

Retrospective audit of total knee replacement anaesthesia and analgesia

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RESEARCH WEEK
20-24 OCTOBER 2025
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Background

- Total knee joint replacements (TKJR) are expected to increase up to 276% from current numbers in Australia by 2030¹
- Major knee surgery is associated with moderate to severe postoperative pain contributing to immobility related complications and poor functional outcomes²
- Northern Health (NH) developed a TKJR post-operative analgesia guideline in 2017 to assist in analgesia decision making.
- Since its inception updated guidelines from the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (ANZCA-FPM), the National Institute for Health and Care Excellence (NICE) and the European Society of Regional Anaesthesia (ESRA) have been published, advocating for change in previous practices^{3,4,5}
 - Recommendations - local infiltration of analgesia (LIA), regional techniques (Adductor Canal Block – ACB) and multimodal analgesia aiming to minimise opioid use.

Aim

- The aim of this study was to retrospectively review anaesthetic approach and post-operative analgesia prescribing for TKJR at TNH over a 6-month period

Objectives

- To review current anaesthesia patterns for patients presenting for elective TKJR at TNH
- To review post-operative pain and functional scores following different anaesthetic approaches
- To review commonly prescribed analgesic regimens following surgery and determine whether they are aligned with currently recommended best practice guidelines

Methods

- De-identified retrospective demographic, anaesthetic and post-operative outcome data was collected on all patients over the age of 18 presenting to NH for a primary TKJR between the 1/2/23 – 30/7/23
- Descriptive tables and graphs produced utilising Microsoft excel

Results

- 56 patients identified
 - 2 excluded - not primary TKJR
- 54 patients included final data set

Table 1. Patient Demographics

Patient Demographics	Number
Total patients for TKJR	54
Male	20 (37.4%)
BMI (mean, SD)	34 +/- 7.7
Age (mean, SD)	69 +/- 9.6
PMHx (number, %)	
Chronic obstructive airways disease	8 (14.8%)
Obstructive sleep apnoea	12 (22.2%)
Ischaemic heart disease	7 (12.9%)
Chronic Kidney Disease (Listed on file)	7 (12.9%)
eGFR (mean +/- SD) (ml/min/1.73m2)	74.5 +/- 17.9
Chronic Liver Disease	0 (0.0%)
Chronic pain history	21 (38.9%)
Preoperative Pain medications (number, %)	
Regular paracetamol	24 (44.4%)
Regular NSAIDs	6 (11.1%)
Regular Neuropathic agent	12 (22.2%)
Regular opioid agent	13 (24.1%)
Short acting opioids	4 (7.4%)
Long acting opioids	8 (14.8%)
OMEDD mg/day (n = 8) (mean, SD)	44.0 +/- 27.4

Table 2. Intraoperative management

Intraoperative	Number (n=54)
Anaesthetic Technique	
Neuraxial and Sedation	18 (33.3%)
Neuraxial, ACB and Sedation	14 (25.9%)
General Anaesthetic only	8 (14.8%)
General Anaesthetic and Neuraxial	7 (12.9%)
General Anaesthetic and ACB	6 (11.1%)
General Anaesthetic, Neuraxial and ACB	1 (1.9%)
Intraoperative Analgesia	
IV Opioids	
Nil	29 (52.7%)
Alfentanil	1 (1.9%)
Fentanyl	18 (33.3%)
Oxycodone	10 (18.5%)
Ketamine	
Nil	46 (85.2%)
Bolus only	4 (7.4%)
Bolus and infusion	4 (7.4%)
Anti-inflammatory medications	
Nil	19 (35.2%)
Paracetamol	10 (18.5%)
Dexamethasone	13 (24.1%)
Paracetamol and Dexamethasone	12 (22.2%)
Local anaesthetic infiltration (LAI)	54 (100%)

Table 3. Post-operative day 1 (POD1) pain scores and functional status between techniques

	Neuraxial and Sedation (n=18)	Neuraxial, ACB and sedation (n=14)	GA only (n=8)	GA and ACB (n=6)	GA and Neuraxial (n=7)	GA, ACB and Neuraxial (n=1)
Post-operative analgesia D1 (number, %)						
Paracetamol	18 (100%)	13 (92.9%)	8 (100.0%)	6 (100.0%)	6 (85.7%)	1
NSAID	12 (66.7%)	7 (50.0%)	5 (62.5%)	4 (66.6%)	3 (42.9%)	0
New neuropathic agent	0	0	0	0	1 (14.3%)	0
Opioids						
Oral only	8 (44.4%)	2 (14.2%)	0	0	1 (14.3%)	1
New SR Opioid	6 (75.0%)	1 (50.0%)	0	0	0	1
PCA	10 (55.6%)	12 (85.7%)	8 (100.0%)	6 (100.0%)	6 (85.7%)	0
New SR Opioid started	5 (50.0%)	3 (25.0%)	6 (75.0%)	3 (50.0%)	4 (66.7%)	
Pain scores D1 (mean +/- SD)						
Rest	3.9 +/- 3.0	4.6 +/- 3.3	5.1 +/- 3.4	5.0 +/- 4.8	2.5 +/- 3.5	8
Movement	7.6 +/- 1.9	8.8 +/- 1.1	8.6 +/- 1.3	6.8 +/- 3.6	8.7 +/- 1.0	10
Physiotherapy engagement D1 (number, %)						
Bed/Sitting Exercise	8 (44.4%)	4 (28.6%)	2 (25.0%)	1 (16.7%)	2 (28.5%)	0
Ambulatory exercises	10 (55.6%)	12 (85.7%)	6 (75.0%)	5 (83.3%)	5 (71.4%)	1
Able to stand POD1	13 (72.2%)	10 (71.4%)	6 (75.0%)	6 (100.0%)	5 (71.4%)	1
Acute admission length (mean +/- SD)						
Admission length (days) (mean +/- SD)	5.1 +/- 2.7	4.9 +/- 1.2	4.6 +/- 2.6	6.0 +/- 2.7	4.6 +/- 1.9	9

Conclusions

- Heterogenous group – multiple different anaesthetic approaches nil demonstrating superiority over another
- Those who received a neuraxial technique were; less likely to require a patient-controlled analgesia (PCA) pump post-operatively, more likely to report lower pain scores however had less ability to engage in ambulatory exercises POD1
- Low use of regional technique - 37% of total patient cohort
- 100% multimodal analgesia use post-operatively – 94% regular paracetamol, 59.3% short term NSAID

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