



Variations in Peripheral Nerve Block Utilization for Primary versus Revision Total Knee Arthroplasty: An Institutional Analysis of 19,497 Cases

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INTRODUCTION

- Peripheral nerve blocks in TKA reduce opioid use, shorten hospital stay, and support multimodal analgesia
- Although PNBs have been reportedly used for revision TKA, no comprehensive descriptive data exists on PNBs for rTKA

We aimed to describe PNB utilization and outcomes for revision TKAs

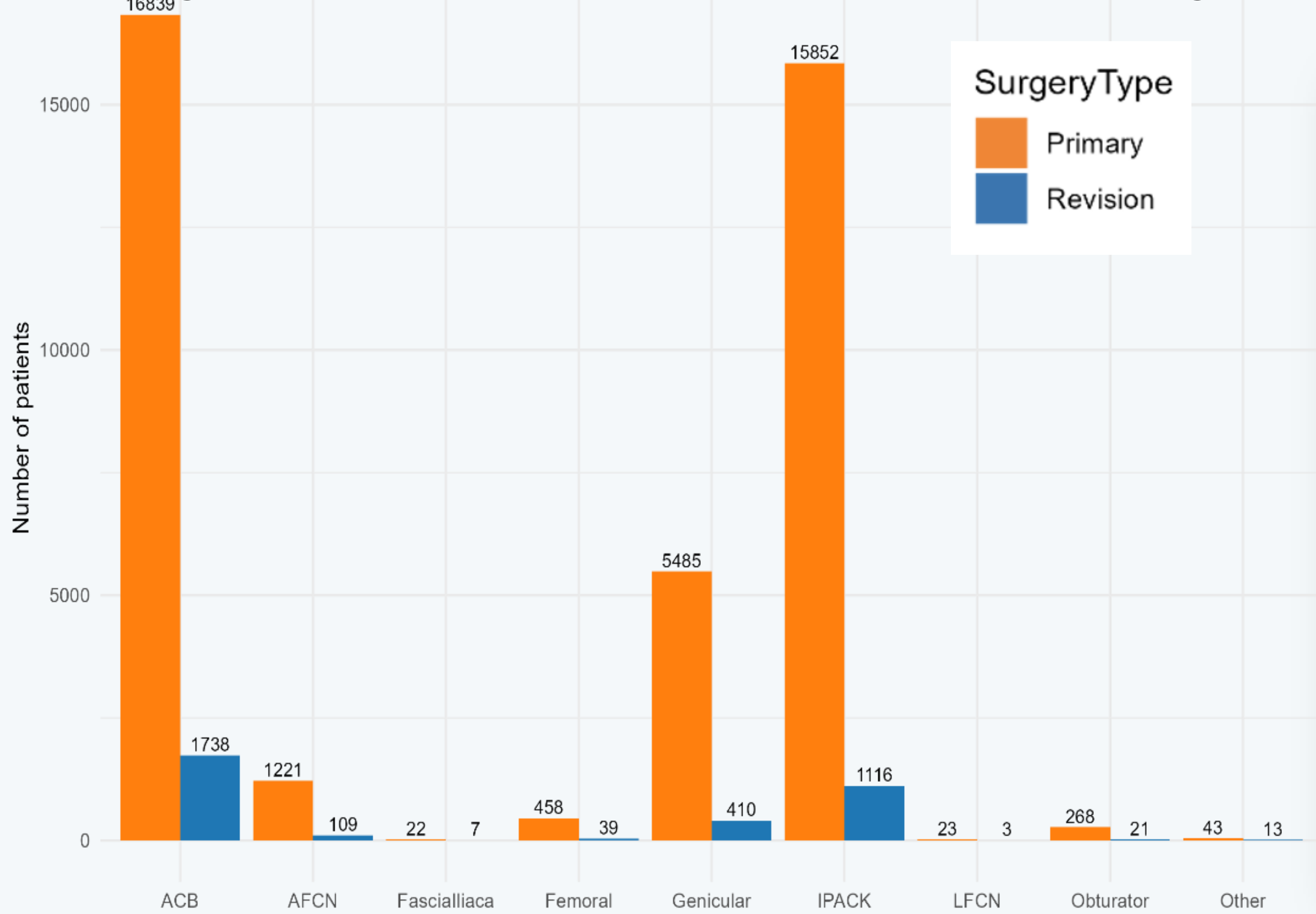
METHODS

- 17,671 primary and 1,826 revision TKA records from January 4th, 2021 to December 31st, 2024, were identified (IRB #2022-2392)
- Primary outcomes: primary anesthesia type, fascial/peripheral nerve block used, medications
- Secondary outcomes: pain scores and opioid use
- Logistic regression and generalized linear mixed models investigated surgeon and anesthesiologist-level differences to explain variations in PNB use

Table 1: Description of block variables by surgery type among knee patients (N= 19,497)

Variable	Total	Primary (N=17,282)	Revision (N=1243)	P-Value*
Neuraxial Block				<.0001
Combined spinal epidural	4246 (21.78%)	3189 (18.05%)	1057 (57.89%)	
Epidural	366 (1.88%)	336 (1.9%)	30 (1.64%)	
Spinal	14,053 (72.08%)	13446 (76.09%)	607 (33.24%)	
None	832 (4.27%)	700 (3.96%)	132 (7.23%)	
Neuraxial Medication				<.0001
Bupivacaine	4967 (25.48%)	3940 (22.3%)	1027 (56.24%)	0.0002
Chloroprocaine	464 (2.38%)	444 (2.51%)	20 (1.1%)	0.4005
Lidocaine	271 (1.39%)	250 (1.41%)	21 (1.15%)	<.0001
Mepivacaine	14828 (76.05%)	14093 (79.75%)	735 (40.25%)	
Peripheral Nerve Block				
Adductor Canal	18577 (95.28%)	16839 (95.29%)	1738 (95.18%)	0.8563
Genicular	5895 (30.24%)	5485 (31.04%)	410 (22.45%)	<.0001
IPACK	16968 (87.03%)	15852 (89.71%)	1116 (61.12%)	<.0001
AFCN	1330 (6.82%)	1221 (6.91%)	109 (5.97%)	0.1321
Femoral	497 (2.55%)	458 (2.59%)	39 (2.14%)	0.2453
Fascia Iliaca	29 (0.15%)	22 (0.12%)	7 (0.38%)	0.0158
LFCN	26 (0.13%)	23 (0.13%)	3 (0.16%)	0.7307
Obturator	289 (1.48%)	268 (1.52%)	21 (1.15%)	0.2196
PENG	9 (0.05%)	7 (0.04%)	2 (0.11%)	0.2080
Sciatic	26 (0.13%)	18 (0.1%)	8 (0.44%)	0.0017
# of Peripheral Nerve Blocks				<.0001
0	302 (1.55%)	266 (1.51%)	36 (1.97%)	
1	1532 (7.86%)	991 (5.61%)	541 (29.63%)	
2	11874 (60.9%)	10993 (62.21%)	881 (48.25%)	
3	4769 (24.46%)	4450 (25.18%)	319 (17.47%)	
4	1020 (5.23%)	971 (5.49%)	49 (2.68%)	

Table 2: Peripheral nerve blocks administered for primary versus revision total knee arthroplasty



Conclusions

- PNBs are highly utilized for primary and revision TKA, with nuanced but clinically significant differences in the types and combinations of PNBs and analgesic medications
- High PNB use rates for revision TKAs indicate its feasibility for complex cases, as rTKA patients had pain scores and MME use that were nearly equivalent to primary TKA cases

RESULTS

- Neuraxial patterns significantly differed:
 - Revisions more frequently received combined spinal-epidurals and general anesthesia without neuraxial anesthesia
 - Primaries more commonly received spinals alone (all p<0.001)
- Cumulative median opioid consumption and pain scores were similar
- PNB utilization was high (98.5% primary, 98.0% revision), with bupivacaine as the primary anesthetic and ACB+iPACK the most common PNB combination
- Primary TKAs received more multimodal blocks:
 - 29.6% rTKA received 1 block vs 5.6% primary (p<0.001)
 - 17.5% rTKA received 3 blocks vs 25.2% primary (p<0.001)
- Revisions commonly used ACB (95.2%), similar to primary TKA (95.3%; p=0.86)
- Revisions had fewer IPACK and genicular, more sciatic and fascia iliaca PNBs, and more commonly used ACB in isolation (all p<0.001)
- There were no primary-revision differences in ACB+iPACK use, but adding “surgeon” random effects revealed rTKA cases were 22% more likely to receive ACB+iPACK

