

Instructions and User Guide

Lumbar Puncture and Spinal Epidural Ultrasound Training Model

BPLP2101, BPLP2102, BPLP2103



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Overview

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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

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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. This user guide includes instructions applicable to a variety of model configurations.
4. Retain Instructions – The safety and operating instructions should be retained for future reference.
5. Heed Warnings – All warnings in the operating instructions should be adhered to.
6. Follow Instructions – All operating and maintenance instructions should be followed.
7. Weight Warning—Use caution as this model is heavy. Use proper lifting techniques to prevent bodily injury. Notify others of the heavy weight warning to prevent others from being injured while operating or moving the model. Product weight is approximately 33lbs (15kg).
8. 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.
9. 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.
10. **CAUTION:** Please use extreme care when using needles and sharp objects as to not accidentally injure yourself during training.



Product Information

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Blue Phantom™ Spinal Epidural and Lumbar Puncture Models

- Lumbar Epidural and Lumbar Puncture Model ([BPLP2101](#))
- Lumbar Epidural and Lumbar Puncture Model with Thoracic Epidural Option ([BPLP2102](#))
- Lumbar Epidural and Lumbar Puncture Model with Cervical Epidural Option ([BPLP2103](#))

Included in this Package

- Blue Phantom™ Spinal Epidural and Lumbar Puncture ultrasound training model
- Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#))
- User Guide and Utilities CD

Additional Items Required for Training

- For optimal performance, please use 18-21 gauge sharp and unbent needles and associated lumbar puncture and catheter kits (please see *Chapter 4: Utilizing Your Training Model—Using Needles* section on page 9 of this user guide)
- Ultrasound system configured with an appropriate transducer for lumbar puncture and spinal epidural procedures
- Ultrasound gel

Optional Accessories for Your Training Model

- Obese Lumbar Epidural and Lumbar Puncture Replacement Tissue ([BPLP2204](#))
- Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)) - Use to simulate CSF.
- Blue Phantom™ Red Ultrasound Refill Solution ([BRS180-Red](#)) - Use to simulate bloody CSF.
- Soft Storage Case ([BPLP2105](#))

Introduction to Your Training Model

This model is intended as a platform for blind insertion or ultrasound guided hands-on technique training. The model is designed to be extremely realistic, mimicking the feel and imaging characteristics of spinal epidural and lumbar puncture procedures. The training model can be positioned in the upright or lateral decubitus position. Blue Phantom's 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

- Excellent training platform for lumbar puncture, lumbar epidural, thoracic epidural (optional), and cervical epidural (optional) procedures
- Users may utilize ultrasound guided or blind insertion techniques for spinal epidural or lumbar puncture procedures
- Superb for needle access and catheter placement
- Model can be positioned in the upright or lateral decubitus position
- Optional Obese Lumbar Epidural and Lumbar Puncture Replacement Tissue ([BPLP2204](#)) provides more adipose tissue disallowing the palpation of the spinous processes
- Made in USA



Utilizing Your Training Model

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Blue Phantom™ Spinal Epidural and Lumbar Puncture Models

BPLP2101, BPLP2102, BPLP2103

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

2. Familiarize yourself with 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 10 of this user guide.

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Anatomy of Your Training Model (*continued*)

Depending on the configuration, your Blue Phantom™ Spinal Epidural and Lumbar Puncture model has either 2 tubes or 4 tubes exiting from the model. Please refer to the table below to determine the tube configuration of your training model.

| Part Number | Product Description | Number of Tubes |
|-------------|---|---------------------------------|
| BPLP2101 | Lumbar Puncture and Lumbar Epidural Only | 1 CSF Tube + 1 Drain Tube = 2 |
| BPLP2102 | Lumbar Puncture and Lumbar Epidural with Thoracic Epidural Option | 2 CSF Tubes + 2 Drain Tubes = 4 |
| BPLP2103 | Lumbar Puncture and Lumbar Epidural with Cervical Epidural Option | 2 CSF Tubes + 2 Drain Tubes = 4 |

Half of the tubes are filled with Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)) to represent Cerebral Spinal Fluid (CSF). The remaining tubes are empty and serve as drains for injected fluids. For more information, refer to *Image A* below.



Image A



The CSF and Drain Tubes should all be appropriately labeled. Please do not remove the labels from the tubes.

The Drain Tubes are designed to collect and automatically expel injected local anesthetics and Blue Phantom™ Ultrasound Refill Solution. For optimal performance, empty the Drain Tubes regularly. To empty, unscrew the blue cap off of the luer lock connector and let the contents drain out of the tube. Once complete, place the blue cap back onto the luer lock connector.



When emptying the Drain Tubes, take care not to lose the blue end caps.

Using Your Training Model

1. Remove your Blue Phantom™ from its packaging and place on a clean, hard, flat surface. Position your model either upright or in the lateral decubitus position.
2. This model performs equally well, whether you utilize ultrasound guidance or blind insertion techniques. For blind insertion, the iliac crests and spinous processes can be palpated. Please note that the accessory Obese Lumbar Epidural and Lumbar Puncture Replacement Tissue ([BPLP2204](#)) contains more adipose tissue, disallowing palpation of the spinous processes. 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 tissue insert 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. If utilizing ultrasound guidance, 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 standard lumbar puncture kits and new, sharp, unbent 18-21 gauge needles and associated catheter kits when accessing the structures in the model.
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 the bone during training, remove the needle and replace it before re-inserting. Striking the bone can cause the needle to become dull.

Performing Spinal Epidural and Lumbar Puncture Procedures

The Blue Phantom™ Spinal Epidural and Lumbar Puncture model accommodates full lumbar puncture and spinal epidural procedural training, including:

- Create a sterile field
- Palpate external anatomy—including the iliac crest and spinous processes
- Inject/infuse local anesthetics and Blue Phantom™ Ultrasound Refill Solution
- Introduce needles to the epidural space and/or subarachnoid space
- Encounter lifelike “pop” when traversing the ligamentum flavum
- Experience loss of resistance when entering the epidural space
- Obtain manometer measurements of CSF when the spinal cistern is accurately accessed
- Thread catheters

Please always utilize standard lumbar puncture kits and sharp and unbent 18-21 gauge needles. 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 warnings 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. It is suitable to inject/infuse local anesthetics, saline, and Blue Phantom™ Ultrasound Refill Solution. NEVER inject tap water into your training model.
3. Any injected fluids will automatically be expelled into the corresponding Drain Tube. For instructions, please refer to *Chapter 4: Utilizing Your Training Model—Anatomy of Your Training Model* on page 8 of this user guide.
4. Users can remove fluid to obtain manometer measurements. Please note that any fluid withdrawn from the model will require refilling. Lack of fluid will result in diminished CSF flow. For instructions on refilling your model, please refer to *Chapter 4: Utilizing Your training Model—Refilling Your Training Model* on page 11 of this user guide.
5. CSF pressure can be increased by infusing 15ml of Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)) into the corresponding CSF Tube. For instructions on infusing fluid, please refer to *Chapter 4: Utilizing Your training Model—Refilling Your Training Model* on page 11 of this user guide.

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.

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Maintaining Optimal Fluid Levels (*continued*)



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.

Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)) is utilized within the model to simulate CSF. If you prefer, you may utilize Blue Phantom™ Red Ultrasound Refill Solution ([BRS180-Red](#)) to simulate bloody CSF.



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 below to determine if your model requires refilling and for complete refilling directions.

How to Determine if Your Model Requires Refilling

The presence of air in the CSF Tubes and lack of CSF flow are indicators that your model requires refilling. Hold the CSF Tube upright towards the ceiling in the fully extended position for at least 60 seconds. If an air bubble migrates to the terminal end of the tube, this indicates that the model requires refilling.

Refilling Your Training Model

Refilling your Blue Phantom™ Spinal Epidural and Lumbar Puncture ultrasound training model is a simple process that will take approximately 10 minutes.



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

Items Required

- Empty syringe
- IV Bag (*optional*)
- Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#))

Directions for Refilling Your Training Model

1. Position the training model in the upright position.
2. Fill the empty syringe with Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)).
3. Identify the CSF Tube that is low on fluid and remove the blue end cap. If you are unsure of which tube to fill, refer to *Image A* on page 8 of this user guide.

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Refilling Your Training Model (*continued*)

4. With the phantom positioned upright, hold the CSF 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.
5. Connect the filled syringe's luer lock female connector to the male connector on the CSF Tube.
6. SLOWLY infuse the refill solution into the CSF Tube in 10ml increments until it is full. Be sure to purge air after each successive 10ml by pulling back on the plunger. Filling the CSF Tube SLOWLY prevents air bubbles from being introduced into the model.
7. High volume users will benefit from connecting either a syringe or an IV bag containing Blue Phantom™ Ultrasound Refill Solution to the CSF Tube. As users withdraw fluid from the model, the CSF Tube is automatically refilled. To do so, please refer to steps 8-10 below. Otherwise, replace the blue cap back on the luer lock connector.
8. To easily maintain optimal fluid levels, fill a syringe or an empty IV bag with Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)).
9. Connect the full syringe or IV bag to the male luer lock connector on the CSF Tube.
10. If utilizing an IV bag, be sure to hang the IV bag 1ft above the model.



When refilling the CSF Tube or utilizing a full syringe or IV bag, take care not to lose the blue end cap.

Caring for Your Training Model

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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.

Swapping Tissue Inserts

Swapping tissue inserts in and out of your Blue Phantom™ Lumbar Puncture ultrasound training model is a simple process that will take approximately 10 minutes.

Items Required

- Empty syringe
- Soapy water mixture: 2ml liquid soap, 2ml tap water
- Paper towels

Directions

1. Position your Lumbar Puncture training model on a clear workspace in the upright position.
2. Fill the empty syringe with the soapy water mixture.
3. Inject the soapy water solution into the holes where the CSF and Drain Tubes exit from the base platform of the training model. This will lubricate the tubes for easy removal.



DO NOT inject the soapy water mixture into the CSF or Drain Tubes.

4. Holding onto the top of the tissue insert, gently lift the tissue insert module superiorly so that it pulls both the tissue insert and the CSF and Drain Tubes out of the model.
5. Completely remove the tissue insert module and the CSF and Drain Tubes from the base spinal epidural and lumbar puncture platform.
6. Now you are ready to insert the new or accessory tissue insert. Please refer to *Image A* on page 8 of this user guide to determine the proper orientation of the tissue insert. It is important that the CSF and Drain Tubes are inserted into the correct holes within the base platform of the training model.
7. Guide the CSF and Drain Tubes into the appropriate holes. Thread the tubes the tissue insert reaches the recess in the base platform. Gently position the tissue insert into the recess until it is positioned flush with the surface of the spinal epidural and lumbar puncture platform.
8. Make any necessary adjustment to the tissue insert and CSF and Drain Tubes so that the insert and tubes are properly positioned.



For more information, please refer to our instructional YouTube movie on [How To Replace Ultrasound Tissue Inserts](#).

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 Blue Phantom™ soft storage case (optional). Always store your Spinal Epidural and Lumbar Puncture training model in the upright position.



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

