

Thoracic Surgery Advanced Training Course for the RobotiX Mentor

Description

A proposed curriculum for training on the main skills for an advanced thoracic surgery lobectomy procedure, followed by simulation-based procedure training of a complete lobectomy case.

Training within a proficiency-based virtual reality curriculum may reduce errors during real surgical procedures. The proficiency values within this component are based on [Validation of the RobotiX Mentor Robotic Surgery Simulator \(J Endourol. 2016 Jan 21.\)](#) The aim of the first component curriculum is for an individual to acquire skills and reach a predetermined level of proficiency before progressing to more challenging cases.

The first component includes 3 tasks from the Fundamentals of Robotic Surgery (FRS) curriculum:

- Ring Tower Transfer - maneuver wristed instrumentation
- Puzzle Piece Dissection - Lung retraction
- Vessel Energy Dissection - Vessel ligation

The second component is Robotic Lobectomy Simulation Task from the Lobectomy Module.

Objectives:

Vessel Ligation and Retraction tasks Objectives:

- Show effective navigation of the camera and use the camera clutch.
- Maneuver the instruments such that the potential of wristed instrumentation is utilized maximally for precise instrument tip positioning.
- Safely and precisely perform fine dissection without damaging the surrounding or the underlying structures. ☑ Identify and choose the correct energy pedal.
- Apply energy to precisely and safely seal and divide vessels.

Robotic Lobectomy Simulation Task Objectives:

- To perform proper dissection of the hilum while avoiding unnecessary complications.
- To practice different methods of the lobe's blood vessels and bronchus division.
- To learn how to avoid and manage potential complications.
- To perform an inspection of the operating site for adequate hemostasis.

Specialties:

- Thoracic and cardiothoracic Surgery

Target Audience:

Practicing physicians, as well as residents/fellows, interested in hands-on simulation-based training for the Robotic Thoracic Lobectomy procedure.

Assumptions:

It is recommended to include a cognitive skills module at the front end of the training program. No previous procedural or technical knowledge is required.

Suggested Time Length:

Suitable for 2 day training courses or for distributed training.

Authors:

The Fundamentals of Robotic Surgery Curriculum (FRS cases):

- Conducted by: Institute for Surgical Excellence. Florida Hospital Nicholson Center. Principal Investigators: R.M. Satava, University of Washington School of Medicine, Seattle, WA. R.D. Smith, Florida Hospital Nicholson Center, Celebration, FL. V.R. Patel, Florida Hospital, Global Robotics Institute, Celebration, FL.

The Robotic Lobectomy Module:

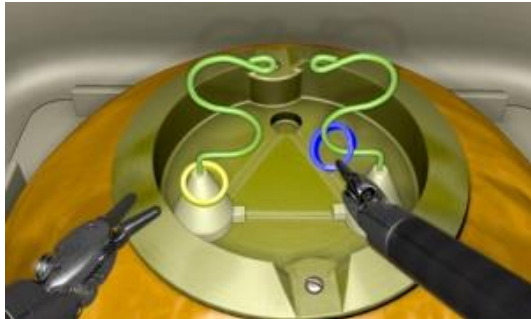
This module is based on the LAP Mentor Lobectomy module, developed in collaboration with:

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- Michael Peer, MD, Thoracic Surgeon, Head of Thoracic Surgery Department, Assaf Harofeh Medical Center, Israel.

Task Descriptions and Curriculum Steps

Familiarization with the simulator: A 5 minute session.

FRS Task 1: Ring Tower Transfer



Remove a ring from the "S" tower, transfer to the other arm and place on a tower located on the side of the dome. This task trains camera navigation, effective use of the camera clutch, and wristed instrument maneuvering for precise instrument tip positioning.

FRS Task 5: Puzzle Piece Dissection



Cut out the puzzle piece shape within the designated line without incising the underlying tissue.

This task trains precise fine dissection so that the skin is incised on the marked lines while not injuring or tearing the underlying tissue.

Required skill level:

Total time (s)	480
No. of instrument collisions	9
Distance by camera	485
Path length (L+R)	10500
Number of cuts > 2mm deep	< 30

FRS Task 6: Vessel Energy Dissection



Dissect through the fat layer to expose the vessel, cauterize the vessel and cut the vessel.

This task trains for the correct use of the pedals for electrocoagulation and accurately cutting between the sealed points.

Required skill level:

Total time (s)	150
No. of instrument collisions	7
Distance by camera	110
Path length (L+R)	2700

Robotic Lobectomy



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