ISSUES IN CLINICAL MANAGEMENT:
Antibiotic Prophylaxis in Acute Wounds

D. Heath Stacey, MD

D. Heath Stacey, MD is a plastic surgeon in private practice in Northwest Arkansas. His clinical interests include breast reconstruction, complex abdominal reconstruction, lower extremity reconstruction, breast and body contouring, and facial aesthetic surgery.

Acute wounds to soft tissue may damage skin, subcutaneous tissue, fascia, and muscle; these wounds are typically managed within the first few hours after injury has occurred. Controversies over when to prescribe antibiotic prophylaxis for these wounds exist, and the purpose of this discussion is to review the indications for use of antibiotic prophylaxis in acute wounds.

The keys to managing acute wounds are adequate sharp debridement to remove all devitalized tissue and irrigation of any contamination to prevent infection. Crush and avulsion injuries tend to need greater debridement of devitalized tissue. Heavily contaminated wounds need higher-pressure irrigation using a 10- to 50-mL syringe. The most critical determinant of preventing a post-wounding surgical site infection is administering an antibiotic 1 hour before the wound occurs. Evidence also suggests that administering an antibiotic within 3 hours will be beneficial in lowering the bacterial burden and preventing infection. After the 3-hour window, there is likely no benefit.[1] A single dose of an antibiotic, usually a first-generation cephalosporin, is given within the 3-hour window after injury. In penicillin-allergic patients, clindamycin or an aminoglycoside may be chosen. A variety of topical antimicrobials and antimicrobial dressings are available. Some evidence supports using a topical antimicrobial for a traumatic laceration as a barrier to bacterial penetration.[2]

Special circumstances that must be considered include human bites, dog bites, bone or joint involvement, traumatic amputations, and wounds in patient with comorbidities or immunosuppression. Rubin et al performed a study of 58 patients with fingertip amputations randomized into two groups.[3] One group received a prophylactic antibiotic course, and the second group received no antibiotics. No infections were reported in either group, and the authors concluded that prophylactic antibiotics are not necessary in these wounds if they are adequately treated surgically. Evidence supports antibiotic prophylaxis in wounds caused by human, cat, or dog bites.[4] The initial intravenous antibiotic is typically ampicillin-sulbactam 3 gm, with a 3- to –5 day course of amoxicillin-clavulanate, 875 mg, orally bid given for postsurgical care. Antibiotics chosen for penicillin-allergic patients are moxifloxacin, 400 mg, orally qd, or clindamycin, 300 mg, orally tid plus ciprofloxacin, 500 mg, orally qd.

Acute soft tissue wounds involving open fractures, typically open Gustilo grade 3 tibial fractures, also require antibiotic prophylaxis.[4] Keys to management are irrigation, sharp debridement, and possible delayed wound closure. The antibiotic chosen for prophylaxis is a first-generation cephalosporin that is continued until 48 hours after wound closure.

References:
1. Burke JF. The effective period of preventive antibiotic action in experimental incisions and dermal lesions. Surgery. 1961;50:161-8.
2. Smack DP, Harrington AC, Dunn C, et al. Infection and allergy incidence in ambulatory surgery patients using white petrolatum vs bacitracin ointment. A randomized controlled trial. JAMA. 1996;276(12):972-7.
3. Rubin G, Orbach H, Rinott M, et al. The use of prophylactic antibiotics in treatment of fingertip amputation: a randomized prospective trial. Am J Emerg Med. 2015;33(5):645-7.
4. Enzler MJ, Berbari E, Osmon DR. Antimicrobial prophylaxis in adults. Mayo Clin Proc. 2011;86(7):686-701.