Insurance Status and Opioid Prescribing Patterns in the ED for Acute Non-Traumatic Abdominal Pain: Implications for Health Equity

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"Making Waves" 25th Annual Pain Medicine Meeting
November 5-7, 2026 | Tampa, Florida

INTRODUCTION

Insurance status influences healthcare access and quality, contributing to persistent health inequities in the United States.[1] Uninsured and publicly insured patients often receive less adequate pain management in the emergency department (ED) despite similar clinical presentations.[2,3] Patients with public insurance are less likely to receive analgesics, including opioids, in the ED than privately insured patients, even with similar pain severity.[4] Acute non-traumatic abdominal pain is a common ED complaint requiring equitable pain management strategies.[5]

This study evaluates opioid and analgesic prescribing patterns in adults presenting to the ED with acute non-traumatic abdominal pain, stratified by insurance status, to understand how systemic factors influence analgesic delivery.

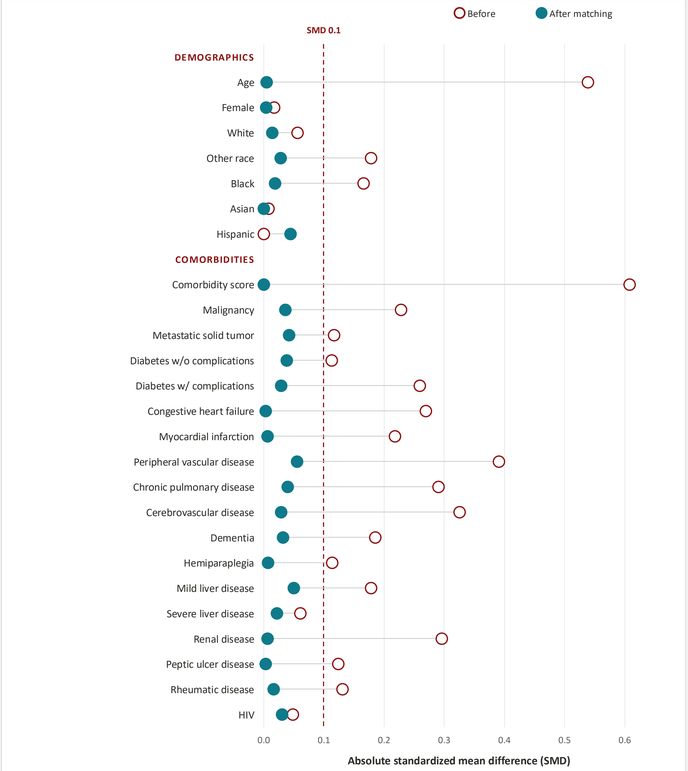
MATERIALS AND METHODS

- Retrospective cohort study of adults aged 18–90 presenting to the ED with acute non-traumatic abdominal pain, January 1, 2015 – December 27, 2024.
- Data source: the Apollo Dataset (de-identified national EHR with linked claims) within Atropos Health's Evidence Network.
- Excluded: surgical or trauma-related diagnoses, and any inpatient hospitalization within one week of the ED visit.
- Exposure: public insurance (Medicare, Medicaid). Comparator: private insurance.
- Primary outcomes: receipt of any opioid and of specific opioids (morphine, oxycodone, hydromorphone, fentanyl), IV and PO.
- Secondary outcomes: NSAIDs, acetaminophen, and ketamine administered during the ED visit.
- Propensity score matching balanced the groups on age, gender, race/ethnicity, and comorbidity burden to address confounding.
- IRB: devoid of patient-identifiable information, this study was exempt from IRB review.

RESULTS

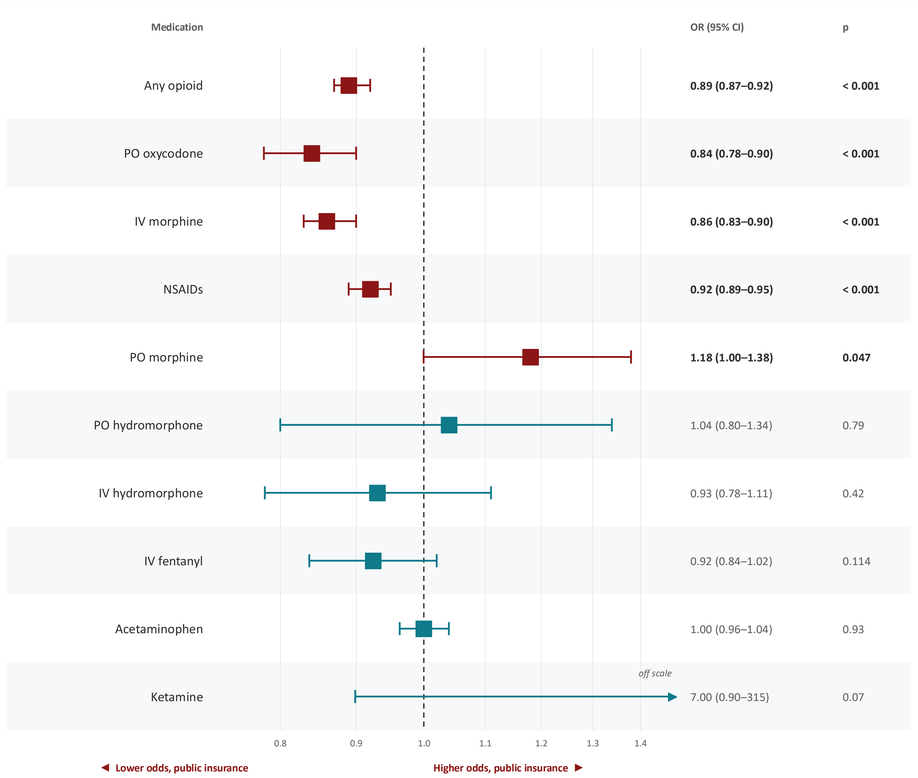
- 132,190 ED encounters analyzed (public 32,190; private 100,000). Before matching, publicly insured patients were older (mean 53.4 vs. 43.1 years), more often Black (16% vs. 10%), and carried double the comorbidity burden (mean score 4.1 vs. 2.0); sex (67% vs. 66% female) and Hispanic ethnicity (5.8% vs. 5.8%) were comparable.
- Matching produced 30,722 matched pairs — 95% of the public cohort — balancing all 25 covariates to SMD < 0.06 (Figure 1).
- After matching, publicly insured patients had significantly lower odds of receiving any opioid (OR 0.89), PO oxycodone (OR 0.84), IV morphine (OR 0.86), and NSAIDs (OR 0.92); all p < 0.001. Conversely, they had higher odds of receiving PO morphine (OR 1.18, p = 0.047). No significant differences were found for hydromorphone, fentanyl, acetaminophen, or ketamine (Figure 2).

FIGURE 1. COVARIATE BALANCE



Calculated from cohort balance tables. Values left of the dashed 0.1 threshold indicate adequate balance; all 25 covariates met this criterion after matching (maximum SMD 0.055).

FIGURE 2. ODDS OF ANALGESIC ADMINISTRATION — PUBLIC VS. PRIVATE



Odds ratios after propensity score matching; the dashed reference line marks OR = 1. Red denotes statistical significance. Ketamine's confidence interval extends beyond the axis (8 events total: 7 public, 1 private), so it is drawn clipped with an arrow.

DISCUSSION

- Publicly insured patients received less pain medication than clinically matched privately insured patients.
- The opioid prescription disparity is invisible unadjusted (OR 1.04, favoring public) and emerges only after full propensity score matching (OR 0.89), because age and comorbidity independently raise analgesic use and mask the gap.
- Lower NSAID use and similar acetaminophen use did not suggest a clear substitution toward non-opioid medication; however, residual clinical differences, including renal function, may contribute
- Higher PO morphine (OR 1.18) has a CI touching 1.00; it should not be over-interpreted.

LIMITATIONS

- Incomplete IV lidocaine capture and no ability to quantify opioid dosing in morphine milligram equivalents.
- No measure of pain severity or triage acuity.
- Medicare and Medicaid are pooled as public insurance, which may mask differences between them.
- Findings are specific to non-traumatic abdominal pain and may not generalize to other ED presentations.

FUTURE DIRECTIONS

- Link discharge diagnosis and triage acuity to test whether the gap persists within like-for-like presentations such as biliary colic, nephrolithiasis, and undifferentiated pain.
- Stratify by age band to test whether the gap widens or narrows across the lifespan

CONCLUSION

Insurance status was independently associated with reduced lower odds of receiving opioid analgesics" (with lower NSAID administration as a secondary finding) in the ED for acute non-traumatic abdominal pain.

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