ALL-SAFE

Meckel's Diverticulum Simulation

Build Instructions

ALL-SAFE Consortium: Pan-African Academy of Christian Surgeons, University of Michigan, Southern Illinois University, Soddo Christian Hospital, AIC Kijabe Hospital, and Mbingo Baptist Hospital

Materials Required for Assembly:

- Flat bed sheet cut to the size of 2.5’ x 2’ (76.2 cm x 60.96 cm). Thin white fabric (example: white bed sheet) is optimal for model creation. Alternatively, a light-colored non-printed material is sufficient.
- 10 rubber bands
- Tape
- Marker/Sharpie
- Ruler
- Scissors
- Box cutter or scalpel
- A piece of cardboard 10.4” x 13.3” (26.5 cm x 33.8 cm)

Assembly of the bowel and mesentery:

A. Cut a flat bed sheet (non-fitted sheet), to the dimensions of 2.5 feet by 2 feet.
B. Roll the sheet along the 2.5’ side until there is only 14” (35.56 cm) of unrolled sheet left.

a. 

b. 

C. Using scissors, cut 8 small holes that are 4” (10 cm) apart under the rolled section of sheet. It is helpful to measure and mark these holes out before cutting.

a. 

D. Push the rubber bands through the holes and tie around to secure the roll

a. 

b. 

c. Cut off the remaining loops so they do not interfere with the simulation. This rolled section of sheet represents the bowel, while the unrolled section represents the mesentery.

E. Generally, a Meckel's diverticulum ranges from 1 to 12 cm in length and is found proximal to the ileocecal valve. To simulate this, choose an end of the "bowel" and pull about 3 to 6 cm of the rolled sheet outward. When satisfied with the size, secure a rubber band around it as shown.

a. 

F. Cut out pieces of tape (about 1.6cm by 1.6cm) and label them the numbers 1-14.

a. 

G. Place the numbers along the rolled section of the sheet, starting at the side of the bowel opposite to that of the Meckel's diverticulum.

   a. Start with 1 to the right of the first rubber band.

   b. Flip the sheet over and place the 2 in the middle of the first two rubber bands. Flip the sheet back over, and continue this pattern until you reach the end of the bowel (where the Meckel's diverticulum is located).

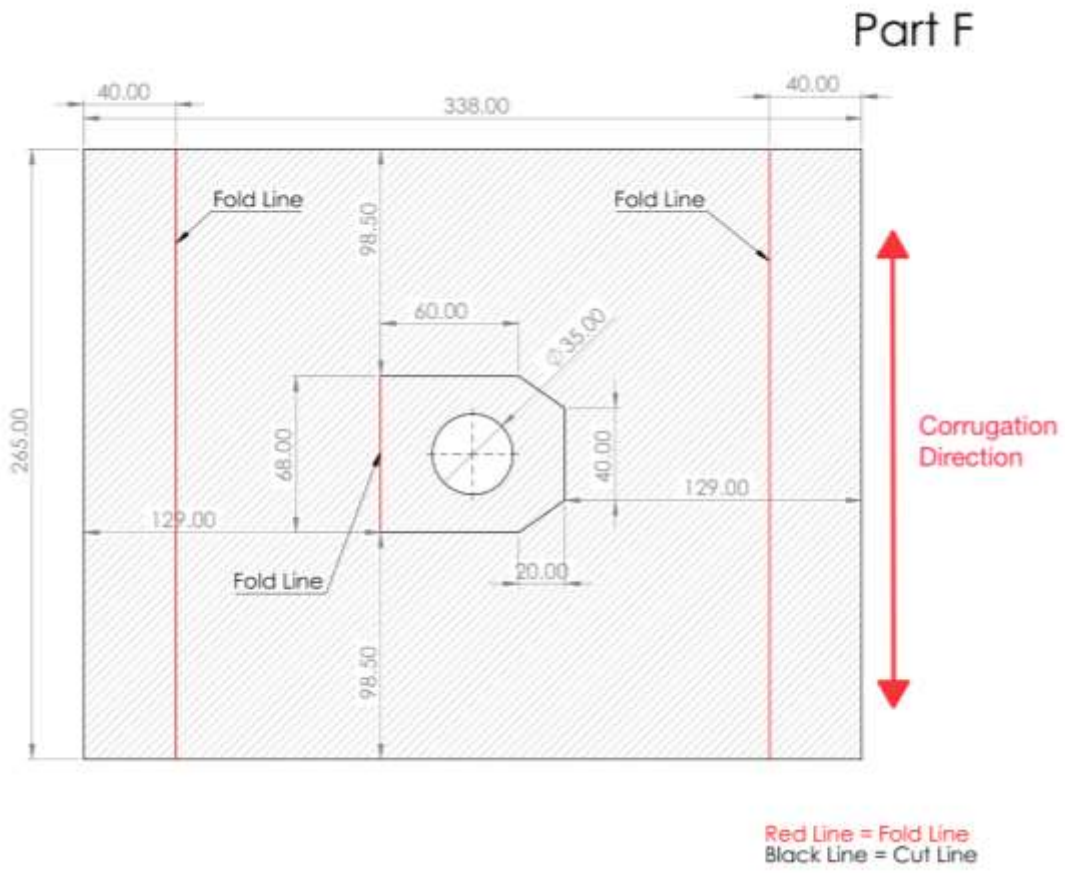
H. Lastly, the mesentery needs to be finished. Bunch up the unrolled sheet and wrap a few rubber bands around the sheet to create the “root” of the mesentery.

a. 

b. 

Assembly of the holder:

A. Cut a piece of cardboard by following the provided template for Part F. Pay attention to the red lines which indicate fold lines, as opposed to cut lines, as well as the corrugation direction of the cardboard piece to be cut.



B. Bend the center part upward, and the side pieces up 4 cm from the edge. The center flap and hole will represent the root of the mesentery, and will hold the bowel to the floor of the trainer box.

a. 

Assembling the bowel module into the trainer box:

A. Place the bunched bowel end through the hole with the odd number side facing upwards.

a. 

B. Secure it there with a rubber band

a. 

C. Flip the bowel over the hide the “root” of the mesentery.

a. 

D. Locate your laparoscopic box trainer and turn it upside down. Insert the flaps from part F into the slits that are used for the stability flaps.

a. 

E. The stability flaps will share the same slits as part F. You may need to adjust a few things in order to get both the stability flaps and Part F to fit into the same slits.

a. 

F. Final Product