“Ditch the Signature Drink": Alternative Interventions to Periarticular Cocktails and Post-Operative Pain Outcomes in Total Joint Patients

Broomfield

Janet Lopez BSN, RN, CCRN, CAPA

Background

- Periarticular infiltration (PAI) medication or "joint cocktail“ can be given intraoperatively by a surgeon in the soft tissue joint space during total joint replacement surgery.[1]
- Established guidelines exist for assessing pain assessment: numeric rating scale (NRS) and verbal descriptive scale (VDS). [2]
- Literature suggests a correlation effect of multiple variables that can increase reported pain scores: depression/anxiety, taking selective serotonin reuptake inhibitors medications, obstructive sleep apnea, chronic pain, fibromyalgia, smoking.[5]
- PAIs were discontinued by our pharmacy leaders to address regulatory changes and concerns surrounding the lack of patient safety data regarding stability of the combined medications.
- The original PAI “joint cocktail” used at Broomfield Hospital (BFH) was a formulation of Ropivacaine, Morphine and Ketorolac.
- Ideal PAI “joint cocktail” combination for pain control has not been established; future research might identify an optimal compound; although there is literature support and compound stability data for a PAI of Ropivacaine, Epinephrine, Clonidine and Ketorolac (RECK).[6,7]
- Evidence illustrates PAI medication deemed most effective within the first 24 hours post operatively. [1]
- PAI at BFH July 1-February 3, 2024, was Ropivacaine only. A higher concentration of nocioreceptors are in the knee than in the hip; a target for Ropivacaine.
- Identified need to approach and implement pain management alternatives: multimodal pain management practice; safe patient care to avoid respiratory depression, drowsiness, and decrease risk factors of falls since early ambulation is paramount for total joint replacement patients’ success to discharge.
- This loss of intraoperative PAI administration led to the need to evaluate additional interventions, options and nursing practice to improve pain scores.[4]
- Meetings and discussion of literature findings with Orthopedic surgeons, Anesthesia Director and Pharmacy manager regarding replacement multi-modal options

Purpose

The purpose of this project is to evaluate trends and post-operative pain scores in patients undergoing total knee and hip joint replacements with varying types of PAI medications and use of multimodal pain management to improve pain outcomes.

Method

- Retrospective chart audits of patients from January 2024-June 2024 that received “joint cocktail” containing Ropivacaine, Morphine and Ketorolac completed to establish baseline pain management scores and efficacy of using a PAI.
- Manual data collection and chart audit from July 1, 2024-present with a developed/revised tracking tool for each change in pain scores; pain medication use collected and trended.
- Education through emails, unit huddles and staff meeting presentations provided to PreOp/Post Anesthesia Care Unit (PACU) nurses with pain score documentation standards and before each implemented recommended practice change.
- Individualized patient tracking tool created to collect data on every total hip/knee replacement patient. Pain scores were tracked as documented in the EHR: pre-operatively, through postoperative phase in PACU, post-op day (POD) 1, POD 7 and POD14.
- Three phases of a multimodal approaches implemented and evaluated:
  - **Phase I)** Ropivacaine only PAI
  - **Phase II)** Ropivacaine PAI. Half dose of oral Meloxicam in pre op, Ketorolac 15mg intravenous (IV) in PACU, oral opioid pain medication, oral/IV muscle relaxants and lastly IV opioid medication administration.
  - **Phase III)** Literature supported PAI ”joint cocktail” that has stability data for 48-hours after combining “RECK”=Ropivacaine, Epinephrine, Clonidine, Ketorolac medications.

Results

Demographic Data January 1- June 30, 2024
Morphine/Ropivacaine/Ketorolac PAI

Surgery	Average Age	Average BMI	98 Total Patients	Procedure
58 Knees	64.8	36.56	47 Males	2 Revisions
38 Hips	64.8	36.44	49 Females	94 Primary

ASA Score	Anesthesia	Experience with a replacement	Past Medical History
ASA 1 2%	1 General	77 First Joint	27 on SSRI's
ASA 2 75%	38 Spinals	18 Second Joint	3 Fibromyalgia
ASA 3 23%	53 Spinals with Block	1 Third Joint	4 Chronic Pain

- Overall, 22% reported pain score 7-8 (7.4) in PACU; 39% reported pain score of 5-6 (5.73 mean)

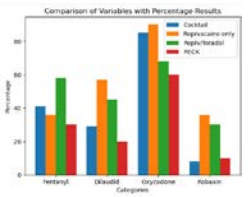
Total Project Demographics

Demographic Data July 1-October 15, 2024
Ropivacaine only PIA

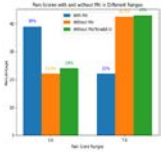
Surgery	Average Age	Average BMI	80 Total Patients	Procedure
43 Knees	64.5	29.44	34 Males	0 Revisions
37 Hips	64	29.27	46 Females	80 Primary

ASA Score	Anesthesia	Experience with a replacement	Past Medical History
ASA 1 3%	8 General	63 First Joint	18 on SSRI's
ASA 2 80%	29 Spinals	17 Second Joint	0 Fibromyalgia
ASA 3 17%	43 Spinals with Block	0 Third Joint	18 Chronic Pain

- Overall, 42% of patients reported pain score of 7-8 (7.85 mean) in PACU; 20% reported 5-6 (5.5 mean)



PAI Cocktail	Ropivacaine Exclusively	Toradol IV with PO pain med practice
85% received Oxycodone either 5mg/10mg	90% received Oxycodone either 5mg/10mg	68% received Oxycodone either 5mg/10mg
29% received Dilaudid in addition to Oxycodone	57% received Dilaudid in addition to Oxycodone	45% received Dilaudid in addition to Oxycodone
41% received Fentanyl in conjunction with Oxycodone	36% received Fentanyl in conjunction with Oxycodone	58% received Fentanyl in conjunction with Oxycodone
8% Robaxin administered	36% Robaxin administered	30% Robaxin administered



★ Initial results yielding that the RECK PAI “joint cocktail” is having improved post operative pain scores and less administration of adjunct IV pain medications

Implications for Practice

- Variables in this study showed correlation of increased pain scores in patients with depression, anxiety, chronic pain, fibromyalgia and SSRI use regardless of PAI used.
- The change in PAI formulation to just Ropivacaine led to an increase in reported pain scores as well as increased IV opioid pain medication consumption and an increase in higher pain scores within 24 hours post-op indicating that it has worse post-operative pain control.
- Overall, this study showed a decrease in satisfactory pain control with a PAI of only Ropivacaine regardless of additional implementation of innovative multimodal approaches.
- Nursing practice recommendations emerged for immediate post-operative pain management regimen based on trends of pain scores in PACU. Oral opioid pain medication within the first 30 minutes of PACU arrival, oral/IV muscle relaxant, timing of re-dose acetaminophen and lastly IV opioid medication administration.
- The use of a PAI containing Clonidine pain scores at 1, 2, 12 and 24 hours post-operatively were significantly lower. IV opioid consumption was also less. Patient satisfaction improved with pain reduction and faster early mobility.
- Phase III RECK PAI outcomes and data collection are on-going.

BARRIERS/LIMITATIONS

- Availability of multiple pain scoring tools and nurses’ understanding of these tools as far as reliability is lacking. Per literature, they are not interchangeable in assessing pain in each patient.
- Nurses’ and Anesthesia providers’ individual approaches to pain management with administration of PO and IV opioids varies.
- Pain is a subjective, multifactorial variable.

References