

# Home-Made Phantoms For US Guided IV Access



## REQUIREMENTS

- (Pyrex) glass container (e.g. 17 x 27 x 5 cm)
- Water (amount depending on the size of your container)
- Cooking pan
- Gelatin 20g per 250ml water
- Optional: Sugar free Metamucil (contains psyllium hydrophilic mucilloid fibre): 1 tablespoon / 1 sachet per 250 ml water.
- A sieve to remove clots
- Coloring agent (Food coloring agent or acrylic paint, readily dissolved in water)
- Party balloons or penrose drains (1/2 inch = 1,25 cm to mimic central veins; ¼ inch or 0,6 cm for peripheral vessels)
- 20 ml syringe
- Paperclips: opened and cut into halves (like a corrugated nail)



Gelatine is chosen as a bulking agent because it is commercially available, inexpensive and easy to suspend in water. It gels quickly and provides both firmness and elasticity to the phantom.

Sugar free Metamucil (contains psyllium hydrophilic mucilloid fibre) can be used as a scattering agent: 1 tablespoon per 250 ml water. When mixed with gelatin, it has an echotexture similar to subcutaneous tissue.

# PROCEDURE



## STEP ONE

1. Measure 1/3 of the container volume in water and heat it up in a cooking pot (don't let it boil). You may want to let the gelatin soak a few minutes in lukewarm water in beforehand.



2. Add the gelatin at 20g per 250 ml water. Stir gently until the gelatin dissolves.

*Tip: Do not use a mixer because this will create small air bubbles in your phantom.*



3. Add the Metamucil: 1 tbs or 1 sachet per 250 ml water

4. Stir until everything has dissolved.

5. Remove clumps Metamucil or gelatin with a sieve if needed.



6. Add a few squirts of colouring agent or dissolved paint

7. Pour the mixture gently in the container and put it in the refrigerator for 1-2 hours.

# PROCEDURE CONT'D....



## STEP TWO

1. While the first layer is stiffening in the fridge, prepare the balloons or Penrose drains.

- You can use red/blue coloured water if wanted.



Balloons: use party balloons and fill them with 12-15 ml of water with the syringe. Make sure all the air is evacuated before knotting.

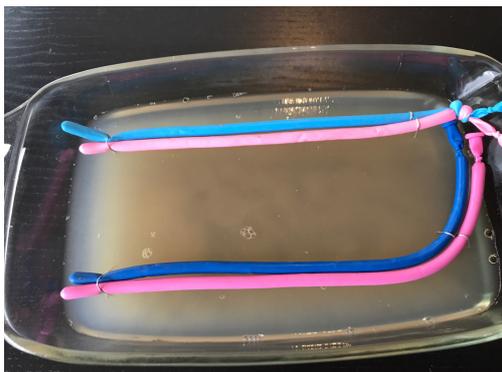
- Penrose drains: tie one end, fill the drain up with water and tie the other end.



## STEP THREE

1. When the basic layer has stiffened, lay the drains/balloons on top.

2. Fix the drains onto the basic layer with the paperclips to prevent the balloon from floating around.



3. Then repeat STEP ONE with just enough gelatin mixture to cover the balloons.

4. Put the container to the refrigerator for 1-2 hours.

# PROCEDURE CONT'D....



## STEP FOUR

1. Repeat STEP ONE. This third layer will cover the balloons/drains completely. Let the phantom stiffen in the fridge for 1-2 hours.



If wanted to, you can take the phantom out of the glass container in one piece after loosening the edges.

This phantom will be fit for use for at least two weeks if kept in the fridge. When kept longer, yeast may take over.



Wishing you a lot of pleasure with your home-made phantom!

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Sources:

*Dr. Rosa Marticorena (Toronto, Canada)*

*Kendall JL, Faragher JP. Ultrasound-guided central venous access: a homemade phantom for simulation. Tips from the trenches. Can J Emerg Med 2007;9(5):371-3*

