Δ **Do We Really Understand the Patient Populations in Database Research:
A Comparison of Femoral Shaft Fracture Patients in Three Commonly
Used National Databases**

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**Purpose:** Use of national databases has increased dramatically in the field of orthopaedics and orthopaedic traumatology. However, with the multitude of databases now being used to draw clinical conclusions, there has been little study of the differences in populations contained in various databases. The aim of the current study is to compare the populations of patients with femoral shaft fractures, a common high-energy orthopaedic injury, in three commonly used national clinical databases, in terms of age, comorbidities, and adverse events.

**Methods:** Patients with surgically managed femoral shaft fractures were identified in the Nationwide Inpatient Sample (NIS), National Surgical Quality Improvement Program (NSQIP), and National Trauma Data Bank (NTDB). Age, Charlson comorbidity index (CCI), individual comorbidities, and inpatient adverse events were compared between databases.

**Results:** The distributions of age (Figure) and CCI suggest a predominantly older population with more preexisting comorbidities in NSQIP (age [mean ± standard deviation] = 71.5 ± 15.6, CCI = 4.9 ± 1.9), and a younger population with fewer preexisting comorbidities in NTDB (age = 45.2 ± 21.4, CCI = 2.1 ± 2.0). Bimodal distributions in the NIS population suggest it includes a more mixed population (age = 56.9 ± 24.9, CCI = 3.2 ± 2.3). Differences in age and CCI were all statistically significant (P <0.001). Differences in outcomes were also observed in the different database populations. In fact, the rate of adverse events varied from 21.6% in NIS to 9.1% in NSQIP (P <0.001). Further, the rate of serious adverse events (death, cardiac arrest, myocardial infarction, stroke, thromboembolic event, or surgical site infection) varied from NTDB (7.4%) to NIS (5.1%); P <0.001. Considering individual adverse events, the rate of thromboembolic events ranged from 4.2% in NTDB to 1.1% in NSQIP (P <0.001). The rate of pneumonia ranged from 4.3% in NTDB to 1.5% in NSQIP (P <0.001). The rate of urinary tract infection ranged from 12.1% in NIS to 2.8% in NTDB (P <0.001).

**Conclusion:** Differences in populations contained in commonly used national databases are not always readily apparent. Care must be taken to fully understand these populations before performing or evaluating database research, as these differences clearly affect observed outcomes.
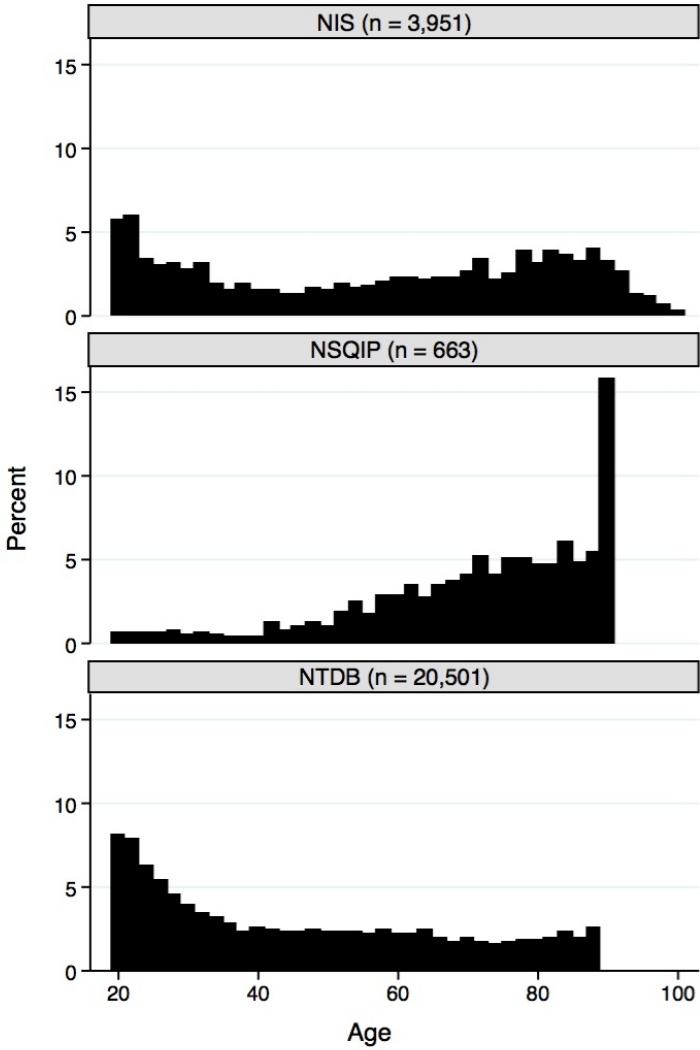
The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.