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Emergency Preparedness and Response

Emergency Wound Management for Healthcare Professionals

(NOTE: See also Emergency Wound Care After a Natural Disaster (/disasters/woundcare.asp) .)

The risk for injury during and after a natural disaster is high. Tetanus (/disasters/disease/tetanus.asp) is a potential health threat for persons who sustain wound injuries. Tetanus is a serious, often fatal, toxic condition, but is virtually 100% preventable with vaccination. Any wound or rash has the potential for becoming infected and should be assessed by a health-care provider as soon as possible.

These principles can assist with wound management and aid in the prevention of amputations. In the wake of a flood disaster resources are limited. Following these basic wound management steps can help prevent further medical problems.

Evaluation

- Ensure that the scene is safe for you to approach the patient, and that if necessary; it is secured by the proper authorities (police, fire, civil defense) prior to patient evaluation.
- Observe universal precautions, when possible, while participating in all aspects of wound care.
- Obtain a focused history from the patient, and perform an appropriate examination to exclude additional injuries.

Treatment

- Apply direct pressure to any bleeding wound, to control hemorrhage. Tourniquets are rarely indicated since they may reduce tissue viability.
- Examine wounds for gross contamination, devitalized tissue, and foreign bodies.
- Remove constricting rings or other jewelry from injured body part.
- Cleanse the wound periphery with soap and sterile water or available solutions, and provide anesthetics and analgesia whenever possible.
- Irrigate wounds with saline solution using a large bore needle and syringe. If unavailable, bottled water is acceptable.
- Leave contaminated wounds, bites, and punctures open. Wounds that are sutured in an unsterile environment, or are not cleansed, irrigated, and debrided appropriately, are at high risk for infection due to contamination. Wounds that are not closed primarily because of high risk of infection should be considered for delayed primary closure by experienced medical staff using sterile technique.
- Remove devitalized tissue and foreign bodies prior to repair as they may increase the incidence of infection.
- Clip hair close to the wound, if necessary. Shaving of hair is not necessary, and may increase the chance of wound infection.
- Cover wounds with dry dressing; deeper wounds may require packing with saline soaked gauze and subsequent coverage with a dry bulky dressing.
- If wound infections develop see "**Guidance for Management of Wound Infections** (#guidance) " (below).
- Follow tetanus prophylaxis guidelines (http://www.cdc.gov/ncidod/diseases/submenus/sub_tetanus.htm) for all wounded patients.
- Follow tetanus prevention (/disasters/disease/tetanus.asp) guidelines.

Other Considerations

- Be vigilant for the presence of other injuries in patients with any wounds.
- Ensure adequate referral, follow-ups, and reevaluations whenever possible.
- Dirty water and soil and sand can cause infection. Wounds can become contaminated by even very tiny amounts of dirt.
- Puncture wounds can carry bits of clothing and debris into wound resulting in infection.
- Crush injuries are more susceptible to infection than wounds from shearing forces.

Guidance for Management of Wound Infections

Most wound infections are due to staphylococci and streptococci. This would likely hold true even in the post-hurricane setting.

- For initial antimicrobial treatment of infected wounds, beta-lactam antibiotics with anti-staphylococcal activity (cephalexin, dicloxacillin, ampicillin/sulbactam etc.) and clindamycin are recommended options.
- Of note, recently an increasing number of community associated skin and soft tissue infections appear to be caused by methicillin-resistant *Staphylococcus aureus* (MRSA). Infections caused by this organism will not respond to treatment with beta-lactam antibiotics and should be considered in patients who fail to respond to this therapy. Treatment options for these community MRSA infections include trimethoprim-sulfamethoxazole (oral) or vancomycin (intravenous). Clindamycin is

also a potential option, but not all isolates are susceptible.
- Incision and drainage of any subcutaneous collections of pus (abscesses) is also an important component of treating wound infections.

Special Considerations Related to Contamination of Wounds by Water

Contamination of wounds with water (fresh or sea water) can lead to infections caused by waterborne organisms. Though infections with these organisms are uncommon, even after floods, this possibility should be considered in patients who fail to respond to initial therapies described above. Water-borne organisms often implicated in these infections include: *Aeromonas* spp., non-cholera *Vibrio* spp. and sometimes Pseudomonas or other Gram-negative rods.

Trimethoprim/sulfamethoxazole, amoxicillin/clavulanate and newer fluoroquinolones (levofloxacin, moxifloxacin, gatifloxacin) will treat *Aeromonas* and the fluoroquinolones will also treat *Pseudomonas* and many other Gram-negative pathogens.

Clinicians should consider Vibrio as a possible causative organism of wound infections incurred in coastal waters or from contact with shellfish or marine wildlife. Vibrio vulnificus wound infections may require extensive debridement and mortality can be high. These infections often manifest with bullous lesions that may be hemorrhagic. Persons with underlying hepatic disease or other immunocompromising illness are at highest risk of Vibrio vulnificus infection. When this infection is suspected, the recommendation is that patients be treated with a combination of ceftazidime and doxycycline.

Source:

6th Edition Emergency Medicine: A Comprehensive Study Guide, 2004
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