

USER MANUAL

Neonatal Minimally Invasive Surgery (MIS) Trainers

Introduction:

These models are scaled to the chest and abdomen of neonates. Each trainer is designed to develop a specific MIS skill set used in pediatric minimally invasive surgery. While mastery of these core skills is essential in performing minimally invasive surgery in a neonate, proficiency of these skills does not assure the ability to perform correction of complex congenital anomalies. Additional preparation including understanding the procedure itself, patient selection, set up, collaboration with other disciplines including anesthesia and nursing, and an understanding of the differences between the MIS and open approach as well as the potential pitfalls of the surgery is necessary for success.

Description of Models

The abdominal models will focus on basic dexterity skills and suturing adapted to the scale model for a neonatal patient. The chest models will emphasize suturing skills needed for esophageal anastomosis and congenital diaphragmatic hernia (CDH) repair. A description of each model follows.

Platform 1

Abdomen Model 1 – Dexterity skills

Skill set: Use of pediatric laparoscopic instruments to transfer beads, string beads, and place washers on peg.
Promotes familiarity with neonatal laparoscopic instruments, hand-eye coordination, and dexterity of both hands

Abdomen Model 2 – Running bowel

Skill set: Promotes same skills as Model 1 applied to the specific task of running the bowel from the ligament of Treitz to the ileocecal valve. Abnormalities of the bowel should be identified.

Platform 2

Abdomen Models 3 & 4 – Laparoscopic Suturing

Skill Set: Promotes same skills as Model 1 as well as suturing
(interrupted, running, and under tension)
Suturing an anastomosis (bowel)

Platform 3

Chest Model 1 – Right hemithorax, Tracheo-esophageal fistula repair

Skill set: Port placement
Thoracoscopic suturing
Suturing anastomosis under tension

Chest Model 2 – Left hemithorax, Congenital diaphragmatic hernia repair

Skill set: Port placement
Thoracoscopic suturing
Closure of defect under tension

All models have a neoprene cover held in place with a frame that is secured to the platform. Incisions in the neoprene can be placed in the locations the participant feels it is most advantageous to perform the task.

Instrumentation/Equipment: The training sets have all materials required to set up models. Replacement materials are included in the sets.

The following is a list of additional equipment/instruments, and materials:

Equipment

Required: Video monitor, camera, and lens (recommend 4mm 30 degree scope). A tower is fine, but since insufflation is not required, a telepak is sufficient and has recording capabilities.

Suggested: Recording capability for performance review and coaching

Instruments (3mm)

Required:

Atraumatic bowel graspers (2),
Maryland,
Scissors,
Needle driver(s)

Materials

Required:

Suture material (recommend 4-0 or 5-0 suture for Anastomosis,
2-0 suture for CDH repair)

Suggested: flash drive to record video if able