

## WVU Fresh Tissue Training Program

**July through December:** Trauma operative skills

PGY 4 pre-requisite:

ASSET: Advanced Surgical Skills for Exposure in Trauma

Team approach: PGY 1, 2, 4

Topics and learning objectives:

Week 1:

1. Penetrating neck injury
  - a. Cricothyroidotomy  
The general surgery resident (GSR) will understand indications for surgical airway, identify key anatomic landmarks and perform cricothyroidotomy (PGY 1-4)
  - b. Exposure and control of carotid artery  
The GSR will understand indications neck exploration after penetrating injury to the neck, identify key anatomic landmarks including: carotid artery, jugular vein and vagus nerve and perform full vascular exposure via SCM incision (PGY 2-4)
  - c. Exposure and repair of trachea-esophageal injury  
The GSR will understand indications for neck exploration in cases of tracheo-esophageal injury to the neck, identify trachea and cervical esophagus and perform simple buttressed repair of both (PGY 4)
2. Penetrating lower extremity injury
  - a. Common femoral and superficial femoral artery exposure, shunt placement  
The GSR will understand indications for lower extremity vascular exploration in the setting of injury, identify key anatomic landmarks including CFA, SFA and PFA and perform tourniquet and shunt placement (PGY 1-4)
  - b. Four compartment lower extremity fasciotomy  
The GSR will understand indications for four compartment fasciotomy and identify key anatomic landmarks including pertinent structures in the anterior, lateral, superficial and deep posterior compartments including the intermuscular septum and neurovascular bundle (PGY 1-4)
3. Management of pelvic injury (time permitting)
  - a. Preperitoneal pelvic packing  
The GSR will understand indications for surgical intervention including and performing pre peritoneal packing in cases of pelvic injury (PGY 1-4)
  - b. REBOA  
The GSR will understand indications for and placement of REBOA in cases of pelvic hemorrhage (PGY 1-4)

Week 2:

4. Penetrating chest injury

a. Left anterolateral thoracotomy, control of cardiac wound

The GSR will understand indications for left anterolateral thoracotomy in trauma, identify key anatomic landmarks including the pericardium, phrenic nerve and thoracic aorta, and perform pericardiectomy, repair of cardiac injury and aortic cross clamp (PGY 2-4)

b. Chest tube placement and Clamshell thoracotomy

The GSR will understand indications for chest tube placement in trauma patients and extension to clamshell thoracotomy, identify key anatomic landmarks including pulmonary hilum and perform chest tube placement, and clamshell thoracotomy (PGY 1-4)

c. Pulmonary tractotomy, lung resection, pneumonectomy

The GSR will understand indications for lung resection in traumatic injury, identify key anatomic landmarks including pulmonary hilum and perform pulmonary tractotomy, lung resection (non anatomic) and pneumonectomy (PGY 2-4)

5. Blunt abdominal trauma

a. Exploratory laparotomy for trauma

The GSR will understand indications for trauma laparotomy, identify key anatomic landmarks including RP zones and perform abdominal packing (PGY 1-4)

b. Management of solid organ injury (liver, spleen, kidney)

The GSR will understand indications for trauma laparotomy in setting of suspected solid organ injury, identify key anatomic landmarks of liver, spleen, kidney and pancreas and perform anatomic resection of spleen and kidney as well as liver packing (PGY 2-4)

c. Management of abdominal vascular injury (IVC, iliac vessels)

The GSR will understand indications for surgical exploration of vascular injury in the abdomen, identify key anatomic landmarks including the IVC and aorta and perform right and left medial visceral rotations as well as IVC repair (PGY 4)

**Learning Materials** (available in SCORE and assigned 1 week prior to session)

Week 1:

1. [Chapter 77. Lower Extremity and Degloving Injury](#) Current Therapy of Trauma and Surgical Critical Care, 2e
2. Two Incision Four Compartment Fasciotomy – video
3. Pelvic packing for fracture – video
4. Penetrating neck and chest injuries - video

Week 2:

1. [Chapter 55. Abdominal Vascular Injury](#) Current Therapy of Trauma and Surgical Critical Care, 2e

2. Clamshell thoracotomy – video
3. Injury to the heart and great vessels -video
4. Damage control techniques – video
5. Injury to the liver, spleen and urinary system - video

#### Assessment Tools

1. Pre and Post knowledge assessment
2. Pre, post and retention trauma training confidence assessment
3. Technical metric assessment including time to task completion and critical tasks completion score for the following key index operations:
  - a. Exposure and control of carotid artery via SCM incision
  - b. Exposure and control of femoral artery above the knee with placement of TQ and shunt
  - c. Left anterolateral thoracotomy with pericardiotomy, repair of cardiac wound, and aortic cross clamp
  - d. Perform abdominal exploration for trauma with packing, identification and control of IVC injury, successful repair of IVC injury

**January through May:** Low volume high complexity advanced general surgery

Team approach: PGY 1, 3, 5

#### Topics and Learning Objectives

##### Week 1:

1. Hepatobiliary Surgeon
  - a. Liver resection  
The GSR will understand salient anatomy for safe right hepatic lobectomy.
  - b. Liver Ultrasound  
The GSR will understand US technique, anatomy and will be able to identify lesions in the liver.
  - c. Porta Hepatis Exploration  
The GSR will understand porta hepatis anatomy and common variations.
2. General Surgeon
  - a. Femoral Hernia Repair  
The GSR will understand groin anatomy and be able to perform a tissue repair for a femoral hernia.
  - b. Open CBD Exploration  
The GSR will understand and perform the steps of open common bile duct exploration including choledochoscopy and T-tube placement.
  - c. Vagotomy and Antrectomy  
The GSR will understand vagus nerve anatomy and perform truncal vagotomy and antrectomy.

## Week 2:

1. Thoracic Surgeon
  - a. Thoracotomy/lung resection  
The GSR will understand pulmonary anatomy and perform an anatomic lobectomy.
  - b. Esophagectomy  
The GSR will understand thoracic esophageal anatomy and perform an esophagectomy.
  - c. Mediastinal Exploration  
The GSR will understand and perform a mediastinal exploration for lymph node sampling.
2. Vascular Surgeon
  - a. Open CEA  
The GSR will understand the technique and perform a CEA with intravascular shunt placement.
  - b. Open infrarenal AAA  
The GSR will understand the technique and perform an AAA repair with interposition graft.
  - c. Open LE bypass with graft  
The GSR will understand the technique and perform an open LE bypass with graft.

## Learning Materials

### Week 1:

1. Applied abdominal wall anatomy - <https://youtu.be/PCceHe0RcPU?si=eqiRH5TXS-q35j3N>
2. open TAR - <https://youtu.be/T0c9ycKRyPg?si=B8orl6ZFinjHmouN>
3. Inguinal anatomy - <https://youtu.be/pSy5zOeV4N8?si=Po6uwGQJ2tU9R4b>
4. Liver anatomy – PDF sent via email

### Week 2 (access Rutherford's 9<sup>th</sup> Ed via Clinical Key, videos are on YouTube)

1. Carotid artery
  1. Rutherford's Vascular Surgery 9<sup>th</sup> Ed Chapters 55 and 91
  2. Houston Methodist Carotid Endarterectomy Part 1 and 2
    - a. [Carotid Endarterectomy \(CEA\) Part 1 \(ALAN B. LUMSDEN, MD\) - YouTube](#)
    - b. [Carotid Endarterectomy \(CEA\) Part 2 \(ALAN B. LUMSDEN, MD\) - YouTube](#)
2. Aortic aneurysm
  1. Rutherford's Vascular Surgery 9<sup>th</sup> Ed Chapters 54, 70 and 71
  2. [Open Repair of Abdominal Aortic Aneurysm \(Charudatta Bavare, MD, M. Mujeeb Zubair, MD\) - YouTube](#)
3. Femoral artery
  1. Rutherford's Vascular Surgery 9<sup>th</sup> Ed Chapter 56, Femoral Artery Exposure Section

2. [Common Femoral Endarterectomy \(Linda Le, MD, Ross G. McFall, MD\) - YouTube](#)
4. Dialysis access, fistula
  1. Rutherford's Vascular Surgery 9<sup>th</sup> Ed Chapter 57, Exposure of the Arm Vessels Section and Chapter 175
5. Thoracic review - TBD