

The Introduction of a Weight-Based, High Volume Scalp Block Dosing Algorithm for Routine Use in Neuro-Oncology Patients Reduces Post-Operative Opioid Use and Improves GCS Scores in Recovery



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Introduction

A survey of current practice amongst anaesthetists at our institution revealed that, in keeping with the literature ¹, two thirds were concerned about opioid interference with neurological assessment, hypopnea and hypercarbia after elective craniotomy. Local anaesthetic (LA) scalp block is associated with improved early pain scores and a reduction in opioid requirements vs. placebo post-craniotomy, particularly when given prior to knife to skin. ^{1, 2, 3} This project sought to introduce a routinely-used scalp block, through protocolisation and education, for use in neuro-oncology patients.

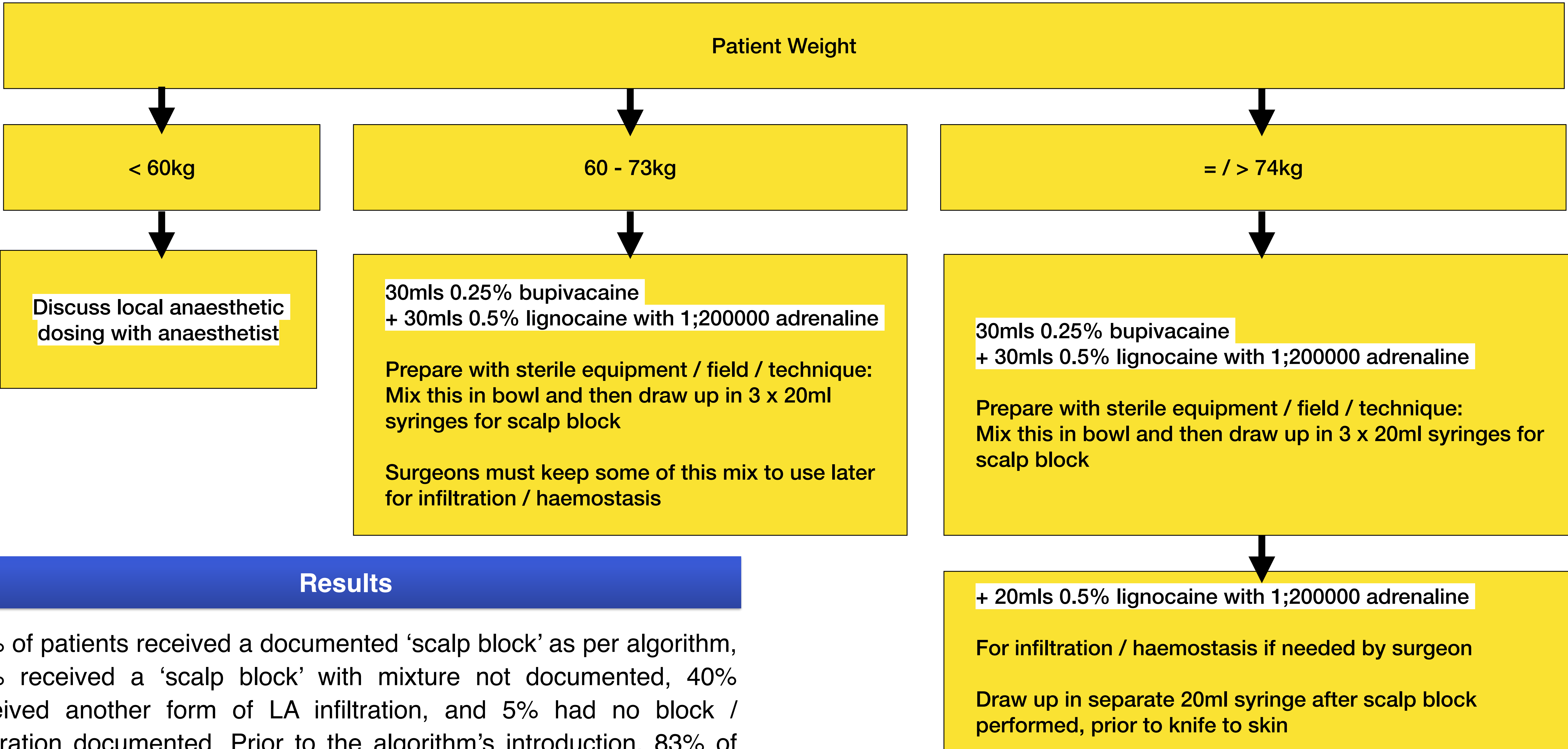
FIGURE 1. A weight-based, high volume scalp block dosing algorithm.

Methodology

We collected data on LA use, pain and GCS scores, and intra- and post-operative opioid use over a three month period for 20 patients pre- and post-intervention (1 year later, unannounced). A weight-based dosing algorithm (Figure 1) was introduced for a high volume, pre-emptive, scalp block that facilitated both surgical haemostasis and post-operative analgesia, similar to that used for awake craniotomy in our institution. The algorithm was intended to improve frequency of use by facilitating routine preparation of mixture by nursing staff.

Scalp Block for Elective Craniotomy: Recommended Dosing

**** Please confirm all dosing with anaesthetist / surgeon at team brief ****



Results

45% of patients received a documented ‘scalp block’ as per algorithm, 10% received a ‘scalp block’ with mixture not documented, 40% received another form of LA infiltration, and 5% had no block / infiltration documented. Prior to the algorithm’s introduction, 83% of patients received surgical LA infiltration mainly using only lignocaine with adrenaline.

TABLE 1. Pre- and post-intervention differences in relevant intra- and post-operative pain and associated indices.

Intra-Operatively	Pre-Intervention	Post-Intervention (1 year later)
Documented ‘scalp block’ as per algorithm	0%	45%
Patients receiving an opioid	72%	80%
Average morphine dose	5.9mg	7.8mg
In Recovery		
Patients receiving an opioid	44%	10%
Average IV morphine dose	10.4mg	6.5mg
Patients reporting pain	35%	33%
Lowest GCS	13.4	14.1
Highest GCS	14.5	14.8
On Ward (first 12 hours post-op)		
Patients receiving morphine	28%	25%
Average oral morphine dose	2.8mg	2.5mg

Conclusion

The introduction of the scalp block algorithm was associated with a decrease in post-operative opioid use and an increase in post-operative levels of consciousness. These changes were observed despite the fact that our study power was reduced due to only 45% of patients receiving a block as per algorithm.

References

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Questions?

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Or send me your question via the meeting App: Luke Edwards

NACCS survey of bite guard use in neuroanaesthesia



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Introduction

Neurophysiological monitoring is increasingly used in neurosurgery to guide surgical resection and prevent inadvertent neurological injury. The application of cortical stimuli can cause clenching of the jaw, resulting in dental damage, soft tissue injury or damage to endotracheal tubes [1]. To prevent complete dental occlusion under general anaesthesia, a bite guard may be inserted between the patient's teeth. However, bite guards can themselves cause problems and there is substantial variation in how bite guards are employed [2].

Methodology

To establish pragmatic data about frequency of use, types of bite guard used and any patient safety implications, we conducted a NACCS approved, national survey, sent electronically to 490 members.

Results

We received 92 responses (95% consultants), of whom 65% use a bite guard at least monthly in their neuroanaesthesia practice. Only 23% have access to a proprietary bite guard, with the majority using DIY gauze bite blocks. Brands mentioned are depicted below, along with an illustration of gauze bite blocks in use.



BreatheSafe®



Hudson RCI®



BiteMe™



Anchorfast™



Multiple comments stated that if the patient was edentulous, no bite guard would be used whereas if they had poor dentition, then the anaesthetist would be more inclined to use a soft DIY guard, rather than a hard plastic preformed guard. 52% of respondents state that the use of a bite guard is discussed at the team brief. Desirable features are shown in the table.

Feature	Percentage of respondents who felt it was important (%)
Easy insertion	77
Point of fixation	51
Bright colouration	46
Labelling on patient	29
Saliva absorbent	21
Bilateral	21
Biodegradable	15
Fixes to endotracheal tube	10
Non-absorbent	8

Of respondents, 68% reported that they had never had a problem with bite guards. However, as shown below, many respondents had witnessed issues:

	Displacement 15%
	Injury to patient 14%
	Airway obstruction 2%

Quotes

Quotes regarding significant incidents are shown below. Other comments included importance of consenting patients for soft-tissue and dental damage if a bite guard is to be used and ways of ensuring that the presence of a bite guard is documented and handed over e.g. on theatre boards, anaesthetic chart, swab count, or WHO checklist.



Prone patient, block fell forward in mouth at some point during surgery, loosened lateral incisor on one side. Despite careful positioning, tongue edge caught between bite block and teeth by end, lead to small tongue laceration.



Two stage procedure. Not documented that bite blocks left in situ after first op. One bite block found at laryngoscopy. Unfortunately 2nd one had migrated further down and this wasn't identified until extubation.



Was using rolled up green swabs for a patient prone in pins. At end of case patient turned supine and lightened but slight delay as pin sites bleeding. So had to deepen again. Then when stopped anaesthetic and looked in mouth one bite block missing. Patient had swallowed it.



Long case, multiple repeated stimuli, about 8h into case ETT leak identified, ETT changed and found to have a breach into lumen and bite blocks flattened. On that occasion the block consisted of 3 rolled pieces of gauze and arguably not tightly rolled.



I have seen damage to lips on insertion, reinforced ETT kinking, pilot tube leakage, pressure damage to lips from rigid bite guards and tongue biting.

Conclusion

The literature suggests that the incidence of bite injuries associated with transcranial motor-evoked potentials is around 0.63%, in the presence of a bite block [1]. Our figures are much higher, which may be partly accounted for by an element of 'double-counting' if multiple anaesthetists responding to the survey witnessed the same incident. However, it may also represent that the real-world incidence outside of protocolised research studies is greater than reported. Implementing the following may help to mitigate against some of the risks of bite guard use:

- Adding use of bite guard to WHO checklist
- Documenting insertion and removal on anaesthetic chart
- Visual reminder on the patient e.g. sticker

Whilst clinical judgement is needed to choose the most appropriate bite guard depending on patient and surgical factors, there does appear to be a gap in the market for a device that is safe and easy to use.

References

1. Tamkus A, Rice K. The incidence of bite injuries associated with transcranial motor-evoked potential monitoring. Anesth Analg. 2012;**115**(3):663-7.
2. Deiner, S, Osborn, I. Prevention of Airway Injury During Spine Surgery: Rethinking Bite Guards. Neurosurg Anesthesiol. 2009;**21**:68-69.

Acknowledgements

We would like to thank NACCS for facilitating the survey and our patient, for giving consent for us to use his photo.

Questions?

Send me your question via direct message on the meeting App: **Leonie Murphy**

Adenosine-induced flow arrest in aneurysm clipping and AVM resection: review of cases and postoperative complications from a neurosurgical centre



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Introduction

Adenosine-induced transient flow arrest can be a useful tool to help achieve proximal aneurysm control during clip ligation of intracranial aneurysms. The clinical effect of a bolus of adenosine is apparent after 10-20 seconds; causing AV nodal blockade, bradycardia and cardiac arrest.¹ We present a case series of patients who received intraoperative adenosine whilst undergoing intracranial aneurysm clipping (IAC) or arteriovenous malformation (AVM) resection at a single specialty neurosurgical centre.

Methodology

This project is locally registered (45-202223-SE). A retrospective review of electronic records for all patients who received intraoperative adenosine bolus during IAC or AVM resection between April 2019 & August 2022 was conducted. Data included: patient demographics, comorbidities, complications, urgency of surgery, SAH grade, size & location of aneurysm & patient outcome. Total dose of adenosine & dose per kg (mg/kg) was recorded. Postoperative cardiac complications included ECG changes, troponin rise and echocardiogram results.

Variable	Total
Age (years)	
Mean \pm SD	53 \pm 7
Range	36 - 72
Gender	
Male (%)	9 (32)
Female (%)	19 (78)
Body Mass Index (kg/m ²)	
Mean \pm SD	26.8 \pm 7
Range	17 - 53
Urgency of surgery	
Emergency (%)	12 (43)
Elective (%)	16 (57)
Total Adenosine dose (mg/kg)	
Mean \pm SD	0.3 \pm 0.24
Range	0.07 - 1.05
Estimated intraoperative blood loss (ml)	
Median	300
Range	50 - 2200
Post-operative ICU stay (days)	
Median	1
Range	1 - 33
Total post-operative stay (days)	
Median	13
Range	1 - 96
Modified Rankin Scale at discharge	
Median	2
Range	1 - 6
Glasgow Outcome Score at discharge	
Median	4
Range	1 - 5

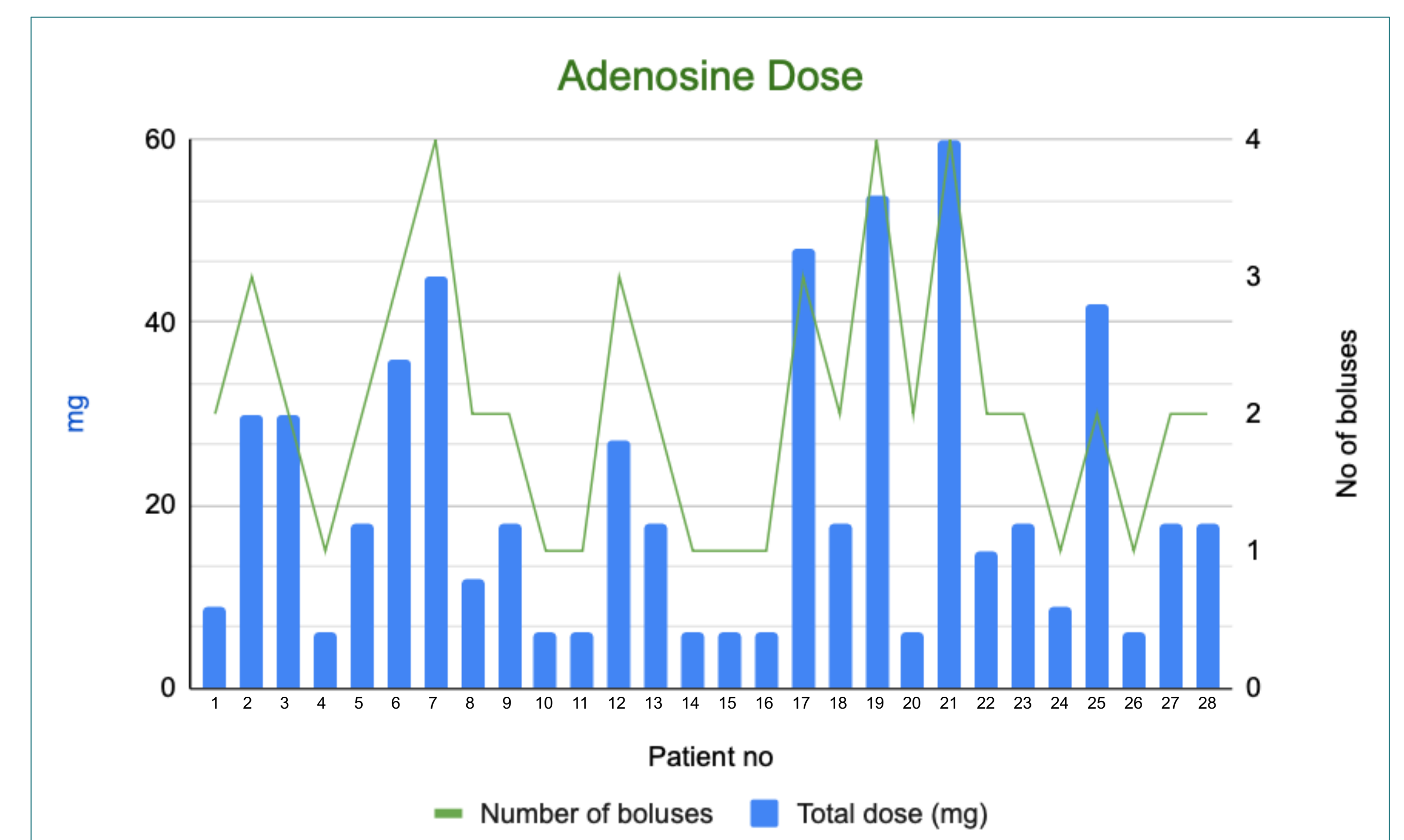
Table 1: Clinical and demographic characteristics of study population (n=28)

Results

28 patients were included (26 ICA, 2 AVM, Table 1). Indications for intraoperative adenosine included periclippping (n=21) & intraoperative rupture (n=5). The median (range) total adenosine dose was 18mg (6-60mg). No intraoperative complications were documented. Temporary clips were required for 7 patients. 4 patients (3 SAH) had postoperative ECG changes (new onset RBBB (n=1); T wave inversion (n=3)). All were associated with a troponin peak (median: 12ng/ml, range: 7-133ng/ml). 2 had postoperative echocardiograms, with normal biventricular function.

Dosing

Overall, 29% of patients required only one dose of adenosine. Median total dose of adenosine used was 18mg (IQR 6-30mg = 0.11-0.37mg/kg)



Conclusion

Our results as in keeping with previous local results & published literature.² Adenosine use in this cohort of patients appears safe. The titratability, quick onset and offset as well as predictable action, make adenosine a useful no-mechanical method for reducing blood flow in aneurysms and AVMs.³

References

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Adapting neuro anaesthesia placements to the new stage 2 curriculum



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Introduction

The anaesthetics 2021 curriculum has led to registrar training being shortened from 5 years to 4 years. Stage 3 trainees (ST6-7) no longer need to undertake specific training within neuro anaesthesia, limiting trainee exposure in a tertiary centre to a 3 month placement during stage 2 training (ST4-5).

Key capabilities M and N within the stage 2 'General Anaesthesia' module of the 2021 anaesthetics curriculum¹ are dedicated to neuro anaesthesia training. These describe the safe provision of anaesthesia for elective and emergency intracranial, spinal and neuroradiology procedures, as well as the application of relevant basic scientific principles.

Beginning a placement in neuro anaesthesia can often be a challenging time, with a large volume of core knowledge and skills to acquire over a short space of time. By introducing structured changes to the stage 2 neuro anaesthesia placement, we hope to optimise trainees' experience during this time period and encourage taking a specialist interest area in neuro anaesthesia later in training.

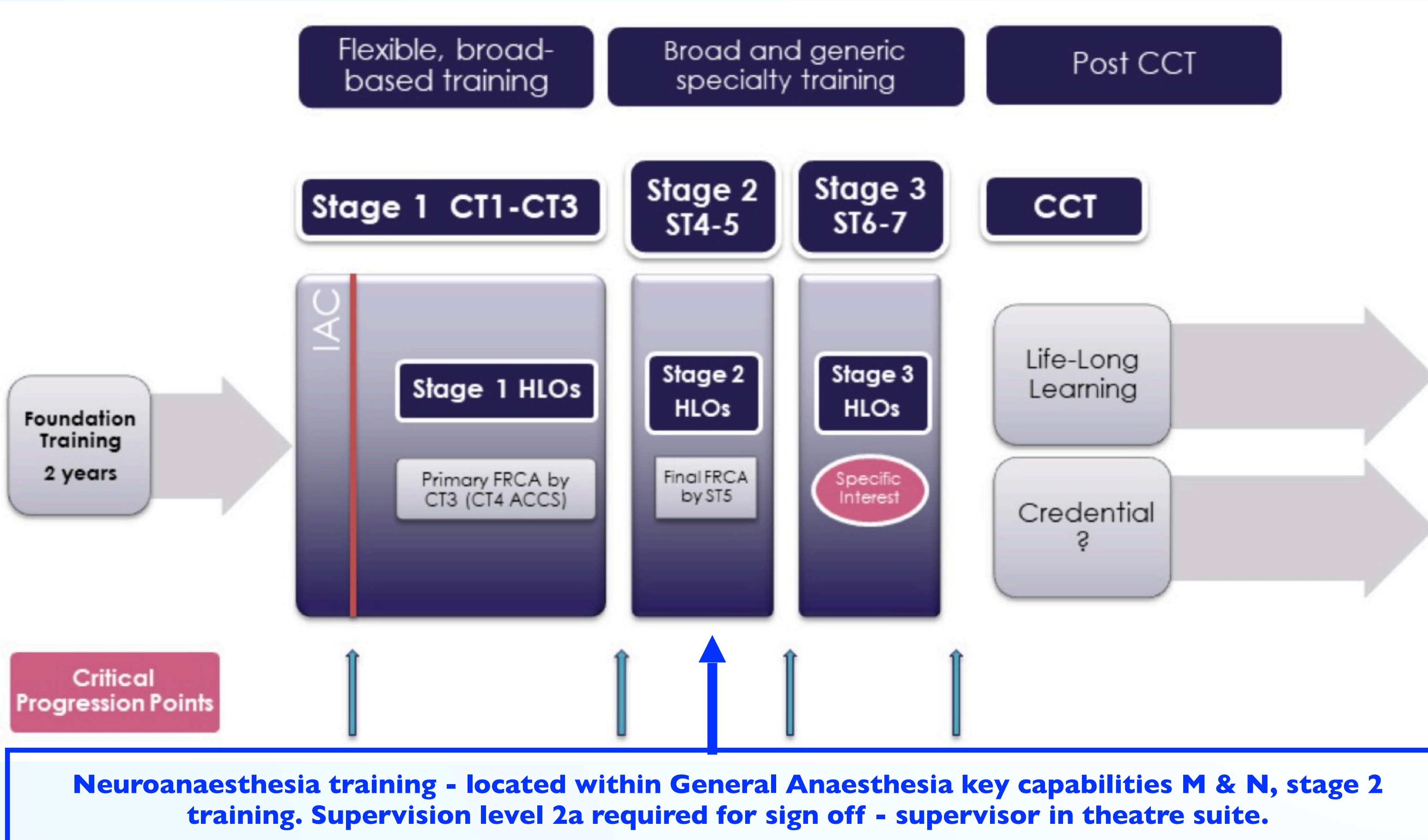


Figure 1 - adapted from 'Royal College of Anaesthetists, 2021 curriculum for a CCT in anaesthetics, version 1.1, February 2023'

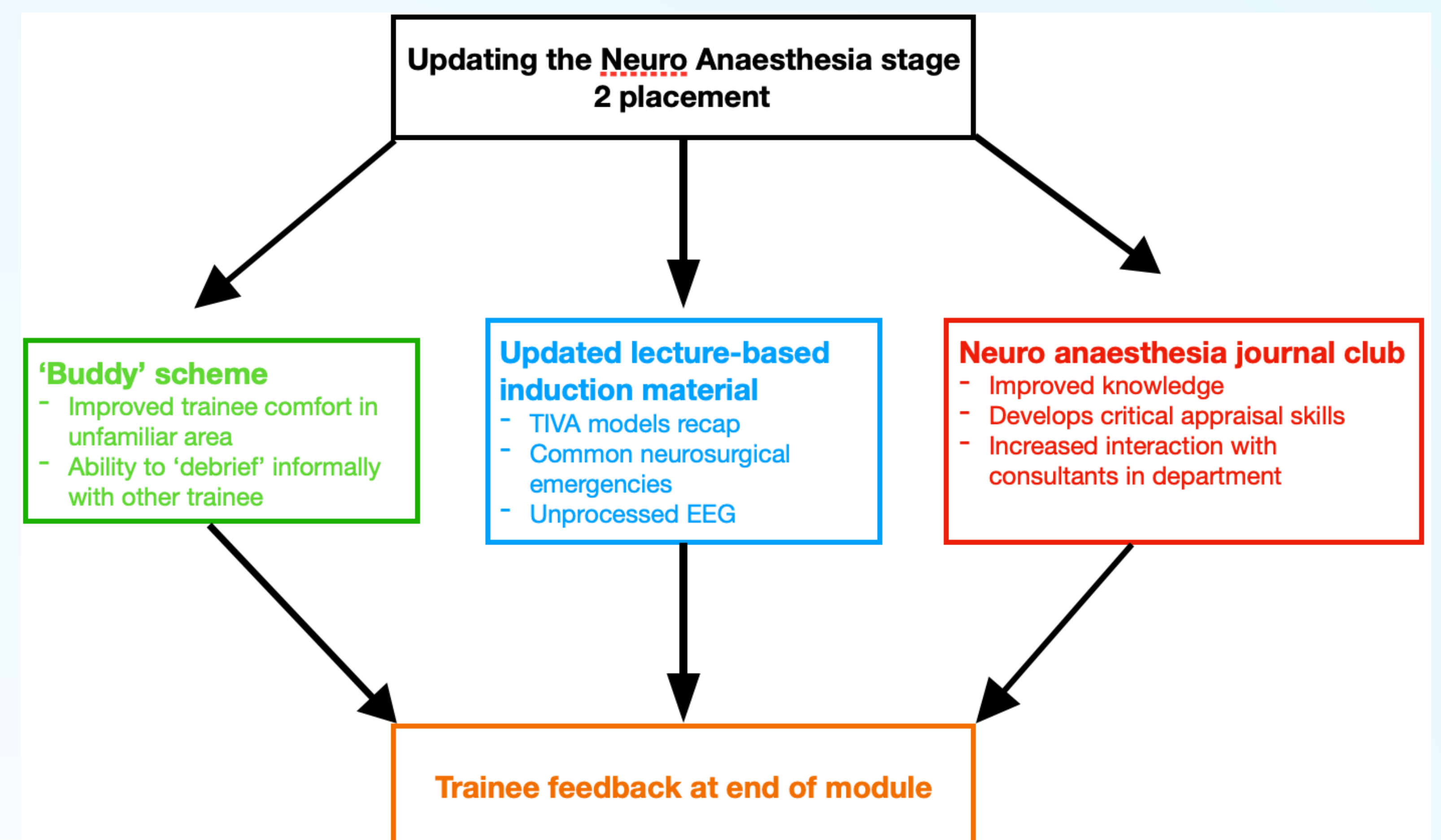
Methodology

We will introduce 3 main changes to the stage 2 neuro anaesthesia placement in May 2023, to maximise trainee exposure during their placement:

1. Updated induction process - During the induction process to neuro anaesthesia, there will be a more structured, lecture based teaching session aimed to familiarise trainees before starting placement and provide a framework for trainees to develop their skills base. Topics covered during the induction will include; anaesthetic management of common neurosurgical emergencies, TIVA models and interpretation of the unprocessed EEG.

2. 'Buddy' scheme - We are introducing a 'buddy' scheme, where junior trainees are paired with senior trainees undertaking a higher module or specialist interest area in neuro anaesthesia. We hope this will provide trainees a means for informal debrief with their 'buddy' over any clinical experiences and provide ongoing support over the course of the module. It will also provide senior trainees opportunities to develop mentoring skills, which are increasingly important moving towards consultant roles.

3. Journal club - We aim to introduce a regular journal club for stage 2 trainees. Taking on a neuro anaesthesia theme, the club aims to expand registrars' knowledge base and develop skills in critical appraisal of papers. By involving the consultant cohort from neuro anaesthetics to help facilitate these sessions, it will hopefully improve trainee-consultant relationships over the 3 month placement, translating into more rewarding theatre sessions.



Results

The impact of these positive changes to stage 2 neuro anaesthesia training will be surveyed using trainee feedback upon completion of the module. This will be collected anonymously from trainees using a google forms document. With constructive feedback, we aim to refine any changes over the course of the following 6-12 months.

If successful and well-received by trainees, there is potential to expand both the 'buddy' scheme and journal club to be Trust-wide events, providing pastoral support to trainees over their 12 month stage 2 placement in a tertiary hospital and broadening knowledge base across the wide range of sub-speciality anaesthetics areas covered during this time period.

Conclusion

Adapting to the 2021 curriculum changes presents challenges to neuroanaesthesia exposure. With a more structured induction program of teaching, a 'buddy' system of informal support to junior trainees and implementation of a journal club, we aim to optimise stage 2 training for anaesthetists in our hospital.

Future areas for consideration also include the neuroradiology service - with increasing frequency of stroke thrombectomies, this provides an important learning opportunity. Emergency thrombectomies in the acutely unwell, often significantly comorbid patient can be a difficult environment to learn in - consideration of a simulation session or added teaching could improve trainee learning in this sometimes challenging area of neuro anaesthesia.

We hope to refine the stage 2 neuro anaesthesia training in our tertiary neurosurgical centre over time. There is potential to expand this model to other training modules in the future, optimising stage 2 anaesthesia training.

References

1. Royal College of Anaesthetists, 2021 curriculum for a CCT in anaesthesia, February 2023

Questions?

Send me your question via direct message on the meeting App: **Payashi Garry**

Perioperative Electrolyte Imbalance and its Effect on Outcome in Patients with Aneurysmal Subarachnoid Haemorrhage



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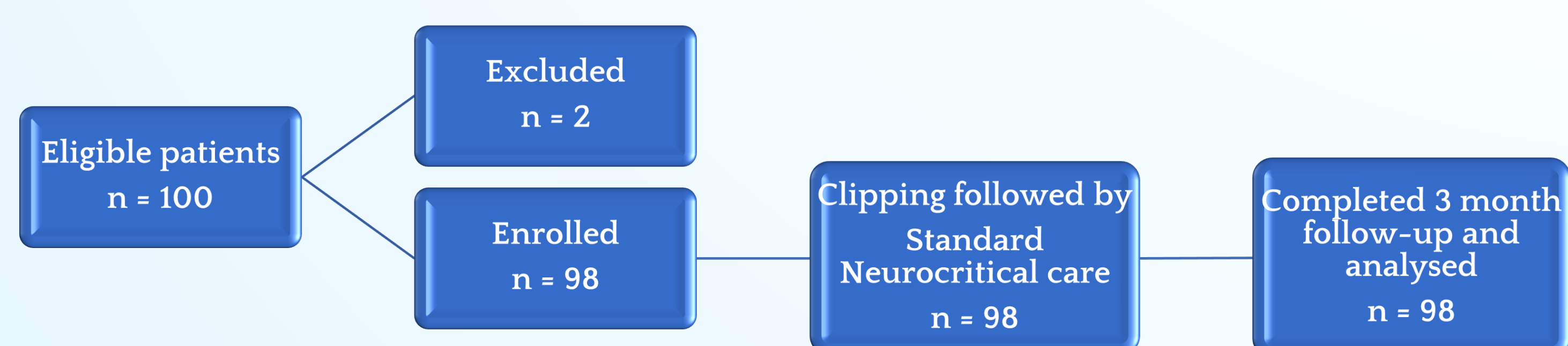


Introduction

- **Electrolyte abnormalities** are frequently encountered in patients with aneurysmal subarachnoid haemorrhage (aSAH)
- Dyselectrolytemia worsens immediate and long-term prognosis
- It may also cause secondary neurological insult and adversely affect other organ systems
- **Aim-** To investigate sodium and potassium imbalance in patients with aSAH, factors contributing to it, and its effect on immediate & late outcomes

Methodology

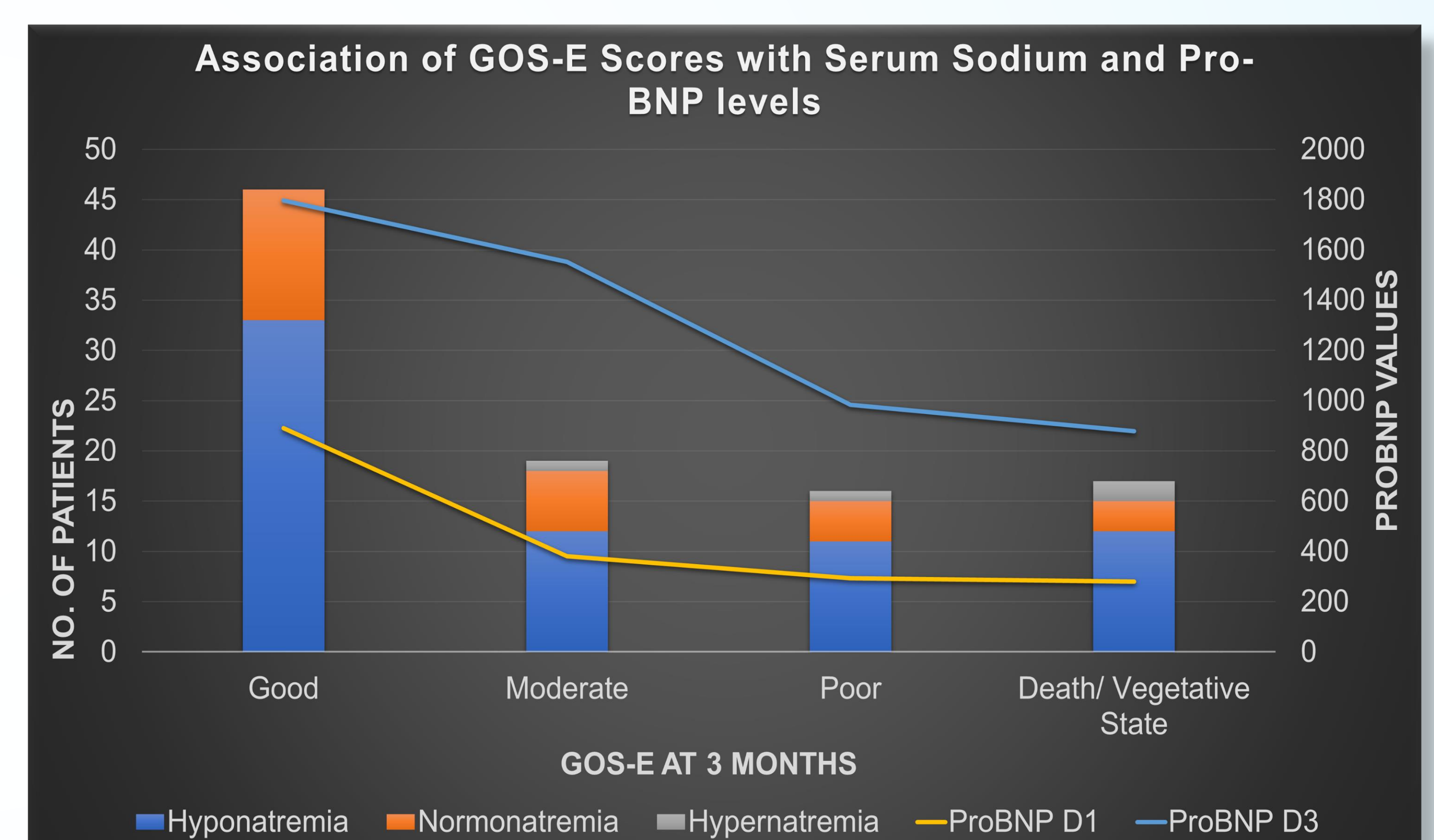
- Approval from institutional ethics committee was taken and written and informed consent was taken from the next of patient's kin
- 100 adult patients with aneurysmal subarachnoid haemorrhage were enrolled over a period of 15 months
- Clinical and radiographic gradings were done at admission
- All enrolled patients underwent microsurgical clipping for cerebral aneurysms and were provided standard neuro-critical care as per institute protocol
- Serum sodium and potassium levels were measured pre-operatively, intra-operatively and then daily, until 7th post-operative day
- Pro-Brain Natriuretic Peptide (Pro-BNP) levels were measured on post-operative days 1 and 3
- Outcomes were evaluated using Modified Rankin Scale (MRS) at discharge and Glasgow Outcome Scale- Extended (GOSE) at 3-month follow-up



Results

Electrolyte Abnormality	Percentage
Hyponatremia	69.8
Hypernatremia	4
Hypokalemia	86.7
Hyperkalemia	8.2
↑ Day -1 ProBNP	77.5
↑ Day -3 ProBNP	95.9

- **Hypokalemia** was most common electrolyte abnormality, followed by **hyponatremia**
- There was no association between severity of aSAH and incidence and severity electrolyte abnormalities
- None of electrolyte imbalances were associated with poorer outcome at discharge by MRS
- Hypernatremia was found to be significantly associated with a poorer GOSE at 3 months follow up (**p value =0.027**)
- ProBNP values on day-1 and day-3 were elevated in most patients
- Pro-BNP levels were significantly elevated in patients who developed hyponatremia (**p value <0.01**)



Conclusion

- Raised ProBNP levels explain development of hyponatremia by natriuresis and can be used as a marker to predict hyponatremia
- Further studies are needed to establish the role of pro-BNP as a predictive tool for protocolizing early institution of therapies for managing hyponatremia in patients with aneurysmal subarachnoid haemorrhage
- As electrolyte abnormalities may result in secondary brain insults and worsen morbidity and long-term outcomes, serial electrolyte monitoring is imperative for early detection and prompt treatment

Questions?

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Apoorva Singh

Evolution of acute spinal cord injury management over 10 years in the United Kingdom: a neuroanaesthesia national survey

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Introduction

In the U.K., about 16 people per million suffer a traumatic spinal cord injury (TSCI) each year.

TSCI is life-altering and acute surgical decompression is controversial: some studies suggest that early (<24 hours after TSCI) decompression improves outcome, but others show no benefit.

The non-surgical management of TSCI is also debated with no agreed blood pressure target because high-quality data is lacking.

In 2012, we surveyed the management of acute TSCI by U.K. neuroanaesthetists and neurointensivists which demonstrated that management was variable and AANS/CNS guidelines to maintain mean arterial blood pressure 85 – 90 mmHg for a week after TSCI are not uniformly followed.

We re-surveyed U.K. neuroanaesthetists and neurointensivists to determine how practise has changed in the last decade with increasing sub-specialty delivered clinical care for TSCI.

Results 2022

Just over 5% (3/56) neuroanaesthetists always monitor central venous pressure and 77% (43/56) always monitor invasive arterial blood pressure.

About 91% (51/56) always monitor body temperature and 82% (46/56) always monitor urine output.

Intraoperative somatosensory (SSEP) and motor evoked (MEP) potentials are always monitored by 14% (8/56) and 13% (7/56) neuroanaesthetists

Most aim for an arterial pCO₂ 4.5 – 5.0 kPa (78%, 43/55) and arterial pO₂ >10 kPa (98%, 54/55).

Mean arterial blood pressure target ≥80 mmHg is preferred by 62% (34/55), whereas 25% (14/55) target blood pressure within 20% of normal.

Most 69% (39/56) neuroanaesthetists use target-controlled infusion (TCI) propofol + remifentanil or sevoflurane (23%, 13/56).

All (100 %) ventilate with O₂/air, and no one uses nitrous oxide. Most (89%, 49/55) use positive end expiratory pressure (PEEP).

On NICU a mean arterial blood pressure target ≥80 mmHg is preferred by 75% (29/39) neuroanaesthetists, whereas 15% (6/39) aim for blood pressure within 20 % of normal for each patient.

The targets of physiological parameters for intubated patients were the same as during surgery, i.e. arterial pCO₂ 4.5 – 5.0 kPa (82 %, 31/38) and arterial pO₂ >10 kPa (100 %, 38/38).

Hyperosmolar agents are only used by 5 % (2/37) and methylprednisolone by 15% (7/47).

Conclusion

New preference for TIVA with BIS likely to accommodate intraoperative monitoring (MEPs/SSEPs). Increased cardiac output monitoring allows for waveform analysis and haemodynamic assessment to titrate fluids/vasoactives. CVP has fallen out of favour due to invasiveness and unreliability. Hypoxaemia and hyperoxia are avoided.

We demonstrate a paradigm shift in management but variability in practice necessitates development of TSCI management consensus guidelines.

Methods

We obtained approval from the Neuro Anaesthesia and Critical Care Society (NACCS) council; the survey was then disseminated online using the same questionnaire as in 2012.

Neuroanaesthetists and neurointensivists were asked questions about managing acute TSCI in general and specifically preferences for anaesthesia, gas mixtures, intraoperative monitoring, control of physiological parameters, use of glucocorticoids, and management in the neurointensive care unit (NICU) the week following the injury.

All 480 full members of the NACCS were contacted online and invited to participate (i.e. consultant neuroanaesthetists and neurointensivists across the UK).

Participants were given three months to complete the online link; then the survey was closed. We received 56/480 responses (11.7 % response rate).

Results 2012 vs. 2022

In the last decade, there are several significant changes in anaesthetic management. We had 56 responders in 2022, compared with 49 in 2012.

There is now more extensive intraoperative monitoring including:

1) Bispectral index (BIS, used at least sometimes by 91%, 51/56 neuroanaesthetists in 2022 vs. 23%, 11/48 in 2012)

2) Non-invasive cardiac output (used at least sometimes by 62%, 35/56 neuroanaesthetists in 2022 vs. 41%, 20/48 in 2012),

3) SSEP/MEP (used at least sometimes by 73 – 77%, 41 – 43/56 in 2022 vs. 21 – 27%, 10/47 – 13/48 in 2012)

CVP monitoring is less used (90%, 43/48 monitored at least sometimes in 2012 vs. 53%, 30/56 in 2022)

Desflurane is no longer preferred, and TCI propofol + remifentanil has become the anaesthetic of choice.

In 2012 neuroanaesthetists used desflurane (35 %, 17/49), TCI propofol + remifentanil (33 %, 16/49), and sevoflurane (26 %, 13/49) compared with TCI propofol + remifentanil (69 %, 39/56), and sevoflurane (23 %, 13/56) in 2022.

NICU management has not changed significantly; most aim for mean arterial pressure ≥80 mmHg, arterial pCO₂ 4.5 – 5.0 kPa, and arterial pO₂ ≥10 kPa, though in 2022 the preference is for arterial pO₂ 10 – 12 kPa rather than >12 kPa.

Acknowledgements

We are grateful to Dr. Joe Sebastian for presenting the survey to the Neuro Anaesthesia and Critical Care Society academic committee for approval prior to distributing to society members.

Questions?

Send me your question via direct message on the meeting App: **Hasan Asif**

Time to tracheostomy insertion in neurocritical-care patients



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Introduction

Tracheostomies are often inserted in critical care patients requiring mechanical ventilation. Whilst up to 15% of the general critical care population require a tracheostomy, tracheostomy rates have been shown to be as high as 35% in patients with acute brain injury¹.

In both general critical care patients and patients with neurological injury optimal tracheostomy timing is unclear¹. Early tracheostomy, often defined as day four, reduces the need for analgesia and sedation, accelerates ventilator weaning and facilitates earlier mobilisation and rehabilitation, but does not confer a mortality benefit when compared to 'late' tracheostomy (variably defined as day seven to ten)².

We audited the time period between intubation and tracheostomy insertion in our tertiary neurological and neurosurgical institution.

Results

87 neurocritical-care patients had a tracheostomy inserted during the study period (table 1). Mean time to tracheostomy insertion was 18 days. Patients with subarachnoid haemorrhage (SAH) had mean time to tracheostomy of 20 days and mean NCC LOS of 42 days. Stroke (intracerebral haemorrhage (ICH)/infarct) patients had mean time to tracheostomy of 17 days with mean LOS of 58 days.

Diagnosis	Number of patients	Mean time to tracheostomy (days)	Mean LOS in NCC (days)
SAH	15	20	42
Stroke (infarct/ICH)	32	17	58
Other	40	17	32
Total	87	18	46

Table 1: Time to tracheostomy & LOS for tracheostomy patients September 2020–January 2023

57% of all tracheostomies were ST and 43% were PT. Mean times to both ST and PT were 18 days.

Methodology

Using computerised patient records, we performed a retrospective review of the time from intubation to tracheostomy insertion for patients in our hospital from September 2020 to January 2023.

We additionally audited insertion technique (percutaneous PT or surgical ST), admission diagnosis and length of stay (LOS) in neurocritical care (NCC). Patients admitted primarily for COVID were excluded.

Conclusion

Our mean times to tracheostomy were all longer than literature definitions of both 'early' and 'late' insertion². Explanations for our longer times to insertion might include;

- Vasospasm following SAH and associated clinical instability precluding tracheostomy insertion
- Uncertain cognitive recovery in NCC patients and consequently longer times for clinical decision-making
- Need for MDT decision on tracheostomy
- Clinicians' preference for surgical tracheostomy
- Lack of on-site ENT services
- Restricted visiting during COVID with consequently fewer opportunities to discuss tracheostomy with families

There is no conclusive evidence for superiority of early versus late tracheostomy insertion^{1,2}. We nonetheless consider ideas to reduce time to tracheostomy to include more frequent MDT meetings and earlier discussion with families.

References

1. Bösel J, Niesen WD, Salih F, et al. SETPOINT2 and the IGNITE Study Groups. Effect of early vs standard approach to tracheostomy on functional outcome at 6 months among patients with severe stroke receiving mechanical ventilation: The SETPOINT2 randomized clinical trial. *JAMA*. 2022;**327**(19):1899–1909. doi: 10.1001/jama.2022.4798.
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Questions?

Send me your question via direct message on the meeting App: Katherine James

Variations in anaesthetic practice for Mechanical Thrombectomy across London

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Neuro-anaesthesia Fellow Consultant Neuro-anesthetist Consultant Neuro-anesthetist

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Introduction

London Thrombectomy Anaesthetic Group (TAG) was set up by NHS England to enable departments offering Mechanical Thrombectomy (MT) to share information and collaborate in order to improve the services we offer. The departments participating in TAG are King's College, St Georges', Charing Cross, the National Hospital for Neurology and Neurosurgery, Queen's Romford and the Royal London Hospitals.

It was identified in TAG meetings that there is a wide variation in practice for anaesthesia for MT across and within centres. This can cause delay in door to needle time - a key target in MT, and confusion for trainees who rotate through different centres.

We decided to gather information to enable us to

- 1) identify any significant variations that with discussion could possibly reduce delay in door to needle time
- 2) develop a simulation or training session for trainees who will be carrying out MT across London.

Methodology

We initially carried out a pilot survey at King's College Hospital asking neuro-anaesthetic consultants and trainees about their practice for MT. The survey asked which investigations and interventions each anaesthetist would require prior to induction of anaesthesia for MT. We also asked whether the investigations required were acceptable from the referring hospital or needed to be done at the MT centre.

Results of our in-house survey were presented at the subsequent TAG meeting. Additional questions regarding logistical aspects of thrombectomy services were added following discussions within the group as we identified that there were variations from trust to trust. These included where the patients arrived in the thrombectomy suite from; e.g ED or straight from the ambulance, who was responsible for handing over the patient to the anaesthetist and where patients routinely went post procedure.

Following agreement on these changes, the survey was sent out to all consultant, ST6/7 and advanced fellowship anaesthetists involved in the provision of MT.

Results

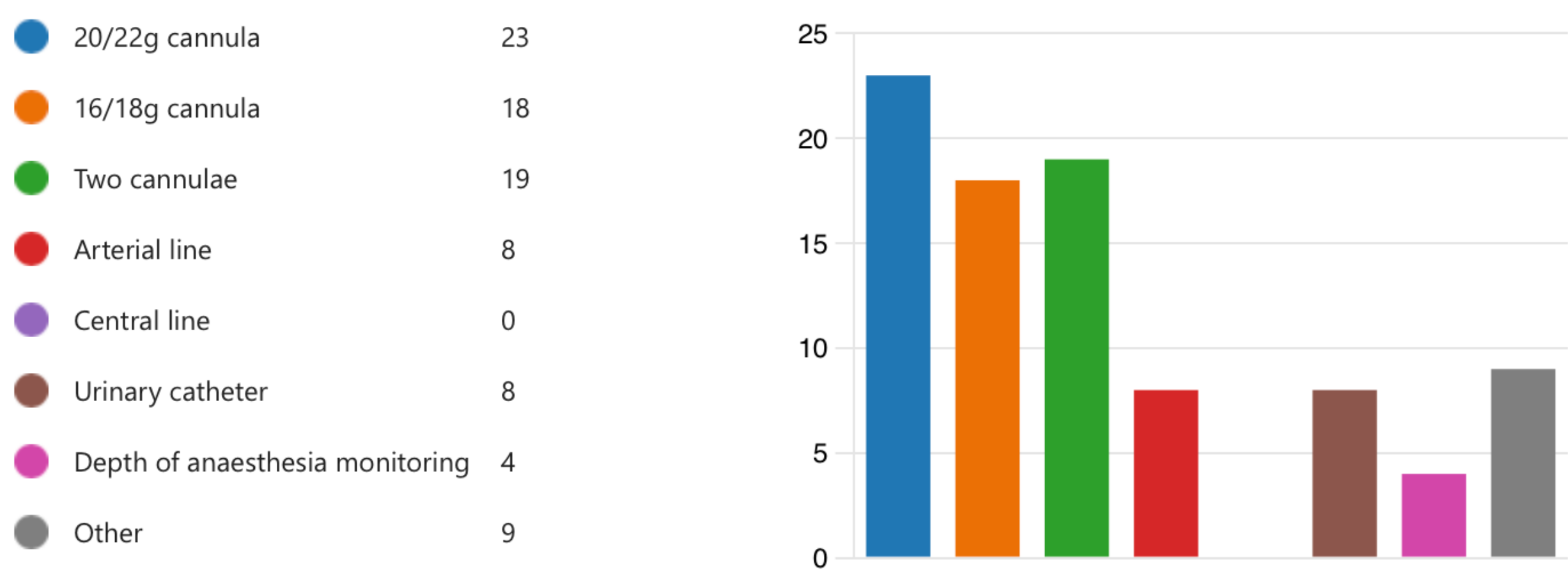
We had 49 responses from 6 MT centres, 41 were consultants and 8 trainees.

10% of respondents (5) would not routinely require any investigations prior to anaesthetising for MT. However 32% (16) would not delay the start of the procedure if none were present. Those that would delay would do so for ECG (14%) and ABG/VBG (16%). With the exception of a group and screen, all respondents who required investigations were happy with results from the referring hospital or MT centre.

Free text responses included

- As with all anaesthetics the requirement for investigations could change on a case by case basis
- Historical results would be valuable

51% (25) of respondents would not require any interventions other than an intravenous cannula prior to induction of anaesthesia. 16% (8) required arterial line, 16% (8) urinary catheter and 8% (4) depth of anaesthesia monitoring.



Patients mostly arrived from ED (80%) and went to a stroke unit (86%) post procedure. The majority of handovers were from the stroke team (84%).

Conclusion

Following discussion of the results at subsequent TAG meetings, as a group we are establishing a teaching session for those involved in MT, discussing the process and rationale for the various investigations and interventions. This will include the production of a video simulation of a case which can be used at local inductions for trainees. We appreciate that established neuro-anaesthetists will have their own practice and intend this to be a guide for those less experienced in mechanical thrombectomy.

The TAG were initially considering a pan-London pre-MT checklist so that the local ED or referring hospital can ensure baseline investigations and interventions are in progress prior to arriving in the IR suite. However we realised that one form will likely not fit all, so within the group we are sharing the pre-thrombectomy proformas currently in use in each centre so we can compare and improve our own as necessary.

TAG is continuing to meet and develop further ideas for collaboration including a pan-London thrombectomy M&M.

Acknowledgements

With thanks to all members of London Thrombectomy Anaesthetic Group:
Jennifer Corns, NHSE Thrombectomy Delivery Manager
St Georges' Hospital
The National Hospital for Neurology and Neurosurgery
Charing Cross Hospital
The Royal London Hospital
Queen's Hospital, Romford

Questions?

Tweet your questions to me! Start your tweet with: @shadirogers #NACCS2023 Poster and/or
Send me your question via direct message on the meeting App: Shadi Pishbin

Neurosimulation – improving confidence in management of critical incidents in neurosurgery.



Dr R. Hayes BSc MBChB FRCA, Dr R. Mittal MBBS FRCA and
Prof. C. Mendonca PhD MD FRCA FAcadMed Honorary
Professor
University Hospitals Coventry and Warwickshire NHS Trust



Introduction

Critical incidents within neuroanaesthesia present many challenges requiring a range of technical and nontechnical skills. Complexities arise from patient positioning factors such as use of the prone position and use of Mayfield Pins, through to factors associated with the nature of the surgery. Team dynamics and human factors play a large part in outcomes. Simulation training can positively impact on the confidence and ability of all staff involved in managing these situations. The Coventry Neurosimulation Course provides an opportunity to rehearse management of neurosurgical critical incidents in a safe manner, using a combination of high fidelity and low fidelity simulation scenarios. We carried out pre- and post-course surveys to assess candidate confidence in managing critical incidents to assess the impact of the course.

Methodology

On the day of the Coventry Neurosimulation Course, during the introductory lecture and at the final debrief, candidates were invited to fill out a google form questionnaire to assess their confidence in managing neurosurgical critical incidents. The Questions were:-

1. Do you consider yourself a novice learner, intermediate learner or advanced learner on the topics covered by this course?
2. What grade are you?
3. Have you any experience in neuro anaesthesia?
4. Have you attended neuro-simulation training before?
5. If so, when?
6. Mark on a 10 point scale how confident you feel with managing emergencies in Neuroanaesthesia. (1 - not confident and 10 – fully Confident)
7. How confident do you feel in managing the following emergencies:
 - a) Raised intracranial pressure
 - b) Hyperacute stroke
 - c) Cardiac arrest in prone position
 - d) Managing neuro emergencies
 - e) Tactical decision makingOptions: Not confident, Slightly confident, Somewhat confident, Fairly confident, Very Confident
8. What expectations do you have for this course?

Between the pre- and post-course questionnaires candidates received the content of the course. This included a lecture on human factors and team dynamics, a lecture by the neurosurgeons on neurosurgical emergencies, 3 workshops on specific emergencies (Cardiac arrest in prone position, Traumatic brain injury and Hyperacute stroke management) and 3 high fidelity simulations covering progressive emergencies in the theatre environment with feedback sessions. Once the course was complete the questionnaires were reviewed. The answers were amalgamated into an excel spreadsheet to enable analysis and identification of any improvements across the course.

Results

Two course have been run and across all candidates there were 26 respondents to the pre-course questionnaire. 3 were consultants, 11 were ST4-ST7, 3 were ST1-ST3, 3 were SAS doctors and 5 were designated as other. 6 said they were novices, 20 said they were intermediate learners. 5 had no experience of Neuroanaesthesia and the rest (21) had experience of Neuroanaesthesia.

Only 2 candidates had attended neurosimulation before, 1 had been 2 years ago and 1 had been 11 years ago. The median candidate confidence self assessment score was 6. 23 candidates responded to the post course questionnaire where the median confidence score had risen to 8. A T-Test across these response rates gave a p-value of 0.0005 indicating that the rise is significant. A significant rise in overall confidence level Candidates indicated their confidence in specific aspects had also risen (Figures 1 and 2).

Figure 1. A graph showing pre course levels of confidence by situation

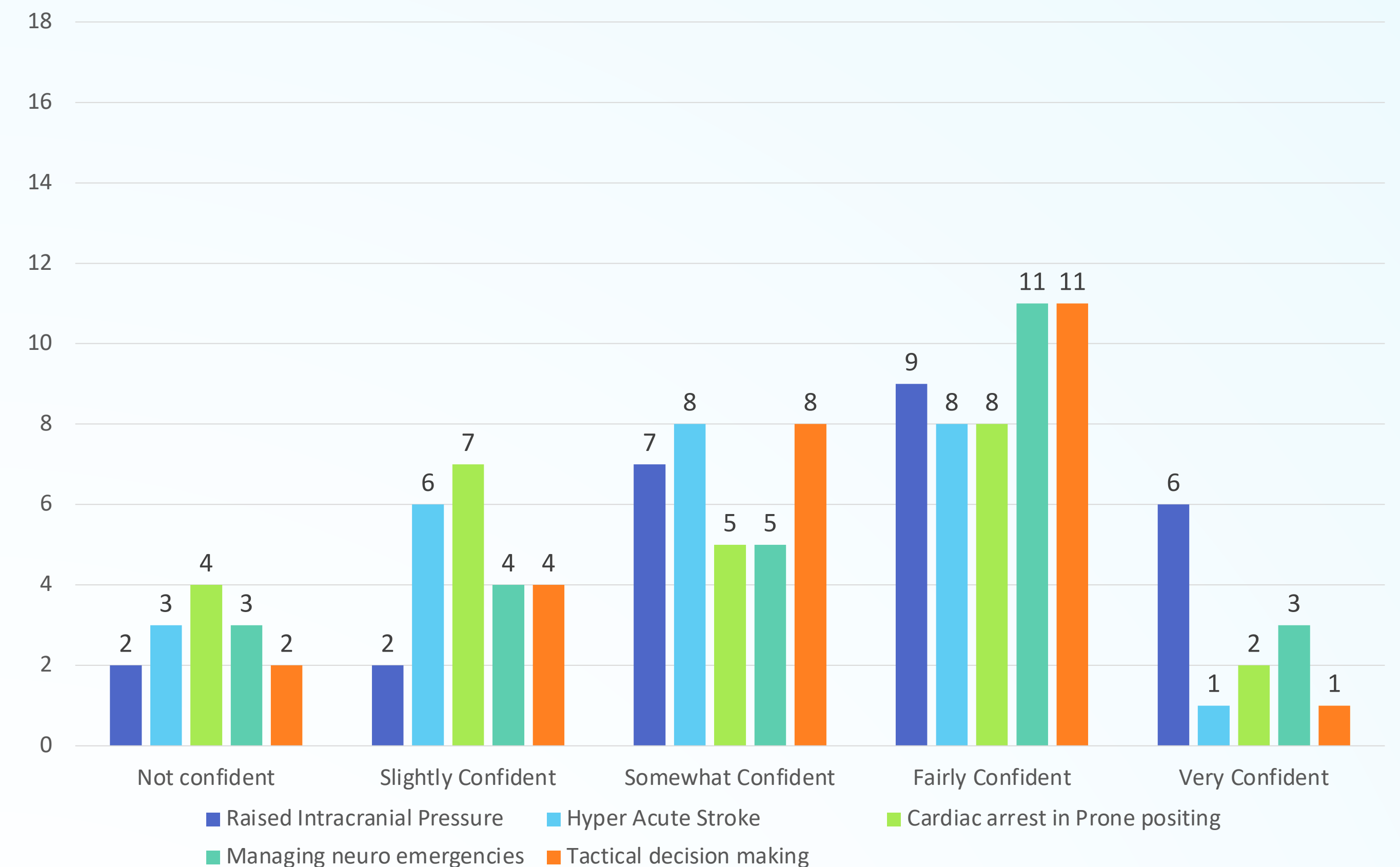
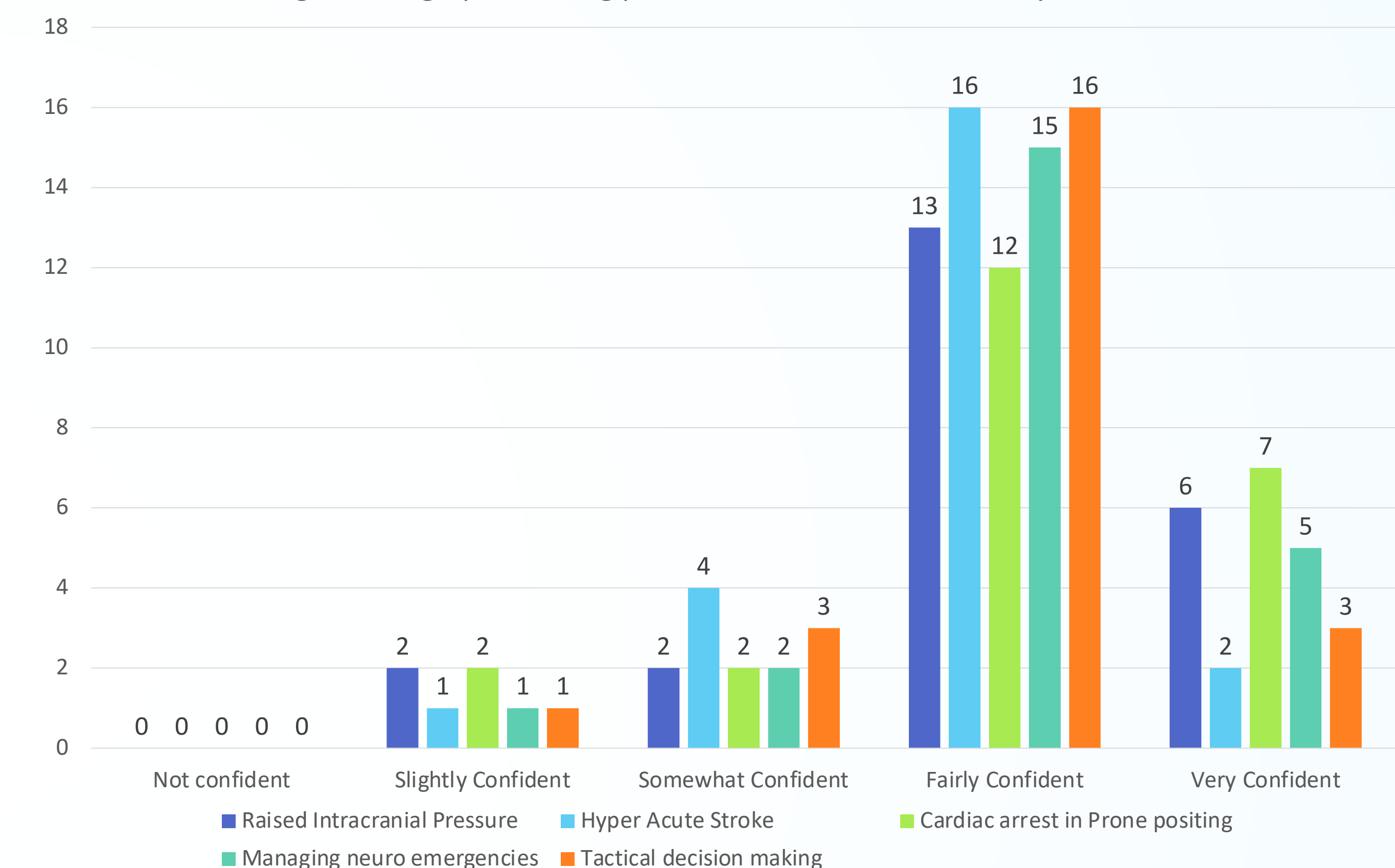


Figure 2. A graph showing post course confidence levels by situation



Conclusion

Simulation training on the Coventry Neurosimulation Course impacts positively on confidence in management of critical incidents in neurosurgery. The overall elevation in score indicated a significant rise in confidence levels amongst course participants. This was also evident when participants were quizzed on their confidence in specific situations.

Simulation training is a safe and effective way of preparing teams to manage critical incidents. These are rare events, but often catastrophic and the ability for a team to drill and prepare for them is invaluable.

The Coventry neurosimulation course is evolving to include all members of the multidisciplinary team involved in neurosurgical care. The aim is to improve the team management of these incidents and improve the dynamic and functioning of the team as a whole.

Acknowledgements

The authors would like to thank all staff at the UHCW Simulation Centre who support and provide technical expertise in delivery of our simulation courses.

Questions?

Tweet your questions to me! Start your tweet with: **@rcayahes #NACCS2023 Poster** and/or

Send me your question via direct message on the meeting App: **Richard Hayes**

Proning in Theatres – An Evaluation of Current Practice and Trainee Experience.



M. Errico FRCA, A. M. V. Luoma FRCA, M. Leemans FRCA. National Hospital for Neurology and Neurosurgery, University College London Hospitals NHS Foundation Trust.



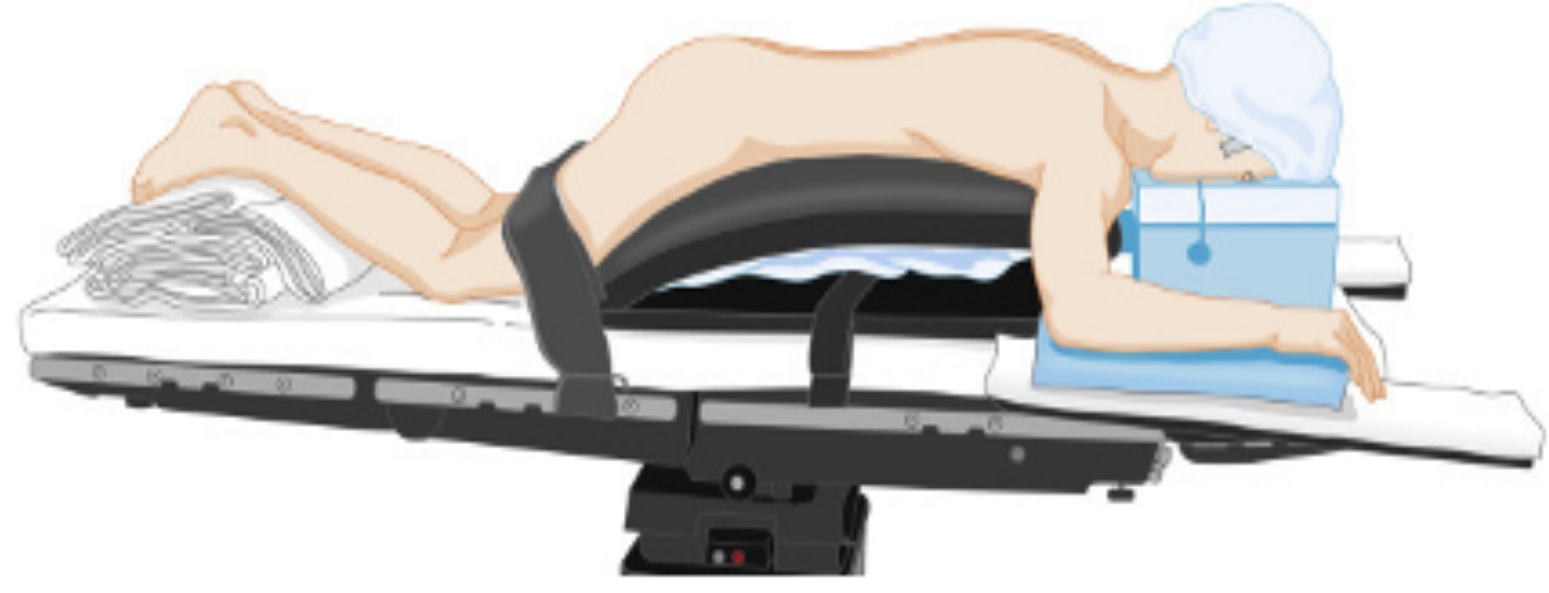
Introduction

The prone position (PP) is frequently used in neurosurgery to facilitate surgical access. It is associated with a variety of physiological changes that directly impact the administration of anaesthesia. Poor positioning is associated with an increased risk of injuries due to pressure & mechanical stressors to vulnerable areas including eyes and peripheral nerves.¹ Complications can result in significant morbidity however these can be avoided with safe proning practice. Despite being a core anaesthetic skill and part of the International Council on Perioperative Neuroscience Training (ICPNT) and Royal College of Anaesthetists (RCoA) syllabus, many anaesthetists are inexperienced in proning patients for surgery. In addition, there are no national guidelines related to the management of patients undergoing surgery in the prone position.

We conducted a quality improvement project (QIP) to enhance education and training in PP amongst the anaesthetic trainees rotating through our department.

Methodology

We implemented a PP local education program between November 2022 and January 2023. This included bitesize practical teaching sessions covering patient consent, use of table and supports, safe positioning and intraoperative considerations. A 'visual aid' was also developed for trainees for easy reference (below). An 11-question electronic survey on PP for surgery was distributed to all neuroanaesthetic trainees in our department using Microsoft 365 Forms. This was done at the beginning (baseline) of their rotation and repeated at 3 months (follow-up).



Positioning for lumbar surgery (Prone)

University College London Hospitals NHS Foundation Trust

ANAESTHETIC ROOM

- Venous access (avoid ACF). Low threshold for invasive monitoring.
- Apply ECG electrodes on patient's back.
- Secure airway with reinforced ETT. Document length of ETT at lips.
- Secure ETT with tape attached to jaw. Avoid tube tie.
- Apply paraffin cream to forehead and cheeks.
- Document supine airway pressures.
- Insert oral temperature monitoring prior to securing ETT.

POSITIONING AND INTRAOPERATIVE MANAGEMENT

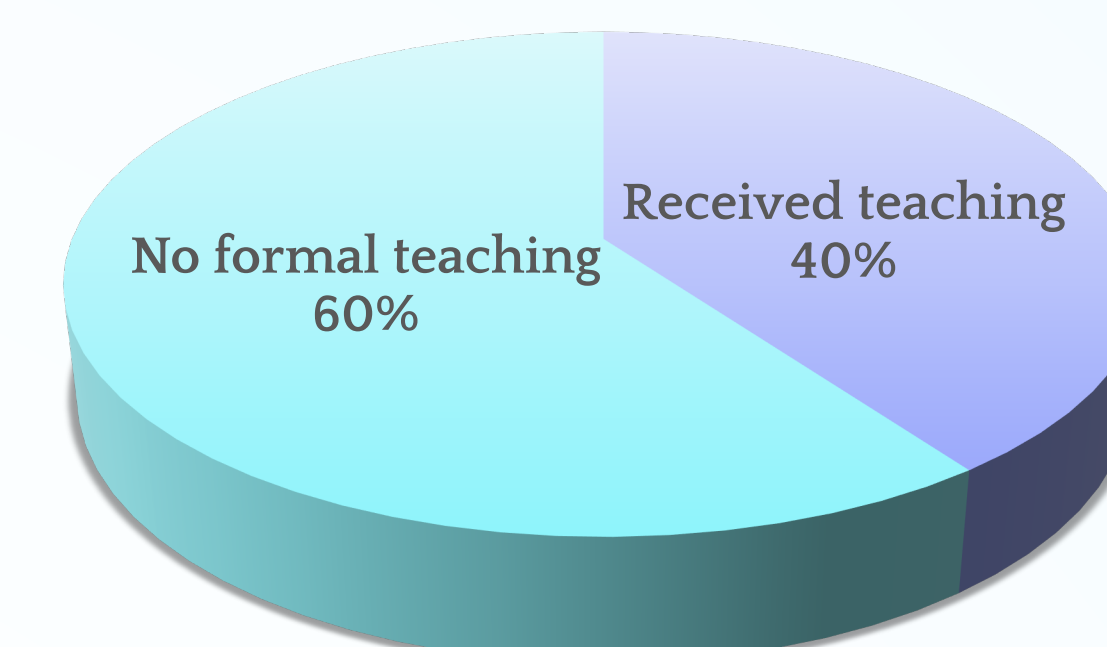
- Bring trolley/bed adjacent to operating table and adjust height to match table's height.
- If AP view needed from C-arm, ensure pedestal away from operative field. Surgeon to check happy with position.
- Slide patient to edge of bed/trolley.
- Ensure top of anterior axillary crease in line with top of Montreal mattress.
- If surgeon requires table to be 'broken', ensure top of ASIS at level of the break.
- Disconnect monitoring/infusion lines/breathing system.
- Apply ProneView® face cushion and ensure ETT with pilot balloon and temp probe exit the same side opening prior to turning the patient.
- Roll patient on to operating table and re-attach to ventilator, infusions and monitoring.
- Ensure neck not over-extended – either drop headrest or add bolster under Montreal mattress at the top of the bed.
- Position arms individually, shoulders slightly adducted (no more than 90°) arms slightly flexed (no more than 90°).
- Ensure eyes/eyebrows visible on mirror platform. Also confirm ETT is free.
- Careful padding of bony prominences (i.e hips, knees, elbows etc).
- Check breasts, abdomen, genitalia. Ensure patient not lying on lines, urinary catheter or IPC calf pump tubing.
- Review and document vulnerable areas such as forehead, eyes, nose etc. every 30 minutes and document on Epic.
- Maintain satisfactory MAP – Aim 20% of baseline MAP.
- Confirm with MDT position is satisfactory.

Department of Neuroanaesthesia and Neurocritical Care April 2022

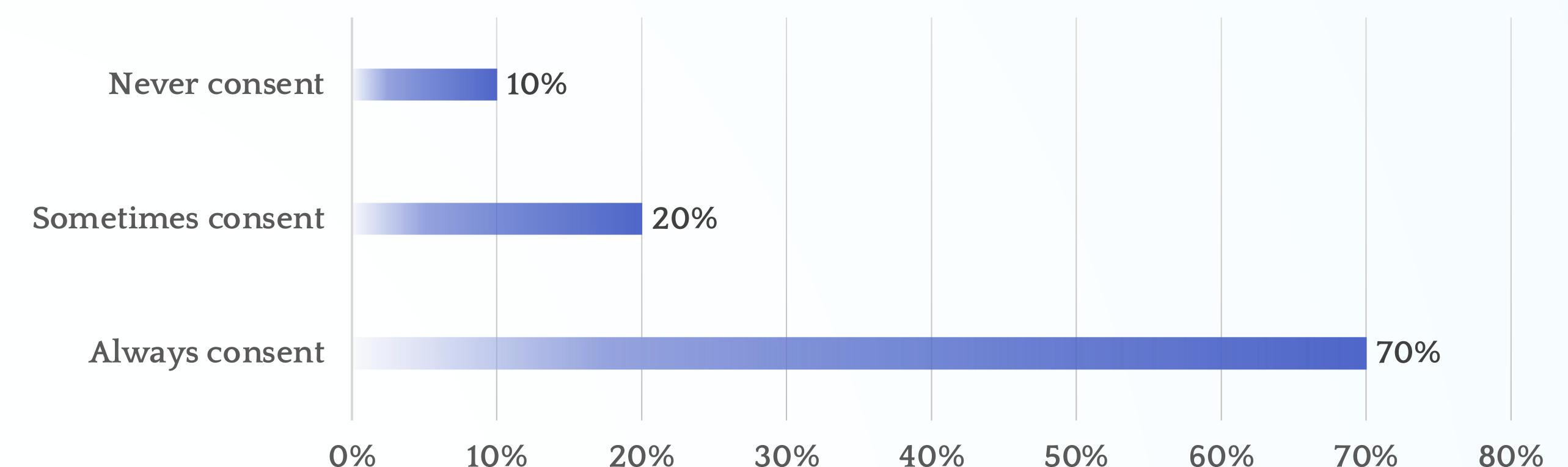
Results

Baseline survey: 10 trainees responded – 59% response rate. This consisted of x2 ST3/ST4, x7 ST5+ and x1 clinical fellow. Nine respondents had recently commenced the rotation whereas 1 had started within 6-12 months; 60% of trainees rarely or never used PP for surgery in the past year; 70% of trainees felt competent proning patients independently without Mayfield pins whereas 40% were confident proning patients independently using Mayfield pins. All trainees indicated they would find PP teaching beneficial during the placement.

PREVIOUS TEACHING IN PRONING PATIENTS FOR SURGERY

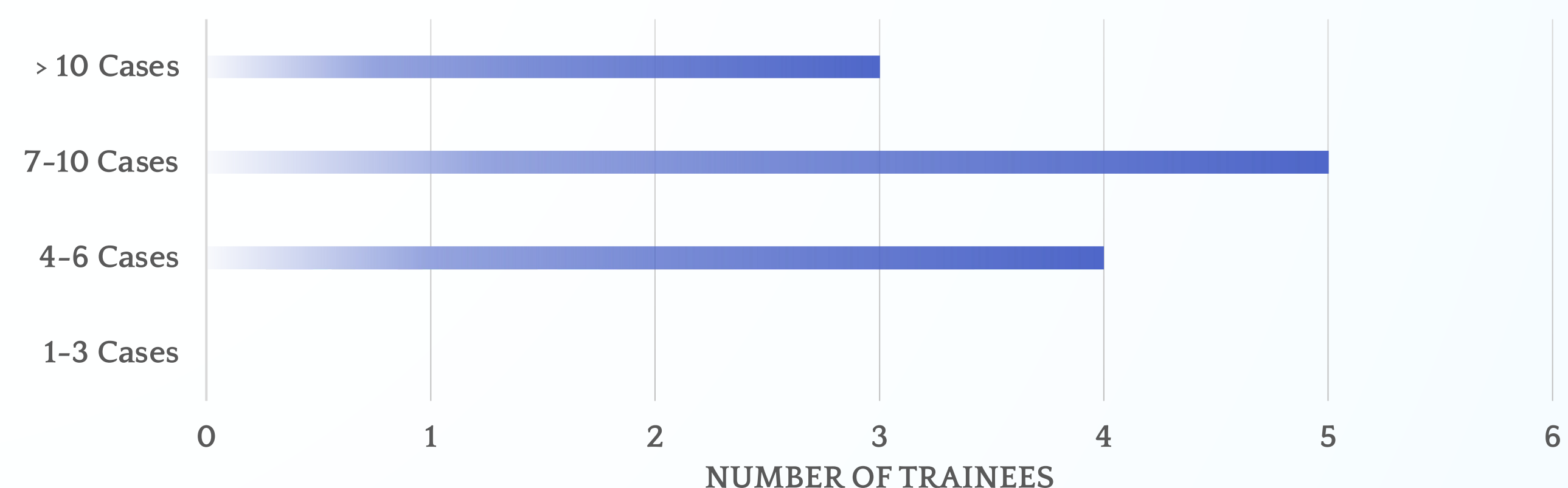


PROPORTION OF TRAINEES SPECIFICALLY CONSENTING PATIENTS FOR PRONING PRIOR TO EDUCATION PROGRAM

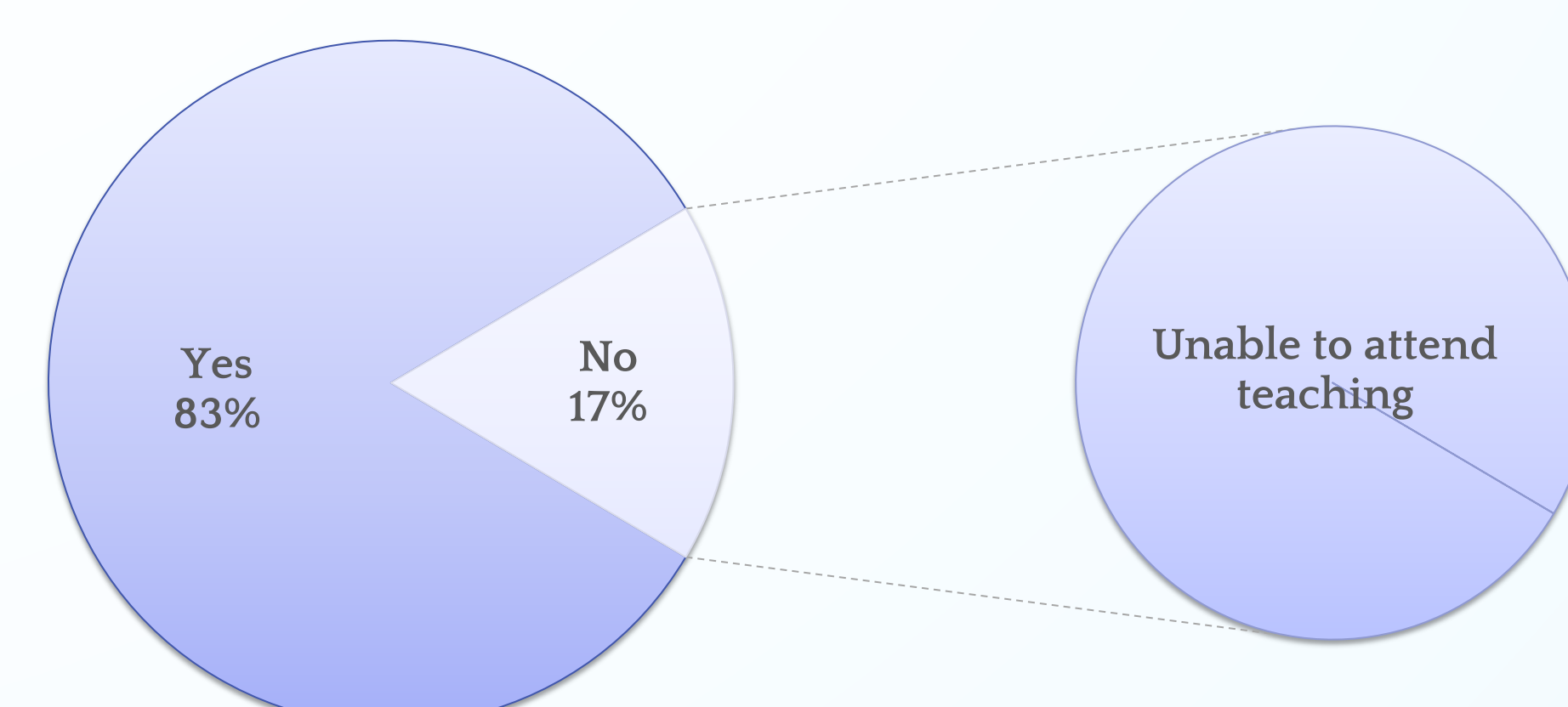


Follow-up survey: 12 trainees responded – 71% response rate. This consisted of x2 ST3/4, x8 ST5+ and x2 clinical fellows. All trainees felt they had performed an adequate number of PP cases and they all consented patients specifically for PP; 92% were confident with independent use of PP without Mayfield pins whereas 83% were confident when using Mayfield pins.

NUMBER OF CASES REQUIRING PP DURING ROTATION



RECEIVED SATISFACTORY PP TEACHING DURING ROTATION



Conclusion

Bitesize practical teaching sessions helped improve confidence in use of PP for neurosurgical procedures. Implementing these teaching sessions in the departmental induction program may ensure all trainees are able to attend. A quick reference visual aid was developed for trainees to encourage safe proning practice. Next steps would be to deliver training sessions with other members of the multidisciplinary theatre team to ensure a standardised approach to PP. Good practice can also be transferrable to other specialties where PP is used including intensive care and general surgery.

References

1. Kwee M, Ho YH, Rozen W (2015). The Prone Position During Surgery and its Complications: A Systematic Review and Evidence-Based Guidelines. International Surgery; 100(2): 292-303.

Questions?

Send me your question via direct message on the meeting App: **Michael Errico**.



NICU Bitesize Orientation Program

Emma Priestley
St George’s Hospital NHS trust



Introduction

- The Bitesize programme was developed to support junior nurses in response to a gap in neurological critical care knowledge post Covid-19
- The NICU was busy and understaffed with a high level of nurses who felt unsupported, burnt out and distressed
- 20 new nurses were unable to be appropriately inducted when they started on the NICU
- There were clear gaps in neurological critical care knowledge amongst junior nurses

Aims

- Aimed to improve confidence and competence for these nurses
- Aimed to improve morale for all NICU staff
- Help with staff retention
- Improve quality of care and embed best practice
- Inclusivity and diversity were at the forefront of this learning programme

Methodology

30 minute presentation

Reducing pressure on nurses
Mindful of mental capacity of learners
Online, face to face and recorded



Scan for sessions

15-minute presentation	15-minute case study	Sessions designed to be inclusive and reduce visual distress
<ul style="list-style-type: none">• 15 minutes is the amount of time a human mind can focus• Concentrated amount of information	<ul style="list-style-type: none">• Situational learning• Constructivism• Learner participation using either discussion or Slido	<ul style="list-style-type: none">• No black on white background• Uncluttered slides• Information released on to each slide gradually

The face to face neuro specific FCCN study day

Games

- Labelling a Large brain picture of anatomy and function

Each learner delivers 10-minute presentation

- Empowering
- Community of practice
- Giving them skills they need for promotions

Workshops

- Subtle GCS changes and spinal cord injury changes
- Practical skills
- Neuro quiz

30 questions based on bitesize presentations

- Promote self learning
- Informal
- Organ donation patient speaker
- Engaging

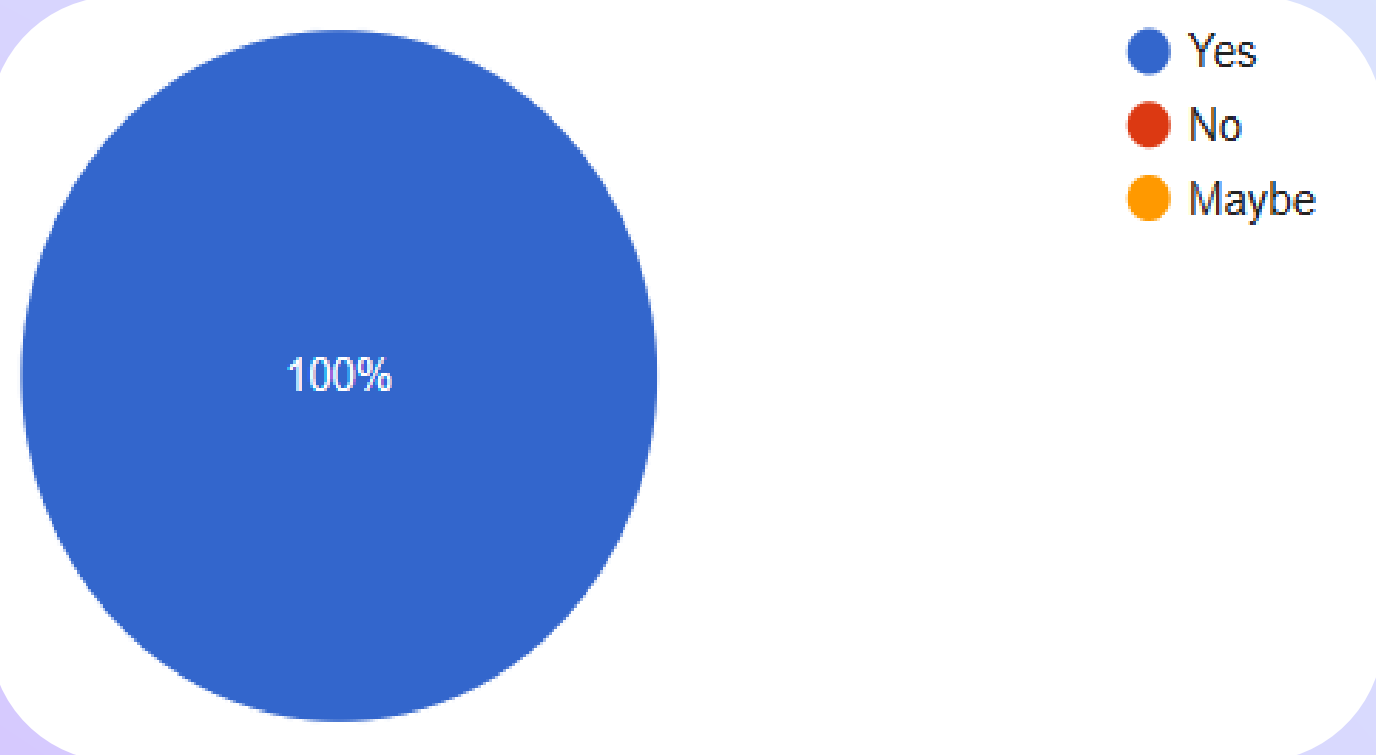
EVD Workshop

- Practice learning

Results

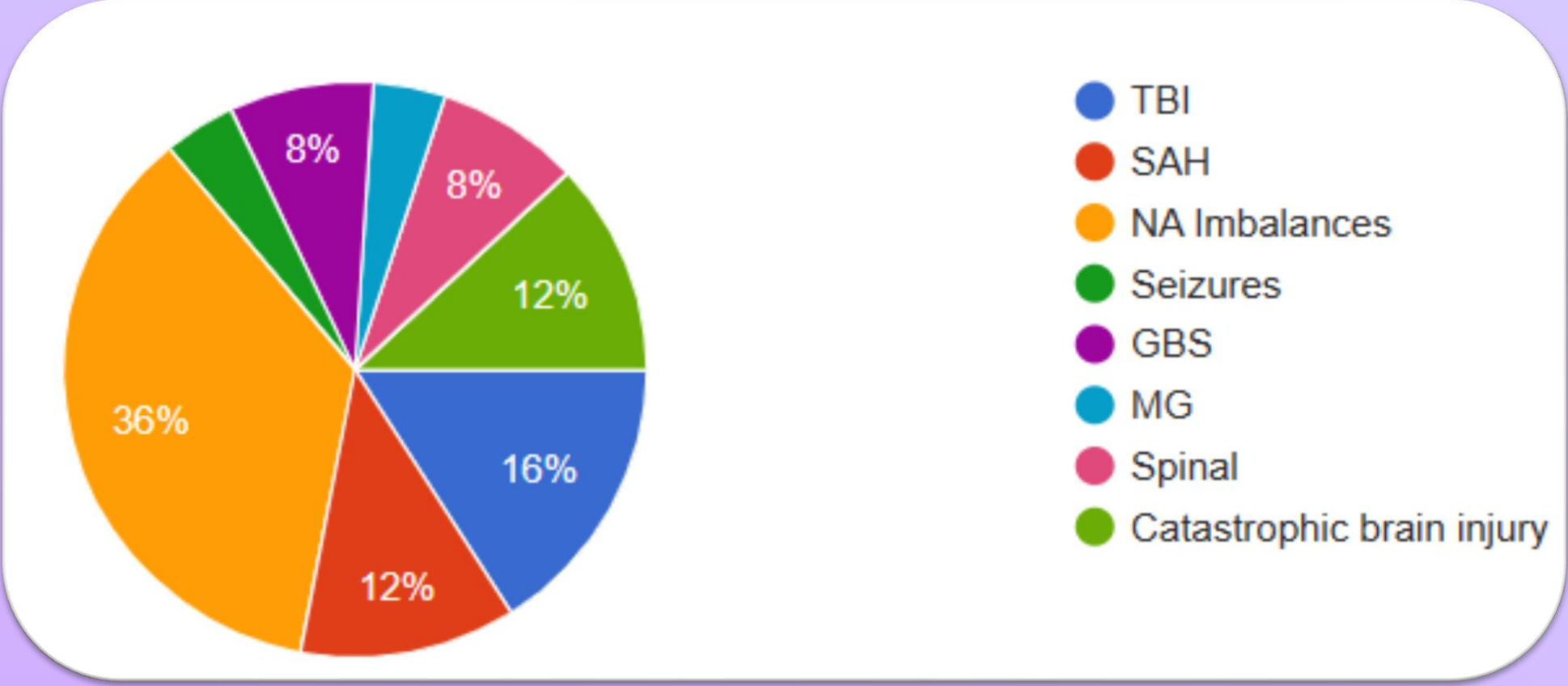
Do you feel your knowledge and confidence has increased by completing the neuro specific study day?

25 responses



Which bitesize session did you enjoy the most?

25 responses



What was your overall experience of the bitesize sessions?

“Really enjoyed the sessions, felt like the once weekly layout and that you could attend in person or watch later videos was really helpful. Was helpful the case studies in each one and opportunity to talk together about our experiences of patients at end of sessions was good”

What was you overall experience of the neuro specific FCCN day?

“It was a varied and enjoyable day. Learnt more and consolidated knowledge. I realised I knew more than I thought I did”.

“Really enjoyed today, liked that the format was different for each session and it was interactive”

What did you gain from listening to all of the presentations?

“A Lot. It was overwhelming at the first few months when working in the unit as I wasn’t sure what to study or if the information was correct (as sometimes there is different guidelines per nurses) but the bitesize helps to clear things up”

Average test score of 86% demonstrated a high retention of knowledge

Conclusion

- The Aim of the bitesize programme was to increase knowledge, confidence, skills and morale
- From the survey data collected there is evidence that the programme set out to achieve its goals
- I found that the nurses working the shift were really supportive ensuring that the new nurses were able to attend the sessions
- The quiz data results demonstrated the new nurses had knowledge to manage a range of neurological critical care conditions safely
- The goal is to continue this orientation programme to embed it as standard practice on the NICU

Development

- To ensure this programme becomes multidisciplinary
- Future plans are to adapt the programme to the needs of the unit to ensure quality and current evidence
- To develop other programmes in a similar format to this

- For the programme to be used by other critical care units and trusts

Acknowledgements

- Thank you to the NICU staff and all the hard work they do everyday

- Thank you to the nurses who have participated in the program and given feedback to enable it to develop

- Finally to Karin Steinhauser and Laura Corfield for their support

Questions?

Tweet your questions to me! Start your tweet with: @emmarankinbtin | #NACCS2023 and/or

Send me your question via direct message on the meeting App: Emma Priestley

Aspirin and ACDF...A Dilemma

Dr Christopher Read and Professor Michael Moore
Department of Anaesthesiology, Beaumont Hospital and
RCSI University of Medicine and Health Sciences

Introduction

Dilemma: Continuing aspirin and risk of bleeding or discontinuing aspirin and risk of acute stent thrombosis and myocardial infarction (MI) in cervical spine surgery.

We report a case of a patient with progressive cervical myelopathy requiring urgent C4/C5 anterior cervical decompression and fusion (ACDF) on lifelong aspirin monotherapy following coronary artery stenting and discuss its implications.

Case Report

A 60-year-old male patient presented with grade 2 myelopathy in his left upper limb. Previous medical history includes an anterior ST elevation MI resulting in placement of a single drug eluting stent (DES) in his left anterior descending artery and treatment with 12 months of dual antiplatelet therapy (DAPT) and subsequent lifelong aspirin monotherapy.

MRI scan revealed focal cord signal change at C4/C5. Following MDT discussion an anterior cervical discectomy and fusion was planned in the presence of aspirin. A cervical discectomy and posterior osteophyctomy was performed and an interbody cage device was installed without complication. The neurosurgical team were particularly aware of the risk of bleeding throughout the surgery and were meticulous with efforts to control bleeding points. A drain was not inserted as it was deemed unnecessary.

Following uneventful surgery and anaesthesia and one hour stay in the post anaesthesia recovery unit the patient was transferred to a high dependency bed for overnight monitoring. Staff were alerted to the potential for bleeding, in particular cervical haematoma and risk of airway compromise. Emergency front of neck airway equipment and "SCOOP" algorithm were placed at the patient's bedside. Following an uneventful post-operative course, the patient was discharged home 48 hours later still on aspirin.

Discussion

ACDF is a common neurosurgical procedure. Postoperative cervical haematoma following ACDF is reported with an incidence of between 1–5% (Debkowska et al, JSS, Mar 2019) which may result in life threatening acute airway obstruction and death. Cervical spine surgery in the presence of an antiplatelet agent is implicated as a risk factor for the development of cervical haematoma.

European Society of Cardiology (ESC) guidelines recommend DAPT therapy for 12 months after acute coronary syndrome with insertion of DES and lifelong aspirin monotherapy. Premature cessation of antiplatelet agents, time to surgery after stenting and urgency of surgery are risk factors for stent thrombosis. ESC recommend that time sensitive non-cardiac surgery should be delayed by a minimum of 3 months of DAPT duration in high-risk cardiovascular patients. When surgical delay is not possible and bleeding risk is so significant that antiplatelet agents are stopped it is recommended these procedures should be performed in hospitals with access to 24/7 catheterization laboratories in case of perioperative ischaemic events. If high bleeding risk surgery is performed whilst on antiplatelet agents, general haemostatic measures should be reinforced, and tranexamic acid may be considered. Our key points for patients on antiplatelet agents presenting for surgery are summarized below.

Cervical Haematoma

Anterior cervical spine surgery in the presence of aspirin has an inherent risk of postoperative bleeding and associated haematoma with airway compromise. Airway compromise can occur as a result of direct mechanical compression leading to a reduction in the cross-sectional area of the airway lumen and the development of intrinsic airway edema in response to the mass effect of collected blood within the wound. Patients with cervical haematoma may progress from being asymptomatic to showing signs of partial airway occlusion and then complete obstruction. Early stages can be associated with difficulty talking and breathing and changes in voice quality may be present (*Table 1*). Sudden haemodynamic changes can occur such as hypotension and bradycardia due to mechanical distortion of the carotid sinus and activation of the baroreceptor reflex (Palumbo et al, The Open Orthopaedic Journal, Mar 2012). The acronym DESATS has been created in haematoma after thyroid surgery to aid early identification of airway compromise (*Figure 2*).

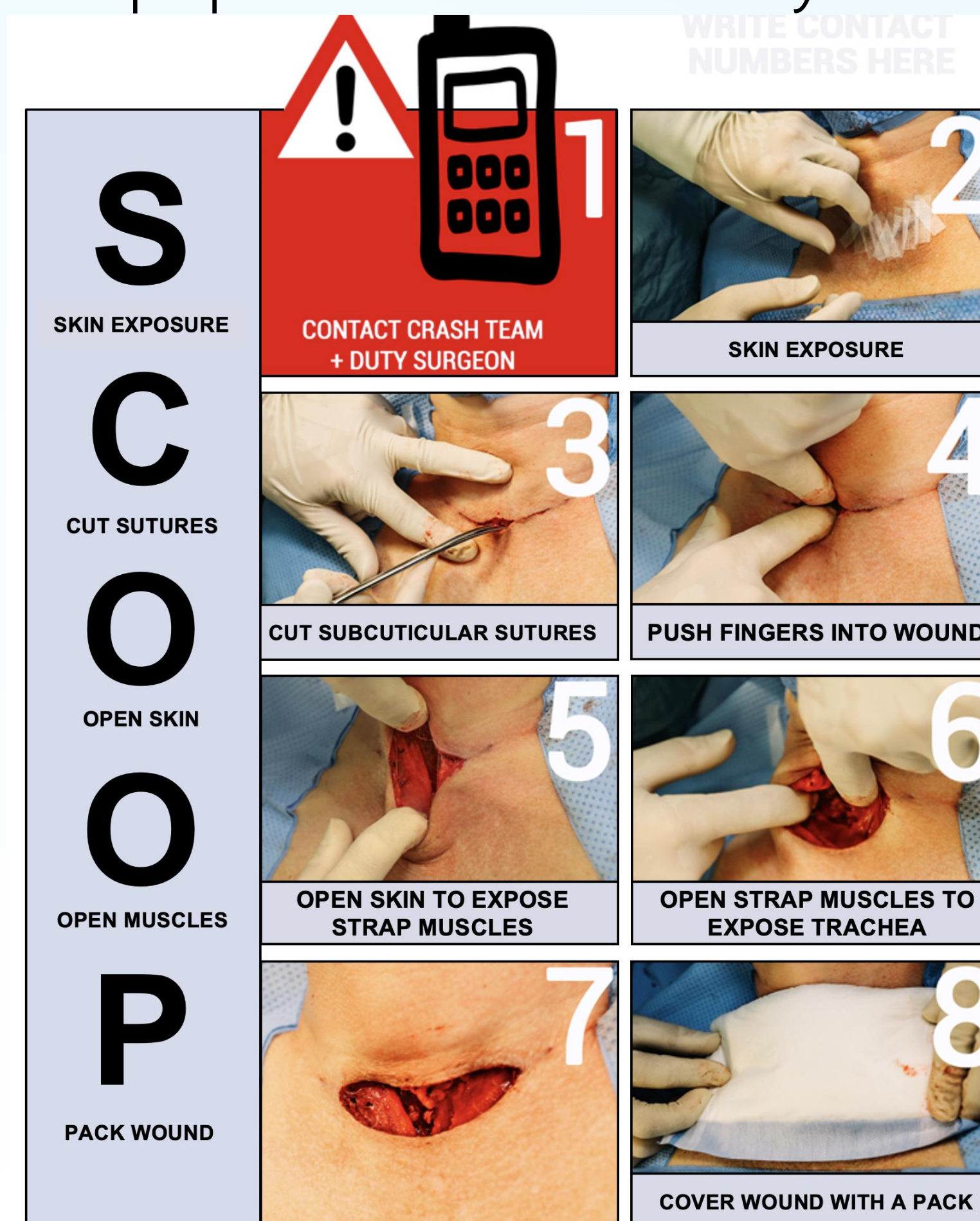
Timing	Respiratory	Neck	General
EARLY ↓	Change in voice quality	Elevated drain output	Restlessness
	Difficulty breathing	Suture line bleeding	Agitation
	Inspiratory stridor	Anterior neck swelling	Panic
	Cyanosis	Facial oedema/plethora	Somnolence
LATE	Respiratory arrest	Tracheal deviation	Unresponsiveness

Table 1: The signs of symptoms of neck haematoma

Discussion

Prevention

Efforts to reduce postoperative haematoma should include an effort to control all soft tissue and bony bleeding points during surgery. A closed suction drain may be of benefit although it will not stop haematoma formation. Excessive bleeding during the operation will point to an increased risk of postoperative haematoma formation and may lead to a delayed extubation strategy and admission to intensive care. Other risk factors for bleeding should be noted such as multiple level surgery and long duration surgery. Delayed extubation may also be considered in patients with comorbid disease such as morbid obesity, sleep apnoea or if initial airway management was difficult.



Closely monitor for DESATS

- D** - Difficulty swallowing/discomfort
- E** - EWS/NEWS
- S** - Swelling
- A** - Anxiety
- T** - Tachypnoea/difficulty breathing
- S** - Stridor

Figures 1 and 2

SCOOP algorithm and DESATS acronym. The Difficult Airway Society (DAS), British Association of Endocrine and Thyroid Surgeons (BAETS) and British Association of Otorhinolaryngology, Head and Neck Surgery (ENT-UK).

Conclusion

Airway obstruction due to wound haematoma is rare but a potential lethal complication of anterior cervical spine surgery. This risk is increased in the presence of aspirin. Risk of cervical haematoma and airway compromise should be anticipated and communicated with all staff involved in the patient's perioperative care. A preoperative plan is required in order to safely carry out this high risk surgery. Health care providers should be able to recognise and promptly manage cervical haematoma with airway compromise and appreciate that airway management not only will be difficult due to the presence of the haematoma but also that the mobility of the neck will have changed due to the presence of a fusion device. We recommend the 'SCOOP' approach (*Figure 1*) for management of airway compromise from haematoma formation in the anterior neck as recommended in 'Management of haematoma after thyroid surgery' systematic review and multidisciplinary consensus statement (Iliff et al, Anaesthesia Jan 2022).

Key points for patients on antiplatelet agents presenting for surgery

MDT discussion

To estimate bleeding vs ischaemic risk
Between anaesthesiologist, surgeon, cardiologist and patient

Assess surgery urgency in attempt to allow for DAPT completion

Non-urgent: delay till DAPT completion
Urgent: is a potential delay until at least 3 months DAPT therapy possible?
Emergency: no option of delay

Assess bleeding risk

Minor/low: consider continuing antiplatelet agents perioperatively
High: continue or discontinue antiplatelet agent based on ischaemic risk

Assess ischaemic risk

Clinical variables (ACS, chronic kidney disease, diabetes, current smoker)
Angiographic variables (multiple stents, long stent, complex lesions)

Decision to discontinue antiplatelet agent: bleeding risk > ischaemic risk

P2Y₁₂ inhibitors discontinued 5–7 days preoperatively
Aspirin discontinued 7 days preoperatively
Early recognition and prompt management of perioperative MI
Cardiac catheterization laboratory available 24/7

Decision to continue antiplatelet agents: ischaemic risk > bleeding risk

Strict haemostatic measures
Consider Tranexamic acid
Monitor for postoperative bleeding complications specific to surgery
All staff involved informed of potential complications and management
Evacuation of neck haematoma box available following cervical spine surgery

Questions?

Email your questions to me: christopherread@beaumont.ie or send me your question via direct message on the meeting App: **Christopher Read**

Update on the development of a clinical practice guideline for patients with chronic subdural haematoma



Stubbs DJ¹ & Davies BM² on behalf of the Improving Care in Elderly Neurosurgery Initiative (ICENI) working group
1: Clinical Lecturer in Anaesthesia, Department of Perioperative, Acute, Critical, and Emergency Care, 2: Doctoral research fellow, Division of Clinical Neurosurgery, University of Cambridge

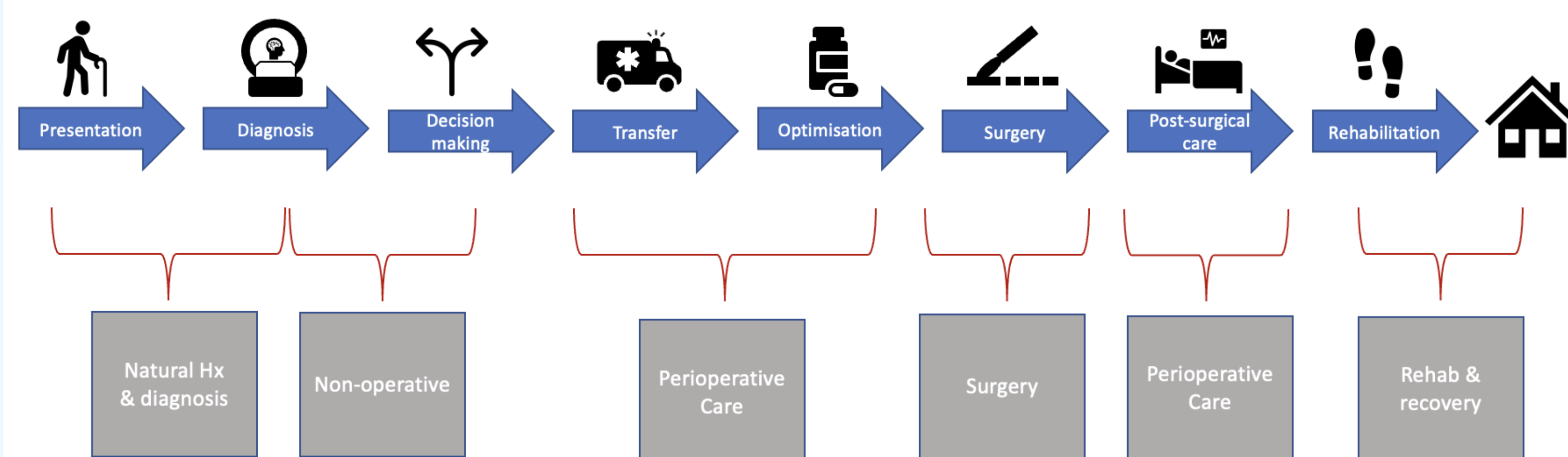


Introduction

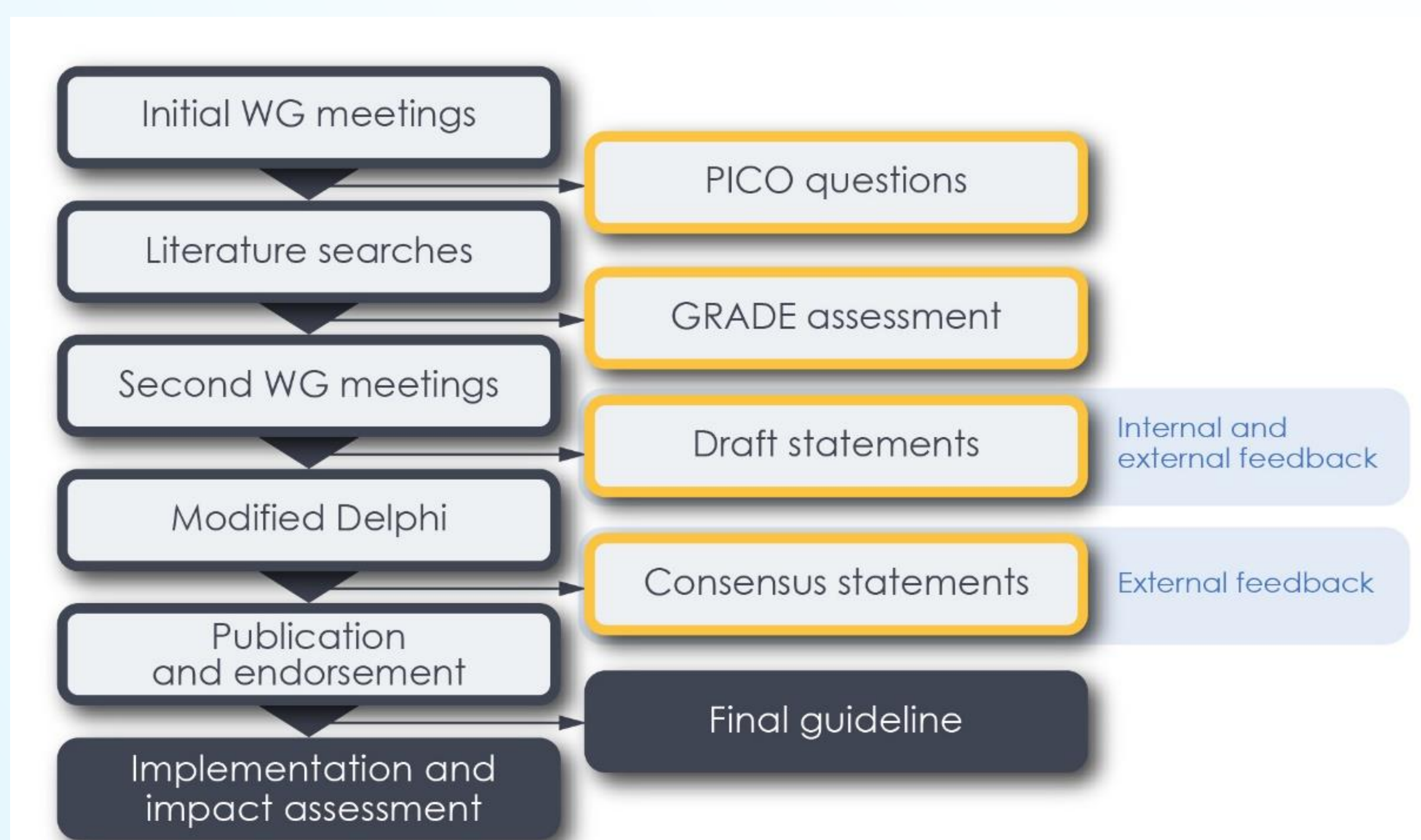
- Chronic Subdural Haematoma (cSDH) is a common neurosurgical condition typically affecting older, medically complex patients, who are often frail
- Care in other surgical cohorts has been enhanced by provision of multidisciplinary guidelines
- Currently no guideline exists to cover all aspects of the perioperative care of patients with cSDH
- This poster provides an update on an ongoing, multidisciplinary initiative to define best-practice for the perioperative care of patients with cSDH**

Methodology

Multidisciplinary working groups formed to examine entire patient journey



- Representatives from national bodies (incl. NACCS & SBNS) and methodologists as part of the ICENI steering committee
- Facilitated discussion in as working groups -> generation of key questions -> literature search
- Draft statements formulated and reviewed
- Adherence to NICE guidance on guideline development and AGREE II checklist



Project flow diagram: WG = Working group, PICO = Population, intervention, comparator, outcome.

Publications so far



Position Paper
Br J Neurosurgery



Scoping review on
educational resources
PLOS One



Association
of Anaesthetists



act Addenbrooke's
Charitable Trust

NIHR | National Institute
for Health Research



THIS.

Results

Progress so far:

- Five multidisciplinary working groups identified **44 key clinical (PICO) questions**
- These were grouped into five major themes: **natural history, non-operative management, perioperative optimization, surgical care, and rehabilitation**
- Extensive **systematic literature searches** were undertaken (June 2022) to identify all primary evidence while pre-existing systematic reviews were also critiqued
- Separate work streams have sought to understand patient perspectives and map the availability of educational resources for both patients and staff
- Through facilitated discussion and review of the literature **79 draft clinical practice statements have been produced.**

Next steps

- National consensus building initiative (June 2023)** – feedback from practitioners in all relevant fields on which statements should be included
- Research ethics approval for this is currently in progress
- Next phase of work will be conducted with **THIS institute (The Healthcare Improvement Studies Institute)**
- Delphi results will inform a **face-to-face consensus meeting of our steering committee in Autumn 2023**

Future work

- Implementation and 'What does good look like?'
- Health economic considerations

Conclusion

- Multidisciplinary guideline development continues**
- Draft statements ready for wider feedback to finalise guideline contents**
- National Delphi will launch in the next 1-2 months → all clinicians caring for cSDH eligible to take part**



Scan for details on our upcoming Delphi!

Acknowledgements

Work to date on the ICENI initiative has been supported by funding from the Addenbrooke's Charitable Trust (ACT) and the National Institute of Academic Anaesthesia (NIAA: Association of Anaesthetists/Anaesthesia - WKRO-2021-0014). DJS was previously funded by a Wellcome Trust clinician PhD fellowship. BMD is funded by an NIHR doctoral research fellowship

Questions?

Tweet your questions to me! Start your tweet with: @djramsaystubbs #NACCS2023 Poster.

Does using local anaesthetic with sedation for chronic subdural haematoma evacuation improve patient outcomes? A systematic review and meta-analysis.



Dr Matthew L Watson¹ MB BChir, Dr Conor S Gillespie² MPhil, Dr Benjamin M Davies² MRCS and Dr Daniel J Stubbs³ PhD, on behalf of the ICENI Clinical Practice Guidelines for Chronic Subdural Haematoma Consortia.

1. Broomfield Hospital, Mid and South Essex NHS Trust, Chelmsford, CM1 7ET.
2. Department of Clinical Neurosciences, University of Cambridge, Cambridge, CB2 0SZ.
3. Clinical Lecturer in Anaesthesia, Department of Perioperative, Acute, Critical, and Emergency Care, University of Cambridge, Cambridge, CB2 0QQ.



Introduction

- A chronic subdural haematoma (SDH) is a collection of altered blood beneath the dura.
- The incidence of SDH is rising, with a predicted rise of 53% in operative case load by 2040.
- This systematic review and meta-analysis examines whether using **local anaesthetic with sedation (LAS)** improves patient and system outcomes when compared to **general anaesthetic (GA)**.
- Outcomes assessed: mortality, recurrence of SDH, postoperative complications, duration of hospital stay and duration of operative procedure.**

Methodology

- LAS = considered the use of either surgical field infiltration of local anaesthetic or a scalp nerve block with/without sedative agents.**
- GA = considered the use of general anaesthetic agents requiring advanced airway management.**
- Search = Medline and Embase identified **6,024 primary studies** relating to SDH
- Studies that underwent full-text screening = 47 articles
- Studies included after full-text screening = 14 articles
- Bias assessment = The Newcastle Ottawa Scale/Cochrane Risk of Bias Tool.
- Meta-analysis = Random effects meta-analyses performed in R.
- PROSPERO registration ID = CRD42022374873.

Results

- 14** articles were included after full text screening. **Only 2 of these** were prospective randomised trials.
- LAS** is associated with **fewer postoperative complications**, a **shorter duration of hospital stay** and a **shorter duration of operative procedure**. The full meta-analysis is summarised in Table 1.
- Moderate heterogeneity was observed between studies used to assess postoperative complications and duration of hospital stay. **Significant heterogeneity was observed between studies used to assess duration of operative procedure.**
- The median and interquartile range for the 12 studies assessed against the Newcastle Ottawa Scale was 7 and 0.5, respectively. The 2 randomised trials both scored a 'low risk of bias' when assessed against the Cochrane Risk of Bias Tool.

Variable	Definition	Number of studies included	Total number of patients included	Number of patients who received LAS included	Forest Plots summarising Meta-Analysis for each variable	Meta-Analysis Statistics
					<div><div>Favours LAS</div><div>Favours GA</div></div>	
Mortality	Death within 3 months of surgery	4	1284	790		<ul style="list-style-type: none">Odds Ratio = 0.91 [0.30, 2.78]P = 0.87I² = 24.7%
Recurrence	Reformation of an SDH that required a reoperation within 3 months of initial surgery	11	2246	1111		<ul style="list-style-type: none">Odds Ratio = 1.25 [0.84, 1.87]P = 0.27I² = 17.2%
Postoperative complications excluding recurrence	Any inpatient medical and surgical complication	8	1590	905		<ul style="list-style-type: none">Odds Ratio = 0.33 [0.20, 0.53]P = <.0001I² = 36.6%
Duration of hospital stay	Time from admission to discharge	3	141	73		<ul style="list-style-type: none">Standardized Mean Difference = -0.75 [-1.28, -0.21]P = 0.006I² = 54.4%
Duration of operative procedure	Time of anaesthesia and operation combined	3	201	102		<ul style="list-style-type: none">Standardized Mean Difference = -1.70 [-2.45, -0.96]P = <.0001I² = 77.6%

Table 1. Results of meta-analyses conducted between type of anaesthesia (LAS vs GA) used for chronic subdural haematoma evacuation and mortality, recurrence, postoperative complication rates, duration of hospital stay and duration of operative procedure. Each variable meta-analysed is defined. The number of studies used to analyse each variable are included. The total number of patients and number of patients in the LAS group are outlined. Forest plots with odds ratio/standardized mean difference are included after meta-analysis. **An odds ratio below one favours LAS. A negative standardised mean difference favours LAS.** 95% confidence intervals and p-values are included. The I² statistic that measures heterogeneity of the meta-analyses are included.

Conclusion

- Using **LAS** for SDH evacuation appears to be associated with **reduced rates of postoperative complications, duration of operative procedure and duration of hospital stay.**
- More randomised controlled trials need to be conducted to confirm these associations identified from the current literature, before any causal conclusions can be made.

Acknowledgements

The authors acknowledge funding from the ICENI group to make this work possible.

Questions?

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ASSESSING RISK IN PATIENTS PRESENTING FOR MECHANICAL THROMBECTOMY

Dr Thom O'Dell BMedSci BMBS MRCP FRCA, Dr Matthew Heron MBBS BSc MSc FRCA, Dr Liquan Zhang MD PhD, Dr Rebecca Campbell MBBS BSc PGCHBE FRCA. St George's Hospital, London.

INTRODUCTION

Mechanical Thrombectomy (MT) is a transformative treatment for eligible patients with acute stroke. In 2020/21 nearly 80% of those eligible did not undergo intervention (1).

Meeting this unmet need poses significant questions for MT services, including how staffing will be organised. The 2021 consensus statement on the safe provision of thrombectomy services (2) provides clear guidance on the skills and training required of the MDT. Anaesthetists providing anaesthetic care for MT should have "appropriate training in neuro-anaesthetic care." As MT services are expanded to meet demand, it may fall to anaesthetists without specific training in neuro-anaesthesia to provide anaesthesia for patients suffering acute ischaemic stroke.



The angiography suite (above) may be an unfamiliar environment for the uninitiated, adding additional challenges to the conduct of anaesthesia for MT. Furthermore, a local change in practice at our centre is seeing anaesthesia for MT evolving from an entirely consultant delivered service to a consultant-led service that may be delivered by a senior anaesthetic trainee. Whilst peri-procedural risk assessment and risk mitigation are key skills of the anaesthetist, we found that there was often anxiety in our own centre about the provision of anaesthesia for MT and its potential risks.

Although there are validated and well established risk assessment tools in common use in other surgical specialities, there is no validated risk scoring tool for patients undergoing thrombectomy to inform peri-procedural anaesthetic management. We sought to determine if established risk assessment tools correlated with local trends in the peri-procedural care of patients undergoing MT.

METHODOLOGY

Retrospective records review for those presenting for MT for 6 months in 2022. ASA, SORT (risk of death within 30-days), P-POSSUM scores, and Clinical Frailty Scale (CFS) calculated. We compared emergency and elective risk, as whilst MT is time critical, patients may not have multiple acute pathologies.

(1) King's College London, SSNAP, 2020-2021 data.

Available: <https://www.strokeaudit.org/>

(2) Mortimer et al (2021). To support safe provision of mechanical thrombectomy services for patients with acute ischaemic stroke: 2021 consensus guidance from BASP, BSNR, ICSWP, NACCS, and UKNG. Clinical Radiology Vol 76(11) p862.

RESULTS

40 cases were identified, of which 30 proceeded to MT under anaesthesia. The **MEAN AGE** of patients was 69yrs (42-89), with an average (mode) **ASA** of 3 (1-4).

SORT SCORE	Mean 9.7% (1.06-36.49%)
------------	-------------------------

P-POSSUM		
Mean P-POSSUM If deemed ELECTIVE	Morbidity:	19.3%
	Mortality:	3.5%
Mean P-POSSUM If deemed EMERGENCY	Morbidity:	44.5%
	Mortality:	9.8%

CLINICAL FRAILTY SCALE	MEAN/MEDIAN/MODE = 3 (range 2 to 6)
---------------------------	--

Mortality at discharge from the Stroke Unit was 5.5% averaged over the same period. There was no 30 day mortality data available due to patient repatriation.

DISCUSSION

In other surgical specialities risk calculations inform seniority of involved clinicians and post-procedural care (eg NELA for Laparotomy). MT patients can be multiply co-morbid, of advanced age, and have not been optimised for remote-site anaesthesia.

SORT and Emergency P-POSSUM scores correlated closely. The risk of post-procedural morbidity is calculated as at least 19.3%, but likely closer to 44.5%. The 30 day mortality risk we calculated was at least 3.5% (in some cases almost 10%).

These numbers are approximations. More work is needed to further understand whether SORT or P-POSSUM scores are best in this cohort. These tools may be used in MT to inform consent conversations with patients and their families. Thus it is important that we identify the "best" risk scoring tool for this patient group. Declining MT with too low a threshold has significant consequences, as does proceeding with very high chance of morbidity.

Our intention is to persist with multiple scoring systems, and compare these to our actual patient mortality data. To capture this accurately we will need to work collaboratively with referring centres due to early repatriation rates. Morbidity will however be more challenging to capture. We hope that clear understanding of risk will lead to improved confidence of non-neuroanaesthetic staff working with these patients.

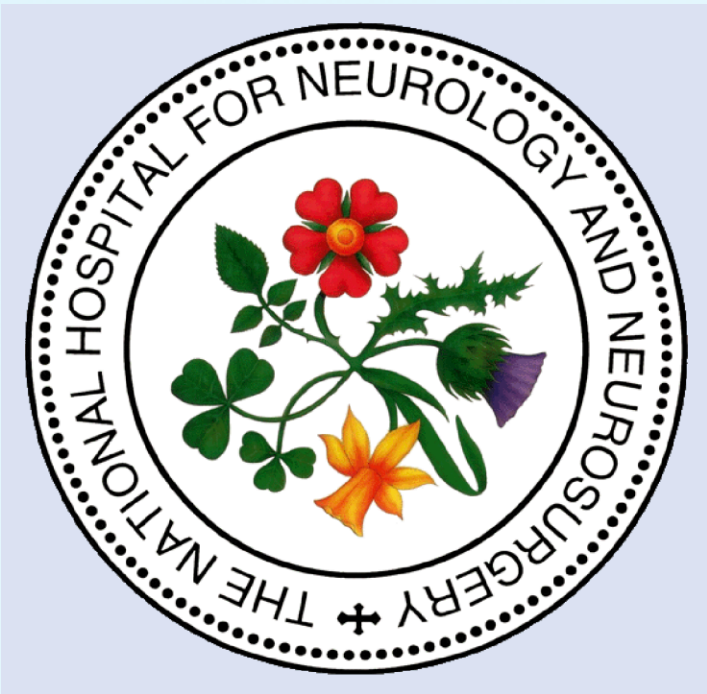
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Working on Wellbeing: Evaluation of Balint Group Participation on Quality of Work Life in Neurocritical Care Doctors

Aaliya Jane Gilbert BMBCh BA, Andrew Paget DClinPsy

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Queen Square



Introduction

- Working in the intensive care unit (ICU) is emotional challenging with potentially profound and long-lasting **psychological sequelae**
- Data has shown up to **47%** prevalence of burnout in ICU professionals¹, determinants of which include high number of working hours and end of life characteristics², with high rates of **emotional exhaustion** in neurocritical care unit (NCCU) staff³.
- A Balint group is a structured forum, to allow medical professionals to **emotionally metabolise** clinical encounters that may have personally affected them, providing a valuable and confidential space for reflection and sharing of common experience chaired by a **trained leader**.
- Evidence shows that regular Balint groups may **prevent burnout** and improve wellbeing in ICU staff⁴.
- There is a **paucity** of evidence evaluating the effect of Balint groups on **NCCU** staff
- The aim of this study was to assess **current wellbeing measures** on ICU doctors and the subsequent effect of Balint group participation of these in the neurocritical care unit of the National Hospital for Neurology & Neurosurgery (**NHNN**), Queen Square.

Results

- 12** NCCU doctors completed the baseline wellbeing survey including junior clinical fellows and specialist trainees in ICU and anaesthesia
- 100%** felt stressed at work at least several times a month with **16.7%** feeling **stressed every day**. **91.6%** agreed that working in NCCU was emotionally **challenging** and **75%** felt they did not have adequate opportunity to **discuss** distressing clinical encounters
- A feedback survey was completed by **100% of attendees** after commencement of regular Balint groups
- 100%** of doctors agreed that Balint group was **helpful** to them and would be helpful to **other trainees**
- 100%** felt that regular groups would provide ample opportunity for **debrief** and **discussion**, and that group **continuation** would provide sufficient **wellbeing provision** at work. **83.4%** felt they were taught valuable **coping strategies** to respond to stressful work events

Conclusion

- Initial survey results show that working in NCCU has **significant emotional impact** on doctors and demonstrate the need for interventions to augment wellbeing and reduce stress.
- Although further long-term outcome data is required, preliminary results show that Balint groups may be an effective strategy to promote **resilience**, reduce **burnout** and protect doctors' **mental health**.

Methodology

- A **cross-sectional survey** was devised to assess work-related stress, existing provision of **wellbeing** facilities and debrief opportunities in NCCU.
- This was **anonymously** completed by junior doctors working in **NCCU** at the **National Hospital for Neurology & Neurosurgery** in December 2022 (n=12).
- Subsequently, a **2-weekly Balint group** was started, chaired by a trained neuropsychologist
- This consists of an informal **case discussion** by a volunteer for approximately five minutes, followed by inquisitive and non-judgemental **discussion** with the rest of the group
- Preliminary **outcome** data was collected **1 month post-intervention** via further anonymous completion of a wellbeing **survey**.

Figure 1: Initial Wellbeing at Work Survey

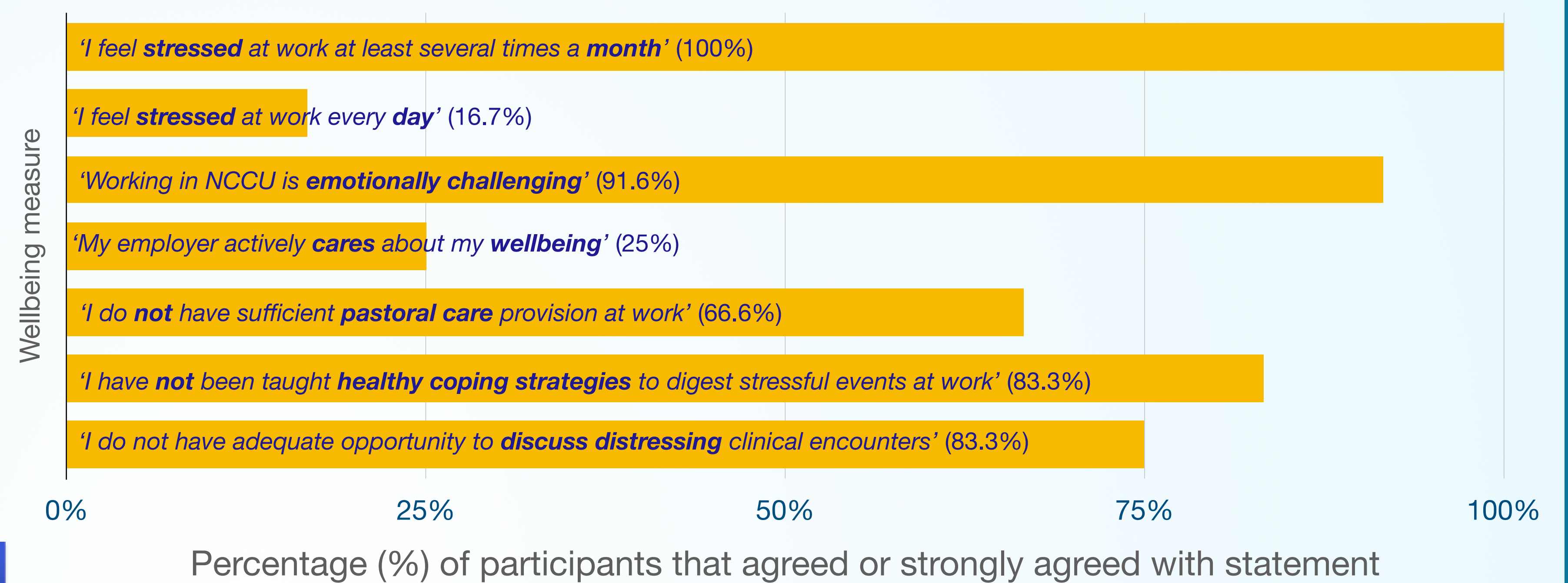


Figure 2: Post-intervention Survey

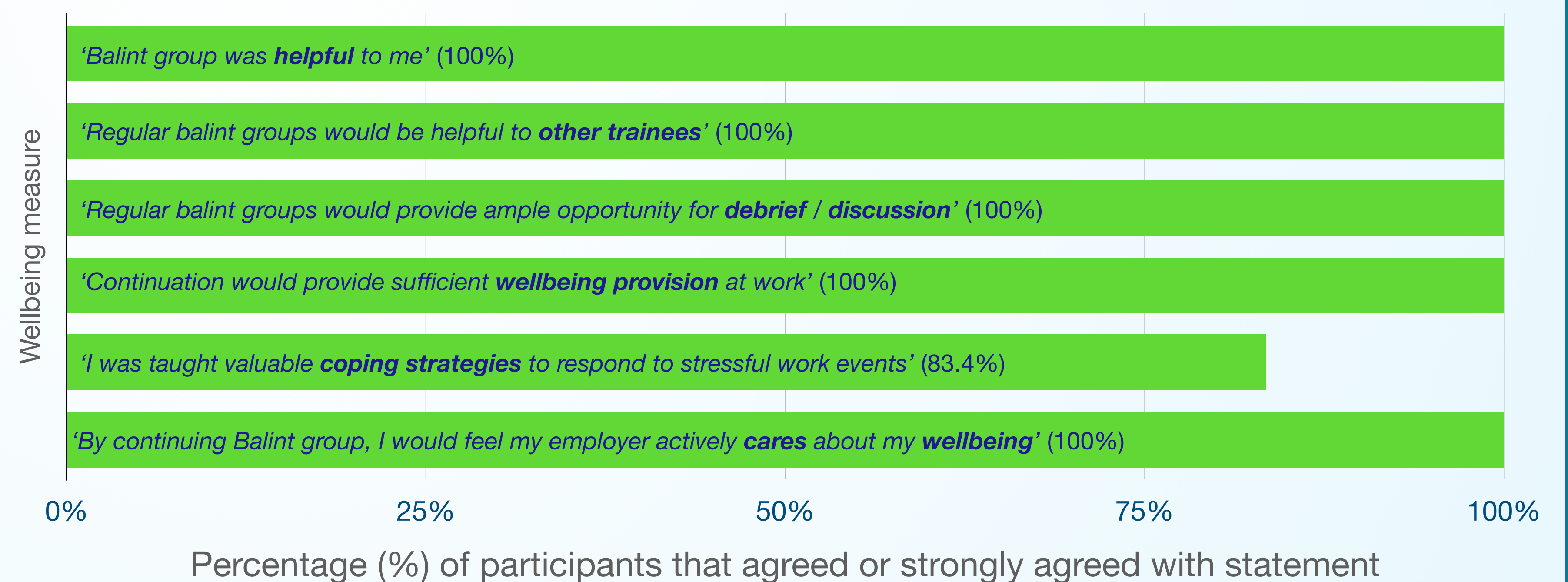


Figure 3: Freetext comments made on post-intervention survey

'It was therapeutic to just offload even if it does not change the clinical situation, and have my feelings acknowledged and validated' • "Safe space to discuss difficult topics"
"Felt able to talk candidly about experiences. Allowed good reflection to practise better care"
"Both facilitators have extensive experience that is invaluable to the SHO/reg/fellow cohort"
"I felt closer to my colleagues afterwards and more able to work effectively with them having understood their feelings about a difficult case"



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Acknowledgements

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- Dr. Andrew Paget & Dr. Jonathan Martin for co-leading Balint group
- Images courtesy of [freepik.com](https://www.freepik.com)

Questions

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Aaliya Gilbert



NACCS Long Case Survey



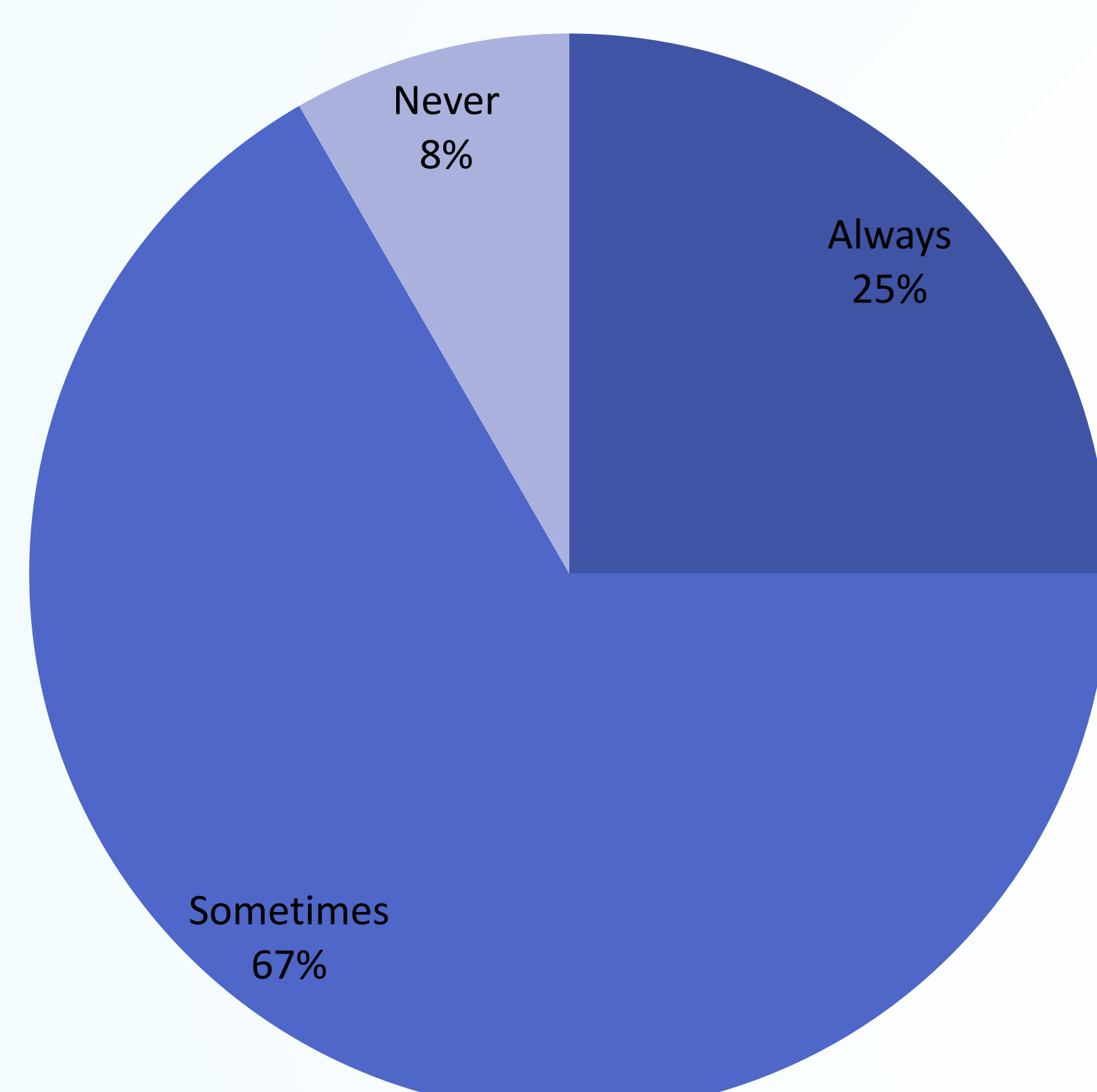
Dr James Turner, consultant anaesthetist, University Hospitals of North Midlands
Dr Jeremy Radcliffe, consultant anaesthetist, National Hospital for Neurology and Neurosurgery

Introduction

At the Link-doctor meeting in May 2021 (at the virtual NACCS annual scientific meeting), a request was made to run a survey on behalf of UK neuroanaesthesia departments investigating current practice around long cases and their staffing. Discussion mirrored previous concern in some departments about their differing attitudes to safe staffing for ultra-long cases.

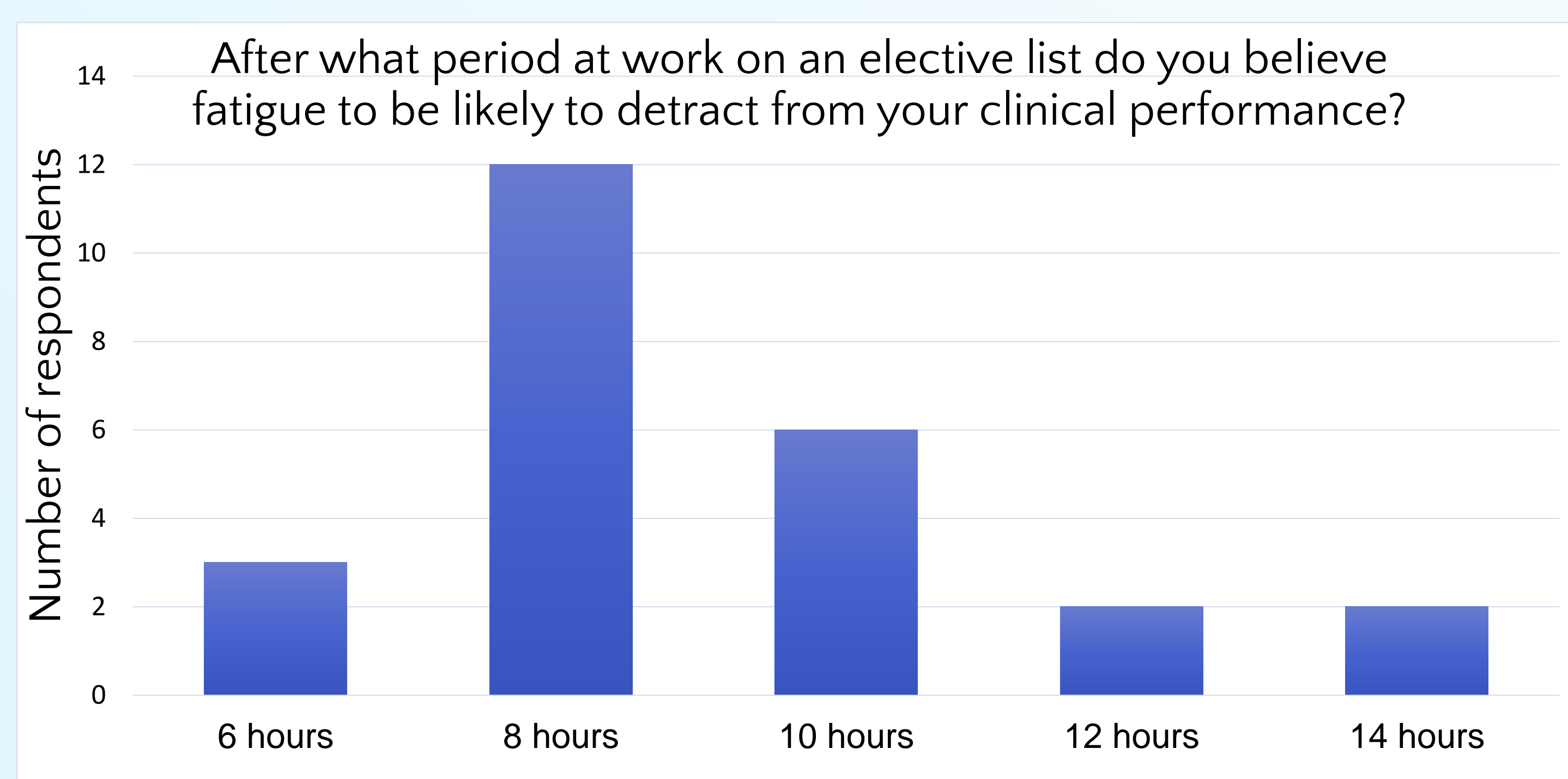
Our intention was to provide evidence for the society of the range of experiences and departmental practice in the consultant anaesthesia staffing of neurosciences lists in the UK

Does your unit accommodate very long cases on operating lists with specially planned late finish times (eg after 3 sessions)?



Methodology

Departments were invited to respond to the survey, in April 2022, by the e-mail address recorded for NACCS Link-doctors, using the 'Survey Galaxy' platform account allocated to NACCS. Link-doctors were requested to ask their colleagues of their experiences running very long lists. The survey contained simple and multiple-choice answers and a few free text options to record any opinion for NACCS to consider.



Results

- 25 responses were received from 22 neurosurgical centres within the UK.
- 92% of neurosurgical units sometimes or always have lists with specifically planned late finishes.
- In over 30% of responses, very long or late running cases are flagged up to the anaesthetic department less than two days before the case.
- 40% of neurosurgical units have more than 10% of their cases' start times delayed by more than two hours, usually due to lack of appropriate post-operative beds.
- Scheduled evening relief or takeover of the case of the neuroanaesthetist is rarely arranged. In some units the day anaesthetist stays, while in others the on-call team covers the out-of-hours portion of the case.
- Fatigue is considered to become potential cause for impaired clinical performance after 8 hours for half of respondents, and after 12 hours for 92%
- 14 of 25 responses reported not having a separate neuroanaesthesia on-call rota
- Many respondents noted the increasing complexity and duration of surgery, as well as an increasingly comorbid patient cohort

Conclusion

Overall, many departments appear to have local arrangements whereby the expected and unexpected long list 'overruns' are catered for.

In many units there was an expectation that the 'on-call' team would inherit a late running list when possible, but if otherwise, and in some units routinely, the 'list responsible' anaesthetist would remain to the end of the case, sometimes without break. This is a factor of importance where there is a majority of units without separate neuroanaesthesia consultant on-call availability, and thus impact on general or other subspecialty workload.

This survey should help departments to plan their local strategy for dealing with expected long cases with the knowledge of UK practice while recognising the need for tailoring towards local staffing availability and surgical activity. In 2023, a section was added to the RCoA GPAS relating to staffing of long cases.

Acknowledgements

We are very grateful to the NACCS committee and the link doctors for supporting this survey

Questions?

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Effect of Perioperative Blood Pressure on Neurological Outcome in Patients Undergoing Clipping following Aneurysmal Subarachnoid Haemorrhage



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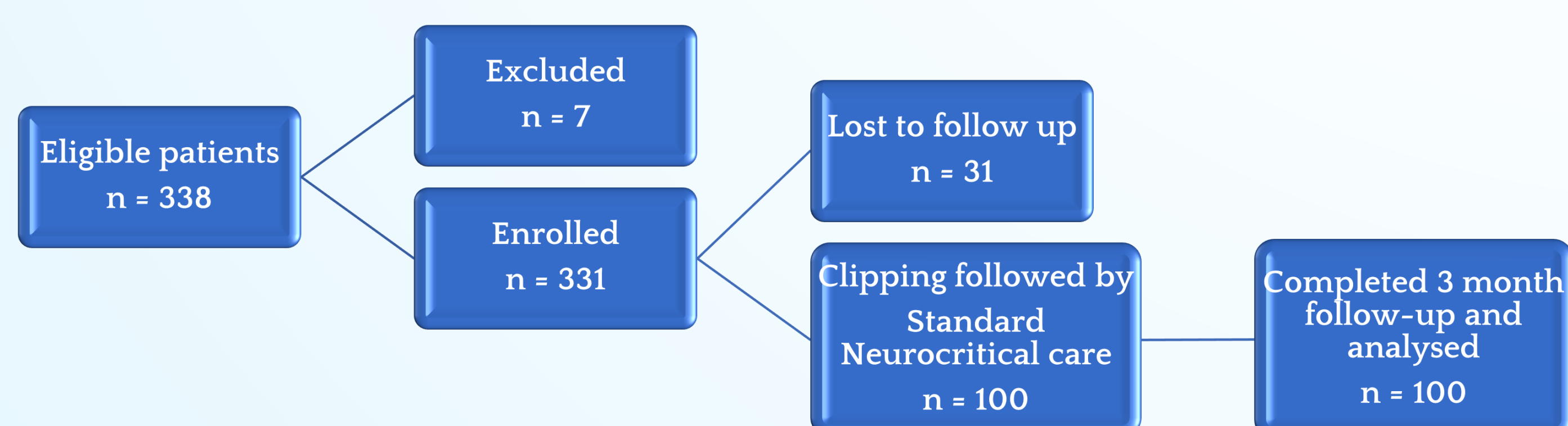


Introduction

- Elevated blood pressure is a homeostatic response to raised intracranial pressure serving to maintain cerebral blood flow
- Low blood pressure results in cerebral hypoperfusion, which may aggravate ischemic injury
- High blood pressures prior to securing the ruptured aneurysm can increase the risk of rebleed
- Studies to define the optimum blood pressure associated with good neurological outcome are lacking
- Aim: To observe the effect of perioperative blood pressure on long term neurological outcome of patients with aneurysmal subarachnoid haemorrhage (aSAH)**

Methodology

- Approval from institutional ethics committee was taken and written and informed consent was taken from the next of patient's kin
- 300 adult patients with aSAH of all grades were enrolled over a period of 15 months
- All enrolled patients underwent microsurgical clipping for cerebral aneurysms and were provided standard neuro-critical care as per institute protocol
- Mean arterial pressures (MAP) were recorded at admission, pre-operatively and intra-operatively
- Post-operative blood pressures was recorded till ICU stay
- Outcomes were evaluated using Modified Rankin Scale (MRS) at discharge and Glasgow Outcome Scale- Extended (GOS-E) at 3-month follow-up



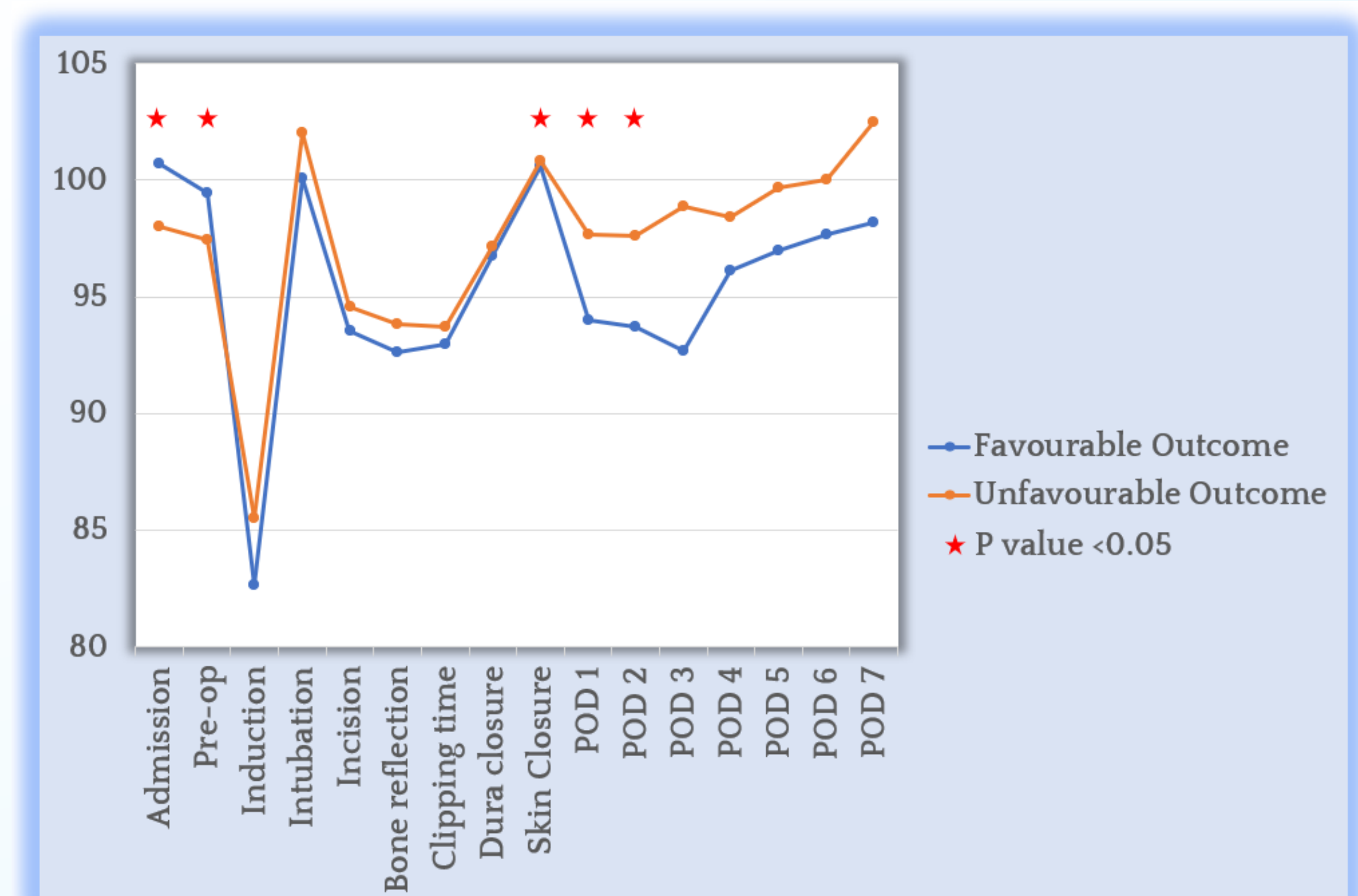
Results

- 60% (n=180) patients had a good outcome, i.e., GOS-E ≥ 7 and 40% (n=120) patients had a poor outcome, i.e., GOS-E ≤ 6
- Univariate analysis- higher values of MAP at the time of admission and in pre-operative period was associated with a favorable neurological outcome at 3 months, assessed using GOS-E (p value <0.01)
- No effect of intra-operative MAP on long term neurological outcome was observed
- In the early post-operative period, patients with higher values MAP associated with unfavourable neurological outcome (p value <0.01)

- This could be attributable to the fact that patients who were developing features of vasospasm were treated with induced hypertension. Unfavourable outcomes in this group were likely related to development of vasospasm
- Multiple logistic regression analysis showed that peri-operative MAP was not an independent risk factor for long term neurological outcome in patients with aSAH
- Older age, worse clinical and radiological grading, and development of complications like vasospasm and infarction post-operatively were significantly associated with a poorer outcome (p value <0.05)

Variables		Odds ratio	P value
Age		1.032	.024*
WFNS Grade		2.033	.012*
Fisher Grades		1.609	.026*
Admission MAP		.971	.174
Pre-operative MAP		.969	.293
Post-operative MAP	MAP Day 1	1.011	.631
	MAP Day 2	1.006	.845
	MAP Day 3	1.032	.134
Post-operative Vasospasm		2.392	$<0.001^*$
Post-operative Infarct		2.879	0.001^*

* P value < 0.05



Conclusion

- Perioperative BP is not an independent predictor of long-term neurological outcome in patients undergoing aneurysmal neck clipping following SAH.
- Since it has the potential to affect the outcome, BP should be meticulously observed and maintained within the normal physiological limits.

Questions?

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Incidence of postoperative pain and analgesic practices in patients undergoing craniotomy: an audit of current practice

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Introduction

The suboptimal management of postoperative pain in neurosurgical patients could lead to complications. Conversely, overtreatment of pain with opioids in these patients may be unsafe.

The incidence of moderate to severe pain in post-craniotomy patients has been reported to be ranging from 38% to 69%.¹⁻⁴ Many of these studies were carried out more than a decade ago. Over the past ten years, the field of neurosurgery and neuroanaesthesiology has evolved as newer technology and newer drugs become more widely available. In view of this, there is a need to assess the incidence of post-craniotomy pain in the modern era of neurosurgery and neuroanaesthesiology.

In this audit, we aimed to evaluate the incidence of pain after craniotomy and the factors affecting it. We also aimed to evaluate the practice of analgesia in these patients. The data obtained from this audit will guide changes in pain management in patients undergoing craniotomy.

Methodology

All adult patients who underwent supra and infratentorial craniotomies in St George's Hospital from December 2022 to February 2023 were prospectively followed up for 3 days postoperatively. Exclusion criteria included patients requiring continued ventilation post-operatively or those with reduced consciousness.

Pain, as assessed by the numerical rating scale (0-no pain to 10-maximal pain), was measured at 2, 6, 24, 48, and 72 hours after extubation. Demographic data, intraoperative management, postoperative analgesic practices, and satisfaction levels were evaluated.

Results

A total of 59 out of 65 craniotomy patients were included in the audit (90.8%). The incidences of moderate to severe pain at 2, 6 and 24 hours postoperatively were 56.2%, 66.1% and 54.3%, respectively. Although pain scores improved at 48 and 72 hours post-surgery, moderate or severe pain incidences remained above 30% (Figure 1). Post-craniotomy pain improved over time (Figure 2). Factors significantly associated with increased postoperative pain included female gender, subfrontal/pterional approach, ≤ 3 types of intraop analgesia, and administration of clonidine.

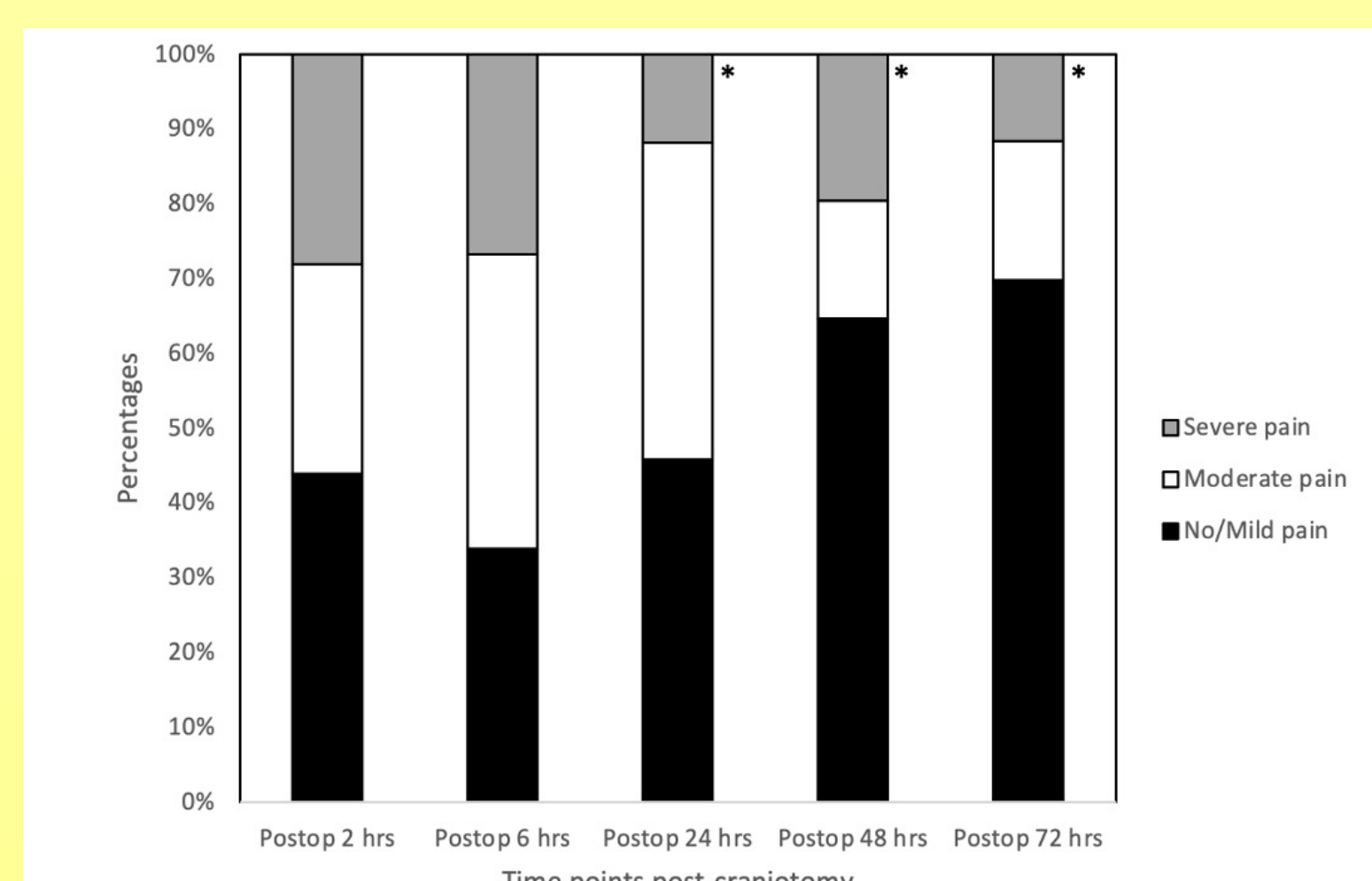


Figure 1. Incidence of no/mild, moderate, and severe pain post-craniotomy at different time points. No/mild pain defined as pain scores of 0–3, moderate pain 4–6, severe pain 7–10.
* Chi-square test $p < 0.05$ for comparison of no/mild vs moderate/severe pain with previous time point

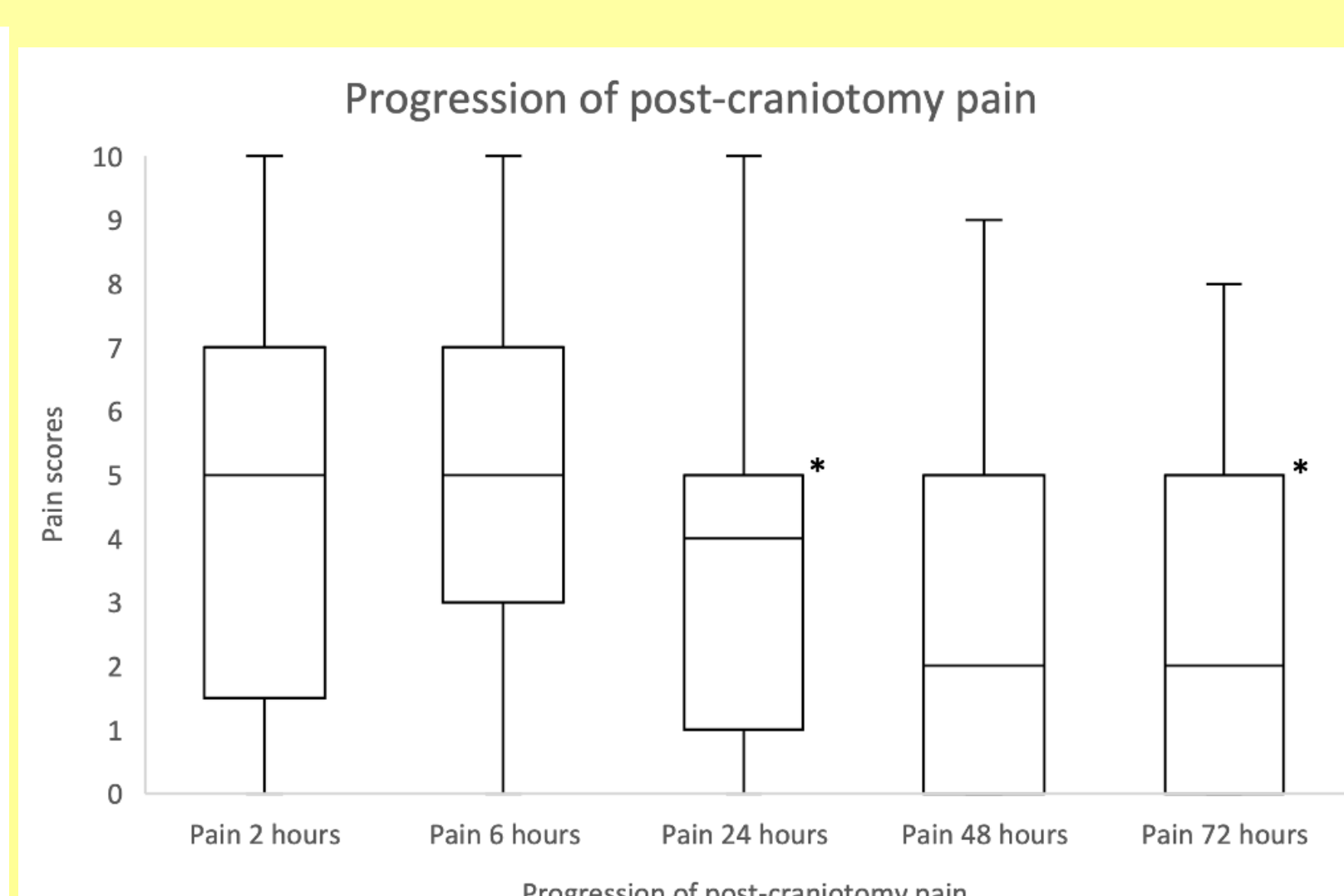


Figure 2. Progression of post-craniotomy pain at 2, 6, 24, 48 and 72 hours.
* $p < 0.05$ with Wilcoxon Signed Ranks test, comparing with the previous pain scores.

There were wide variabilities in intraoperative and postoperative analgesia management (Tables 1 and 2). Opioids were the analgesics administered most both intraoperatively and postoperatively. The incidence of opioid complications postoperatively was 39.3%. Postoperative nausea and vomiting were associated with a higher dose of opioids (Figure 3). The performance of scalp block was significantly associated with a lower dose of postoperative morphine use over 72 hours [median (IQR) 2.0 (0-3.3) mg vs no scalp block 6.7 (3.3 – 14.2) mg, $p=0.01$]. Overall, more than 90% of patients reported high levels of satisfaction with their pain management.

Table 1. Intraoperative analgesic practice for craniotomy patients (n=59 unless otherwise stated).

Scalp block [n(%)]	
Yes	5 (8.5)
No	54 (91.5)
Intraoperative analgesia given [n(%)]	
Morphine	39 (66.1)
Fentanyl	20 (33.9)
Alfentanil	1 (1.7)
Remifentanyl	53 (89.8)
Paracetamol	56 (94.9)
Clonidine	10 (16.9)
NSAID	0 (0)
Magnesium sulfate	25 (42.4)
Dexamethasone	57 (96.6)
No of intraoperative analgesics ⁰ [n(%)]	
2	6 (10.2)
3	23 (39.0)
4	23 (39.0)
5	7 (11.9)

⁰ Including paracetamol, morphine, fentanyl, alfentanil, clonidine, magnesium sulfate, NSAID, and dexamethasone, but excluding remifentanyl.

Table 2. Postoperative analgesic practice for craniotomy patients (n=59 unless otherwise stated).

Prescribed scheduled postop analgesics [n(%)]	
Paracetamol	56 (94.9)
Dihydrocodeine/codeine	39 (66.1)
Tramadol	1 (1.7)
Nonsteroidal anti-inflammatory drug	1 (1.7)
No of prescribed scheduled postop analgesics	
0	2 (3.4)
1	19 (32.2)
2	36 (61.0)
3	2 (3.4)
Prescribed PRN opioids [n(%)]	
Oral morphine	58 (98.3)
IV morphine	48 (81.4)
IV fentanyl	6 (10.2)
Administered PRN opioids [n(%)]	
Oral morphine, n=58	40 (69.0)
IV morphine, n=48	25 (52.1)
Total dose of morphine given over 72 hours in mg, n=51 [median (IQR)]	6.67 (3.33 – 16.67)

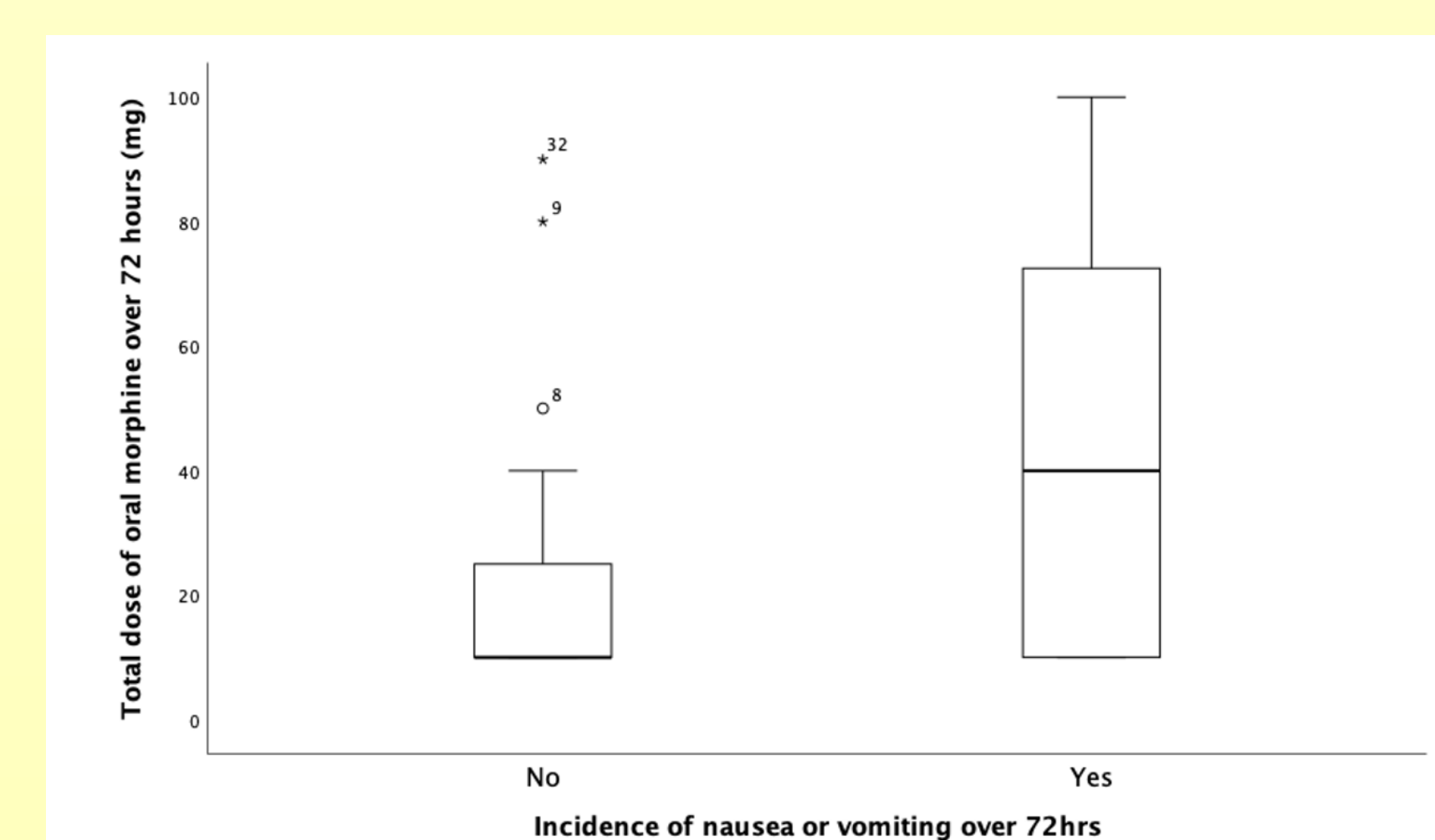


Figure 3. Boxplot of the total dose of oral morphine in patients with and without nausea or vomiting, over 72 hours. Mann Whitney test $p < 0.025$ ($U=110.5$) for comparison between groups.

Conclusion

There was a high incidence of moderate to severe pain in patients undergoing craniotomy with evidence of widely variable analgesic practices.

Targeted strategies below were identified and are currently being implemented to improve the management of post-craniotomy pain:

- Preoperative
 - Administration of preemptive analgesia such as gabapentin, paracetamol
- Intraoperative
 - Use of NSAID at the end of surgery for suitable patients
 - Consideration for the use of COX-2 inhibitors
 - Scalp block
 - Intraoperative multimodal analgesia – use of more classes of analgesics
- Postoperative
 - Protocolized prescription of analgesics
 - Postoperative scheduled (by-the-clock) multimodal analgesia
 - Pain team referral for patients with uncontrolled pain
 - Use of NSAID for suitable patients
 - Identification of high-risk patients
 - Vigilance for complications of opioids
- Educational sessions/awareness campaigns
 - Awareness of pain in clinicians caring for post-craniotomy patients
 - Scalp block – standardization of technique

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Immediate post-operative oxycodone consumption in craniotomy following intraoperative remifentanyl.

Shankar Lal¹, Waqas Minhas¹, Michael Moore²

Department of anaesthesiology, Beaumont Hospital, Dublin, Ireland.

1: Trainee Anaesthesiology.

2: Associate Professor, Anaesthesiology.

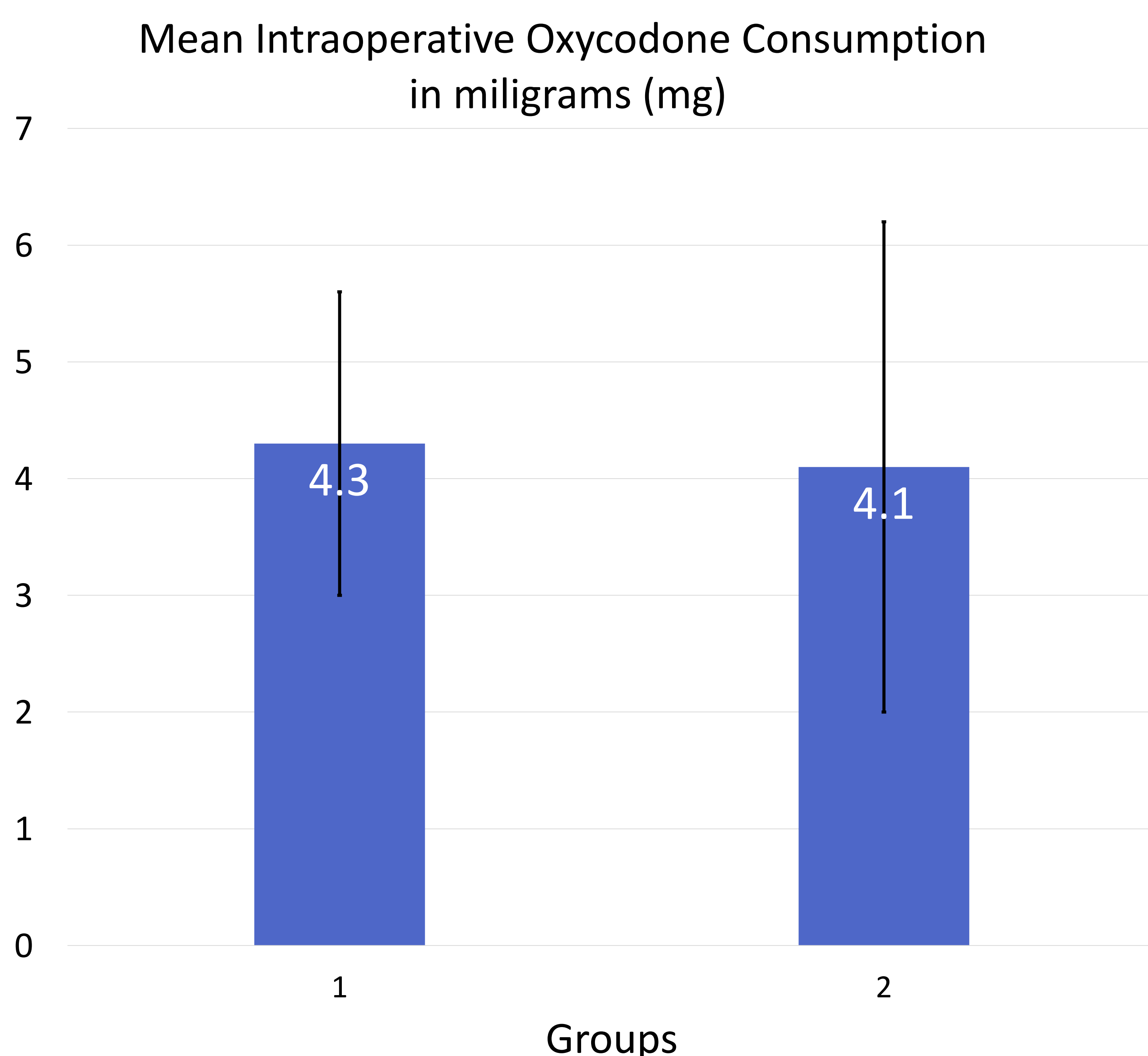
Introduction

Munoz et al. revealed timely administration of morphine reduced post-operative morphine consumption in patients receiving remifentanyl-based general anaesthesia.

We performed a retrospective audit to evaluate the effect of the timing of intraoperative oxycodone administration and subsequent oxycodone consumption in PACU in craniotomy patients who had received intraoperative remifentanyl.

Methodology

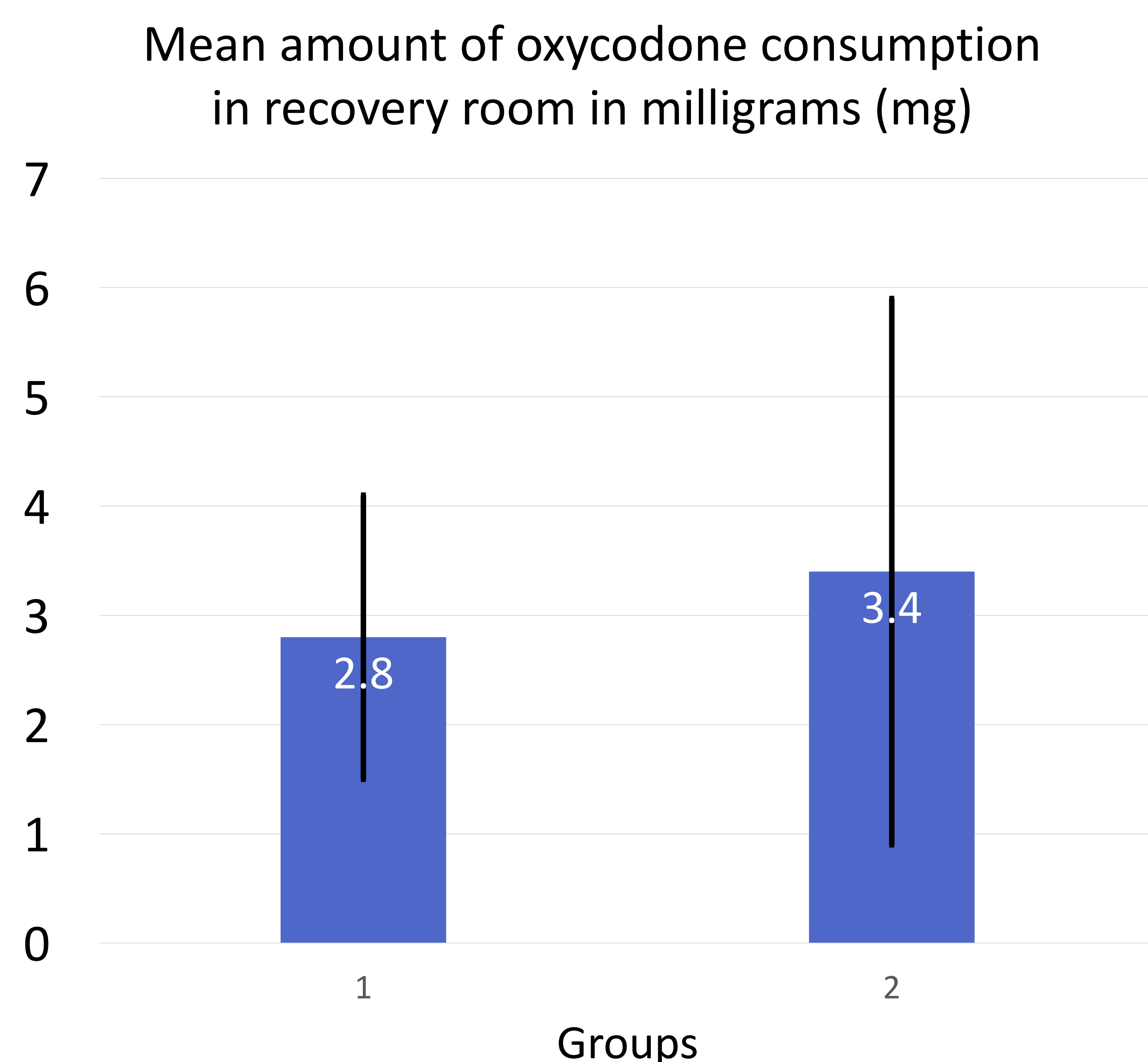
We retrospectively audited the medical records of 50 patients undergoing supratentorial craniotomy. Group-1 patients received oxycodone more than 40 minutes before end of surgery and Group-2 patients received oxycodone less than 40 minutes. Quantity and timing of oxycodone administration, surgery end time, PACU oxycodone dose, and PACU length of stay were collected.



Results

The mean quantity of intraoperative oxycodone administered was 4.3 mg (SD 1.3) in group-1 vs 4.1 mg (SD 2.1).

The mean oxycodone consumption in PACU in group-1 was 2.8mg (SD 1.3) and group-2 was 3.4mg (SD 2.5).



Conclusion

Our audit showed that earlier administration of oxycodone in craniotomy patients receiving intraoperative remifentanyl showed a reduction in oxycodone consumption in PACU. Fewer patients needed oxycodone in the PACU when oxycodone was administered 40 minutes prior to the end of surgery. We plan to conduct a further study to determine if earlier administration of oxycodone may result in quicker discharge time from PACU, less post-operative nausea and vomiting, less nursing interventions and more patient satisfaction.

From our audit we recommend craniotomy patient receiving intraoperative remifentanyl should receive oxycodone more than 40 minutes prior to end of surgery.

Questions?

Send me your question via direct message on the meeting App: Shankar Lal

Using Communities of Practice (CoP) to improve Mechanical Thrombectomy (MT) delivery in England, a national quality improvement initiative.

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Introduction

2% of strokes in England receive mechanical thrombectomy (MT). This is delivered by 24 Comprehensive Stroke Centres (CSCs) serving 83 Acute Stroke Centres.

The Long Term Plan objective is to ensure 10% of patients suffering strokes receive MT by 2029. In April 2021 the Thrombectomy Implementation Group (NHS England) commissioned Getting it Right First Time and stakeholders to produce an analysis of MT in England, aiming to share learning through a communities of practice (CoP) model as a national quality improvement programme.

Etienne Wenger described communities of practice as 'groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly'.

The purpose of the programme was to collate data and analysis on the organisation and provision of MT services, and to work with local systems across England to review the evidence, highlight best practice and agree tangible actions that could improve outcomes for patients following stroke and MT. An important focus for the programme was to identify ways of working that can sustain the anticipated growth in MT volumes.

A key focus for the programme was to bring together evidence and experiences and use this as the basis for working with all teams involved in delivering MT from across the country. The goal was to identify good practice and share experiences so that services can support one another to strengthen their thrombectomy pathways and future-proof them as volumes grow. Every CSC and ASC was invited to join a Community of Practice. Each Community involved a number of CSCs. ASCs were invited to join the groups that included the CSCs they made significant referrals to. Each Community included membership from ambulance services and linked services within hospitals that host CSCs (e.g. diagnostics).

The Communities of Practice were broadly defined on geography so that practitioners had an opportunity to strengthen local networks. To give a wider perspective, some Communities of Practice involved a CSC from outside the local region.

For each Community of Practice, we held a one-day virtual engagement event. These were led and facilitated by senior clinicians with experience in stroke medicine, interventional neuroradiology and quality improvement approaches. In addition to clinical expertise, we ensured that the leadership had deep knowledge of NHSE's national stroke programme, the GIRFT stroke programme and SSNAP, as well as expertise in programme management and processes to engage services with evidence.

Methodology

National process/outcome data were analysed (to Dec. 2021) including; hospital episode statistics, Sentinel Stroke National Audit Programme data, a NIHR Programme Grant research survey Promoting Effective & Rapid Stroke Care, ambulance quality indicators and a survey of members of the Neuroanaesthesia and Critical Care Society of Great Britain and Ireland.

Subsequently 7 MDT CoP QI meetings were held online to share this data and learning. Communities of Practice were formed as below:

CSC Community of Practice membership

Community of Practice	Comprehensive Stroke Centres
South and South East	John Radcliffe Hospital Southampton General Hospital Royal Sussex County Hospital Charing Cross Hospital University College Hospital North Bristol Hospitals
South and South West	Derriford Hospital St George's Hospital King's College Hospital Walton Centre Stroke Team
North West	Salford Royal Royal Preston Hospital Royal Hallamshire Hospital
North East and Yorkshire	Leeds General Hospital James Cook University Hospital Royal Victoria Hospital Hull Royal Infirmary
Midlands	Queen's Medical Centre – Nottingham Queen Elizabeth Hospital Edgbaston Royal Stoke University Hospital
East and Essex	Cambridge – Addenbrooke's Hospital Royal London Hospital Queen's Hospital Romford

The overall structure for each Community of Practice engagement event was:

Making the case for building Communities of Practice: content included an introduction from regional lead, policy drivers, outlining Communities of Practice as way to support one another.

Quantitative data: selected by clinical experts, discussions to ensure data were meaningful, stimulate thinking about where gaps are and how services currently work, prompt appetite for new knowledge/greater collaboration.

Breakout workshops: chaired by leads based in different parts of Communities of Practice, discussion of key issues/processes (communities differed in how individual breakouts were structured, but each event covered the same topics e.g. prehospital assessment, initial ASC assessment, CSC transfer, CSC MT & repatriation, governance/safety/learning)

Coming back to the main room: reflection, commitment and agree actions and next steps from breakout groups.

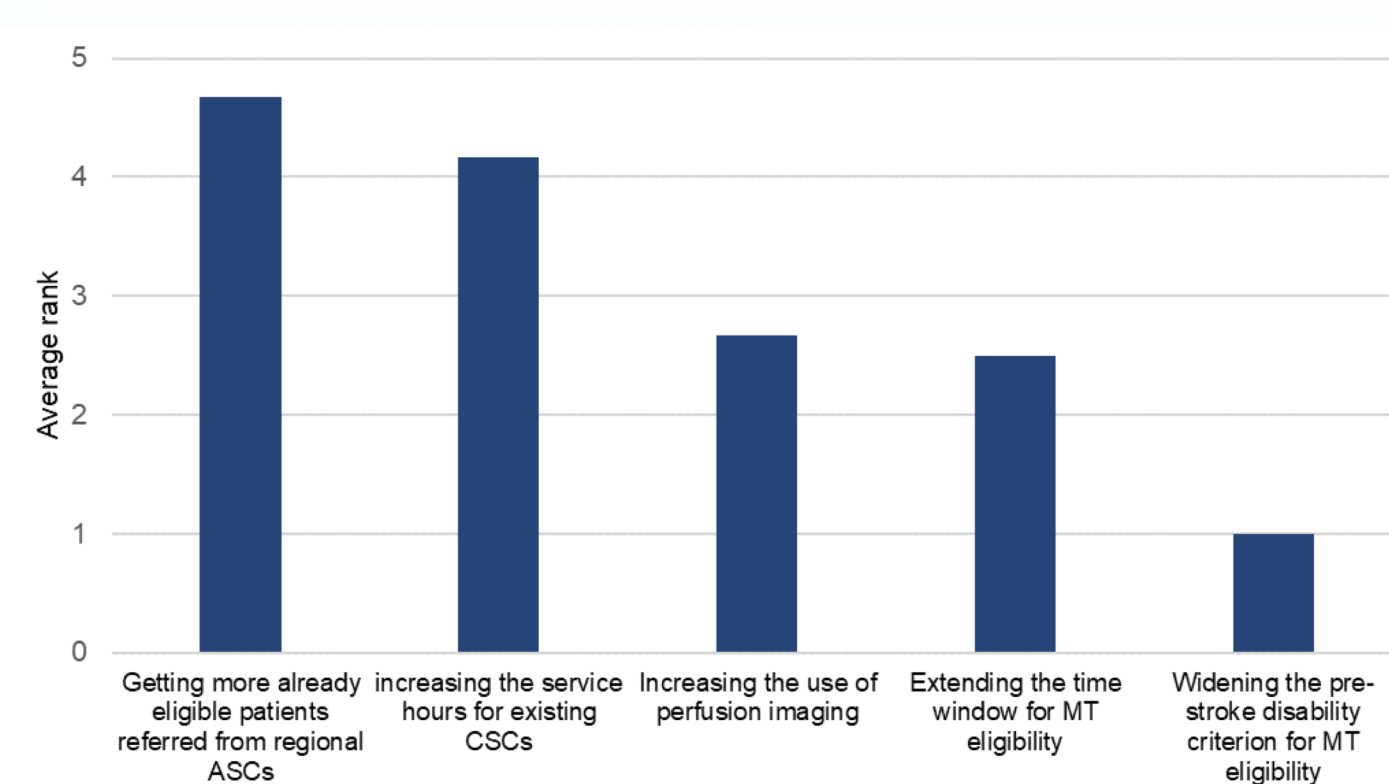
Surveys were conducted at the start and end of each Community of Practice event to understand whether participants believe the Communities are a useful vehicle for sharing and supporting quality improvement.

Results

A snapshot of anaesthetic practice was collected from 26/29 UK CSCs, some of which was presented at the NACCS ASM 2022. The first table below summarises key data reviewed in CoPs and illustrates some of the variation (as ranges & IQRs). On average these demonstrate procedural and clinical/safety outcomes as expected for real-world populations. Almost 50% of patients receiving MT are directly admitted to the CSC whereas on catchment population basis it should be 26%. The proportion of stroke patients referred by ASCs to CSC for MT was wide at 0.5% to 6%. Door in door out time (DIDO) was prolonged with national median of >2.5h. At the time 5/24 CSCs in England offered a 24 hour service. Same day repatriation was preferred in 6/24. External patient transfer can take >80 minutes dependent on CSC configuration.

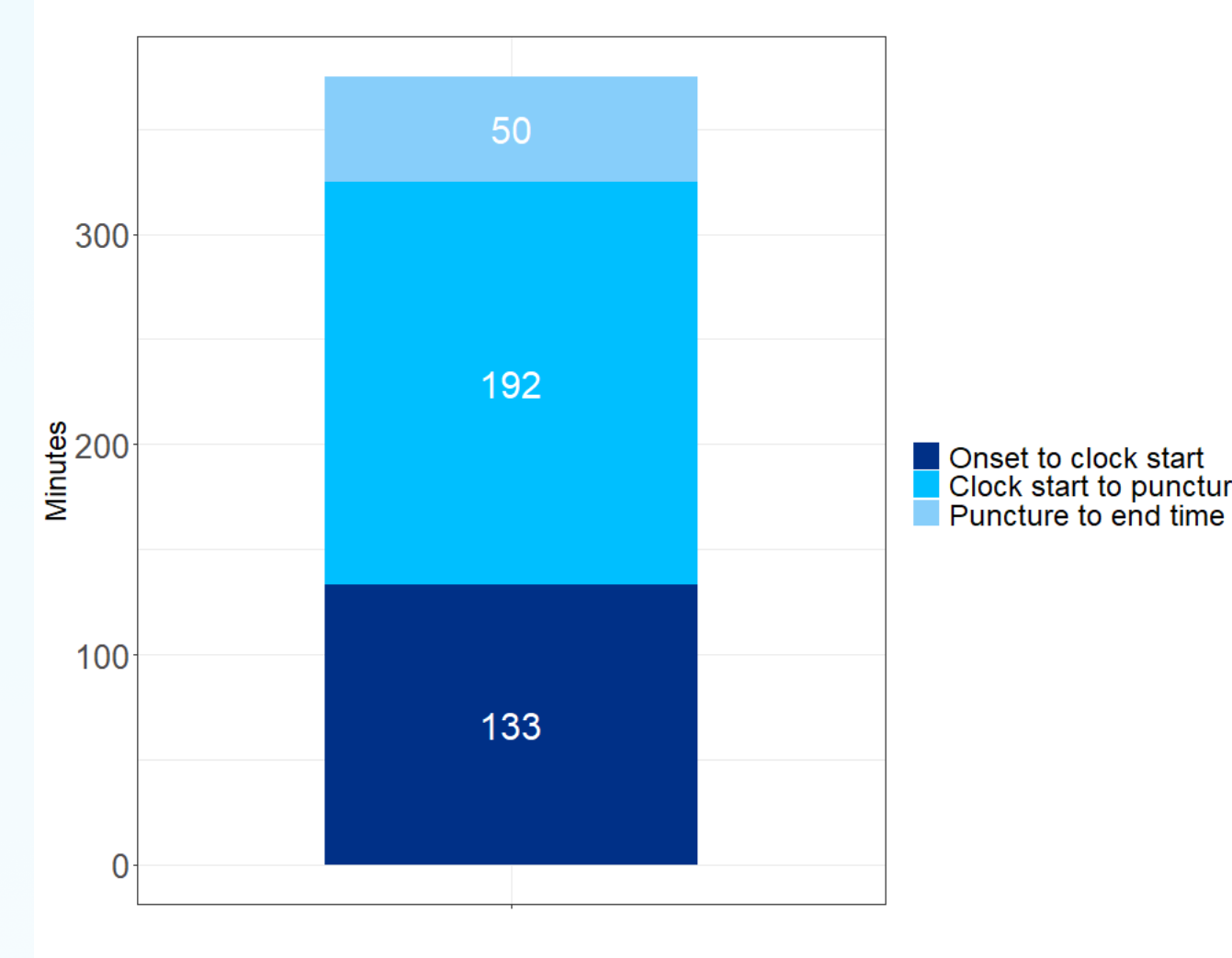
Median MT/year/CSC	83 (most active ~200)
Median Door in Door Out Time	2 hours 35 minutes (IQR 138-178)
Median time symptom onset to groin puncture	5 hours 25 minutes (IQR 251-445)
Median length of thrombectomy	50 minutes (IQR 32-72)
Thrombolysis in cerebral infarction score 2b-3 (Successful Outcome)	79% (IQR 72-83%)
Discharge mRS 0-3	53% (IQR 37-63%)
Mortality at 30 days	16% (IQR 5-27%)
Complications following MT	20% patients (range 0-44%)
General anaesthesia for MT	84.6%
Anaesthetic provision for MT	42.3% Neuroanaesthetists

CoP Opinions of Main stimuli to growth in MT activity over the next few years (ranking – 5= most important, 1=least important (Source Mentimeter Survey at CoP))

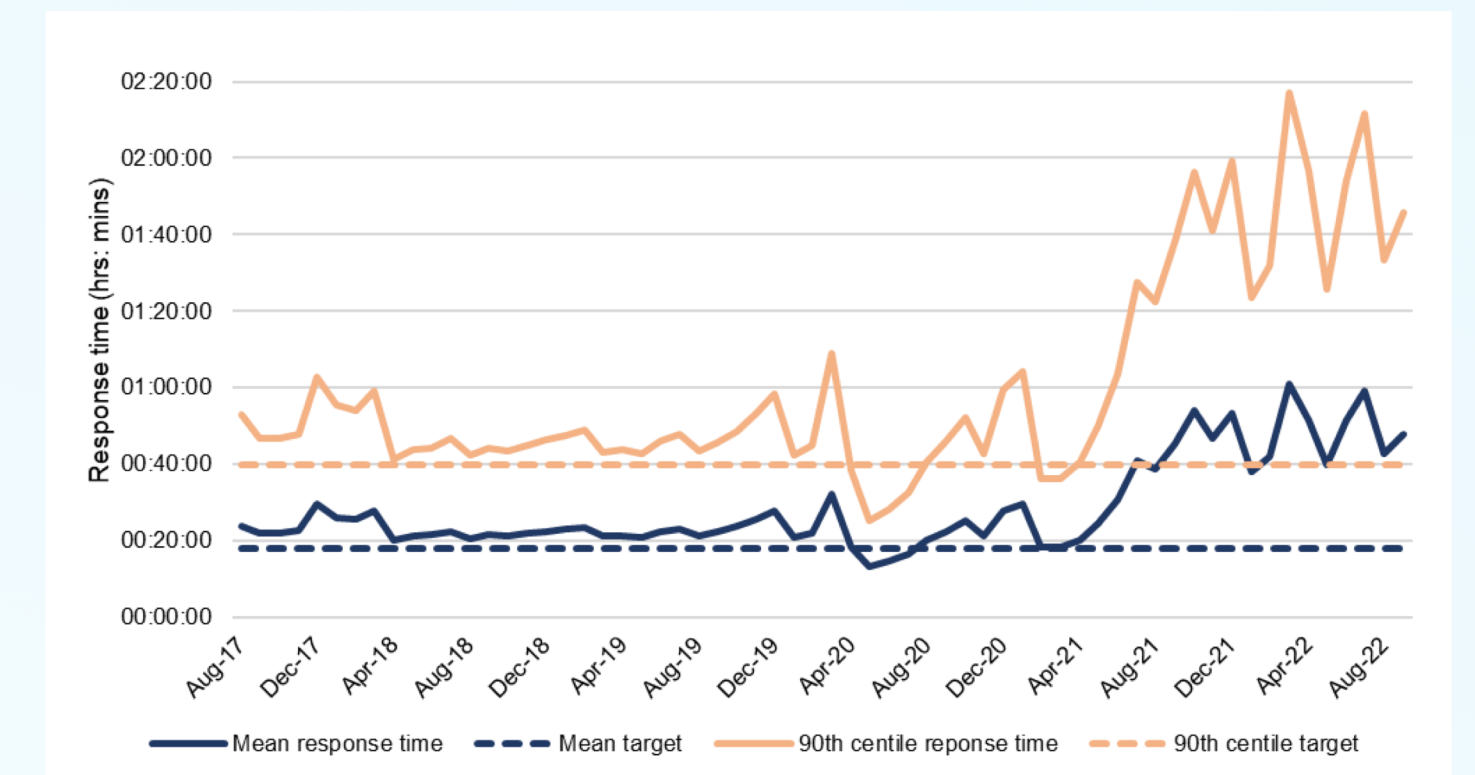


Results

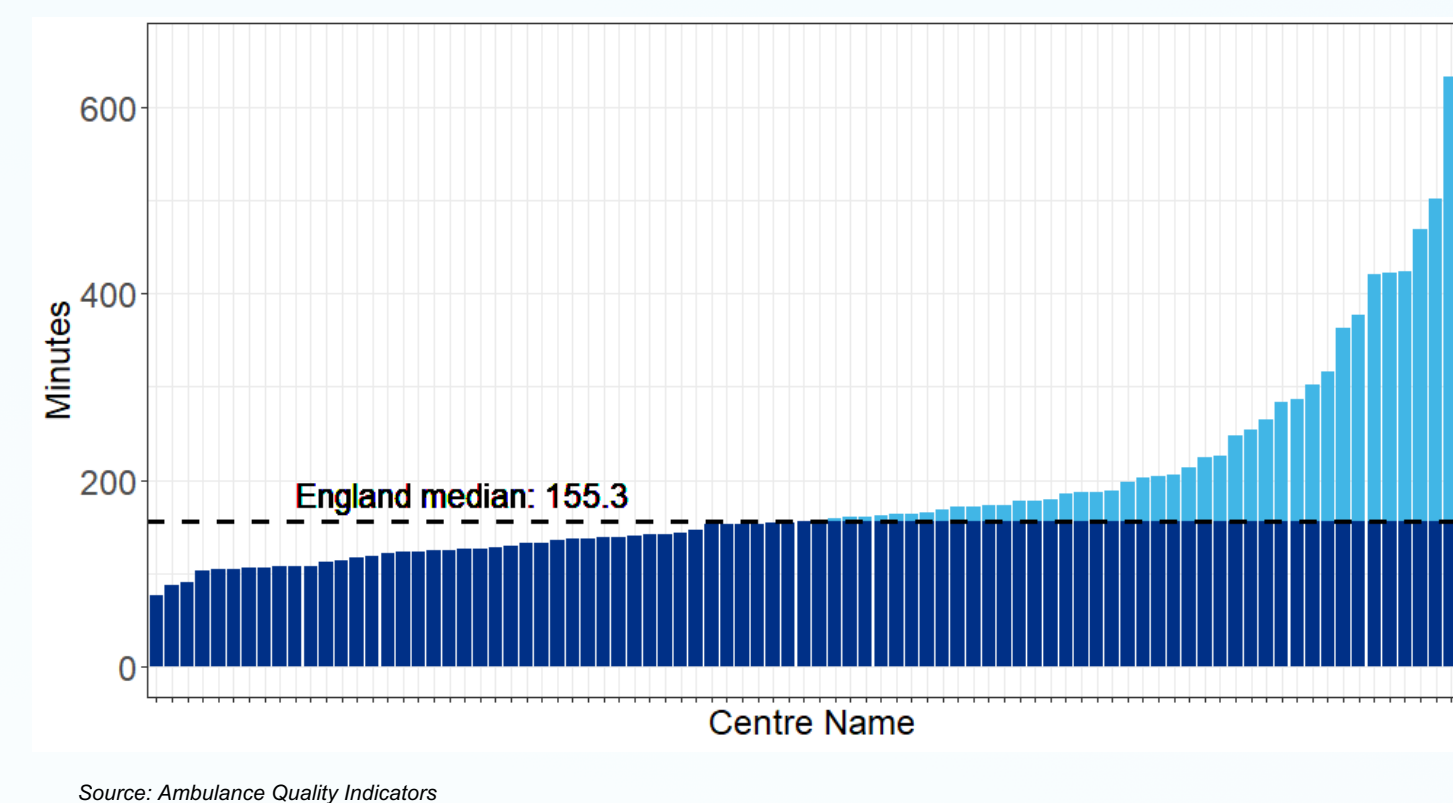
Thrombectomy average pathway times (2021) (SSNAP 2021)



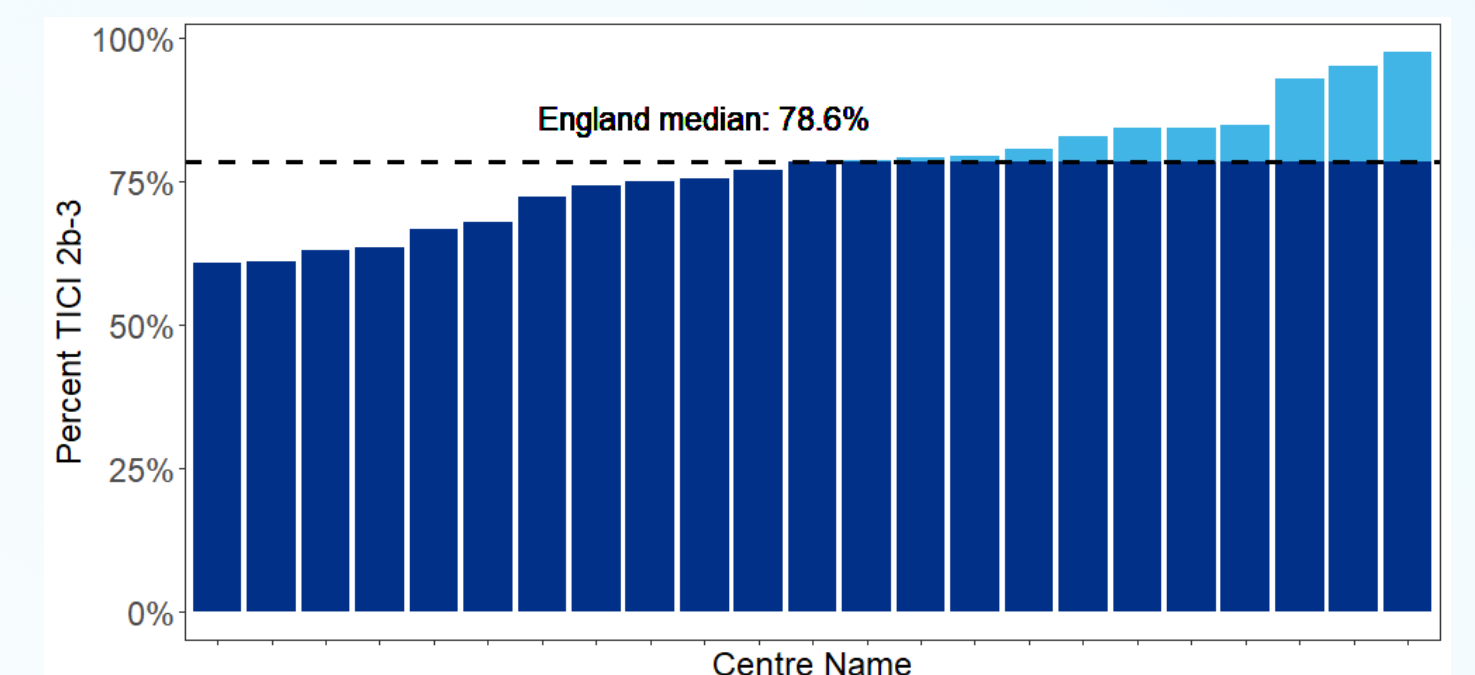
Ambulance response time for Category 2 calls (August 2017-September 2022, England)



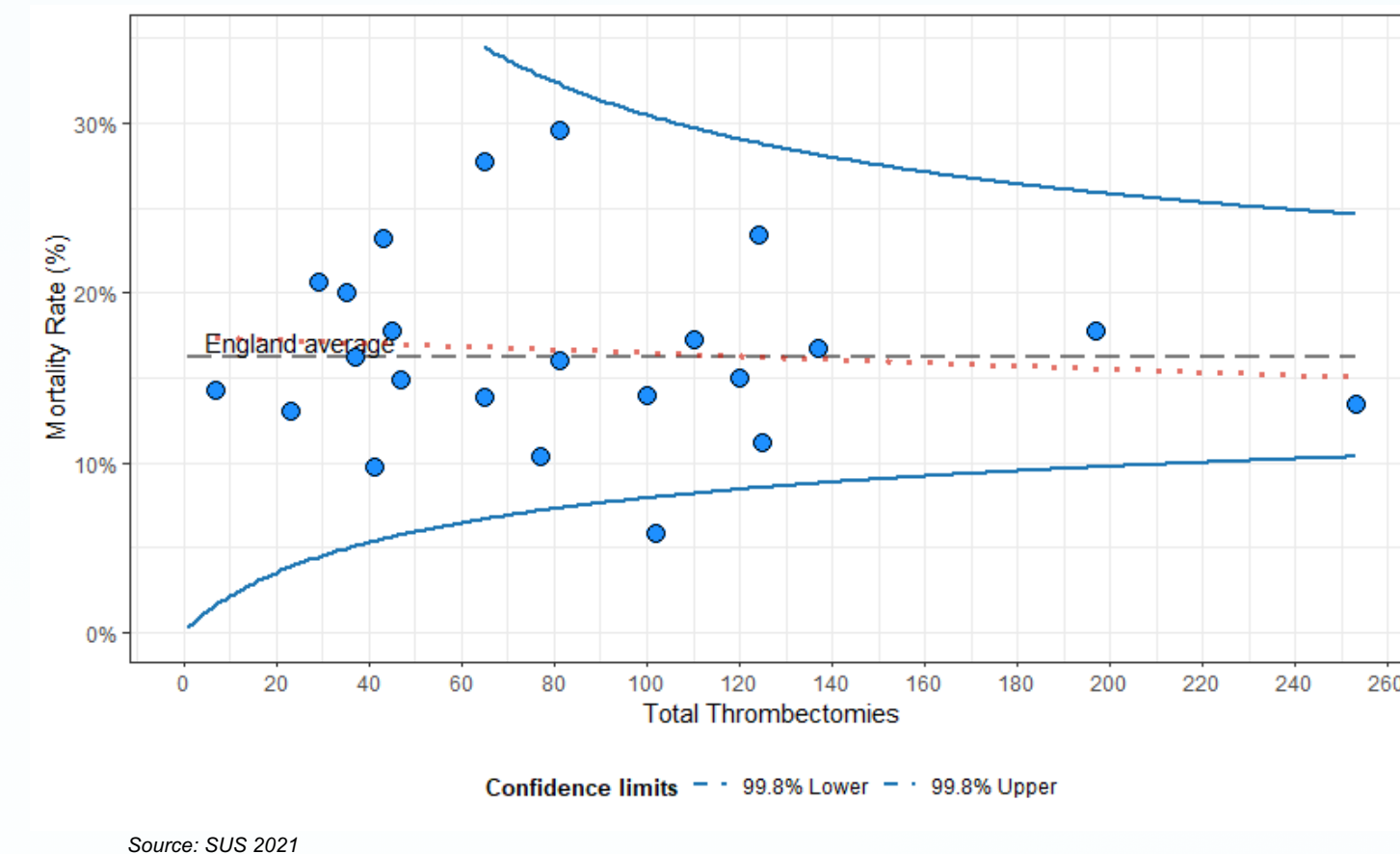
Median Door-In-Door-Out (DIDO) times by ASC (2021)



Percentage of patients with TICI 2b-3 achieved (2021)



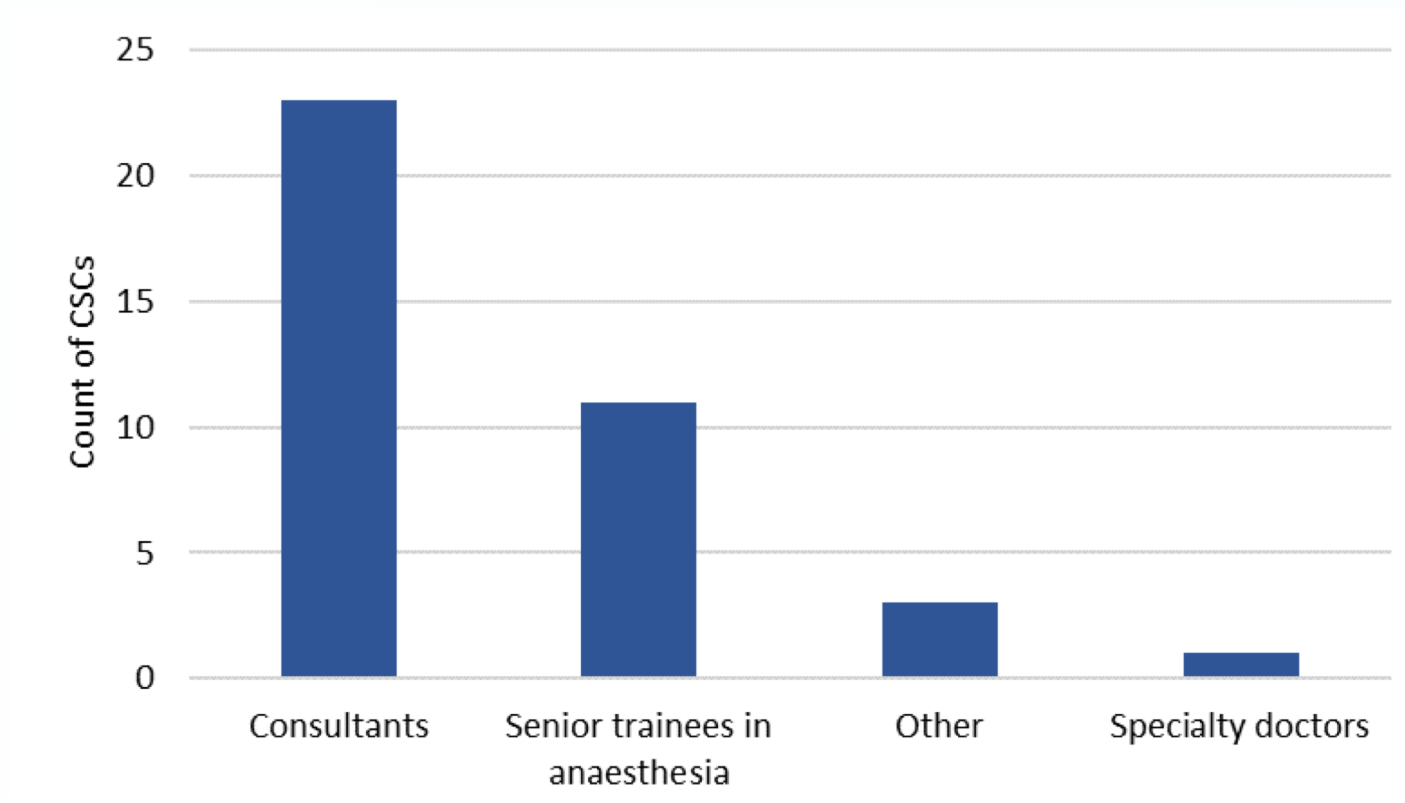
Thrombectomy mortality rate within 30 days – by CSC, 2021



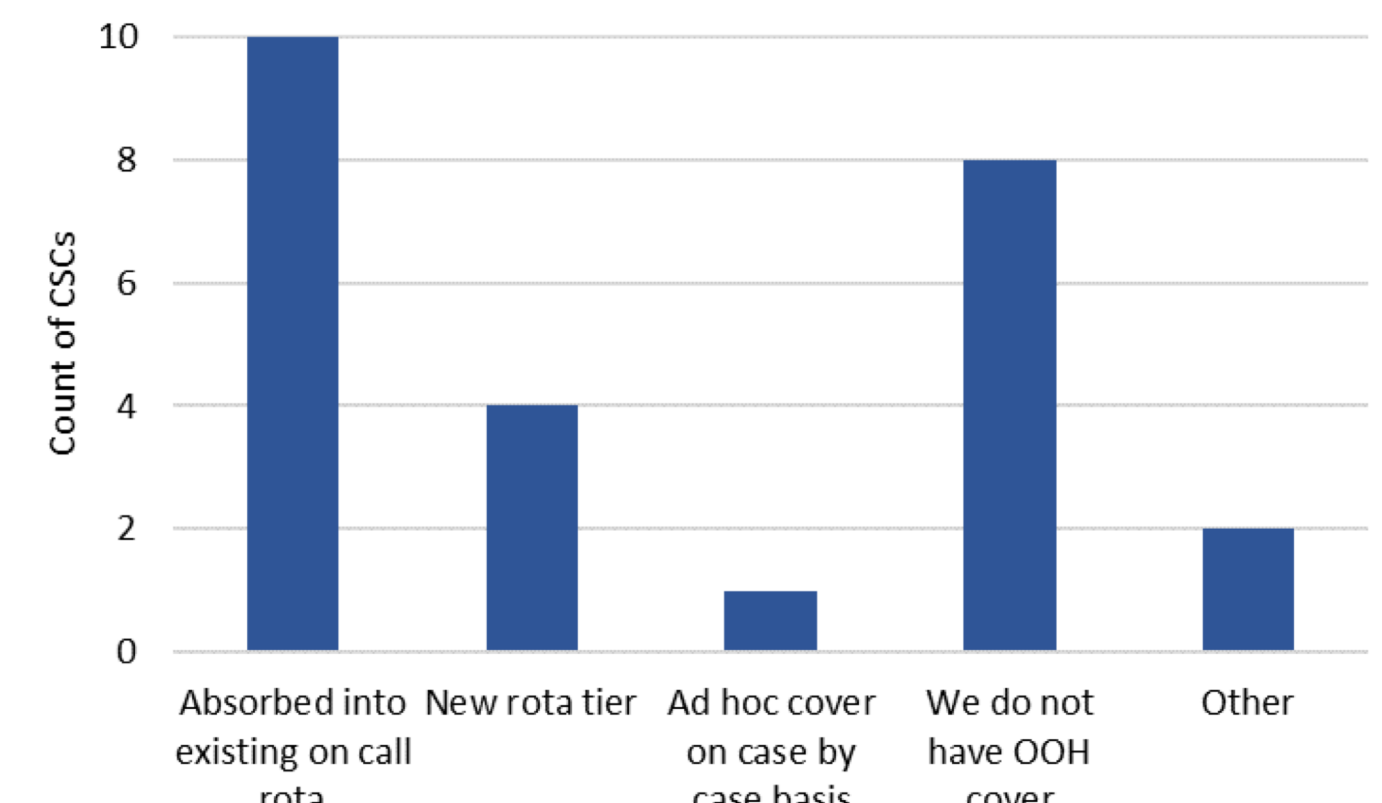
Who provides anaesthetic services for MT? Source: Survey of NACCS members, 2021

Who provides anaesthetic services to interventional neuroradiology in your centre?	
Neuroanaesthetists	11
Mix neuro and general	14
Other	1

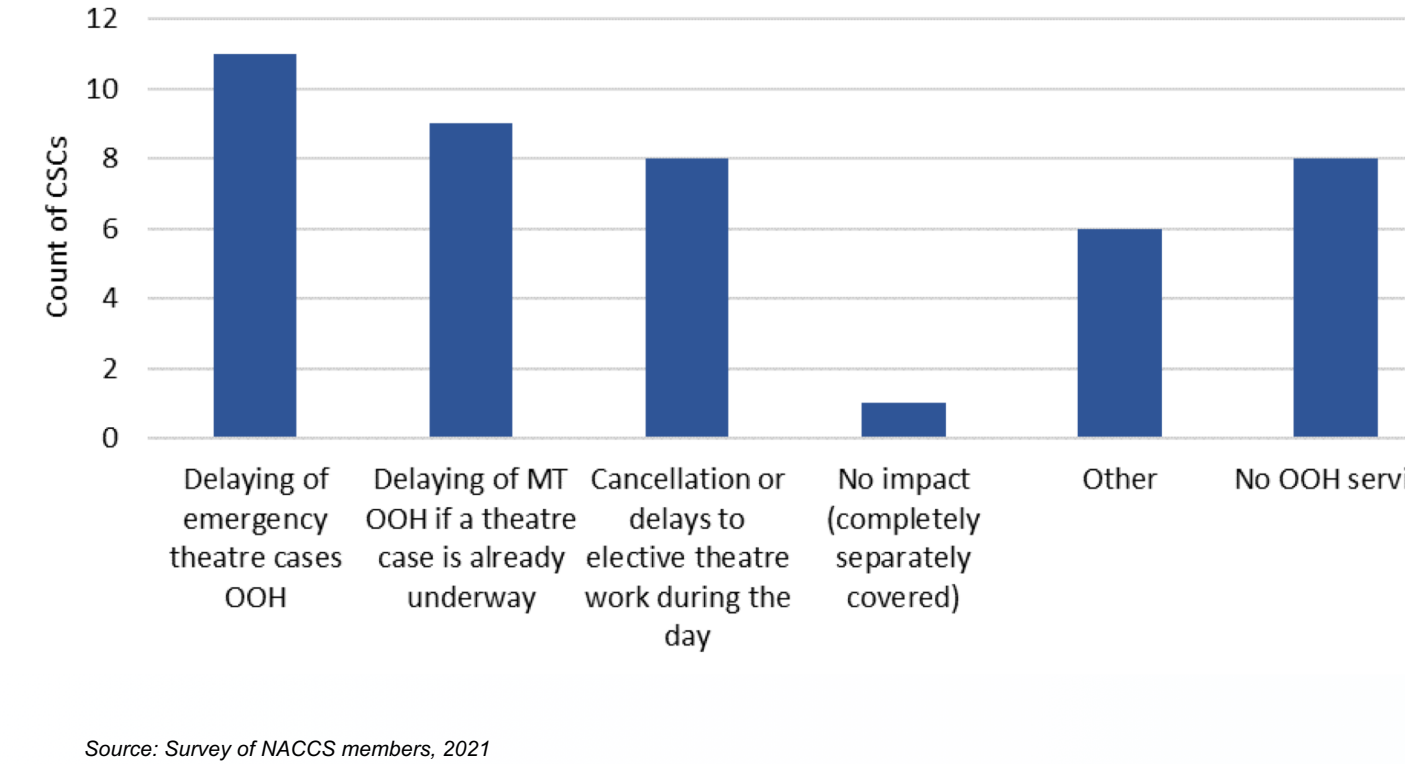
Grade of anaesthetist providing anaesthesia for MT



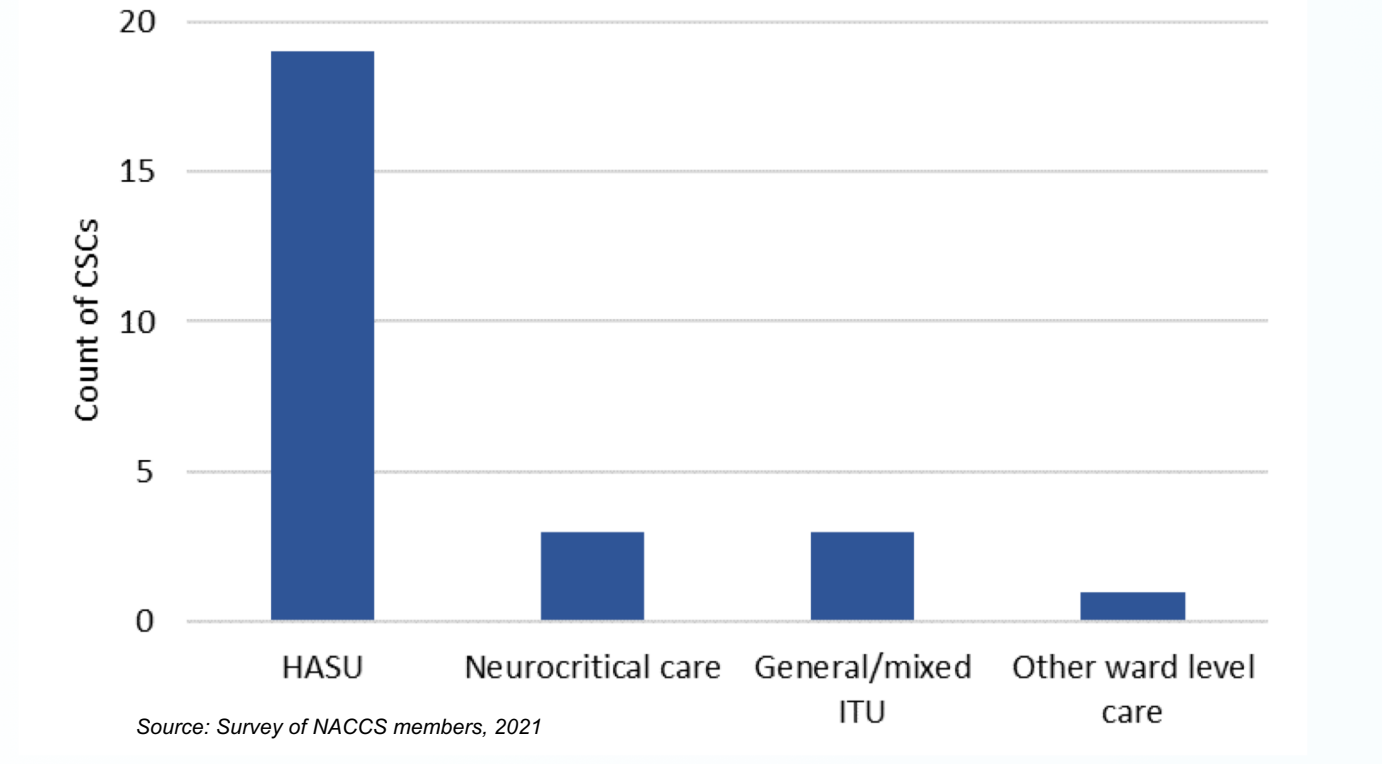
How is out of hours MT anaesthesia covered?



The impact that OOH MT has had on other services



Where do the majority of patients go post-MT?



Choice of anaesthetic technique Source: Survey of NACCS members, 2021

What is the most commonly used anaesthetic technique in your unit for these cases?	
General Anaesthetic	22
Conscious Sedation and Local Anaesthetic	3
Local Anaesthetic	1

Whom drives choice of anaesthetic? Source: Survey of NACCS members, 2021

With regards choice of anaesthesia - What or whom drives this preference?	
Radiologist	10
Anaesthetist	2
Each case individually discussed	16
Other	7

Conclusion

On average, results show MT provision has outcomes as expected for real-world populations. Substantial variation exists. Expanding ASC referral rates, reducing DIDO times and increasing hours of operation is likely to improve access/outcomes. Whilst MT volumes remain low, anaesthetic cover is generally provided as extra responsibilities to existing rotas. As volumes grow this may not be sustainable and services may need to look at other models for anaesthetic cover. CoP are a useful method of sharing and accelerating learning between units, standardising care and building networks.

Questions?

Send me your question via direct message on the meeting App: **Rebecca Campbell**
rebecca.campbell@stgeorges.nhs.uk

Evaluating rates of external ventricular drain associated infection in critically ill patients across the COVID-19 pandemic: A retrospective service evaluation

A. Skroban¹, E.M. Parkin², F.A. Wallace³

¹Medical Student, Division of Medical Education, University of Manchester, ²Consultant ACCP, Salford Royal Hospital, ³Intensive Care Consultant, Salford Royal Hospital

Introduction

Ventriculitis can be a devastating external ventricular drain [EVD]-associated complication resulting in long-term neurological sequelae¹ and increased patient mortality². Ventriculitis can pose a diagnostic challenge as its clinical presentation can be non-specific and in critically ill patients it is difficult to differentiate features of a new infective process from the underlying neurology.

This service evaluation aimed to determine the EVD-associated ventriculitis rates in critically ill patients in a large critical care unit and assess whether care bundle interventions introduced in 2019 as a part of infection risk reduction measures, were being maintained. Prior to 2019 there had been significant EVD-associated work completed on the unit to address concerns regarding infection rates.

However, the COVID-19 pandemic has since placed the ICU setting under exceptional pressure through its impacts on admissions, capacity, resources and staffing. The impacts of this on the quality of EVD care delivered and by extension, impacts on EVD-associated infection rates are unclear.

Aims

The service evaluation and audit aimed to answer the following:

- What were the rates of EVD-associated infection in critically ill patients in April-July 2019, 2020 and 2021?
- What were the organisms implicated in infection?
- What antimicrobial therapy was being prescribed?
- Are the 2019 care bundle interventions being maintained?

Methodology

SERVICE EVALUATION:

Critically ill patients with an EVD in situ between April-July 2019, 2020 and 2021 were retrospectively reviewed using electronic patient records. Cases of ventriculitis were categorised as being *definite* or *probable*. Cases of *antibiotics for ventriculitis in the absence of definite or probable ventriculitis* were also identified. Follow-up was up to 30 days post-EVD removal or up to the point of further neurosurgical intervention. The primary outcome was the rate of ERI (sum of *definite* and *probable* infections) expressed as the ventriculitis rate per 1000 EVD days and as the percentage of EVDs.

AUDIT:

Care bundle interventions were assessed prospectively on the unit over a period of 7 weeks. Once weekly all patients on the CCU with an EVD in situ were identified, and data was collected based on observations made at the bedside.

Results

The number of patients with an EVD in situ was 38, 30 and 38 on the 2019, 2020 and 2021 periods respectively. In the 2019, 2020 and 2021 period the total number of EVD days was 382, 337 and 387 respectively.

INFECTION RATES:

The infection rate was 18.32, 14.84 and 12.92 per 1000 EVD days in 2019, 2020 and 2021 respectively (*Table 1*). The greatest incidence of *definite* infections was observed in 2021. The mean time to infection for ERI was (time from insertion to first positive culture, abnormal CSF) was 12.6, 15.4 and 11.2 days for 2019, 2020, 2021 respectively. The mean EVD duration in situ among the ERI group in this study was 11.2, 14.0, 8 days for 2019, 2020, 2021 respectively. In 2019, 2020, and 2021 5/7, 3/5 and 3/5 diagnoses of ERI were made following EVD removal.

	April-July 2019	April-July 2020	April-July 2021
EVD-associated ventriculitis rate (%EVDs) [<i>definite and probable infections</i>]	15.9% (7/44)	13.9% (5/36)	11.6% (5/43)
EVD-associated ventriculitis rate (/1000 EVD days) [<i>definite and probable infections</i>]	18.32	14.84	12.92
<i>Probable</i> infections (%EVDs)	13.2% (5/38)	5.6% (2/36)	0% (0/43)
<i>Definite</i> infections (%EVDs)	5.3% (2/38)	8.3% (3/36)	11.6% (5/43)
<i>Definite</i> infections (/1000 EVD days)	5.24	8.90	12.91
<i>Antibiotics without evidence of definite/probable infection</i> (%EVDs)	6.8% (3/44)	19.4% (7/36)	2.3% (1/43)

Table 1: EVD-associated ventriculitis rates.

ORGANISMS:

Gram-positive cocci were isolated in 2019, while in 2020 and 2021 there was a preponderance of Gram-negative organisms. None of the isolated organisms were resistant to the empirical management nor met the criteria for multi-drug resistance.

ANTIMICROBIAL PRESCRIBING:

Meropenem and vancomycin accounted for the greatest antimicrobial burden across all periods (*Figure 1*). The total number of ventriculitis-antibiotic days for 2019, 2020 and 2021 were 175, 228 and 305 respectively. For targeted antimicrobial therapy, ceftriaxone accounted for the greatest burden in 2020 and 2021 and linezolid in 2019.

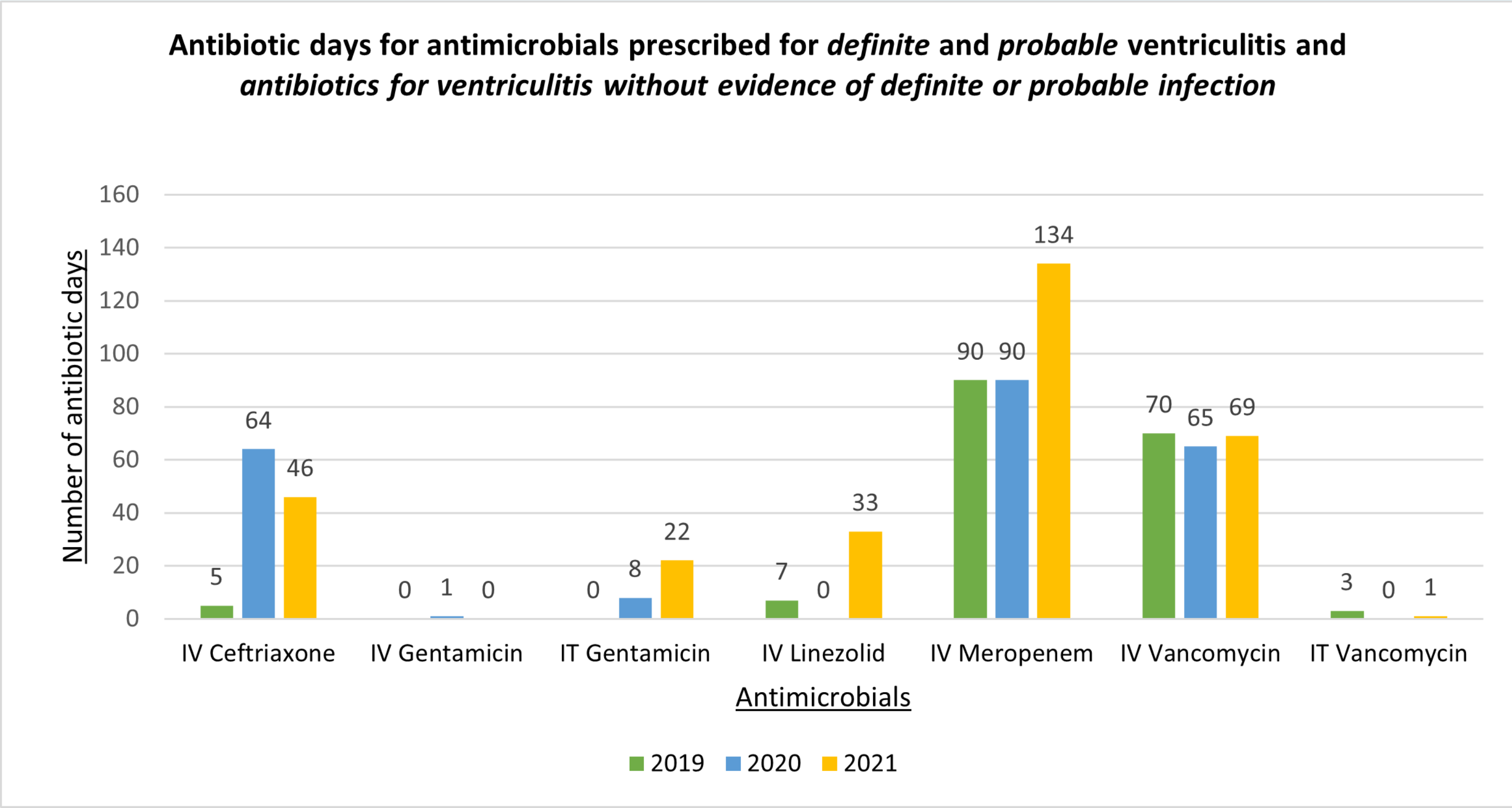


Figure 1: Antimicrobials prescribed.

CARE BUNDLE ADHERANCE:

The 2019 care bundle was not being consistently maintained (*Figure 2*).

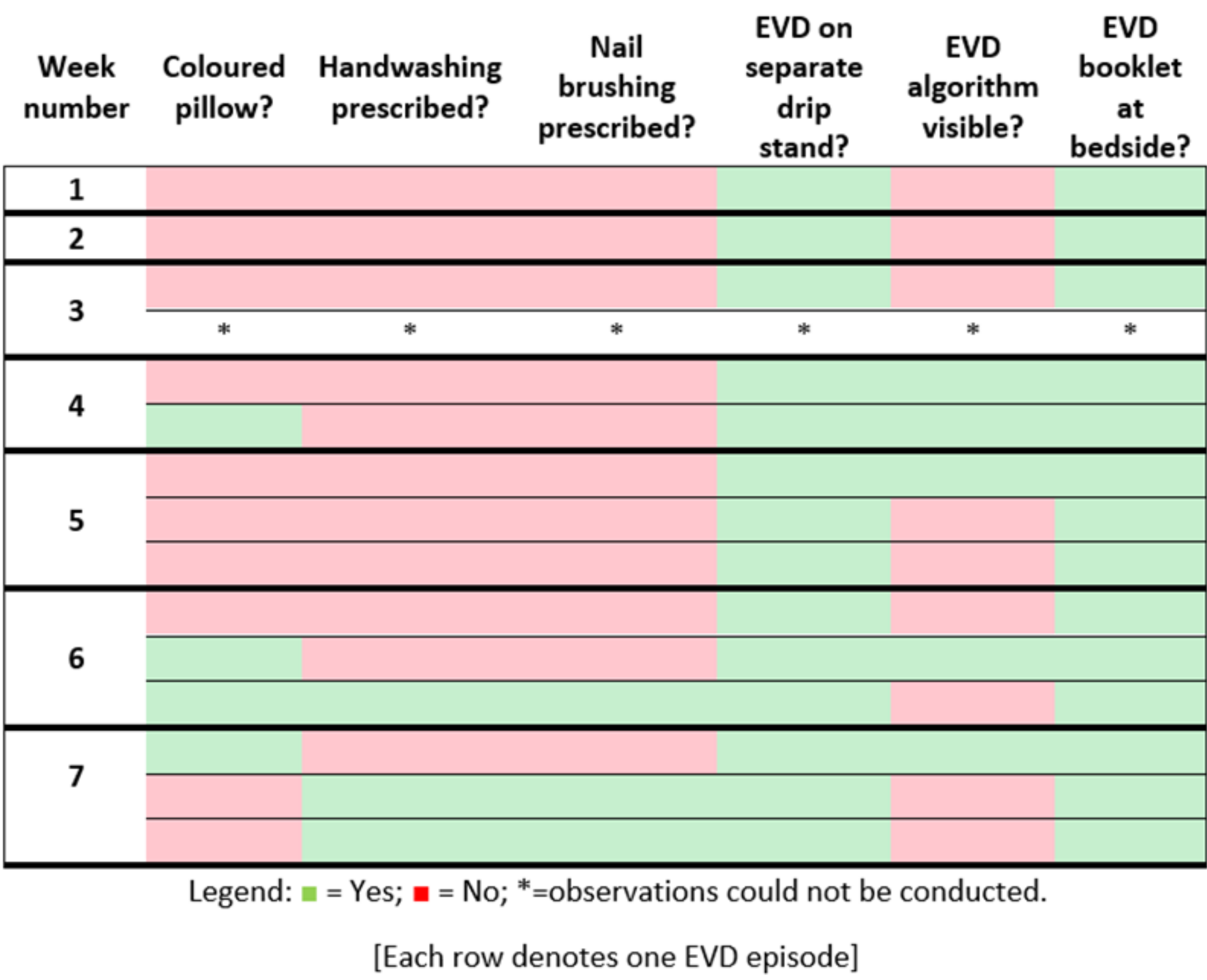


Figure 2: Summary of audit findings.

Conclusion

The 2020 period (coinciding with the first wave of the pandemic) exhibited the greatest proportion of cases of *antibiotics without evidence of definite/probable infection*. During the pandemic, increased cumulative antibiotic prescribing was observed for CNS cover. It is unclear whether this was reflective of a general trend of increased empirical antimicrobial use in ICUs³, or of prescribing attitudes of staff redeployed to ICUs working outside of usual practice.

Comparisons with other published infection rates are limited by the heterogeneity in surveillance definitions and duration of follow-up. There have been few studies that have examined nosocomial CNS infections across the pandemic.

Ventriculitis remains a diagnostic challenge and a pertinent issue in critically ill patients on the unit. The unit is currently working to review staff care bundle familiarity and implement a reporting system allowing for contemporaneous infection rates to be established, allowing for EVD-infection risk reduction measure efficacy to be assessed, with the goal of improving patient safety.

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Questions?

Send me your question via direct message on the meeting App: Aleksandra Skroban

Update on the development of a clinical practice guideline for patients with chronic subdural haematoma



Stubbs DJ¹ & Davies BM² on behalf of the Improving Care in Elderly Neurosurgery Initiative (ICENI) working group
1: Clinical Lecturer in Anaesthesia, Department of Perioperative, Acute, Critical, and Emergency Care, 2: Doctoral research fellow, Division of Clinical Neurosurgery, University of Cambridge

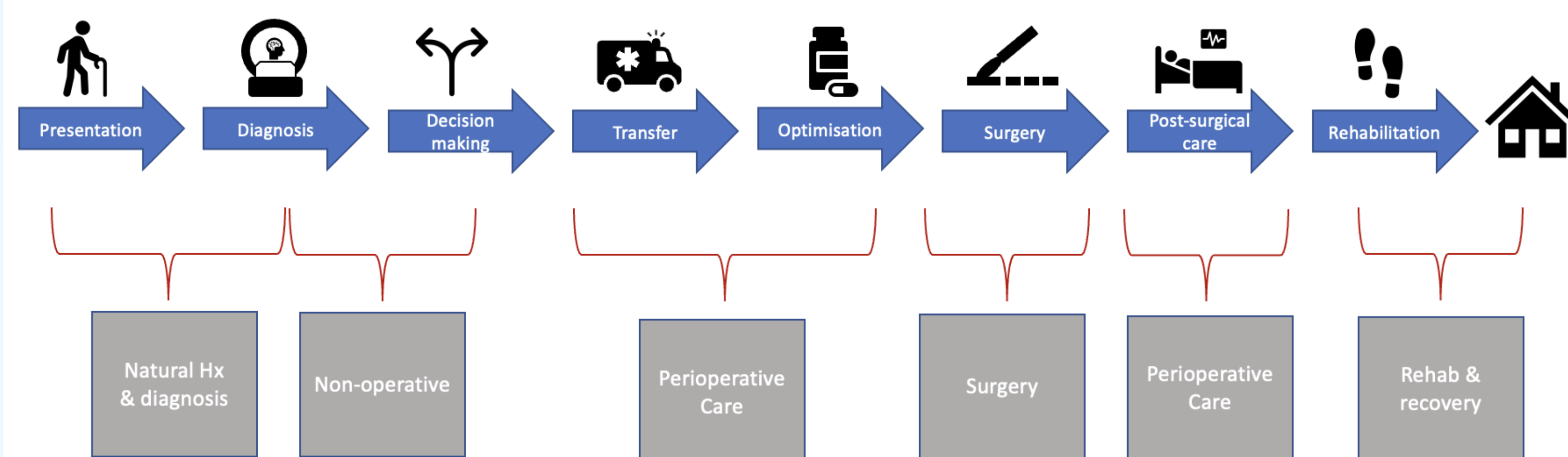


Introduction

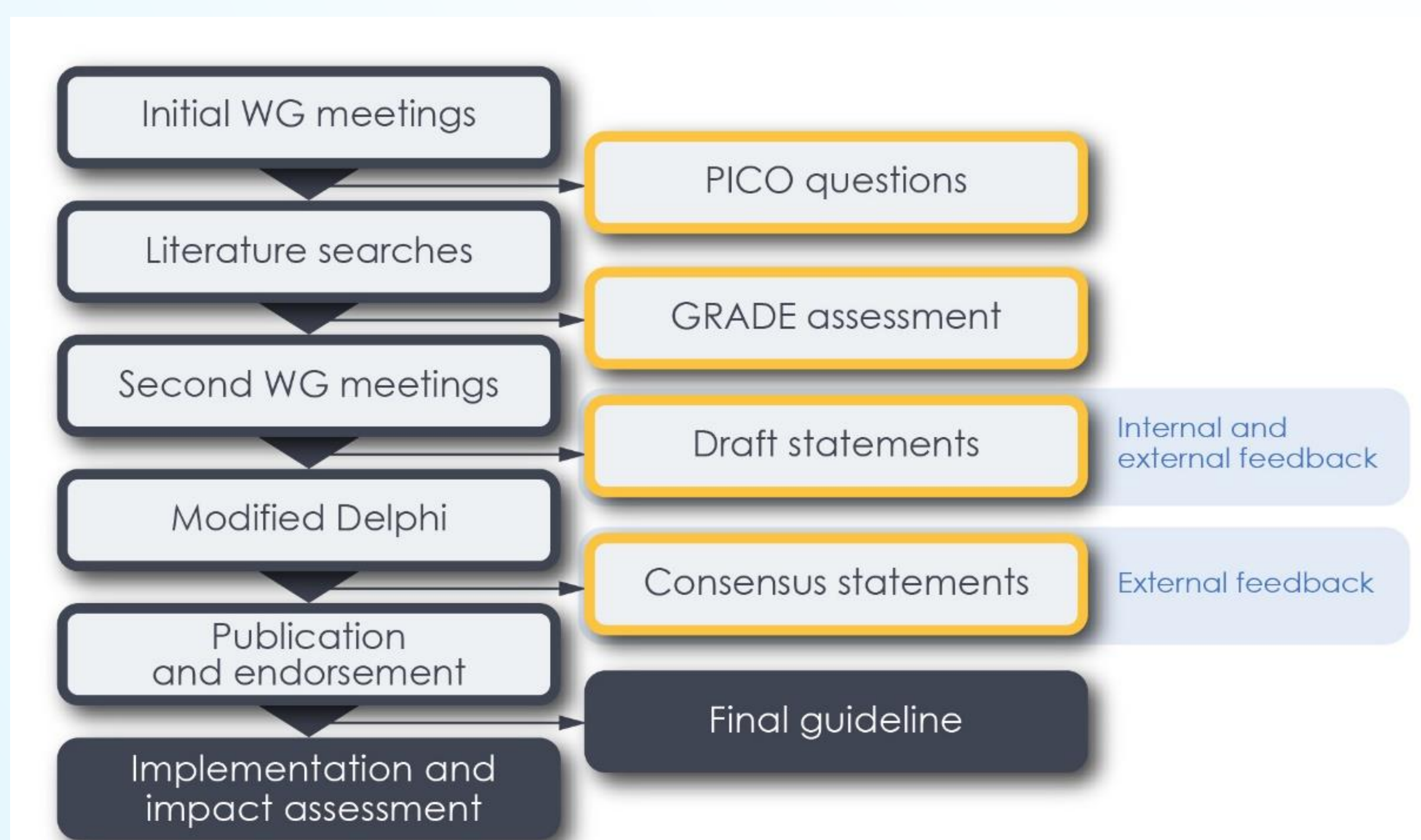
- Chronic Subdural Haematoma (cSDH) is a common neurosurgical condition typically affecting older, medically complex patients, who are often frail
- Care in other surgical cohorts has been enhanced by provision of multidisciplinary guidelines
- Currently no guideline exists to cover all aspects of the perioperative care of patients with cSDH
- This poster provides an update on an ongoing, multidisciplinary initiative to define best-practice for the perioperative care of patients with cSDH**

Methodology

Multidisciplinary working groups formed to examine entire patient journey



- Representatives from national bodies (incl. NACCS & SBNS) and methodologists as part of the ICENI steering committee
- Facilitated discussion in as working groups -> generation of key questions -> literature search
- Draft statements formulated and reviewed
- Adherence to NICE guidance on guideline development and AGREE II checklist



Project flow diagram: WG = Working group, PICO = Population, intervention, comparator, outcome.

Publications so far



Position Paper
Br J Neurosurgery



Scoping review on
educational resources
PLOS One



Association
of Anaesthetists



act Addenbrooke's
Charitable Trust

NIHR | National Institute
for Health Research



THIS.

Results

Progress so far:

- Five multidisciplinary working groups identified **44 key clinical (PICO) questions**
- These were grouped into five major themes: **natural history, non-operative management, perioperative optimization, surgical care, and rehabilitation**
- Extensive **systematic literature searches** were undertaken (June 2022) to identify all primary evidence while pre-existing systematic reviews were also critiqued
- Separate work streams have sought to understand patient perspectives and map the availability of educational resources for both patients and staff
- Through facilitated discussion and review of the literature **79 draft clinical practice statements have been produced.**

Next steps

- National consensus building initiative (June 2023)** – feedback from practitioners in all relevant fields on which statements should be included
- Research ethics approval for this is currently in progress
- Next phase of work will be conducted with **THIS institute (The Healthcare Improvement Studies Institute)**
- Delphi results will inform a **face-to-face consensus meeting of our steering committee in Autumn 2023**

Future work

- Implementation and 'What does good look like?'
- Health economic considerations

Conclusion

- Multidisciplinary guideline development continues**
- Draft statements ready for wider feedback to finalise guideline contents**
- National Delphi will launch in the next 1-2 months → all clinicians caring for cSDH eligible to take part**



Scan for details on our upcoming Delphi!

Acknowledgements

Work to date on the ICENI initiative has been supported by funding from the Addenbrooke's Charitable Trust (ACT) and the National Institute of Academic Anaesthesia (NIAA: Association of Anaesthetists/Anaesthesia - WKRO-2021-0014). DJS was previously funded by a Wellcome Trust clinician PhD fellowship. BMD is funded by an NIHR doctoral research fellowship

Questions?

Tweet your questions to me! Start your tweet with: @djramsaystubbs #NACCS2023 Poster.

Service Evaluation of Epidural Blood Patch Delivery for Non-postdural Puncture Headaches at a Tertiary Neurosurgical Centre



J.A.G. Purdell-Lewis* FRCA; K.M. Skidmore* MBBCh
* Anaesthetic Department, North Bristol NHS Trust



Introduction

Epidural Blood Patches (EBPs) are a treatment option for Non-postdural Puncture Headache (NPDPH) pathologies including spontaneous intracranial hypotension. ¹

The patient pathway for NPDPH EBPs is variable, possibly due to clinical presentation and awareness, but also due to hospital specialty availability. ²

This service evaluation reviews EBP delivery for NPDPH in a UK tertiary neurosurgical centre.

Methodology

All EBPs between 1st January 2022 and 28th February 2023 at North Bristol NHS Trust were reviewed.

Exclusion criteria were EBPs following implicated neuraxial procedures, e.g. spinals, epidurals or lumbar drains.

Retrospective data for patient pathway, consent, EBP specifics, and follow-up was then collated.

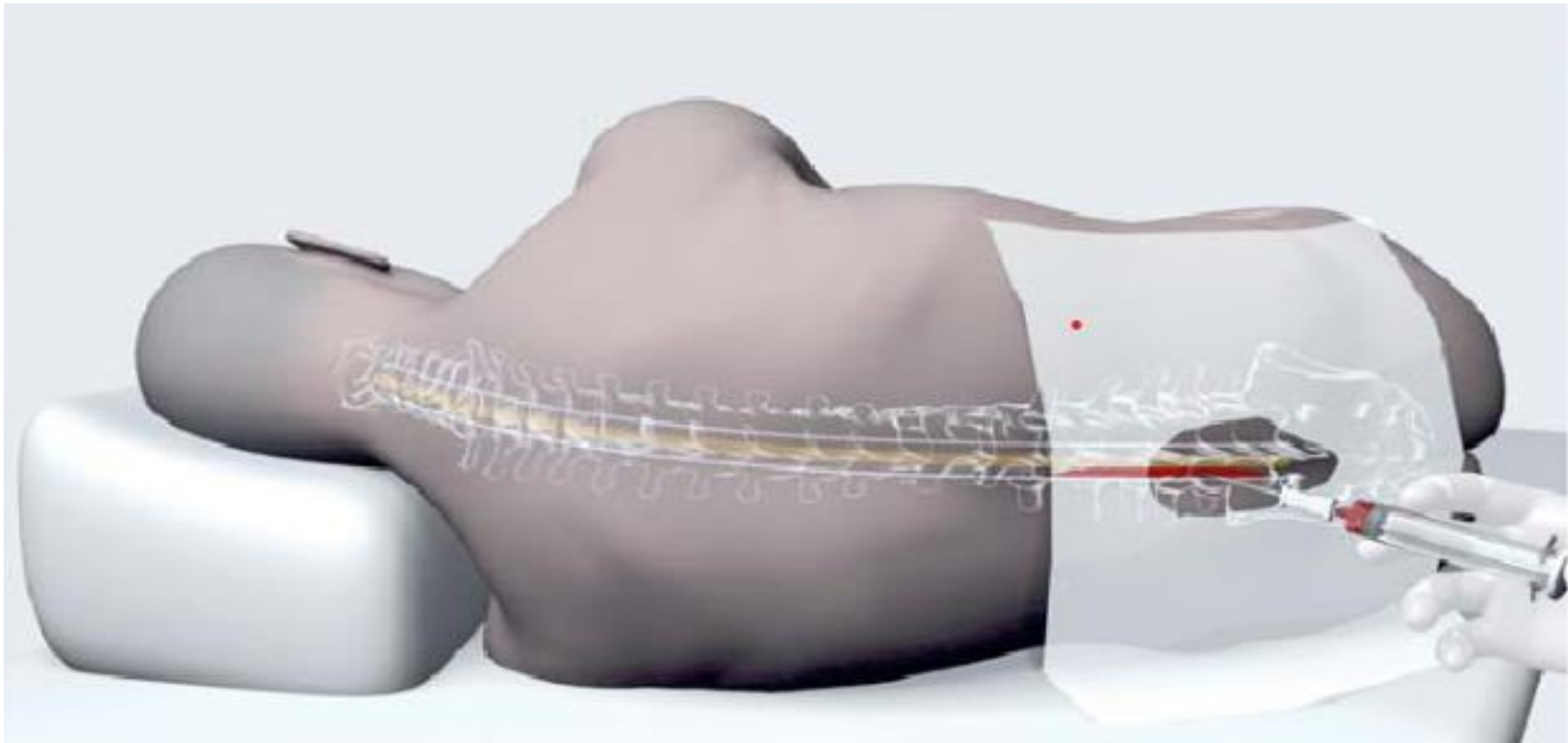


Figure 1: Epidural blood patch delivery in the lateral position ³

Results

Eighteen procedures met the inclusion criteria. One patient received 3 EBP treatments and two patients received 2 EBPs.

Figure 2 outlines diagnosis, parent specialty (PS), proceduralist (P), waiting time for EBP and length of hospital stay. Underlying diagnosis or parent specialty did not delineate proceduralist.

		Neurology	Neurosurgery	Neurology and neurosurgery
Number of cases		12	5	1
Diagnosis	Spontaneous intracranial hypotension	8	2	1
	CSF* leak implicated on MRI/myelogram imaging	3	3	0
	Reversible cerebral vasoconstriction syndrome	1	0	0
Proceduralist	General Anaesthetist	12	2	1
	Pain Anaesthetist	0	1 *	
	Neurosurgeon	0	2 *	
Wait for EBP from admission		1.4 days (0 to 4 days)	0 days (0 days)	
Mean length of hospital stay – days		5.6 days (0 to 10)	0.4 days (0 to 1 day)	12 days

Figure 2: Break down of underlying headache pathology, proceduralists base speciality and hospital length of stay

+ CSF = Cerebrospinal Fluid; ++ EBP = Epidural Blood Patch;
* X-ray used to identify appropriate level

Results Cont.

CONSENT

Documentation of the consent process was mixed. Seventeen cases had obtained written consent from proceduralist +/- the parent specialty. In the remaining case only the parent specialty (not the proceduralist) had gained formal written consent.

In 8 cases (dark blue bar in Figure 3), the parent specialty had not gained written consent for the procedure.

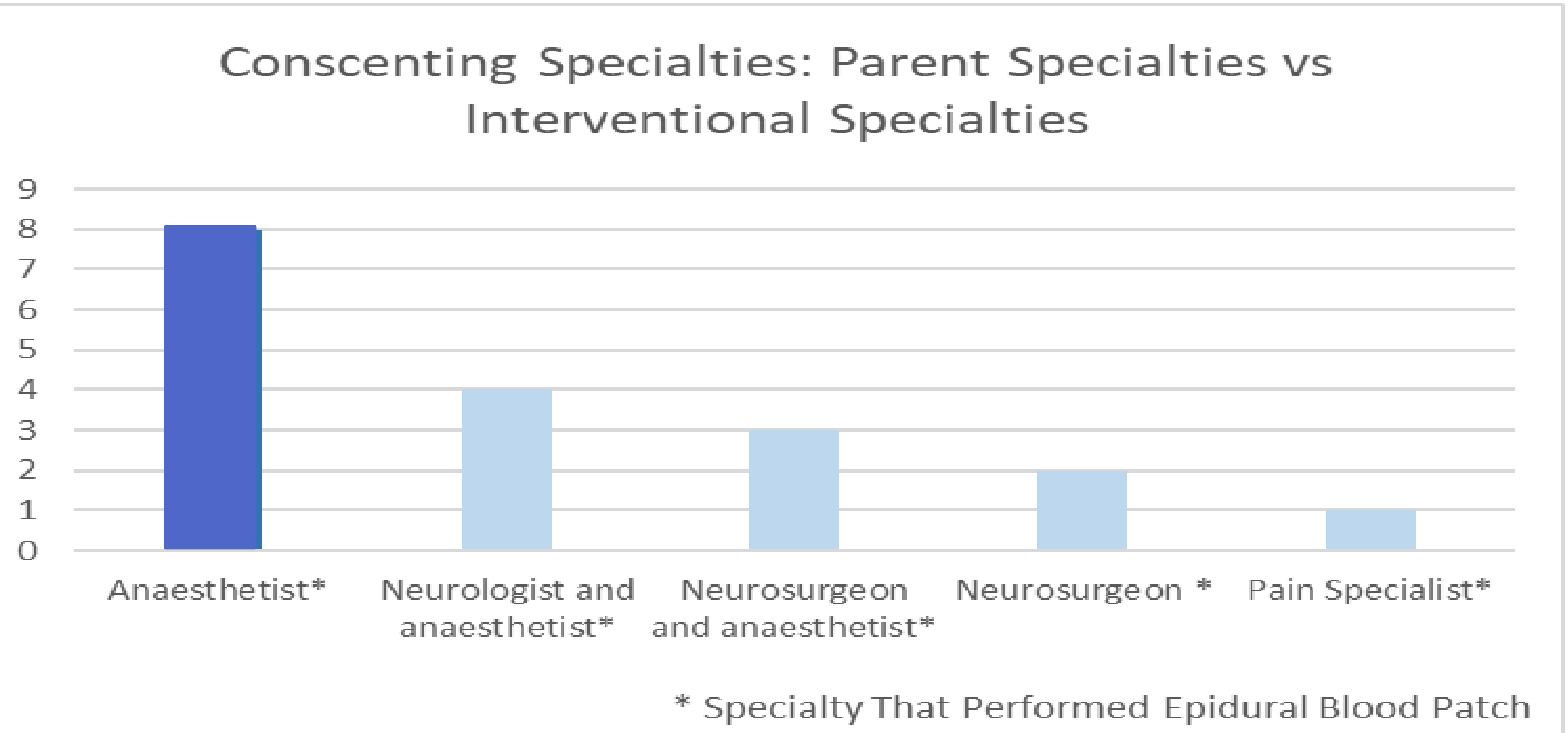


Figure 3: Written consent gained by the parent specialty and/or proceduralist.

BLOOD VOLUME AND VERTEBRAL LEVEL

Mean EBP blood volume was 21.7ml (6-40mls). The level of procedure ranged from T1/T2 to L3/L4. A discussion regarding optimal level or multiple level intervention for EBP was documented on two occasions:

- Targeted image guided T1/T2 intervention by the pain team = 6mls.
- Two level EBP by at T10/T11 & L2/L3 at the direction of neurology =total 31mls.

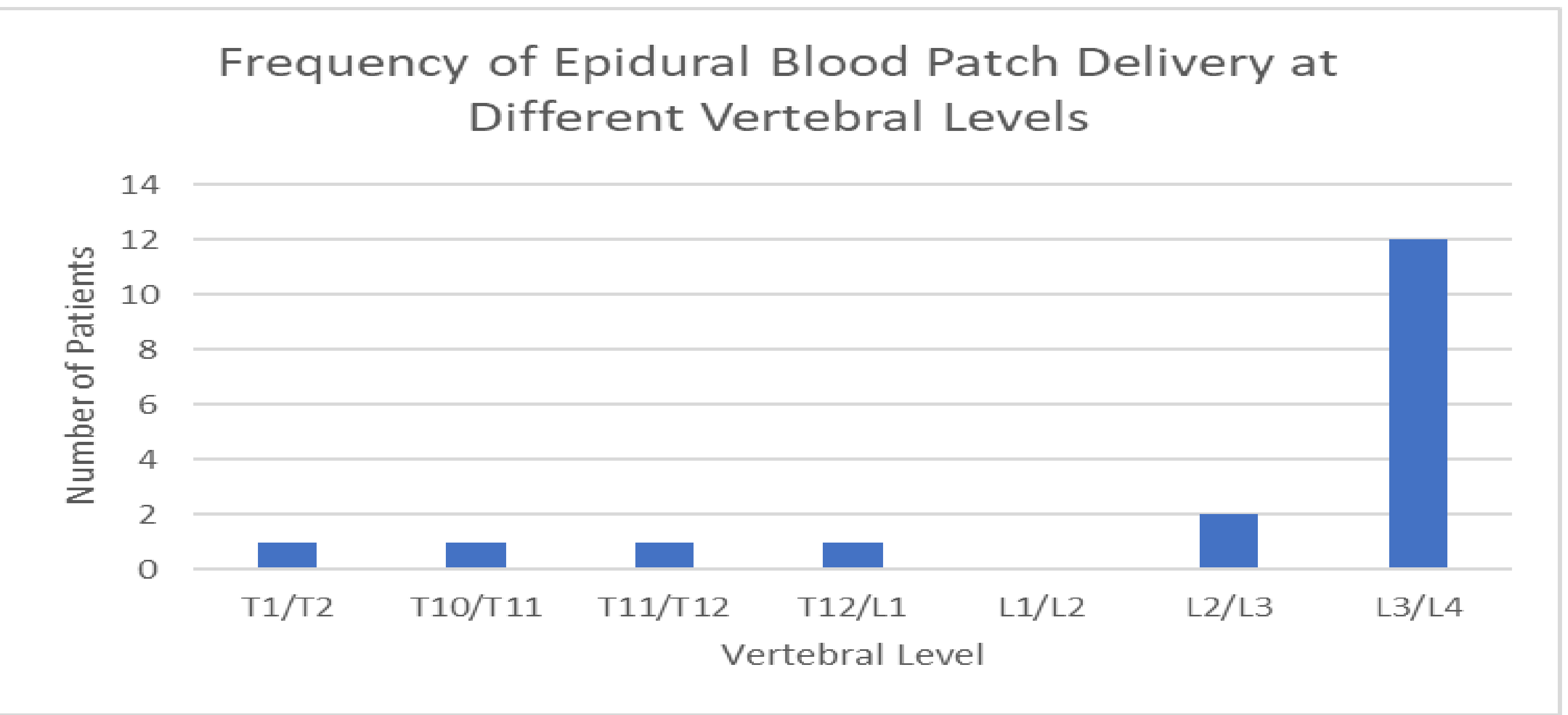


Figure 4: Vertebral level of blood volume administered

Of the 15 EBPs completed by an anaesthetist, only 1 case was formally followed up by the interventionalist. The remaining cases were followed up by the referring specialties.

Conclusion

In our institution EBPs for NPDPH is an infrequent intervention.

Pathway to EBP delivery was via neurosurgery or neurology, with diagnosis overlap between specialties. EBP timing and hospital stay differed starkly between specialties, possibly due to pathology and presentation, or due to patient flow.

Development of an EBP pathway would help standardise consent, EBP delivery and follow-up.

A national survey of delivery of EBPs at tertiary neurosurgical centres would help inform this.

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Questions?

Tweet your questions to me! Start your tweet with: @handle #NACCS2023 Poste
Send me your question via direct message on the meeting App: Jeremy Purdell-Lewis

Improving the peri-operative journey

for patients with chronic subdural haematoma at Oxford University Hospitals

K. Jerram, P. Garry

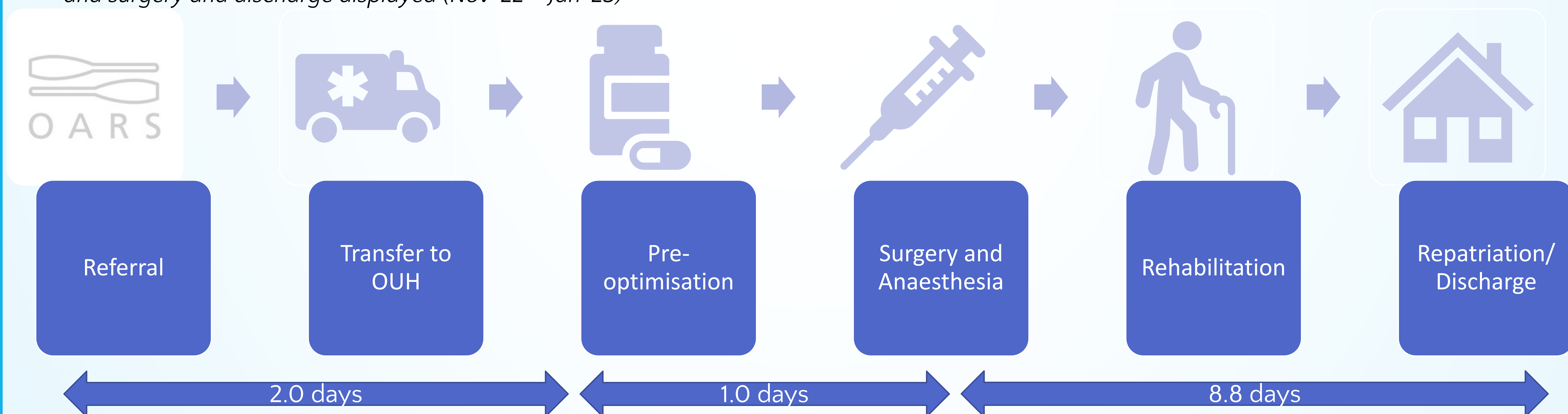
Nuffield Department of Anaesthesia, John Radcliffe Hospital

Introduction

Patients with Chronic Subdural Haematoma (SDH) requiring surgical drainage are known to have high levels of peri-operative morbidity.¹ Their peri-operative journey from referring hospital to discharge has many steps and requires co-ordination between a large multidisciplinary team (see Figure 1). There is a drive to optimise this, similar to parallel conditions, for example fractured neck of femur.² At Oxford University Hospitals (OUH) our Neurosurgical inpatient beds are shared between elective and emergency patients. Thus any improvement in the peri-operative journey for patients with chronic SDH should have an added benefit of improving elective operating capacity.

At OUH, we identified there were sometimes delays in operative management of patients with chronic SDH due to theatre capacity issues. We therefore introduced a thrice weekly daytime emergency operating list, with an aim to reduce waiting times and out of hours operating for this cohort of patients. We have evaluated the effect of this and also considered the wider peri-operative journey to find further targets for improvement.

Figure 1: The peri-operative journey of patients with chronic subdural haematoma requiring operative management at OUH. Mean duration between referral and arrival at OUH, arrival and surgery, and surgery and discharge displayed (Nov '22 – Jan '23)



Methodology

Patients undergoing a primary drainage of chronic SDH were found through interrogation of the electronic theatre management system. Two three-month periods were compared: January – March 2019 and November 2022 – January 2023. Patient notes were reviewed. The initial audit (2019) focused on delays to surgery once admitted to OUH. The reaudit (2022-23) covered this and evaluated the full peri-operative journey from referring hospital to discharge.

References

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Results

Patients were generally elderly and had comorbidities. Demographics were similar in the two groups (see Table 1). The wait for surgery was improved by 0.16 days following introduction of the daytime emergency lists. Furthermore the proportion of cases undertaken out of hours was reduced by 8%.

Wider evaluation of the patient journey in the more recent group showed it took a mean of 2.0 days for patient admission to OUH from the original source of referral (see figure 1). The mean post-operative stay prior to discharge or repatriation was 8.8 days.

Table 1: Patient demographics, plus waiting time for surgery and proportion of cases undertaken out of hours

	Jan – March '19	Nov '22 – 'Jan 23
Number of patients	36	33
Patient Age (Mean)	78.8	78.6
Patient ASA (Median)	3	3
Mean wait for surgery after arrival in OUH (days)	1.16	1.0
Proportion of cases undertaken out of hours	44.4%	36.4%

Conclusion

Our introduction of a thrice weekly daytime emergency operating list is associated with a reduction in the waiting time for chronic SDH drainage and the proportion of cases undertaken out of hours. Although the mean reduction in wait is modest, this improvement alone would provide 21 extra bed days over the course of a year. We plan to use this as evidence for further expansion of the daytime emergency list to 5 days a week, so that we have a dedicated 24/7 emergency theatre.

Analysis of the more recent patient cohort shows that the wait for surgery is a small component of the peri-operative journey and inpatient stay at OUH. We have started to collaborate with members of the multidisciplinary team to find further ways of improving the patient journey and concurrently improving elective operating capacity.

Questions?

Send me your question via direct message on the meeting App: **Keelan Jerram**

Changes in Cerebral Oxygenation During Anterior Cervical Discectomy and Fusion Surgery: An Observational Study Using Near-Infrared Spectroscopy.

Shankar Lal¹, Michael Moore²

Department of anaesthesiology, Beaumont Hospital, Dublin, Ireland.

1: Fellow Neuroanaesthesia and Neurocritical care medicine.

2: Associate Professor, Anaesthesiology.

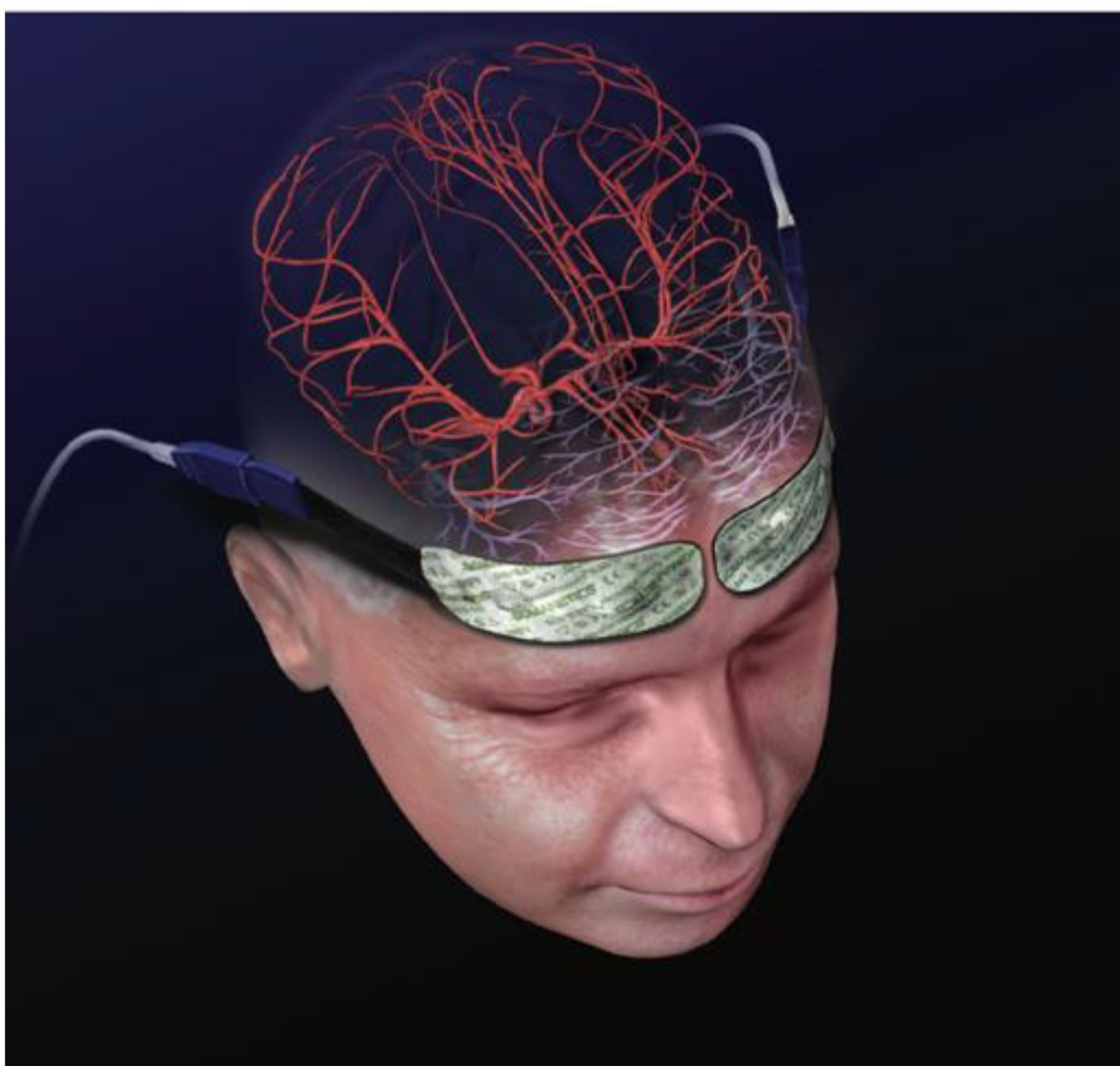
Introduction

Injuries to the carotid artery and subsequent strokes due to extended retraction are uncommon complications in anterior cervical discectomy and fusion (ACDF) procedures.

However, investigations have shown that retracting the carotid artery during cervical spine surgery can disrupt typical blood flow and can potentially increase the risk of stroke with increasing risk in patients with pre-existing atherosclerotic disease. We conducted an observational study to determine the effect of retractors on cerebral oxygenation using NIRS monitoring intraoperatively.

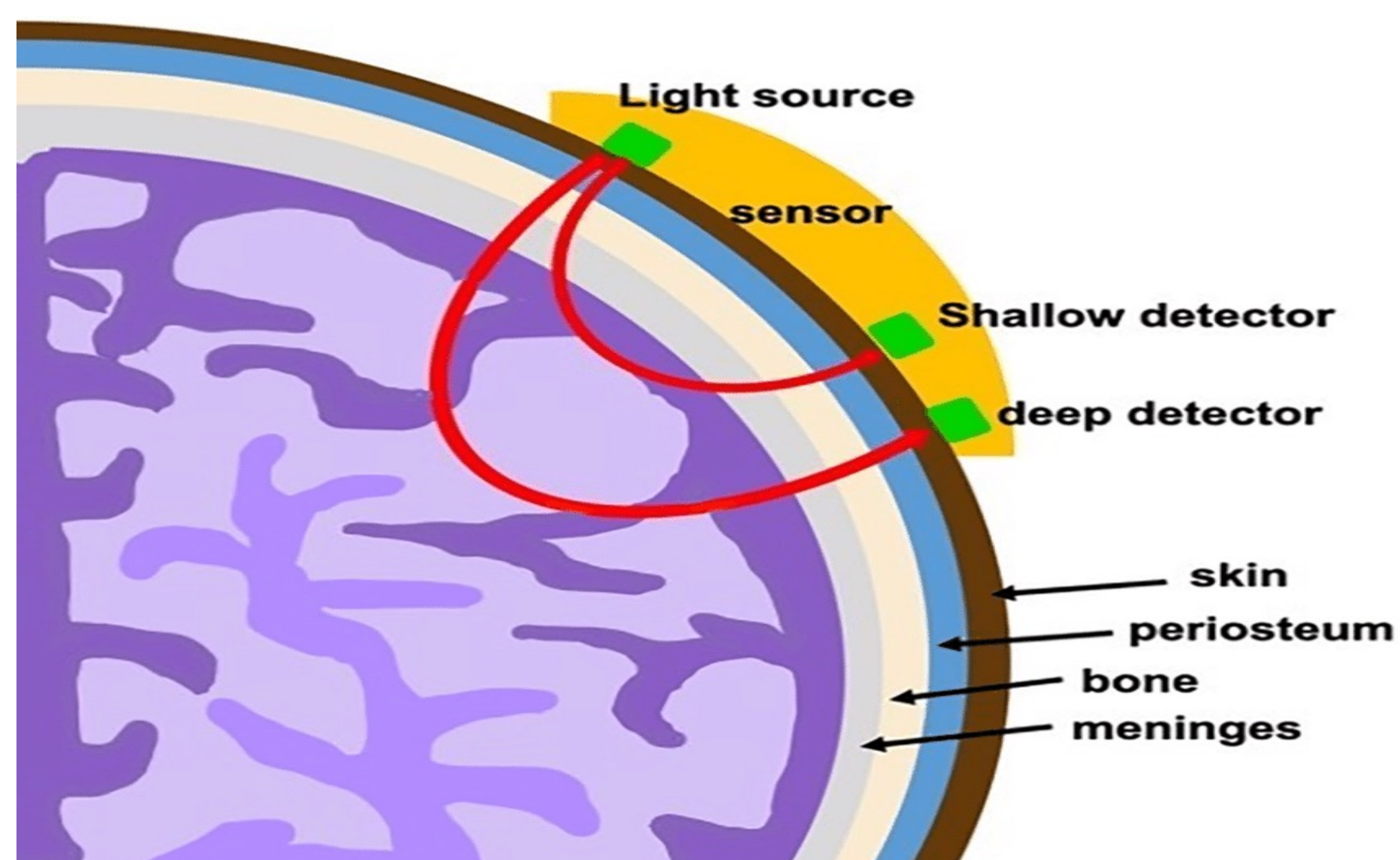
Methodology

We closely monitored cerebral oxygenation in 12 patients undergoing ACDF procedures. Data were collected before and after retractor placement at 5-minute intervals until extubation. Concurrently, vital signs and patient demographics, comorbidities, and postoperative recovery outcomes were recorded.



Results

The study encompassed a diverse patient group with a mean age of 47.3years (SD=16.0), half of whom were male. On average, the surgery lasted 105minutes (SD=51.1), with the retractor in place for 64 minutes (SD=29.9). Blood loss was minimal, averaging 42.0ml (SD=7.2), and patients received an average of 1,513mL (SD=428.1) of crystalloid. The total dose of vasopressors (phenylephrine infusion) was 11.58mg (SD=3.7). Cerebral oxygenation levels did not exhibit a statistically significant reduction following retractor placement; however, due to the limited number of patients, the statistical relevance of these observations could not be definitively established.



Conclusion

NIRS has been used during coronary artery bypass surgery, carotid artery surgery and bench position shoulder surgery. Due to the potential risk of carotid artery compression, we applied NIRS monitoring to detect possible decrease in cerebral oxygenation.

Our study did not detect any changes in NIRS CMRO₂ during ACDF surgery; we recommend further randomized study on this subject.

Questions?

Send me your question via direct message on the meeting App: Shankar Lal



Is there a role for Patient Controlled Analgesia following Cervical Laminectomy?

A before-and-after practice change audit

C.T. Eyeington FRCA, A. Deshmukh FRCA, A. Prakash FRCA, J. Francis FRCS, C. Cammarano MD
Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

Introduction

Cervical laminectomy is associated with postoperative pain that can limit mobilisation and prolong hospital length of stay (HLoS). Patient Controlled Analgesia (PCA) is commonly used postoperatively. However, an initial audit that suggested PCAs were associated with a longer HLoS. Therefore, we introduced a multidisciplinary pain management protocol and performed a re-audit.

Methodology

Following local ethical approval, we performed a before-and-after practice change audit of pain and mobilisation in cervical laminectomy patients. We assessed pain scores using the visual analogue scale, 0-10, in the Post Anaesthesia Care Unit (PACU) and on Day 1 (D1). We recorded intra-operative analgesia adjuncts and postoperative HLoS, time to mobilisation and regular post-operative analgesia delivered.

Results

There were more PCAs prescribed in the before group, 21% v 7% and there was a between-group difference in pain scores in PACU and D1, median 4 v 6 and 4 v 6, respectively, though these did not reach statistical significance.

Fewer patients in the before group received intra-operative Ketamine, Clonidine and Lidocaine, 0 v 21%, 7 v 29% and 43 v 64%, respectively, though this did not reach statistical significance. There was a suggestion that fewer patients in the after group received supplemental regular analgesia in addition to paracetamol, 64 v 93%.

The median time to mobilisation and hospital length of stay were 1 v 2 days and 5 v 7 days, respectively. However, neither approached statistical significance.

Conclusion

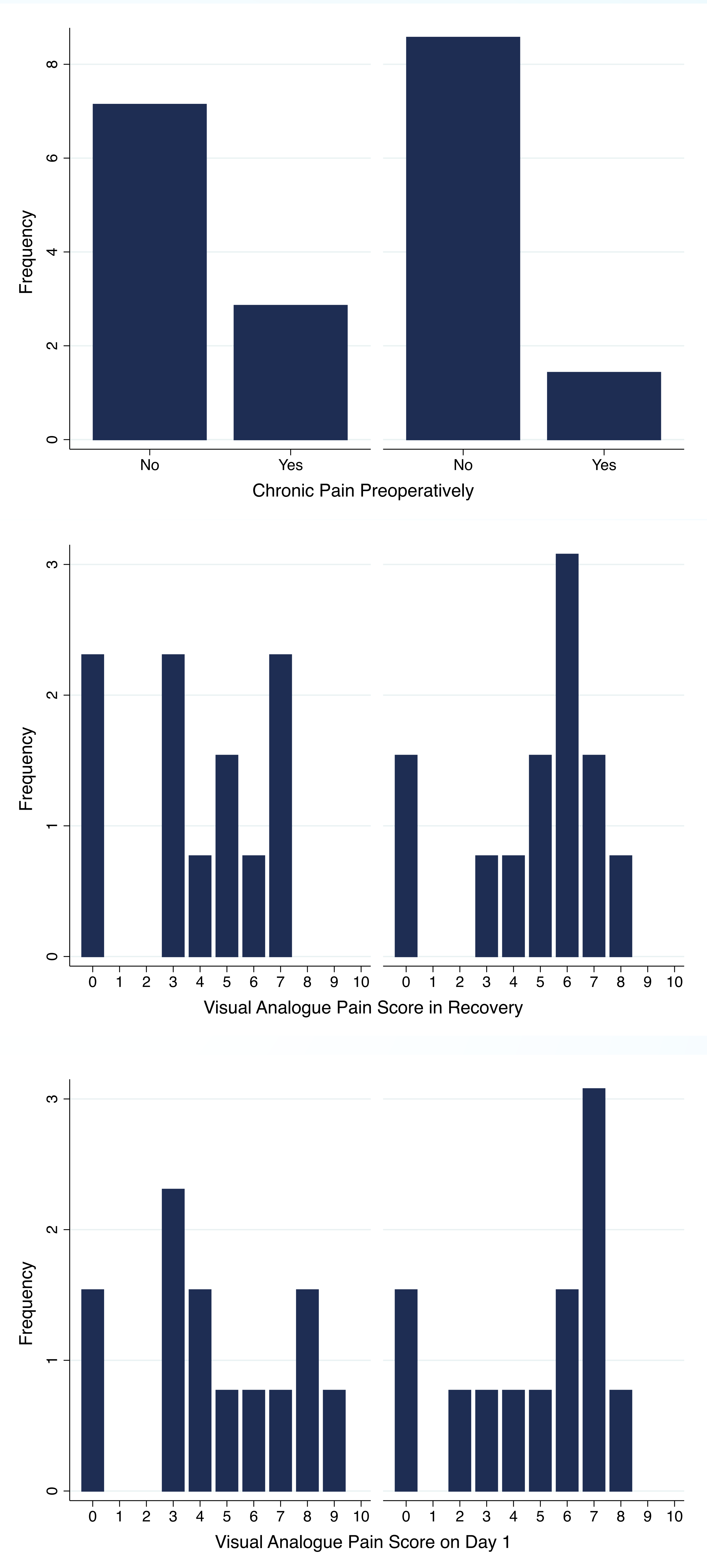
In the 3 months following a new pain management protocol for cervical laminectomy, there was a suggestion that fewer PCAs were prescribed. This was not associated with increased pain in PACU or on D1, or a longer HLoS. Moreover, there was no difference in intra-operative and post-operative analgesia management that would mitigate for the lack of a PCA.

This suggests that post-operative pain management without a PCA was not detrimental.

Questions?

Before

After



Variable, median(IQR) / n, %	Before	After
New, regular analgesics -excluding paracetamol	3, 21%	6, 43%
Patient Controlled Analgesia (PCA)	3, 21%	1, 7%
Morphine Sulphate Tablets	0, 0%	1, 7%
Parecoxib	0, 0%	1, 7%
Codeine	0, 0%	2, 14%
Ibuprofen	0, 0%	1, 7%
End surgery to walking, days	1 (1 - 2)	2 (1 - 6)
Inpatient stay duration, days	5 (2 - 8)	7 (3 - 26)

HIGH RISK PATIENTS FOR MECHANICAL THROMBECTOMY: WHO DO WE TURN AWAY?

Dr Matthew Heron MBBS BSc MSc FRCA, Dr Thom O'Dell BMedSci BMBS MRCP FRCA, Dr Liquan Zhang MD PhD, Dr Rebecca Campbell MBBS BSc PGCHBE FRCA. St George's Hospital, London.

INTRODUCTION

The stroke association estimates that in the UK 100,000 people per year will suffer from a stroke, and 1.3million people in the UK are living with the consequences of stroke (1). Stroke continues to represent a significant cause of morbidity and mortality nationally.

The introduction of Mechanical Thrombectomy (MT) represents a huge leap forward in the management of acute ischaemic stroke. Commissioning of MT services in the NHS recognised the transformative power of MT to reduce post-stroke morbidity and mortality. Initial evidence for MT in large artery occlusion (LAO) ischaemic stroke performed within six hours of symptom onset has been bolstered by additional evidence of safety and efficacy in some later presentations and in occlusive ischaemic strokes of the posterior cerebral circulation.

Patients presenting for MT can be of advanced age, with multiple co-morbidities. They present without medical optimisation for remote-site general anaesthesia (GA), and by nature of their acute presentation place particular challenges on the anaesthetist. Since the rollout of MT services at St George's Hospital in London, anaesthetic management has trended away from local anaesthesia (LA) with or without sedation, to a majority of cases being performed under general anaesthesia (GA).

Occasionally, patients are deemed inappropriate to proceed under GA. In such cases, it would be appropriate to consider proceeding to MT under local anaesthesia. We undertook a local review of cancelled cases to determine why these cases did not proceed under LA, and establish themes in peri-procedural risk in MT.

METHODOLOGY

Based on local stroke audit data, we identified every patient who was accepted for Mechanical Thrombectomy, but who was subsequently cancelled.

A retrospective review of electronic patient records for all identified patients between June 2016 to July 2022 was undertaken.

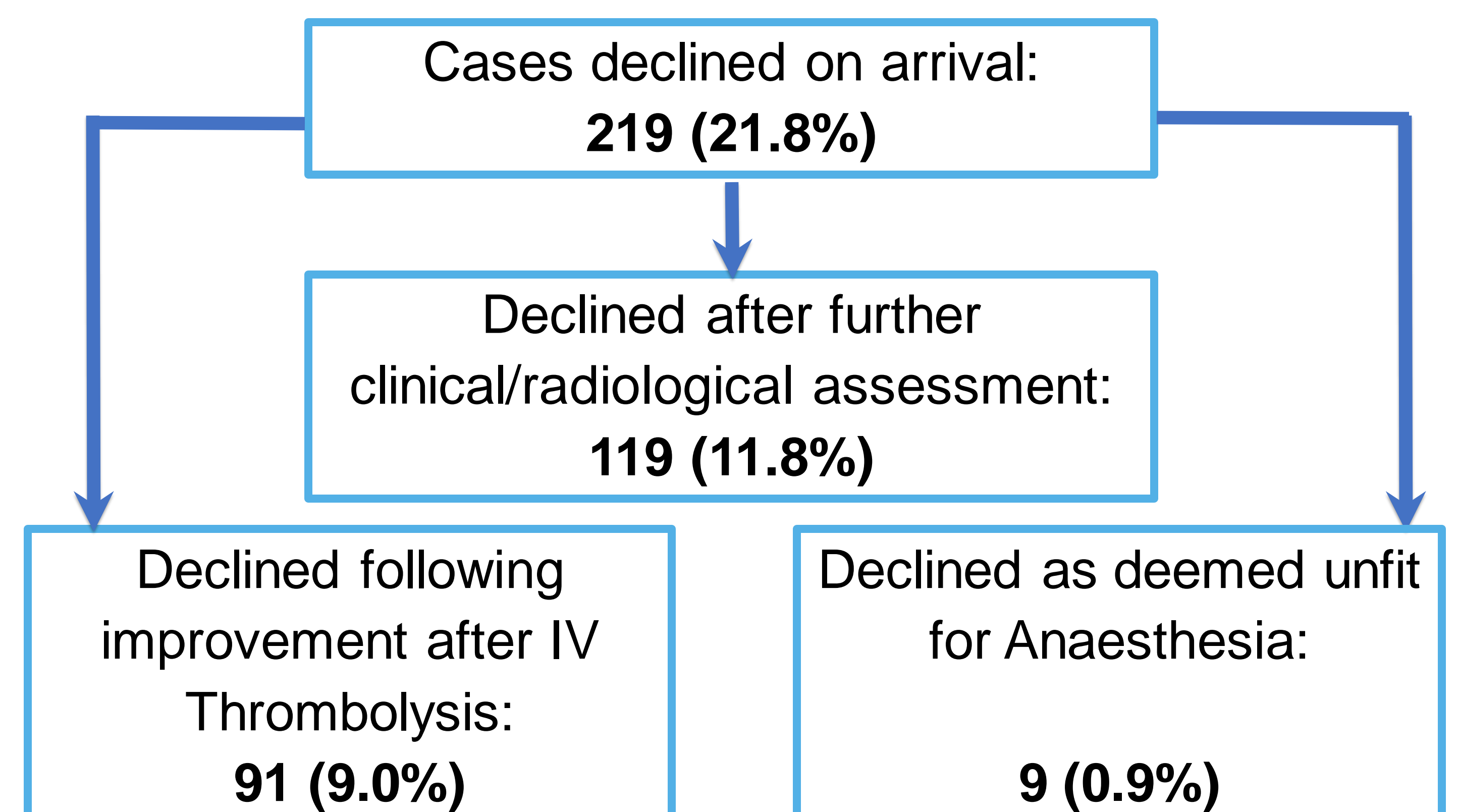
We looked for the reason for cancellation, and for all those cancelled for anaesthesia-related reasons we looked for the reason for cancellation and whether there was any documentation by the anaesthetist in the patient record justifying their decision.

RESULTS

During the study period, 1006 patients were accepted for MT, of which 219 (21.8%) cases were declined for MT on arrival after further assessment.

(1) King's College London, SSNAP, 2020-2021 data.
Available: <https://www.strokeaudit.org/>

RESULTS



Of the 9 patients identified as unfit for general anaesthesia, each had a documented discussion of clinical reasoning, though there were only 2 cases where there was a direct entry by an anaesthetist.

REASON FOR CANCELLATION	
ISCHAEMIC ECG	1 PATIENT
ACUTE HEART FAILURE	4 PATIENTS
SEVERE VALVULAR DISEASE	2 PATIENTS
ACUTE RESPIRATORY FAILURE	1 PATIENT

One additional patient had a history of a recent rapid decline in health, with multiple co-existing acute pathologies in whom it was felt inappropriate to proceed.

Only one patient proceeded to MT under local anaesthesia, though the procedure was abandoned due to coughing and movement on lying flat.

DISCUSSION

The majority of patients referred for MT proceeded as planned. There were surprisingly few cancellations by an anaesthetist. In each case, the rationale was clear. 7 of the 9 patients declined for GA presented with acute cardiac pathologies, with both clinical and radiological evidence in most cases. It is worth considering whether there are any modifiable factors in these cases. Our feeling was that there was not likely sufficient time in most cases, however prompt assessment and treatment at referring sites may allow some cases with extended MT windows to proceed.

Thrombectomy networks hold the potential for creating processes to identify patients who may be able to receive medical interventions which would render them able to proceed to MT. This small study demonstrates that those cases which cannot proceed under GA may be impractical under LA. It highlights the importance of multi-disciplinary collaboration both within hospitals and across regional stroke networks to ensure MT can be offered to as many eligible patients as possible.

QUESTIONS?

Tweet your questions to me! Start your tweet with:
@mattyheron #NACCS2023 Poster

A Service Evaluation of Anaesthetic Strategy for Stroke Thrombectomy in a UK Regional Stroke Thrombectomy Referral Centre

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A. Goswami FRCA*, A. Mortimer PhD***

* Anaesthetic Department, North Bristol NHS Trust, ** Cardiology Department, North Bristol NHS Trust
*** Radiology Department, North Bristol NHS Trust



Introduction

Stroke is the second most common cause of death globally. ¹ Endovascular thrombectomy (ET) for embolic stroke improves 90-day functional outcome. ²

General anaesthesia (GA) has historically been implicated in mixed ET outcomes. However, the General Anaesthesia vs Sedation for Stroke (GASS) study has further supported the role of GA in successful revascularisation and functional outcome. ³

This service evaluation reviews the anaesthetic strategies used in a UK regional stroke ET centre.

Methodology

The Sentinel Stroke National Audit Programme (SSNAP) was used to identify patients presenting to North Bristol Trust (NBT) with a confirmed stroke.

Inclusion criteria was attempted stroke thrombectomy under GA. Data points were collected retrospectively for cases between 1st January 2021–December 31st 2021.

These included: patient flow, anaesthetic strategy, haemodynamic changes and interventional outcome.

Results

In total 158 patients met the inclusion criteria. Cases were excluded due to lack of documentation (6) or use of sedation (3). Mean age was 65.8 years (range 19 to 93). Twenty five per cent of patients were under 55 years old.

Thirty-nine patients (24%) presented directly to NBT, one hundred and eighteen cases (76%) were referred to NBT. Ninety one cases (58%) received thrombolysis, sixty seven cases (42%) did not.

Mean procedure duration was 121 minutes (range 45 mins to 320 minutes).

ANAESTHESIC TECHNIQUE
Anaesthesia was either volatile (94; 59%) or total intravenous anaesthesia (TIVA) (64; 41%). [Figure 1]

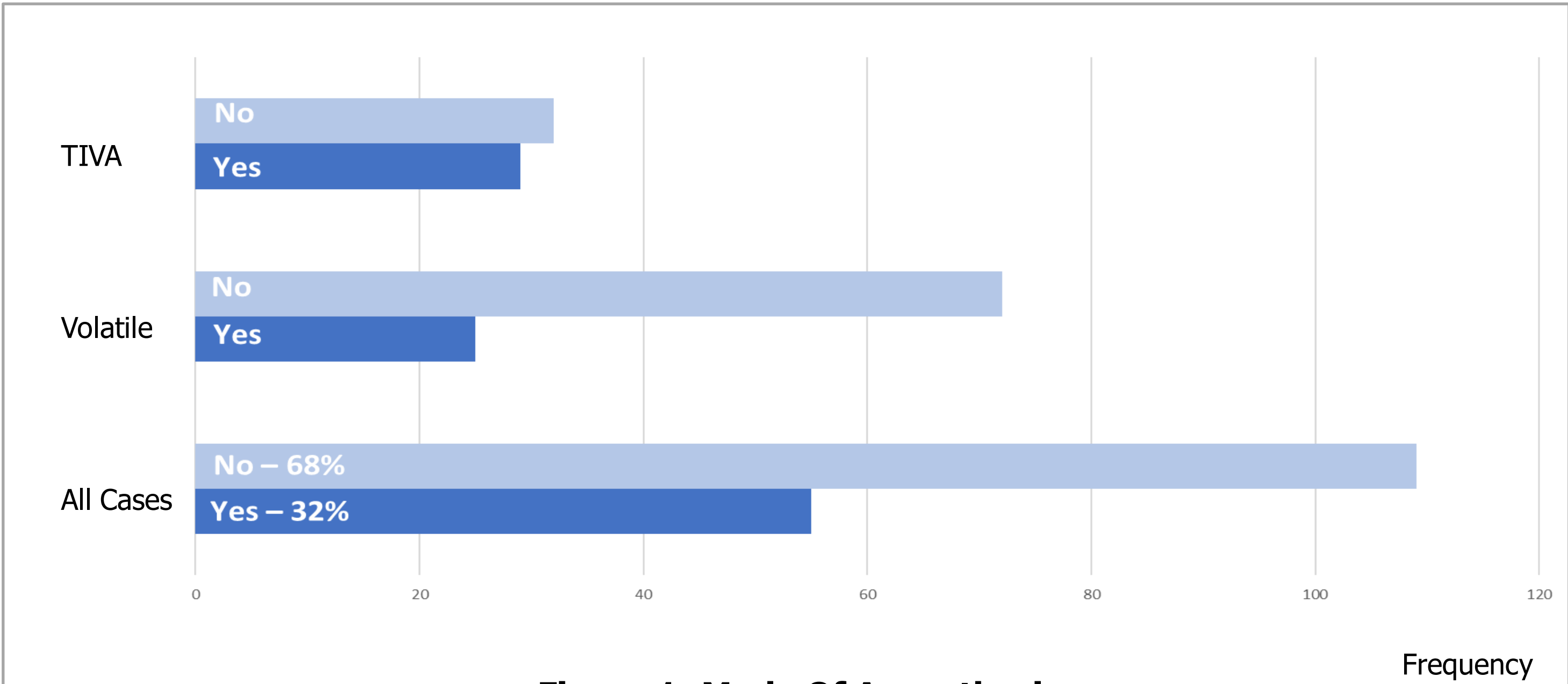


Figure 1: Mode Of Anaesthesia

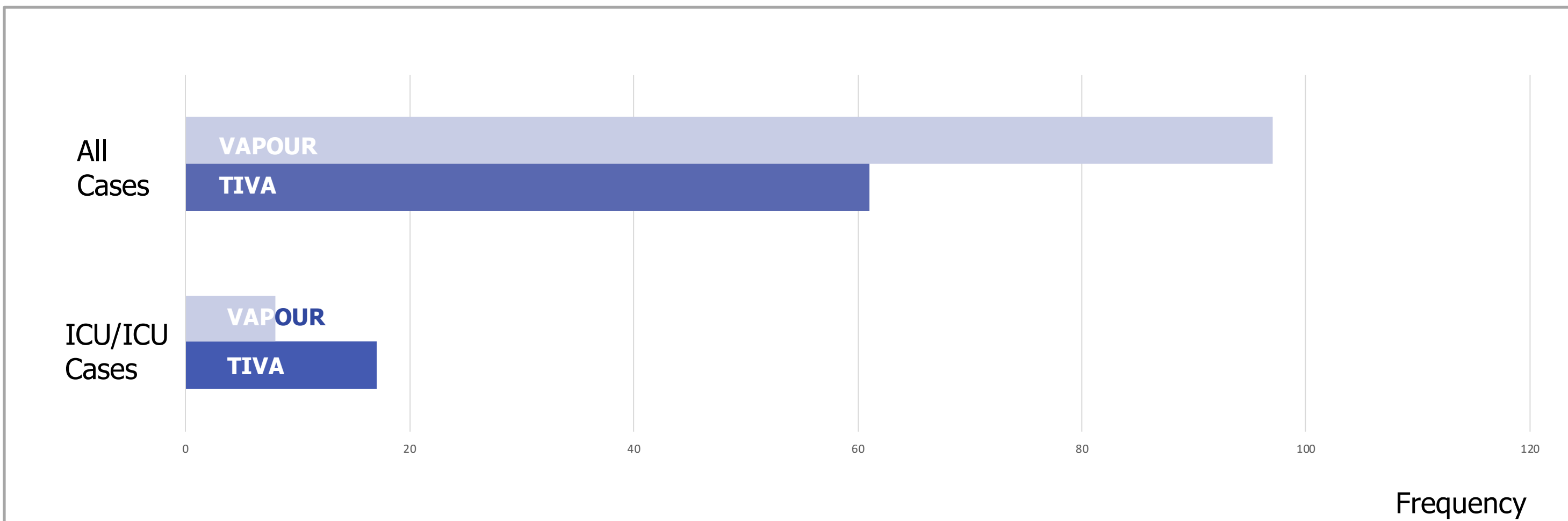


Figure 2: Depth Of Anaesthesia Monitoring

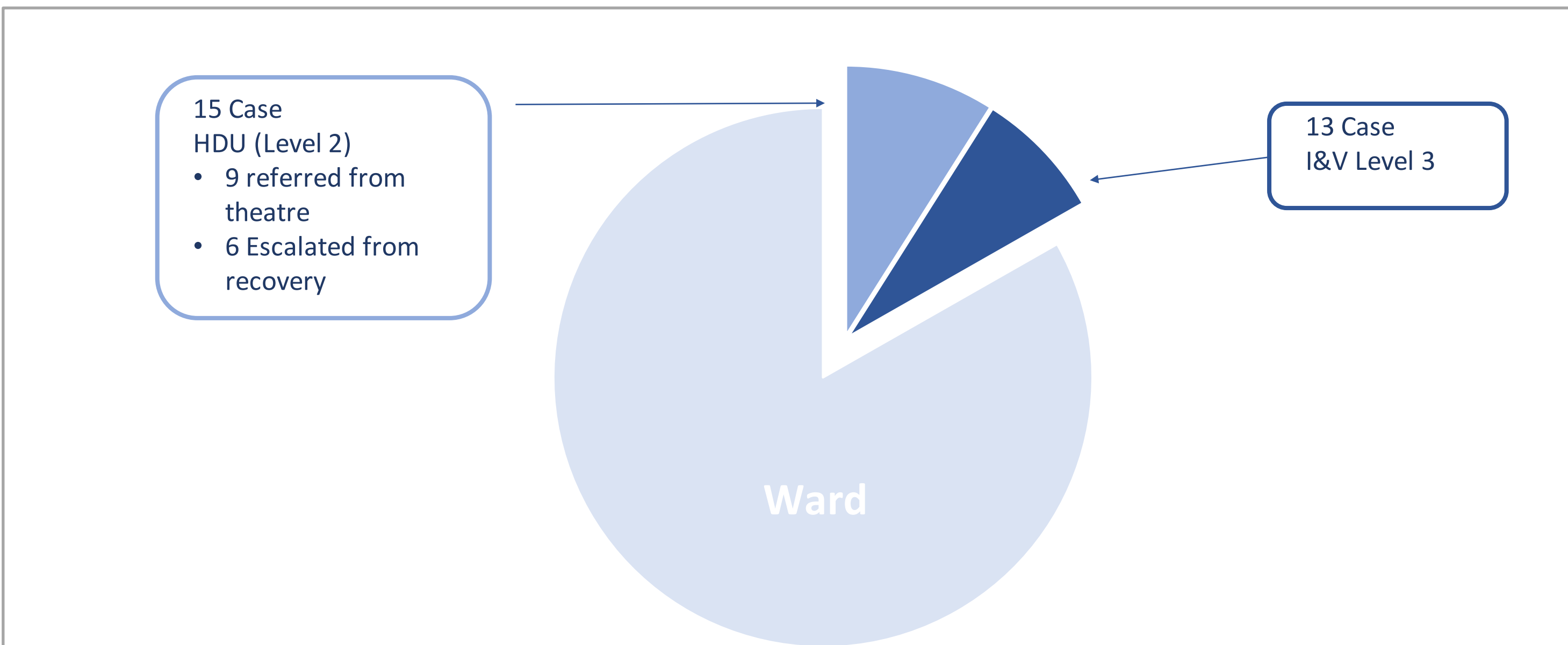


Figure 3: Post procedure level of care

Results Cont.

Depth of anaesthesia (DOA) monitoring was used in 35% of cases. A higher proportion of TIVA anaesthesia used DOA (29 patients; 47%) vs volatile (25 patients; 26%). [Figure 2] Maximum mean arterial pressure (MAP) reduction from baseline MAP was the same in both the volatile and TIVA groups (22mmHg; 23%).

POST PROCEDURE
Post procedure one hundred and thirty two cases received level 1 care, fifteen received level 2 care and thirteen level 3 care.

Only thirty-six (23% of patients were followed up with a Modified Rankin Score at 90 or 180 days.

Post Procedure Metric	
Mean NIHSS + Score at presentation (range)	18.1 (5 to 37)
Mean NIHSS + Score change at 24 hours (range)	-4.5 (- 24 to + 16)
TICI Score ≤ 2a ++ (Percentage)	18 (11%)
TICI Score ≥ 2b ++ (Percentage)	140 (89%)
Follow-up Modified Rankin Score Follow-up: Favourable = 0 to 2 * (Percentage)	8 (22%)
Follow-up Modified Rankin Score Follow-up: Unfavourable = 3 to 5 * (Percentage)	28 (88%)

Figure 4: Break down of patient pathway, thrombolysis usage and post procedure outcome scores.

+ National Institute for Health Stroke Scale ++ Thrombolysis in Cerebral Infarction
* Only thirty-six (23% of patients were followed up with a Modified Rankin Score)

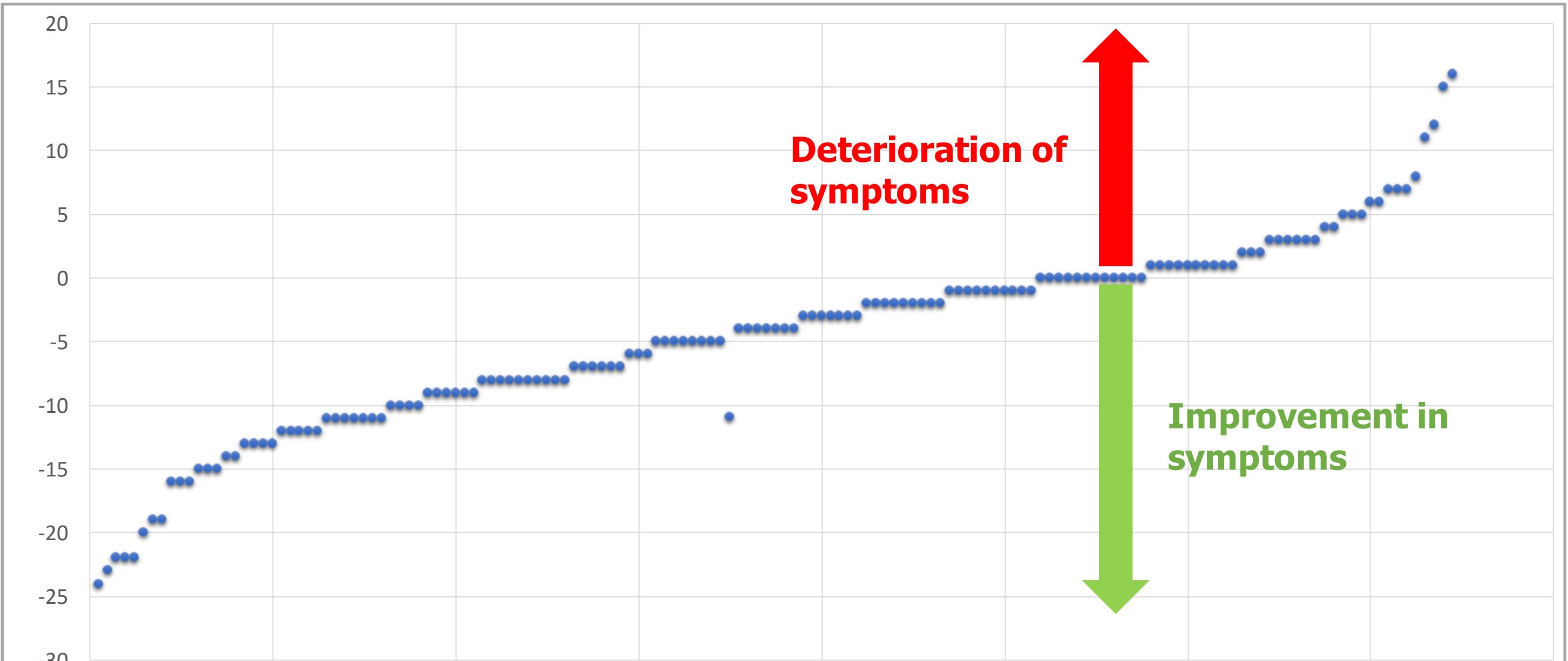


Figure 5: Change in National Institute for Health Stroke Scale (Presentation vs 24 hours post procedure)

Conclusion

In keeping with a growing body of evidence, GA was preferred in 98% of cases.

Volatile and TIVA strategies were used, demonstrating an equal drop in MAP.

DOA monitoring was used in 35% of cases. This has been fed-back to the department with the suggestion that it should be used in all cases to minimise the effects of burst suppression in already vulnerable brain parenchyma.

Functional outcome follow-up was only completed in 36 patients, limiting evaluation of service efficacy

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Questions?

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Send me your question via direct message on the meeting App: Jeremy Purdell-Lewis

A systematic review of outcome measures used in research on tracheal intubation after cervical spine injury



Dr Tyler Cunningham¹, Dr Matthew Wiles²

- 1. Foundation Year One Doctor, The Rotherham NHS Foundation Trust
- 2. Consultant Neuroanaesthetist, Sheffield Teaching Hospitals

Introduction

Tracheal intubation is often required after traumatic injury. In patients with a traumatic cervical spine injury, there have been concerns historically about the potential risk of worsening or indeed causing, spinal cord injury with potentially devastating neurological effects. However, few studies have directly assessed neurologically important endpoints in this population. Thus, the ideal initial tracheal intubation technique for patients with suspected or confirmed cervical spinal injury remains contentious.

A further problem with many published studies is the choice of primary outcome measure; these often do not directly relate to the risk of cervical spine movement in terms of the potential for cervical spinal cord impingement.

We, therefore, performed a systematic bibliometric review of airway management techniques in patients with actual or suspected cervical spine injury in order to assess the reported outcome measures studied.

Methodology

The study was registered with PROSPERO. We searched multiple on-line databases from inception until the date of search (December 31st, 2019) using the search terms “cervical/c-spine”, “intubation/endotracheal intubation/tracheal intubation” and “trauma/injury/instability/unstable”.

We focused on studies that were examining tracheal intubation (via the nasal or oral route) in adults with confirmed or suspected cervical spine injury or instability in order to identify the primary outcomes used in these studies.

We did not include studies involving paediatrics (patients aged < 18 years) or tracheostomy insertion.

Potentially eligible studies were identified by screening the title and abstract of all publications identified by the literature search. The full-text of these studies was then obtained for further evaluation. Screening and evaluation for inclusion in the review were done independently and separately performed by two authors. Any disagreements on inclusion were to be resolved by asking a third author for an opinion to gain a 2:1 majority decision.

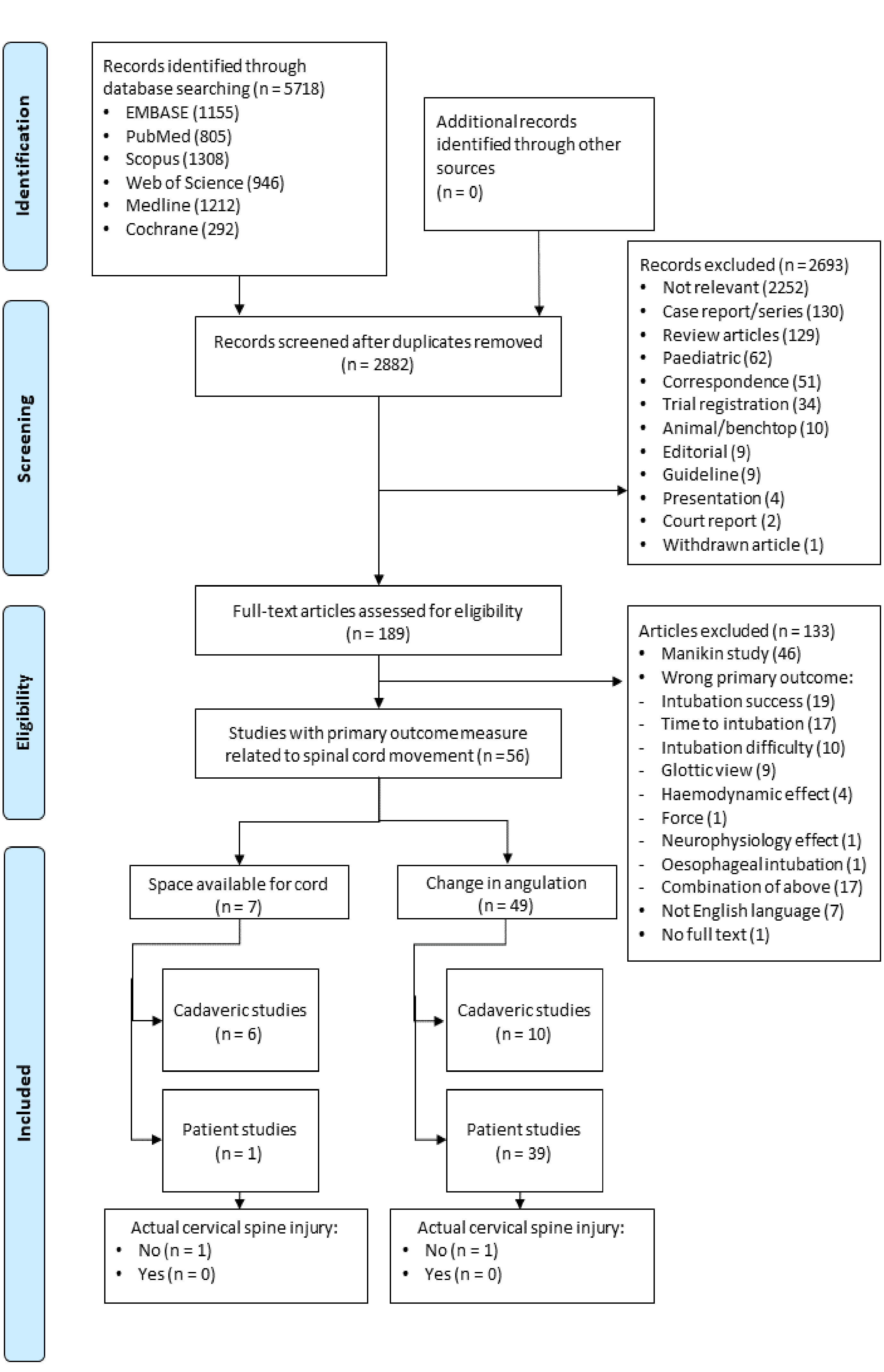
Any papers that were included had their primary outcomes extracted and those studies whose primary endpoint related to spinal cord movement were further assessed to determine whether these studies involved patients or cadavers and whether they had an actual cervical spine injury.

Results

Following the literature search and after removing duplicates, a total of 2,882 reports were screened. After screening abstracts and titles, 189 reports were subject to full-text screening (Fig. 1).

Mannikins were used in 46 (24%) studies and 58 (29%) studies used an outcome based on tracheal intubation metrics including intubation success rates, time to intubation or intubation difficulty score.

Only 56 (30%) studies had a primary outcome measure that was related to vertebral column movement: 49 studies examined changes in cervical spine angulation (involving 1636 patient and 72 cadaveric intubations); and 7 directly measured the effect of tracheal intubation on the spinal cord (involving 8 patient and 52 cadaveric intubations).



Conclusion

This study demonstrates that there is a paucity of evidence to guide the optimal technique for tracheal intubation in patients with actual or suspected cervical spine injury.

The majority of studies reviewed did not examine endpoints related to spinal cord movements with many studies focusing on endpoints such as time-to-intubation or glottic view. The authors would argue that these are not the neurologically-important endpoints that one should focus on in this patient population.

Despite screening 189 relevant studies we could identify only one study that had investigated directly the effect of tracheal intubation on the spinal cord in living subjects.

There is an urgent need for future research studies to focus on clinically important endpoints and to avoid the use of surrogates. We hope that our findings will help guide journal editors, researchers and funding groups in the future.

Questions?

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Send me your question via direct message on the meeting App: **Tyler Cunningham**



Morbidity and Mortality in Refractory Status Epilepticus Following Intensive Care Admission

Dr. Aaliya Jane Gilbert BMBCh BA & Dr. Mahad Ahmed Hagi MD,
Dr. Sivanthi Kanagasundaram MD, Dr. Chris Taylor BSc FRCP FRCA FFICM,
Dr. Ugan Reddy BSc MBChB FRCA FFICM

Neurocritical Care Unit, The National Hospital for Neurology & Neurosurgery (NHNN)
Queen Square



Introduction

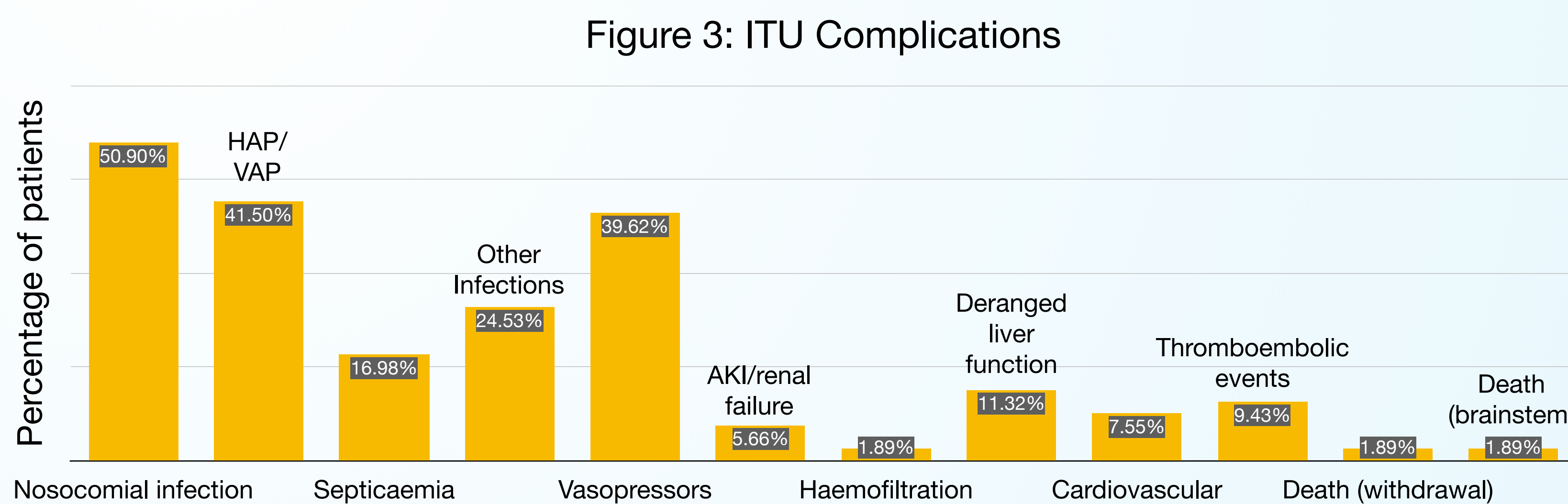
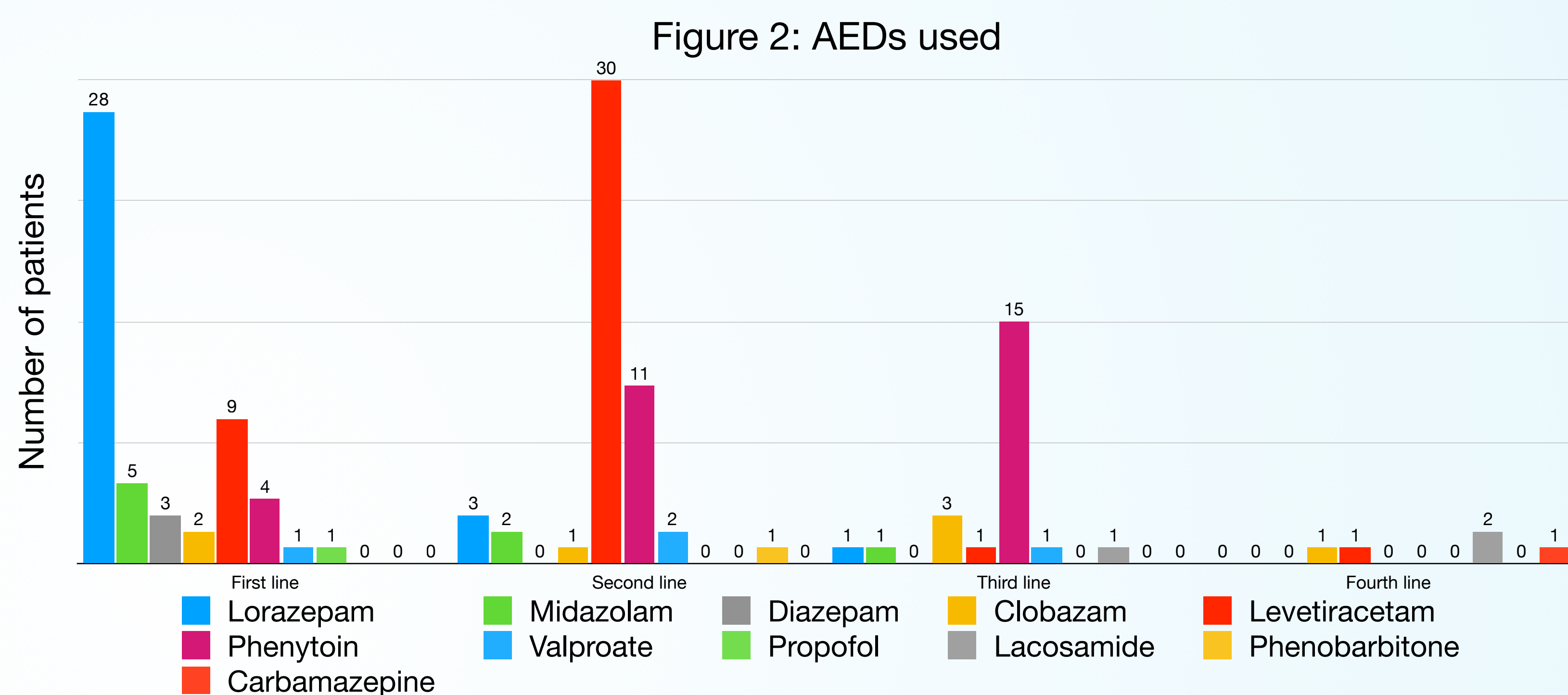
- ❖ Refractory status epilepticus (RSE) has been defined as status epilepticus (SE) that **does not respond to initial treatment** with 2 antiepileptic drugs (AEDs)¹, by a minimum seizure duration or SE requiring induction of **anaesthesia**².
- ❖ **Mortality** following RSE for patients admitted to the intensive care unit (ICU) is **high** in published data, ranging from **12-77%** in single series³, with mean mortality rate of **48%** reported in a meta-analysis between 1980 and 2001 of 193 patients³.
- ❖ The aim of this study was to to **benchmark ICU outcomes** at NHNN for RSE patients against nationally and internationally published standards of morbidity, mortality and long-term functional status and aid in delineation of salient **predictive** features of each.

Methodology

- ❖ A single centre **retrospective observational** study was conducted at the National Hospital for Neurology and Neurosurgery (NHNN).
- ❖ After approval from our clinical audit department, data was extracted from our electronic health record (**EPIC**) identifying patients who were admitted to the intensive care unit with a diagnosis of 'refractory status epilepticus' (RSE) during a **three year period** between the 8th April 2019 and the 6th January 2022.
- ❖ **70** patients were identified via our initial data extraction, however **17** patients did not meet our inclusion criteria/definition of RSE.
- ❖ Primary outcome measures were **mortality**, and **morbidity** as functional status measured using the Modified Rankin Score (MRS) as good (0-3 or at baseline) or poor (4-6).

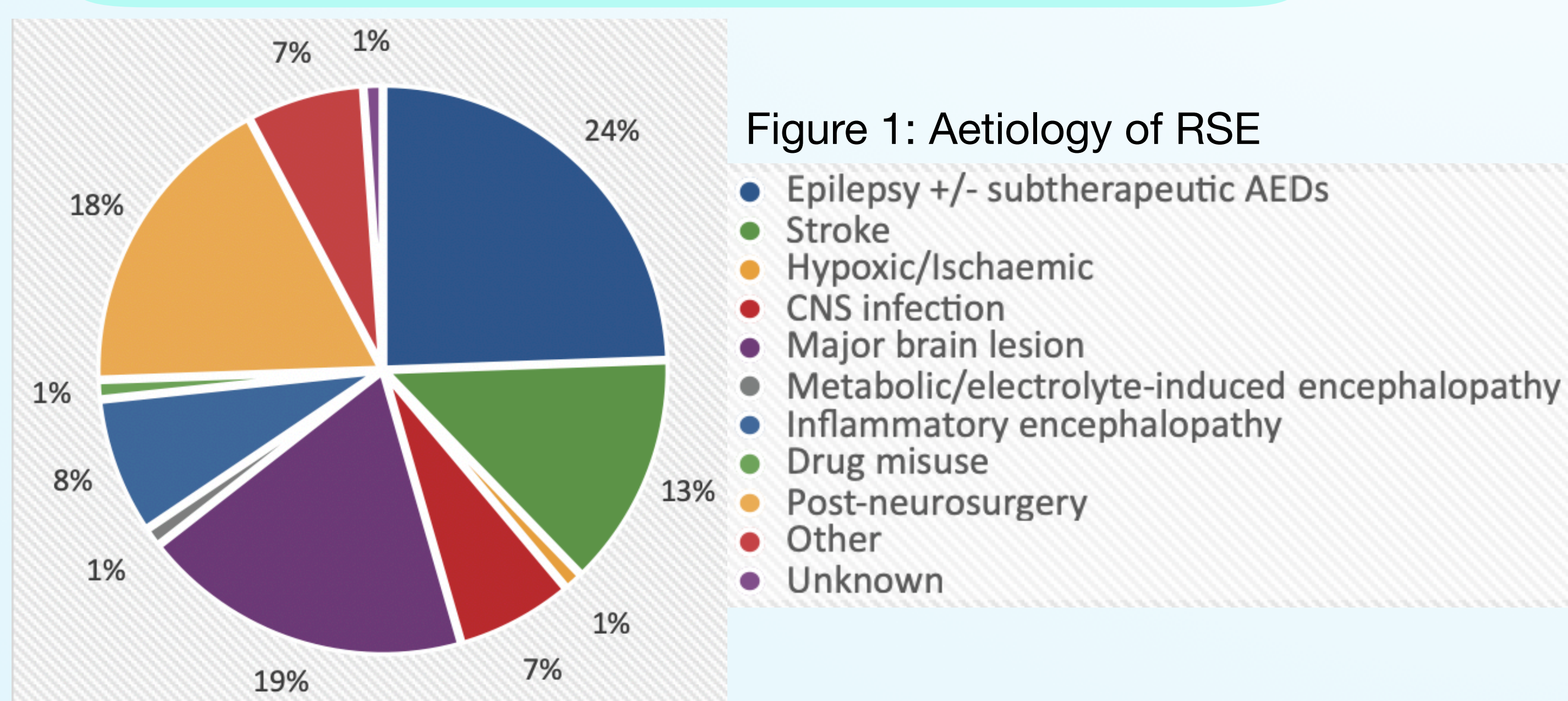
Results

- ❖ **53** episodes of RSE were included (see figure 1 for aetiology)
- ❖ Anaesthetic agents were used in **67.9%** of patients, with **66%** requiring invasive ventilation
- ❖ Mean duration of ICU length of stay was **16.3 days**
- ❖ The most commonly used first, second and third line AEDs were **lorazepam** (52.8%), **levetiracetam** (58.8%) and **phenytoin** (60%)
- ❖ Of patients who required general anaesthesia, the most frequently used sedative agent was **propofol** at 86.11%, followed by **midazolam** infusion at 75%
- ❖ Number of maintenance AEDs ranged from **1-10 (mean 2.96)**
- ❖ 30.19% of patients had evidence of seizure resolution or **burst suppression** on EEG
- ❖ **Mortality was 3.77% (n=2)**, which rose to **5.77%** in mechanically ventilated patients
- ❖ Good/baseline functional outcome at 3 months, 6 months and 1 year post-discharge occurred in **56%**, **57.1%** and **61.3%** of patients respectively
- ❖ Predictors of good and bad outcome were pre-existing **epilepsy** (p=0.003) and **stroke** (p<0.001) respectively
- ❖ Presence of a major **brain lesion** was associated with higher mortality (p=0.036).



Conclusion

- ❖ **Mortality (3.77%)** in patients treated for RSE in NHNN ICU was **substantially lower** than that in published data although poor functional outcome was similar (38.7% at 1 year). Observed lower mortality is **multifactorial**, however may be due to specialist centre management, MDT collaboration and high quality nursing care.
- ❖ **61.29%** of RSE patients had a **good or baseline functional status** at 1 year, demonstrating that despite the significant morbidity and mortality associated with RSE, patients may retain good function or regain baseline function.
- ❖ These data have **broader implications** for salient predictive features of morbidity and mortality, in addition to **effective treatment** strategies for RSE.



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Acknowledgements

- Department of Neurocritical Care, National Hospital for Neurology & Neurosurgery
- UCLH medical records
- Images courtesy of [freepik.com](https://www.freepik.com)

Questions

Send us your questions via direct message on the meeting App: **Aaliya Gilbert, Mahad Hagi, Chris Taylor, Ugan Reddy**

A new multidisciplinary, high fidelity neurosurgical theatre simulation course.



Dr. Shadi Pishbin
Neuro-anaesthesia Fellow

Dr. Sarah Muldoon
Consultant Neuro-anaesthetist

Ms. Nida Kalyal
Neurosurgical ST3



King's College Hospital

Introduction

Educational Need

King's Neurosurgery sits within a major trauma centre, providing a comprehensive tertiary neurosurgical service to a catchment of 4 million people across South East England.

Trainees in neuroanaesthesia rotate every three months, with neurosurgical trainees rotating every 1-3 years. Anaesthetic and scrub nursing teams have recently expanded due to increasing elective and emergency operating, with significant overseas recruitment.

A variety of critical clinical situations can arise in neurosurgical theatres, e.g. venous air embolus, difficult airway management, major haemorrhage, cardiac arrest in unfavourable patient positions. Team work and experience are vital to safe patient outcomes. This can be difficult to maintain with rotational staffing and the adhoc nature of emergencies.

Intervention

Successful neuroanaesthesia Sim courses run in the UK. Beginning with low fidelity in-situ sim in theatre, we launched an immersive, multidisciplinary (MDT) high fidelity sim course. We believe this is the first to fully replicate the intra-operative neurosurgical environment, and the first with equal MDT involvement in both the faculty development of the course and candidate participation.



Fig. 1 - Faculty

Methodology

A pilot course was carried out in October 2022. Faculty comprised neuroanaesthetic and neurosurgical consultants and registrars, and band 5 and 6 theatre and anaesthetic nurses. Two intra-operative scenarios were developed, with clinical and team-based learning objectives.

The venue was a mock operating room within King's College London's Surgical & Interventional Engineering Facility. UpSurgeOn® cranial surgical phantoms or the RealSpine® training system were attached to a Gaumard HAL® mannequin, allowing simulation of both surgical operating and patient physiological response.

Candidates were ST4-7 and Clinical Fellow anaesthetists, ST3-8 neurosurgeons and Band 5-7 nursing and ODP staff from King's neurosurgical theatres. The half-day session began with familiarisation with the Mock OR and psychological safety briefing. Two MDT groups took turns to participate then observe a scenario, with AV set-up allowing live streaming to a viewing room.

The Diamond Debrief model was used to facilitate MDT debrief of scenarios, covering the clinical and team-based objectives.

Feedback was gathered from faculty and candidates on the practicalities and educational outcomes of the course. Incorporating this feedback, a second full-day course with an additional scenario ran in February 2023.

Results

17 candidates attended the pilot course and 16 attended the second course in February.

100% of candidates on each course reported the day was useful and would impact their practice positively.

In response to "What was good about the course?", full multidisciplinary participation was the most frequently mentioned positive aspect. Anaesthetic candidates commented on the value of participating in scenarios alongside neurosurgical and nursing candidates.

As a result of participating in the course, both nursing and neurosurgical candidates commented that more simulation training would be beneficial to their professional development.

Candidate feedback and faculty observation suggested not all MDT groups contributed or were heard equally during debrief sessions. For the second course we altered seating arrangements during the debrief and more actively facilitated contributions to improve this, and introduced role-specific mentors that candidates could approach for further discussion. Feedback from the second course suggests this resolved the issue.

Well structured, lots of debrief time, good balance between exploring clinical learning and interdisciplinary working.

The MDT approach was fantastic - allowing insight into other professions agenda during emergencies.

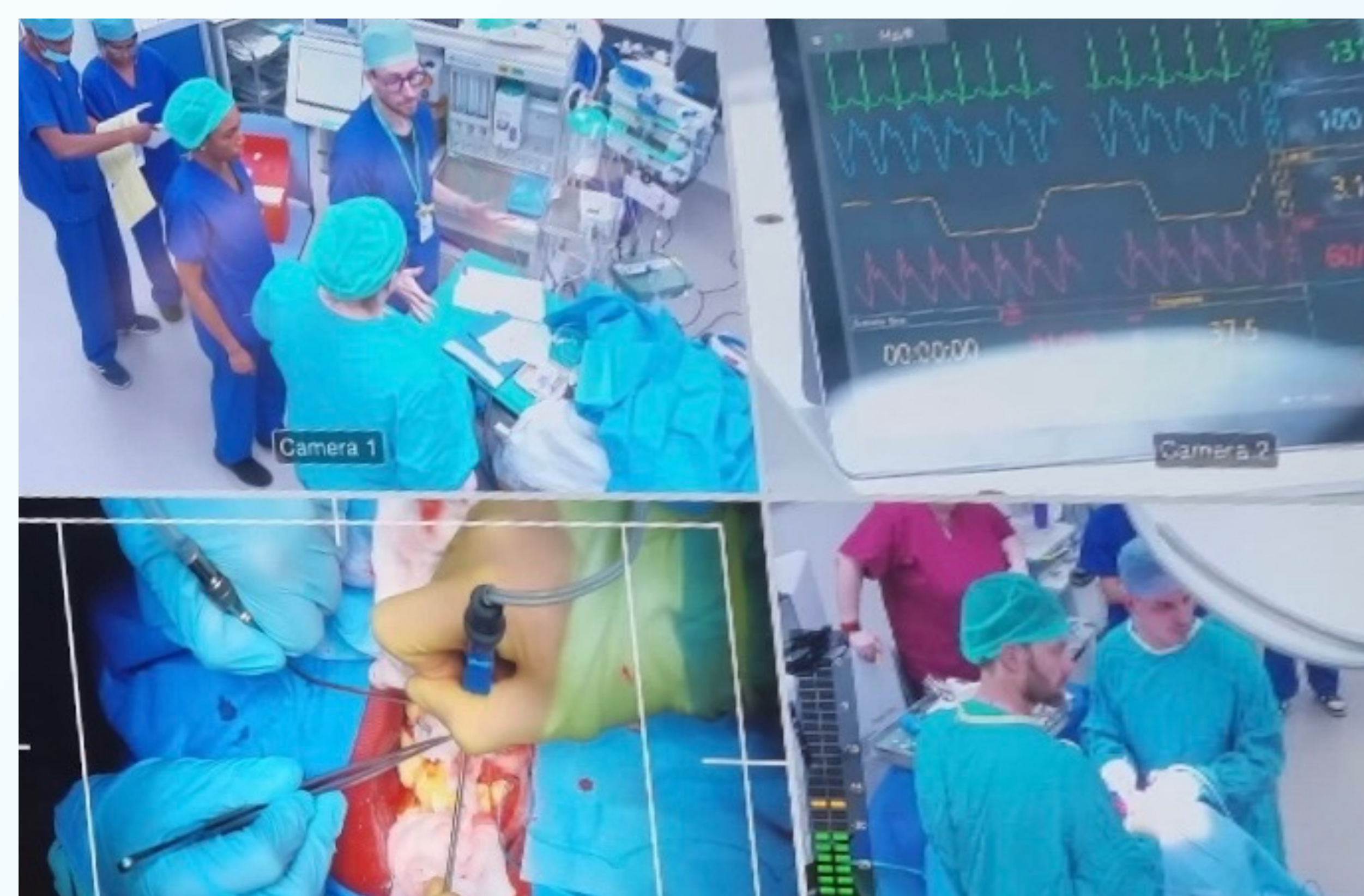


Fig. 2 - Footage from scenario, as broadcast to viewing room

Conclusion

We have established a fully immersive neurotheatre simulation course with equal input from and educational benefit for all MDT professionals. We have demonstrated that all groups, even those less familiar with Sim as a learning tool, found it beneficial to their clinical knowledge and team working.

Candidate and faculty feedback from the second course has been used to further develop existing and new scenarios and the debrief sessions. The course will continue to run three times a year, with a view to expanding over time to offer places to candidates regionally then nationally.

Acknowledgements

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Ms. Zenobia Kattah

Mr. Rhyan Dasalla
Mr. Aries Tiongson



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The impact of the Covid-19 pandemic on case numbers achieved by neuroanaesthetic trainees and fellows at a specialist quaternary neurosciences centre: a service evaluation project



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Introduction

The Covid-19 pandemic led to a dramatic reduction in neurosurgical activity in the UK, with one standalone neurosciences centre completing 65% fewer cases¹. Our own specialist neurosciences institution, the National Hospital for Neurology and Neurosurgery (NHNN), saw its neurocritical care unit be repurposed as a 'Covid-ICU'². The impact of reduced neurosurgical operating, and of redeployment of anaesthetic staff to critical care, on neuroanaesthetic training has not been formally investigated.

The aim of this study was to determine how the number of neuroanaesthesia cases achieved by anaesthetic specialty registrars (SpRs) and neuroanaesthetic senior clinical fellows (SCFs) might have changed during the Covid-19 pandemic.

Methodology

Having registered this service evaluation locally, the quarterly case numbers achieved by each rotational (three months) full-time SpR and SCF were obtained retrospectively from our electronic health records system (*Epic Systems, WI, USA*) between May 2019 and January 2023. Median quarterly case numbers for each cohort of SpRs and SCFs were calculated, with May-July 2019 (Q2(2019)), the earliest quarter in our study, chosen to represent baseline neuroanaesthetic activity (Fig. 1). Kruskal-Wallis and Mann-Whitney U tests (*Prism 9, GraftPad Software, MA, USA*) were used to compare baseline Q2(2019) data to Q2(2020), Q2(2021), and Q2(2022) data.

Results

- There were [median(IQR)] 9 (9-10) SpRs and 6 (4-6) SCFs per quarter.
- SpR Results:**
 - There was a significant difference in median SpR case numbers between the four Q2s overall ($p=0.005$);
 - Q2(2020) was the only year that differed significantly from baseline ($p=0.003$).
- SCF Results:**
 - SCF case numbers were not significantly different overall ($p=0.069$);
 - Though Q2(2020) did see the lowest case numbers, comparison with baseline did not reach statistical significance ($p=0.079$).

Conclusion

There was a significant reduction in SpR case numbers immediately following UK Covid restrictions in March 2020; low numbers of SCFs may explain the non-significant fall in SCF cases. An important limitation of our study is that our findings rely on SpRs and SCFs having recorded their names appropriately on the *Epic* anaesthetic chart; clinicians have been reminded to do this in light of this project.

Though strategies were implemented by NHNN to maintain neuroanaesthetic education (institution of a weekly education newsletter, as well as provision of neurosurgical and neuroradiological teaching on procedures not being performed at the time), it is clear that the pandemic severely disrupted neuroanaesthetic training at our institution.

The next steps in our study involve obtaining the case-mix data for the quartiles which were impacted most by Covid-19 to determine if any particular domain within neuroanaesthesia was particularly affected, e.g. neuroradiology, craniotomy, or complex spinal surgery. This may suggest that cohorts of trainees might finish anaesthesia training without adequate exposure to certain aspects of neuroanaesthesia, which may have consequences for their employability, or practice, as consultants.

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Sameer Ganatra

Specialty Registrar and Senior Clinical Fellow Case Numbers, May 2019 to January 2023

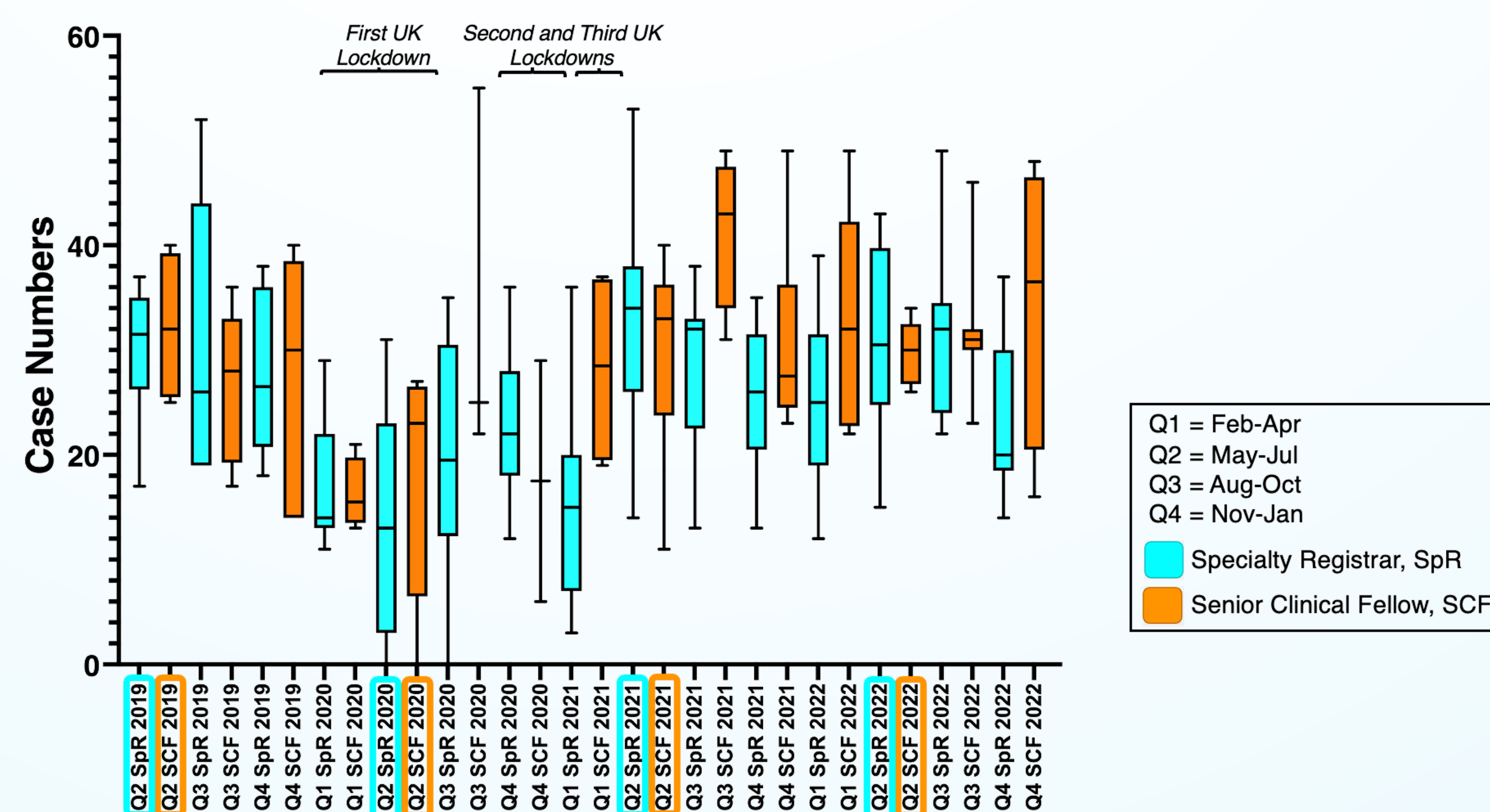


Figure 1

Audit reviewing the Anaesthetic Management and Outcomes of Neurosurgical Patients aged over eighty in a Tertiary Neurosurgical Centre.



Dr Vijay Kumar, Dr Rajesha Srinivasaiah, Dr Susan Griffiths
The Walton Centre NHS Foundation Trust, Liverpool (UK)



Introduction

- Elderly neurosurgical patients have a higher risk of perioperative morbidity and mortality due to age related physiological and pathological changes, multiple medical comorbidities, polypharmacy, frailty, post op complications and length of hospital stay.
- People over 85 are the fastest growing age group within the population and will represent 2 to 3% of the world population in 2030.
- Aims of this audit was to determine the number of octogenarians presenting for neurosurgical/Interventional neuro radiology procedures

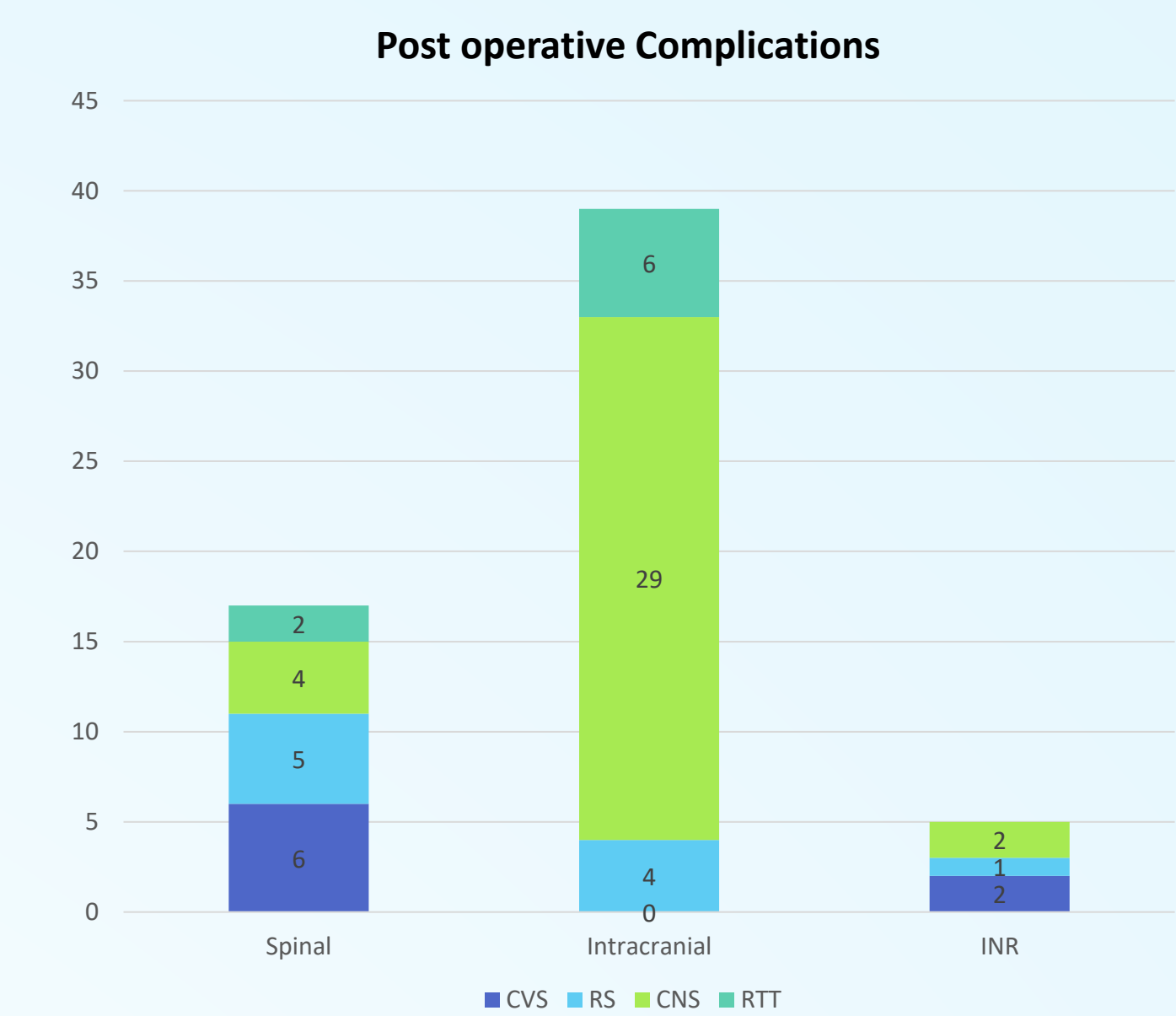
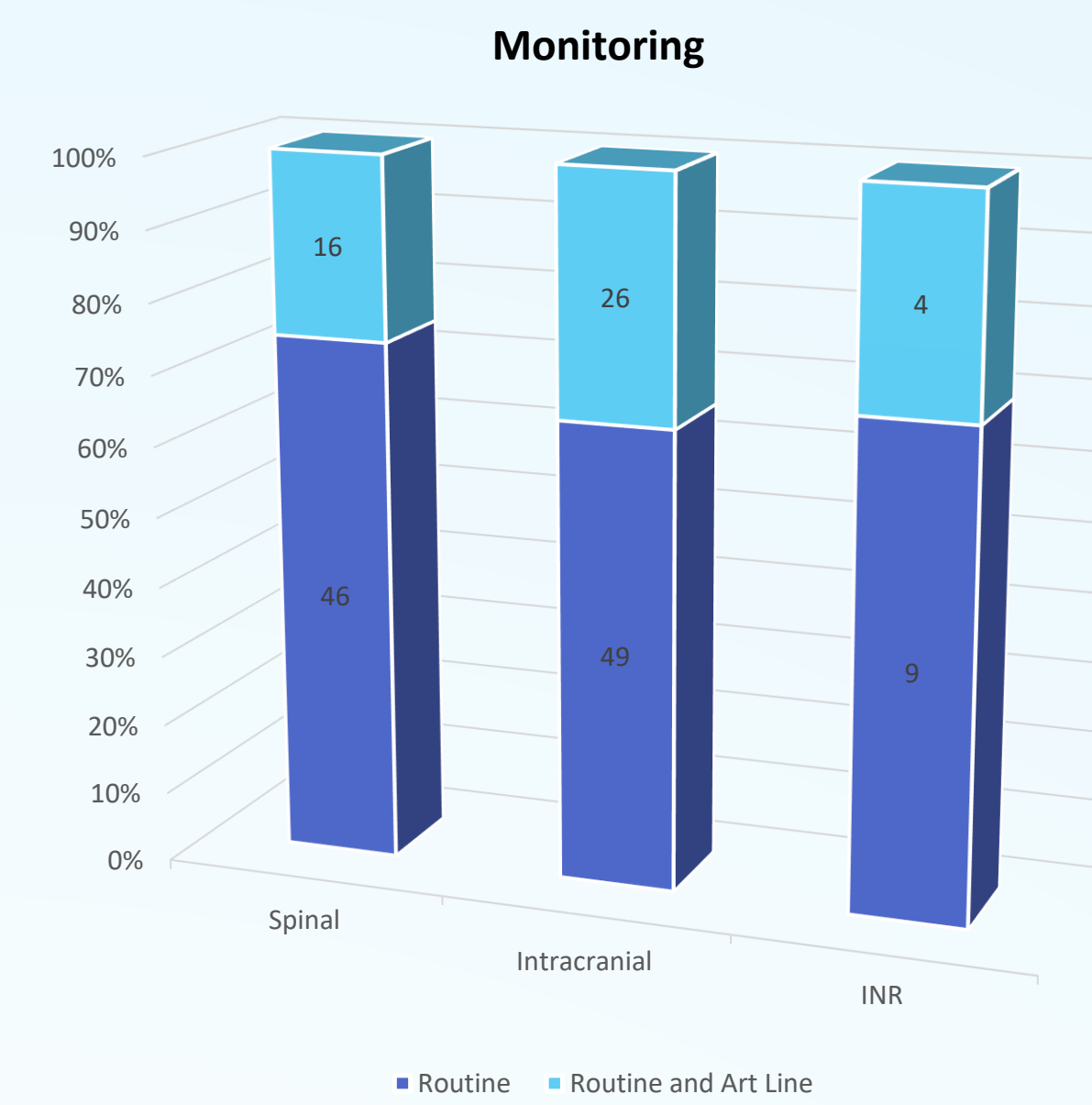
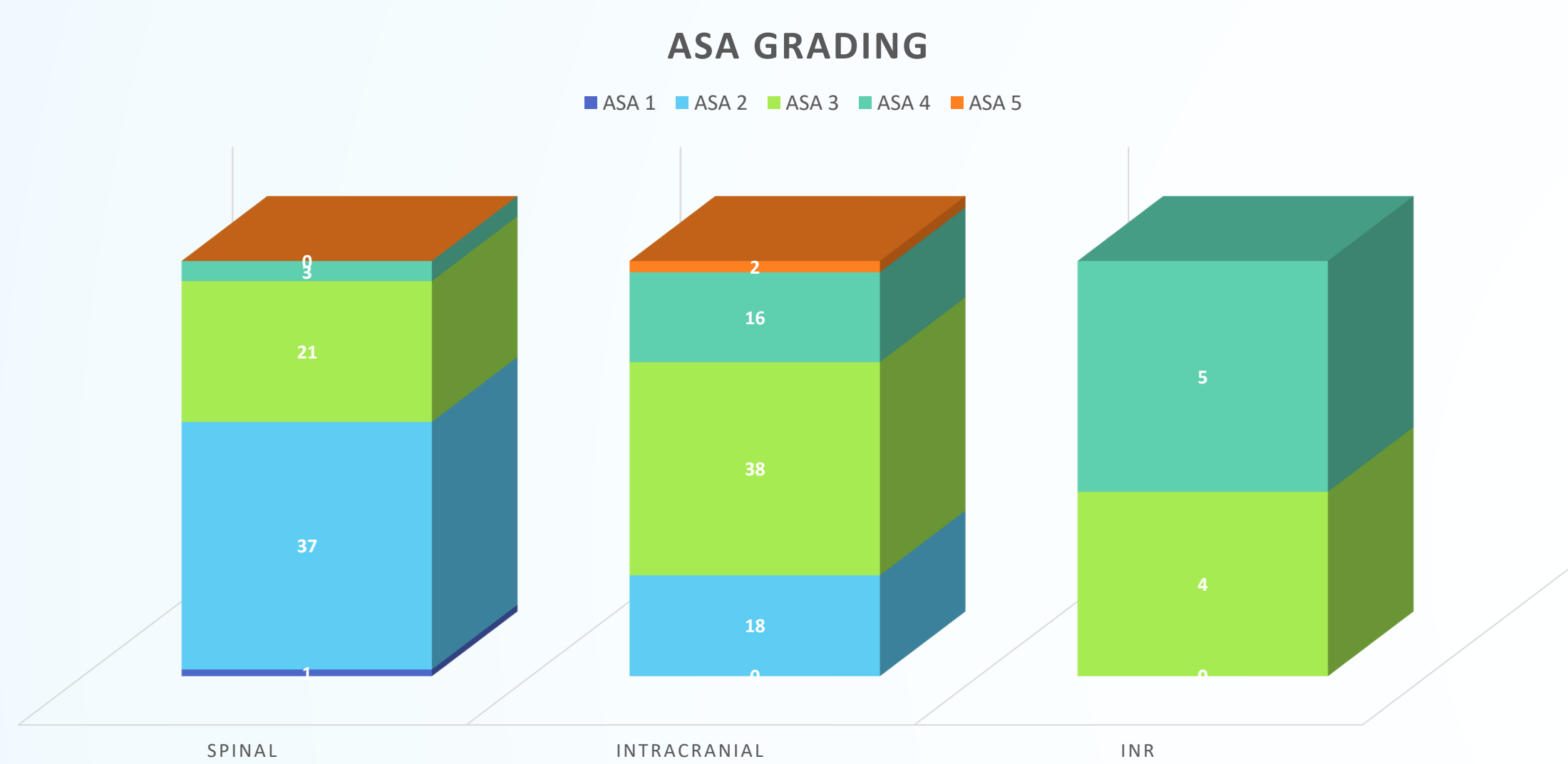
1. Type of Procedure
2. Review of Current Management
3. Outcomes at 1 year
4. Scope for improvement

Methodology

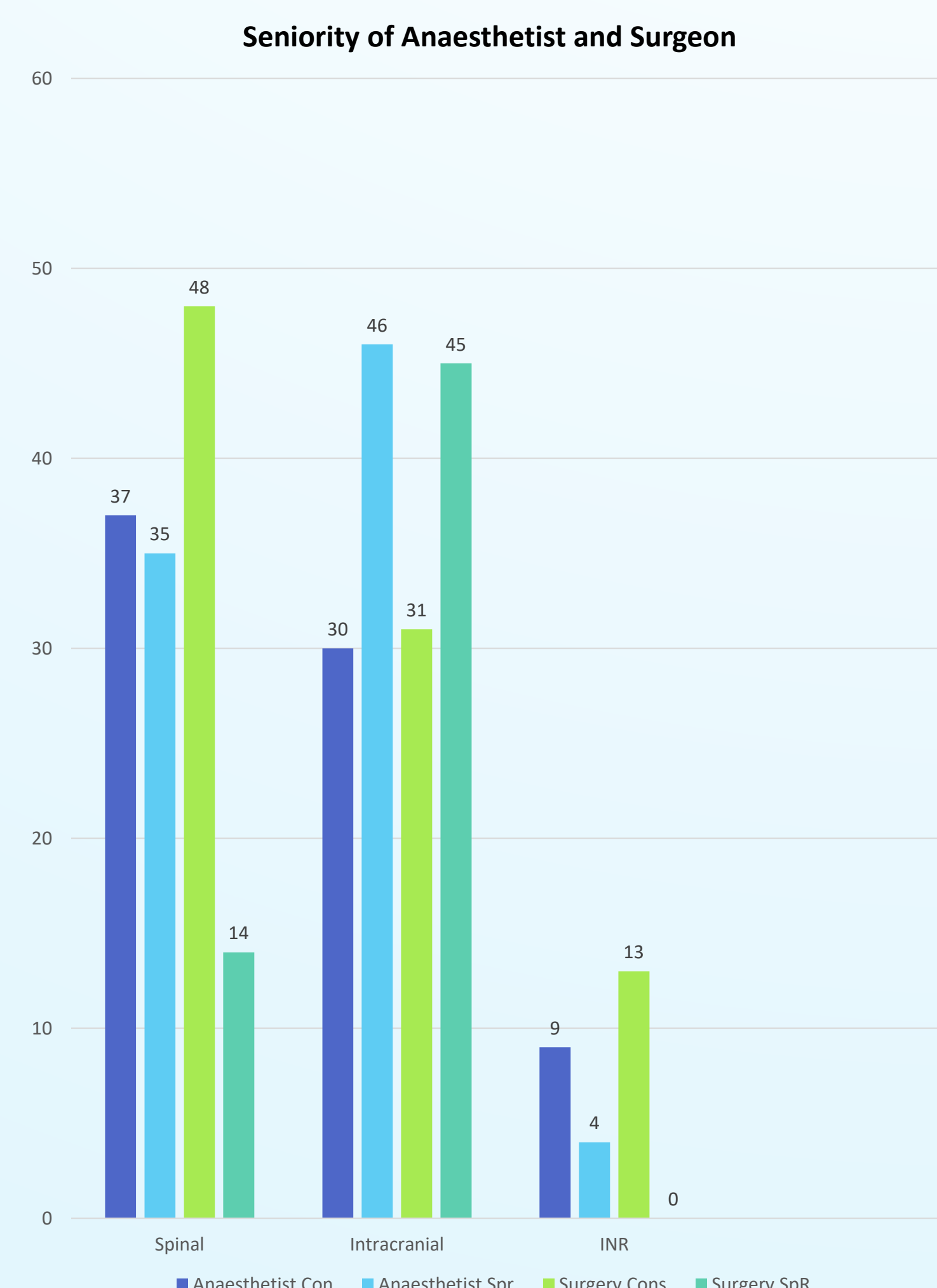
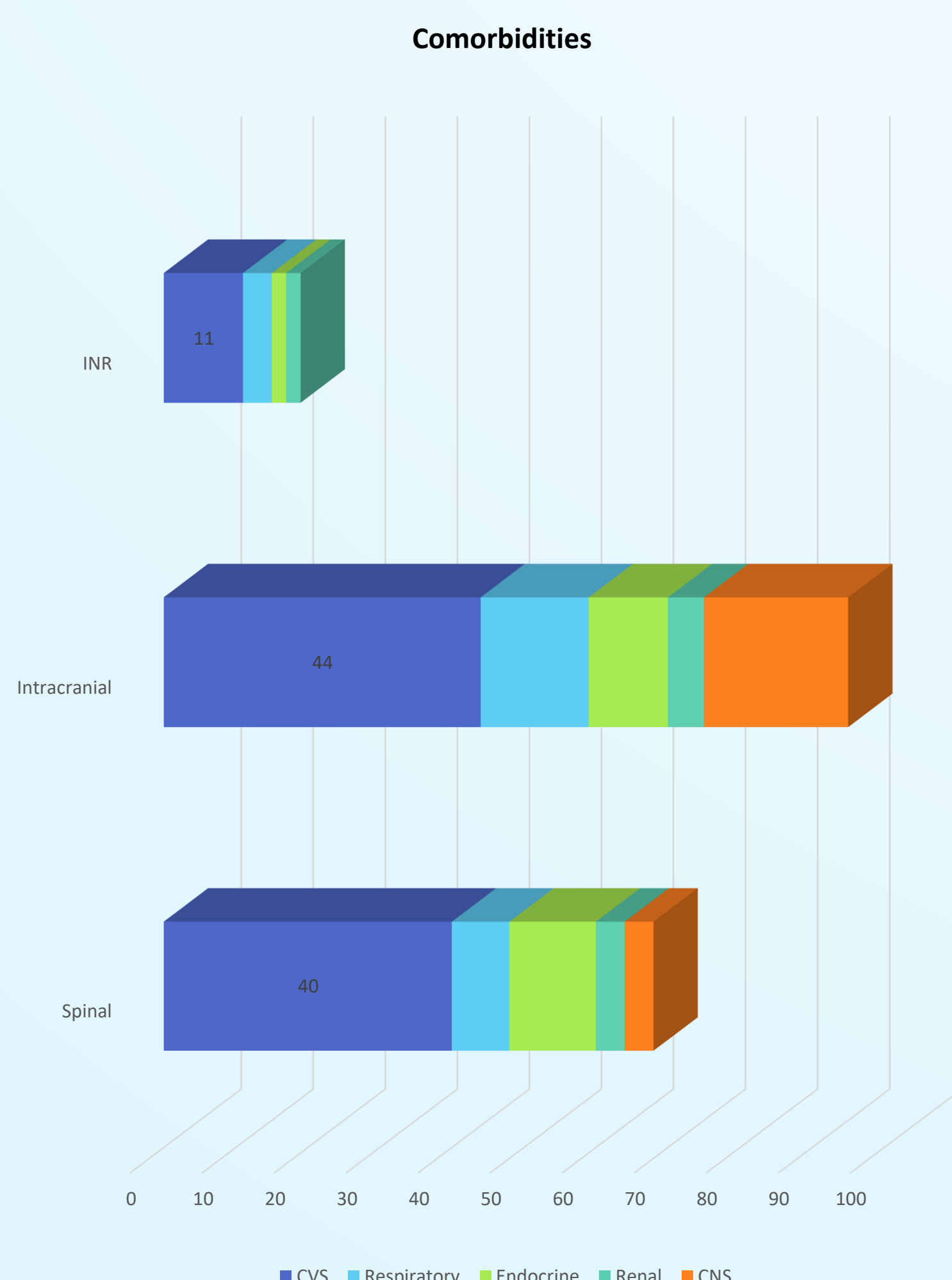
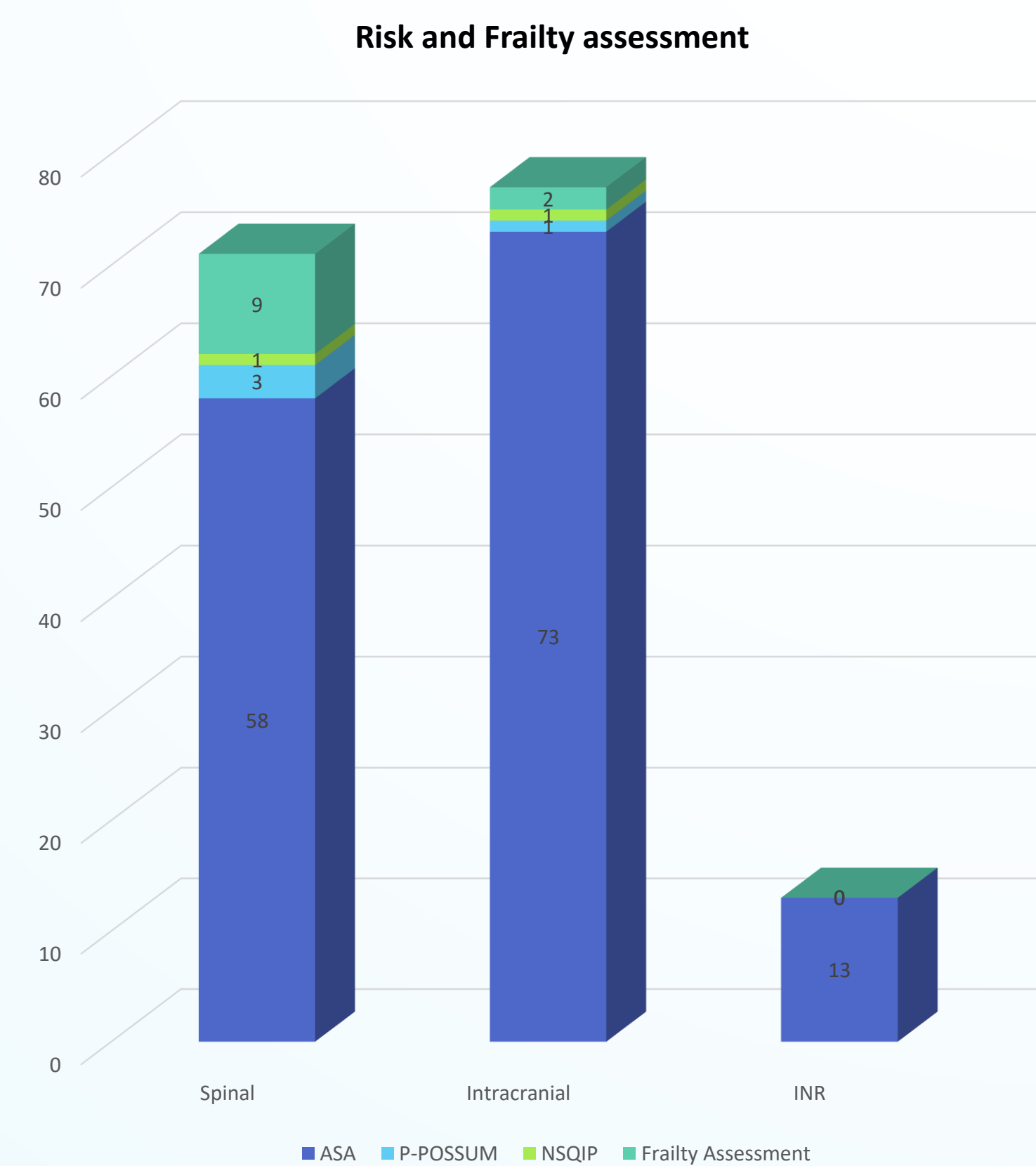
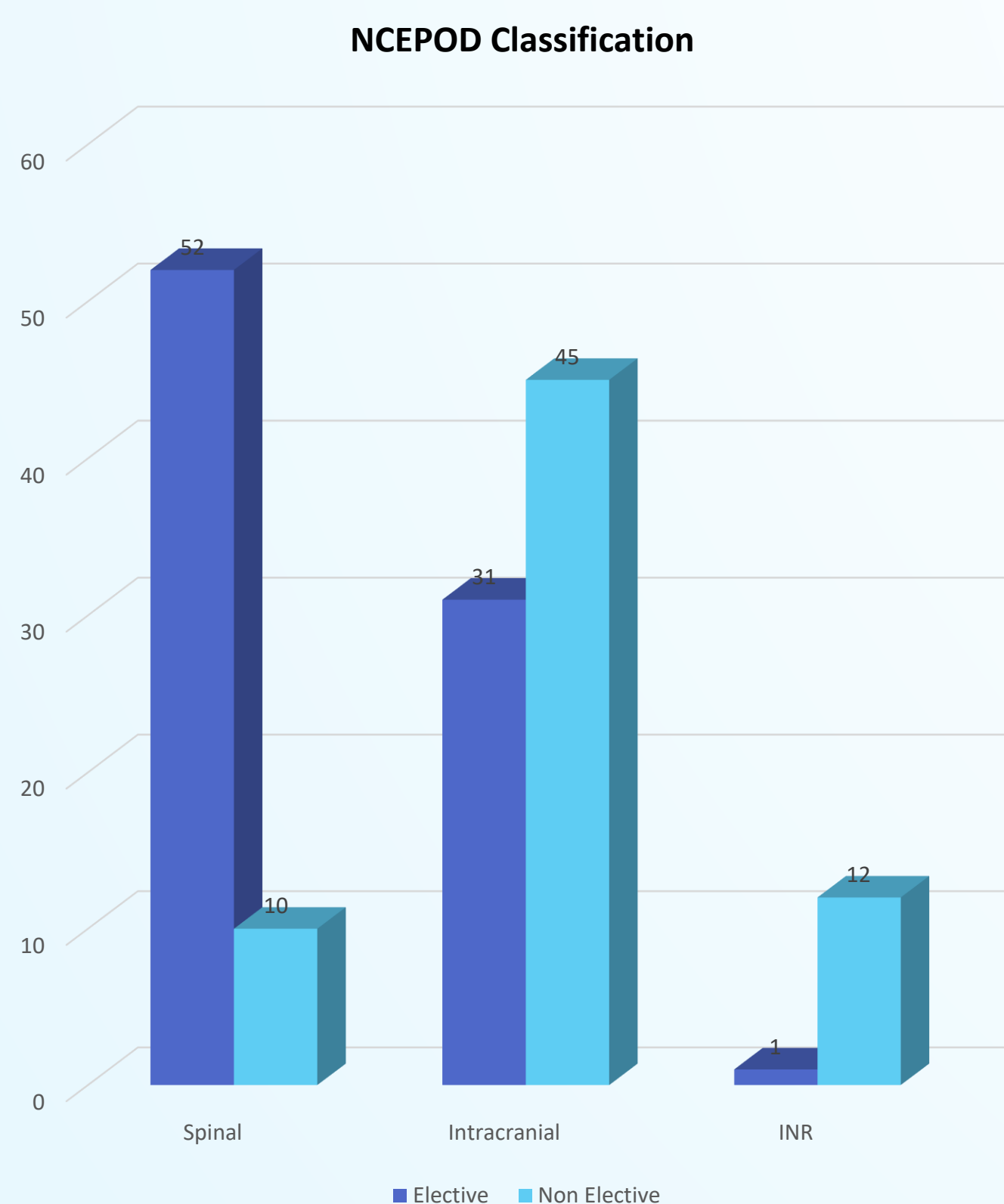
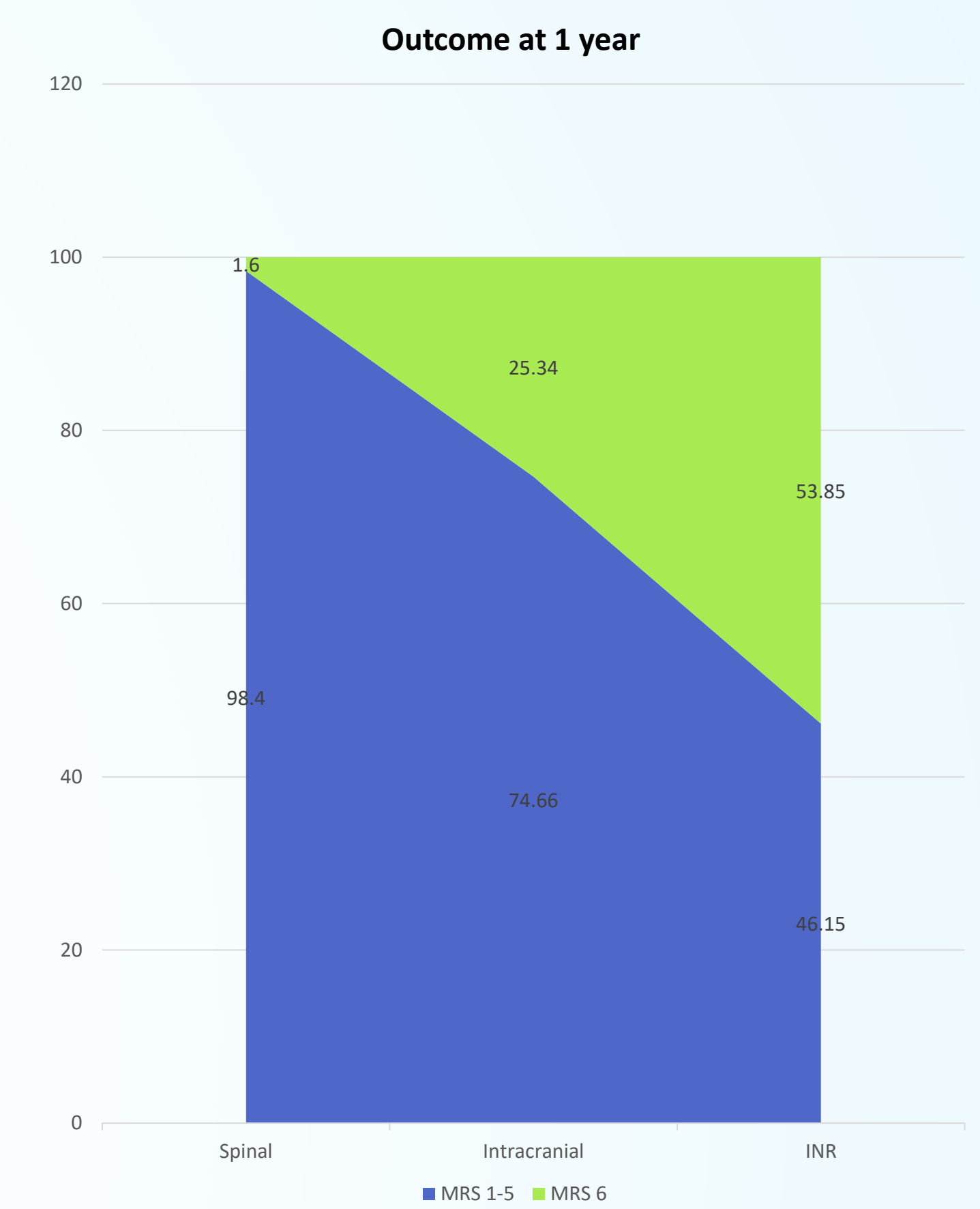
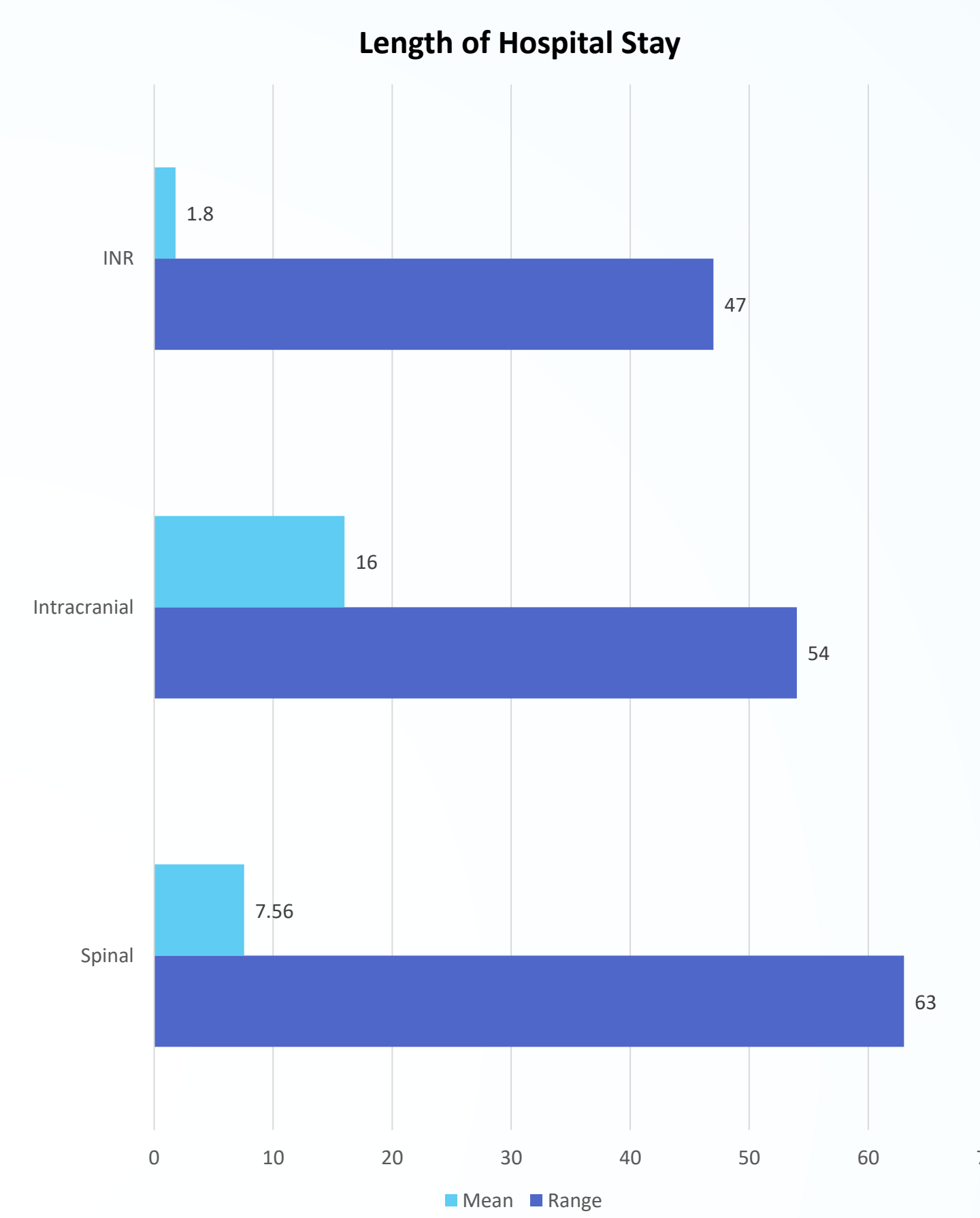
- Audit registered with hospital clinical governance department
- Retrospective audit
- 1 year duration (2019)
- Medical informatics department identified patients who were >80 years and underwent neurosurgical /INR procedures
- Patient's electronic records, paper case notes and follow-up clinical records were reviewed.
- Data related to patient demographics, ASA classification, NCEPOD classification, comorbidities, frailty assessment, risk stratification, GA technique, intra op Monitoring, seniority of Surgeon and Anaesthetist, post op destination, post operative complications, length of hospital stay and outcome at 1 year collected and analysed.

Results

- Total of 150 patients were included - 86 were males and 64 were females.
62 - spinal (33 male/ 29 female)
75 - intracranial (48 male/ 27 female)
13 - interventional neuro radiology (INR) (5 male/ 8 female)



- Most of the patients required Level 1 post operative care(90% Spinal/ 94% Intracranial and 46% INR),
- 8.6% patients required Level 2 (Spinal 2, Intracranial 6 and INR 5) and
- 4.6% patients were admitted for Level 3 care (6 Spinal/ 5 Intracranial/ 2 INR)



Conclusion

- Increasing number of octogenarians are presenting for surgeries and have multiple co-morbidities.
- Promote shared decision making, early involvement of relatives and/or carers.
- Consultant Anaesthetist/surgeon involvement in all high risk cases.
- To consider use of depth of anaesthesia monitoring in all octogenarian patients, invasive blood pressure monitoring for all high risk patients.
- Patients who developed post op complications had increased length of hospital stay.
- Protocol driven multidisciplinary care including frailty risk assessment and rehabilitation where necessary can minimise post operative complications and improve postoperative outcome.
- To plan admission and discharge at an early stage, identify post operative care needs of the patients (few patients had a prolonged hospital stay waiting for appropriate care package in the community).
- Post operative cognitive dysfunction was common in octogenarians and multimodal strategies should be used to reduce its incidence (2).

Acknowledgements

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Questions?

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'Sip Til Send': Improving fluid fasting times with a liberal fluid fasting policy

Y Bramma¹, R Swan², A Taylor³, C Taylor²

1. Consultant Neuroanaesthetist, 2. Specialty Trainee, 3. FY2

Institute of Neurological Sciences, Glasgow, UK



Introduction

Current guidelines recommend a 2-hour fasting period for clear fluids. Those patients who are second or later on a list should be identified and allowed to drink until 2 hours prior to their operation time. In practice, this is difficult to achieve due to the unpredictable nature of operating lists and evidence shows that a 2-hour fluid fasting policy more often translates into actual fasting times of 6-18 hours.¹

Excessive fasting has a number of potential harmful effects including: dehydration; hypovolaemia and haemodynamic changes during anaesthesia; increased post-operative nausea and vomiting; increased post-operative delirium; and patient discomfort, anxiety and dissatisfaction. Yet clinically significant pulmonary aspiration in surgical patients is rare and most often associated with particulate matter, not clear fluids.

Many hospitals have now moved towards a more liberal fluid fasting policy. NHS Tayside have had great success with their 'Sip Til Send' policy, allowing patients to drink clear fluids right up until they are 'sent for' by theatre. We sought to introduce a similar policy in our hospital.

Methodology

A baseline audit was carried out over a 2 week period. Data collected included: time of arrival in theatre reception and fluid fasting time, staff survey, and patient satisfaction survey.

The anaesthetic department agreed a new 'Sip Til Send' policy, which was ratified through our governance pathway. We were conscious of challenging staffing levels on the wards and wanted to keep the new policy as simple as possible. We decided to allow only water, rather than any clear fluid, and imposed no strict limit on volume. We asked the ward to ensure each patient had access to a patient jug of tap water or bottle of non-carbonated water and encourage them to drink to thirst. 'Sip Til Send' is the default policy and if a patient is to be excluded for medical reasons (e.g. severe reflux), the onus is on the anaesthetist to inform the nursing staff of the change.

An education programme was undertaken prior to the policy launch. Tea trolley-style teaching sessions were used to target nursing staff (ward/theatres) and junior medical staff. All medical and nursing staff also received a copy of the new policy via email. Information posters with key facts were displayed in all clinical areas for the benefit of both patients and staff.

Repeat audit was carried out at 4 months to assess impact. Any adverse events were recorded via our usual incident reporting system, which triggers discussion at our department clinical governance meeting.

Questions?

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Yvonne Bramma



Results

At baseline, the average fluid fasting time was 6 h (4 h for patients 1st on a list, 9 h for patients 2nd or later). 50% of patients reported feeling "thirsty" or "very thirsty" pre-operatively. 69% of staff felt that patients were fasted for too long and expressed frustration at lack of communication from theatre about list order and what time patients are allowed to drink to.

Following implementation of the new policy, 91% of patients drank water up until they were sent for by theatre. Of these patients, none reported feeling thirsty pre-operatively and they were pleased at being able to drink water while waiting to come to theatre. The patients who did not drink water pre-operatively were unable to for medical reasons (unsafe swallow due to neurological conditions). Staff agreed that the new policy was clear and easy to deliver and had had a positive impact on patient care. No adverse incidents were reported.

Conclusion

'Sip Til Send' has been effective at reducing excessive fasting times in our hospital. Other hospitals across the UK have been similarly successful in introducing more liberal fluid fasting policies and we hope that this will lead to a change in guidance nationally.

However, such policies do rely on patient autonomy to drink. We have a significant cohort of patients who are unable to drink orally due to neurological conditions or altered airway anatomy. Avoiding excessive fasting in these patients requires additional input from staff e.g. NG water or IV fluids. This can be difficult to achieve at times of low staffing and high numbers of patients with complex needs.

References

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Acknowledgements

With thanks to the Sip Til Send Team at NHS Tayside - Tweet them for more information! @SipTilSend

Cancellations in Neurosurgery

**Dr. Daveena Meeks MBBS BSc FRCA, Dr. Charlotte Brathwaite-Shirley MBBS BSc MRCP (UK) FRCA &
Dr. Gowri De Zylva MBBS FCARCSI**

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Introduction

King's College Hospital (KCH) is a major regional centre for Neurosurgery, offering a comprehensive range of adult and paediatric services. Paediatric and adult patients living in South East London and Kent, as well as other areas across the UK, are referred to KCH for specialist care and treatment. Neurosurgical activity has been increasing steadily. Elective surgery cancellation is considered a fundamental problem within the NHS. The cancellation of elective cases has adverse outcomes for patients, staff and the health economy. Day-of surgery cancellations disrupt patient flow, create psychological and financial hardships for patients and their families, and stretches an already overstretched workforce. To reduce surgery cancellations, the main cause(s) must be identified and addressed.

Objectives:

- To minimise day-of surgery cancellations for elective neurosurgery
- To identify and evaluate the reasons for cancellations

Methodology

We conducted a third-cycle, retrospective audit on elective neurosurgery cancellations. Elective paediatric and adult cases over the period of November 2021-2022 were analysed. Data were retrieved from Galaxy (an electronic theatre management system) and Electronic Patient Records (EPR). Emergency cases were excluded.

Results

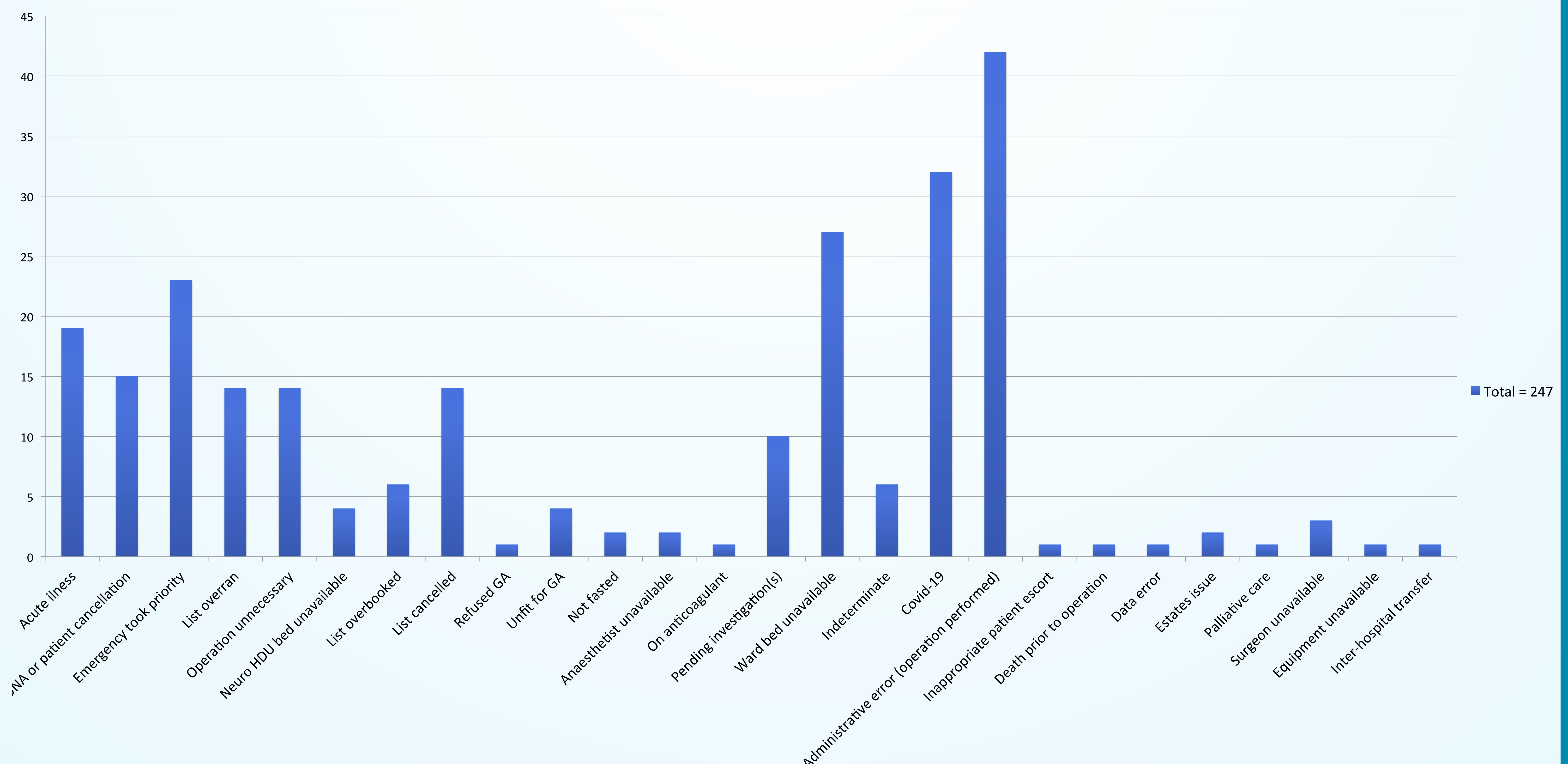
247 elective neurosurgical cases were cancelled from November 2021-2022. 57 patients were cancelled due to surgical reasons (n=12 list overrun, n=14 operation deemed unnecessary, n=23 emergency case took priority, n=3 surgeon unavailable, n=1 equipment unavailable, n=1 palliative care, n=2 prior complication, n=1 inter-hospital transfer). 9 patients were cancelled for anaesthesia-related reasons (n=1 refused GA, n=4 unfit for GA, n=2 not fasted, n=2 Anaesthetist unavailable). 18 patients were cancelled due to an acute illness. 10 patients were cancelled pending further investigation(s). 32 patients were cancelled due to COVID-19 infection. n=27 patients were cancelled due to unavailable ward bed and n=4 unavailable high-dependency unit bed.

Conclusion

We identified a number of different reasons for elective neurosurgery cancellations (Figure 1). Surgery-related causes (e.g. lack of theatre time and operation no longer necessary) are the primary reason for cancellation, followed by patient-related causes (COVID-19 infection and other acute illnesses), hospital inefficiencies and incomplete pre-operative investigations.

The transition from in-person to virtual pre-assessment clinics hindered the identification of patients for whom surgery was deemed unnecessary or inappropriate, and was a major contributing factor in cancellations pending further investigation(s). COVID-19 was a novel indication for cancellation in this audit cycle. Lists must reflect realistic theatre time. Ward and neuro-critical care bed capacities must be maintained to ensure national standards are met.¹

Figure 1: Graph of the total number of cancelled elective Neurosurgical cases from November 2021-2022



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Acknowledgements

This poster was supported by the KCH Department of Neuroanaesthesia

Questions?

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Rapid progression of Guillain Barre syndrome (GBS) following Covid -19 infection : A case report

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Sheffield Teaching Hospitals NHS Foundation Trust , Sheffield

Introduction

- Covid 19 caused by SARS COV2, predominantly affects the respiratory system. Neurological symptoms of Covid 19 include headache, syncope, myalgia, anosmia, and ageusia.
- Guillain-Barré syndrome (GBS) is a rare autoimmune polyneuropathy that typically presents as an acute, ascending paralysis with concomitant albuminocytologic dissociation in cerebrospinal fluid (CSF)
- We present a case of recurrent GBS following Covid 19 infection

Case report

History :

- A 43-year-old female presented with sudden onset weakness in both upper and lower limbs and loss of reflexes 6 days after testing positive for Covid 19.
- PMH: Marathon runner , AIDP GBS in 2009 and made full recovery over 18 month with conservative management .

Investigations :

- MRI brain and spine: Chiari 1 malformation and **cervical syrinx** extending from C1/C2 to C7 with the most pronounced area of dilatation from C1/C2 to C4 level, evidence of cauda equina root enhancement
- Nerve conduction study : **reduced amplitude of CMAP** , with no signs of demyelination AMAN variant of GBS .
- CSF : Normal
- Blood : **IgG GD1b +**

Timeline & Management :

23/12 : Tested positive for Covid - 19 , ongoing cough

9/1 – Admitted for progressive weakness in upper & lower limbs
IVIG – 0.4g/kg * 5 days

10/1 – FVC<30 % , facial weakness ,tone N ,absent reflexes
INTUBATED & VENTILATED

12/1 – Diaphragmatic effort on the ventilator

16/1 – Tracheostomy inserted ,
minimal neuromuscular improvement after 5 days of IVIG

17/1 – Regains facial movement , able to lift head

18/1 – PLASMAPHERESIS started – 7 cycles planned

27/1 –Improvement in power to 3/5 after 5th cycle

30/1 – Upper limb power 3-4/5 , lower limb power 2-3/5

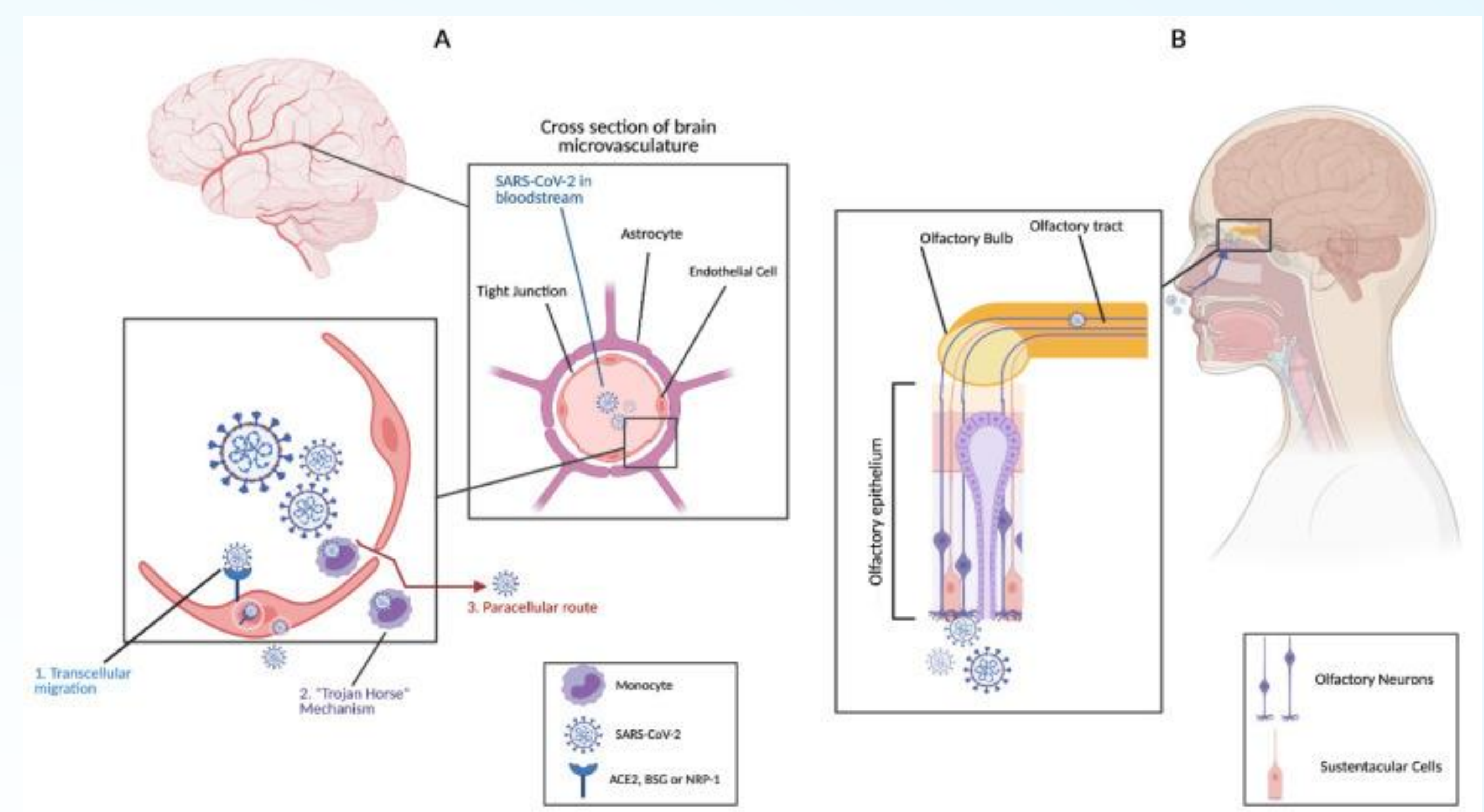
4/2 -Regain full power upper limbs , able to cycle 9 miles lying down

5/2 – 24 hours external CPAP

8/2- Decannulated , able to stand with support

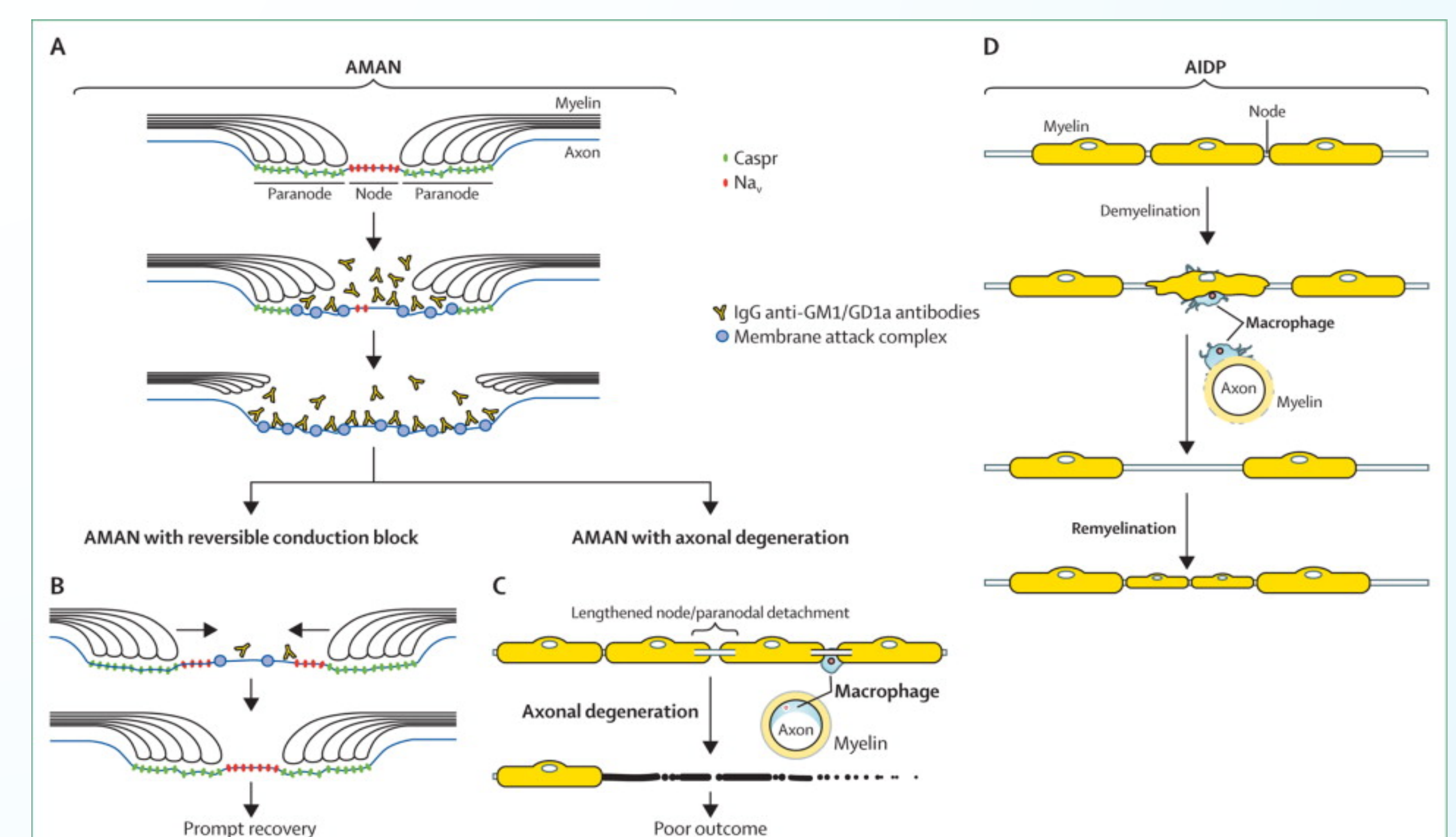
Discussion

- Central Nervous system involvement of Covid 19 include encephalitis, encephalopathy, Cerebrovascular accidents and neurodegenerative disorders.
- Mechanism is attributed to binding of the virus to ACE 2 receptors in the blood brain barrier along with haematogenous , transcribal and retrograde neuronal spread



Phenotype of GBS post Covid	% Presentation
Cranial nerve involvement / no muscle weakness	22.9%
Sensory motor variant	75%
Pure Motor variant	2.1%

- 78% of patients respond well to immunoglobulin therapy
- In the illustration A : early progression and rapid recovery is presumed to be due to membrane complexes attacking the nodes of Ranvier – slowing down sodium conductance .



- Genetic and immunological host factors partially determine the clinical phenotype irrespective of preceding infection
- Our patient presented with a diagnostic conundrum of a syrinx on MRI at presentation making us ponder for a neurosurgical cause
- The clinical phenotype of the current GBS infection was worse than her previous episode : a case of recurrence vs new presentation

Conclusion

This is the first atypical presentation of recurrent GBS following Covid -19 infection that has been reported. The rapid progression and reversal of symptoms suggests a strong immunological correlation between SARS CoV2 and GBS .

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