The Impact of Race on Postoperative Opioid, NSAID, and Acetaminophen Prescribing Patterns for Pediatric Surgery Pain Management

Johnny Dang, BA; Briana Syed, BS; Emily Kim, MS; Jazzalyn Zou, BS; Rahul Venna, BS; Denise Wilkes, MD, PhD
[1]Department of Pain Medicine, [2]Department of Anesthesiology
The University of Texas Medical Branch, Galveston, TX

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Introduction

Racial Disparities in Pain Management: Racial bias influences pain assessment and prescribing patterns, with minority patients often receiving less adequate pain management than White patients.[1]

Opioid Prescribing Concerns: Post-surgical opioid use is a key pathway to misuse in adolescents, with racial differences in prescribing linked to higher adverse outcomes among minority patients.[2]

Study Objective: Comprehensive analysis of prescribing patterns across racial groups in pediatric surgical settings remains limited. This study used TriNetX data to investigate racial differences in postoperative pain medication prescribing for pediatric surgical patients.

Methods

Study Design and Data Source: We analyzed de identified electronic medical records from 263,708 pediatric surgical patients (2000–2024) using the TriNetX platform. Two analyses were conducted: a historical analysis (2000–2024) and a recent 5-year analysis (2019–2024), comparing White and non-White patients (Black, Asian, American Indian, Hawaiian, and Other). The study received IRB exemption (UTMB #2024-0105) and followed STROBE guidelines.

Patient Selection and Cohort Definition: Eligible patients were aged 0–18 years, underwent surgery with general anesthesia, and had ≥30 days of follow-up. Cases with missing race/ethnicity data or regional anesthesia were excluded.

Procedure Classification: Procedures were identified using CPT, HCPCS, and SNOMED codes for general anesthesia cases. Codes for regional anesthesia were excluded.

Medication Outcomes: We assessed opioid, NSAID, and acetaminophen prescriptions within 30 days post-surgery.

Statistical Analysis: Prescription rates were compared using Chi-squared and Fisher's exact tests with Bonferroni correction. Significance was set at p<0.05. Analyses were conducted using R (v4.2.0).

Acknowledgements

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Results

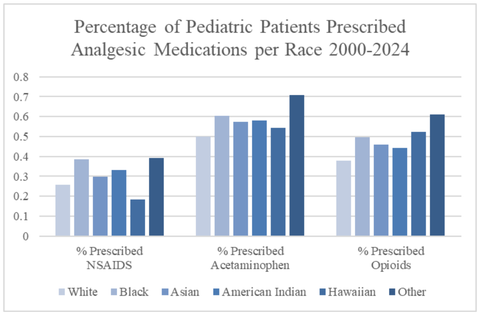

Figure 1. Racial disparities in pediatric analgesic prescribing (2000-2024). White patients received fewer analgesics compared to most non-White groups: opioids (37.77% vs 44.25-61.11%), NSAIDs (25.94% vs 29.89-39.28%, except Hawaiians at 18.44%), and acetaminophen (50.14% vs 54.49-70.71%). Significant differences persisted across most racial comparisons despite some reduction in disparities over time.

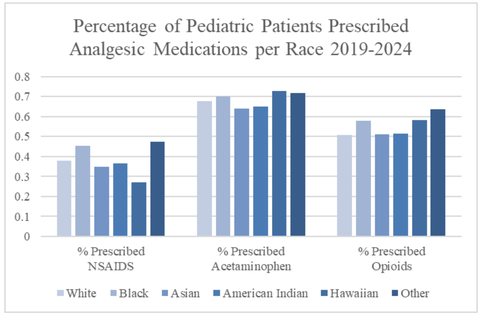

Figure 2. Racial disparities in pediatric analgesic prescribing (2019–2024). Black (58.02%) and Other race (63.69%) patients received more opioid prescriptions than White patients (50.78%), with no significant differences for Asian and American Indian patients. NSAID prescribing was higher for Black and Other race patients but lower for Asian (34.77%) and Hawaiian (26.92%) patients versus White patients (37.94%). Acetaminophen showed minimal disparities.

Race	NSAIDs (n)	Total patients (n)	Percentage prescribed (%)	p-value (NSAIDs, compared to White)	Acetaminophen (n)	Total patients (n)	Percentage prescribed (%)	p-value (Acetaminophen, compared to White)	Opioid (n)	Total patients (n)	Percentage prescribed (%)	p-value (Opioids, compared to White)
White	52157	201110	*25.935%*	<0.001	100839	201110	*50.141%*	<0.001	75964	201110	37.772%	<0.001
Nonwhite	22486	59156	*38.011%*	<0.001	37276	59156	*63.013%*	<0.001	30886	59156	52.211%	<0.001
Black	13690	35547	*38.512%*	<0.001	21448	35547	*60.337%*	<0.001	17641	35547	*49.627%*	<0.001
Asian	2060	6894	*29.881%*	<0.001	3957	6894	*57.398%*	<0.001	3165	6894	*45.909%*	<0.001
American Indian	315	947	*33.263%*	<0.001	550	947	*58.078%*	<0.001	419	947	*44.245%*	<0.001
Hawaiian	111	602	18.44%	<0.001	328	602	*54.485%*	0.169	315	602	*52.326%*	<0.001
Other	6616	16843	*39.280%*	<0.001	11909	16843	*70.706%*	<0.001	10292	16843	*61.106%*	<0.001

Table 1. Medication prescription rates across races (2000-2024). Differences in NSAID and opioid prescription rates were statistically significant across all races (p<0.001). Differences in acetaminophen prescription rates were statistically significant across all races except Hawaiian (p=0.169).

Race	NSAIDs (n)	Total patients (n)	Percentage prescribed (%)	p-value (NSAIDs, compared to White)	Acetaminophen (n)	Total patients (n)	Percentage prescribed (%)	p-value (Acetaminophen, compared to White)	Opioid (n)	Total patients (n)	Percentage prescribed (%)	p-value (Opioids, compared to White)
White	43534	114739	*37.942%*	<0.001	77842	114739	*67.843%*	<0.001	58268	114739	50.783%	<0.001
Nonwhite	15297	34418	*44.445%*	<0.001	24043	34418	*69.856%*	<0.001	20236	34418	58.795%	<0.001
Black	8821	19487	*45.266%*	<0.001	13648	19487	*70.036%*	<0.001	11307	19487	*58.023%*	<0.001
Asian	1384	3980	*34.774%*	<0.001	2544	3980	*63.920%*	<0.001	2033	3980	*51.080%*	1
American Indian	180	491	*36.660%*	1	319	491	*64.969%*	0.877	252	491	*51.324%*	1
Hawaiian	77	286	26.92%	<0.001	208	286	*72.727%*	0.434	167	286	*58.392%*	0.054
Other	4835	10170	*47.542%*	<0.001	7314	10170	*71.917%*	<0.001	6477	10170	*63.687%*	<0.001

Table 2. Medication prescription rates by race (2019–2024). NSAID prescription differences were significant across all races except American Indian (p=1). Acetaminophen differences were nonsignificant for American Indian (p=0.877) and Hawaiian (p=0.434), but significant for other races (p<0.001). Opioid differences were nonsignificant for Asian (p=1), American Indian (p=1), and Hawaiian (p=0.054), but significant for Black and Other races (p<0.001).

Discussion

Summary: Racial disparities in pediatric analgesic prescribing persist, with non-White patients receiving higher prescription rates for opioids, NSAIDs, and acetaminophen compared to White patients. 2019–2024 trens show some narrowing of disparities, especially for opioids and NSAIDs among Asian, American Indian, and Hawaiian patients.

Comparison: Previous studies showed non-White patients received fewer analgesics due to bias and communication barriers. Increased awareness of racial disparities may have led to overcorrection, with higher prescribing rates for non-White patients. Findings contrast with earlier literature documenting undertreatment of minority patients.

Limitations: Lack of insurance and socioeconomic data may influence prescribing patterns and fill rates.[3,4] Institutional differences (academic vs. community) and prescription fill data were not captured. Study focuses on short-term prescribing, not long-term outcomes or addiction risk.

Future Directions

Study Design Considerations: Propensity matching across cohorts with similar characteristics (procedure type, care setting, etc.) for more reliable comparisons of prescribing habits

Guideline Implications: Future pain management guidelines should address disparities by considering socioeconomic factors, insurance status, and implicit bias.

Long-Term Outcomes: Research on non-opioid alternatives and conservative approaches is needed to reduce opioid-related risks and improve long-term outcomes.

References

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