

Procedural Pain Management efficacy: A clinical audit highlighting disparities in Sex, Age, and Ethnicity

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Background/ Introduction

Chronic pain significantly impacts quality of life, requiring a multidisciplinary approach where interventional strategies play a vital role. This clinical audit reviews Procedural Pain Management Interventions (PPMI) offered at Health New Zealand South Canterbury as part of a comprehensive management strategy. Critically, these interventions are utilized as a specific treatment modality rather than a be-all-end-all, serving as a component of a broader, holistic therapeutic plan. Between September 2024 and September 2025, 193 PPMIs were conducted, including both Nerve Blocks (NB) and Radiofrequency Neurotomy (RF). These procedures, performed in alignment with ANZCA standards, demonstrated a high overall success rate during this period. The audit systematically evaluates real-world efficacy to ensure local practices continue to meet evidence-based benchmarks. By analysing demographics—including age, sex, and ethnicity—we can identify specific factors that influence treatment outcomes. A primary focus of this review is to compare treatment responses between men and women to uncover potential sex-based trends in pain modulation. This data collation allows for a clear distinction between effective and non-effective outcomes for each procedure type. Ultimately, these findings validate our current protocols and help optimize service delivery for patients navigating chronic pain.

Aim

To quantify the efficacy of NB and RF procedures and compare success rates across sex, age groups, and ethnicity to identify demographic variances in treatment response.

Method

This retrospective clinical audit, utilizing the four-stage PDSA cycle to evaluate 193 procedural pain management interventions (PPMI) at Health New Zealand South Canterbury.

- Plan:** The audit was designed to evaluate the real-world efficacy of Nerve Blocks (NB) and Radiofrequency Neurotomy (RF) conducted between September 2024 and September 2025. The plan established clear objectives: to measure outcomes against ANZCA professional standards and identify demographic-specific response trends.
- Do:** Data were retrospectively gathered from 193 procedures where interventions were used as specific treatment modalities within a broader care plan. Clinical Nurse Specialist (CNS) follow-up data from 6–8 weeks post-intervention were retrieved, focusing on Pain Intensity, Enjoyment of Life, and General Activity (PEG) scores.
- Study:** The collected data were analysed using descriptive statistics to categorize outcomes as binary "Effective" or "Not Effective." This phase involved stratifying results by age, ethnicity, and sex to compare therapeutic responses and identify success factors, such as the high efficacy rate observed in Māori patients.
- Act:** Based on the study's findings, the audit moved into the "Act" phase by proposing targeted clinical improvements. These include developing a specialized pathway for younger patients and formalizing a structured review process for male non-responders to refine future service delivery.

Results

- Overall procedural efficacy was **74%**, with RF demonstrating a marginally higher efficacy (77.22%) than NB (71.93%).
- The greatest patient-reported benefit was in Pain Reduction (average **46.31%** improvement).
- Significant disparities were observed: **Female patients had an 80.69% efficacy rate**, substantially higher than the **54.17% rate for male patients**. Which suggests a **26.5% gap**.
- Efficacy was highest among **Māori patients (84.21%)** and those in the 35-49 and 80+ age groups (both are greater than or equal to 82%),
- the lowest response was in the 20-34 age group (62.50%).

Critical Finding: Sex Disparity

The audit revealed a significant performance gap between sexes.

Female Patients

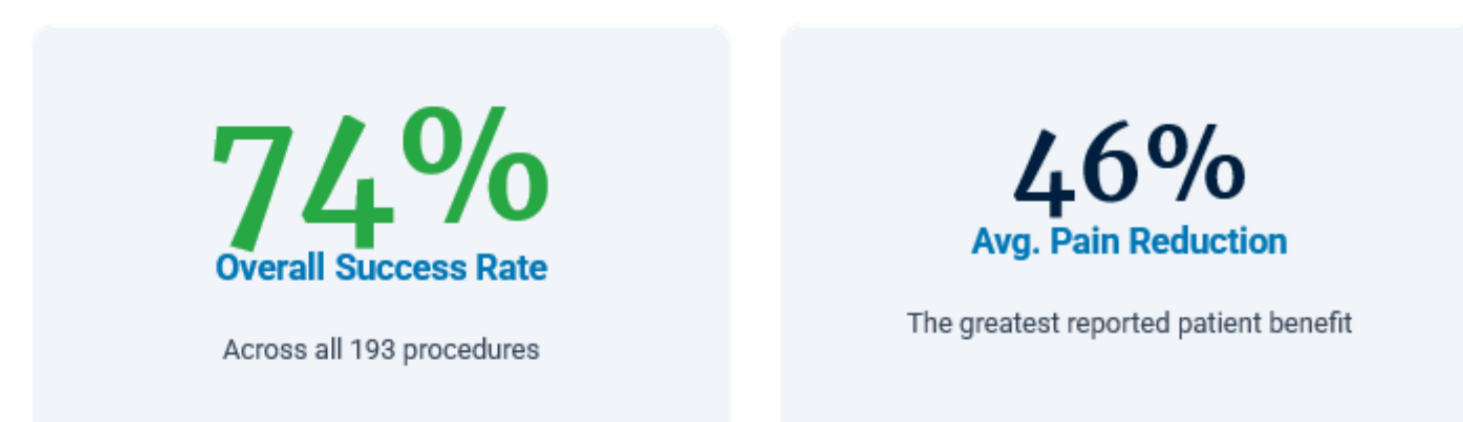
80.7% Success

Male Patients

54.2% Success

A **26.5% gap** requiring immediate review.

Overall Efficacy Results



Procedure Comparison: RF vs NB



Reference:

Inman, S. L., Faut-Callahan, M., Swanson, B. A., & Fillingim, R. B. (2004). Sex differences in responses to epidural steroid injection for low back pain. *The Journal of Pain*, 5(8), 450–457. <https://doi.org/10.1016/j.jpain.2004.07.004>

Krebs, E.E., Lorenz, K.A., Bair, M.J. et al. Development and Initial Validation of the PEG, a Three-item Scale Assessing Pain Intensity and Interference. *J GEN INTERN MED* 24, 733–738 (2009). <https://doi.org/10.1007/s11606-009-0981-1>

Conclusion

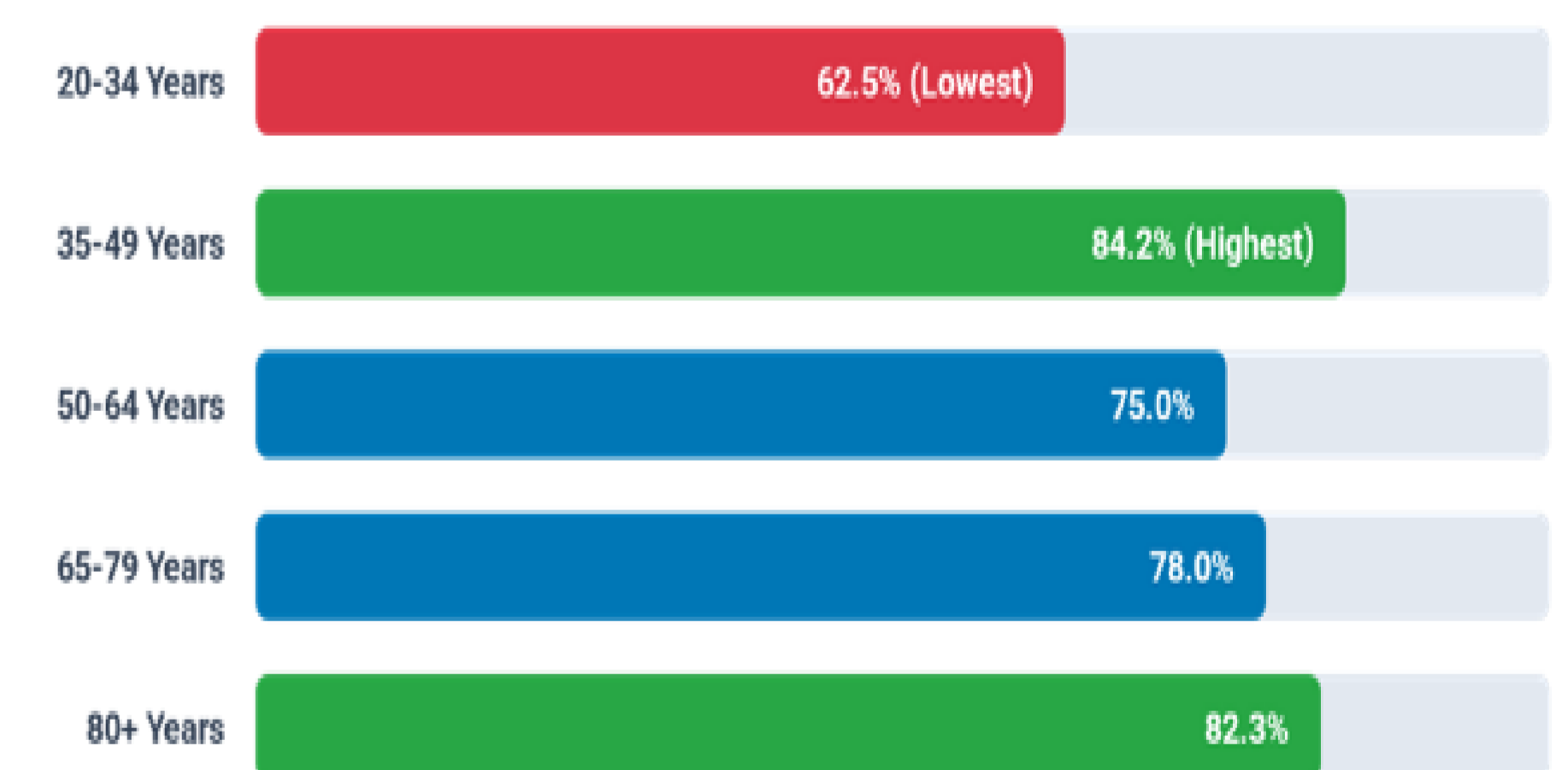
This clinical audit affirms that procedural pain management interventions offered by Health New Zealand South Canterbury are generally effective and align with established clinical standards, successfully achieving substantial Pain Reduction for the majority of patients. Radiofrequency Neurotomy is slightly more efficacious than Nerve Blocks, a finding that should be considered during procedural planning, though both remain valuable tools. However, the audit reveals critical demographic variances in treatment success. The stark disparity in efficacy between female (80.69%) and male (54.17%) patients is the most significant finding, indicating that procedural success is far from uniform across the sexes. Similarly, the reduced response rate in the youngest cohort (20-34 years) compared to middle-aged and very elderly patients suggests that age-specific factors, possibly related to underlying pain mechanisms or psychosocial elements of chronic pain, are influencing outcomes. The higher response rate among Māori patients (84.21%) compared to NZ European patients (72.83%) also warrants recognition and further exploration to understand factors contributing to this enhanced success. The 25-30 procedures that resulted in non-response for male and young patients represent a group for whom the current procedural intervention alone is insufficient, necessitating alternative or augmented management pathways.

Recommendations

Based on the audit findings, the following recommendations are proposed to optimize service delivery and enhance patient outcomes:

- Demographic-Specific Interventions**
 - Male Patient Review:** Implement a structured review of male non-responders to identify recurring clinical or psychosocial barriers to efficacy.
 - Young adults Pathway (Ages 20–34):** Integrate procedural interventions with intensive multidisciplinary support, including physiotherapy and pain education, to address functional recovery barriers in younger cohorts.
- Clinical & Functional Optimization**
 - Procedure Selection:** Update selection criteria to favour Radiofrequency Neurotomy where clinically appropriate, reflecting its higher observed efficacy rate.
 - Functional Goal Setting:** Establish mandatory CNS-led self-management sessions post-procedure to bridge the gap between pain reduction and lifestyle improvement (PEG scores), focusing on activity and enjoyment.
- Equity & Quality Assurance**
 - Māori Success Analysis:** Conduct a focused review of the high efficacy rate in Māori patients (84.21%) to identify and integrate successful clinical and cultural care models into standard practice.
 - Annual Audit Cycle:** Formalize an annual audit to monitor demographic trends and ensure continued adherence to ANZCA professional standards.

Efficacy by Age Group



Younger patients (20-34) show significantly lower response rates, suggesting a need for alternative pathways.

Positive Finding: Ethnicity

