

## Costs of Care for Low-Energy Extremity Gunshot Injuries Are Reduced with Standardized Treatment

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**Purpose:** Civilian low-energy gunshot wounds (GSWs) are common and generate substantial morbidity. Previous work demonstrated that limiting antibiotics to a single intravenous (IV) dose, without formal debridement in the operating room, effectively mitigates the risk of infection after extremity GSW or arthrotomy secondary to GSW. The goals of the current study were to determine treatment costs associated with isolated low-energy GSWs to the extremity and to estimate cost savings associated with a single-dose antibiotic strategy.

**Methods:** The registry at an urban Level-I trauma center was queried for low-energy GSWs over 4 years. A series of 380 patients with extremity-only GSW were reviewed. Treatment was recorded including type and duration of antibiotics. Costs were calculated including facility services in the emergency department, operating room, and hospital. Direct expenses had fixed and variable components for staffing (nonphysician) salaries, benefits, and other expenses, and medical supplies. Indirect expenses included overhead costs for personnel and facilities. Professional services were not included.

**Results:** There were 460 GSWs in 380 patients with mean age was 30.3 years; 95.3% were male. The rate of infections requiring IV antibiotics or surgical debridement was 1.3%. There were 309 admissions, 273 operations performed, and 1010 days of antibiotics prescribed. The estimated total facility cost to treat all patients was \$1,801,554; this translated to \$3916/GSW and \$4741/patient. In contrast, treating patients with a single dose of antibiotics would cost \$77/patient with all costs incurred in the emergency department. Excluding patients with fracture fixation, compartment syndromes, vascular and or nerve repairs, there were 108 unnecessary admissions, 26 unnecessary debridement surgeries, and 630 days of unnecessary antibiotics, oral and/or IV, for uncomplicated GSWs. Besides eliminating invasive procedures, the single-dose antibiotic protocol would save the health-care system \$187,879 in actual expenses (\$46,970/year), not including additional costs related to orthopaedic and other professional services.

**Conclusion:** The cost of gunshot-related medical treatment to our trauma center is high. Actual charges were not determined but would be much higher and would also include professional charges. Notably, this population has a large proportion of uninsured and Medicaid patients, effectively shifting monetary costs directly to the hospital. Limiting antibiotics to a single IV dose in the emergency room can reduce treatment expenses substantially, while maintaining a low infection rate after extremity GSW.