

### Persistent Opioid Usage Following Hip Fracture Surgery in Opioid-Naïve Older Patients

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**Purpose:** While the risk of long-term dependence following opioid treatment of musculoskeletal injury is often studied in younger populations, most studies of opioids in older patients have centered on short-term risks such as oversedation and delirium. The purpose of this study was to assess the prevalence of, and risk factors for, prolonged opioid usage following hip fracture in opioid-naïve older individuals.

**Methods:** This was a retrospective cohort study of opioid-naïve patients aged ≥60 years who underwent surgical treatment of a hip fracture at 1 of 35 hospitals owned by a large US health maintenance organization (2009-2018). Postoperative outpatient opioid use was evaluated in the following time periods: P1 (day 0-30 post-surgery), P2 (day 31-90), and P3 (day 91-180). The primary outcome was prolonged outpatient opioid use, defined as having 1 or more opioid prescriptions dispensed in all 3 time periods (P1, P2, and P3). Multivariable logistic regression was performed while adjusting for potential confounders.

**Results:** 29,618 opioid-naïve patients underwent surgical treatment of a hip fracture during the study period. Of patients who were alive during the time period in question, the proportion of outpatient opioid usage was 83.7% (24,776 / 29,618) in P1, 69.0% (19,380 / 28,068) in P2, and 16.7% (4435 / 26,481) in P3. In the multivariable analysis controlling for confounders, risk factors for prolonged opioid usage included young age (60-69 years), female sex, body mass index ≥30 kg/m<sup>2</sup>, current/former smoking, American Society of Anesthesiologists classification ≥3, and a history of substance abuse. Prolonged opioid usage was less common among patients who were Asian, had an annual income ≥\$150,000, or had undergone regional anesthesia.

**Conclusion:** In this study, 1 in 6 elderly hip fracture patients were still taking opioid pain medications at 3 to 6 months postoperatively. While prior research on the hazards of opioids in the elderly has primarily focused on short-term risks such as oversedation and delirium, these findings suggest that addiction and chronic opioid use may represent risks for this older population as well.

Table: Risk factors for persistent opioid usage following hip fracture surgery (N=26,481)

| Characteristic         | Crude incidence of persistent opioid use | Multivariable Odds Ratio (95% CI) | P       |
|------------------------|--|-----------------------------------|---------|
| Age                    |  |                                   |         |
| 60-69                  | 19.2% (687/3574)                         | 1.24 (1.11-1.38)                  | <0.0001 |
| 70-79                  | 17.6% (1200/6818)                        | 1.05 (0.97-1.14)                  | 0.24    |
| 80-89*                 | 16.3% (1846/11,346)                      | 1.00                              | ---     |
| 90 or older            | 14.8% (702/4743)                         | 0.94 (0.86-1.04)                  | 0.24    |
| Sex                    |  |                                   |         |
| Female                 | 17.3% (3286/19,053)                      | 1.24 (1.14-1.34)                  | <0.0001 |
| Male*                  | 15.5% (1149/7428)                        | 1.00                              | ---     |
| Race/ethnicity**       |  |                                   |         |
| Asian                  | 10.9% (252/2307)                         | 0.66 (0.57-0.76)                  | <0.0001 |
| Black                  | 19.7% (213/1083)                         | 1.10 (0.93-1.29)                  | 0.27    |
| Hispanic               | 16.8% (423/2521)                         | 0.91 (0.81-1.02)                  | 0.10    |
| White*                 | 17.2% (3510/20,366)                      | 1.00                              | ---     |
| Income                 |  |                                   |         |
| Less than \$25,000     | 17.6% (740/4212)                         | 1.04 (0.65-1.68)                  | 0.86    |
| \$25,000-\$49,999      | 17.6% (906/5154)                         | 1.53 (0.86-2.73)                  | 0.15    |
| \$50,000-\$74,999*     | 17.3% (777/4487)                         | 1.00                              | ---     |
| \$75,000-149,999       | 16.6% (133/7809)                         | 1.25 (0.77-2.02)                  | 0.37    |
| \$150,000 or more      | 15.0% (669/4457)                         | 0.56 (0.37-0.83)                  | 0.004   |
| Body mass index        |  |                                   |         |
| Less than 22           | 15.6% (1466/9411)                        | 1.02 (0.93-1.11)                  | 0.70    |
| 22-24.9*               | 15.7% (1124/7145)                        | 1.00                              | ---     |
| 25-29.9                | 17.7% (1255/7091)                        | 1.07 (0.98-1.18)                  | 0.12    |
| 30 or more             | 22.1% (581/2634)                         | 1.15 (1.00-1.33)                  | 0.047   |
| ASA classification     |  |                                   |         |
| 1-2*                   | 14.3% (1111/7797)                        | 1.00                              | ---     |
| 3 or greater           | 18.0% (3043/16,880)                      | 1.16 (1.01-1.16)                  | <0.0001 |
| Smoking status         |  |                                   |         |
| Current/former         | 18.8% (2115/11,271)                      | 1.08 (1.01-1.16)                  | 0.033   |
| Never*                 | 15.6% (2271/14,539)                      | 1.00                              | ---     |
| Anxiety                |  |                                   |         |
| Yes                    | 20.4% (587/2872)                         | 1.07 (0.96-1.19)                  | 0.20    |
| No*                    | 16.3% (3848/23,609)                      | 1.00                              | ---     |
| Depression             |  |                                   |         |
| Yes                    | 21.7% (369/1700)                         | 1.13 (0.99-1.29)                  | 0.08    |
| No*                    | 16.4% (4066/24,781)                      | 1.00                              | ---     |
| Substance abuse        |  |                                   |         |
| Yes                    | 24.4% (461/1891)                         | 1.18 (1.03-1.35)                  | 0.015   |
| No*                    | 16.2% (3974/24,590)                      | 1.00                              | ---     |
| Surgery type**         |  |                                   |         |
| Fracture fixation      | 17.7% (2794/15,796)                      | 1.12 (1.05-1.21)                  | 0.001   |
| Hemiarthroplasty*      | 15.6% (1488/9542)                        | 1.00                              | ---     |
| Total hip arthroplasty | 13.1% (94/717)                           | 0.78 (0.62-0.98)                  | 0.036   |
| Anesthesia type        |  |                                   |         |
| Regional               | 15.6% (1736/11,117)                      | 0.92 (0.86-0.99)                  | 0.022   |
| General*               | 17.6% (2681/15,222)                      | 1.00                              | ---     |

Analysis excludes 3137 patients who died prior to Q2. The following variables had missing data: BMI (n=9; 0.0%), smoking status (n=49; 0.2%), ASA (n=281; n=1.1%), anesthesia type (n=18; 0.1%).

\*Reference group.

\*\*Excludes 37 patients with race/ethnicity classified as other and 59 patients with surgery type classified as other.

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.

PAPER ABSTRACTS