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How to Create this Gynecological Task Trainer

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How to Create This Gynecological Task Trainer

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Sources

The task trainer base is described in this article: Hellier SD, Ramponi DR, Wrynn A, Garofalo S. An Innovative Approach: Using Simulation to Teach Primary Care Gynecologic Procedures. *Simul Healthc*. 2017 Aug;12(4):268-273. doi: 10.1097/SIH.0000000000000213. PMID: 28072606.

The uterus, cervix and connecting piece were designed by Jami Monico and Dr. Karen Carlson.



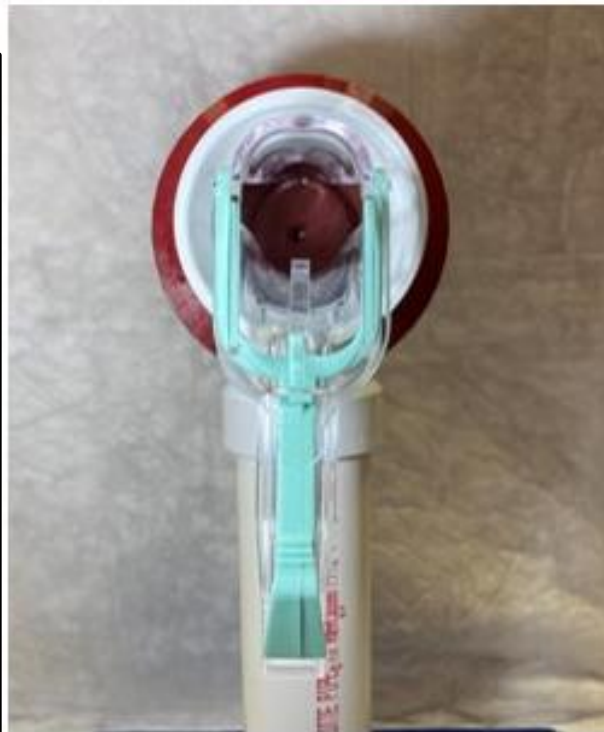
Features

- Tabletop design
- Reusable
- Silicone cervix
 - Pliable material
 - Patent cervical os
- Viscous substance inside uterus represents tissue

Simulate gynecological procedures, including:

- Tenaculum placement on the cervix
- Cervical cancer screening
- Measure uterine depth with a sound
- Endometrial biopsy
- Intrauterine device placement and removal
- Manual vacuum aspiration

From left to right: Uterus, cervix, connecting piece, and PVC pipe simulates the vagina



How Many Task Trainers Do You Need?

- With the tabletop design, the simulation can be done with multiple learners in one classroom.
- Decide how many task trainers your program needs, then proceed with obtaining the supplies.

Time to create one task trainer and durability

1. The 3D printing will take the longest and the print time depends on the machine.
 - Very durable
2. Silicone cervix – the cure time for the Ecoflex 00-20 is 4 hours.
 - The silicone cervix should last for repeated uses. Potential damage to the cervix is from tenaculum placement.
3. Wood base and PVC pieces – quick to assemble
 - Very durable



Supply List

Task Trainer Base

1. Wood base, approximately ¾" x 10" x 10"
2. Charlotte pipe coupling 1.5" x 2" PVC DWV Hub x Hub increaser/reducer
3. PVC pipe 1.5-inch diameter x 6-inch length
4. PVC DWV All Hub Sanitary Reducing Tee 2 x 2 x 1.5 inches
5. Gorilla construction adhesive – 1 tube
6. Hook and loop tape with adhesive - white, ¾ inch, approximately 5" per task trainer

3D-Printed Items

Access to a 3D printer

Filament for 3D printing: For each task trainer, create one uterus and one connecting ring. Create at least one 3D-printed cervix mold – mix and pour silicone into the mold to create the cervix. The links to the 3D print files (.stl file format) are below.

- a) Uterus - print with translucent PLA or other hard plastic, 48 grams. File: <https://webmedia.unmc.edu/medicine/OBGYN/3D/uterus.stl>
- b) Connecting ring - print with red PLA or other hard plastic, 35 grams. File: <https://webmedia.unmc.edu/medicine/OBGYN/3D/connecting-ring.stl>
- c) Cervix mold - print in any color of PLA or other hard plastic, 38 grams. File: <https://webmedia.unmc.edu/medicine/OBGYN/3D/cervix.stl>

Silicone Cervix

1. Ecoflex 00-20 Super Soft Shore Platinum Silicone Rubber Compound
 - a) Approximately 3 ounces per cervix (part A 1.5 oz and part B 1.5 oz)
 - b) Silicone ease release, 1 can
2. Silc Pig Silicone Pigments – “blood” color
3. Stir sticks
4. 3 disposable plastic cups, 12-16 ounces
5. Painter’s plastic or plastic wrap – to cover the work surface when creating the silicone cervix

Polyps

1. Red pipe cleaners –approximately 2 inches for each polyp

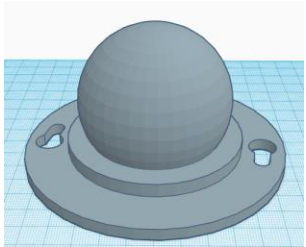
Gel – to simulate uterine tissue/contents

1. Thick-It liquid thickener
2. Red food coloring
3. Water



Print Objects with 3D Printer

1. 3D print uterus with translucent filament

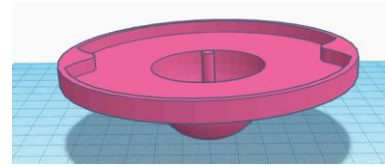


Uterus object in Tinkercad, design software



3D-printed uterus

2. 3D-print cervix mold in any color (for efficiency, print a few so you can pour silicone into many at a time)

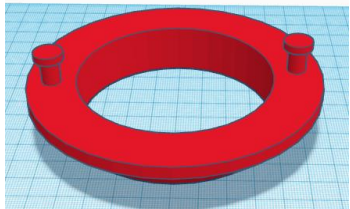


Cervix mold object in Tinkercad, design software



Silicone cervix

3. 3D print connecting ring



Connecting ring object in Tinkercad, design software



Connecting ring



Uterus, cervix, connecting ring, and PVC apparatus



Silicone Cervix

Tip: Create many at a time

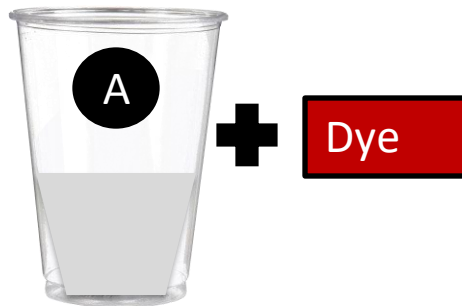
1. Assemble supplies for the silicone cervix from slide 3.
2. Protect the work surface with plastic.
3. Place cervix mold, curved side down, on a disposable cup.



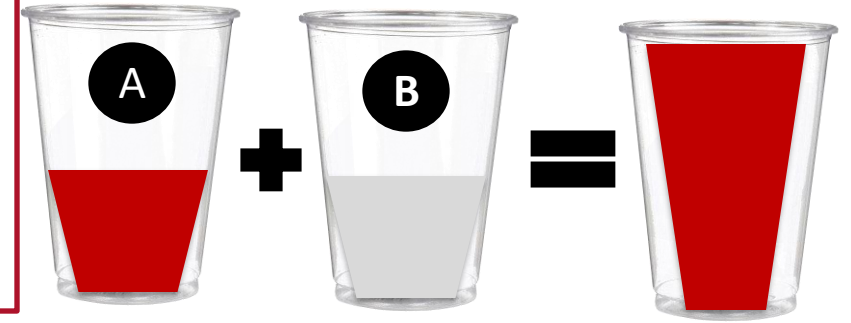
4. Spray release onto the cervix mold.



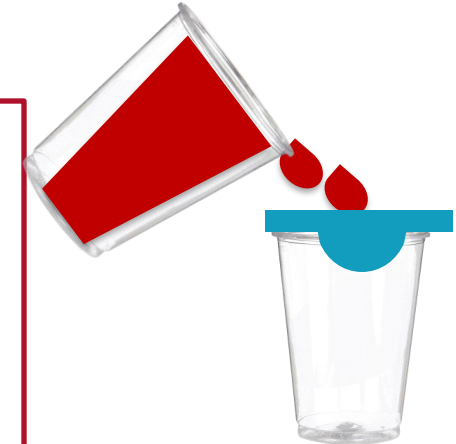
5. Part A
 - Silicone
 - Pour 1.5 oz (3 tablespoons) of part A into a plastic cup. Add a small amount of red dye and mix well.



6. Part B
 - Silicone
 - Pour 1.5 oz (3 tablespoons) of part B into the A cup and mix well.



7. Pour the mixture into the mold and allow to cure per manufacturer instructions.



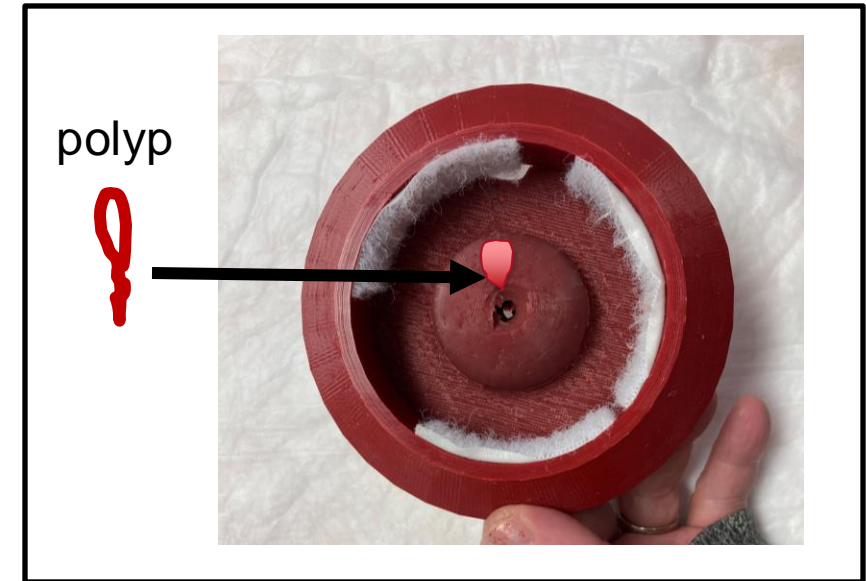
8. Gently remove the cervix from the mold.



Cervical Polyps

Cervical polyps may be added to the cervix prior to the simulation. Follow these directions prior to placing the uterus/cervix/connecting ring onto the PVC apparatus.

1. Cut red pipe cleaner about 2" in length.
 - Twist the ends together to form a loop in the middle.
2. Make a small incision in the cervix at the desired location of the polyp.
3. Insert the pointed end of the polyp into the incision.



Assemble the Task Trainer

4

PVC sanitary reducing "T"
2" x 2" x 1.5"
*Place the 1.5" end onto the PVC pipe. This piece represents the vagina.

3

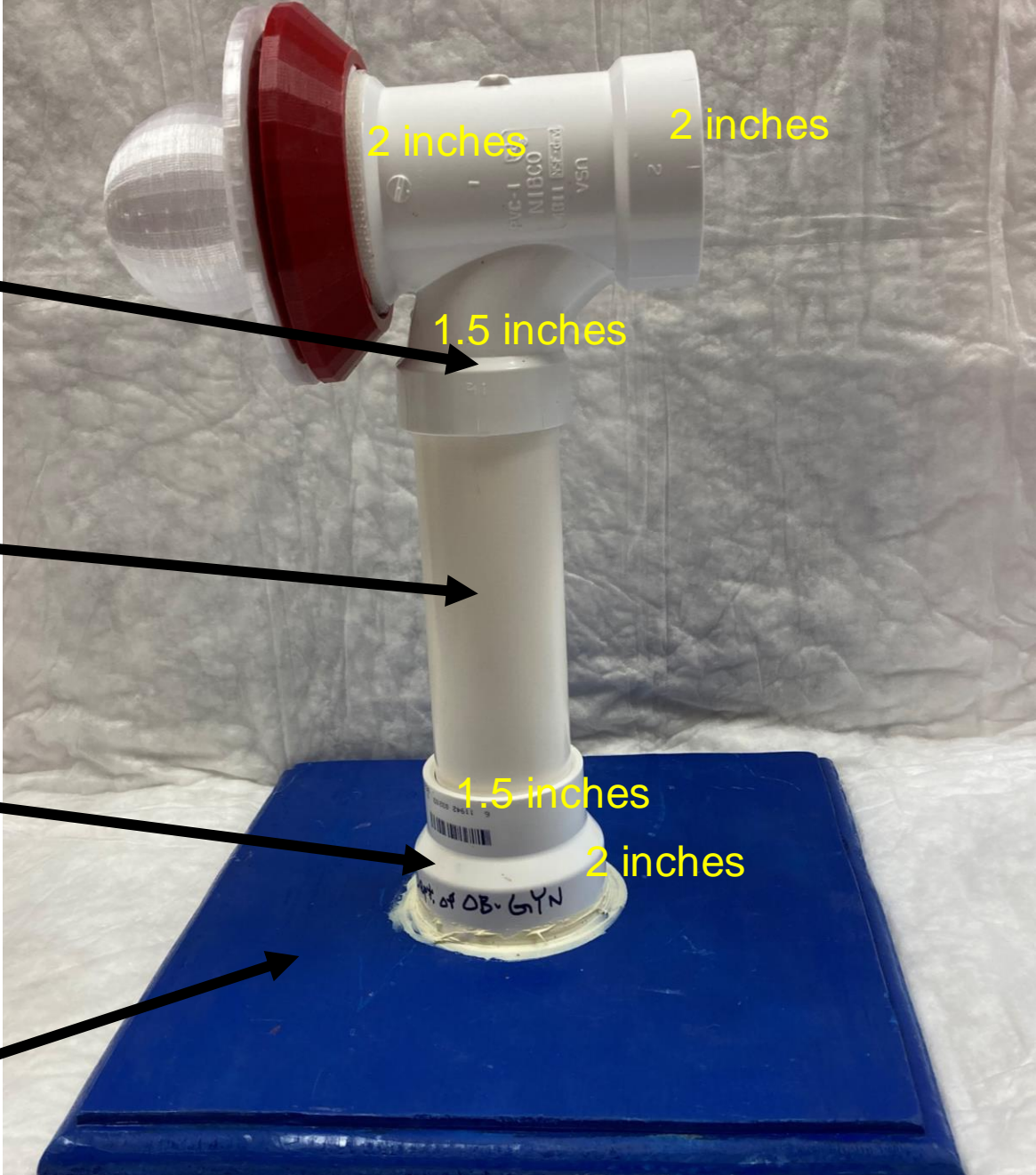
PVC pipe
1.5" diameter, cut to 6" length
*Insert one end into the coupling piece.

2

Charlotte pipe coupling
1.5" x 2"
*Glue the 2-inch diameter end onto the middle of the base with construction adhesive.

1

Wood base
3/4"-1" x 10" x 10"
*Sand and paint as desired



Uterus and Cervix Assembly

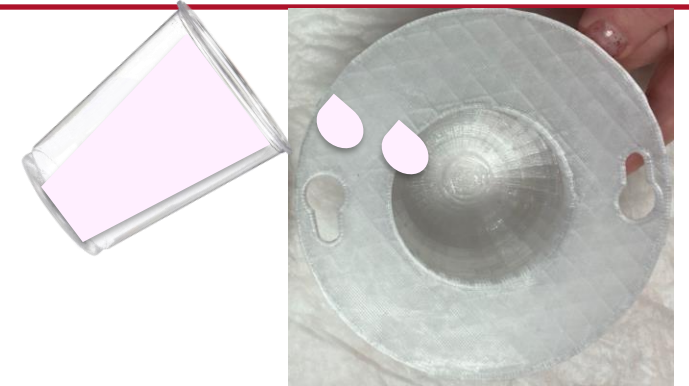
1. Apply sticky-back hook-and-loop tape (Velcro) to the outer edge of the end of the PVC pipe where the uterus will be placed. The Velcro should last for repeated uses.



2. Apply the other side of the hook-and-loop tape to the inner edge of the connecting ring.



3. If using simulated uterine tissue, mix Thick-It with water until a pudding-like consistency. Add a drop of red food coloring and pour into the uterus.



4. Assemble the uterus, cervix, and connecting ring. Pass the knobs on the outer ring through the holes on the uterus and twist the uterus to secure the pieces.



5. Place the connecting ring onto the end of the PVC sanitary "T".



Simulation Set-up



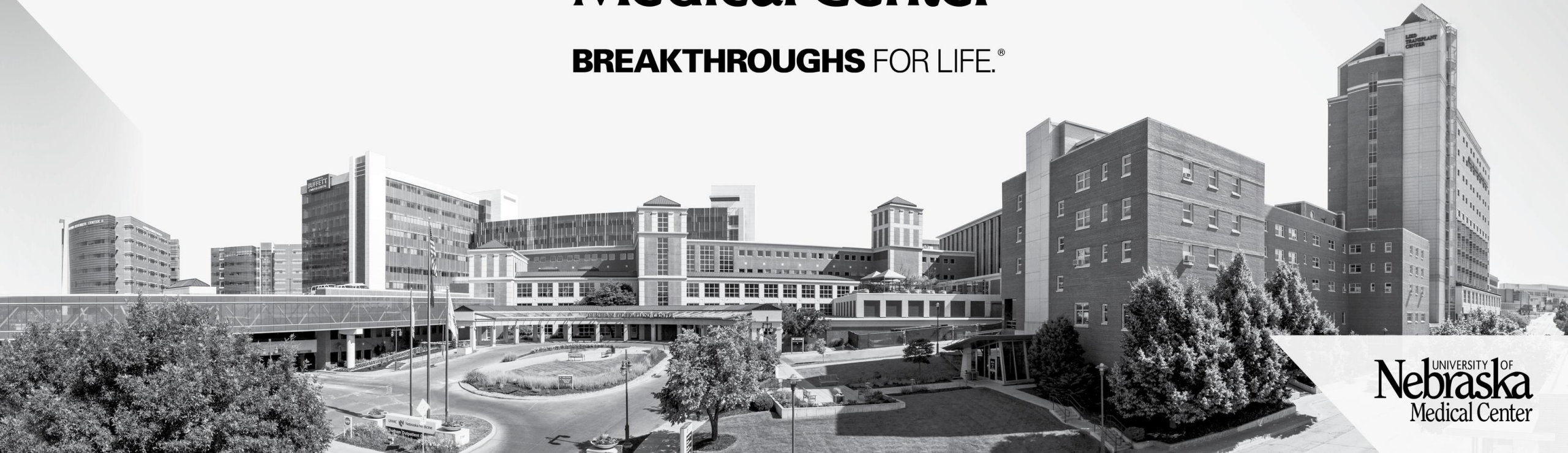
Gynecological task trainers set up in a classroom and ready for a group simulation.





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