stop bleeding; what should I do?**

Remember to apply gauze to the puncture site, and then to apply pressure to the haptic device as though treating an actual patient. It may be necessary to apply pressure for up to 1 minute, depending on the patient.



**28. Can I attach the tube to the tube holder prior to needle puncture?**

Yes, once selected, tubes can be either directly attached to the needle with tube holder, or placed in the tube tray. You can attach the specimen tube to the needle prior to insertion and then insert the needle with specimen tube as a unit.

**29. There is too much clicking and mouse interaction required to fill the specimen tubes, is there any way to minimize this?**

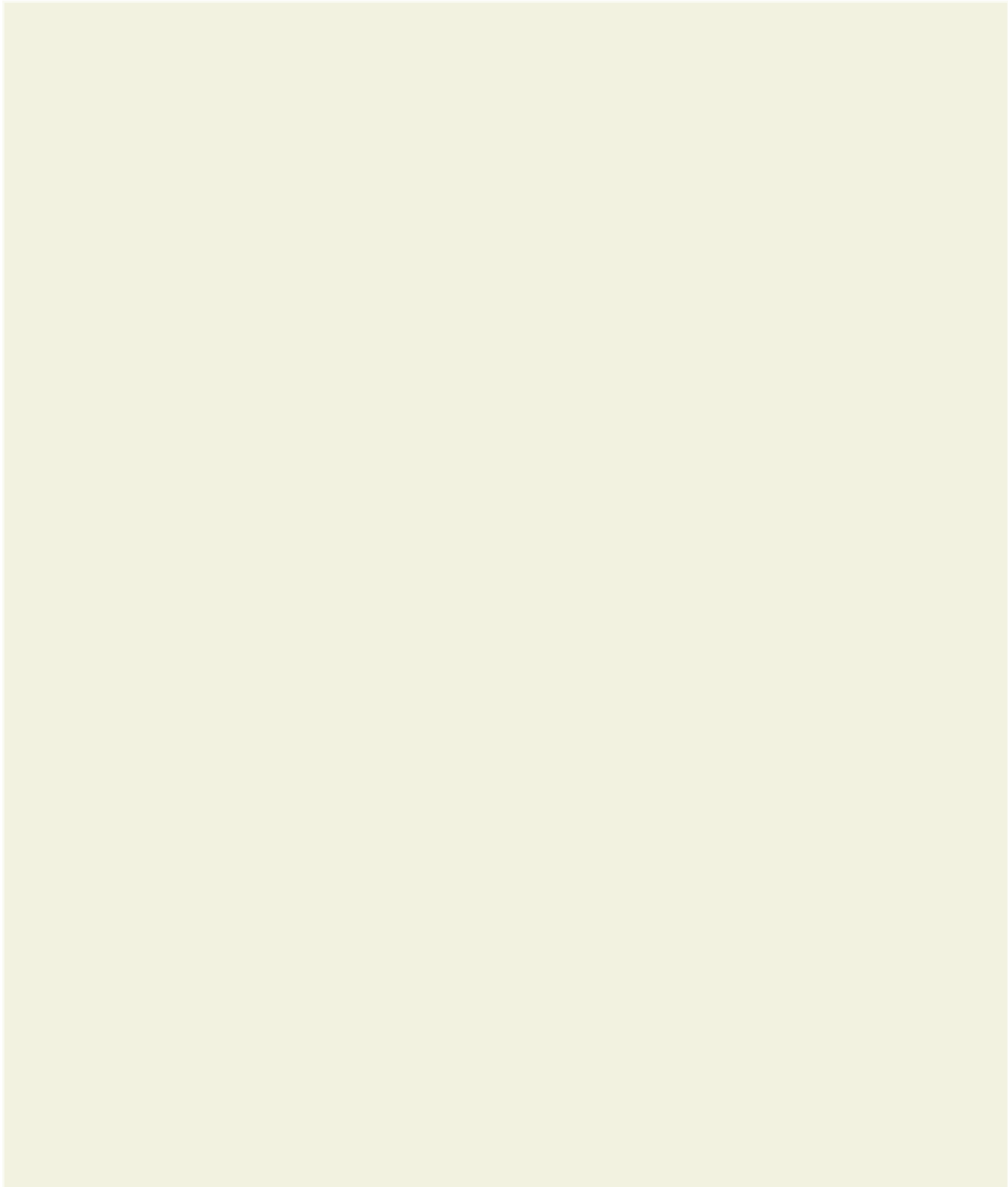
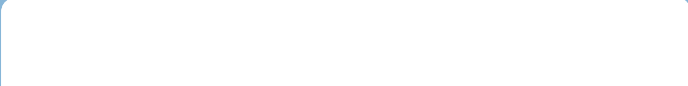
Yes, if the instructor selects "Automatic Tube Attachment" and "Automatic Tube Mixing" from the configuration menu, then all empty specimen tubes in the tube tray will automatically attach to the tube holder starting from the left-most specimen tube.

**30. I do not understand when to use the haptic device, is there any way to know how and when to interact with the device?**

Yes, the icon in the top right of the simulation screen will tell you exactly when, and how to interact with the haptic device. Interaction with the haptic device when this icon is not displaying a representative action (needle insertion, palpation/pressure application or tube attachment) will cause inconsistencies.

# Virtual Phlebotomy

Directions for Use



# Virtual Phlebotomy

Directions for Use

## Support

## Support

### **SUPPORT**

For Customer Service, contact Laerdal at: (800) 433-5539

For Technical Service, contact Laerdal at: (800) 431-1055 EXT. 5596

For additional module licenses and other issues, please contact your local Laerdal representative.

Please contact Dell for service and support of the computer and all software except the Virtual Phlebotomy software.