

Implementation of an Analgesic Amputation Care Pathway: A Quality Improvement Analysis

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INTRO

- Pain associated with above and below knee amputations (AKA & BKA) can be severe and challenging to manage
 - Predisposes to chronic residual limb pain (RLP) and phantom limb pain (PLP)
- Peripheral nerve catheters (PNC) for AKA and BKA are shown to reduce acute pain and opioid consumption
- Only 40% of BKA/AKA patients offered PNCs pre-pathway at our institution – majority post-op 2° barriers to access
- We developed an analgesic amputation care pathway to increase the use of PNCs at our academic tertiary care center

METHODS

- Goal:* Increase the # of lower limb amputation patients receiving a PNC
- Design:* A QI project comparing Pre-pathway retrospectively (June 1, 2022- June 30, 2023) and Post-pathway prospectively (Sept 1, 2023 – Sept 30, 2024). Post-pathway patients were followed to POD 28

RESULTS

257 patients (124 pre-pathway, and 133 post-pathway)

The Numbers

-  **PNC use [43.4% absolute = 3.2x relative]**
- PNC duration = 4.0 days pre-, and 5.0 days post-pathway
- APS LOS = 3.2 days pre-, and 5.7 days post-pathway
- PNCs = Significantly  POD 1 pain scores (0.97 pts) and OME consumption (23.8mg less). No difference POD 3 or 28
 - Despite the post-pathway cohort having higher mean baseline OME consumption and more patients undergoing AKAs

DISCUSSION

- Feasible to provide PNCs to >80% of AKAs and BKAs
- Increased overall provision of PNCs by > 40% from baseline, which resulted in significant improvements in early analgesia and opioid consumption
- Pathway did not require deployment of additional resources, but better application of available resources and expertise

Process Success Variables:

- Early APS referral allowed scheduled pre-operative PNC insertion when regional expertise available
- Multiple “back-up” options including surgeon placed blocks
- Supported by:* Established APS, regional anesthesia program and buy-in from vascular surgery
- Frequent education and reminders to departments
- Cognitive aid embedded in EHR to facilitate pathway

Next Steps

- Improve catheter longevity past POD#1 (possible catheter replacement, increase regional expertise)

By implementing an analgesic amputation care pathway, we successfully increased peripheral nerve catheter use and significantly improved POD 1 pain outcomes

TOH Amputation Care Pathway

Pre-Op Vascular consults APS for analgesic optimization (Ideal = 48h preop)

- Coordinate w/ regional staff/fellow for pre-op nerve catheter placement (Ideal ~12-24h in advance)
- Evaluate for risk factors of chronic pain

Pain Management Options

Plan A: Nerve catheter placed preop (~12-24h in advance or AM of procedure)

Plan B: Epidural placed in OR (if no contra-indications)

Plan C: ITM + Surgeon placed catheter * (*Help guide catheter placement to avoid dislodgement)

Plan D: GA + Surgeon placed catheter *

Plan E: GA + PCA +/- ketamine postop

Post-Op

Patient on APS

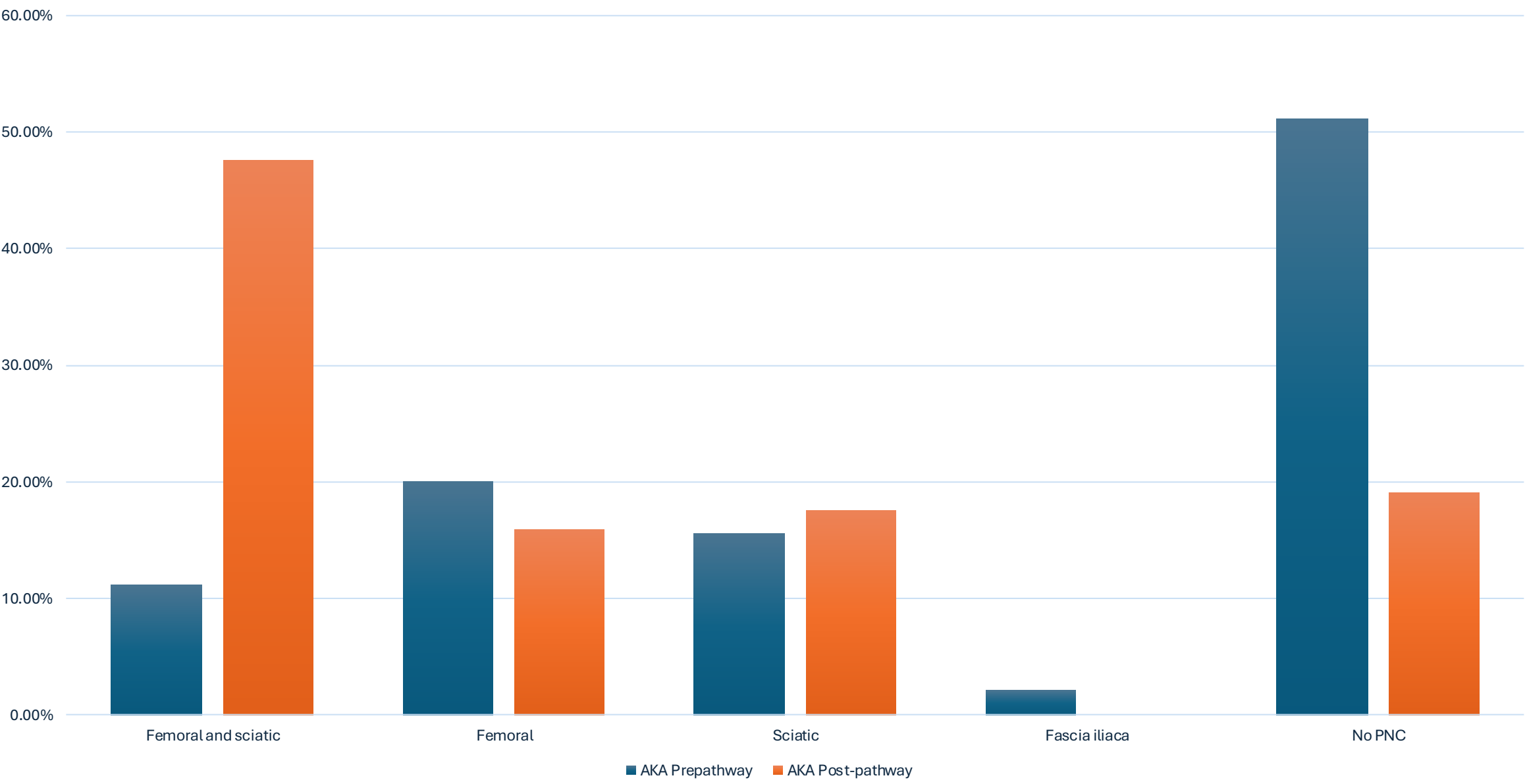
- Tylenol +/- NSAID (if no contra-indications)
- Nerve block x 7 days (up to 10 days)**
 - PIB: 10ml q 60min for 1 catheter; 20ml q120 min for 2 catheters (y-connector)
 - If being discharged, can go home with ambulatory pump
- OR Epidural x 48-72h postop minimum**

Supportive management

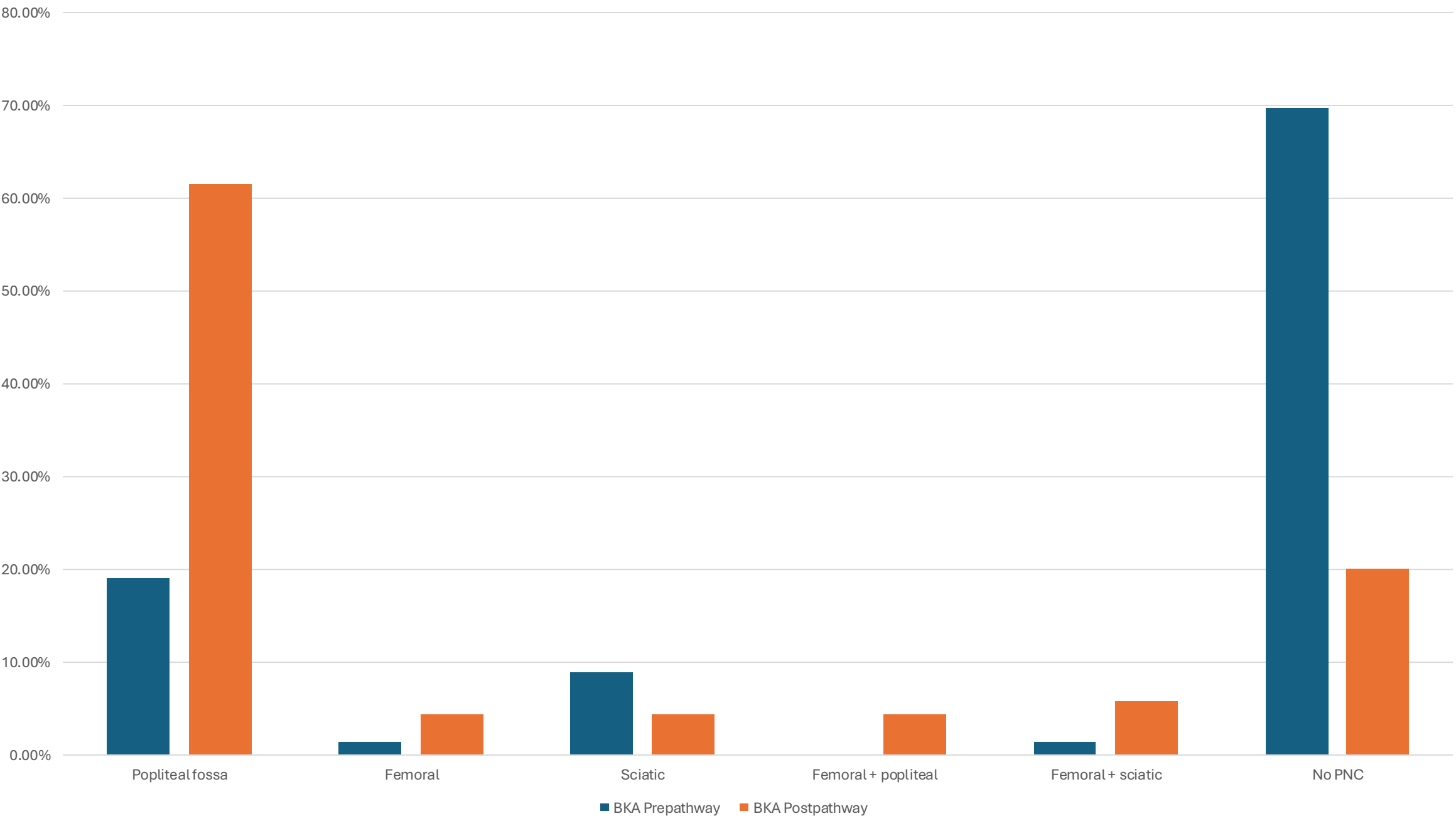
- Stump wrapping & Elevation
- Cold & Massage therapy
- Group supports, advice regarding stump + prosthesis care

BKA = Pop Fossa catheter + ACB SS
AKA = Femoral nerve catheter + Sciatic SS
(+/- sciatic catheter – can be surgeon placed)

ABOVE KNEE AMPUTATION PNC Type



BELOW KNEE AMPUTATION PNC Type



Insertion Timing	Provider	Pre-Pathway (n=124)	Post-Pathway (n=133)
Pre-op ¹ (n, %)	Anesth	25 (20.16%)	70 (52.63%)
Intra-op ² (n, %)	Surgeon	12 (9.68%)	15 (11.3%)
Post-op ³ (n, %)	Anesth	9 (7.26%)	9 (6.77%)
Pre-op + Intra-op (n, %)	Anesth & Surgeon	0 (0.00%)	12 (9.02%)
Intra-op + Post-op (n, %)	Surgeon & Anesth	0 (0.00%)	1 (0.75%)