

# Does ERAS affect opiate use and outcomes in arthroplasty

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## Introduction

Analgesia is an important aspect of an arthroplasty patient's perioperative journey. However, the use of opiates can lead to top chronic dependency, with up to 35% in knee arthroplasty<sup>1</sup>; and 39% in hip arthroplasty<sup>2</sup> patients.

In Victoria it is easy for a surgical patient to obtain a repeat opiate script from their GP, contributing to the opiate epidemic. As medical and surgical practitioners, it is part of our duty to reduce opiate use in the community.

The ideal analgesic protocol remains elusive. The Enhanced Recovery After Surgery (ERAS) society provides the following recommendations for joint arthroplasty<sup>3</sup>.

| High Level of Evidence         | Moderate Level of Evidence |
|--------------------------------|----------------------------|
| Epidural use                   | Intrathecal opiates        |
| Local anaesthetic infiltration | Paracetamol                |
| Long acting opiates            |                            |
| NSAIDs                         |                            |
| No PCA                         |                            |
| Early mobilisation             |                            |

## Aim

The aim of this audit was to identify if our ERAS protocol had an impact on the length of stay, time to mobilisation, visual analogue pain scores (VAS) and opiate consumption in total hip and knee arthroplasty patients.

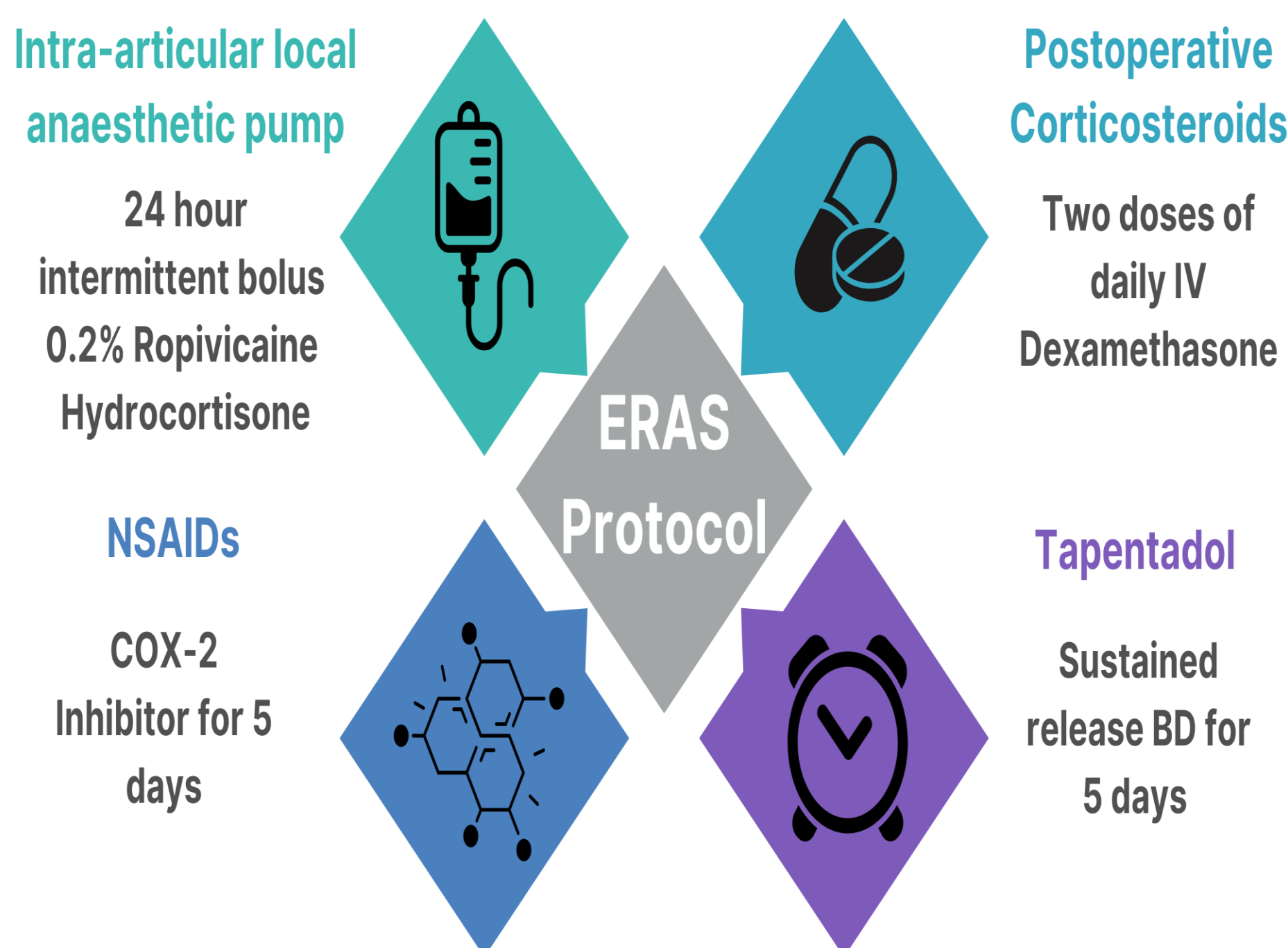


Figure 1: ERAS Protocol

## Methods

A retrospective audit study of data collection from Northern Hospital patients spanning a 2.5 year-period was conducted with ethical approval (2023\_Non-HREC\_04).

All elective hip and knee arthroplasty patients (that were admitted between January 2021 – August 2023) were identified. Those with chronic pain history, revision arthroplasty, previously non-ambulant, neck of femur fractures and patients with a non routine postoperative treatment (e.g. prolonged unforeseen ICU admission) were excluded.

Patients were identified using an IPM search and cross-checked with the weekly Xray meeting list. Data were stored on a REDCap database.

Data regarding patient demographics, surgical details, length of stay (LOS), discharge destination, and VAS pain scores were collated. An in-built opiate calculator was used to determine a patient's average daily consumption of oral milligrams of morphine equivalence (OMME) consumption. Safe script was utilised to determine the number of instances a patient had a dispensed repeat opiate script within 6 weeks and 3 months; and calculated the total OMME.

Statistical analysis was performed using STATA BE 19 software. Chi square tests were used for categorical variables and Mann-Whitney U for continuous; with a p value <0.05 being significant.

## Results

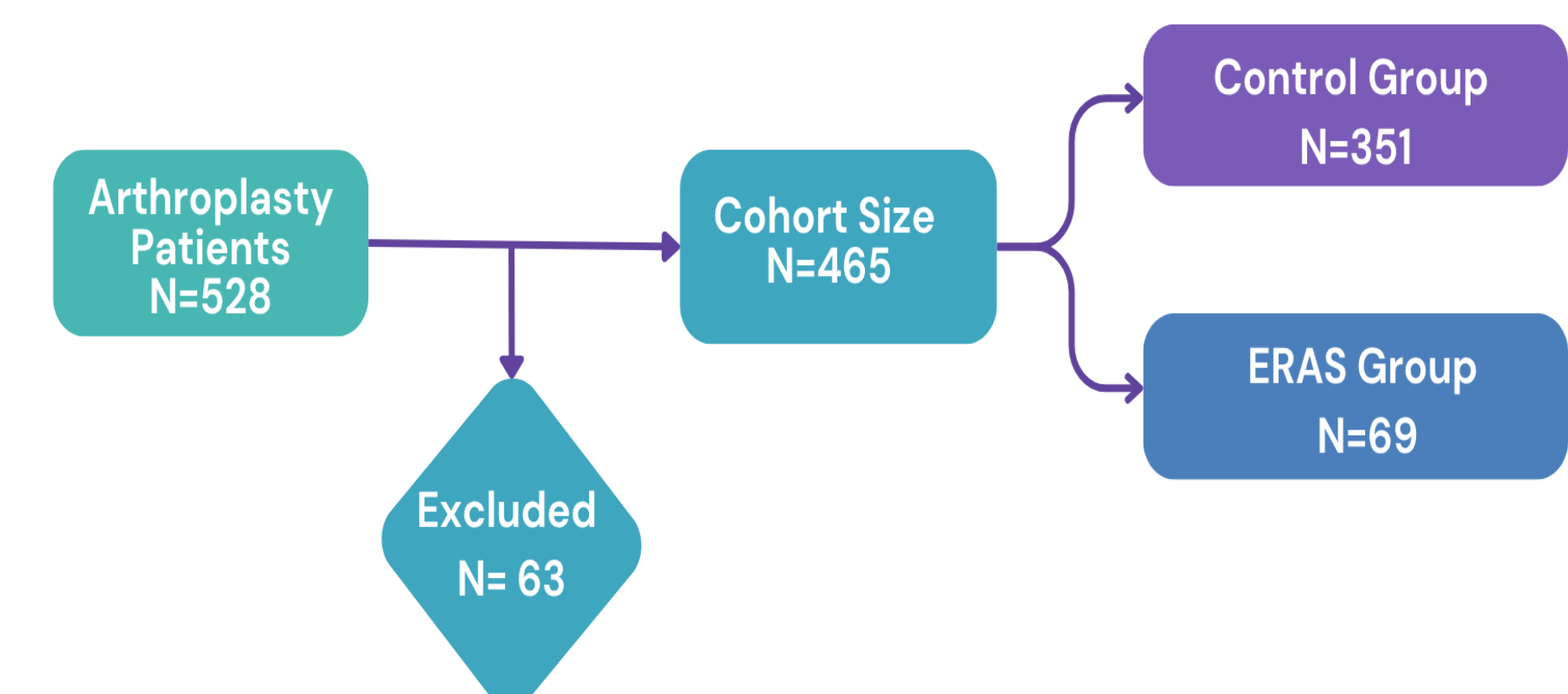


Figure 2: Patient Cohort

Our patient cohort consisted of 55 ERAS patients and 351 controls. Aside from a longer duration of surgery in the ERAS group 2.8 hours compared to the control group 2.5 hours (p=0.02), there were no differences in patient demographics and surgical data as shown in Tables 1 and 2.

| Demographics         | ERAS        | Control     |
|----------------------|-------------|-------------|
| N (%) / Median (IQR) | N = 69      | N = 396     |
| Sex                  |             |             |
| Male                 | 25 (36.2%)  | 163 (42.5%) |
| Female               | 44 (63.8%)  | 233 (58.8%) |
| Age                  | 71 [62,75]  | 68 [62,75]  |
| BMI                  | 32 [28, 36] | 32 [27,37]  |
| ASA                  |             |             |
| 1                    | 3 (4.5%)    | 71 [62,75]  |
| 2                    | 42 (63.6%)  | 71 [62,75]  |
| 3                    | 21 (31.8%)  | 71 [62,75]  |
| 4                    | 0 (0%)      | 71 [62,75]  |
| Smoking              | 9 (13%)     | 61 (15.5%)  |
| Rheumatoid           | 3 (4.3%)    | 20 (5.1%)   |
| Postop PCA           | 32 (46.4%)  | 215 (54.3%) |

Table 1: Patient Demographics

During the inpatient postoperative period, the ERAS group was shown to have **significantly reduced VAS pain scores** as well as **earlier mobility**, as demonstrated in Tables 3 and 4 respectively. Additionally, the ERAS group was shown to have a **significantly lower median LOS by 1 day**.

| Pain (VAS)                  | ERAS        | Control   | p-value |
|-----------------------------|-------------|-----------|---------|
| Median (IQR)                | N = 69      | N = 396   |         |
| Day 1 rest                  | 3 (1,5)     | 4.8 (2,7) | <0.01   |
| Day 1 movement              | 4.5 (3,6.5) | 5.9 (4,8) | <0.01   |
| Penultimate/DC day rest     | 2 (0,3)     | 2.9 (0,5) | 0.02    |
| Penultimate/DC day movement | 2.4 (0,4)   | 4 (0,7)   | <0.01   |

Table 3: VAS Pain Scores

| Mobility/DC          | ERAS           | Control      | RR [95%CI]        | p-value |
|----------------------|----------------|--------------|-------------------|---------|
| n (%) / Median [IQR] | N = 69         | N = 396      |                   |         |
| Day 1 walk           | 44 (68.8%)     | 200 (55.4%)  | 1.77 [1.02, 3.10] | 0.04    |
| D/C to Rehab         | 9 (13%)        | 123 (31.1%)  | 0.42 [0.22, 0.79] | <0.01   |
| LOS - days           | 3.3 [3.1, 4.3] | 4.3 [3.3, 6] |                   | <0.01   |

Table 4: Mobility and Discharge

Regarding opiate consumption, no difference was observed in the inpatient average OMME consumption, possibly due to the inclusion of tapentadol in the ERAS protocol (shown in Table 5). Interestingly, the ERAS group were discharged with a greater amount of total OMME on their scripts. However, when reviewing safe script data for the ERAS group, there was a **significantly lower incidence of repeat opiate scripts dispensed by 3 months** (Table 6).

| OMME Consumption     | ERAS          | Control         | p-value |
|----------------------|---------------|-----------------|---------|
| Median (IQR)         | N = 69        | N = 396         |         |
| Inpatient daily avg. | 45 (35, 61)   | 47.5 (28, 77.2) | 0.63    |
| Discharge script     | 180 (90, 420) | 150 (75, 262.5) | 0.02    |
| Post D/C 3 months    | 0 (0,309)     | 150 (0,600)     | 0.03    |

Table 5: OMME Consumption

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## Results

| Post Discharge                   | ERAS       | Control     | RR                | p-value |
|----------------------------------|------------|-------------|-------------------|---------|
| N (%)                            | N = 69     | N = 396     | [95%CI]           |         |
| Repeat opiate script by 3 months | 30 (43.5%) | 236 (59.6%) | 0.73 [0.55, 0.97] | 0.01    |
| Gait aid 6 weeks                 | 14 (26.9%) | 111 (53.4%) | 0.5 [0.32, 0.8]   | <0.01   |
| Postop Infection                 | 1 (1.8%)   | 6 (1.7%)    | 0.85 [0.1, 6.93]  | 0.88    |

Table 6: Post discharge outcomes

## Conclusion

Our ERAS protocol has demonstrated a positive effect on patient length of stay, VAS pain scores, facilitating patient early mobilisation and discharge home and postoperative repeat opiate script utilisation.

Future prospects would be to incorporate a multivariate analysis and implementation of a prospectively study design.

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