Preventing Combat-Wound Related Infections

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Disclosures

None
# Objectives

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<td>Review epidemiology of combat wound related infections</td>
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<td>Understand immediate care of wounds at point-of-injury or Role 1 medical treatment facilities</td>
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Epidemiology of Combat Wound Infections

1. With increased survivorship of those wounded in combat, there is increased prevalence of infection & sepsis.

2. Up to ~30% of those with combat wounds will develop infection, higher amongst those most severely injured.

3. Skin & Soft Tissue Infections & Pneumonia are the most common.
FIGURE 3. Distribution of infection syndromes (N = 2,210) among wounded military personnel who transferred to participating US hospitals. BSI – bloodstream infection; CNS – central nervous system infection; SSTI – skin and soft-tissue infection; UTI – urinary tract infection.
Early Vs Late Infections

Immediate Injury and Contamination

Skin Flora (Gram positive bacteria) Cause Infection

Environmental/Nosocomial Infections (Invasive fungal, MDROs from hospitals)
Role of Infection Control and Standard Precautions In Combat Zones

- **Standard Precautions**
  - Hand Hygiene
  - Personal Protective Equipment

- **Transmission-Based Precautions**
  - Cohorting
  - Isolation/Contact Precautions

- **Adherence to Antimicrobial Prophylaxis**
  - Narrow Spectrum Antibiotic
  - Guideline-based duration (short)
First Responder, Healthcare Provider Considerations

- Combat and non-combat injuries
- Transmission of droplet & airborne infections
- Blood-borne pathogen exposures
  - HIV, Hepatitis B and C
Vaccine Preventable Infections

- Tetanus vaccine & Immunoglobulin
- S/p splenectomy vaccination within 14 days
- Hepatitis B vaccination & Immunoglobulin
Early, appropriate care can prevent wound infections, early sepsis and longer-term morbidity and mortality.

Transport time from point-of-injury is a critical part of determining when to given antibiotics; delayed transport means > 3 hours to receipt of higher level of medical care.
Wounded Warrior – Strategies For Wound Management

1. Stabilize, Sterile Bandage
2. Transport Time Assessment
3. Irrigation +/- debridement as soon as skilled personnel are available
4. Start Antibiotics
   - Point-of-Injury vs Medical Treatment Facility
Irrigation & Early Formal Irrigation and Debridement

• Irrigation (and ultimately debridement when able), is the first critical line of defense to prevent infection. Irrigation is superior to systemic antibiotic prophylaxis.

• Irrigation and systemic antibiotic prophylaxis together synergistically decrease rates of infection in combat wounds

• Irrigation can be done with sterile isotonic solutions or potable water, with several liters in low pressure bulb syringe or by gravity.

Injury Site and Antibiotic Choice

• Point-of-Injury
  • Moxifloxacin 400mg PO x1 dose if not in shock, awake and able to take oral medications.
  • Ertapenem 1gm IV pr IM for penetrating abdominal wounds or shock, cannot take PO
  • Alternatives: levofloxacin 500mg PO x1, Cefotetan 2g IV Q12hrs
Injury Site and Antibiotic Choice

**Within 3 hours with skilled medical care:**
- Cefazolin 2g Q 6-8 hrs is the backbone for all except for eye or burn
- Add metronidazole if esophageal disruption, penetrating abdominal wound, grossly contaminated penetrating brain injury

**Alternatives include clindamycin, ertapenem, or for brain injury ceftriaxone and metronidazole or vancomycin and ciprofloxacin**
Do Not Forget Non-Combat Operational Injuries

Clear risk of infection
MDRO and Invasive Fungal Infection

• MDRO & gram-negative infections are often nosocomial and related to multiple care transfers, long transport times & longer hospital stays
• Fungal infections are more common with blast injuries and must be monitored for closely
References: