Blue Phantom™
ULTRASOUND TRAINING MODELS

Instructions and User Guide

Ultrasound Internal Jugular Training Model

BPIJ500

January 18, 2012 Rev 1.0

Blue Phantom™
ULTRASOUND TRAINING MODELS

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Overview 1

Giving you the confidence only experience can offer™

Congratulations on the purchase of your Blue Phantom™ ultrasound model(s) for hands-on training. Every product we manufacture at Blue Phantom™ is specifically designed to be the most realistic and ultra-durable ultrasound simulation phantoms available anywhere. Our high standards for quality manufacturing and design guarantee that you receive only the absolute best.

About Blue Phantom™

Blue Phantom™ brings you the most realistic and durable hands-on ultrasound training models available anywhere. At Blue Phantom™ we know that learning to use ultrasound requires practice. You gain confidence and skill through experience. That is why we offer you the best ultrasound simulation training available.

Blue Phantom™ Warranty

Blue Phantom™ takes pride in its quality design and manufacturing standards. Our products are warranted to you by Blue Phantom™ for one year from the date of purchase against defects in workmanship and materials. During the warranty period, a defective part or product will be replaced either with a new or reconditioned part or product, depending on the availability at the time.

This warranty covers normal consumer usage and does not cover damage incurred through use not consistent with the product design. Failure that results from alteration, accident, misuse, vandalism, or neglect is not covered under this warranty. This warranty does not extend to any products that have been used in violation of written instructions.

Product Cautions 2

Please read this instruction guide carefully. Do not begin using this model until you fully understand these safeguards and have read the User Guide in its entirety.

Important Safeguards

1. Read Instructions – All safety and operating instructions should be read before the unit is operated.

2. While all parts of this User Guide are important, the red flag that you see to the left denotes especially important content. Please familiarize yourself with all of the content prior to using your training model or damage to the model can occur,
3. Retain Instructions – The safety and operating instructions should be retained for future reference.
4. Heed Warnings – All warnings in the operating instructions should be adhered to.
5. Follow Instructions – All operating and maintenance instructions should be followed.
6. Weight Warning—Product weight is approximately 6.2lbs (2.8kg).
7. Care must be taken to place the model in a position in which it will not fall off of the bed or surface, as this may cause injury.
8. Accessories – Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall causing serious injury to a child or adult, and serious injury to the unit.

9. **CAUTION:** Please use extreme care when using needles and sharp objects as to not accidentally injure yourself during training.

Product Information 3

Blue Phantom™ Internal Jugular Training Model

BPIJ500

Included in this Package

- Blue Phantom™ Internal Jugular Central Line Training Model (BPIJ500)
- Thermoform Plastic Protective Shell
- Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red)
- Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue)
- User Guide and Utilities CD

Additional Items Required for Training

- For optimal performance, please use 18-21 gauge sharp and unbent needles and associated catheter kits (please see *Chapter 4: Utilizing Your Training Model—Using Needles and Catheters* section on page 9 of this User Guide)
- Ultrasound system with a high frequency linear array transducer
- Ultrasound gel

Optional Accessories for Your Training Model

- Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red)
- Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue)

Introduction to Your Training Model

This model is intended as a platform for ultrasound hands-on internal jugular (IJ) central line technique training. The model is designed to be extremely realistic and its self healing design provides you with superb durability. In order to get the most out of your training platform, it is important that you properly care for your model.

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Quick Facts about Your Training Model

- Images like a real patient providing a realistic training environment
- Use ultrasound guidance to cannulate and thread guidewires, dilators and catheters
- Self healing tissue withstands tremendous use
- Simulated arterial pulsation is manually created using the provided hand bulb
- Use with any ultrasound system—no computer simulation or software necessary
- Model is pre-filled with Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red) in the arterial line and Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue) in the venous line
- Made in USA

Utilizing Your Training Model 4

Blue Phantom™ Internal Jugular Training Model

BPIJ500

Anatomy of Your Training Model

1. Remove your training model from its shipping container and make sure that you have received all of the items listed in *Chapter 3: Product Information—Included in this Package* section on page 5 of this User Guide. If you did not receive one of the listed items, or if you received the wrong items please contact Blue Phantom™ Customer Support immediately:
   Telephone: (425)881-8830
   Email: customersupport@bluephantom.com
   Web: www.bluephantom.com

Save the thermoform plastic shell for storing your model.

2. Familiarize yourself with the anatomy of your training model.

Blue Phantom™ ultrasound training models are constructed using our patented simulated ultrasound tissue and mimics imaging characteristics to that of human tissue. Care must be taken to not place the model on rough surfaces as the model can take on the characteristics of that surface. Do not place objects under the model as the tissue is soft and will conform to the shape of the object.

Your training model comes pre-filled with Blue Phantom™ Ultrasound Refill Solution. If you suspect that your model is low on fluid, please refer to *Chapter 4: Utilizing Your Training Model—Maintaining Optimal Fluid Levels* section on page 11 of this User Guide.

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Anatomy of Your Training Model *(continued)*

Your Blue Phantom™ Internal Jugular training model has 2 tubes exiting from the model (refer to *Image A* below). The venous line is filled with Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue) while the arterial line is filled with Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red).

Image A

Using Your Training Model

1. Remove your Blue Phantom™ from its packaging and place on a clean, hard, flat surface.
2. This model was designed for ultrasound guided IJ central line training. If you would like, the model can also be utilized for blind insertion technique training. Please see steps 3-4 below if you plan to utilize ultrasound guidance.

You may mark your model with a dry erase marker at your own risk. Blue Phantom™ recommends testing the dry erase marker on the underside of the model prior to regular use. If satisfied with the test mark, you may utilize the dry erase marker during training. Immediately following use, gently remove the dry erase marker using a damp paper towel. DO NOT leave dry erase marker on your model for more than one hour or permanent damage to your model may occur.

3. Place ultrasound gel on the model or on the ultrasound transducer in adequate quantities so that the probe slides effortlessly across the surface of the model. Add more gel as necessary.
4. Adjust the ultrasound system controls per the manufacturer's instructions, increasing and decreasing the depth and gain controls until the desired image is obtained.

If you intend on guiding sharp objects into the phantom, never place the model in a location where you might accidentally puncture yourself.

Using Needles and Catheters

1. For best performance, we recommend that you utilize new, sharp, unbent 18-21 gauge needles and associated catheter kits when accessing the structures in the model; you may utilize up to 7 French Triple-Lumen catheters.
2. Do not use any needle larger than 18 gauge or permanent damage to your model may occur.
3. Smaller bore needles (>21 gauge) can bend during use and damage your model's simulated tissue.
4. Aggressive repositioning of needles rather than removing and repositioning can cause stubborn or permanent needle tracks due to the needle tip dragging through the simulated tissue.
5. Dull needles may also cause permanent damage to the tissue. It is important to replace needles approximately every ten cannulations.
6. If you strike bone during training, remove the needle and replace it before re-inserting. Striking bone can cause the needle to become dull.
7. Accessing arteries may result in the presence of refill solution dimples at previous cannulation sites; this does not indicate that your training model is damaged.

Performing Internal Jugular Central Line Procedures

The Blue Phantom™ Internal Jugular training model accommodates full central line procedural training, including:

- Create a sterile field
- Cannulate vessels and thread guidewires, dilators and catheters
- Points of access include internal jugular (IJ) approach
- Confirm needle tip location by withdrawing fluid once the vessel is accurately accessed
- Simulate arterial pulsation manually by pumping the provided hand bulb
- Veins are compressible using mild pressure while the arteries remain uncompressed

Your Internal Jugular training model includes vascular anatomy and anatomical landmarks of the right upper thorax and neck.

- Arterial anatomy includes: carotid artery
- Venous anatomy includes: internal jugular vein (IJ)
- Anatomical landmarks include: the trachea, medial clavicle and suprasternal notch

Please always utilize sharp and unbent 18-21 gauge needles and associated catheter kits; you may utilize up to a 7 French Triple-Lumen catheter. For more information, please refer to *Chapter 4: Utilizing Your Training Model—Using Needles and Catheters* section on page 9 of this User Guide. Always heed the following warning while utilizing your training model:

1. DO NOT use antiseptics such as iodine on your training model. This may cause permanent damage to the simulated tissue.
2. NEVER inject tap water into your training model.
3. DO NOT perform “cut downs” or nick the simulated tissue with a scalpel (or other sharp object) when utilizing a dilator.
4. Any fluid removed from the vessels will require refilling. Lack of fluid can cause a diminished ultrasound image and resistance to threading of catheters and guidewires.
5. Through normal use, users can experience a reduction in fluid volume within the model. Please refer to *Chapter 4: Utilizing Your Training Model—Maintaining Optimal Fluid Levels* section on page 11 of this User Guide for more information.

Maintaining Optimal Fluid Levels

The Blue Phantom™ Ultrasound Refill Solution contained within the model is specially formulated to allow for optimal performance. It is important to maintain a good fluid level within your ultrasound training model. Through normal repeated use, users can experience a reduction in the amount of fluid, resulting in small amounts of air within the model. This is directly dependent upon the amount of fluid removed during simulation training.

WARNING: Using fluid other than that supplied by Blue Phantom™ will void your warranty. Using other fluid will cause changes in the imaging qualities of the model, reduce the ability to thread catheters, and cause fungal or bacterial growth within the model. DO NOT dilute the Ultrasound Refill Solution contained within your model.

The simplest way to maintain optimal fluid levels in the vessels is to have users inject the accessed fluid back into the model after accessing the targeted vessel. This is limited to users that are not performing the entire catheter placement procedure. Take care not to inject blue fluid (venous system) into the arterial system or red fluid (arterial system) into the venous system.

CAUTION: Use refill solution only as directed. Not intended for human consumption. If accidental consumption occurs, drink a glass of water and consult a physician. May irritate eyes; flush well with water. May contain pigments that can stain clothing; wash immediately with cold soapy water. Keep out of reach of children.

Please see the section below to determine if your model requires refilling and for complete refilling directions.

How to Determine if Vessels Require Refilling

Choose one of the following methods to determine if the vessels require refilling, repeat for both arterial system and venous system:

1. Non-Imaging Method
   The presence of air in the QuickFill™ tubes is an indicator that your model requires refilling. Hold the QuickFill™ tube upright towards the ceiling in the fully extended potion for at least 60 seconds. If an air bubble migrates to the terminal end of the tube, this indicates that the model requires refilling.

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How to Determine if Vessels Require Refilling *(continued)*

2. Ultrasound Method
   An optimally filled vessel will be identified by the presence of a black echo-free lumen (refer to *Image B* below). A low fluid environment is identified by the inability to visualize the vessels during normal imaging situations (refer to *Image C* below). This is due to the presence of air within the vessels, which will reflect all of the sound energy

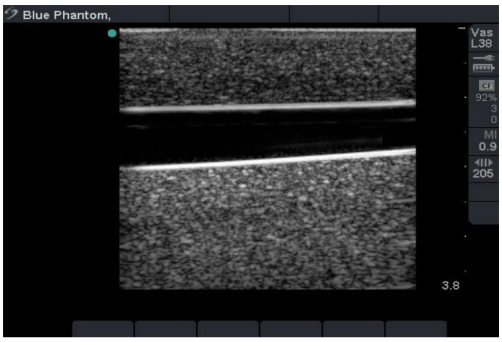

Image B

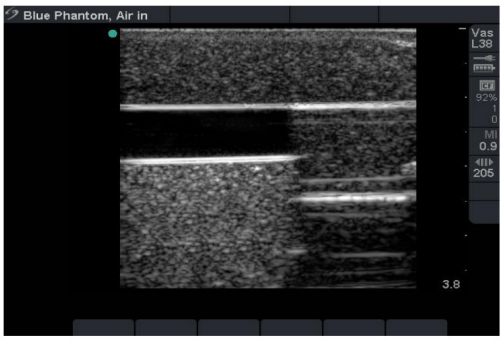

Image C

If you have determined that your model requires refilling, please refer to *Chapter 4: Utilizing Your Training Model—Refilling Your Training Model* section below.

Refilling Your Training Model

There are a number of acceptable ways to refill the simulated vessels. Choose the method that works best for your training environment. Refilling your training model is a simple process that will take approximately 10 minutes. Please follow the directions below.

If you are uncomfortable refilling your training model for any reason, contact Blue Phantom™ and we can refill your model for a nominal fee.

Items Required

- Empty syringe
- Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue) for venous system
- Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red) for arterial system
- IV bag *(optional)*

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Refilling Your Training Model *(continued)*

Directions

1. Position the training model lying flat on a stable surface.
4. If you are refilling the venous system, fill the empty syringe with Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue). If you are refilling the arterial system, fill the empty syringe with Blue Phantom™ Red Ultrasound Refill Solution (BRS180-Red).
5. Remove the blue end cap from the corresponding QuickFill™ tube.
6. Hold the corresponding QuickFill™ tube upright towards the ceiling in the fully extended position. Hold the tube upright for at least 60 seconds to allow any accumulated air to migrate to the terminal end of the tube.
7. Connect the filled syringe's luer lock female connector to the male connector on the venous QuickFill™ tube.

Take care not to inject the wrong fluid into the wrong QuickFill™ tube. Be sure to infuse Blue Ultrasound Refill Solution (BRS181-Blue) into the venous line and Red Ultrasound Refill Solution (BRS180-Red) into the arterial line.

8. SLOWLY infuse the refill solution into the tube in 5ml increments until it is full. Be sure to purge air after each successive 5ml by pulling back on the plunger. Filling the tube SLOWLY prevents air bubbles from being introduced into the model.
9. High volume users will benefit from connecting either a syringe or an IV bag containing Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue) to the venous tube. As users withdraw fluid from the model, the venous tube is automatically refilled. To do so, please follow steps 10-12 below. Otherwise, replace the blue end cap on the luer lock connector.
10. To easily maintain optimal fluid levels, fill a syringe or an empty IV bag with Blue Phantom™ Blue Ultrasound Refill Solution (BRS181-Blue).
11. Connect the full syringe or IV bag to the male luer lock connector on the venous tube.
12. If utilizing an IV bag, be sure to hang the IV bag 1ft above the model. DO NOT hang the IV bag greater than 1ft above the model. This will cause the venous system to become over pressurized, which may cause fluid to seep out through previous cannulation sites.

When refilling the QuickFill™ tubes or utilizing a full syringe or IV bag, take care not to lose the blue end caps.

Overfilling the Vessels

It is possible for you to overfill the vessels if you infuse too much fluid into the vessels during the refill process. If you use an IV bag, it reduces the likelihood that this will occur unless the IV bag is placed at an elevation significantly higher than the training platform.

It will be obvious when the vessels are overfilled when small dimples of ultrasound refill solution appear on the surface of the model at previous cannulation sites. Simply removing excess fluid and air from the vessels will alleviate this issue. Overfilling the vessels is unlikely to cause any permanent problems with your model but please take care to avoid overfilling.

Caring for Your Training Model 5

Proper Use and Care

Proper care of your training model will result in tremendous utility. Please heed all instructions contained in this User Guide when using your model.

Cleaning Your Training Model

After each use, your training model can be easily cleaned using mild soapy water. For best results, mix one part liquid soap with one part tap water. Gently rinse the model with the soapy water to remove any accumulated debris.

Use a clean, soft, lint-free cloth to dry after cleaning. Dry the model using a dabbing motion, rather than wiping or rubbing the model.

Wiping or rubbing the surface aggressively can result in scuffing the simulated tissue.

Storing Your Training Model

The model can be stored at room temperature either in the open or in the included thermoform plastic storage shell.

Do not store the model in contact with other objects. This can cause the simulated tissue to become deformed.

Blue Phantom™ Customer Support

Blue Phantom™ is committed to providing you with superb products and uncompromising customer support. Should you require assistance feel free to contact us directly at:

Telephone: (425)881-8830
Email: customersupport@bluephantom.com
Web: www.bluephantom.com