

## Instructions and User Guide

# Ultrasound Musculoskeletal Training Model

BPMSK-1000 Series



# 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. This User Guide includes instructions applicable to a variety of model configurations. Not all models contain electrical components. If your model does not contain electrical components (Hand Pump configurations), please disregard the *Chapter 2: Product Cautions—Risk of Electrical Shock* section on page 5 of this User Guide.
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 17lbs.
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.



Upon receiving the unit, please read this User Guide in its entirety. If you have any questions regarding proper use and care, please contact Blue Phantom™ immediately. Telephone: (425)881-8830 Email: [customersupport@bluephantom.com](mailto:customersupport@bluephantom.com) Web: [www.bluephantom.com](http://www.bluephantom.com).

It is important to keep the model acceptable temperatures. Operate all components where the temperature is between 0° and 35° C (32° to 95° F). Avoid dramatic changes in temperature or humidity as condensation may form on or in the electronic pumping system.

## Product Information

# 3

### Blue Phantom™ Musculoskeletal (MSK) Series

- [BPMSK-1000 Series](#)- Musculoskeletal (MSK) Ultrasound Training Model

### Included in this Package

- Blue Phantom™ Musculoskeletal (MSK) Ultrasound Training Model
- Blue Phantom™ Clear Ultrasound Refill Solution (BRS182-Clear)

### Additional Items Required for Training

- For optimal performance, please use 18-21 gauge sharp and unbent needles. Please see *chapter 4: Utilizing Your Training Model—Using Needles* section on page 11 of this User Guide)
- Ultrasound system with a high frequency linear array transducer
- Ultrasound gel
- Syringe

### Optional Accessories for Your Training Model

- Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#))
- Blue Phantom™ Soft Storage Case (BPHA602)

### Introduction to Your Training Model

This model is intended as a platform for ultrasound hands-on MSK Knee injections and aspirations 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.

*(continued on next page)*



## Quick Facts about Your Training Model (continued)

- Images like a real patient providing a realistic training environment
- Use ultrasound guidance (or blind insertion) for knee injections and aspirations for osteoarthritis and rheumatoid arthritis
- Self-healing tissue withstands tremendous use, dramatically reducing necessity for replacement parts
- Use with any ultrasound system—no computer simulation or software necessary
- Made in USA



# Utilizing Your Training Model

# 4

## Blue Phantom™ Musculoskeletal (MSK) Series

BPMSK-1000

### Appearance 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 4 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](mailto:customersupport@bluephantom.com)  
Web: [www.bluephantom.com](http://www.bluephantom.com)
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.

*(continued on next page)*

## Appearance of Your Training Model (*continued*)

Your Blue Phantom™ Musculoskeletal training model has 2 tubes exiting the tissue; one at the proximal end of the model (refer to *Image A* below). The second tube exits from the dorsal view of the model. The Bursa and Suprapatellar spaces are filled with Blue Phantom™ Clear Ultrasound Refill Solution (BRS182-Clear).



*Image A*

## Using Your Training Model

1. Remove your Blue Phantom™ from its packaging and place on a clean, hard, flat surface. Place the model in the supine position.
2. This model was designed for ultrasound guided knee injections. If you would like, the model can also be utilized for blind insertion technique training. Please see steps 3-4 on the next page 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.

*(continued on next page)*

## Using Your Training Model (*continued*)

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



1. For best performance, we recommend that you utilize new, sharp, unbent 18-21 gauge needles.
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.

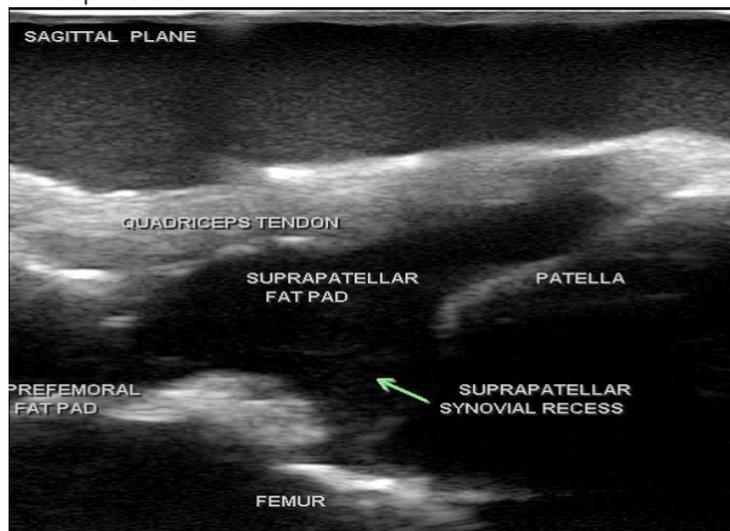
## Performing Musculoskeletal Procedures

The Blue Phantom™ Musculoskeletal training model accommodates full Musculoskeletal procedural training, including:

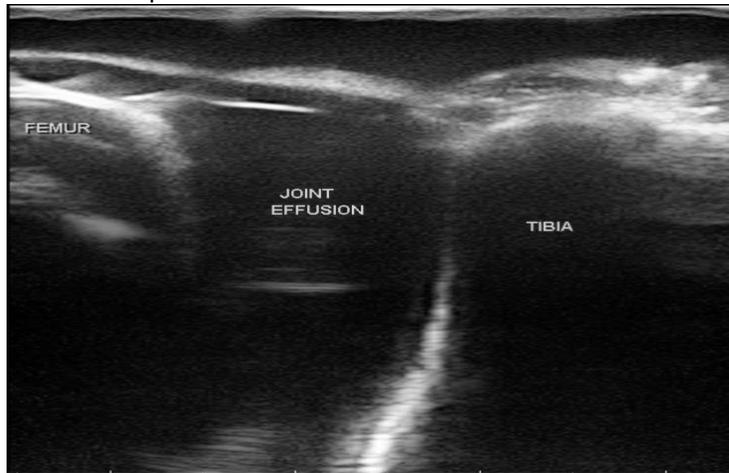
- Create a sterile field
- Infuse local anesthetics and Blue Phantom™ Ultrasound Refill Solution
- Use ultrasound system to find the correct anatomical landscape to perform the procedure
- Points of access include the bursa and suprapatellar approach
- Confirm needle tip location by withdrawing fluid once the vessel is accurately accessed

Your Musculoskeletal training model includes anatomical landmarks of the knee:

- Anatomical landmarks include: Knee Ligaments, Distal Femur Bone, Proximal Tibia/Fib Bone, Patella, Patellar Bursa, Quadriceps Tendon, Femur Fat Pad, Quadriceps Fat Pad, Percutaneous Fat Tissue, Suprapatellar Space
- Patellar Bursa and Suprapatellar Space allow users to simulate various injections and aspirations



- Joint Gap and Joint Effusion:



Please always utilize sharp and unbent 18-21 gauge needles. For more information, please refer to *Chapter 4: Utilizing Your Training Model—Using Needles* section on page 8 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. It is suitable to inject/infuse local anesthetics, saline and Blue Phantom™ Ultrasound Refill Solution when performing regional anesthesia procedures. NEVER inject tap water into your training model.
3. Fluids injected on the outside of fluid pockets will require removal. Pull back on the plunger after injecting fluids to pull the fluid back into the syringe.
4. DO NOT perform “cut downs” or nick the simulated tissue with a scalpel (or other sharp object).
5. Any fluid removed from the vessels will require refilling. Lack of fluid can cause a diminished ultrasound image.
6. 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, 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 fluid pockets is to have users inject the accessed fluid back into the model after accessing the targeted vessel.



**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 next page of this User Guide to determine if your model requires refilling and for complete refilling directions.

## How to Determine if Fluid Pockets Require Refilling

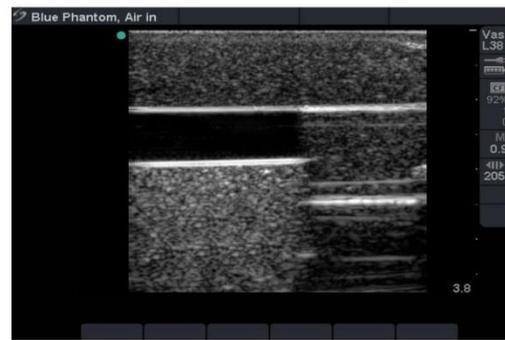
Choose one of the following methods to determine if the vessels require refilling:

### 1. Ultrasound Method

An optimally filled fluid pocket 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 fluid pocket 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*

### 2. 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 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.

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 for both Automated Pump and Hand Pump configurations.

*(continued on next page)*

## Refilling Your Training Model (*continued*)



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

Many users find it easier to refill their training model when the tissue insert has been removed from the base platform.

### Refilling the Musculoskeletal model:

#### Items Required

- Empty syringe
- Blue Phantom™ Clear Ultrasound Refill Solution ([BRS182-Clear](#)) for arterial system

#### Directions

1. Position the training model lying flat on a stable surface.
2. Fill the empty syringe with Blue Phantom™ Clear Ultrasound Refill Solution (BRS182-Clear ).
3. Remove the blue end cap from the tubes extending out of the model.
4. Hold the QuickFill™ tube upright towards the ceiling in the fully extended position.
5. Hold the tube upright for at least 60 seconds to allow any accumulated air to migrate to the terminal end of the tube.
6. Connect the filled syringe's luer lock female connector.
7. SLOWLY infuse the refill solution into the tube in 5ml increments until it is full.
8. 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. When refilling the QuickFill™ tube take care not to lose end cap.

## Overfilling the fluid pockets

It is possible for you to overfill the fluid pocket if you infuse too much fluid into the pocket during the refill process.

It will be obvious when the fluid pockets 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 Blue Phantom™ storage case (optional). Always store your Central Line training model positioned upright or lying on its back.



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](mailto:customersupport@bluephantom.com)

Web: [www.bluephantom.com](http://www.bluephantom.com)



Find us on  
**Facebook**

