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 pericardiotomy, 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 GRS will understand thoracic esophageal anatomy and preform 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=Po6uwGQJ2TtU9R4b
4. Liver anatomy – PDF sent via email

Week 2 **(**access Rutherford's 9th Ed via Clinical Key, videos are on YouTube)

1. Carotid artery
    1. Rutherford's Vascular Surgery 9th Ed Chapters 55 and 91
    2. Houston Methodist Carotid Endarterecotmy 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 9th 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 9th 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 9th Ed Chapter 57, Exposure of the Arm Vessels Section and Chapter 175
5. Thoracic review - TBD