Emergency War Surgery Course (EWSC)

Combat Orthopeadic Trauma Surgery Course (COTS+)

Course Objectives

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►Explain the concepts & elements of triage & teamwork within the battlefield trauma system

- Review injuries, levels of care and theater evacuation concepts specific to military care
- Explain the concepts and elements of triage and teamwork within the battlefield trauma system

►Describe the principles, indications, & procedures for damage control in the management of combat casualties

- Apply trauma principles to surgery in austere environments
- Describe the principles, indications and procedures for damage control in the management of combat casualties

►Demonstrate surgical techniques required to manage combat injuries to the head, face, eye, neck, torso, & extremities

- Demonstrate hands-on surgical techniques in the laboratory
- Demonstrate surgical techniques required to manage combat injuries to the head, face, eye, neck, torso and extremities

Pre-Course

1.1 EWSC Introduction

- Explain the concepts and elements of the battlefield trauma system.
- Describe principles, indications, and procedures for damage control management of combat casualties.
- Demonstrate surgical techniques required to manage combat injuries.

1.2 War Wounds

- Recognize injury patterns caused by weapons of war – high-powered rifles and explosive devices.
- Recognize need for repeat debridement surgeries of war wounds.
- Recognize risk factors for Invasive Fungal Infections (IFI).
- Be familiar with management of Unexploded (UXO) Ordnance.

1.3 Blast Trauma and Dismounted Complex Blast Injury

- Describe the four components that comprise the blast injury mechanism: Primary, Secondary, Tertiary and Quaternary.
- Describe the physiological requirement s and stress of the blast trauma patient.
- Describe the term Dismounted Complex Blast Injury. Summarize and distinguish between acute treatment goals, initial resuscitation goals for this injury.
- Summarize Operative Approach Guidelines as they relate to surgical hemostasis, volume control, and decontamination with DCBI. Discuss posterior blast wounds and genitourinary blast injury considerations.
- Summarize Post-operative Guidelines with DCBI

1.4 Abdominal, Urologic, and Gynecologic Trauma

- Indications for laparotomy on the battlefield
- Use of FAST exam in the evaluation of the combat casualty
- Management of injuries to major abdominal, genitourinary and gynecological organs

1.5 Vascular Injuries

- Describe evaluation of the patient with a potential vascular injury.
- Explain the general principles for vascular injuries.
- Describe the management techniques of specific vascular injuries.
- Define the management techniques appropriate at different levels of care.

1.6 Thoracic Injuries

- Recognize and manage specific thoracic and cardiac injuries on the battlefield.
- Describe the indications and technique for performing a resuscitative thoracotomy.
- Describe common thoracic and cardiac exposures and recognize which injuries they address.

1.7 Transfusion Medicine for Combat Trauma

- Define “emergency release” blood.
- Review massive transfusion protocols.
- Review whole blood use.
- Review blood product availability at different roles.

1.10 REBOA

- Discuss what REBOA is, what it is used for, and who is it for.
- Describe the placement procedures for REBOA.
- Discuss REBOA used in combat situations.
- Describe the keys to success for REBOA.
- Discuss the contraindications of REBOA.

1.11 Traumatic Brain Injury

- Be facile with medical treatment options for traumatic brain injuries.
- Be familiar with indications for surgical intervention.
- Know limitations in the treatment of host nationals.
- Know limitations involving aeromedical evacuation of traumatic brain injury (TBI) patients.
- Know to contact theater neurosurgeon for expert advice.

1.12 Face and Neck Injuries

- Discuss the spectrum, evaluation, and management of injuries to the face and neck.

1.13 Eye Trauma

- Prevent ocular injuries by wearing military combat eye protection (MCEP), ballistic protective eyewear (BPE), EyePro or Eye Armor
- “Keep an eye out” for ocular trauma: Maintain high index of suspicion
- Do NOT put pressure on eye with suspected open globe injury
- Teleophthalmology can improve and extend ophthalmic trauma care
- SHIELD AND SHIP
- Recognize and treat the 2 ocular emergencies

1.14 Field Critical Care

- Airway and anesthesia in the trauma patient
- Principles of critical care on battlefield
- Management of battlefield infections

1.15 Soft Tissue and Extremity Injuries

- Understand principles of debridement and management of soft tissue injuries.
- Recognize the clinical pattern of crush injuries.
- Understand the principles of amputation.

1.16 Extremity Fracture Management

- Describe the initial evaluation and management of extremity fractures of upper and lower extremities.
- Debride non-viable tissue in open fractures.
- Spare viable tissue in open fractures.
- Use early antibiotics with cephazolin.
- Give tetanus toxoid as soon as possible.
- Describe the diagnosis and management of compartment syndrome.

1.17 Spine Injury Management

- Understand the initial management of spine fractures and spinal cord injuries in the deployed setting.
- Understand medical management of patients with spinal cord injury.
- Understand the principles of transportation of patients with spinal cord injury.

1.18 Pelvic Fracture Management

- Identify patients at risk for pelvic fractures.
- Learn initial pelvic fracture management.
- Identify need for aggressive resuscitation and use of blood products.
- Identify early need for multi-disciplinary approach involving trauma and orthopedic surgery.

1.19 EnRoute Care

- Understand capabilities at each level of care.
- Understand military medical evacuation terminology.
- Understand risks and limitations of aeromedical evacuation.

1.20 Burn Care

- Estimate burn size based on the Lund-Browder Chart.
- Resuscitate using Rule of 10’s and Joint Trauma System’s (JTS) Clinical Practice Guidelines (CPGs).
- Prevent hypothermia.
- Learn the indications for and how to perform escharotomies.
- Learn basics of wound care.

1.21 Mass Casualty & Triage

- Define mass casualty.
- Review triage principles: triage set-up, staff support, triage constraints
- Apply triage to a series of patients.
- Conduct a mass casualty and triage exercise.

1.22 Pediatric Trauma

- Pediatric resuscitation
- Anatomic and physiologic considerations of pediatric patients

1.23 Military Health Systems

- Be familiar with the military medical system.
- Understand organizational structures within the system.
- Understand the military surgeon's role in the organization.
- Tactical Casualty Combat Care

1.24 Tactical Casualty Combat Care

- Identify the three objectives of TCCC.
- Describe the key factors influencing combat casualty care.
- Identify the evidence that documents the lifesaving impact of TCCC use.
- Describe the three phases of care in TCCC.
- Identify the most common causes of preventable death among combat casualties.

1.25 Prolonged Field Care

- Define PFC definitions and operational context.
- Identify the capabilities and limitations Role 1 providers are using to help mitigate mortality and morbidity.
- Describe the limits of PFC contingency planning and training.
- Identify specific Role 1 PFC Clinical Practice Guidelines (CPGs) with emphasis on "Min, Better, Best" construct.
- Describe telemedical consult techniques and assets.
- Identify future direction and research gaps.

Day 1 Combat Orthopeadic Trauma Surgery Course

1.26 Surgical Skills Laboratory

- Introduction
  - Describe student skill performance expectations
  - Discuss skill lab procedures for use of fresh human cadaver models and simulated tissue models
  - Discuss IACUC Protocols

- Skills Laboratory – Part 1 – Neck and Upper Extremity (Human Cadaver Model)

- Demonstrate knowledge of key Upper Extremity anatomical exposures for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs performed:

    1) Subclavian Artery above Clavical Exposure
    2) Axillary Artery Exposure
    3) Brachial Artery Exposure
    4) Radial/Ulnar Artery Exposure
    5) Upper Extremity Fasciotomy (Forearm, Arm)

▶ Skills Laboratory – Part 2 – Lower Extremites and Pelvis (Human Cadaver Model)

- Demonstrate knowledge of the lower extremity and pelvis anatomical exposures for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs performed:

    1) Femoral Artery Exposure
    2) Exposure/Shunting SFA Injury/Fogarty
    3) Popliteal Artery Exposure
    4) Fasciotomy Lower Leg/Wound Vac
    5) Fasciotomy Thigh
    6) Gluteal Fasciotomy

▶ Skills Laboratory – Part 3 – Rotational Flaps (Human Cadaver Model)

- Demonstrate knowledge of rotational flaps anatomical exposures for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs Performed:

    1) Gastroc Flap
    2) Soleus Flap
    3) Reverse Sural Flap
    4) Radial Forearm Flap

▶ Skills Laboratory – Part 4 – Proximal Control and Escharotomy (Human Cadaver Model)

- Demonstrate knowledge of the proximal control and escharotomy for the care of injured and acutely ill surgical patients.

- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs Performed:

    1) "Hockey Stick" Exposure of Iliacs
    2) Control Iliacs in Abdomen
    3) Pelvic Packing
    4) Escharotomy

Day 2

▶ Skills Laboratory – Part 5 – Upper Extremity and Pelvic External Fixation (Human Cadaver Model)

- Demonstrate knowledge of Upper Extremity and Pelvic External Fixation for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs Performed:

    1) External Fixation of Humerus
    2) Elbow Spanning External Fixation
    3) External Fixation of Forearm
    4) External Fixation of the Pelvis (Iliac Crest Technique)

▶ Skills Laboratory – Part 6 – Lower Extremity and Pelvic External Fixation (Human Cadaver Model)

- Demonstrate knowledge of Lower Extremity and Pelvic External Fixation for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs Performed:

    1) External Fixation of Femoral Shaft
    2) External Fixation of Tibial Shaft
    3) Knee Spanning External Fixation
    4) Ankle Spanning External Fixation (Delta Frame)

▶ Skills Laboratory – Part 7 – Upper Extremity Amputation and Debridement (Human Cadaver Model)

- Demonstrate knowledge of Upper Extremity Amputation and Debridement for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.

- Labs Performed:

    1) Below the Elbow Amputation
    2) Above the Elbow Amputation
    3) Debridement of Open Tib/Fib Fracture

▶ Skills Laboratory – Part 8 – Lower Extremity Amputation (Human Cadaver Model)

- Demonstrate knowledge of lower extremity amputation for the care of injured and acutely ill surgical patients.
- Demonstrate his or her technical ability to expose important structures that may require acute surgical intervention to save life or limb.
- Gain confidence in performing anatomic exposures independently.
- Labs Performed:

    1) Below the Knee Amputation
    2) Above the Knee Amputation

1.27 Post Test/Test Review/Course Critiques

▶ TLO: Students will complete the post rest with review and course critique.