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“A National Analysis of Hospital Readmissions and Associated Costs in Chronic Osteomyelitis Across Age, Sex, and Socioeconomic Status”

BACKGROUND: Chronic osteomyelitis is a persistent bone infection that may develop following the traumatic or iatrogenic introduction of bacteria into bone tissue. Chronic osteomyelitis remains challenging to treat because of bacterial defenses like biofilm formation and immune evasion. The standard management of chronic osteomyelitis involves the prolonged use of antibiotic therapy with or without surgical debridement; however, the recurrence of infection and subsequent hospital readmission for previously discharged patients remains a relevant concern. Apart from the risk to the patient's well-being, these readmissions may contribute substantially to healthcare utilization and costs. Understanding whether readmission rates for chronic osteomyelitis differ across demographic groups could identify populations at greater risk of readmission and be used to inform strategies to prevent unnecessary healthcare costs. The Nationwide Readmissions Database (NRD), a part of the Healthcare Cost and Utilization Project (HCUP), serves as an archive of hospital inpatient stays that can be used to estimate national hospital readmission rates. Using the NRD, this study aims to examine the characteristics and associated costs of 7- and 30-day readmissions among patients with chronic osteomyelitis by age, sex, and socioeconomic status.

OBJECTIVES: The primary objective of this study is to describe characteristics and costs associated with 7- and 30-day hospital readmission rates among patients with index admission where osteomyelitis is the primary admission diagnosis.

METHODS: This retrospective study used publicly available data from the Nationwide Readmissions Database (NRD), a part of the Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality. Adult patients readmitted with primary International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) diagnosis codes for osteomyelitis were queried for readmissions to participating hospitals at 7 days and 30 days post discharge from an index stay for osteomyelitis treatment between 2018 and 2022. Readmission rates and associated treatment costs were stratified by age, sex, and patient community-level income.

RESULTS: All cause-readmission rates per 100,000 persons during 2022, the final year of included analysis, were 14.03 at 30-days and 5.05 at 7-days. Comparatively, readmissions for treatment of osteomyelitis ranged from 4.31-4.53 at 30-days and 2.06-2.33 at 7-days. Stratified by patient characteristics, patients with a 7-day readmission were all male and represented in

age range 18-44 years old. 30-day readmission rates were also higher in this age bracket, ranging from 8.02-8.39, compared to older patients (4.2-4.71). 30-day readmission rates were similar between males and females but higher in patients with lower income bracket (4.94-5.43 versus middle income 3.88-4.33). No patients in high income bracket were identified as having a readmission. Average cost of treatment at readmission at 7-days was \$16-17,000 and at 30 days \$18-20,000.

CONCLUSIONS: While readmission following treatment of osteomyelitis occurs at a lower rate than all cause inpatient hospital readmissions, the treatment costs are high and populations differences in rates evident in male patients and lower income patients may help identify patients most at risk.