



2026 ANZCA ASM Prize session abstract examples

High flow nasal oxygen versus face mask oxygen for pre-oxygenation of pregnant patients with high body mass index – a randomised controlled crossover non-inferiority study

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Introduction

Obesity in pregnancy confers higher risk of airway management complications[1]. Obstetric guidelines recommend best practice pre-oxygenation as target end tidal oxygen (etO₂) ≥ 90%[2]. Our prior study in pregnant patients showed strong evidence that high flow nasal oxygen (HFNO) was superior to face mask oxygen (FM) at achieving this threshold[3]. The efficacy of HFNO and FM pre-oxygenation in pregnant patients with high body mass index (BMI), particularly obesity class II or above is uncertain. We conducted a randomised controlled crossover study to investigate our hypothesis that HFNO is non-inferior to FM for increasing etO₂ after pre-oxygenation of pregnant patients with BMI ≥ 30 kg/m² in late pregnancy.

Methods

After prospective ethics approval, trial registration (ANZCTR:12624000283572) and consent, 70 participants were randomised (computer generated with allocation concealment) to undergo serial simulated pre-oxygenation protocols with either HFNO followed by FM (Group HFNO-FM) or vice versa (Group FM-HFNO) in the ramped position. EtO₂ was measured using an anaesthetic face mask at four time points: 5 min rest (baseline) followed by 3 min HFNO or FM, then 5 min rest (to confirm O₂ washout) followed by 3 min FM or HFNO. HFNO was delivered via Optiflow Switch™ at maximum 70 l/min and FM via tight-fitting face mask at 10 l/min. Data were grouped producing primary outcomes of etO₂ captured after HFNO and after FM. Non-inferiority margin was 5% etO₂. Secondary outcomes were the proportion of participants achieving etO₂ ≥ 90%, tolerance of HFNO, proportion of patients maintaining mouth closure with HFNO and correlations between primary outcome and relevant measured variables. Paired sample t-test was used to compare the primary outcome measure. Comparisons between proportions was made using McNemar's test for paired samples. Correlations were examined using Pearson's correlation coefficient.

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Results

Seventy pregnant participants were enrolled. Four were excluded due to withdrawal or non-tolerance. The median [IQR] participant weight and BMI for Group HFNO-FM vs. Group FM-HFNO were 97 [88-118] kg vs. 107 [93-132] kg, and 37 [33-41] kg/m² vs. 38 [34-46] kg/m² respectively. First etO₂ after HFNO was higher than after FM pre-oxygenation; mean (SD) 90 (3.2)% vs. 88 (3.3)% [mean difference 1.8 (95% CI 0.7 to 2.9)%; p-value 0.002]. HFNO was superior to FM in achieving etO₂ ≥ 90%; 50/66 participants (76%) HFNO vs. 19/66 participants (29%) FM; p<0.001. 77% participants tolerated 70 l/min (maximal) HFNO flow rate and 74% participants maintained mouth closure for the full HFNO protocol. There were no significant correlations between etO₂ and age, gestation, weight, BMI, HFNO flow rate, duration of mouth closure, respiratory rate or minute ventilation.

Discussion

HFNO was non-inferior and indeed superior to FM pre-oxygenation in pregnant patients with BMI ≥ 30 kg/m² under simulated conditions. After 3-minutes of pre-oxygenation, the number of participants who achieved etO₂ ≥ 90% was 2.5-fold greater with HFNO. Our findings suggest that HFNO is an optimal modality for pre-oxygenation of pregnant patients with high BMI in settings where it is available.

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An audit of neurosurgical case-mix, care delivery and outcomes in the State Trauma Centre for Western Australia

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Introduction:

Emergency neurosurgical interventions (ENI) have high morbidity and mortality and consume a large number of resources. The aim was to evaluate data at Royal Perth Hospital (RPH), the Level 1 State Trauma Centre in Western Australia, to gain a better understanding of case-mix, care delivery and outcomes in comparison to equivalent hospitals in the Global Neurotrauma Outcomes Study (GNOS) [1].

Methods:

Retrospective audit at RPH of all trauma patients older than 16 years undergoing ENI from March to December 2023. Patients were identified using a keyword search of the Theatre Management System software. 94 data fields were populated for each patient. Primary outcome was 14-day mortality and secondary outcomes included length of intensive care unit (ICU) and hospital stay.

Results:

Case-mix: 106 eligible patients (66% male, 34% female) were identified with median (IQR) [Range] age of 69 (44-79) [17-92] years. Most presentations were secondary via another medical facility (69%) with only 31% presenting directly to RPH. 48% of cases were classified as severe trauma with an Injury Severity Score > 12. Brain pathology requiring intervention was: Isolated subdural, 58%; ≥2 intracranial haematomas, 37%; isolated subarachnoid, 3%; isolated extradural, 1%; scalp haematoma, 1%. The median (IQR) [Range] midline shift in mm was 5 (2-10) [0-20].

Care-delivery: 43% of patients underwent a burr hole procedure and 8% an external ventricular drain (EVD). For these, median (IQR) [range] time from booking to surgery was 6.8 (3.4-20.6) [1.1-52.6] hours and 1.0 (0.8-2.5) [0.2-27.3] hours respectively. Consultant presence for these less technical procedures was 5% for surgeons and 67% for anaesthetists. More invasive surgery included craniotomy (34% of cases) and craniectomy (14%). For these more complex and technical procedures time from booking to theatre was 1.6 (0.6-5.5) [0-49.1] hours and consultant presence was 18% for surgeons and 65% for anaesthetists.

Outcomes: Overall, 14-day mortality was 9% but varied according to presentation type (primary 24%, secondary 3%) and surgery type (burr hole 0%, EVD 33%, craniotomy 8%, craniectomy 27%). Overall median (IQR) [Range] ICU time (34% patients) was 13 (7-18) [1-54] days, and hospital length of stay was 12 (8-26) [2-131] days.

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Discussion:

RPH has a similar case-mix to very high Human Development Index hospitals participating in GNOS, with the latter reporting median (IQR) age 54 (34-69) years, 76% male and 45% severe trauma. A distinctive feature at RPH is the higher proportion of secondary presentations (69% vs 50%) which reflects the geographical scale of Western Australia and potentially introduces a selection bias towards more survivable injuries reaching RPH.

In terms of care-delivery, there was lower neurosurgeon consultant presence at RPH across all operations (11% vs 77%) and specifically for craniectomies (33% vs 50%). Time from booking to surgery was also often prolonged. These findings may relate to a lack of elective neurosurgical caseload at RPH, with consultants cross-covering from other sites. Addressing this could form the basis of future quality improvement initiatives.

In terms of outcomes, 14-day craniectomy mortality at RPH was similar to equivalent hospitals worldwide (27% vs 25%), however 14-day overall mortality was lower (9% vs 20%). This may be driven by fewer primary presentations and a higher proportion of isolated subdural haematomas (58% vs 47%). This notion is also consistent with lower ICU admission at RPH (34% vs 81%).

Acknowledgements:

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Impact of antithrombotic medications on perioperative management and outcomes in elderly chronic subdural haematoma patients

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A chronic subdural haematoma (cSDH) is a collection of altered blood products beneath the dura. Cohort studies suggest that over 40% of patients with cSDH are taking antithrombotic medications at diagnosis. [1] However, high quality data guiding perioperative antithrombotic management in this population is limited. Recent evidence that the continuation of aspirin may not worsen re-accumulation rates is a potential significant change in practice that may reduce delays to surgery. [2] We undertook a retrospective analysis of patients presenting to a tertiary centre for operative management of cSDH. The primary objective was to determine the impact of antithrombotic medication on time to surgery. Secondary objectives include the impact on perioperative management and clinical outcomes in patients with cSDH in an Australian population. We also described cessation and reversal strategies for antithrombotic medications at our institution, as well as length of cessation and recommencement rates.

Methods

A retrospective review was conducted on patients aged ≥ 65 years who underwent an operative management of cSDH at The Alfred Hospital, Melbourne, Australia between January 2023 and August 2025. Inclusion criteria were patients with cSDH over the age of 65. The primary outcome measured was time to surgery. Secondary data collected included patient characteristics, pre-morbid functional status, GCS on admission, operation performed, intraoperative monitoring and length of hospital stay. Outcome measures recorded include discharge destination, 60-day mortality and re-accumulation rates. Data for patients on antithrombotic medications included medication types, indications, cessation periods, and method of reversal of antithrombotic effects. Continuous data were analysed using student T-tests, and categorically data were analysed with Chi-square tests.

Results

Of 179 patients, 96 (53.6%) were taking antithrombotic medication at diagnosis. These patients had a significantly longer time to surgery (4.41 vs 1.49 days, $P=0.002$) and were less likely to be discharged directly home (35 vs 47 patients, $P=0.007$). They were significantly more likely to be reviewed by haematological (39 vs 5 patients, $P<0.001$) and perioperative medical services (39 vs 17 patients, $P=0.002$). No significant difference was demonstrated in mortality (4 vs 3, $P=0.849$) or re-accumulation rates (25 vs 15, $P=0.202$) at 60 days post-surgery.

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Of the patients on antithrombotic medications, 31 (32.2%) received additional blood products and/or pharmacological management to reverse the antithrombotic medication. Antiplatelet medications were recommenced in 55% of patients (median of 55.5 days post-cessation). DOAC medications were recommenced in 59% of patients (median of 56 days after cessation).

Discussion

Patients with cSDH taking antithrombotic medication experience significant delays to surgery and are less likely to return directly home following admission. These patients, who are typically elderly, comorbid and frail, represent a more clinically complex cohort and currently receive individualized antithrombotic management from specialist medical teams. Research into the perioperative continuation of antithrombotic medications and the development of a national registry are required to further guide evidence-based perioperative antithrombotic strategies in this growing patient population.

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Leukocytosis and Outcomes in Older ICU Patients After Ischemic Stroke: A Binational Multicenter Cohort Study

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The incidence, severity, and mortality burden of ischemic stroke increase markedly with advancing age (1). Adults aged at least 85 years have in-hospital ischemic stroke case-fatality rates exceeding 25 percent, reflecting diminished neuroplasticity, impaired autoregulation, heightened susceptibility to reperfusion injury, and a pro-inflammatory vascular milieu. White blood cell count (WCC) is an accessible biomarker of systemic inflammation and has been linked to stroke severity, infarct size, hemorrhagic transformation, and mortality in mixed-age cohorts. However, patients aged 90 years or older are consistently underrepresented or excluded from stroke research, leaving a knowledge gap regarding prognostic markers in the oldest-old (2,3). We therefore examined the association between WCC measured within 24 hours of intensive care unit (ICU) admission and mortality among nonagenarians and centenarians with ischemic stroke across Australia and New Zealand.

Methods

We conducted a retrospective multicenter cohort study using the Australian and New Zealand Intensive Care Society Adult Patient Database from 2010–2024. The Alfred Hospital Ethics Committee approved this study (project No. 253/24) and waived the requirement for informed consent due to the use of de-identified retrospective registry data. Generative AI was used for grammar and language refinement only. We included patients aged at least 90 years admitted to ICU with a primary diagnosis of ischemic stroke according to APACHE III-J codes. Patients with hemorrhagic stroke, hematological malignancy, immunosuppression, AIDS, sepsis or septic shock, or chronic immunosuppressive therapy were excluded. Demographics, comorbidities, physiological and biochemical parameters, and illness-severity indices (APACHE III and SOFA) were extracted. The primary exposure was highest WCC in the first 24 hours, categorized as leukopenia ($<4 \times 10^9/L$), normal ($4-11 \times 10^9/L$), or leukocytosis ($>11 \times 10^9/L$). The primary outcomes were ICU and in-hospital mortality; secondary outcomes included ICU and hospital length of stay (LOS). Associations were examined using uni- and multivariable logistic regression treating WCC as categorical and continuous. A landmark analysis excluding deaths within the first 24 hours evaluated robustness to early catastrophic injury. Statistical significance was defined as $p < 0.05$.

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Results

Among 615 eligible patients, 72 percent had normal WCC, 1 percent leukopenia, and 27 percent leukocytosis. In multivariable models, leukocytosis was independently associated with both ICU mortality (adjusted OR 2.33, 95 percent CI 1.11–4.96, $p=0.026$) and in-hospital mortality (adjusted OR 2.01, 95 percent CI 1.29–3.13, $p=0.002$) compared to normal WCC. Treating WCC as a continuous variable demonstrated a graded association with mortality: each one-unit increase in WCC was associated with higher ICU mortality (adjusted OR 1.21, 95 percent CI 1.03–1.41, $p=0.018$) and hospital mortality (adjusted OR 1.11, 95 percent CI 1.02–1.21, $p=0.015$). Leukocytosis was independently associated with prolonged ICU LOS (adjusted ratio 1.15, 95 percent CI 1.00–1.32, $p=0.043$). In the landmark cohort excluding deaths within 24 hours, leukocytosis remained associated with increased ICU mortality (adjusted OR 2.75, 95 percent CI 1.14–6.87, $p=0.026$) and in-hospital mortality (adjusted OR 1.91, 95 percent CI 1.21–3.01, $p=0.006$).

Discussion

Among the oldest-old ICU patients with ischemic stroke, leukocytosis within 24 hours of admission was a strong and independent predictor of mortality and prolonged resource use. These findings extend evidence from younger stroke cohorts and highlight the prognostic utility of a simple inflammatory biomarker in a population with high vulnerability and limited physiological reserve. Early WCC measurement may help refine risk stratification and inform clinical decision-making. Further prospective research should evaluate underlying mechanisms and the potential role of immune modulation in this rapidly growing population.

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Epidural analgesia for management of acute postoperative pain following elective Pelvic Exenteration Surgery

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Pelvic exenteration is a complex surgical procedure undertaken for locally advanced or recurrent pelvic malignancies, most commonly of colorectal or gynaecological origin. It is characterised by a large midline laparotomy and extensive pelvic dissection, resulting in a substantial postoperative pain burden [1]. Effective management of acute postoperative pain is therefore essential to optimise recovery and perioperative outcomes. Epidural analgesia is widely used in major abdominal and pelvic surgery, for its analgesic and opioid-sparing benefits; however, its role in patients undergoing pelvic exenteration remains less well characterised. This audit evaluated epidural prescribing practices, analgesic efficacy, and associated complications following elective pelvic exenteration.

Methods:

Ethics approval was obtained (EX/2025/MNH/124316). This retrospective audit included all patients who underwent elective pelvic exenteration surgery at a major Australian tertiary centre between 01/08/2023 to 30/10/2025. Patients were identified using ICD-10 pelvic exenteration codes. Anaesthetic and Intensive Care Unit records were reviewed for demographics, surgical details, analgesic prescriptions, pain scores (numerical rating scale), and complications. Statistical analysis was performed using IBM SPSS software. Descriptive statistics summarised patient characteristics and surgical type. Subgroup analyses compared pain scores, OMED and epidural usage between surgical types and patient groups.

Results:

Of the 39 identified pelvic exenteration procedures, 76.9% were total exenterations, predominantly performed for colorectal malignancy (79.5%). Side wall resection was undertaken in 51.3% of patients, sacrectomy in 25.6%, and nerve or other bony resection in 20.5%.

Epidural analgesia was prescribed in 82.1% of patients, with the remainder receiving regional wound catheters, ketamine infusion, and Patient Controlled Analgesia (PCA). Rescue PCA was required in 32.3% (10) of patients initially managed with epidurals. Most epidurals (83%) remained in situ for 5–7 days; only one required early removal due to a major complication, with all other early removals attributed to ineffective analgesia.

Post Anaesthetic Care Unit (PACU) pain scores were low (median 0, IQR 0–2), with 87.1% of patients requiring no opioid analgesia. Pain scores at rest on postoperative Days 1, 2, and 3

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were 2 (IQR 0.25–4), 3 (IQR 1–3.5), and 2 (IQR 1–3), respectively. Additional opioid requirements in patients prescribed an epidural were 0 mg Oral Morphine Equivalent (OMED) in PACU (IQR 0–0), increasing to 8 mg on Day 1 (IQR 0–28) and 24 mg on postoperative Days 2 and 3 (IQR 0–67.5 and 0–79). There was no significant difference in pain scores in PACU, Day 1, 2 or 3 between patients who were prescribed an epidural vs those without (Mann-Whitney U, $p > 0.05$).

No significant differences in pain scores, opioid consumption or epidural volume administered were observed in patients who underwent sidewall, sacral, or nerve resection compared with those who did not (Mann–Whitney U, all $p > 0.05$). Opioid-tolerant patients had significantly higher daily postoperative opioid requirements compared with non-tolerant patients on postoperative days 1–3 (Mann–Whitney U 22.0–17.5, $p = 0.014–0.009$).

Discussion:

Epidural analgesia provided effective immediate postoperative pain control following elective pelvic exenteration, with low pain scores, minimal early opioid requirements and only rare incidence of complications. The absence of significant differences in pain scores or opioid consumption between epidural and non-epidural groups, and across varying extents of resection, suggests that contemporary multimodal non-neuraxial analgesic strategies may provide comparable analgesia in selected patients. Future studies comparing these two analgesic strategies would be beneficial to improve patient care.

Authors have no conflicts related to this study.

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