

Healthcare

CAE Blue Phantom User Guide

BPA304-HP Gen II PICC, PIV, and Arterial Line Vascular Access
Ultrasound Training Model



CAE

Disclaimer

This product is a simulation device designed for training and demonstration purposes only.

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Cautions and Warnings

Read this user guide, including all cautions and warnings, before you use your CAE Blue Phantom™ ultrasound training model. Use this product only as described in this guide. If you use the product incorrectly, it may be unsafe and will void your warranty. Keep this information for future reference.

General Precautions

- Make sure the training model is set up on a stable, sturdy work surface such as a bed, stretcher, or table that will not collapse and cause injury to users.
- Heavier training models should be placed on a patient bed or stretcher rated to support such weight.
- Place the model on smooth surfaces only. Rough or uneven surfaces can leave impressions on the skin and damage the model.
- Do only the procedures supported by each product as described in this guide.
- Use only needles to access fluids.
- Do not use or store other sharp objects such as scissors, scalpels, or box-cutters with the training model.
- Do not pull on the training model skin. This can cause the skin to tear.
- Do not mark directly on the training model as this will permanently damage it.
- Do not insert any objects or tools into the model except for the equipment, accessories, or medical supplies intended for use with this model.
- Do not use chemical solvents on the models.
- Clean the training model with water and a light soap solution only. Do not immerse the model or use large amounts of liquid to wash it.

Latex-Free

- All CAE Blue Phantom training models, products, and accessories are manufactured only of materials that do not contain latex.

Needles and Catheters

- Use only new, sharp, unbent 18–21 gauge needles or 7F catheters. Smaller needles (higher than 22 gauge) can bend during use and damage the model.
- The self-healing feature of CAE Blue Phantom simulated tissue applies only to needle sticks from 18–21 gauge needles. Healing is not guaranteed if needles larger than 18 gauge, scalpels, or other sharp implements are used to cut into or pierce the model.
- Replace needles after ten uses. Dull needles can damage the model.
- Use extreme caution when using needles during training to avoid injury.

Fluids System

- Use only CAE Blue Phantom fluids. Other fluids can affect the imaging quality and promote fungal or bacterial growth, and may void your warranty. Use fluids only as directed.
- Do not substitute any other fluid unless indicated by this guide.
- Do not modify the fluid reservoirs or any assembly components.
- Protect your eyes, skin, and clothing against accidental fluid exposure. Refer to the Material Safety Data Sheet (MSDS) for guidance.
 - May irritate eyes or skin; flush well with water.
 - May contain pigments that stain clothing; wash immediately with cold soapy water.
- Fluid is not intended for human consumption. If accidental ingestion occurs, drink a glass of water and consult a physician.

Service and Repair

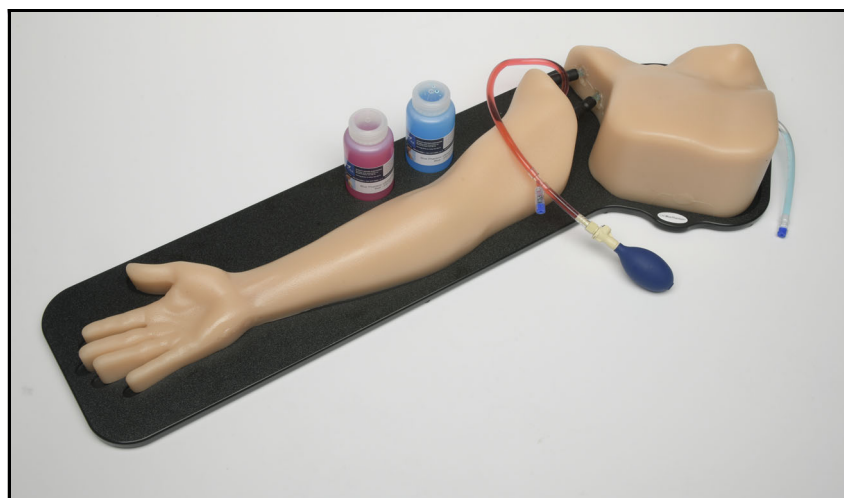
- The CAE Blue Phantom training models are not user-serviceable. Only a trained technician may open or disassemble the product.
- Unauthorized use or handling of the model may void the warranty.
- If you have a problem with your product, contact CAE Customer Support.

Introduction

This user guide describes the features, use, and care of the following training model:

- CAE Blue Phantom Gen II PICC, PIV, and Arterial Line Vascular Access Ultrasound Training Model (BPA304-HP)

This model is intended as a platform for the practice of ultrasound-guided peripheral IV line and PICC line access, as well as arterial line access.



Ultrasound Training Model

Anatomy

CAE Blue Phantom training models are constructed using our patented Simulex™ ultrasound tissue which has imaging characteristics that mimic human tissue. The models contain skeletal components so the user will encounter the same imaging landmarks as in a human patient.

The anatomy of the arm includes:

- Cephalic vein
- Radial vein
- Basilic vein
- Ulnar vein
- Medial cubital vein
- Brachial artery
- Radial artery
- Ulnar artery

Introduction

The chest piece anatomy includes:

- Superior vena cava
- Subclavian vein

The training model has tubes that have a female Luer lock connector to work with syringes that have a male Luer lock connector. The tubes are used to fill the individual vessels within the model.

Models are delivered with minimal fluid. Users must infuse additional fluid to prepare the model for use. More information can be found in the *Using the Training Model* section of this guide.

The model has a hand bulb to manually simulate arterial pulsation. The pulsation is not palpable and is only visible on ultrasound to distinguish between artery and vein. For more information, see the *Using the Training Model* section of this guide.

This training model has a replaceable arm. See the *Care and Maintenance* section of this guide for instructions on how to replace the arm. The chest piece, used to verify PICC line catheter placement, is permanent and cannot be replaced.

Equipment Overview

The following items are included with your shipment:

- Ultrasound training model
- Red ultrasound refill fluid
- Blue ultrasound refill fluid

The following additional items are required for training but not included in your purchase:

- Ultrasound system with appropriate transducer
- Ultrasound gel
- Vascular access equipment as per local protocol

CAE Blue Phantom training models are compatible with any diagnostic ultrasound system. General frequency ranges for diagnostic ultrasound imaging are 2-20MHz.

Optional accessories or consumables for your model are available to purchase on the CAE website:

- BPAI305 Gen II PICC, PIV, and arterial line vascular access replacement insert
- BRS180-RED Red ultrasound refill fluid
- BRS181-BLUE Blue ultrasound refill fluid

Using the Training Model

This section has information and instructions about the setup and use of the training model and any specific training procedures.

Setup

Follow the guidelines below to unpack and set up your CAE Blue Phantom training model.

1. Open the shipping carton:
 - Use extreme caution with sharp tools, such as a box cutter, to avoid damage to the training model.
2. Unpack the equipment:
 - Remove the training model from its shipping container. For heavier models, use proper lifting techniques to prevent bodily injury.
 - Review the equipment, accessories, and supplies to make sure all necessary pieces are present. See the *Equipment Overview* section of this guide for a list of items included with this model.
3. Set up for training:
 - Put the model on a stable patient bed, stretcher, or table.
 - Prepare your ultrasound system and equipment.
 - Gather any procedural equipment and supplies.

Fluid Setup

The training model is shipped with minimal fluid in any vessels or fluid spaces. During periods of non-use, fluid may also evaporate from inside the model.

Before first use, you must add fluid and remove any air. Use one of these methods:

Method A: Syringe Fill (also to remove air)

1. Remove the cap of the fill tube.
2. Fill a syringe half-full and connect it to the tube.
3. Hold the tube up and tap it to move any air bubbles upwards.
4. Aspirate the air before before filling for optimal imaging.
5. Inject 10 ml of fluid.
6. Remove 5 ml of fluid along with any air.
7. Repeat steps 3 through 6 until all the air is removed and the vessels are filled.
8. Replace the cap.

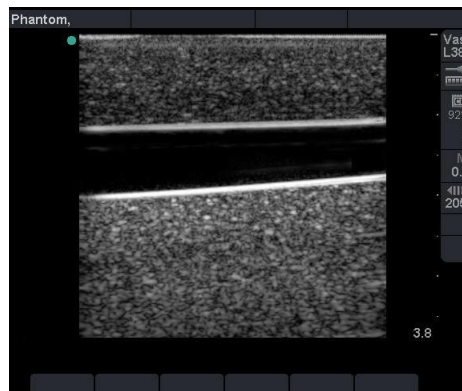
Method B: Quick-Fill port for high volume use

1. Connect an IV bag containing CAE Blue Phantom fluid to the fill tube.
2. Hang the IV bag no more than 12 inches (30 cm) above the training model to avoid overfilling.

NOTE: A clear sign of overfill is the appearance of small dimples of simulated blood on the surface of the model at the sites of previous cannulations. To correct overfill, see the *Troubleshooting* section.

3. As users withdraw fluid, it is refilled continuously from the IV bag.

An optimally-filled vessel can be identified using ultrasound by the presence of a black echo-free lumen.



Normal Fluid Level - Good Imaging

A low fluid environment is identified by the inability to see the vessel during normal ultrasound imaging. This is due to the presence of air, which reflects all sound energy.



Low Fluid Level - Poor Imaging

Training

This section provides information about using your model for training and practice.

Ultrasound Scanning

Note: CAE Blue Phantom products do not teach ultrasound procedures or techniques. Refer to your institution or training program for more information.

To scan with your training model and conduct a simulated ultrasound-guided procedure:

1. Place the model in the appropriate position for scanning.
2. Place ultrasound gel on the transducer or on the training model in an adequate quantity so that the transducer slides effortlessly on the model. Add more gel as needed.
3. Adjust the ultrasound system controls per your training protocol and the manufacturer's instructions. Optimize the image with the ultrasound controls as needed.

Ultrasound-guided Procedures

For vascular access procedural training, use your local protocol and equipment. Make sure to follow the policies and guidelines of your institution.

⚠ CAUTION

Do not use antiseptics, such as iodine, on your model. This can cause permanent damage.

During the procedure, users may withdraw fluid to confirm needle placement. Any fluid withdrawn must be refilled because it is important to maintain the fluid level within the vessels.

Refill the fluid using one of the filling methods described in the *Fluid Setup* section of this guide. A third way is for users to refill fluid by simply re-injecting it:

- During use, the user immediately injects any withdrawn fluid back into the model at the access site.
- Take care not to inject any air into the model when using this method.

NOTE: This method cannot be used with full catheter placements.

Using the Hand Bulb

This model is equipped with a hand bulb. You can create a pulse in the ulnar and radial arteries (in the wrist only) by lightly squeezing the hand bulb. The pulse is not physically palpable, but is visible via ultrasound.

The veins do not pulsate, and are collapsible with light pressure from the transducer.

⚠ CAUTION

Excess pressure on the hand bulb may cause a fistula between arteries and veins.

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Care and Maintenance

With proper care, your training model will remain in optimal condition and ready for use.

Storage and Transport

Follow these guidelines to properly store or transport your model:

- Storage temperature degree range: 45 to 85 °F (7 to 29 °C)
- Do not store in contact with other models or hard objects as the pressure can damage the Simulex tissue. Do not stack multiple training models on top of each other.
- Ensure any tubes are not pinched or compressed under the model. This will damage the tubes and void the warranty.
- Store the model with some fluid in any vessels and fluid spaces. If these become dry, it will damage the model and and cause poor ultrasound imaging.
- If fluid was infused into the model during training, remove excess fluid after each training session. If you store the model with too much fluid inside, it can cause damage.
- Transport the model securely so it does not fall.
- Do not carry by the tubes or use them as handles as this will damage the model.

Cleaning

To maintain the product skin for the lifespan of the product, clean the exterior of the model after each use. Follow these steps:

1. Mix one cup of tap water with ¼ teaspoon of mild liquid soap (such as dish soap).
2. Gently clean the model's exterior with the soap mixture and a soft, non-abrasive sponge or cloth.
3. Rinse lightly with clean water.
4. Dab or pat with a clean, soft, lint-free cloth to dry the product after cleaning. Do not wipe or rub the skin, which can damage it.
5. After the model has dried completely, lightly coat the external surface of the model with baby powder and dust off any excess.

Replacing the Arm

To replace the arm, you will need:

- Replacement arm
- Two hemostat clamps

To replace the arm:

1. Use a hemostat to clamp each of the tubes exiting the chest piece just before the connectors.



Hemostat Clamp Locations

2. Gently disconnect the arm tubes and lift the arm from the base.
3. Lay the new arm on the base.
4. Connect the arm tubes.
5. Remove the clamps.
6. Purge air from the refill tubes (see the *Removing Air* section of this guide).

Note: The chest piece is permanent and cannot be replaced.

Troubleshooting

This section provides information to identify and fix problems that may occur with the product.

Fluid Overfill

You can overfill fluid spaces and vessels if you inject too much fluid. Overfill does not usually result in permanent damage, but you should correct it as soon as possible.

Withdraw excess fluid to alleviate overfill, or, with the Quick Fill method, make sure the IV bag is not hanging any higher than 12 inches (30 cm) above the training model.

Removing Air

Fluid can evaporate from the model during shipment or during extended periods of non-use. Air may also enter through accidental injection during fluid filling or training use. This may cause the Simulex tissue to stick together in some areas, preventing fluid from circulating. Remove any air from the model for optimal performance.

To remove air:

1. Fill a syringe with fluid and connect it to the applicable fill tube.

Note: To access the arterial tube port, disconnect the hand bulb by pressing the silver quick disconnect button on the side. Pull out the port within the tube.

2. Infuse fluid, and tilt the model up at least 6-10" so any air rises to the top.
3. Let the model sit for at least one hour to allow any air to rise.
4. Use the syringe to slowly pull the fluid out of the model.
5. Watch for air bubbles and let them rise to the top (back) of the syringe.
6. Slowly push fluid back in without pushing the air in.
7. Repeat steps 4-6 three to four times.
8. Empty the syringe into a container and use it to remove any additional fluid, then disconnect it.

Note: When all the fluid is removed, the syringe will be under vacuum. Do not put excessive force on the syringe or the tissue may rupture.

9. If there is still air, fill any fluid spaces or vessels with fluid and let the model sit overnight, then repeat the procedure.

If you observe air still present in the junction between arm and chest piece, follow these steps:

1. Elevate the entire platform at a 45 degree angle by lifting the chest piece end. One person should hold the arm piece while another holds the chest piece to keep them in place.
2. Gently tap the model for 60 seconds. This will allow the air within the vessel to move to the top of the tube.
3. Repeat the procedure to remove air until the targeted vessel is full and all of the air has been removed.

Help and Technical Assistance

For assistance, contact CAE Customer Support. Contact information for all regions is available on the back cover of this guide and at the CAE Healthcare website.

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For more information about CAE products, contact your regional sales manager or the CAE distributor in your country, or visit caehealthcare.com.

Tel +1941-377-5562 or 866-233-6384

For customer support, please contact CAE.

Customer Support Headquarters - United States

Monday - Friday from 7:00 a.m. to 6:00 p.m. ET

Phone 1-866-462-7920

Email: srqcustomerservice@cae.com

Customer Support - Canada

Monday - Friday from 8:00 a.m. to 5:00 p.m. ET

Phone 1-877-223-6273

Email: can.service@cae.com

Customer Support - Europe, Middle East, and Africa

Monday - Friday from 8:00 a.m. to 5:00 p.m. CET

Phone +49 (0) 6131 4950354

Email: international.service@cae.com

Customer Support - United Kingdom and Ireland

Monday - Friday from 9:00 a.m. to 5:00 p.m. GMT

Phone +44 (0) 800-917-1851

Email: uk.service@cae.com

Customer Support - Latin America

Monday - Friday from 9:00 a.m. to 5:00 p.m. BRT/BRST

Phone +55 11 5069-1510

Email: la.service@cae.com

Customer Support - Asia Pacific

Monday - Friday from 8:00 a.m. to 5:00 p.m. CET

Phone +49 (0) 6131 4950354

Email: ap.service@cae.com