

# Evaluating Acute TMR And RPNI For Pain Reduction After Below-the-knee Amputation In An Underserved Urban Population

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## Background

- Neuroma-related pain is a major source of morbidity after lower-extremity amputation, contributing to impaired function and prosthetic intolerance
- TMR and RPNI have demonstrated benefit in reducing post-amputation pain and neuroma formation
- Safety-net populations often have higher comorbidity and socioeconomic burden, yet outcomes in these settings remain underreported
- **Aim:** Evaluate pain outcomes after TMR ± RPNI within 3 months of below-the-knee amputation at a safety-net hospital.

## Materials and Methods

- **Study design:** Single-institution retrospective review (2019-2025)
- **Patients:** Patients undergoing lower-extremity amputation with TMR ± RPNI identified using CPT codes for amputations and nerve-related interventions
- **Inclusion:** TMR or combined TMR/RPNI performed within 3 months of amputation and patients who underwent BKAs without intervention
- **Statistical Analysis:** paired two-tailed t-tests, chi-squared tests

## Results

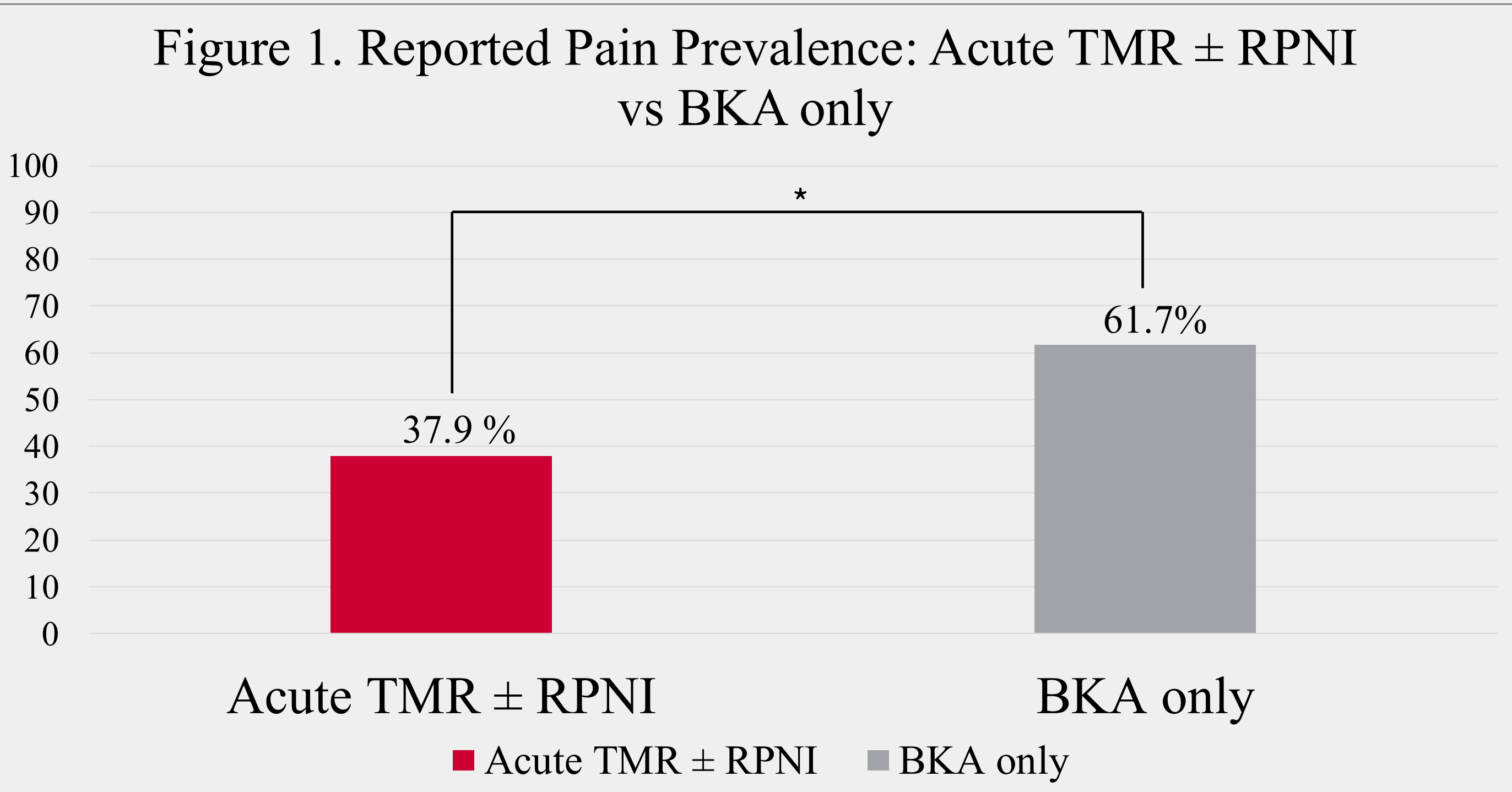


Figure 1. Reported pain prevalence at final follow-up in patients undergoing acute TMR ± RPNI compared with BKA only. Pain prevalence was 37.9% in intervention group and 61.7% in the BKA-only group ( $p=0.035$ ).

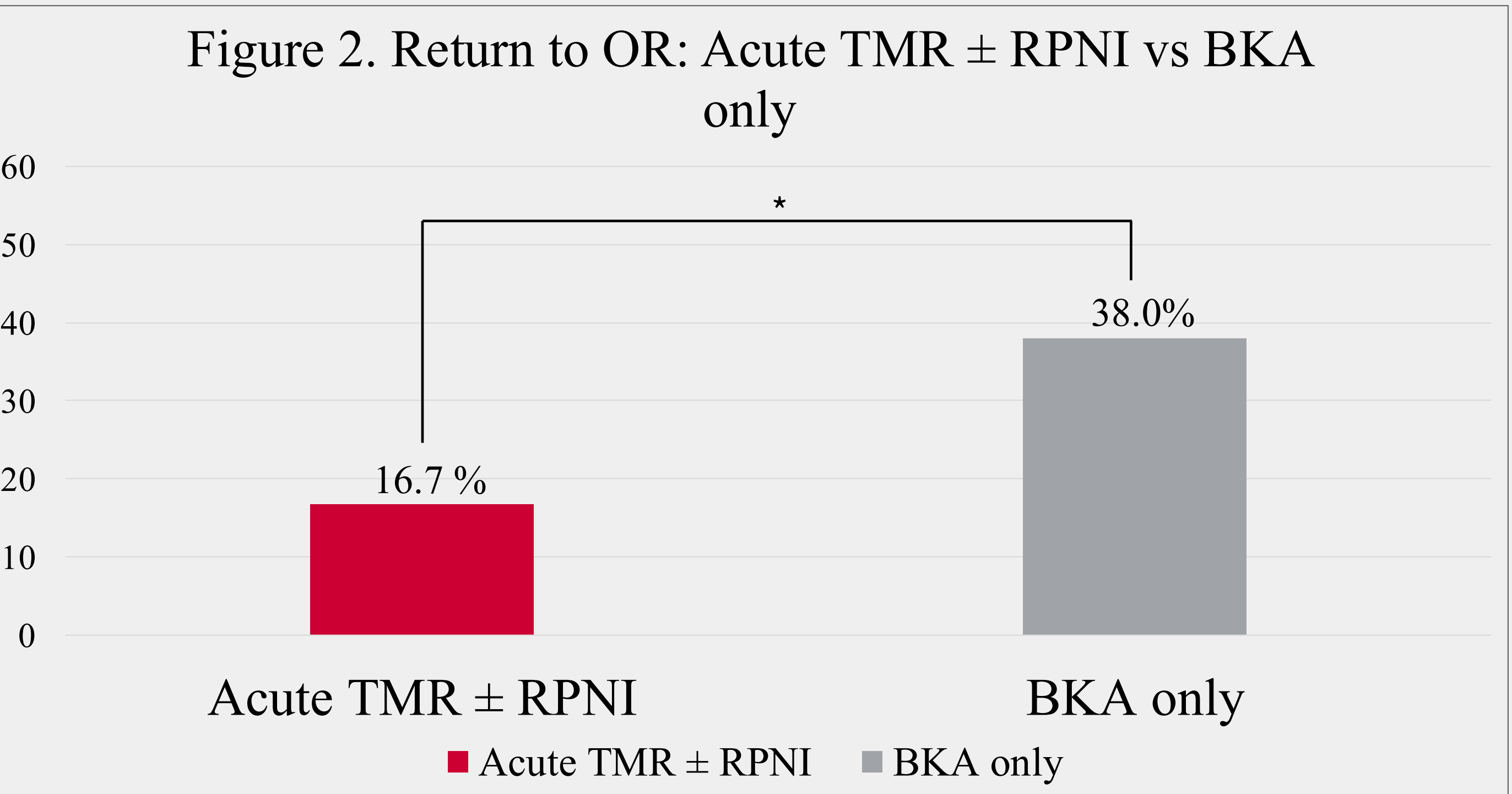


Figure 2. Return to the operating room in patients undergoing acute TMR ± RPNI compared with BKA only. Return to OR occurred in 16.7% of the intervention group and 38.0% of the BKA-only group ( $p=0.016$ ).

## Results

- **Cohort:** 89 patients; 74.8% male; mean age 53.8 years
- **High comorbidity burden:** Diabetes 75% (mean HbA1c = 9.26), Hypertension 72%, Tobacco-use 57%
- **Insurance:** Medicaid 22.6%, uninsured 15.7%, Medicare 29.6%, private 18.3%
- **Recovery:** Mean LOS - Control 14.5 days; Intervention 14.4 days
- **Pain outcomes:**
  - Pain prevalence at final follow-up lower in intervention group ( $p=0.035$ )
  - No significant differences in pain intensity, phantom limb pain, or residual limb pain
- **Return to OR:** Control 38% vs Intervention 16.7% ( $p=0.016$ )
- **Complications:** No significant differences in wound dehiscence, infection, neuroma, atrophy, prosthetic intolerance)

## Conclusions

- Early TMR ± RPNI after amputation is associated with reduced pain prevalence and fewer returns to the OR compared to BKA only
- No differences in pain intensity or complication rates
- Larger studies needed to confirm findings