Postoperative Opioid Prescribing Patterns Across Surgical Procedures: A Pareto Analysis of the ACS NSQIP Database

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The question

Discharge prescriptions often exceed what patients use, and 3–10% of opioid-naive patients develop persistent use.

Which procedures drive most discharge opioid burden, and are blocks associated with smaller prescriptions?

Methods

Data
2024 ACS NSQIP, 656 hospitals

Cohort
elective adults discharged on an oral opioid with complete dosing

Outcome
total discharge MME (CDC 2022 conversion)

Exposure
regional or epidural adjunct, from the "additional anesthesia" field

Analysis
Pareto analysis of total MME by CPT code (cumulative share, Gini coefficient); adjusted linear models in 4 orthopedic procedures

963,565 NSQIP cases
786,346 elective
579,383 discharged on opioid
338,857 analyzed

Excluded 240,526: incomplete dosing, non-oral forms, or implausible doses.

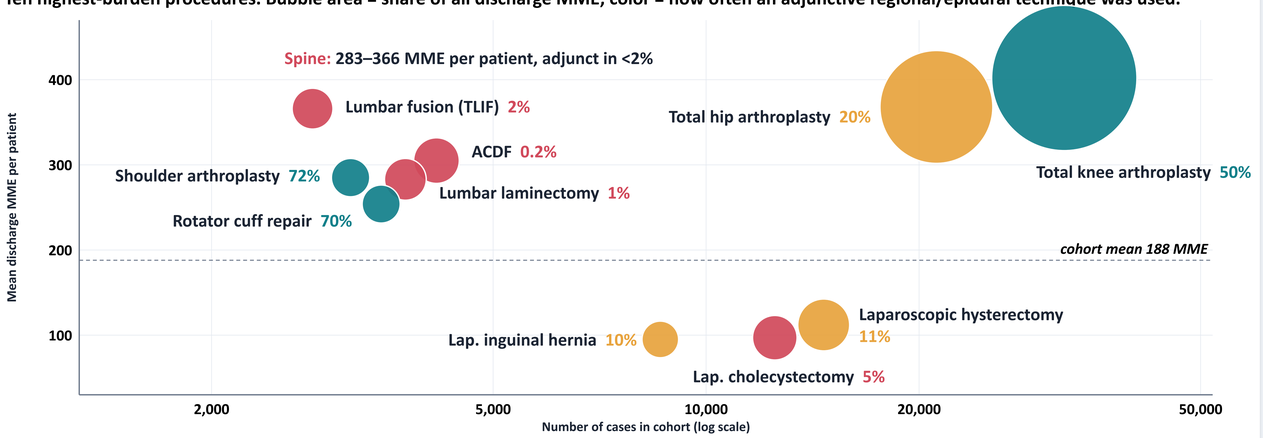
14
of 2,042 procedures
= half of discharge MME

Discharge opioids follow a Pareto pattern: 0.7% of procedures produced half of all MME and 4.5% produced 80%. Regional adjuncts were associated with smaller orthopedic prescriptions, yet spine surgery almost never received one.

338,857 elective patients · 63.8 million MME · Gini 0.92 · orthopedics + neurosurgery: 58% of MME from 34% of cases

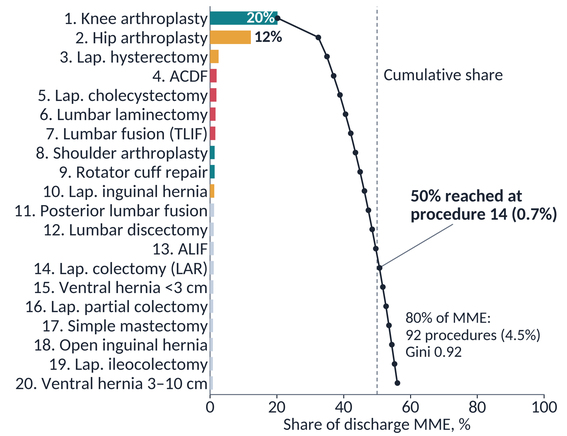
Where the opioids are vs. where the blocks are

Ten highest-burden procedures. Bubble area = share of all discharge MME; color = how often an adjunctive regional/epidural technique was used.



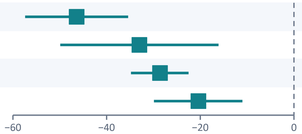
Pareto analysis

Top 20 procedures. Bar color = adjunct use, as at left (grey = not analyzed).



Adjusted difference in discharge MME with an adjunct

	Difference, MME (95% CI)	% mean	Median no→yes
Rotator cuff repair	−46.4 (−57.4 to −35.4)	18%	225 → 210
Shoulder arthroplasty	−33.0 (−49.9 to −16.1)	12%	280 → 225
Knee arthroplasty	−28.6 (−34.8 to −22.5)	7%	315 → 315
Hip arthroplasty	−20.4 (−29.9 to −11.0)	6%	300 → 300



Adjusted for age, sex, ASA III–IV, inpatient status, principal anesthetic, operative time, diabetes, hypertension, COPD, and heart failure. Exploratory; not corrected for multiple comparisons.

Conclusion

Burden follows a Pareto pattern. 14 of 2,042 procedures produced half of all discharge MME; knee and hip arthroplasty alone, one third.

Adjuncts tracked with less, but medians held. Adjuncts were associated with lower discharge MME; knee and hip medians were unchanged.

Spine is the gap. High opioid intensity, yet the lowest use of adjunct regional anesthesia.

MME, morphine milligram equivalents; ACDF, anterior cervical discectomy and fusion; TLIF, transforaminal lumbar interbody fusion.

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