

An Analysis of the Burden of Illness and Treatment in Knee Osteoarthritis in a U.S. Administrative Claims Database

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Background

- Knee osteoarthritis (OA) is the most common type of OA
- It is associated with aging and its prevalence will rise with the aging population¹
- It results in damage to the articular cartilage and underlying bone²
- It is a leading cause of chronic pain and disability³
- The treatment strategy is multi-modal; currently, pharmacologic therapies only target pain relief, which carry concomitant safety risks
- The objective of this study was to describe knee OA prevalence, comorbidities, treatment trends, and associated all-cause and knee-OA-related healthcare utilization/costs in the U.S.

Methods

- The IBM Watson Health MarketScan® Research Databases from 2013-2018 were used to identify knee OA patients (Figure 1)
- Knee OA prevalence in 2017 was calculated as the number of patients with a knee OA diagnosis divided by the total number of patients with continuous enrollment in 2017
- The Deyo-Charlson Comorbidity Index (DCI) was used to assess patients' overall burden of disease⁴
- All-cause (knee-OA-related claims as well as all other medical and pharmacy claims) and knee-OA-related (any claim with a diagnosis of knee OA) healthcare utilization and costs were measured during the follow-up period
- Number of patients prescribed medications commonly used for pain alleviation among knee OA patients (corticosteroids [any form], hyaluronic acid, NSAIDs, and longer-term opioids [> 30 -day supply]) and their costs were assessed in the follow-up period
- Costs were estimated as per-patient-per-year (PPPY) to account for the variable-length follow-up period
- Categorical variables were summarized with counts and percentages; continuous variables were summarized with mean and standard deviations

Results

Figure 2. PPPY All-Cause and Knee-OA-Related Healthcare Costs

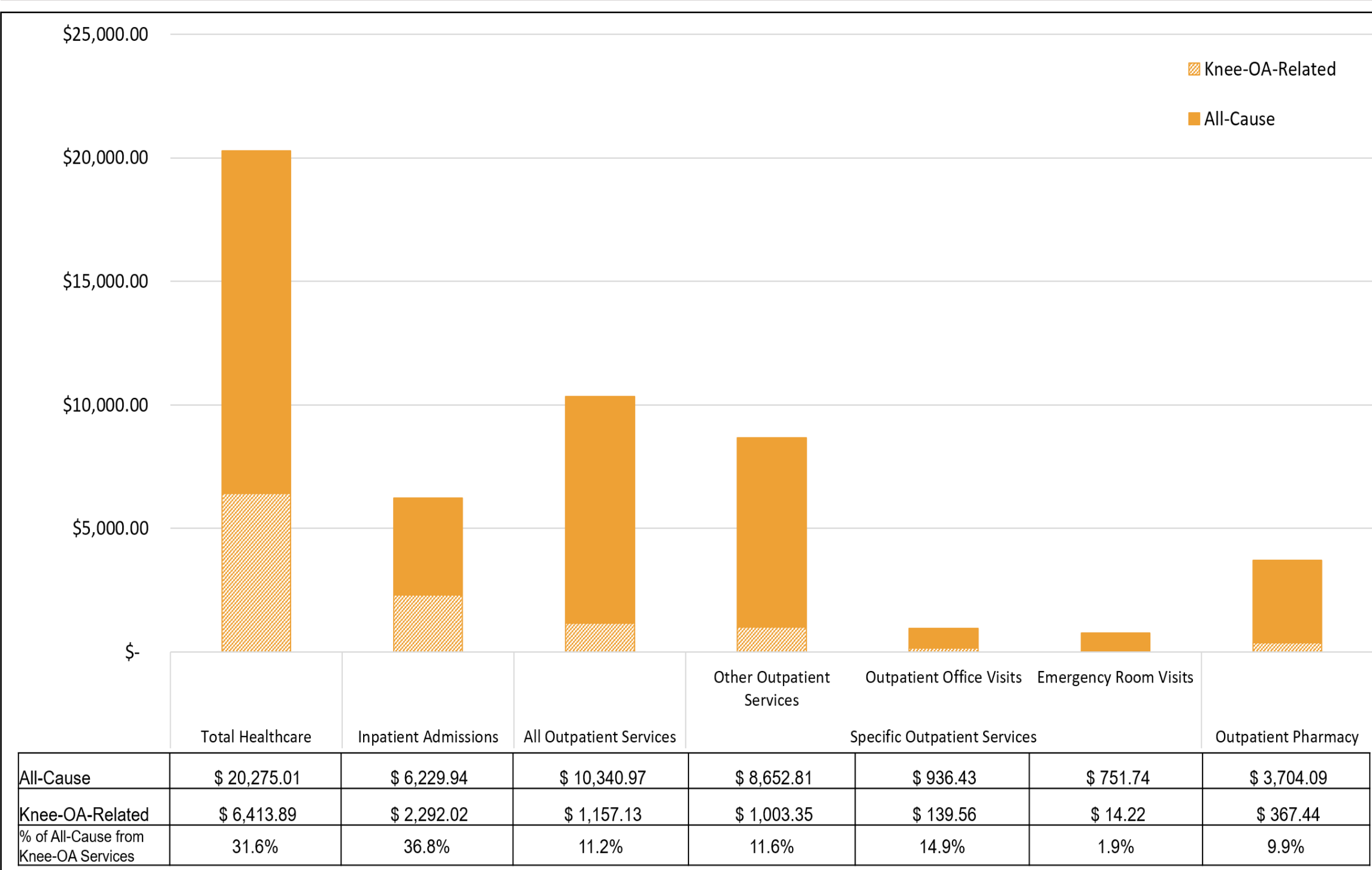


Figure 3. Medication-Specific Costs Among Patients Prescribed Medication in the Variable-Length Follow-Up Period

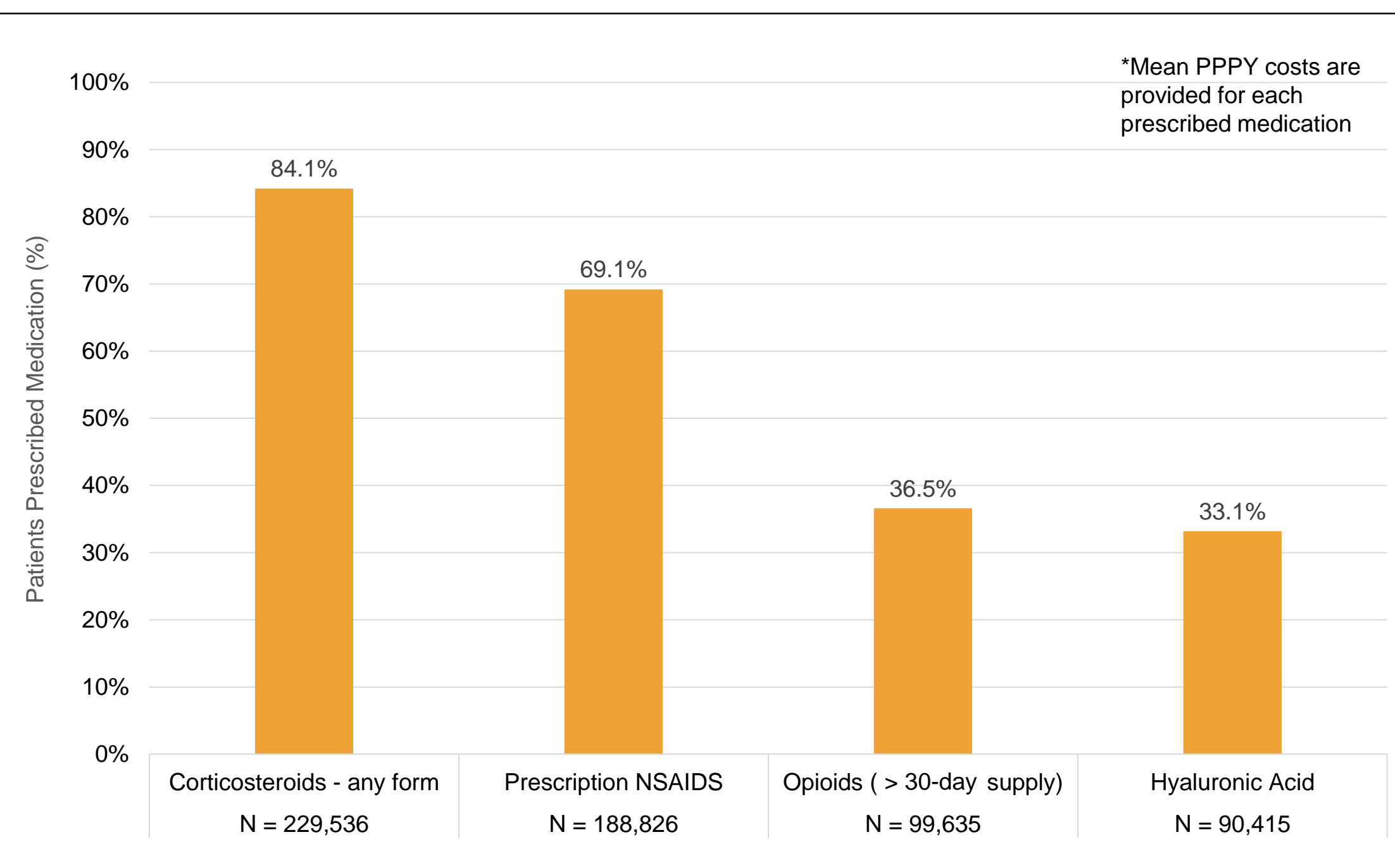
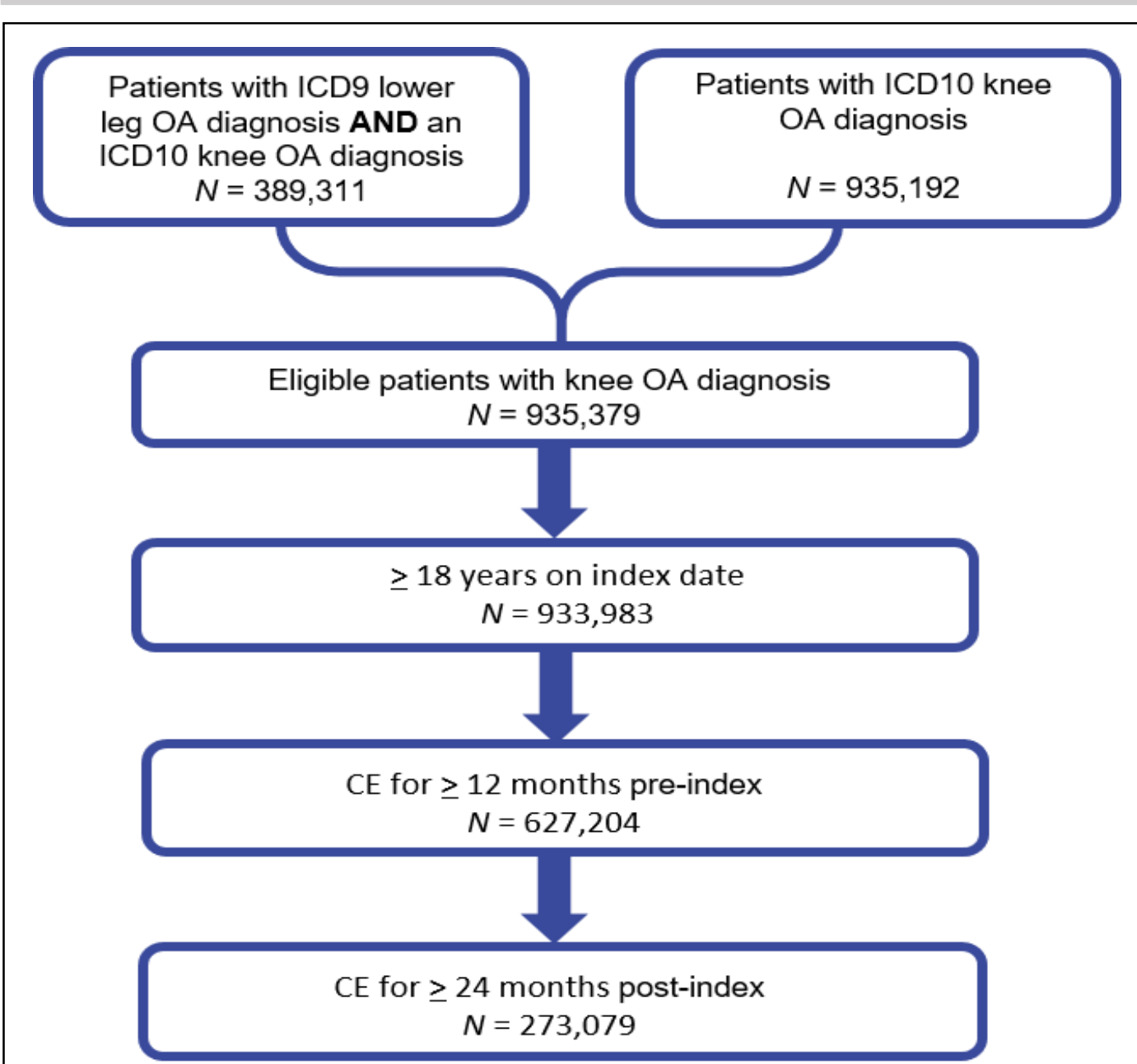


Figure 1. Patient Selection



- 273,079 patients met the study selection criteria (Figure 1)
- The estimated 2017 prevalence in the eligibility-matched cohort was 5.0% among patients ≥ 18 years old and 14.3% among patients ≥ 60 years old
- 61.6% of the sample was female and the average age was 60.6 years (SD: 11.89, Range: 18-103)
- 66.9% of patients had commercial health insurance, 33.1% had employer-provided Medicare supplemental insurance
- Average follow-up time was 3.08 years (SD: 1.24, Range: 0.6-5.75)
- The average Deyo-Charlson Comorbidity Index (DCI) was 0.86 ± 1.4 . Mild or moderate diabetes (0.18 ± 0.00) and COPD (0.14 ± 0.00) contributed most to the comorbidity burden of knee OA patients at baseline
- The proportion of patients with all-cause utilization that had ≥ 1 knee-OA-related claim was 100%, 49.1%, and 91.1% for outpatient, inpatient, and pharmacy services, respectively
- Knee OA patients had a total average annual healthcare cost of \$20,275, comprised of outpatient services (50.0%), inpatient admissions (30.7%), and outpatient prescriptions (18.3%) (Figure 2)
- Opioids (> 30-day supply) and hyaluronic acid were prescribed to 36.5% and 33.1% of patients, respectively (Figure 3)

Conclusions

- Healthcare utilization is frequent among knee OA patients with $> 90\%$ having outpatient visits and pharmacy claims
- The PPPY healthcare cost of knee OA is substantial, making up almost a third of all-cause costs
- A considerable percentage of patients received longer-term opioids
- Humanistic and economic considerations in terms of societal and financial burden of knee OA in relation to other chronic pain conditions warrant further research to evaluate the significance of these findings

Limitations

- Patients with knee OA often seek over-the-counter pain relief prior to seeing healthcare providers and/or receiving prescription medication; therefore, the true cost of the disease is likely to be underrepresented by claims
- As with all claims data, there is a potential for misclassification from diagnostic coding errors, potentially resulting in misclassification of knee OA status, comorbidity burden, and study outcomes

References

1. Turkiewicz A, et al. *Osteoarthritis and Cartilage*. 2014;22(11):1826-32.
2. Sinusas K. *Am Fam Physician*. 2012;85(1):49-56.
3. Cross M, et al. *Ann Rheum Dis*. 2014;73(7):1323-30.
4. Deyo RA, et al. *J Clin Epidemiol*. 1992;45(6):613-19.

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