EBPOM LONDON 2020

Abstract Competition

EBPOM
Evidence Based Perioperative Medicine

EBPOM LONDON 2020 – ABSTRACT COMPETITION

This year we had over 100 entries to our abstract competition from a wide range of specialities and from all over the world.

As part of the EBPOM London 2020 virtual meeting, two of our Faculty members, Professor Mike Grocott and Professor Monty Mythen, held a series of poster forums on the 25 and 26 June 2020 where abstract authors were able to present their work via a video call.

Each one-hour forum was limited to a maximum of 10 posters, allowing enough time for all presenters to discuss their own work while also being able to ask and answer each other's questions, including those asked by the Faculty members.

In this document you can find all the abstracts submitted to the competition. A list of authors and their institution can be found at the top of each abstract.

From the selection of abstracts submitted the following were chosen as our winners / runners up:

Oral presentations finalists

Placement	**Presenter**	**Reference**
Winner	Tharusan Thevathasan	EL204.4/7
2nd	Alexandra Hogan	EL203.1/1
3rd	Luke Fletcher	EL204.2/5
Honourable mention	Jonathan Wilson	EL202.2/5
	Vishaka Kerner	EL203.3/2
	Eleanor Harvey (submitted by Alasdair Wills)	EL201.2/5

Poster presentations finalists

Placement	**Presenter**	**Reference**
Winner	Emma Barlow	EL203.2/7
Runner up 1	Rhys Taylor	EL202.4/8
Runner up 2	Gemma Scotland	EL204.4/3

If you are interested in submitting to any of our future abstract competitions, please visit our website for further details.

EL201.1/1

Authors: Amit Ajay Shah, Dr Benjamin John Maddison
Institution*:* Broomfield Hospital, Chelmsford, Essex, UK

Title:
Audit on guidelines for routine preoperative ECG testing

Introduction:
The Anaesthetic Assessment Unit at Broomfield Hospital evaluates patients prior to elective surgery to optimise their perioperative fitness. Part of this process involves performing routine preoperative tests in order to assess the risks involved with surgery for the individual. Unnecessary testing of otherwise healthy or low-risk patients is costly, both in terms of wasted time and resources. However, failure to appropriately investigate individuals prior to anaesthesia and surgery could potentially result in avoidable perioperative morbidity. NICE guideline NG45 advises which tests to routinely offer people before surgery.

It is important that this guidance is followed, both to reduce the risk of harm to patients and to reduce the burden on limited resources. We conducted an audit to identify if patients were having ECG testing appropriately. Following this, we developed an algorithm to help identify which patients needed ECG testing. We then conducted a re-audit to assess whether we had improved our compliance with national guidance.

Methods:
Over a 5 week period we collected data on patients attending for preoperative assessment, identifying their comorbidities, ASA grade and severity of proposed surgery. We used this data to identify whether they should have had a preoperative ECG performed, and compared this to whether an ECG was actually performed. After introducing the decision-making algorithm, we repeated the audit to investigate whether we had improved our patient selection for ECG testing. Microsoft Excel spreadsheets were used for data collection and analysis.

Results:
In the original audit the sample size was 489 patients; in the re-audit 202. We showed that 66.3% of patients were appropriately managed originally; this improved to 87.6% after implementing the decision-making algorithm. We also saw a reduction in the percentage of patients having an ECG from 67.7% to 59.9%.

Conclusion:
ECG testing is considered to be cheap and quick, but because of the volume of patients upon whom it is performed, it can become costly. We have showed that by introducing an algorithm to aid in decision-making, we can reduce the number of patients needing to be tested and increase the number of patients being managed in line with national guidance. By extrapolating our data to the total number of patients seen per annum in this Unit, we estimate a net cost saving of at least £23,400.

References:
National Institute for Health and Care Excellence; Routine preoperative tests for elective surgery; April 2016

EL201.1/2

Authors: Asmie Vanajaraj, Dr Yewku Enchill-Yawson
Institution: Colchester General Hospital

Title:
NT-proBNP screening in pre-assessment clinics

Introduction:
There are over 580,000 people with heart failure in the UK[1] with 200,000 new diagnoses every year[1]. Currently, treatment of heart failure costs £625million (1-2%) from the NHS budget[2].

Aim:
To assess the effectiveness of the protocol for checking NT-proBNP level in patients attending pre-assessment clinic, suspected of having heart failure, to rationalise echocardiography (ECHO) service use in accordance with NICE guidance, between June-September 2019. Staff nurses' perspectives of NT-proBNP screening, ease of use and necessary improvements were also explored.

Methods:

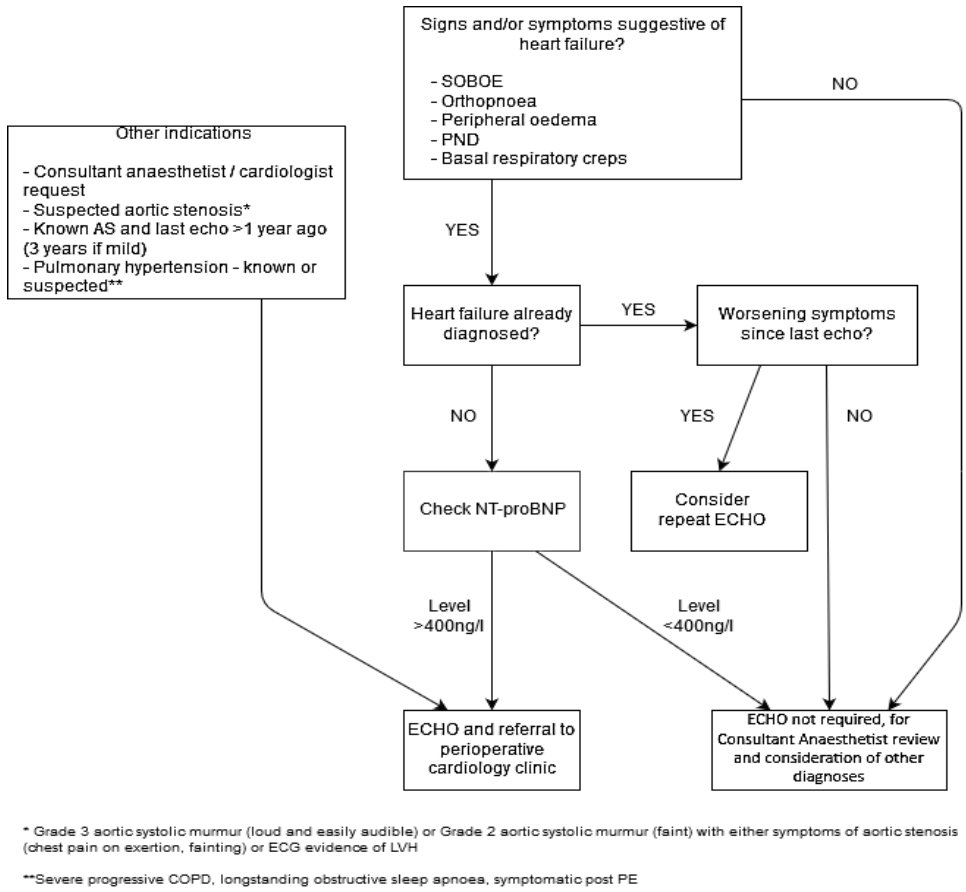


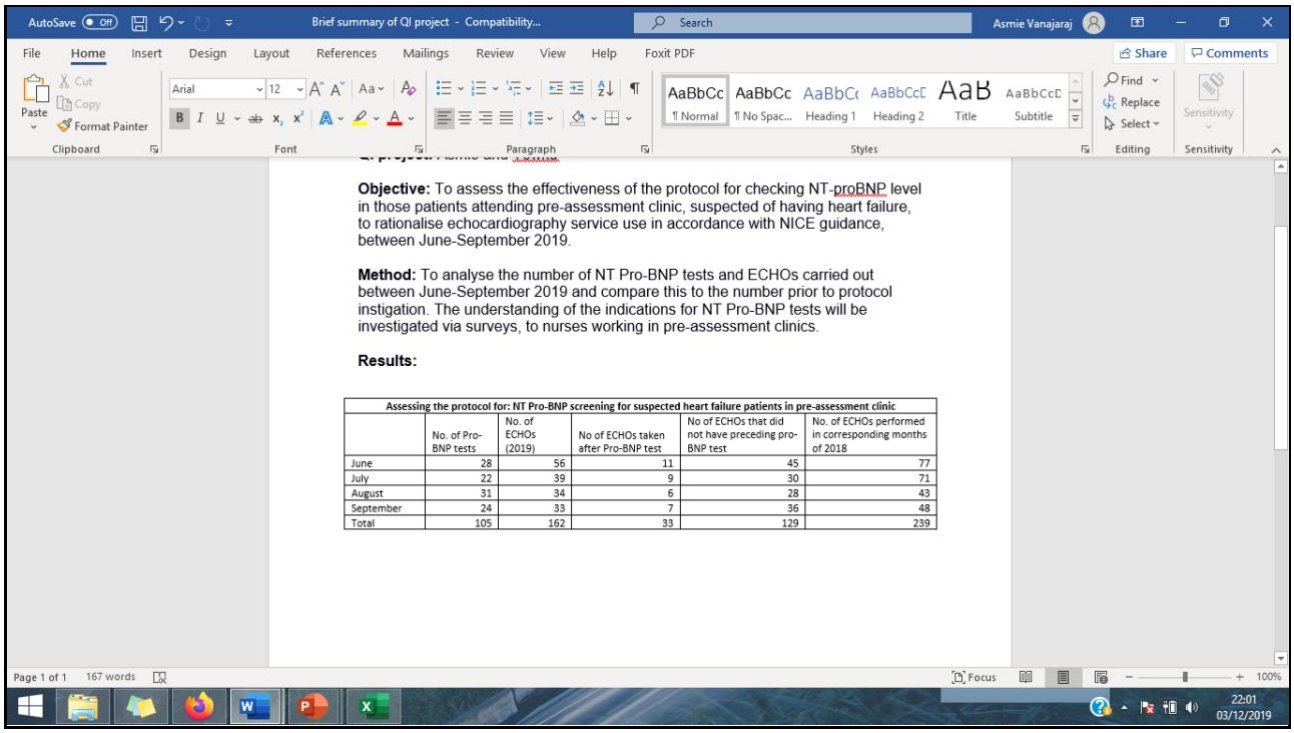
Figure 1- Guideline introduced in summer 2019 to rationalise use of echocardiograms and promote use of NT-proBNP test.

The number of NT-proBNP tests and ECHOs carried out on pre-operative patients between June-September 2019 were analysed, and compared to the number prior to protocol instigation (June-September 2018). The patients in question were diagnosed or suspected of having heart failure,

atrial fibrillation or a heart murmur. The primary outcome measure was to see if the introduction of the blood test decreased the number of subsequent ECHOs.

Online surveys were carried out to investigate the perspective of nurses working in pre-assessment clinics, regarding their understanding of the protocol.

Results:



Objective: To assess the effectiveness of the protocol for checking NT-proBNP level in those patients attending pre-assessment clinic, suspected of having heart failure, to rationalise echocardiography service use in accordance with NICE guidance, between June-September 2019.

Method: To analyse the number of NT Pro-BNP tests and ECHOs carried out between June-September 2019 and compare this to the number prior to protocol instigation. The understanding of the indications for NT Pro-BNP tests will be investigated via surveys, to nurses working in pre-assessment clinics.

Results:

Assessing the protocol for: NT Pro-BNP screening for suspected heart failure patients in pre-assessment clinic					
	No. of Pro-BNP tests	No. of ECHOs (2019)	No of ECHOs taken after Pro-BNP test	No of ECHOs that did not have preceding pro-BNP test	No. of ECHOs performed in corresponding months of 2018
June	28	56	11	45	77
July	22	39	9	30	71
August	31	34	6	28	43
September	24	33	7	36	48
Total	105	162	33	129	239

Table 1- Table showing the number of NT-proBNP tests and echocardiograms performed in 2018 and 2019, and the order in which they were performed.

The number of ECHOs performed in 2019 decreased by 32% from 2018. In this 3-month period, this would save between £5,000 and £17,000; an annual saving of between £20,000 and £68,000.

All ECHOs performed after the NT-proBNP occurred according to the guidelines except one. ECHOs had a variety of indications aside from heart failure, including structural abnormalities. Due to this, 1 in 5 of all pre-operative ECHOs were correctly performed in accordance to the guidelines. Accounting for these indications, the number of NT-proBNP tests and ECHOs performed in 2019 is approximately equal to the number of ECHOs performed in 2018.

The majority of staff demonstrated good understanding of the screening protocol but suggested they would also benefit from refresher courses.

Conclusion:

Overall, the number of pre-operative echocardiograms were reduced from 2018 to 2019, with the introduction of the new NT-proBNP screening guidelines. With continued consistency, this will benefit the NHS in terms of both time and cost efficiency.

References:

1. British Heart Foundation, UK Factsheet, August 2019
www.bhf.org.uk/-/media/files/research/heart-statistics/bhf-cvd-statistics-uk-factsheet

2. Sutherland K., Bridging the quality gap: Heart failure [Internet]. Health.org.uk. 2010
https://www.health.org.uk/sites/default/files/BridgingTheQualityGapHeartFailure_0.pdf

EL201.1/3

Authors: Sarah Moore
Institution: St. James' Hospital, Dublin

Title:
The pivot from face to face prehabilitation to virtual classes during the Covid-19 crisis

Introduction:
The OpFit programme is a pre-operative rehabilitation programme for patients scheduled for cancer surgery in St. James' Hospital, Dublin. It consists of 1:1 physiotherapy assessment and treatment sessions with daily high intensity exercise classes. Since the onset of the Covid-19 crisis in March 2020, the programme has pivoted towards virtual care for cancer surgery patients at home.

Methods:
In March 2020, all physiotherapy out-patient appointments and classes in St. James Hospital were cancelled due to the Covid-19 crisis. As cancer surgery was still continuing, there was a need to continue pre-operative rehabilitation for these patients at home. The initial assessment takes place via phone or BlueEye video consultation where patients are assessed and screened for suitability to participate. The class consists of a 45 minute physiotherapy led, high-intensity exercise class via a video conferencing app called Zoom. Patients are monitored during class using the Borg Breathlessness Scale.

If patients are unable to attend the class virtually, they complete an initial assessment and an individualised home based exercise programme is designed for them. They are contacted once weekly to further progress the programme.

Results:
Protocols and processes were agreed and the first virtual prehabilitation class took place on 23rd of April 2020. There have been 71 referrals received since the start of the Covid-19 crisis. Of these, 19 patients attended the virtual exercise class, with the median number of classes attended being 4 (range 1-19). 6 of these were female and 13 were male. The average age was 58 years (range 38-78). 41 patients engaged in the home-based exercise programme. Of these, 22 had no access to a device to take part, 10 were unable due to other commitments and 9 patients had surgery before the Zoom classes commenced. 7 patients did not have time as they were scheduled for surgery imminently and 4 had a change in their medical plan. Informal patient feedback to date has been very positive.

Conclusion:
Running the OpFit prehabilitation programme through telehealth is both safe and feasible for patients awaiting cancer surgery patients. The programme has supported these patients during the Covid-19 crisis by providing them with a daily structure and support from other patients. However one third of patients did not have access to a device to engage in the programme. Further work is needed to investigate how remote access can be provided to these patients. Further analysis will be carried out to assess patient experiences and to compare outcomes of telehealth versus face to face prehabilitation.

EL201.1/4

Authors: Gwenllian Howe, Mr Adam James, Dr Claire Halligan, Dr Najia Hasan
Institution: Royal Glamorgan Hospital, South Wales

Title:
Obesity: A growing problem for Anaesthetists

Introduction:
Obesity is an increasingly common challenge for Anaesthetists. These patients are at a higher risk of perioperative complications [1]. The incidence of obesity in Cwm Taf Morgannwg University Health Board (CTMUHB) is higher than the national incidence [2]. At present, there is no standardised pathway for the assessment and care planning of obese patients awaiting surgery in CTMUHB. We propose that the development of a standardised pathway would help improve efficiency, patient safety and shared decision making.

Methods:
A 6-month retrospective data collection, for patients with a BMI ≥ 40, was completed using the electronic Preoperative assessment system. In addition, an anonymised survey of Anaesthetic Consultants and Staff Grades was conducted to canvas opinion on how the assessment and optimisation of these patients could be improved.

Results:
Our data demonstrated varying practice. Almost half of the patients with a high OS-MRS (Obesity Surgery Mortality Risk Stratification) score (≥3), were not seen by a Consultant Anaesthetist. Of the three patients that scored a 4, each had differing preoperative management. 91% (n = 21) of survey participants would expect an obese patient to be seen by a Consultant Anaesthetist at the Preoperative assessment clinic. The consensus of opinion was that this would be defined as a BMI ≥ 50.

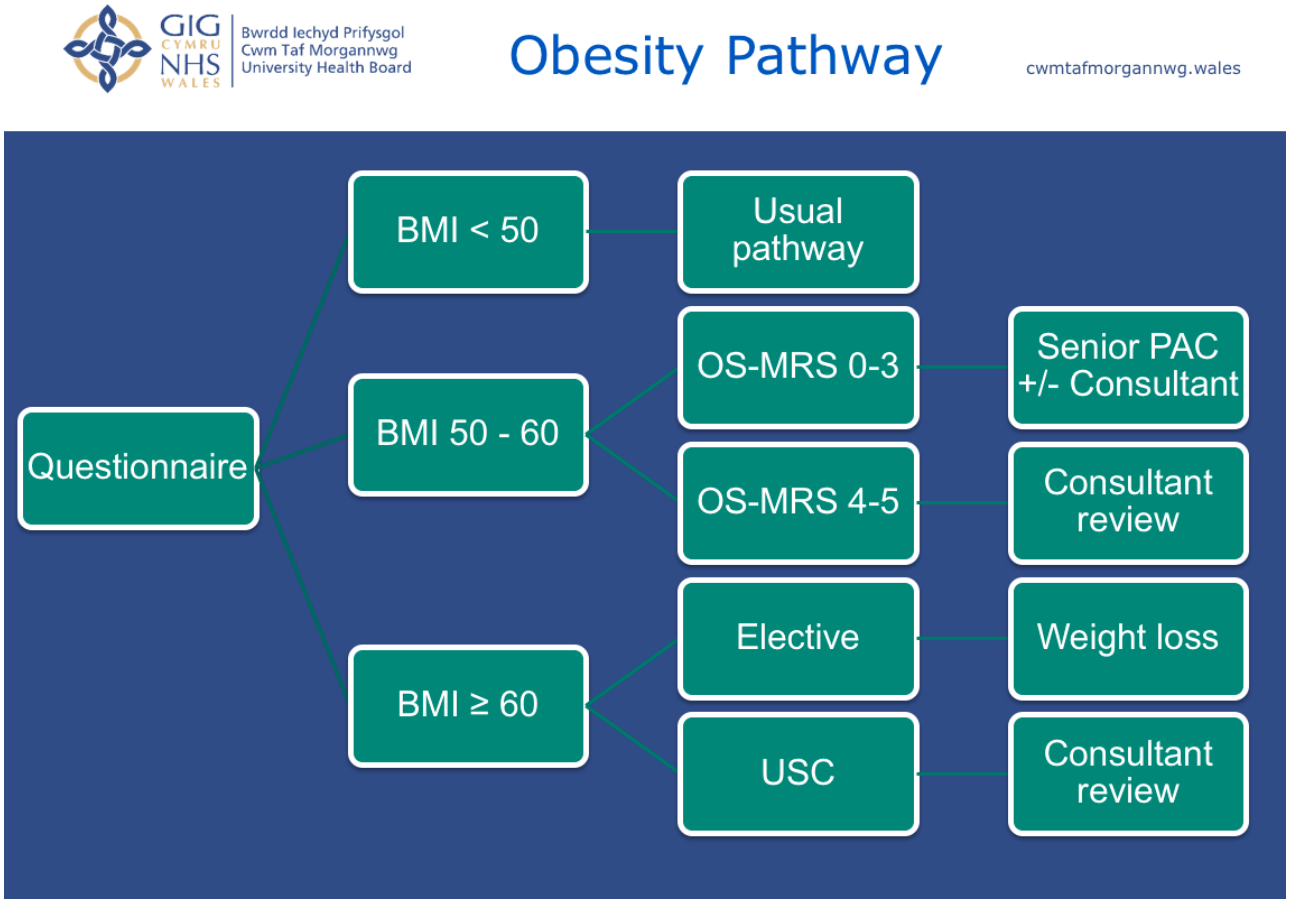
Conclusion:
Our results demonstrate varying practice. We propose a pathway to streamline the assessment of this patient group when presenting for elective and urgent surgery. Current evidence suggests that a BMI ≥ 50 is associated with an increased risk of postoperative complications [3]. All patients with a BMI ≥ 50 will be OS-MRS scored and risk stratified appropriately. However, patients with a BMI exceeding 60 would see a Consultant Anaesthetist. Outcomes will be reviewed following a 3-month pilot of this pathway to assess its impact.

References:

1. Nightingale, C.E, Margarson, M.P, Shearer, E. et al. *Perioperative management of the obese surgical patient 2015.* Anaesthesia, 2015, volume 70, pg 864 [Accessed online on 12 February 2020].
2. Cwm Taf University Health Board, 2017. *Three-year integrated medium-term plan 2017-2020.* Available at: http://cwmtafmorgannwg.wales/Docs/Integrated%20Medium%20Term%20Plans/IMTP%202017-20/Book%20A1%20-%20IMTP%202017-20%20-%20Local%20Population%20Health%20-%20Final%20Draft.pdf. [Accessed online on 29 January 2020].
3. Livingston, E.H, Arterburn, D, Schifftner, T.L et al. *National Surgical Quality Improvement Program Analysis of Bariatric Operations: Modifiable Risk Factors Contribute to Bariatric*

Surgical Adverse Outcomes. Journal of the American College of Surgeons, 2006. Vol 203, issue 5, pp 625-633. [Accessed online on 20 February 2020].

Figure 1



EL201.1/5

Authors: Narendra Siddaiah, Mr Benjamin Stanley
Institutions: Royal Orthopaedic Hospital NHS Trust, Birmingham

Title:
An Audit to assess NEWS 2 scoring at the Royal Orthopaedic Hospital

Background:
National Early Warning Score 2 (NEWS 2) is an update to the original NEWS (1). It aims to aid the identification of deteriorating hospital inpatients (2).

Assesses 6 physiological parameters: (1)

- Blood pressure
- Heart rate
- AVPU
- Temperature
- Oxygen Saturation
- Respiratory rate

Updates from the original NEWS: (3)

- Addition of 'new confusion' to AVPU
- Second SpO2 scale added
- More formalised escalation documentation

Aims:
To assess whether NEWS 2 charts for inpatients at the Royal Orthopaedic Hospital (ROH) are completed adequately, compared to the expected standard of 100%, and to assess any patterns of incompleteness

Methods:
Development of Question and Data collection sheet
Manual data collection from bedside NEWS2 charts at ROH
N = 45 patients across 3 inpatient wards
Data collected on completeness and patterns of incompleteness of different chart sections

Results:

	Completed	Inadequacy
Baseline observations	11%	89%
SpO2 scale	8.9%	91.1%
Observations chart	92%	8%

Discussion:

- Patient observations and total scores fully completed in the majority of cases.
- No clear pattern of incompleteness means this is likely due to individual errors rather than systematic issue
- Baseline patient parameters were incomplete, with urine output most commonly absent.
- SpO_2 scales were left blank in the majority. This presents a potential risk of hypercapnic respiratory failure in CO_2 retaining patients if they are over-oxygenated.

- Patient escalation was not adequately documented in 2 instances.

Recommendations:

1. Survey of staff to assess knowledge and understanding of NEWS 2
2. Highlight the importance of chart completion, emphasing the NEWS 2 changes, and the associated patient benefits
3. Strategies: posters, online sessions and face-to-face teaching
4. Aimed at all staff: main charts filled out by ward nurses/HCAs; baseline parameters by pre-op/theatre staff; SpO_2 section is consultant only
5. Re-audit in 6 months to assess progression and need for further work

References:

1. Royal College of Physicians. National Early Warning Score (NEWS): Standardising the assessment of acute illness severity in the NHS. Report of a working party. London: RCP, 2012
2. Royal College of Physicians. NHS England approves use of National Early Warning Score (NEWS2) 2 to improve detection of acutely ill patients. [internet]. 2017 [cited 31 October 2019].
3. Marsden R, The updated National Early Warning Score and its use with suspected sepsis. Royal College of General Practitioners. [internet]. no date [cited 31 October 2019].

EL201.1/6

Authors: Aalekh Prasad, Prof Tulsi Nag
Institution: Ramakrishna Mission Seva Pratishthan, Kolkata, India

Title:
Scalp Block For Drainage Of Cerebral Abscess In A Patient With Tetralogy Of Fallot

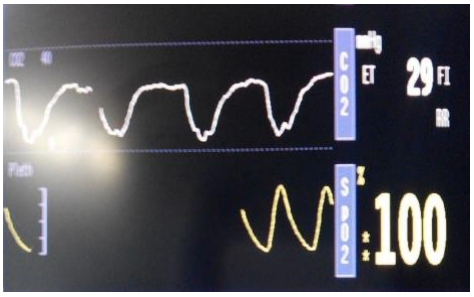
Tetralogy of fallot (TOF) is the most common cyanotic congenital heart defect [1] .Such patients are prone to frequent cerebral abscesses [2] and account for 13-70% of all brain abscesses [3] .

A 21 year old male was admitted in the Department of Neurosurgery with headache, vomiting since 2 months and multiple episodes of abnormal body movements since 2 days. The patient was a known case of TOF. On examination the patient was conscious, oriented with a GCS of 15/15 and was vitally stable with central cyanosis, clubbing and a pansystolic murmur. Doppler was suggestive of a ventricular septal defect of size 0.7 cm with left to right flow. CT Brain revealed a large space occupying lesion (approx. 4.2 x 5.4 x 5.9 cm in size) in the left temporal and left parietal region with a midline shift of approximately 13mms towards right.

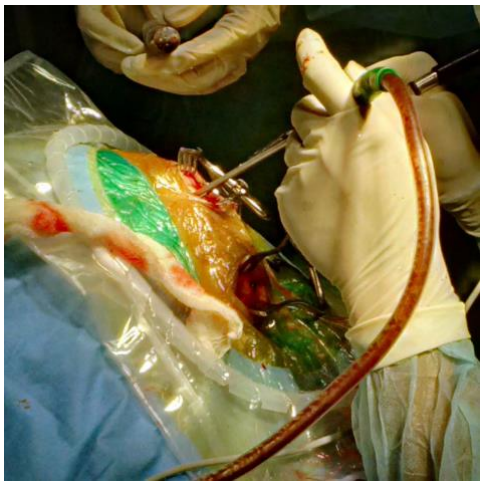

In the OR, standard monitors were attached.A 18 gauge intravenous (IV) cannula was secured. Oxygen was given through hudson’s face mask at a flow rate of 5L/min.

The patient was given a prophylactic dose of Ceftriaxone 500mg i.v. against infective endocarditis. Patient was given inj. ondansetron 8mg i.v., inj. midazolam 1mg i.v. and after local infiltration of lignocaine (2%), a peripherally inserted central venous catheter was secured in the right basilic vein and a left radial arterial line were secured.

The patient was given intravenous sedation with inj. fentanyl 50 mcg and inj. ketamine 25mg, after confirming adequate analgesia, scalp block was given using 60mg inj. Bupivacaine (0.5%), 80mg Inj. Lignocaine (2%) and 4ml of distilled water using a 23G needle.



The procedure was uneventful.



Conclusion:

From the above we may conclude that, scalp block with sedation proved to be an extremely rewarding procedure that resulted in a good outcome for this patient and may be considered as an alternative technique for drainage of cerebral abscess in selective patients with unrepaired tetralogy of fallot.

References:

1. I Naqash,B Ahad,J Zargar,A kirmani,M Wani.Anaesthetic Management of A Case of Tetrology of Fallot for Drainage of Brain Abscess:A Case Report.
2. Routray SS,Raut K,Mishra D,Mishra R.Cerebral Abscess in a 8 year old with uncorrected tetralogy of Fallot:Anaesthetic Challenge.International Journal of Biomedical and Advance Research, (2013) 04 (11).
3. Raha A,Ganjoo P,Singh A,Tandon MS,Singh D.Surgery for brain abscess in children with cyanotic heart disease:An anesthetic challenge.J Pediatr Neurosci.2012;7:23–26.

EL201.2/1

Authors: Chengyuan Zhang, Dr Neil Shaw
Institution: Victoria hospital Kirkcaldy

Title:
A novel multi-disciplinary patient-centred approach to teaching medical students perioperative medicine

Introduction:
Pre-clinical medical students at the University of St Andrews have had no previous exposure to the patient and their perioperative pathway of care. We designed, trialled and implemented small group teaching sessions based in preoperative assessment clinic. These aimed to teach basic clinical skills through a process of active learning. In addition, students were provided with an introduction to the principles and practices of perioperative medicine aimed at the level of a newly qualified doctor.

Methods:
We took a three-step approach to teaching delivery. Firstly, students undertook pre-course reading and watched a video outlining the perioperative process. Then we referred to this with a brief case-based discussion covering the key learning objectives. Secondly, each student followed a patient through the integrated pathway of pre-operative assessment, engaging with and learning from the entire multi-disciplinary team and patient. The focus was on history taking, clinical examination, practical procedures and communication skills. Students were given frequent, immediate feedback and encouraged to reflect on their experiences. Lastly, we facilitated a debrief centred on these experiences and reflections. These were used to determine their own objectives for further learning.

Discussion:
Feedback from students and the entire pre-assessment team have been overwhelmingly positive since implementation. The pre-course material allowed them to prepare in advance and at their own pace whilst small-group work encouraged understanding by articulating and discussing material. Students have also appreciated getting to know the patient *as a person* and feel more motivated and prepared for clinical medicine.

Conclusion:
Students have felt engaged by the combination of small group learning with patients' and families' experiences as they interact with all members of the pre-assessment team. This has provided an excellent opportunity to learn clinical skills and gain an invaluable experience of the relationship between the patient and the perioperative care process.

EL201.2/2

Authors: Dr Azka Afzal, Dr Michelle Leemans, Dr Valpuri Luoma
Institution: National Hospital for Neurology and Neurosurgery

Title:
The incidence of blood transfusion for posterior lumbar interbody fusion.

Introduction:
Posterior lumbar interbody fusion (PLIF) can result in significant blood loss and consequent need for transfusion[1]. Transfusions are associated with increased perioperative morbidity and mortality. In this audit we investigate incidence of PLIF transfusions in non-anaemic patients and in anaemic patients with and without preoperative optimisation of anaemia between 1/11/16 and 31/10/18.
The World Health Organisation (WHO) defines anaemia as Hb<130g/L in men and Hb<120g/L in women. The 2017 International Consensus Statement (ICS) on perioperative anaemia cites Hb<130g/L in both sexes to avoid unfavourable outcomes[2].

Our preassessment clinic works with perioperative care clinicians in a multidisciplinary team (MDT) to identify and optimise anaemic patients.

Methods:
We reviewed case notes collecting: patient demographics, length of hospital stay (LOS), preoperative Hb, perioperative Hb drop, whether referred to MDT and whether blood transfused.

Results :
59 cases were reviewed. Median age was 60 (31-84) years. 32% (19/59) of patients were anaemic preoperatively by the ICS criterion. Of these, 37% (7/19) were referred to anaemia MDT. Every anaemic patient not referred to MDT (12/19) was a woman with
120≤Hb<130g/L preoperatively. We hypothesise that staff working to older WHO criteria did not consider these women anaemic.
16% (3/19) of anaemic patients were transfused compared to 10% (4/40) of non-anaemic patients. 0% of anaemic transfused patients were referred to MDT. 100% (7/7) anaemic patients referred to MDT avoided transfusion.
All-patient transfusion rate was 12% (7/59) with a mean perioperative Hb drop of 33g/L.

Conclusion:
We suggest that optimisation of anaemia before elective PLIF reduces the incidence of perioperative transfusion and results in better patient care.
We propose to educate surgeons and anaesthetists on new anaemia guidelines then repeat this audit.

References:
1. Goldstein C.L., Macwan K., Sundararajan K., Rampersaud Y.R. Perioperative outcomes and adverse events of minimally invasive versus open posterior lumbar fusion Meta-analysis and systematic review. J. Neurosurg. Spine. 2016;24:416-427

2. Muñoz, M., Acheson, A.G., Auerbach, M., Besser, M., Habler, O., Kehlet, H., Liumbruno, G.M., Lasocki, S., Meybohm, P., R Baikady, R., Richards, T., Shander, A., So-Osman, C., Spahn, D.R. and Klein, A.A. International consensus statement on the peri-operative management of anaemia and iron deficiency. Anaesthesia, 2017;72:233247

EL201.2/3

Authors: Abhishek Chitnis, Dr Jehangirshaw Parakh, Dr Manpreet Sahemey, Dr Patrick Collins, Dr Tahirou Diallo, Dr Simon Stacey
Institution: Newham University Hospital

Title:
Working Together: Practical Skills Teaching for Surgeons on the Intensive Care Unit During the COVID-19 Pandemic

Introduction:

- Perioperative medicine is the multidisciplinary, collaborative care of patients and may be provided by anaesthetists, intensivists and medics working together with surgeons.
- Due to the decrease in surgical theatre capacity from the COVID-19 pandemic, The Royal College of Surgeons of England advised the surgical workforce will need to adapt, resulting in surgeons being redeployed to support non-surgical specialties [1].
- This was the case at Newham University Hospital, the area with the highest COVID-19 death rate in England and Wales [2], where surgeons were redeployed to the Intensive Care Unit (ICU).
- In order to deal with large influx of patients, it was decided to teach surgeons basic ICU practical skills, both in simulation and in-situ, so that anaesthetists/intensivists could be freed to manage other tasks.

Methods:
Questionnaires were given to 16 general and orthopaedic surgeons redeployed to the ICU in April/May 2020. Questions explored their ability to perform various practical skills both pre and post redeployment. Data was collected using a standardised proforma and analysed using spreadsheet software.

Results:
The response rate was 100% (16/16). A summary of the results is detailed in *Table 1*. Results demonstrated the majority of participants – 13/16 (81%) – were able to independently perform skills such as arterial line insertion and drawing up of daily intubation/emergency drugs post-redeployment. This was of great help to anaesthetists/intensivists, who were then able to manage the surge of new COVID-19 patients. Surgeons also learnt transferable skills including utilising ultrasound techniques to identify blood vessels, with 100% (16/16) of participants being able to independently perform this following redeployment. This practical skill will be of invaluable future use post-pandemic, for example in cases of difficult peripheral venous cannulation.

Conclusion:
Practical skills teaching for surgeons on the ICU helped them to learn new transferable skills in addition to reducing the workload for anaesthetists/intensivists during the COVID-19 pandemic. Through our experiences, and as reflected in the literature [3][4], we therefore advocate multidisciplinary collaboration as key to achieving positive outcomes, and we hope our teamwork translates to improved future perioperative patient care.

Table 1 – Results

Are you confident in inserting arterial lines?		
	Prior to redeployment	Post redeployment
Yes – independently	0 (0%)	13 (81%)
Yes – with supervision	2 (13%)	3 (19%)
No	14 (87%)	0 (0%)
Are you confident in inserting central lines?		
	Prior to redeployment	Post redeployment
Yes – independently	0 (0%)	3 (19%)
Yes – with supervision	1 (6%)	12 (75%)
No	15 (94%)	1 (6%)
Are you confident in identifying blood vessels using the in-plane/out-of-plane ultrasound approach?		
	Prior to redeployment	Post redeployment
Yes – independently	1 (6%)	16 (100%)
Yes – with supervision	2 (13%)	0 (0%)
No	13 (81%)	0 (0%)
Are you confident in setting up a ventilator for invasive/non-invasive ventilation?		
	Prior to redeployment	Post redeployment
Yes – independently	0 (0%)	0 (0%)
Yes – with supervision	2 (13%)	12 (75%)
No	14 (87%)	4 (25%)
Are you confident in drawing up intubation/emergency drugs?		
	Prior to redeployment	Post redeployment
Yes – independently	0 (0%)	13 (81%)
Yes – with supervision	1 (6%)	3 (19%)
No	15 (94%)	0 (0%)

References:

1. Guidance for surgeons working during the COVID-19 pandemic (March 2020). Royal College of Surgeons of England [Online]. Available at: https://www.rcseng.ac.uk/coronavirus/joint-guidance-for-surgeons-v1 [Accessed: 15 May 2020].

2. Deaths involving COVID-19 by local area and socioeconomic deprivation (May 2020). Office for National Statistics [Online]. Availableat: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsinvolvingcovid19bylocalareasanddeprivation/deathsoccurringbetween1marchand17april [Accessed: 15 May 2020].

3. Ervin JN, Kahn JM, Cohen TR, et al. Teamwork in the intensive care unit. American Psychologist. 2018;73(4):468-477.

4. Krakower DS, Kothari D, Sullivan AM, et al. Improving communication between medical and surgical specialists using interspecialty education strategies: A mixed-methods study. Journal of Contemporary Medical Education. 2015;3(4):170.

EL201.2/4

Authors: Sarah O'Beirne, Dr Jonathan Wilson, Ms Zoe Murphy
Institution: York Teaching Hospital

Title:
Service evaluation of ward-based arterial line management of elective colorectal surgery patients, and interventions triggered by its use

Introduction:
The York Surgical Enhanced Protocol (EOP) [1] has been used since 2015 to target haemodynamic management in high-risk elective colorectal surgical patients. Arterial lines are used to detect hypotension and raised lactate[2], and trigger intervention if abnormalities arise (Figure 1).
High risk patients are identified pre-operatively using cardio-pulmonary exercise testing (CPET), as patients with reduced aerobic fitness have increased mortality rates.[3] The EOP is used on Ward 16's Nurse Enhanced Unit (NEU), with arterial line monitoring guiding management of hypotension using fluid and inotropes.

Objective:
To describe how arterial line information impacts on the management of patients in the first 24 hours after surgery.

Methods:
Treatment records of patients with a CPET score of 2 being managed on NEU between October 2015 and April 2018 were reviewed retrospectively. Data were collected from the observation charts in the notes for the following items:

- Incidence of hypotension (< 65 mmHg mean arterial pressure)
- Incidence of raised lactate (≥ 3.0 mmol/L)
- Whether EOP interventions were triggered
- Interventions given (either fluid bolus or inotropes)

Permission for the project to be carried out was granted by the Clinical Effectiveness Team at York Teaching Hospital.

Results:
80 patients met the criteria. 21 patients had no data due to missing perioperative charts. Complete data were collected for 59 patients. 92% of patients were hypotensive, and 100% of those with lactate of ≥ 3.0 triggered EOP interventions. 37.5% of those with raised lactate were not hypotensive. Interventions: 39 % received vasopressors, 66 % received fluid resuscitation and 36 % received both fluids and vasopressors. 10 % of patients had issues with their arterial lines leading to a short time period or lack of data.

Conclusion:
Ward-based arterial line monitoring appears safe, and allows detection of hypotension and raised lactate, triggering EOP interventions in many cases, and is especially useful in normotensive patients with raised lactate. Non- invasive blood pressure monitoring is the standard alternative, avoiding risk of disconnection and injection into arterial lines, however readings are intermittent and risk delayed identification of hypotension.
In summary, use of arterial lines on NEU enables level 2 monitoring and protocol initiation in high-risk patients outside critical care, potentially relieving bed space pressures.

References:

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2. (2) Bakker J & de Lima A (2004). Critical Care, 8(2), pp.96-98
3. (3) Wilson R et al. (2010). *BJA: British Journal of Anaesthesia*, 105(3), pp.297-303

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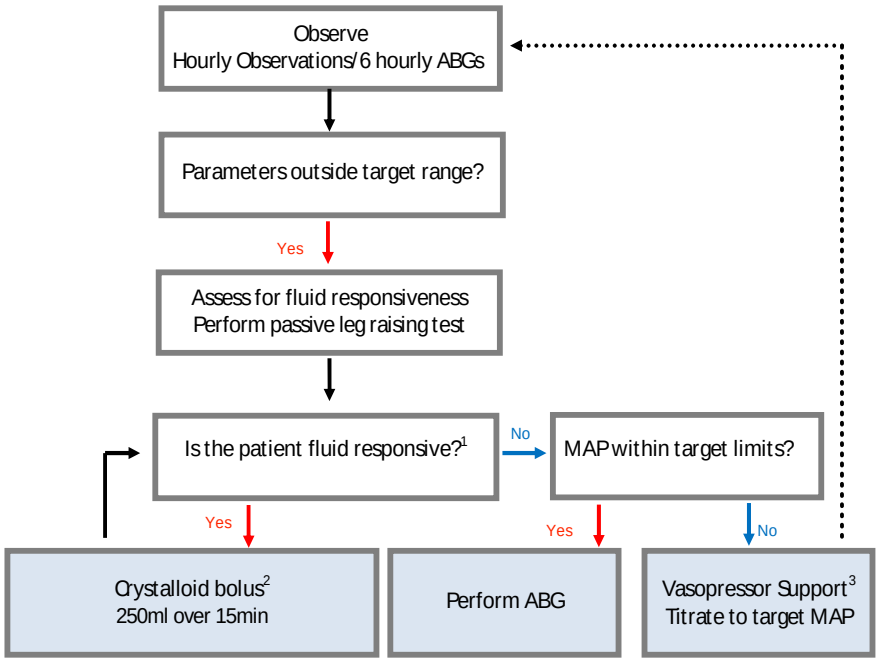

Figure 1-Enhanced Perioperative Protocol (adapted from York Teaching Hospital (2020))

EL201.2/5

Authors: Dr Alasdair Wills, Dr Jenna Hutchinson, Dr Elenor Harvey, Dr Lauren Barraclough, Dr Louisa Shovel, Dr Ramanathan Kasivisvanathan, Dr Susanna Walker
Institution: Royal Marsden

Title:
Establishment of a new multi-disciplinary pathway for identification and optimisation of pre-op, high risk, upper GI cancer patients.

Introduction:
At the Royal Marsden Hospital we have established a new perioperative pathway, 'SUMMIT' (Systematic Multi-disciplinary Management, Investigation and Intervention), consisting of two elements: 1) A restructured pathway where patients receive their global pre-assessment, at a much earlier stage. 2) An MDT meeting which allows us to identify and discuss patients in a holistic manner. The aims of SUMMIT are to reduce the incidence of delays to surgery, improve patients' physical and psychological health before and after surgery, and improve multi-disciplinary decision making for these patients. The meeting occurs every two weeks and is attended by the Surgeons, Anaesthetists, Dieticians, Physio's and Clinical Nurse Specialists. The use of Cardio-Pulmonary Exercise Testing (CPET), ideally pre-chemo, allows discussion using objective measures of risk and benefit for any potential surgical intervention. SUMMIT enables direct referral of patients to the hospital's pre-established prehab project 'The MILE' (My Lifestyle & Exercise Programme). This provides physio-led prehabilitation, management of anaemia and malnutrition, and psychological support.

Method:
The postponement rate of upper GI surgeries for a 1-year period prior to SUMMIT was calculated. These were then subdivided into modifiable and non-modifiable causes. This was then compared to the modifiable rate over a six month period, following establishment of SUMMIT. We also calculated the number of patients deemed unsuitable for surgery, who then proceeded to surgery, following optimisation and prehabilitation.

Results:
In the 1-year period prior to establishing SUMMIT, 15 out of 60 patients were postponed. Of these, 5 were due to modifiable factors that should have been addressed at an earlier stage, to avoid surgical delays. SUMMIT has been running for a 9 month period (with some disruption due to Covid). We have had a total of 56 patients entered into the SUMMIT pathway and of these, 30 enrolled in the MILE programme. Of 29 patients who have now had surgery, none have been postponed. We have had 2 patients initially deemed too high risk for surgery, who improved through optimisation and prehabilitation, proceed to surgery.

Conclusion:
SUMMIT has improved MDT decision making, allowing earlier identification and optimisation of high-risk patients. It has reduced the number of postponements to surgery and enabled a significant proportion to engage with the hospital prehabilitation programme.

EL201.2/6

Authors: Eleanor Harvey, Dr Jennifer Walters, Dr Urvi Sanganee, Dr Michelle O'Mahoney
Institution: The Royal Marsden Hospital

Title:
Remote Pre-Assessment Clinics for the London Cancer Hub in response to COVID19 – are we achieving a comparable standard of care?

Introduction:
The Cancer Hub, was implemented across 3 hospital trusts in London in response to the COVID19 pandemic. Part of this hub, the Royal Marsden Hospital, to date has seen over 450 patients undergo vital cancer surgery.

The NHS guidance for managing cancer referrals during the pandemic recommends telephone consultations to minimise interactions with health services.[1] This means remote anaesthetic pre-assessment is a vital part of the hub.

Methods:
To assess our outcomes, we compared our scheduled surgery cancellation rate during a 6 week period of 2019 and 2020. We retrospectively reviewed the notes of all patients pre-assessed during these periods, comparing outcomes and identifying the cancellation reasons.

Results:
Both groups had comparative demographics; the majority of patients were female (72% in 2019, 66% in 2020) and with similar average age (57.7 in 2019, 58.7 in 2020). However, the ASA demographics were skewed, with a higher proportion of ASA 1-2 patients in 2019 (71% in 2019, 64% in 2020), and more ASA 3 patients in 2020 (36%).

The overall cancellation rate of scheduled surgeries in 2020 was 12.4% (458 cases, 57 cancellations). Compared to face to face pre-assessment in 2019, where the overall rate was 10.1% (218 cases, 22 cancellations).

COVID19 screening results, (positive or not available) accounted for 16% of cancellations. Removing these cases from the data, makes the 2020 cancellation rate comparable at 10.5%. There is a clear increase in cancellation due to patients needing further medical work up (25% in 2020 to 4% in 2019). However, these have not been day of surgery cancellations.

Conclusion:
There is an overall increased cancellation rate compared to last year. In 2020, once cancellations due to COVID19 have been accounted for, we have pre-assessed twice the number of patients, doing so remotely, with a narrower timeframe for optimisation and still kept cancellation rates similar.

We must monitor the changes in cancellations as the lockdown measures lift, whilst patients self isolate pre-surgery,[2] their household members may not and potentially increasing their risk of exposure, infection and therefore cancellation.

The increase in patients being cancelled for further investigations/optimisation, needs further analysis to determine causality. This could be related to higher risk surgeries, the short referral pathway or due to remote pre-assessment. It is reassuring that our day of surgery cancellation rates

are unchanged, and helps show that remote clinics can be used to pre-assess patients once pathways for optimisation are established.

References:

1. NHS England and NHS Improvement. Cancer alliance information on managing cancer referrals ; 2020.

2. Intercollegiate General Surgery Guidance on COVID-19 27/03/2020 https://www.rcsed.ac.uk/news-public-affairs/news/2020/march/intercollegiate-general-surgery-guidance-on-covid-19-update *Accessed 28/03/2020*

EL201.2/7

Authors: Leena Nagappan, Dr Erica Remedios, Dr Joel Adams
Institution: Fiona Stanley Fremantle Hospitals Group

Title:
Building urgent surgical capacity in a Satellite Hospital for COVID 19, an Australian Perioperative Experience

Introduction:
We describe how we rapidly reconfigured urgent perioperative services from a tertiary teaching hospital COVID center to an elective satellite hospital to maintain urgent surgery services whilst protecting staff and patient health in response to the COVID 19 pandemic.

Methods:
We comprehensively describe our experience of undertaking service reconfiguration to maintain urgent surgery during the COVID 19 epidemic. Areas of focus include a description of the preexisting model of care, screening protocols to ensure site separation of COVID from non-COVID patients whilst including only clinically appropriate patients for a peripheral center, how theatre preparedness was achieved for increased complexity and urgency of patients and 24 hour emergency care and support from a management, staffing and equipment perspective. Our reconfiguration enabled emergency surgery patients to have continued access to theatre whilst allowing theatre capacity to be maintained for COVID positive cases in the main hospital. Patient support services were escalated, including focus on sanitation and hygiene, where we enabled vulnerable staff members to work in a safe environment during the pandemic. Our service plan involved all clinical and allied health perioperative stakeholders in a specialized working group throughout the COVID 19 outbreak.

Results & Conclusion:
We describe how we successfully transferred surgical services to the satellite elective surgical hospital. Specialties of interest included Orthopedic Surgery, General Surgery, Urology and Ophthalmology. This allowed for creation of increased theatre, critical care support and bed capacity at our tertiary center for COVID positive patient care, whilst keeping pre-screened patients safe from COVID 19. In addition we were able to keep vulnerable staff safe through identification and site separation of members of our department whilst maintaining the skill mix needed to provide a safe and efficient perioperative service, and train and maintain personal protective equipment supply at both peripheral and tertiary centers.

EL202.1/1

Authors: Rebecca Jackson, Dr Catherine Cromey
Institution: Morriston Hospital

Title:
Pre-operative screening for obstructive sleep apnoea – Can we improve our current practice?

Introduction:
The perioperative management of patients with a suspected diagnosis of obstructive sleep apnoea (OSA) can be challenging [1-2]. Current practice in Morriston Hospital is to refer all patients with a STOP-BANG score of 3 or greater to a consultant anaesthetist to make a perioperative plan. Referrals for sleep studies are made on an individual basis. Our objective was to initially review the pre-assessment referrals made for sleep studies over a period of 12 months. Using this data along with the published evidence available, our secondary aim was to develop a guideline for the pre-operative management of these patients.

Methods:
Firstly, all pre-assessment referrals for sleep studies were reviewed over a 12 month period. We recorded: the sleep study result, STOP-BANG score, planned operation, and the time from referral for sleep study to the date the patient was declared "fit for surgery". Secondly, a systematic review of the literature was conducted with regard to the perioperative care of patients with a high suspicion of OSA.

Results:
Fifty-five patients were referred for sleep studies. Sixteen patients were either still waiting, not tested, or did not attend their appointment. Twenty-five patients required positive airway therapy treatment following the sleep study result. No association was found between the STOP-BANG score and incidence of OSA. The average time from referral for sleep studies to being deemed 'fit for surgery' was 19 weeks.

There are few large scale clinical trials in this area of perioperative medicine, therefore the review of the literature mostly consisted of review articles and consensus-based guidelines [3-10]. Nevertheless, published opinion suggests patients with suspected OSA can be safely managed perioperatively [3-6]. Provided comorbid conditions are optimized and strategies are in place to mitigate risk, delaying surgery to perform further investigation is not always required [1,3-4]. Based on these findings a pre-assessment guideline for the management of patients with suspected OSA was formed (Fig. 1).

Conclusion:
There is a reasonable delay to surgery caused by waiting for sleep study investigations that may not always be necessary. By using our guideline, we could have potentially prevented 21 patients (38%) from being referred, thus preventing an avoidable delay to surgery. The guideline is currently under review within the pre-assessment department, with a view to introduce it on the resumption of normal service.

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1. Ayas NT, Laratta CR, Coleman JM et al. Knowledge gaps on the perioperative management of adults with obstructive sleep apnea and obesity hypoventilation syndrome. An official American thoracic society workshop report. Annals of the American Thoracic Society, Vol 15, pp117-126, 2018.

2. Dimitrov L & Macavei. Can screening tools for obstructive sleep apnea predict postoperative complications? A systematic review of the literature. Journal of Clinical Sleep Medicine, Vol 12, pp1293-1300, 2016

3. Chung F, Memtsoudis SG, Ramachandran SK et al. Society of anesthesia and sleep medicine guidelines on preoperative screening and assessment of adult patients with obstructive sleep apnea. Anesthesia and Analgesia, Vol 123, pp452-473, 2016

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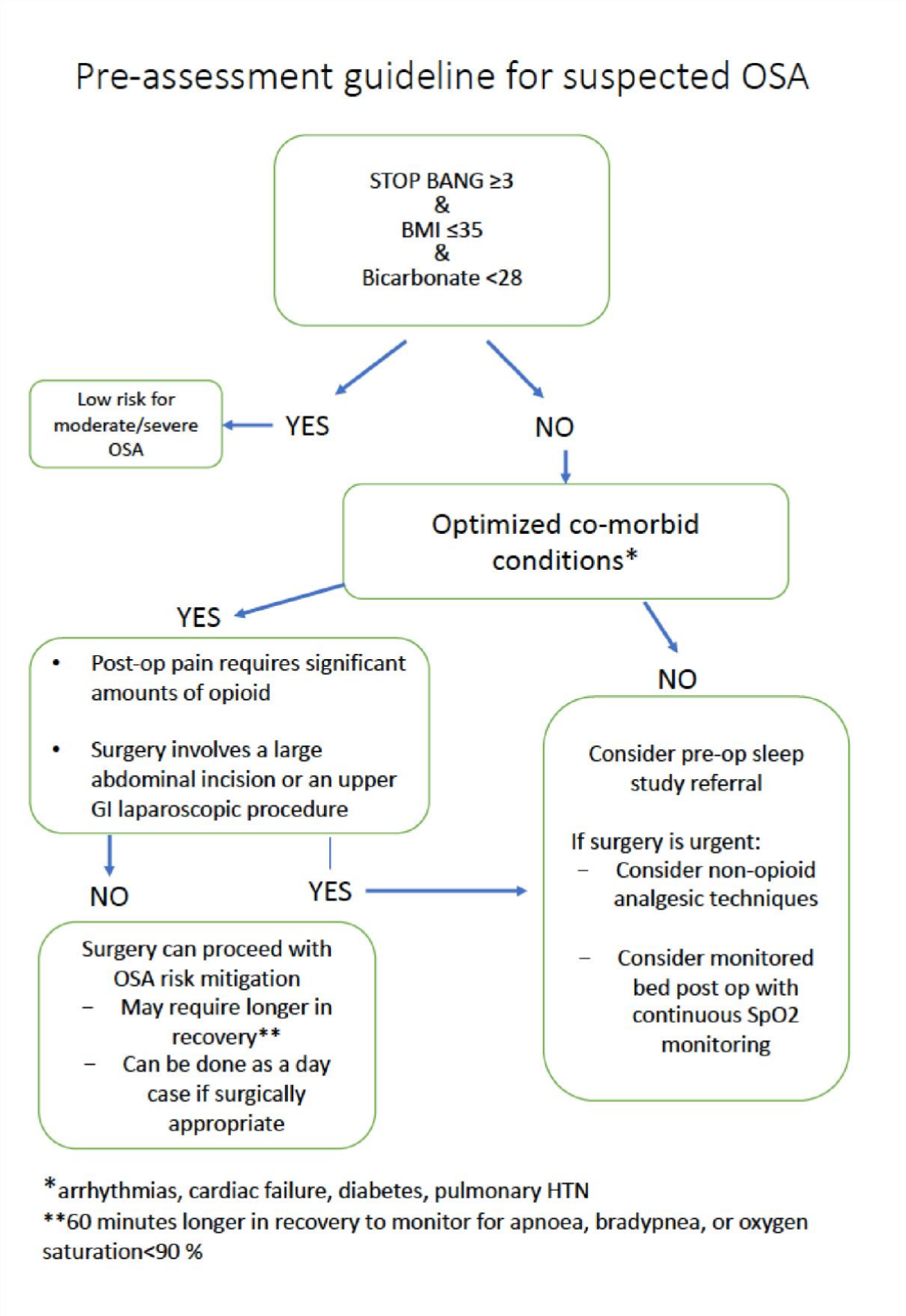
7. Nagappa , Wong J, Singh M, Wong D & Chung F. An update on the various practical applications of the STOP-Bang questionnaire in anaesthesia, surgery and perioperative medicine. Current Opinion in Anaesthesiology, Vol 30, pp118-125, 2017.

8. Cozowicz C, Poeran J, Zubizarreta N et al. Non-opioid analgesic modes of pain management are associated with reduced postoperative complications and resource utilisation: a retrospective study of obstructive sleep apnoea patients undergoing elective joint arthroplasty. British Journal of Anaesthesia, Vol 122, pp131-140, 2019.

9. Chung F, Abdullah, Liao P. STOP-Bang questionnaire a practical approach to screen for obstructive sleep apnea. CHEST, Vol 149, pp631-638, 2016.

10. Chung F, Chau E, Yang Y et al. Serum bicarbonate level improves specificity of STOP-Bang screening for obstructive sleep apnea. CHEST, Vol 143, pp1284-1293, 2013.

Figure 1.


Pre-assessment guideline for suspected OSA
STOP BANG ≥3
&
BMI ≤35
&
Bicarbonate <28
YES
Low risk for moderate/severe OSA
NO
Optimized co-morbid conditions*
YES
• Post-op pain requires significant amounts of opioid
• Surgery involves a large abdominal incision or an upper GI laparoscopic procedure
NO
Surgery can proceed with OSA risk mitigation
– May require longer in recovery**
– Can be done as a day case if surgically appropriate
YES
NO
Consider pre-op sleep study referral
If surgery is urgent:
– Consider non-opioid analgesic techniques
– Consider monitored bed post op with continuous SpO2 monitoring
*arrhythmias, cardiac failure, diabetes, pulmonary HTN
**60 minutes longer in recovery to monitor for apnoea, bradypnea, or oxygen saturation<90 %

EL202.1/2

Authors: Sanjeev Sahota, Dr Simon Gill, Dr Alexandra Miller, Dr Katherine Pope
Institutions: Royal Cornwall Hospital

Title:
Piloting a Multi-Disclipinary Study Day: Addressing Barriers to High Quality Perioperative Care

Introduction:
250,000 of the ten million NHS patients undergoing surgery each year are considered high risk due to comorbidity or frailty, and evidence increasingly suggests we are failing to optimise their perioperative management[1]. Perioperative medicine refers to a multidisciplinary approach delivering patient-centred, integrated medical care from the point where surgery is considered through to a patient's recovery. In response to the gap in medical education within perioperative medicine[2,3], we developed an interactive study day for trainees aimed at improving understanding and confidence in managing complex perioperative patients. By bringing together the skills and expertise of a wide collaborative team and sharing examples of good practice, the aim of the program was to increase understanding and confidence in managing complex perioperative patients.

Methods:
We created a one day teaching programme incorporating short interactive lectures, small group case-based discussion and high-fidelity simulation involving complex surgical patients. The 17 candidates consisted of surgical, medical and anaesthetic trainees, from foundation level 2 to junior registrar level. The faculty consisted of anaesthetists, geriatricians, intensivists and surgeons. All candidates completed an anonymous questionnaire based on the Kirkpatrick Evaluation Model[4] before and after the training, with a follow-up questionnaire emailed to candidates 3 months later. We used a two-tailed Wilcoxon signed-rank test to capture whether there was a true difference between reported scores before and after the study day.

Results:
Our small study found statistically significant improvements in self-reported confidence and competence managing perioperative medical problems, assessing patient capacity, understanding the role of intensive care and other non-surgical specialties, and communicating with other specialties. All candidates felt the study day was useful, and were either very likely (75%) or likely (25%) to recommend the day to their peers. Positive reported outcomes were retained at 3 months follow-up, i.e Kirkpatrick evaluation level 3, change in behaviour.

Conclusion:
The primary goal of perioperative medicine is to provide safe and good quality care to patients throughout their surgical journey[1] with a number of national bodies recommending an increase in multidisciplinary perioperative medical care for surgical patients.[4,5] Our results showed significant improvements in candidates' understanding and confidence managing perioperative patients within a multidisciplinary team, suggesting that study days such as this can be an effective training tool to improve perioperative care, especially in terms of collaborative team working and shared decision making.

References:

1. The Royal College of Anaesthetists, London:RCoA, 2015
2. Partridge et al, Age and Ageing, 43(5), 721-724, 2019
3. Shipway et al, Journal of Surgical Education, 72(4), 641 – 647, 2015
4. Kirkpatrick & Kirkpatrick, Berrett-Koehler Publishers, 2006

EL202.1/3

Authors: Sarah John, Dr Matthew Stott
Institutions: Aintree University Hospital

Title:
Assessing the need for a Preoperative Frailty Service at Aintree University Hospital

Background:
Frailty is defined as a clinically recognisable state of increased vulnerability resulting from aging-associated decline in reserve and function across multiple systems resulting in a reduced ability to cope with everyday and acute stressors. It is associated with poor healthcare outcomes including increased complication rates and mortality following elective surgery[1]. The increased surgical risk in frail patients is due to comorbidities; cardiac failure, arrhythmias and reduced exercise tolerance. This can be improved by optimisation prior to elective surgery if the patients at risk are identified[2]. This includes preoperative geriatrician input, prehabilitation and planning for increased social support postoperatively.

Aims:
This project aims to identify the scale of the problem of frailty at Aintree University Hospital with a view to developing a perioperative frailty service. This service would be a multidisciplinary approach to the optimisation of patients before and after surgery.

Methods:
Data was collected on patients over the age of 60 presenting at preoperative assessment clinic prior to elective surgery over a two-week period. The Rockwood Clinical Frailty Score was used to give a clinical frailty score (CFS), demographics such as number of medications and relevant speciality were recorded.

Results and Discussion:
Data was collected on >75% of patients passing through pre-op clinic. 35% patients during the time frame were over 60 (N=160). 33% of these had a CFS of 4 or over (N = 53). This proportion was greatest in hepatobiliary and upper gastrointestinal specialties (41%), urology (38%) and orthopaedics (38%). Of those with a CFS greater than or equal to 4, 40% had cancer diagnosis and 83% were on five or more medications. This data indicates that a substantial proportion (33%) of patients over 60 are considered as frail on the CFS. They could gain considerable benefit from a frailty service resulting in reduced complications, reduced hospital stays and quicker return to independence.

Conclusion:
This data gives a snapshot of the number of frail patients requiring elective surgery at Aintree University Hospital and suggests that a preoperative frailty service could benefit a considerable number of vulnerable patients.

References:
1. Lin, H. et al. Frailty and post-operative outcomes in older surgical patients: a systematic review. *BMC Geriatrics.* 2016;151
2. Harari D. et al. Proactive care of older people undergoing surgery ('POPS'): Designing, embedding, evaluating and funding a comprehensive geriatric assessment service for older elective surgical patients. *Age and Ageing.* 2007;36:190-196

EL202.1/4

Authors: Eleanor Powell, Dr Michael Adamson, Prof Richard Davies, Dr Ian Appadurai, Dr Huw Evans
Institution: University Hospital of Wales, Cardiff

Title:
Cardiopulmonary Exercise Testing (CPET) in South Wales: Does our surgical population need prehabilitation?

Background:
Cardiopulmonary exercise testing (CPET) assesses baseline cardiorespiratory fitness to help guide shared decision making and patient risk stratification prior to surgery. CPET can also be used for comorbidity optimisation and plan prehabilitation through individualised exercise programs.[1] Prehabilitation is "the process of enhancing an individual's functional capacity to enable him or her to withstand a forthcoming stressor such as major surgery".[2] We have conducted a review of our preoperative CPET data from 2008 to 2018 and compared to the published literature, in order to better understand the fitness of our South Wales population.

Method:
We conducted a retrospective review of preoperative CPET data over a 10-year period from 2008 to 2018. Values for anaerobic threshold (AT), peak oxygen consumption (peak VO_2), ventilatory equivalents for carbon dioxide (VE/VCO_2) were collected along with age, sex and type of surgery. Patients were excluded from peak VO_2 analysis if their respiratory exchange ratio (RER) at peak exercise was less than 1.05. Data was analysed for normality using SPSS. Data was parametric, thus further analysis used mean and standard deviation.
We reviewed three meta-analyses assessing the use of CPET for preoperative risk stratification. We extracted AT and PVO_2 data from 43 studies included in these meta-analyses for comparison with our population.

Results:
2557 patient CPET reports were analysed; 1670 (65%) male and 887 (35%) female. The average age was 68 and 67 years, for men and women, respectively. The mean AT was 10.9mls/kg/min (n=2085, SD2.5). 70% females and 48% males had an AT below 11.0mls/kg/min. The mean VE/VCO was 33.5 (SD 5.8) with 35% of males and 38% females having a VE/VCO >34. 1642 (73%) patients were determined to have a good effort CPET with RER>1.05 and included in analysis of peak VO_2. The mean peak VO_2 for our population was 17.1mls/kg/min; 18.1mls/kg/min for males and 14.9mls/kg/min for females. Figure 1 is a bubble chart comparing our mean population PVO_2 with those extracted from 37 CPET research studies. Figure 2 is a bubble chart comparing our mean population AT with those extracted from 43 CPET research studies.

Figure 1: A bubble chart showing the mean $PV0_2$ for Cardiff compa0red to other published CPET studies. (The size of the bubble represents the size of the study population).

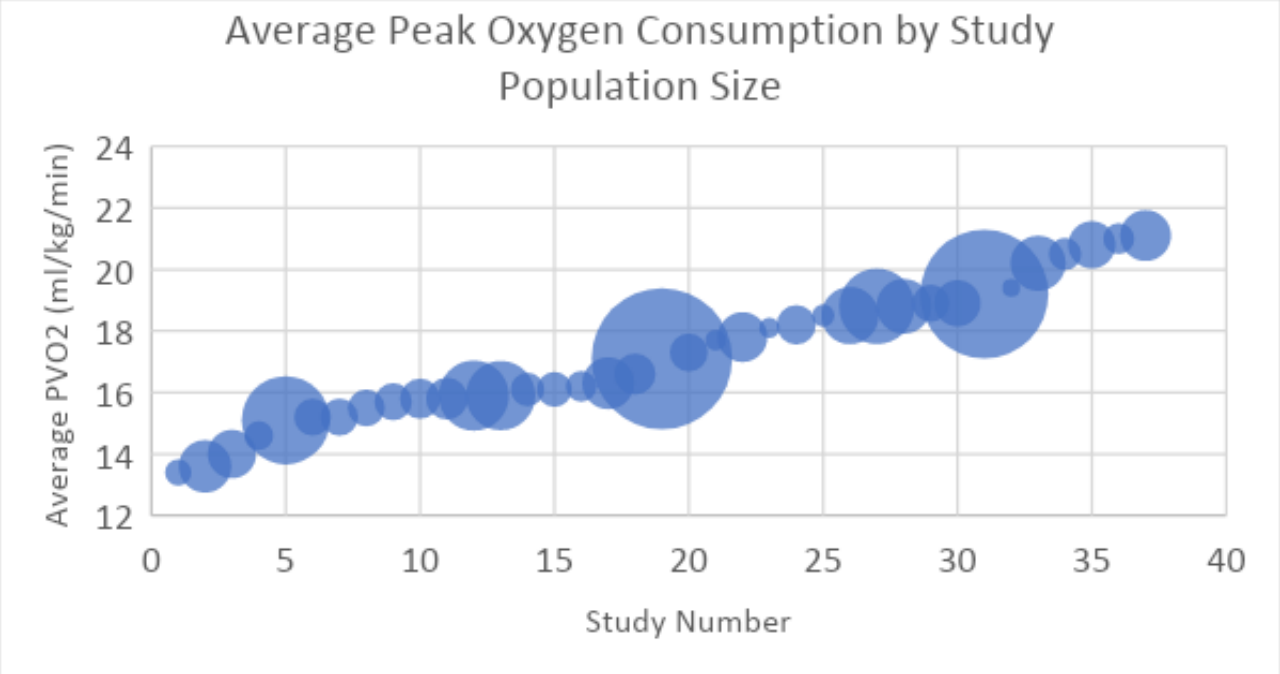
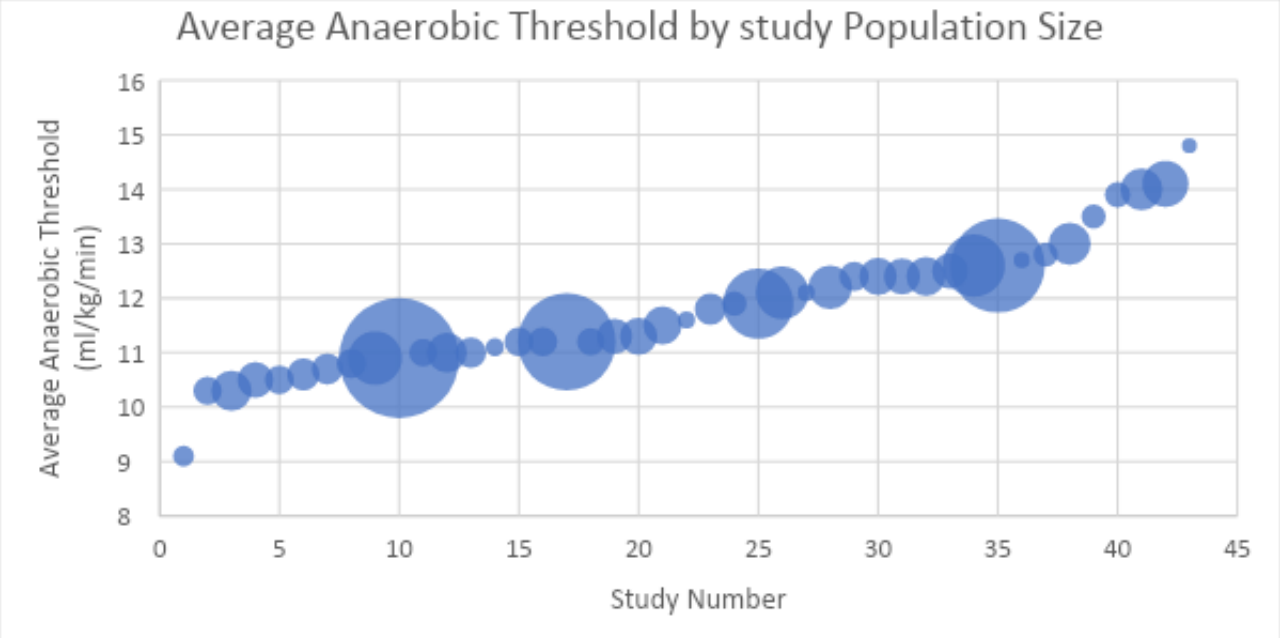


Figure 2: A bubble chart showing the mean AT for Cardiff compared to other published CPET studies. (The size of the bubble represents the size of the study population).



Discussion:
The mean AT for our 2557 patients was 10.9mls/kg/min, suggesting we serve a relatively unfit, deconditioned population. Comparing our mean AT against other published CPET studies, supports the notion that our population appears to have relatively low preoperative fitness levels. The relatively low mean AT compared to $V0_2$ may suggest potential for improving baseline fitness of our patient population using preoperative exercise.[3,4] In addition, a large proportion of females (70%) had an AT below the suggested 11mls/kg/min cut off, which raises the question whether there is a need for separate risk cut offs for male and female patients; one size may not fit all.[5] Our findings support the continued use of CPET to assess individual patient's functional capacity and define perioperative risk. In the future, CPET is likely to have an increasingly sophisticated role in shared decision making and guiding multimodal prehabilitation programmes.

References:

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EL202.1/5

Authors: Dr Supanki Kamalanathan, Dr Mruga Diwan
Institutions: Royal Liverpool University Hospital

Title:
Lessons Learned after the Implementation of a New Anaemia Pathway for Major General Oncological Resections

Introduction:
There has been increasing awareness in perioperative anaemia, contributing to postoperative complications, increased blood transfusion needs and increased hospital stay.[1] An international consensus has stated some key recommendations in the preoperative setting including[2]:

- Target haemoglobin should be >130g/L in both sexes.[2]
- Serum ferritin <30ug/L is the most specific and sensitive test for iron deficiency (with some caveats to this).[2]

As a result, the consensus statement recommended hospitals should implement a perioperative care pathway to quickly identify anaemic patients before surgery and treat with oral/IV iron. At the Royal Liverpool University Hospital, a new pre-operative anaemia pathway was implemented in December 2019 (see Figure 1). This prospective audit looked into this pathway for major general oncological cases at the RLUH.

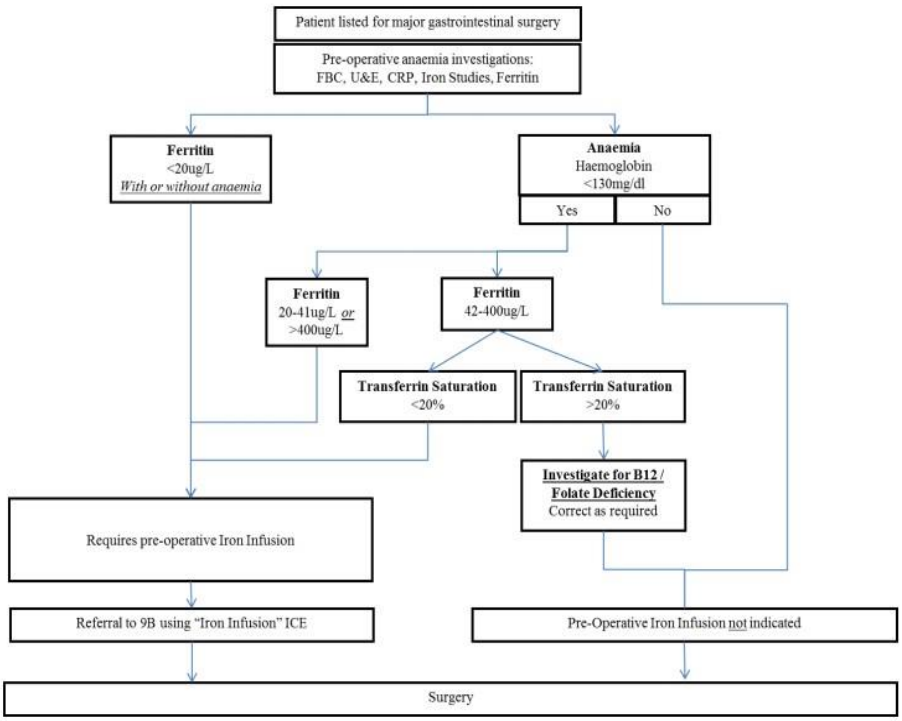

Figure 1: Decision Making Algorithm in the Management of Perioperative Anaemia in Major Oncological Resections

Method:

From 1st December 2019-10th March 2020, we prospectively looked at all the major general cancer resections at our institution. We noted pre-operative haemoglobin, ferritin and transferrin saturation, whether they met the above criteria and if they did, we documented if they received IV iron.

Results:

The study collected data from 101 patients. 43 patients were not anaemic and did not require IV iron. 26 patients did not have full investigations and therefore could not confirm as to whether they would have met the criteria. All of these patients had full blood count/haemoglobin but data on ferritin and transferrin saturation was missing. 32 patients did have the full investigations and met the criteria for IV iron. Of these patients, only 8 received IV iron.

Conclusion:

This project shows that not all pathways are fully successful upon first implementation. However, the importance of early auditing draws attention to initial problems in a timely fashion. We believe issues with patients receiving IV iron occurred due to 2 factors: the lack of routine ferritin and iron studies testing for these patients and lack of a robust iron referral pathway in place for the preoperative team. As a result, we are developing a system whereby anaemia patients can be more easily picked up in preoperative clinic. This hopefully will then trigger ferritin and iron studies and the involvement of anaemia specialist nurses. We aim to re-audit this pathway and hope to find some improvement in our perioperative anaemia management in major general oncological patients.

References:

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2. M Munoz et al. International consensus statement on the peri-operative management of anaemia and iron deficiency. *Anaesthesia.* 2017:72(2):233-247

EL202.1/6

Authors: Dr Rosie May, Ms Lynn Davies, Dr Michelle Leemans
Institution: National Hospital for Neurology and Neurosurgery

Title:
Neurosurgical pre-assessment clinic reduces on the day theatre cancellations

Introduction:
Cancellations on the day of intended neurosurgery contribute to poor patient experience, delays in treatment, reduced theatre efficiency and increased length of hospital stay, with associated financial implications for institutions. Additionally there are physical, psychological and financial implications for patients[1]. We conducted a retrospective service evaluation to assess the burden of these clinical cancellations in our tertiary institution and whether attendance at pre-assessment clinic (PAC) would affect this.

Methods:
We retrospectively reviewed all operations cancelled for clinical reasons on intended day of surgery over a one-year period (01/04/2019 - 31/03/2020) in an adult neurosurgical centre. Electronic case records were evaluated to determine the incidence of and the reason for clinical cancellations and whether the patient had been seen in PAC prior to admission. Fisher's exact test was used to determine if assessment in PAC statistically reduced the likelihood of cancellations. For patients seen in PAC, we also considered which causes of cancellation were potentially avoidable.

Results:
Seventy-eight operations of 2443 scheduled (3.2%) were cancelled on intended day of surgery for clinical reasons. Of those, 39 of 2029 (1.9%) patients seen in PAC were cancelled. This compares to 39 of 414 (9.4%) not seen in PAC ($p<0.0001$). For patients seen in PAC, the most common cancellation reasons were acute medical problems (9/48, 19%) and differing opinions between anaesthetists in PAC and on day of surgery (6/48, 13%). For patients seen in PAC, we judged 16 cancellations (41%) to have been potentially avoidable, being predominantly due to medication errors, communication issues and short interval between PAC and surgery. We were unable to assess a potentially avoidable cancellation rate for patients not seen in PAC.

Conclusion:
Cancellations on day of surgery were over four times less likely for patients seen than for patients not seen in PAC. Quality improvement initiatives are consequently being implemented to increase the proportion of patients seen in PAC, to optimise the interval between PAC and surgery and to improve written and verbal communication with patients about peri-operative medication changes.

References:
Dimitriadis PA, Iyer S, Evgeniou E. The challenge of cancellations on the day of surgery. International Journal of Surgery Volume 11, Issue 10, December 2013, Pages 1126-1130

EL202.1/7

Authors: Katherine Sutherland, Dr Katherine Nickell
Institution: Southmead Hospital, North Bristol NHS Trust

Title:
Optimising the perioperative pathway for patients with learning disabilities

Introduction:
Adult patients with learning disabilities regularly attend North Bristol NHS Trust for procedures requiring anaesthesia. Until recently, there was no process for identifying these patients perioperatively, and no guidance on managing this complex group, who are at risk of significant health disparities (1). This led to an increasing number of complaints, day of surgery cancellations and suboptimal care at different points along the perioperative journey.
The objective was to improve the management of patients with learning disabilities attending for surgery under general anaesthetic or sedation, and to formalise a pathway for care from the point patients are listed for a procedure.

Methods:
The Trust anaesthetists were surveyed on their experiences of managing this patient group. A working group was then organised, including preoperative assessment clinic (POAC) staff, the learning disability (LD) team, theatre leads and anaesthetists, to devise an improved pathway of care.

The processes the surgical specialties used to book patients for procedures and the pathway the patients followed preoperatively were identified. In particular, complaints were examined to identify weaknesses in the current system and points at which communication failed.

Results:
Of 45 anaesthetists completing the survey, 66% had anaesthetised a patient with a learning disability in the past 6 months. 47% felt neutral/unconfident in management of this patient group and 100% welcomed guidance.

Identification of these patients was prioritised at booking for all 11 surgical specialties and a system was devised for alerting POAC and the LD team before patients attended POAC. This was disseminated via divisional Clinical Governance meetings.

Communication between POAC and the theatre team was also scrutinised. The information gathered and plan made at POAC is now disseminated via an email RADAR alert to all staff groups involved in care on the day of procedure.

Guidance for discussion with patients/carers at each stage of assessment was addressed, and considerations for reasonable adjustments suggested (table 1).

Considerations prior to POAC	**Planning for day of procedure**
Could preoperative assessment be done remotely?	Access to hospital via quieter route?
Consider bloods in the community	Timing of procedure e.g. first on list Additional time allowances.
Appropriate timing of face to face appointment e.g. early in the day	Mobility needs

Accessibility of hospital	Information prior to procedure, desensitisation necessary?
Waiting in quieter area	Distraction on day of surgery
POAC nurse, anaesthetist and LD team assessment simultaneously, if appropriate	Plan for sedation
Hospital passport filled in by patient/carer	Carers or relatives' presence in theatre
Mental Capacity Assessment/Consent form	Alerts and Communication with theatre team, i.e. RADAR

***Table 1**: Considerations for reasonable adjustments prior to POAC and when planning for attendance on day of procedure*

The work was synthesised into a guideline, describing the pathway of care (figure 1), to enable joined up management of patients from booking to recovery.

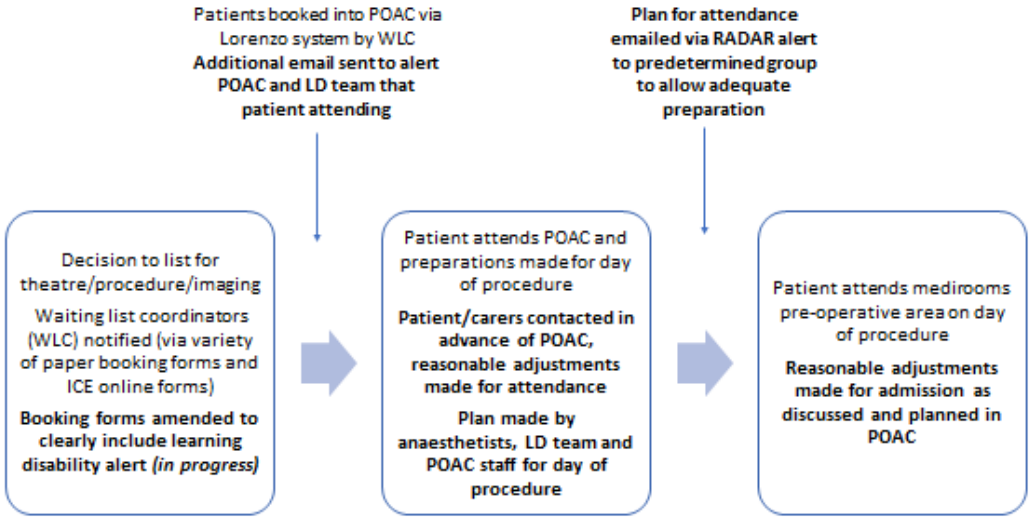

***Figure 1**: Pathway for management of patients with a learning disability attending for a procedure under general anaesthesia or sedation (new changes introduced in **bold**)*

Conclusion:

The working group, consisting of POAC, LD and theatre teams, brought a range of skills and experience, and will be useful ongoing to maintain optimal care of this patient group. Standardising the perioperative pathway for patients with learning disabilities will increase patient, carer and staff confidence that patients are able to access healthcare appropriately, resulting in better experiences for everyone involved throughout their pathway of care.

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EL202.2/1

Authors: Ann-Marie Crowe, Dr Brian Marsh
Institution: Mater Misericordiae University Hospital (MMUH), Dublin

Title:
Resuscitation orders in the perioperative setting: a survey of knowledge, attitudes and practices among consultant and trainee anaesthesiologists

Introduction:
With advance directives gaining more clarity in state legislation in Ireland (1, 2), anaesthesiologists in Ireland will inevitably come across adult patients with documented resuscitation orders that will legally and ethically demand interpretation when encountered in the perioperative setting. An international study (3) has shown variable perceptions among anaesthesiologists towards the binding nature of resuscitation orders in the context of anaesthesia provision, particularly when associated with emergency situations or iatrogenic complications.

Methods:
Ethics approval was obtained via the hospital Institutional Review Board. A cross-sectional online survey was distributed to anaesthesiologists in hospitals across Ireland. The survey comprised of 30 questions covering five areas: demographics, knowledge, practice, discussion and barriers. Cloudbased software (www.surveymonkey.com) was employed to create, distribute and collate results.

Results:
11 teaching hospitals participated. 29% response rate (n=161), 76.4% completion rate (n=123). 74.8% of respondents do not know if there are published guidelines (4, 5) for patients with resuscitation orders in the perioperative setting. 65.85% do not know if there is a local hospital policy for same. Sources of knowledge of the applicability of resuscitation orders in the perioperative setting include previous clinical experience (62.6%), personal reading (43.9%), formal training from the college (12.2%) and workplace training (4.9%).

There was no uniform consensus on the suspension of resuscitation orders in the perioperative period. 43.9% of respondents would initiate resuscitation in the event of *any* arrest occurring in theatre, with 66.7% initiating resuscitation if secondary to iatrogenesis, irrespective of an order stating otherwise.

47.1% report that, if present, a patient's resuscitation order *rarely or never* makes specific reference to anaesthesia or critical care interventions. Nearly half (46.4%) *rarely or never* initiate discussions with patients about perioperative treatment limitations or goals. 82.9% agree that uncertainty around the applicability of such orders in the perioperative setting is a barrier to discussion. Perception of adequacy of training was low and 92.7% agree that formal training would be beneficial to their clinical practice.

Conclusion:
The study demonstrates a need for education on the management of patients with resuscitation orders in the perioperative setting. By uncovering low self-perceived levels of knowledge of legislation and guidelines, and by highlighting mixed attitudes towards resuscitation orders and variability in current practices, the authors hope that the study initiates much-needed conversations on the topic, particularly at a time when advance directives find a more firm legal footing in Ireland.

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EL202.2/2

Authors: Elizabeth Neale, Dr Christopher Leddy, Mr Andrew Tait, Dr Myra McAdam
Institution: Glasgow Royal Infirmary

Title:
Postoperative pulmonary complications at Glasgow Royal Infirmary (GRI) following emergency abdominal surgery

Introduction:
Postoperative complications (PPC) following major surgery are a common cause of increased morbidity, mortality and length of stay[1]. The development of PPC are potentially modifiable at various points along the perioperative pathway. We audited the incidence of PPC in patients following emergency abdominal surgery at GRI with the aim to establish our local PPC rate and identify and address potentially modifiable risk factors to improve patient care.

Methods:
Patients were identified retrospectively from the local Emergency Laparoscopic and Laparotomy Scottish Audit (ELLSA) database between November 2017 and October 2018. Electronic clinical records were used to calculate the PPC rate. A PPC was defined as a new or ongoing oxygen or ventilatory requirement or where there was evidence that the patient was on antibiotics for a confirmed or suspected lower respiratory tract infection on postoperative day 7. We also collected data regarding patient characteristics, length of stay, ventilation and neuromuscular blockade, and retrospectively calculated each patient's ARISCAT[2] score.

Results:
250/264 patients were included for initial analysis. The PPC rate was 22.4% (56/250).

Characteristic	PPC (n)	Non-PPC (n)	Statistical analysis (p)
Sex: Male Female	46% (26/56) 54% (30/56)	42% (79/187) 58% (108/187)	0.57
Median Length of Stay (days)	20 (56)	8 (186)	<0.00001
30 day mortality	7% (4/56)	6% (12/194)	0.79
Mean ARISCAT score	57 (55)	45 (187)	
Neuromuscular blockade reversal not given or documented	20% (10/49)	11% (20/188)	0.06
Ventilation not recorded: PEEP Tidal volume	 55% (30/55) 55% (30/55)	 47% (87/186) 48% (89/186)	0.31

Table 1. Analysis of results by PPC and non-PPC subgroups. 49-56/56 in the PPC group and 186-194/194 in the non-PPC group were analysed depending on data available.

Conclusion:
The local incidence of PPC was similar to those previously quoted[1,3]. Patients who developed a PPC had a higher mean ARISCAT score, median length of stay and mortality rate. This was lower than the nationally reported mortality rate[4]. There was a high proportion of cases were ventilation was not documented, and in patients who developed a PPC, where neuromuscular blockade reversal was not given or documented. These findings have informed the development of a strategy targeting modifiable perioperative risk factors for patients undergoing emergency abdominal surgery (see figure 1). A planned re-audit will take place following the implementation of this strategy.

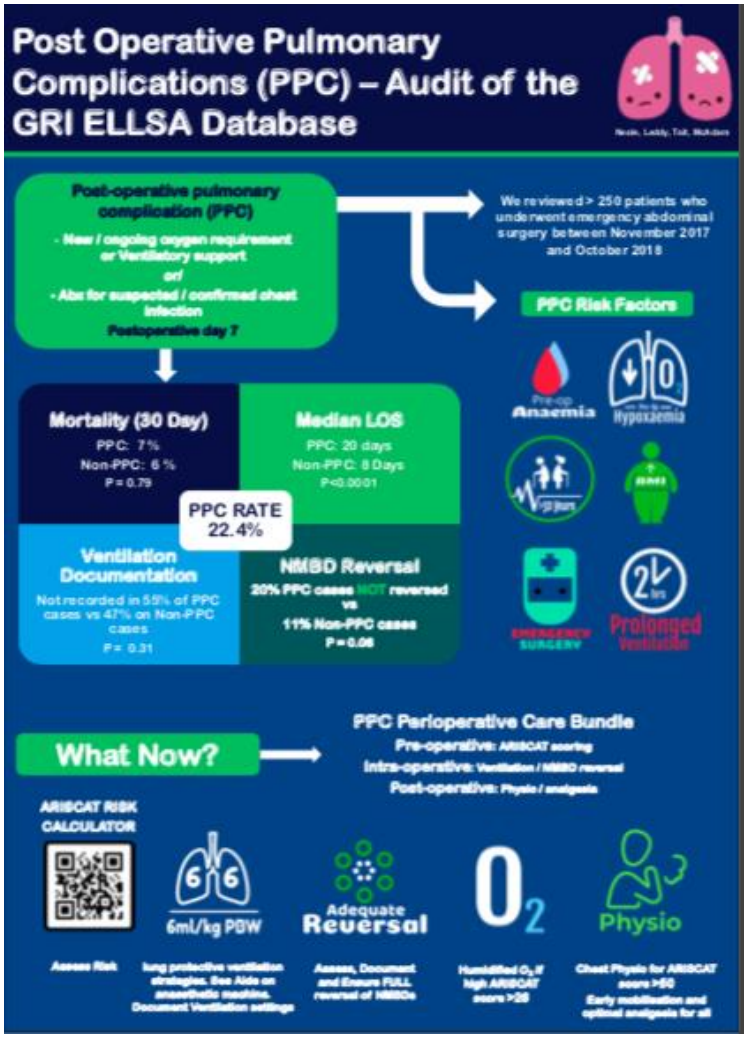

Figure 1. An infographic detailing the new strategy to reduce PPC.

References:

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EL202.2/3

Authors: Luke Nixon, Dr Lucy Stacey, Dr Charlotte Oliver, Dr Sara Churchill
Institution: University Hospital Wales, Cardiff

Title:
Bad Blood, Bad Recovery

Introduction:
Pre-operative anaemia is well evidenced to significantly increase in hospital mortality and hospital stay length, increasing mortality by a 1.99 odds ratio[1]. Whilst another study reported a significant association between pre-operative anaemia and haemorrhage during orthopaedic surgery[2]. Review of major elective surgery within the PQIP (Perioperative Quality improvement Programme) showed a void in our assessment and subsequent management of patients with anaemia presenting for major elective surgery. Therefore, a quality improvement project was commenced to highlight, assess and manage perioperative anaemia with the aim of improving postoperative morbidity, minimise inpatient stay and transfusions; improving quality of care.

Methods:
Patients undergoing major elective surgery between March to October 2019 consented for recruitment in our local PQIP data collection at the University Hospital of Wales, Cardiff. Results included 268 patients with 17 excluded due to incomplete data. The sample was divided into anaemic (Hb<13g/dL) and non-anaemic (Hb≥130g/dL) groups, with data collected on the mean Hb, anaemia treatments undergone, and the estimated blood loss during surgery.

Results:
A small percentage (26.5%) of the UHW operative patients with confirmed anaemia are receiving anaemia treatment, with 16.3% being oral ferritin therapy. The mean Hb in the anaemic group (Hb<13g/dL) is relatively low with a Hb of 11.76. There is significant evidence (P<0.005) that patients with confirmed anaemia (<13g/L) are more likely to undergo significant bleeding peri-operatively (blood loss >500mL), with an odds ratio of 2.72 (see table 1.)

Conclusion:
There is evidence that the UHW surgical patients within the PQIP study are being undertreated for anaemia, despite a low mean Hb within this group. These patients are consequently over 2.5x more times likely to undergo large blood loss during their surgery. In response, we have introduced a new anaemia pathway (see figure 1) involving an anaemia diary as part of our quality improvement cycle to improve the quality and continuity of care to this group of surgical patients.

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Table 1: Comparison of anaemia against per-operative blood loss

[Hb]	Blood Loss	
	≤500mL	>500mL
<13g/L	67 (71.3%)	27 (28.7%)
≥13g/L	136 (86.6%)	21 (13.4%)

X_2	$P = 0.003$
Phi-coefficient	0.189
Fisher's Odds Ratio	2.72

Figure1: The new pre-operative anaemia pathway

EL202.2/4

Authors: Dr Iain Mooney, Dr Simon Lewis
Institution: Southmead Hospital, Bristol, UK

Title:
Man versus machine: is there agreement on ASA grading between an automated system and anaesthetists?

Introduction:
Southmead Hospital is an 800-bed tertiary referral centre in Bristol, UK. Its preoperative assessment clinic (POAC) sees all patients booked for elective surgery, which approximates to over 35,000 operations per year (1).

Since 2019 a pre-operative software system called Synopsis iQ (Intouch with Healthcare, Cirencester, UK) has been trialled. This records their visit and generates an American Society of Anaesthesiologists (ASA) grade based upon data entered in clinic. A summary is then placed into the patient's notes.

Automated ASA grading has previously demonstrated close agreement with human classifiers (2). ASA grades from patient-entered information could be used to screen and triage patients remotely without clinicians, avoiding unnecessary visits to hospital for those in the lowest risk gropus. This is even more valuable given the COVID-19 pandemic.

Methods:
A snapshot audit was performed in October 2019 using patient lists from 2 days in August 2019. 138 patients attended clinic, 48 were excluded due to incomplete data or cancelled/delayed surgery leaving 90. Using Synopsis, the ASA grade was retrieved using an NHS number. This automated ASA (cASA) was recorded along with day of surgery ASA ($eASA_1$) which was retrieved from an electronic documentation system. Anaesthetists were also asked to perform a blinded desktop review using Synopsis to generate a 3rd ASA ($eASA_2$).

Results:
14 patients (12.6%) had an underestimation of cASA when compared with the day-of-surgery anaesthetist ($eASA_1$) as seen in table 1.

Table 1. Contingency table of cASA <3 and >2 vs $cASA_1$ <3 and >2

cASA	eASA		Total
	I or II	III or IV	
I or II	56	14	70
III or IV	5	15	20
Total	61	29	90

Similarly, 16 (14.4%) cASA grades were underestimated when using a second anaesthetist ($eASA_2$). Agreement between human graders ($eASA_1$ and $eASA_2$) found underestimation in 10 cases (9%) and overestimation in 7 (6.3%).

Conclusion:

When compared to a larger data set from the Netherlands, we found an 11-fold higher rate of misclassification between automated ASA grading and anaesthetist grading (2). These misclassifications were between the categories of ASA I/II and ASA III/IV. Our findings would suggest that our local system is not ready to use as a triage tool to screen for those who are appropriate to have a remote, clinician-less preoperative assessment. However, there is also disagreement between clinicians, which may point to the possible ethereal nature of ASA grading.

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2. Zuidema X, Tromp Meesters R, Siccama I, Houweling P. Computerized model for preoperative risk assessment. Br J Anaesth. 2011;107(2):180–5.

EL202.2/5

Authors: Jonathan Wilson
Institution: York Hospital, York UK

Title:
Intervention for abdominal aortic surgery: choosing wisely

Introduction:
Planned interventions for abdominal aortic aneurysm (AAA) carry a mortality risk, which for open surgical repair was 3.2% in 2017, and for endovascular repair (EVAR) was 0.7%. Recent draft guidelines for management of AAA from the UK National Institute of Clinical Excellence state EVAR confers no long-term benefit, requires when compared with *uneventful* open repair. We analysed our elective open AAA repairs from 2004 to 2018, to identify significant pre-operative factors associated with mortality, and to evaluate whether cardio-pulmonary exercise testing (CPET) has utility. Risk factors would then be used to create a simple, pragmatic scoring system to aid identification of patients for safe open repair.

Methods:
A retrospective analysis of prospectively gathered data, approved by York Teaching Hospitals R&D Dept, and HRA.
Demographic, co-morbidity and CPET data were extracted from the main CPET database, checked for completeness and accuracy, cross referencing with information from CPD where necessary. Hospital mortality and long-term survival were obtained from CPD. Data were analysed with SPSS.

Receiver operating curves (ROC) were constructed to assess predictive utility of linear variables such as VE/VCO_2, AT, and age. Univariate analysis and binary logistic regression, where appropriate, were used to determine whether other binary variables, such as the prevalence of a particular co-morbidity, were independently associated with post-operative survival.

Results:
483 had open AAA repair (6.2% mortality). 69 patients (9%) had pre-operative medical interventions as a result of CPET.

Three independent categories of risk factor were identified:

1. Age Risk: Age > 74 triggered **Age Risk** (OR 3.9, 95% CI 1.6-9.5).
2. Co-morbidity Risk: Any of cardiac failure, dysrhythmia, cerebrovascular disease or renal insuffiency triggered **Co-morbidity Risk** (OR 3.8, 95% CI 1.8-8.4).
3. CPET Risk: either or both Anaerobic threshold < 11.4, or Ventilatory Inefficiency (VE/VCO2>36) trigger **CPET Risk** (OR 3.99, 95% CI 1.17-8.37).

Patients were allocated into one of two groups based on Age and Co-morbidity risks alone:
a) Low risk (neither factor present): 47% of total, mortality rate 1.3%
b) High risk (one or both factors present): mortality rate 10.5%. OR 8.80 (2.63 - 29.43).
All three low-risk deaths had abnormal CPET variables.
Abnormal CPET in high risk patients increased risk of mortality with borderline significance, p=0.042, OR 3.38 (0.98 – 11.60).

Conclusion:
Age and co-morbidity can identify a low-risk group for AAA open repair. CPET can aid management through intervention, and evaluation of higher risk patients.

EL202.2/6

Authors: Megan Burton, Dr Rebecca Jackson, Dr Catherine Cromey
Title: Morriston Hospital

Title:
Pre-assessment clinic – A quality improvement study to highlight issues to improve practice and reduce cancellations.

Introduction:
The benefits of Pre-Assessment Clinic (PAC) in elective surgery in improving patient outcomes, selecting patients for day case surgery and reducing on the day cancellations are well documented [1-4]. Previous practice in Morriston Hospital has been to use the online operating system to record on the day cancellations but this method missed many potential lessons. The objective of this study was to identify issues related to PAC for elective surgery, highlighting recurring issues with an aim to implement solutions to reduce delays and cancellations on the day of surgery thus improving our practice.

Methods :
Over a 4 week period, semi-structured interviews were conducted with the anaesthetist responsible for each elective list to identify any issues associated with PAC process for that particular list. Issues leading to cancellation or delay were recorded and investigated further. This information was organised and discussed between the review team and solutions suggested.

Results:
Thirty-nine issues were recorded, 21(54%) of which were deemed to be a PAC related issue. There were 8 on the day cancellations. Four (50%) of these were deemed to be anaesthetic related. These were classified into three groups: 'Medication Compliance', 'Anticoagulation' and 'Obstructive Sleep Apnoea (OSA) investigation'.

Conclusion:
By using this method of data collection we were able to highlight specific problems which were not previously found on our database search. Although some issues come down to difference in opinion between PAC anaesthetists and list anaesthetists which we need to acknowledge and accept will on some level continue to occur [5]. This methodical and detailed review of PAC issues has enabled us to highlight system errors of which many are simple and easily rectifiable, as well significant and reoccurring anaesthetic issues. We were able to focus three main areas for improvement.

1. OSA guidelines written and in the process of implementation
2. Anticoagulation guidelines updated and work in progress to facilitate implementation of an anticoagulation nurse practitioner
3. Patient medication sheet produced (Figure 2)
4.

With implementation of these solutions we expect to see fewer cancellations and unnecessary delays therefore improving patient outcomes [6].

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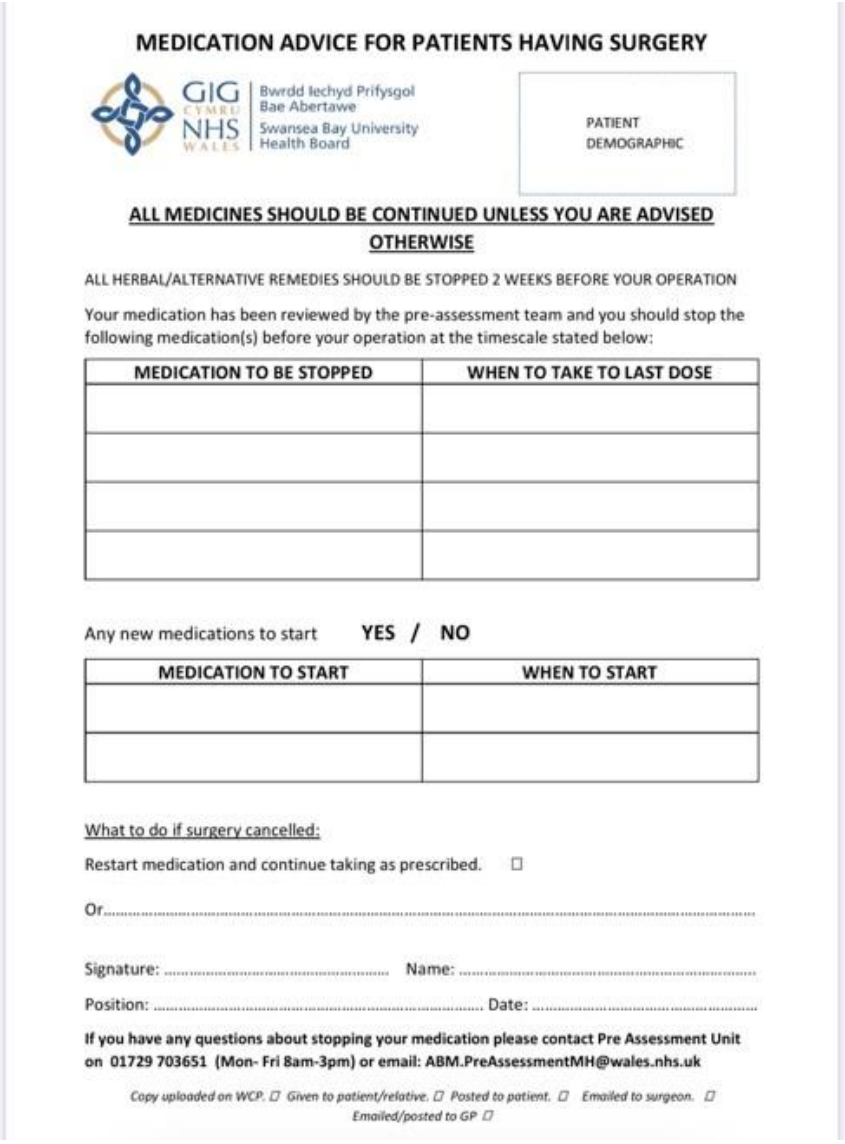
Figure 1



MEDICATION ADVICE FOR PATIENTS HAVING SURGERY

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Bae Abertawe Swansea Bay University Health Board

PATIENT DEMOGRAPHIC

ALL MEDICINES SHOULD BE CONTINUED UNLESS YOU ARE ADVISED OTHERWISE

ALL HERBAL/ALTERNATIVE REMEDIES SHOULD BE STOPPED 2 WEEKS BEFORE YOUR OPERATION

Your medication has been reviewed by the pre-assessment team and you should stop the following medication(s) before your operation at the timescale stated below:

MEDICATION TO BE STOPPED	WHEN TO TAKE TO LAST DOSE

Any new medications to start **YES / NO**

MEDICATION TO START	WHEN TO START

What to do if surgery cancelled:

Restart medication and continue taking as prescribed. ☐

Or.....

Signature: ..... Name: .....

Position: ..... Date: .....

If you have any questions about stopping your medication please contact Pre Assessment Unit on 01729 703651 (Mon- Fri 8am-3pm) or email: ABM.PreAssessmentMH@wales.nhs.uk

Copy uploaded on WCP. ☐ Given to patient/relative. ☐ Posted to patient. ☐ Emailed to surgeon. ☐ Emailed/posted to GP ☐

EL202.2/7

Authors: Dr Katie Misselbrook, Mr David Murray, Ms Catherine Tothill, Ms Laura Shepherd, Ms Kathrine Brechin, Dr Rhys Taylor, Dr Christina Beecroft
Institution: Ninewells Hospital

Title:
Testing, Testing 1-2-1-2

Introduction:
The first Scottish case of SARS-CoV-2 novel coronavirus was detected in NHS Tayside. During initial contact tracing, the response was to establish a robust testing service and on the 17th March, NHS Tayside launched the community testing "drive through" facility. The Times reported "in early April more health workers were being tested on Tayside than in the whole of England,"(1) a fact re-iterated by Nicola Sturgeon, who hailed Tayside as an "exemplar" in Scotland. Evolution of the 'Community Testing Team (CTT)' provided the foundation for SARS-CoV-2 pre-operative testing. Emerging evidence shows a predicted post-operative mortality of 23%(2) in patients subsequently diagnosed with SARS-CoV-2, so priority focused on mitigation of risk for vulnerable patients requiring urgent planned surgery. Antigen (swab) testing, detecting viral RNA with reverse transcriptase PCR, is at the heart of our 'green' surgical pathway. Wide variance in false negative rate of 3-40% (3) influenced our decision to swab the patients twice prior to hospital admission.

Method:
A multi-disciplinary Pre-Surgical Isolation (PSI) "Green" Pathway was designed and implemented on May 4th, led by our Pre-Assessment team. Patients are tested on day 0 and day 12 of 14 days pre-surgical isolation. We approached the established CTT to create a pathway for our patients and as part of staff re-deployment, our colleagues at the Dundee Dental Hospital offered help. Regular video conferencing established a dedicated "green swabbing team" who receive direct referrals from pre-assessment clinic. Through the use of generic email accounts, communication was established to confirm all tests performed and received in the lab. The dental team are experienced caring for a wide range of patient groups, making them an excellent resource during NHS restructuring amidst the COVID pandemic.

Results:
NHS Tayside has developed robust, resilient mobile community testing for patients on the PSI "green" pathway. The green pathway, which started on the 4th May, has to date successfully performed 59 mobile SARS-CoV-2 swabs on pre-surgical patients. In 100% of these swabs SARS-CoV-2 was not detected.

Conclusion:
The Tayside pre-surgical COVID swab pathway is an innovative model. Tayside has demonstrated adaptability, consistency and continuity, to overcome the issues of SARS-CoV-2 testing with the development of not only the Green Pathway, but an Indeterminate "yellow" for patients unable to isolate pre-operatively and an 'Out of Region' pathway, embracing the Scottish Governments guidance for cross region working. Re-establishing patient-centred surgical services is a collaborative multi-disciplinary process and Tayside's Community Testing Team is fundamental to this.

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EL202.3/1

Authors: Dr Katie Cooke, Dr Richard Green
Institution: Royal Bournemouth and Christchurch Hospitals NHS

Title:
The impact of poster education on smoking cessation pre-operatively

Introduction:
Smoking has a significant impact on the perioperative period in terms of pulmonary and cardiovascular complications, poor wound healing and prolonged hospital stays. Cochrane reviews have investigated the most effective preoperative smoking cessation intervention. This project aims to assess the effect of poster education on patients' intention to stop smoking preoperatively.

Methods:
Patients were identified during the preoperative assessment period. The evaluation was undertaken in 4 phases. Phase 1: pre-poster knowledge (36 patients), phase 2: knowledge after the poster was displayed and patients self-referred to smoking cessation service (82 patients), phase 3: knowledge after the poster was display with active referral by NHS staff to smoking cessation service (54 patients) and phase 4: patients were asked if they would give up smoking, if it was compulsory to have their operation (58 patients).

Results:
38% of patients in phase 3 vs 33% in phase 1 said they would give up smoking before their operation. No patients in phase 1 would try to cut down on the amount they smoked, whereas 5% and 2% in phase 2 and 3 respectively said they would try to cut down preoperatively. 5 patients self-referred to the smoking cessation service (phase 2), compared with 25 patients who agreed to active referral in phase 3. 56% of patients in phase 4 said they would not give up smoking before their operation and this did not change when asked if it was a compulsory requirement for the operation.

Conclusion:
Patients are more motivated having seen the posters to attempt to reduce or stop smoking. It is clear that active referral by the hospital staff increases the utilisation of smoking cessation services in Dorset, but making it a compulsory requirement, will not encourage patients give up smoking pre-operatively.

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EL202.3/2

Authors: Bethani Clegg, Ms Manisha Rayami, Ms Alicia Tickle, Mr Nathan Mitchell, Ms Suzannah Horn
Institution: Scunthorpe General Hospital

Title:
Improving Outcomes for Neck of Femur Fracture Patients in the Absence of an Orthogeriatrician

Orthogeriatrician review is essential for patients presenting with Hip Fracture[1]. In the absence of an orthogeriatrician at Scunthorpe General Hospital, this audit aimed to optimise peri-operative care by the direction of scarce resources in nutrition, physiotherapy and geriatric care.
The Edmonton Frailty Score (EFS) is a validated tool to predict frailty[2]. A modified EFS score was collated for all patients undergoing surgery for neck of femur fracture in Scunthorpe General Hospital over a one month period. Significant correlation of the EFS was assessed by calculating the Pearson coefficient against length of stay, occurrence of post-operative complications, mortality and number of medications on discharge.

A total of 23 patients were identified; 12 male and 11 female. The majority of patients were in the 'vulnerable to mild frailty' category of EFS. The mean length of stay was 12.5 days. The mode number of medications on discharge was 10. There was no mortality prior to discharge. Length of stay, number of medications and postoperative complications were all highest in the vulnerable-mild EFS frailty category (r=0.38). Those with post-operative complications unsurprisingly had the longest admissions.

In conclusion, amended EFS reliably identified those at risk of complication. However the highest correlation of adverse outcomes was unexpectedly seen in patients with mild frailty as compared to severe frailty. This may be due to the small sample size or perhaps explained by severe frailty being more readily recognisable. The high number of medications on discharge confirms the presence of polypharmacy in this population. In response, a modified EFS was proposed to be added to the neck of femur fracture clerking proforma, along with a >10 medication alert. We hope to negotiate that every 'at risk' patient will be prioritised for a review of medications and care by a geriatrician prior to discharge. In addition the EFS will provide a guide for resource allocation from the wider multidisciplinary team, such as dieticians and physiotherapists.

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EL202.3/3

Authors: Dr Matthew Black, Dr Emmanuel Dhoss, Dr Nathan Peters
Institution: Royal Brisbane and Womens' Hospital, Brisbane, Australia

Title:
An audit of Anaesthetists' Experience in The Usage of Gel-Free Ultrasound Probe Covers

Introduction:
Ultrasound guided procedures form a part of everyday practice in Anaesthesia.

In light of multiple clinical studies and case reports (2-12), ultrasound gel has been shown to contribute to nosocomial infections. It may also make probe disinfection less effective if not adequately removed by cleaning. (13, 15,16)

So eliminating ultrasound gel from these procedures could be advantageous. The gel-free ultrasound-probe cover by Meditron Civco Envision (MCE) (1), requires only a small amount sterile liquid (ie water) between patient and cover. Our objective was to assess the suitability of these covers in Anaesthesia practice.

Methods:
Formal ethics approval (LNR/2020/QRBW/61917) was obtained. Voluntary, anonymous, paper and electronic surveys were conducted over a 2 month period in 2020 at Royal Brisbane and Women's Hospital (RBWH), Brisbane, Australia.

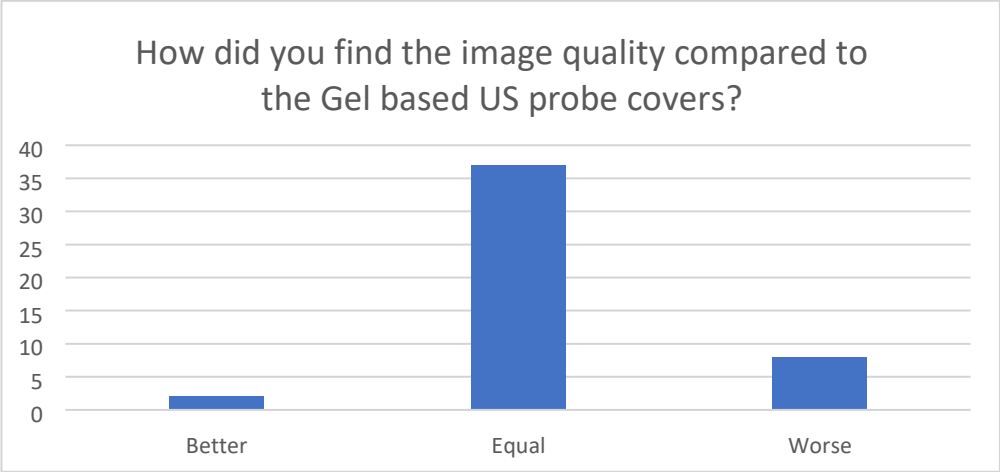
MCE Gel-Free 60cm Ultrasound Probe covers were donated by the manufacturer. No funding was received for this study.

This observational study used feedback from anaesthetists performing US guided procedures and focused on the ease of use, adherence to aseptic precautions, and image quality.

Data obtained were participant demographics, cover usage, comparison against usage of gel, type of conductive agent used, adherence to aseptic non touch technique (14), problems encountered, probe cover length suitability and feedback comments.

Results:
Total of responses = 47 (Registrars 41, Consultants 6).
Majority used the cover for IV access **(21)** vs. Arterial access **(20)** vs Regional anaesthesia **(6).**

Most anaesthetists found the image quality to be equal or better compared to the gel based US probe covers **(39 [83%])**.



Conductive medium used was Chlorhexidine disinfectant solution **(29 [62%]),** Sterile Saline **(9 [19%]),** Sterile gel **(7 [15%]),** Lignocaine **(1 [2%])** and Sterile saline & Chlorhexidine **(1 [2%])**

Most anaesthetists found the gel free cover easy to apply **(42 [89%])** and to adhere to aseptic precautions **(45 [95%])** . Majority did not have problems with vascular device dressing adhering post use (**46 [97%])**.

Subjective feedback included difficulty in applying cover **(4)**, poor image quality for regional anaesthesia **(2)** and requires frequent reapplication of conductive medium **(4)**.

Conclusion:

The MCE Gel-free ultrasound cover had comparable image quality to gel based covers, it was considered easy to apply by most participants, and compatible with the required aseptic precautions.

The main limitation highlighted from this study was that users encountered difficulty when undertaking dynamic scanning around the site of intended use. This was thought to be related to the lack of, or evaporation of, conductive medium.

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EL202.3/4

Authors: Harpreet Gill, Eileen Sills, Jugdeep Dhesi, Judith Partridge, Mohit Bansal, Rashida Pickford, Sarah Allen, Anna Janowicz, Sarah Murray, Ramai Santhirapala
Institution: Guy's and St Thomas' NHS Foundation Trust, London, UK

Title:
Choosing Wisely – Developing Perioperative Shared Decision Making at Guy's and St Thomas' NHS Foundation Trust, London, UK

Introduction:
Choosing Wisely is an international initiative with the aim of improving healthcare conversations, with the UK arm specifically focused on shared decision making (SDM).[1] In this study, we piloted SDM using Choosing Wisely UK's 'BRAN' (Benefits, Risks, Alternatives and do Nothing) tool at a tertiary London hospital. Increasingly, complex conversations in perioperative care mandate the systematic adoption of SDM across entire perioperative pathways.

Methods:
We established a Trust Steering group, with executive buy-in, and invited clinical directorates to participate in Choosing Wisely UK pilots. Three responded to phase 1 of the pilots; orthopaedic surgery, perioperative medicine for older people undergoing surgery (POPS) and dermatology skin cancer clinic. Each pilot underwent a phased quality improvement process:

1. Ascertaining baseline measures of shared decision-making using SM-Q9 and SDM-Doc paired questionnaires
2. Patient and staff stakeholder engagement
3. Developing and testing interventions specific to each pilot
4. Supporting BRAN interventions through education and training

Results:
Baseline mean SDM-Q9 and SDM-Doc scores were high, greater than 80% across all three pilots (N=179), suggesting that patients and clinicians felt they were engaging in SDM conversations prior to implementation of BRAN. 57 semi-structured patient interviews, across two pilots, revealed patients felt BRAN was useful and wished BRAN patient information to be given ahead of a consultation. Staff engagement, through a combination of focus groups and nominal group techniques, revealed attitudinal challenges such as 'we do this already' and 'it is difficult to elicit patient preferences'. There were concerns regarding relevant stakeholder buy-in and medicolegal issues pertaining to informed consent. Staff also reported the need for consistent messaging across perioperative pathways, such as the use of BRAN across all disciplines. The staff and patient engagement supported the development of a co-designed nationally endorsed BRAN patient information leaflet. Additional interventions were a BRAN documentation tool, an informed consent adjunct and early stages of a pathway redesign.

Conclusions:
A systematic approach is required to deliver and standardise SDM within perioperative care. We believe combining 'top down' and 'grassroots' approaches leverages relevant stakeholders. Barriers to SDM were similar to those in cited literature. Choosing Wisely UK's 'BRAN' tool is a useful adjunct to support SDM conversations. Patient and staff engagement is critical to the delivery of SDM across multidisciplinary perioperative pathways. Current tools for the measurement of SDM may not report quality of shared decision conversations in the perioperative space.

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EL202.3/5

Authors: Aruna Ekanayaka, Dr Jonathan Jobanputra, Dr Prakash Vadukul, Dr Jaimin Patel
Institution: Queen Elizabeth Hospital Birmingham

Title:
Too much of a good thing? Prevalence of Perioperative Hyperoxia in a Major Teaching Hospital Revisited

Introduction:
Adequate oxygenation is defined as peripheral oxygen saturations (SpO2) of 94-84%. Supranormal oxygen levels (SpO2>98%) can produce detrimental effects including cardiovascular effects and pulmonary complications secondary to reactive oxygen species and increase ICU mortality (1). Conservative oxygen therapy demonstrates few adverse effects on ICU ventilation outcomes (2). Peri-operative management of oxygenation may reduce resultant morbidity & mortality.

We evaluated hyperoxia in critical care for patients undergoing major surgery. Initial audit of 60 patients in April 2018 at a teaching hospital in Birmingham, UK showing prevalent peri-operative hyperoxia. Mean intra-operative PaO_2 was 23.9kPa. Post-operatively, 47% of data points where supplemental oxygen was administered showed SpO2 of >98%. Those requiring mechanical ventilation in ICU were at risk of hyperoxia (mean PaO_2 14.41kPa).

Methods:
Education of theatre/ICU staff with teaching and decision trees to encourage minimal oxygen supplementation was employed between May 2018 and May 2019. Re-audit of peri-operative oxygenation was performed over three weeks in June 2019 for patients admitted to critical care following elective/acute surgery.

Demographics, recorded co-morbidities, operative information and blood gas results with observations were acquired and collated from electronic patient records.

Results:
Records for 63 patients were analysed. 47 patients underwent elective surgery, 16 patients underwent emergency surgery. Open surgical approaches were used in the majority (90%) of patients while laparoscopic and percutaneous techniques were used in the remainder.

Hyperoxia remained prevalent intra-operatively with mean PaO_2 23.8kPa (23.97kPa April 2018).

Post-operatively on ICU, where supplemental oxygen was delivered, 35.5% of data points collected showed SpO2 of >98% (47.1% in April 2018). Those undergoing mechanical ventilation with supplemental oxygen remained at particular risk of hyperoxia with mean PaO_2 13.74kPa and mean SpO2 97.8% (mean PaO_2 13.74kPa and mean SpO2 97.8% in April 2018).

Conclusions:
Despite education, hyperoxia was prevalent in theatre and for prolonged periods in intensive care with supplementary oxygen often delivered without clear indication. In particular mechanically ventilated patients were hyperoxic despite educational programmes and visual decision aids.

Additional work is being undertaken to understand the causes of high rates of hyperoxia in theatre and understand individual practices in gas delivery during anaesthesia.

Prevalent hyperoxia still represents a modifiable risk factor to prevent further physiological deficit and reduce potential mortality. However improvement with targeted education programmes and decision aids for critical care teams to guide management of FiO_2 & supplemental oxygen delivery is challenging. Closed-loop methods to automatically titrate supplemental oxygen may be beneficial.

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EL202.3/6

Authors: Anjali Kundu, Dr Kanil Ranjith
Institution: All India Institute of Medical Sciences, New Delhi

Title:
Perioperative implications of an implanted deep brain stimulator: a case report

Deep brain stimulation (DBS) has emerged as a promising therapeutic modality for advanced Parkinsonism and essential tremor and there is ongoing research regarding its use in chronic pain and psychiatric disorders[1]. With the increasing number of patients with DBS implants in-situ, we are likely to encounter such patients for surgery, commonly. The main problems encountered are electromagnetic interference with other equipments like ECG, diathermy, peripheral nerve stimulators, pacemakers, cardioverters and defibrillators and questionable safety while performing procedures like MRI and electroconvulsive therapy.

A 54 year-old woman, with history of Parkinsonism, currently off-medication and a DBS implant (Medtronic Activa) in-situ presented with an alleged history of fall from height with polytrauma. She already underwent an emergency laparotomy, upon arrival, and was now posted for debridement and secondary closure of the abdomen. On examination the patient had no clinically evident tremor or rigidity. After a neurological consultation the patient was taken up for the surgery. The DBS was turned off with the patient's control device after induction. The surgeon was requested to use bipolar diathermy or harmonic scalpel to minimise interference. The surgery was uneventful. DBS was again switched on in the end. There was no episode of tremor or rigidity in the post operative period.

Although, there are elaborate guidelines for management of patients with pacemaker in-situ, DBS implants have not yet been studied extensively. The DBS system has four parts[2]: 1)quadripolar electrodes implanted into specific deep brain sites like ventralis intermedius nucleus, subthalamic nucleus or the globus pallidus; 2) a plastic ring or cup for fixation of the electrodes to the skull; 3) an internal pulse generator (IPG) inserted subcutaneuously on the chest wall; 4) extension wires running subcutaneously connecting the electrodes and the IPG. There are two types of programming devices- 1) physician controlled and 2) patient controlled.[3]

The chief concern is, that, electromagnetic interferences can lead to malfunctioning of the IPG; and, heating and damage to the brain tissue at the tip of the implanted brain electrodes.[3] On the other hand, switching off the DBS can lead to reappearance of the baseline symptoms like tremors and rigidity which can be challenging in regional anaesthesia and can affect recovery from general anaesthesia.

DBS is emerging to be the treatment of choice in management of refractory Parkinsonism. Hence, anaesthesiologists must be made aware of its perioperative implications to ensure conduct of safe anaesthesia.

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EL202.4/1

Authors: Dr Owen Lewis, Dr Rhidian Jones
Institution: Princess of Wales Hospital, Bridgend

Title:
Implementation of NT-Pro-BNP testing in a pre operative assessment clinic

Background:
Natriuretic peptides (NP's) have become an important tool in the diagnosis and management of heart failure (1). A review in our institution identified that using NP levels as a screening tool for suspected heart failure in our pre op assessment clinic, could significantly reduce the amount of echocardiograms requested and therefore also cost. This study reports the results of implementing NT-Pro-BNP levels as this screening tool

Methods:
NT-Pro-BNP levels were requested in patients attending pre op assessment clinic who the assessing anaesthetist felt may have heart failure and did not require an echocardiogram for another reason. An echocardiogram was requested only if the NT-Pro-BNP level was >400. We reviewed every case where NT-Pro-BNP levels were requested from 09/2018 to 09/2019, examining if echocardiograms had been requested appropriately and the results of any that had been performed.

Results:
38 patients had NT-Pro-BNP levels measured during the study period. Of these 27 (71%) where <400pg/ml. None of these patients went on to undergo echocardiography. Of the 11 patients who had levels <400pg/ml, 9 (82%) underwent echocardiography and 5 (55%) of these had evidence of ventricular impairment. There were 13 cases where it was possible NT-Pro-BNP testing should have done prior to echocardiography and 11 (85%) of these cases had normal ventricular function.

Discussion:
This study demonstrates that using NP levels as a screening tool for suspected heart failure in the pre op assessment clinic is certainly feasible. Even with a pessimistic interpretation NT-Pro-BNP levels were correctly requested in 78% of cases, and once requested they were used appropriately to determine if echocardiography was required. Assuming a cost of £75 (2) for an echocardiogram and £20 for NT-Pro-BNP this has lead to a cost saving of £1265 over 1 year, with the potential for greater savings had NT-Pro-BNP levels been requested in every suitable case. In addition and potentially more importantly 27 patients and their families were able to avoid an additional trip to hospital.

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EL202.4/2

Authors: Dr Owen Lewis, Dr Rhidian Jones
Institution: Princess of Wales Hospital, Bridgend

Title:
Integrating Pre-Operative Inspiratory Muscle Training into the "High Risk" Surgical Patient Pathway in a DGH

Background:
Postoperative pulmonary complications (PPC's) are a significant cause of morbidity and mortality in patients in patients undergoing major abdominal surgery. Pre operative inspiratory muscle training (IMT) demonstrated a reduction in the incidence of pneumonia and atelectasis in a recent Cochrane review (1). It is also the subject of a large on going RCT. This project aims to examine the feasibility of integrating pre operative IMT to an existing "high risk" surgical patient pathway.

Methods:
From October 2019-March 2020 all patients attending POW Hospital's shared decision making clinic for major colorectal surgery, had their maximum inspiratory pressure (MIP) measured. They were then offered a personal training device, with the resistance set at 40% of their MIP and instructed to use it to take 30 breaths twice a day. They were subsequently offered appointments every 2 weeks (up until their surgery) to retest their MIP and adjust the resistance on their personal device accordingly. Patients MIP over time as well the their attendance at follow up appointments was recorded.

Results:
In the 6 month period October 2019 – March 2020 31 patients recorded a MIP in the shared decision making clinic. 20 (64.5%) attended a follow up appointment at 2 weeks repeating a MIP test. Of the 20 patients who repeated the MIP test at 2 weeks 12 (57%) had improved, with a mean increase for the group of 12.6%. 2 (6.4%) patients attended at both 2 and 4 weeks on average their MIP improved by 39%.

Discussion:
These results demonstrate that it is possible to integrate pre operative IMT in to existing patient pathways at relatively low cost. The IMT training devices only cost £35 each, however the extra time taken in clinic lead to appointments being extended by 15 minutes. In our opinion these results demonstrate high levels of patient engagement, particularly as the system to offer follow up appointments was refined during the project. While acknowledging small patient numbers the average increase in MIP of 12.6% is in keeping with previous literature and as such likely to confer benefit in terms of reduction of PPC's. Moving forward we plan to continue offering pre operative IMT and aim to start recording a post operative MIP value.

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EL202.4/3

Authors: Eleanor Powell, Dr Arthur Ee, Dr Harri Jones
Institution: Morriston Hospital, Swansea

Title:
Dr.E.A.M.S Can Come True: A Perioperative Initiative

Aims:
To introduce a multidisciplinary perioperative review service for NELA patients, within a DGH setting.

Background:
Recently, there has been a drive to deliver patient-centered perioperative care by introducing enhanced recovery pathways for elective patients.[1] The National Emergency Laparotomy Audit (NELA) was introduced to standardise care for this critically unwell population, to improve patient outcomes and reduce mortality.

NELA patients with a preoperative mortality >5% should be considered for an enhanced care bed, postoperatively. Nationally, 77.5% of these high-risk patients are admitted to critical care[2], compared with just 61% in Morriston Hospital. Over the past 3 years, 16% of Morriston NELA patients with a preoperative mortality >10% were discharged to the ward and 20% of these patients died within 30 days of surgery.

As we do not have the capacity to admit all laparotomy patients to critical care, we need to find alternative ways to ensure close monitoring postoperatively. University College London Hospital have implemented a postoperative review based on the D.R.E.A.M.S vision[3] This campaign aims to highlight core perioperative components to reflect the ERAS goals.

Method:
We identified a stakeholder group of intensivists, anaesthetists, general surgeons, pain and outreach nurses and introduced an outreach ward round, with support from the advanced perioperative trainee. The team reviews NELA patients for 72 hours postoperatively, focusing on the D.R.E.A.M.S criteria and calculating the POM morbidity score.[4]

Results & Discussion:
Pilot feedback has been extremely positive from all stakeholder. Service evaluation has led to adaptations of the D.R.E.A.M.S proforma to improve communication with the surgical teams. To ensure service sustainability, we are working with the surgical directorate to formalise the MDT approach and are engaging the elderly care physicians.

The D.R.E.A.M.S. team currently offer a recommendation service, advising on fluid management, analgesia and highlighting high-risk patients to critical care. The patients have reported that they appreciate having the opportunity to discuss anxieties, such as insomnia and nausea which can otherwise be forgotten.

Going forward, we have highlighted a need for perioperative education for the surgical foundation doctors, who have little experience regarding the NELA pathway. We have designed and implemented a NELA-specific simulation, focusing on risk assessment and management of perioperative complications.

We hope that the enthusiasm for patient-centered perioperative review continues and enable these high-risk patients to receive closer monitoring and an improved postoperative experience.

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ADDRESSOGRAPH

PERIOPERATIVE MEDICAL REVIEW
Emergency Laparotomy

GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Bae Abertawe
Swansea Bay University Health Board

NELA PREOPERATIVE PREDICTED MORTALITY
……..%

CONSULTANT SURGEON: _____

Date/Time of Surgery:
Background:
……
……

Day 1 Post Op

Drinking ☐ Eating ☐ Analgesed ☐ Mobilising ☐ Sleeping ☐	NEWS SCORE:		
	HR:	BP:	O2 Sats:
	Temp:		RR:

NEURO GCS /15
Is delirium suspected? YES/NO (If YES, assess CAM ICU)

PAIN (Consider removing epidural and/or changing to non-opiate medication if appropriate)
Able to deep breathe/cough/mobilise? Y ☐ N ☐
Pain score …. /3 Type of analgesia: Spinal ☐ Epidural ☐ Rectus sheath ☐ PCA ☐

RESP O2 requirement ↑ ↓ O/E:

CVS Arrythmia Y ☐ N ☐ CRT ….. sec. Concerns about ischaemia/failure? Y ☐ N ☐

HAEM Hb …… ↑ ↓ Clotting normal? Y ☐ N ☐
Anticoagulation plan ……

GI Abdomen soft Y ☐ N ☐ NG output ……mls. ↑ ↓ Drain output …… mls
Type of nutrition: NBM ☐ Sips ☐ E&D ☐ TPN ☐

RENAL Cr …… ↑ ↓ UO satisfactory Y ☐ N ☐
Fluid balance: hypo / euvo / hypervolaemic Does patient need IV fluids? Y ☐ N ☐

Main Issues (POM SCORE: ……)
-
-
-

DREAMS DAY 1 OUTCOME
☐ Review required tomorrow
☐ Refer critical care
☐ Discharge from DREAMS team

EL202.4/4

Authors: Arlene Connelly, Christina Quinn, Dr Genevieve Lowe
Institution: Queen Elizabeth University Hospital, Glasgow

Title:
Who wants some red stuff? PRC usage at QEUH

Introduction:
We aimed to identify high users of packed red cells (PRC) in the surgical areas of our large teaching hospital in order to appropriately target anaemia prevention and management.

Methods:
Blood transfusion services provided data for surgical wards and critical care covering 2018, containing 2880 blood matching requests. This was rationalised to a three month period, and data collected to identify specialty, surgical procedure, procedure urgency and haemoglobin levels.

Results:
Over three months there were 755 individual matching requests for 346 patients, with 279 patients transfused a total of 826 units. Figure 1 shows the transfusion distribution.

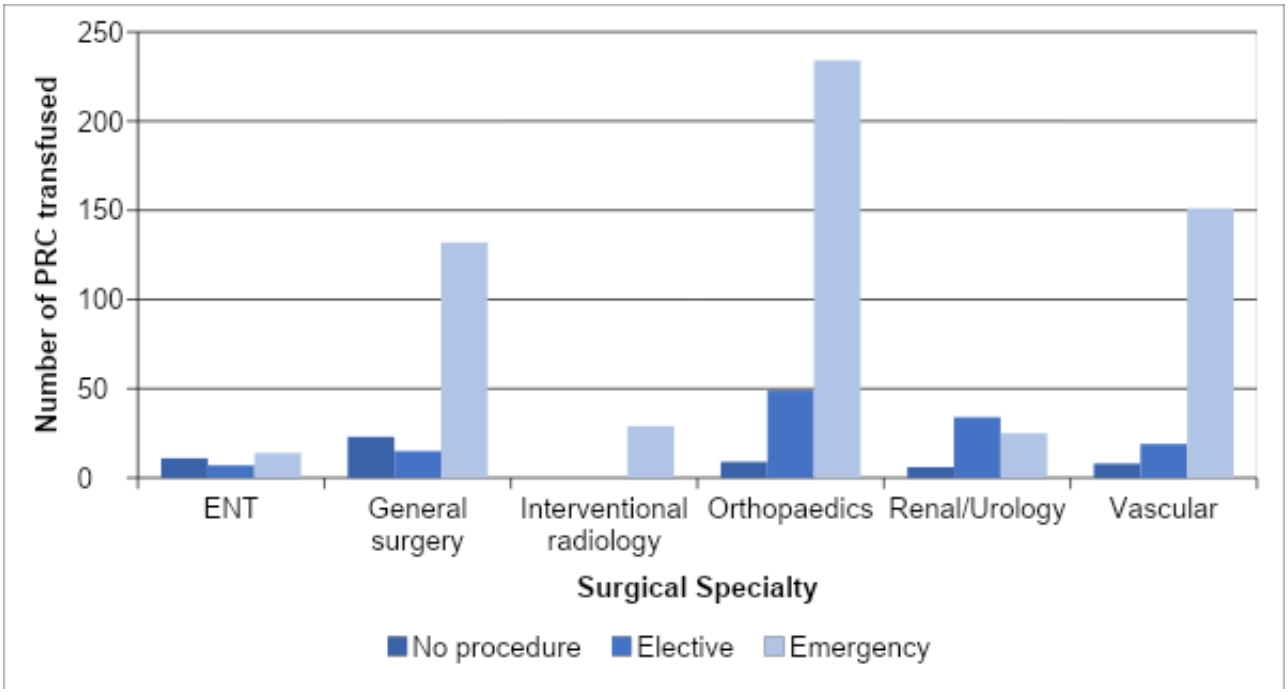

Figure 1. PRC usage distribution for surgical specialty and procedure urgency

High users were:

- Emergency procedures; 74% of transfusions
- Orthopaedics; 37.3% of match requests, 35.4% of units transfused, and 39.4% of all transfused patients
- Vascular surgery; 21.5% of all units given, but 16.5% of all patients transfused, giving an average of 3.9 units administered per transfused patient.

Elective patients (n=49) accounted for 15.6% of all units transfused. The average pre-procedure haemoglobin was 116 g/l (range 78-174g/l). The majority of these patients (95.9%) were transfused

after knife to skin. Almost half (46.9%) of the elective patients transfused had an orthopaedic procedure.

Conclusion:

Our work has highlighted several areas for improvement:

- We are developing anaemia pathways for elective patients and a recently appointed specialist nurse will help develop this service.
- Orthopaedic surgery has been identified as a high user, and work is underway to establish the extent of this in the context of the high throughput of our orthopaedic service.
- Gynaecology is absent from this audit, as it is housed separately from the main hospital. Work has begun looking at anaemia and transfusion for major gynaecology procedures.

EL202.4/5

Authors: Natalie Clements, Dr Shona McConnel, Dr John O'Donoghue, Dr Miriam Stephens
Institution: University Hospital Hairmyres

Title:
Pre-operative assessment Post Pandemic: Setting up a service

Introduction:
Surgical pre-assessments at the University Hospital Hairmyres in East Kilbride, were shelved in April 2020 in the prelude to the COVID19 pandemic. This district general hospital in normal times would see 100 patients per week go through pre-assessment.

Surgeries planned for April and May were delayed to protect patients from increased risk of viral exposure in the hospital (Al-Balas et al., 2020) and due to redeployment of anaesthetists. Rapidly increasing clinical demands made intensive care medicine the priority over elective surgery.

After the peak of the pandemic, with lessening numbers of COVID19 patients, the backlog of urgent surgical cases was apparent.

The objective of this project was to pioneer a service for patient pre-assessment for urgent surgery whilst minimising risk to patients of nosocomial COVID19 infection, and to staff from performing aerosol generating procedures on patients with sub-clinical COVID19 infection.

It was proposed that a further 50 patients from 15th May to 15th June could be assessed for fitness for surgery and COVID infection and proceed to surgery.

Numbers of delays from this new service that were directly COVID related could be assessed. Patient and staff satisfaction with risk minimisation could also be assessed.

Method:
A streamlined 'one-stop-shop' service was orchestrated to allow patients to be assessed in a multi-dimensional clinic experience. The patient was assessed with blood tests, ECG, ECHO, PFTs, stress testing and IV iron available on the same day. The results were reviewed in real time allowing rapid decisions and to avoid multiple trips to the hospital.

The patients were tested for COVID at the clinic, asked to self isolate until the day of surgery and tested again on the morning of surgery. Only on completion of 2 negative tests and the fulfilment of a symptom questionnaire could the operation proceed.

Results:
The full results are yet to be seen. Initial figures show that patients are proceeding to urgent surgery through this pathway. Approximately 25% of patients have asymptomatic COVID infection which was identified through pre-assessment

90% of patients thought that the one-day pre-assessment service was useful in avoiding multiple hospital visits.

Staff reported mixed feelings on the new service and identified areas which could be improved, including increased general practice involvement in testing and prescribing.

Conclusion:
A novel service was orchestrated to meet the needs of pre-operative patients which minimises delays and ensures patient and staff safety. The streamlining of peri-operative services from multi-disciplinary specialties is key to minimise footfall in the hospital.

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EL202.4/6

Authors: Rachel Chan, Dr Ryo Ueno, Mr Cameron Green, Prof Ravindranath Tiruvoipati, Dr Ashwin Subramaniam
Institution: Royal Hobart Hospital

Title:
Association of frailty and clinical outcomes of surgical patients admitted to intensive care units: A Systematic Review and Meta-Analysis

Introduction:
Improved life expectancies has resulted in an increase in older people undergoing surgery worldwide.[1-4] With over 40% of intensive care unit (ICU) admissions being postoperative, from recovery or from surgical wards,[5,6] risk stratification is essential. Preoperative frailty may be a strong predictor of adverse post-operative outcomes.[7] This systematic review was conducted to investigate the association between frailty and clinical outcomes in surgical patients admitted to ICU.

Methods:
PubMed, Embase and Ovid MEDLINE were searched for relevant articles published between January 2000 and May 2019. Full-text original articles in English that used any frailty tool and reported results of surgical adult patients (≥18 years old) admitted to ICUs with mortality as a main outcome were considered. Secondary outcomes included discharge destination, ICU and hospital length of stay (LOS), and duration of mechanical ventilation. We used Mantel-Haenszel method for dichotomous results and Inverse Variance where continuous variables were reported. Quality of included studies and risk of bias for included studies was assessed using the Newcastle Ottawa Scale.

Results:
Ten observational studies met inclusion criteria. These included 82,268 patients, 22.687 (27.3%) of which were frail. Frailty was assessed using 9 different assessment tools. Frailty was associated with an increased risk of short-term (intra-operative, ICU or in-hospital) mortality (RR = 2.4; 95% CI 1.84-3.14: $p<0.00001$; $I^2 = 67\%$) (Figure 1). Frail patients were more likely to be dependent on healthcare services (institution, skilled nursing facility or rehabilitation unit) at hospital discharge (RR = 2.98; 95% CI 2.14-4.15; $p<0.00001$; I^2 94%). Frailty was also found to be associated with longer ICU LOS with a mean difference of 1.8 days (95% CI = 0.61-3.01; $p = 0.003$; $I_2 = 0\%$) , hospital LOS 8.12 days (95% CI = 3.8212.42; $p = 0.0002$; $I_2 = 93\%$) and increased duration of mechanical ventilation (MD 23.73 hours; 95% CI 4.37-43.09; $p = 0.02$, I2 =94%). Frailty was not found to be associated with long-term (>12 months) mortality ($p = 0.06$).

Conclusion:
Frail patients, requiting post-operative ICU admission had increased risk of short-term mortality, prolonged ICU and hospital LOS, and discharge to a healthcare facility. This review suggests that preoperative frailty assessments and risk stratification are essential in patient and clinician planning, and utilisation of critical care services.

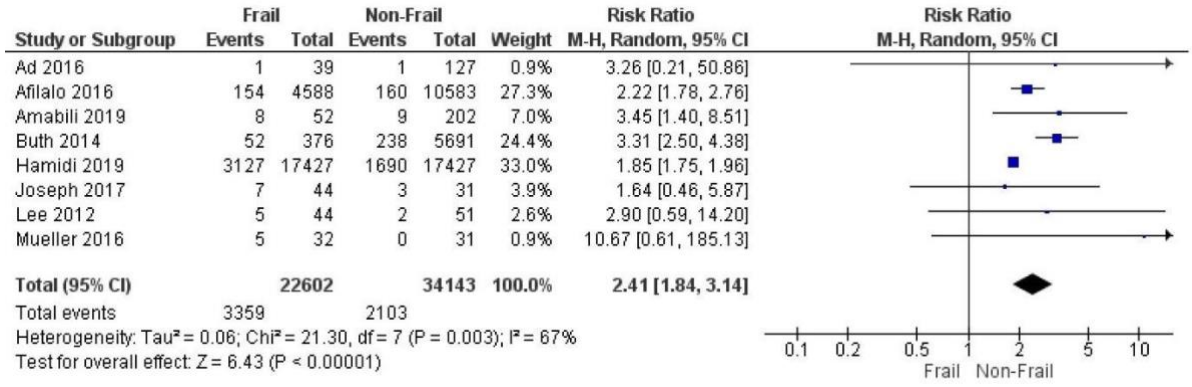

Figure 1 - Short term mortality

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EL202.4/7

Authors: Karthikeyan N Selvaraju, Dr Caroline Mcconnell
Institution: Princess Royal Hospital

Title:
Attitude and knowledge about shared decision making during perioperative period in a district general hospital

Introduction:
Shared decision making (SDM) has significant impact on patient care including patient satisfaction and reducing the incidence of overtreatment(1). The legal imperative, drive to personalise care and good medical practice principles shows the importance of SDM during perioperative period(1–3). However the implementation challenges include lack of knowledge and conducive attitude among clinicians(1). We aimed to understand this with a survey as a part of improving perioperative care.

Methods:
We administered a cross sectional, web based and voluntary survey among the clinicians working in the anaesthesia department, in May 2020. The survey tool was based on the tool used by Forcino et al(4)l. The questions were designed to survey the knowledge and attitude and included a clinical scenario based on Emanuel et al model(5).
Results: The response rate was 50% (21 of 42 clinicians) and completion rate was 86%. Figure 1 shows the percentage of correct responses for knowledge questions and percentage of conducive attitudes for attitude questions. The response for the clinical question revealed that only 50 % of the respondents chose a deliberative approach and this further dropped to 22 % if the clinician has practiced their specialty more than 10 years. Significant findings include gap in knowledge about the impact on opting for surgeries, perception of time constraints and intention to stick to clinician's preference.

Conclusion:
The findings highlight significant knowledge and attitude barriers and would form a part of change in culture in anaesthetist getting involved at an early stage in the perioperative pathway(6).

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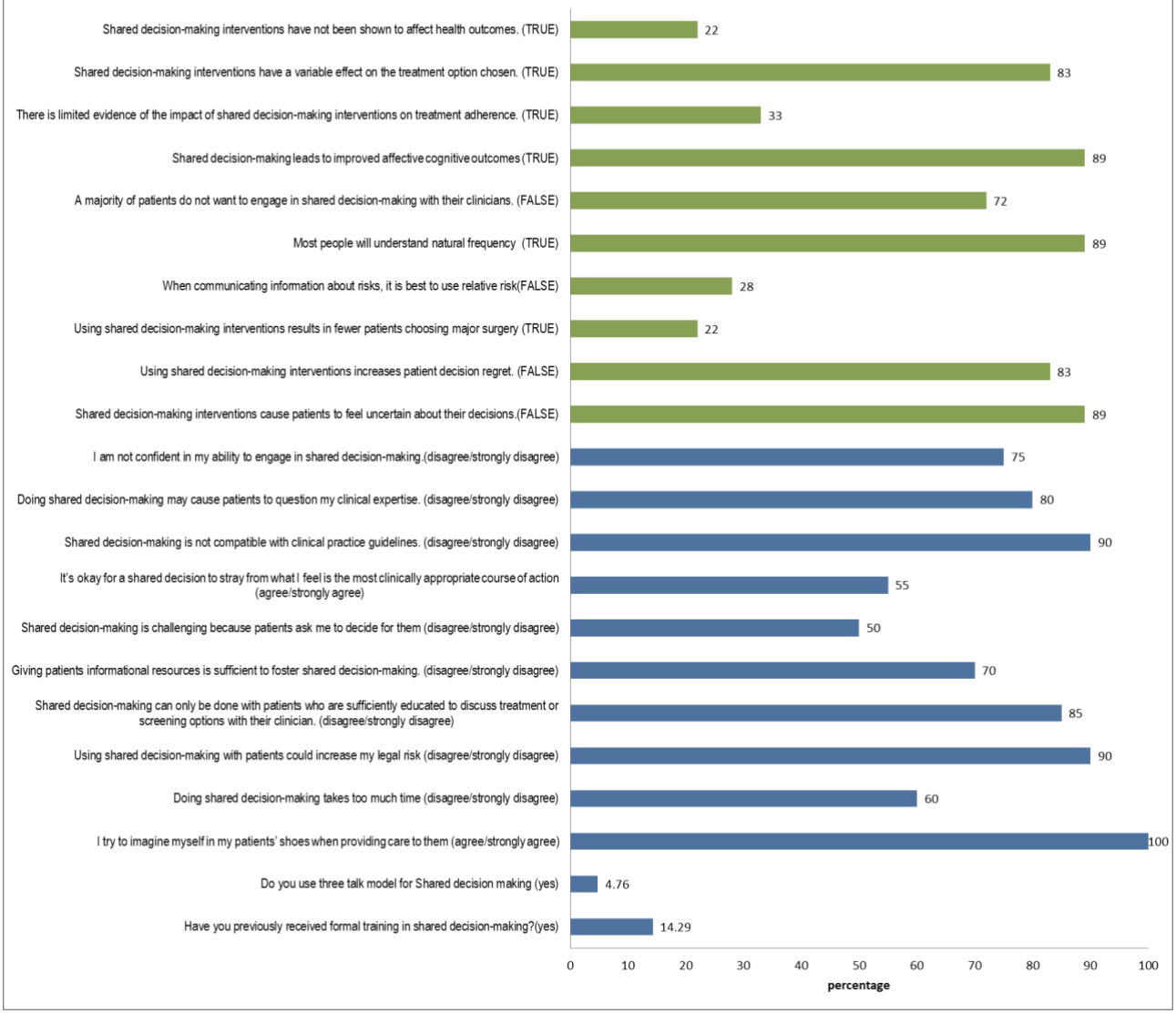
Figure 1: Responses with correct answers for knowledge questions and conducive attitudes for attitude questions



EL202.4/8

Authors: Rhys Taylor, Dr Katie Misselbrook, Dr Christina Beecroft
Institution: Ninewells Hospital

Title:
When the journey matters as much as the destination…

Introduction:
As healthcare systems across the world attempt to return to some semblance of normality in the wake of COVID-19, the spotlight rests on the many patients whose treatments were delayed, but now require expedited management.

Method:
In line with national guidance [1] [2] [3], NHS Tayside has developed a pathway to support the perioperative care of patients undergoing planned surgery. This includes comprehensive pre-assessment and optimisation, a fourteen-day period of pre-surgery isolation (PSI) with SARS-CoV-2 swabs performed on day zero and day twelve of PSI, and a designated 'green' surgical zone.
This multidisciplinary pathway begins with case selection, aided by a clinical prioritisation team of senior clinicians from both surgery and anaesthesia. With the constraints of the 14- day PSI period, lists are coordinated by a designated PSI waiting list team. A dedicated community testing team performs domiciliary day 12 SARS-CoV-2 swabs and a transport team brings patients to hospital in adapted vehicles.
A weekly MDT discusses developments and feedback and with an increased focus on the patient 'journey', our pre-assessment nursing team are invaluable in supporting patients through PSI. As recommended by the Royal College of Surgeons [4], we regularly contact patients through phone calls guided by a standardised, focused question sheet. We address any queries or concerns; ascertain the patient's physical and mental wellbeing; and monitor for symptoms consistent with COVID-19.
Meticulous attention to detail is crucial to the integrity of the pathway. Should patients become infected with COVID-19, even relatively minor surgical procedures are associated with a much worse perioperative outcome [5][6] and so every effort is made both to identify risk and to support patients to maintain PSI. Regular communication allows rapid identification of issues whilst simultaneously offering the patient reassurance and support at a time when they may otherwise feel vulnerable and isolated [7].

Results:
Thirty-nine patients have followed the pathway over 3 weeks. All the SARS-CoV-2 swabs (day 0 and day 12) have been negative to date, and there have been no cases of post-operative complications associated with COVID-19 infection. Our current cohort consists of 0 mortalities, 22 discharges, 17 inpatients and a further 68 listed in the coming three weeks.

Conclusion:
Following our success, we are expanding our pathway to increase patient numbers across other sites in Tayside, in accordance with the NHS 'Open for Business' campaign [8] and its drive for the resumption of urgent non-COVID-19 clinical work [9].

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EL203.1/1

Authors: Alexandra Hogan, Claire Luck, Sarah Woods, Andrea Ortu & Svet Petkov.
Institution: Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

Title:
Orthostatic Hypotension Detected Pre-Operatively is Associated with Falls, Unsteadiness and Dizziness Post-Operatively

Introduction:
The relationship between orthostatic hypotension (OH) and perioperative events is poorly understood. The few studies available focus on post-operative OH diagnosis[1] and have small sample sizes[2,3]. We reviewed the notes of our surgical patients to understand better the incidence and effect of OH when detected at pre-operative assessment (POA).

Method:
Supine and 1- and 3-minute post-standing blood pressure (systolic and diastolic: SBP/DBP) values were recorded in a proportion of patients who attended POA clinic between August 2019 and February 2020. Significant BP drop on standing (compared to supine BP) was defined as ≥20mmhg and ≥10mmhg for SBP and DBP, respectively ('OH'). OH was explored in relation to post-operative documented falls and episodes of dizziness, being 'unsteady' and feeling 'fearful to get-up' because of that.

Results:
Data were available for 170 patients (mean age 70.9 years [SD 10.6], 43y-90y; 80 [47.1%] male) most of whom were scheduled for abdominal cavity (17.6%), orthopaedic (26.5%), urology (27.6%) and gynaecological (14.7%) surgery; and predominantly American Society of Anesthesiology (ASA) grade ≥2 (95.7%). A quarter (40/170; 23.5%) of patients who had at least one standing BP measurement had a significant postural drop in either or both SBP and DBP; SBP was affected more frequently (see Table). For those patients with both 1- and 3-minute standing measurements and at least one significant BP-drop value (N=33), this occurred at only 1-minute in 33.3%, at only 3-minutes in 18.5% and at both time points in 48.5%. There was no relationship between pre-operative OH-status and age, gender, weight, haemoglobin, surgical speciality, ASA grade (nor pre-existing diabetes/hypertension/neurological/cardiac/falls diagnoses specifically), ECG abnormalities, or intra-operative or hospital-discharge BP values. Patients with OH identified pre-operatively had increased length of hospital stay (OH-patients: median 2.0 days, range 0-15, rank 87.0 *vs.* no-OH patients: 1.0 day, 0-35, rank 66.9; U=1385.0, p=.010, 0.2[z/√N]). They were also more likely to have an episode of fall/dizziness/unsteadiness recorded in their post-operative notes (33.3% vs. 7.5%: Chi^2 14.9, df 1, p<.001) - this association held for 1min-standing values only (p=.002).

Conclusion:
Pre-operatively detected OH affects approximately a quarter of adults who are ASA ≥2. It is associated with a longer stay in hospital and with more reports of falls, dizziness and unsteadiness during post-operative recovery. Larger studies are needed to show more definitively how this finding relates to underlying comorbidities and prescribed medications.

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	Lying SBP	Lying DBP	Lying HR	1min Stand SBP	1min Stand DBP	1min Stand HR	3min Stand SBP	3min Stand DBP	3min Stand HR
N=	169	169	168	170	170	166	113	113	113
Mean (SD)	143.2 (23.8)	76.9 (11.5)	71.7 (12.3)	137.8 (26.1)	77.4 (12.6)	78.3 (13.7)	141.7 (24.4)	79.0 (12.4)	78.2 (14.4)
Proportion of patients with a significant drop in standing BP compared to lying BP. No. (%)				26 (15.3)	14 (8.3)	-	18 (15.9)	9 (8.0)	-

EL203.1/2

Authors: Alexandra Hogan, Dr Corinna Pascuzzi, Sarah Woods, Claire Luck, Dr David De Monteverde-Robb, Dr Svet Petkov & Dr Andrea Ortu
Institution: Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

Title:
State the Weight: The Importance of Accurately Recording. Patient Weight During the Perioperative Period.

Introduction:
An accurately recorded weight underlies a patient's safe perioperative care. It is fundamental to risk stratification, drug-dosing and ventilation strategies[1-4]; there may also be financial implications from medications prescribed at higher doses than necessary. Weight may be estimated by patients themselves or by health care professionals (HCPs) or measured on scales. Unfortunately problems exist: weight-estimation shows wide intra-individual variation[5,6]; with rising obesity the '70kg average' may no longer apply; and it is unknown if weights recorded at pre-operative assessment (POA) clinic change much by the day of surgery. We explored these issues by analysing estimations and measurements of our patients' weights.

Methods:
Clinical audit approval was given for patient chart review, recording of weight-estimations by patients themselves and by HCPs (prior to patients being weighed at POA clinic), and additional weighing of some patients on the day-of-surgery.

Results:
Average, measured weight across 278 adult patients (mean age 58.1y, SD 17.4; 17-89y) was 80.4kg (SD 18.3; 40-149kg. Male [n=132] 86.0kg, SD 17.7; Female [n=146] 75.4kg, SD 17.5). Weight estimation shows a similar propensity for under-estimation by both patients and HCPs (Table), with patients' estimated values being more accurate than HCP-estimated values. The median interim between weight measurements recorded at POA-clinic and on the day-of-surgery was 22 days (range 1-210 days). The median weight change between these times was -0.8kg (-4.4kg to +9.8kg), but there was no significant correlation with the interim time duration. There was a small but significant discrepancy between POA-clinic weight (median 75.3kg, 49.6-127.1) and day-of-surgery weight (74.7kg, 50.9-128.2) (Wilcoxin test p=.001, $0.4[z/\sqrt{N}]$). Notably, 48 patients (66.7%) lost weight between their POA-clinic appointment and their day-of-surgery, whereas 21 (29.2%) gained weight and 3 patients (4.2%) showed no change.

Conclusions:
Consistent with a widely-held belief the 'average adult' weighs more than 70kg (now 80kg). Unlike a previous study[5], we found widespread *under*-estimation of weight, albeit patients were more accurate generally than HCPs. Most patients lost weight even in the often short-time between attending POA clinic and their day-of-surgery. Possible reasons for this include stress, advice from surgeons, underlying pathology (e.g. cancer) and bowel preparation. We recommend a return to weighing patients on the day of surgery for their own safety and for financial efficiency associated with correct drug-dosing.

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	N=	Weight Correctly Estimated	Weight Under-Estimated	Weight Over-Estimated	Estimate Incorrect by >5kg	Estimate Incorrect by >10kg
Patients	151	4 (2.6%)	95 (62.9%)	52 (34.4%)	18 (11.9%)	4 (2.6%)
Health Care Professionals	204	4 (2.0%)	122 (59.8%)	78 (38.2%)	58 (28.4%)	19 (9.3%)
					χ2 14.1, df 1, ***p<.001***	Fishers Exact ***p=.015***

EL203.1/3

Authors: Alexandra Hogan, Dr Andrea Ortu, Dr Ghansham Biyani & Dr Brock Andreatta
Institution: Addenbrooke's Hospital, Cambridge University Hospitals

Title:
Change in Theatre Anaesthetics Efficiency and Practice in a Large Tertiary Hospital During the Coronavirus Pandemic.

Introduction:
Covid-19 required us to change our anaesthetics practice within a very short timeframe. The requirement for personal protective equipment (PPE) has been perceived to 'slow us down' and 'to make procedures cumbersome' perhaps impeding our usual safe performance. We reviewed patients' notes to explore relevant changes to our practice, specifically the burden on time-efficiency and airway skill.

Method:
With clinical audit approval we reviewed the notes of adult patients who were on our main operating theatre lists at various timepoints between 31st March and 20th April 2020 ('Coronavirus-Time'-[C-T] group; PPE worn irrespective of Covid-19 status). A comparison group included patients involved in another pre-existing audit from August 2019 to February 2020 ('Baseline-Anaesthesia'-[B-A] group). Annotated electronic anaesthetic charts were reviewed for efficiency (anaesthesia preparation time ['start' to 'ready'] and total anaesthesia time) and airway-related practice.

Results:
Group data (table) shows that the B-A group were older, but with American Society of Anesthesiology (ASA) values indicating less significant comorbidity. Notably, the B-A group were identified at pre-operative assessment whilst the C-T group were identified from theatre lists with resulting differences in surgery-type (1. Abdominal. C-T:28.9% vs. B-A:17.3%; 2. Orthopaedic. C-T:37.2% vs. B-A:24.5%. 3. Urology/Gynaecology. C-T:5.8% vs. B-A:39.5%. 4. Ophthalmology/ENT/Maxillary-Facial. C-T:7.4% vs. B-A:12.2%. 5. Plastics/Breast. C-T:5.7% vs. B-A:3.6%. 6. Vascular. C-T:6.6% vs. B-A:2.9%). Notwithstanding this, anaesthesia preparation- and total anaesthesia-times were both significantly increased in the C-T group (table). Airway practice changed, with increased endotracheal intubation (C-T:85.0% vs. B-A:60.1%; Chi_2 22.6(3), *p<0.001*), albeit with reduced bag-valve-mask ventilation at induction (C-T:47.3% vs. B-A:80.6%; *p<0.001*). There was a slight increase in the use of videolaryngoscopy/airtraq (C-T:18.4% vs. B-A:15.1%; *p=0.088, ns*). Despite these changes the proportion of first-pass endotracheal intubations was maintained (95.5% in both groups). Fewer anaesthetists used auscultation to confirm airway placement (C-T:5.6% vs. B-A:43.2%; Chi_2 43.9(1), *p<0.001*), but the median endotracheal-tube depth was comparable (C-T:21cm, 19-24. B-A:21cm, 18-24. *ns*), suggesting unintended endobronchial intubation rate may not have increased. More airways were done by consultant anaesthetists (C-T:63.7% vs. B-A:47.8%: Chi_2 14.3(2), *p=0.001*); most trainees had been redeployed elsewhere.

Conclusion:
As expected, within a very short timeframe Coronavirus resulted in significantly increased anaesthetic-time and notable changes to our airway practice. Both technical and non-technical factors explain decreased efficiency including PPE-restricted mobility, delay following aerosol generating procedures, situation novelty and requirement for extra patient reassurance. Despite

adaptations, and perhaps partly mitigated by increased Consultant involvement, airway management remained safe. Perhaps 'slower' also allowed for 'surer'.

	N=	Age (Median, Range)	Weight (Median, Range)	ASA Grade	Anaesth. Prep Time (Median, Range)	Total Anaesth. Time (Median, Range)
Covid-Time Anaesthesia Group ('C-T')	121	56y (17-97)	74.0kg (36.1-173.0)	I-14 (11.5%) II-48 (39.6%) III-40 (33.1%) IV-17 (14.0%) V-2 (1.6%)	22.5mins (5.0-121.0)	164.0mins (33.0-773.0)
Baseline Anaesthesia Group ('B-A')	139	72y (43-90)	79.7kg (43.0-156.0)	I-6 (4.3%) II-93 (67.4%) III-37 (26.8%) IV-2 (1.4%) V-0	15.0mins (5.0-65.0)	122.0mins (14.0-787.0)
		U=5092 (N=260) Z=-5.49 p<0.001 0.34[z/√N]	U=7089 (N=256) p=0.077	Chi^2 30.5(4) p<0.001	U=4725 (N=225) Z=-3.28 p=0.001 0.21[z/√N]	U=5942 (N=259) Z=-3.99 p<0.001 0.24[z/√N]

EL203.1/4

Authors: Dr Avinash Aswath & Dr Caroline Fortescue
Institution: Royal Bournemouth Hospital

Title:
Study evaluating the efficacy and safety of Continuous Popliteal sciatic nerve block (CPSNB) for postoperative analgesia after major ankle surgery.

Introduction:
Major foot and ankle surgeries can be associated with moderate to severe pain, which can extend to postoperative day 3[1]. A single shot popliteal[2] and saphenous nerve block provides good pain relief but using a continuous catheter technique can enhance this effect for further duration[3-7]. A previous audit in our institution demonstrated this. Hence we conducted a retrospective study evaluating the safety and efficacy of CPSNB technique currently used.

Methods:
We retrospectively collected and analysed data of all adult patients having major ankle surgery under general anaesthetic (GA) and regional anaesthesia with CPSNB (Pajunk catheter and standard technique of block) from June 2016 till November 2019.
Data collection was done by electronic review of notes.

Results of Audit:
Total number of patients during study period – 63 of which 3 were excluded

Table 1: Patient characteristics / surgery details and Length of stay / duration of CPSNB catheter use.

Study characteristic	**Result**
Age	Average age 63 years
Male : Female ratio	55 to 45 %
Average BMI	31
ASA classification	73% were ASA 2 and 12 % were of ASA3 category
Type of ankle surgery	50% had Total ankle replacement(TAR) and 39% had Ankle fusion .
Average tourniquet time	155 minutes
Anaesthetic technique	All had GA and block – CPSNB and single shot Adductor Canal Block (ACB)
Length of stay (total number of nights in hospital)	a) TAR – Average 2.6 nights (range of 1- 7 nights) b) Fusion surgeries - Average of 3.69 nights (range of 2 – 9 nights) .
Duration of CPSNB catheter use (day the catheter was removed)	a) TAR – Average for 2.1 days and 50% had it removed on 3rd postoperative day b) Fusion surgeries : Average 2.1 days and 51% had it removed on 3rd postoperative day.

Table 2: Post operative monitoring and CPSNB Catheter related complications

Postop day	**Number of patients**	**Worst Pain score (numerical scale 0 - 10)**	**Average opiate consumption (Equianalagesic dose of morphine in mg)**	**% Of patients requiring rescue analgesics (Ketamine, Gabapentin, Tramadol, Clonidine)**	**Catheter related problems. L – Leakage D- Dislodgement N- No block**

					R – Redness at site I – infection.
D0	60	3	16	7	5% - L
D1	59	3	38	21	15%-L, 1.6% N, 6.7% D
D2	46	4	44	25	2.1% N, 15%L , 4.3% D
D3	23	6	51	38	0
D4	19	4	46	42	0

Average pain score was less than 5/10 during 1st 3 days postoperatively with an average opiate consumption of 16, 38 and 44 mg respectively on Day 0,1 and 2.

With regards to catheter related complications, leakage of local anaesthetic (15%) was commonest problem with dislodgement (6.7%) and no block (1.6%) being less common. There were no major complications related to the CPSNB.

Discussion:
The study shows that overall the CPSNB seems to work well providing good pain relief (efficacy) and minimal catheter related problems (safety). In the future we aim to minimise length of stay by educating and encouraging patients to use the CPSNB infusion at home until 56 hours postoperatively and look for long-term complications.

Declaration of interest or financial support:
None

Approval:
Ethical approval not sought for this retrospective data collection, however Audit department have approved the project.

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EL203.1/5

Authors: Dr Mark Prince, Dr Tim Orr, Dr Daniel Yarwood, Dr Becky Morris, Dr Claire Hirst, Dr Jon Slattery, Dr Matt Needham, Dr Catherine Riley & Dr Alexa Mannings
Institution: Sheffield Teaching Hospitals

Title:
Perioperative management of obstructive sleep apnoea: a regional survey of practice

Introduction:
Obstructive sleep apnoea (OSA) is an increasingly common co-morbidity presenting in elective surgical patients. It is associated with adverse perioperative outcomes but consensus is lacking on the optimum management of such patients.[1] Identification of both patients with confirmed sleep apnoea and those with risk factors or who may be as yet undiagnosed is essential to avoid complications associated with general anaesthesia and post-operative care. Guidelines on the perioperative management of OSA are available;[2] however variations in standards of care still exist across different hospitals and regions.

Methods:
We aimed to investigate the perioperative management of OSA in all hospital trusts across the Yorkshire and Humber region via a survey circulated to their pre-op assessment lead clinicians.

Results:
We received 11 completed forms, a 79% response rate. Routine screening for OSA prior to elective surgery is undertaken in only 45% of hospitals, with all of those who do using a recognised screening tool (e.g. STOPBANG). 82% never request a venous bicarbonate, even in patients identified as high risk of OSA. For planned urgent surgery such as for cancer, only 36% had escalated post-operative care in response to a diagnosis of OSA. 73% of patients with OSA but without home CPAP are admitted to critical care post operatively, with the remaining 27% staying in a dedicated level 1 facility. However, if the patient already has their own CPAP machine then they are managed on a normal surgical ward 82% of the time, markedly reducing the critical care burden in this patient group. 50% of responders reported that elective surgical cases were cancelled on either a weekly or monthly basis at their institution due to a lack of dedicated post-operative facilities for OSA patients.

Conclusion:
Our data shows a significant variation in clinical practice between different hospitals for the management of OSA. The implications of this are potentially avoidable and costly critical care admissions and frequent cancellation of elective surgical cases.

References:

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EL203.1/6

Authors: Catherine Riley & Dr Nadia Ladak
Institution: Sheffield Children's Hospital

Title:
Reducing paediatric perioperative exposure to environmental tobacco smoke

Introduction and Aims:
Children exposed to environmental tobacco smoke (ETS) spend a longer time in the post anaesthetic care unit[1], are more likely to have unplanned overnight admissions[2] and have double the risk of perianaesthetic respiratory adverse events (risk ratio 2.52)[3].
The perioperative period presents a "teachable moment" that can motivate behavioural change[4]; therefore as paediatric perioperative practitioners, we are ideally placed to screen for exposure to environmental tobacco smoke and signpost families to local smoking cessation services if applicable. We aimed to gauge the extent of this practice, stimulate discussion and identity areas of improvement.

Methods:
We undertook a national survey, distributed electronically via the paediatric perioperative medicine network and the Paediatric Anaesthesia Trainee Research Network (PATRN).

Results:
We had 40 replies representing 34 hospitals throughout the UK, both tertiary paediatric units and district general hospitals. Most units do not routinely ask about exposure to environmental tobacco smoke; 23/34 units categorically do not, and respondents from five units were unaware of their Trust policy. Only six of the 34 hospitals (17.6%) do screen and only three of these offer smoking cessation support. Half of all respondents do not know if their unit offers this service at all. Providing literature and signposting to local smoking cessation clinics were the most common methods; funding had recently been lost for these services at one unit so GP referral remained their only option.

More commonly than environmental tobacco smoke exposure screening, 47% (16/34) of centres routinely document a child’s body mass index and refer to weight reduction services if childhood obesity is identified.

Discussion and Conclusion:
Despite evidence of the risks to children exposed to environmental tobacco smoke who undergo anaesthesia, very few units routinely screen or support smoking cessation, missing valuable opportunities to educate families and target a public health measure with huge potential benefits beyond the planned anaesthetic. Screening is most effectively done in a preoperative clinic rather than on the day of surgery and encourages the development of paediatric perioperative services. Barriers include the limited time available in the clinic and the lack of awareness of smoking cessation services by perioperative practitioners. Routinely documenting environmental tobacco smoke exposure, like weight, could alert practitioners to a potential problem and motivate smoking cessation provision potentially collaborating with other services such as health visitor teams.

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2. The Effect of Tobacco Smoke on Children Undergoing General Anesthesia and Surgery Setzer Pediatrics1997; 100; 731
3. Impact of environmental tobacco smoke exposure on anaesthetic and surgical outcomes in children: a systematic review and meta-analysis Chiswell and Akram Arch Dis Child 2017; 102: 123–130.

EL203.1/7

Authors: Dr Leigh-James Spurling, Prof Ramani Moonesinghe & Dr Matt Oliver
Institution: University College Hospital London

Title:
Enhanced care unit admission after emergency laparotomy

Introduction
Critical care provision in the UK has never been more stretched than now . However, pressures are not new. Critical care units (CCU) take the highest risk patients, among them, patients having emergency laparotomy (EL). The National Emergency Laparotomy Audit (NELA) and Royal College of Surgeons[1] state that EL patients with predicted mortality >5% should receive postoperative care in CCU.

Currently, there is increasing interest in developing enhanced care areas offering monitoring, staffing and organ support that lies between those of typical wards and critical care units[2,3]. Recently, the Faculty of Intensive Care published a document outlining the implementation of these enhanced care areas[4]. We aim to characterise patients having EL to determine feasibility of admission to enhanced care areas post-operatively.

Methods
This was a retrospective cohort study of NELA patients admitted post-operatively from December 2013 - November 2017, linked with ICNARC Case Mix Programme data on critical care admissions.

Predicted mortality was calculated using the NELA Risk Adjustment Model[5]. Observed 30-day mortality was compared against predicted for a variety of organ-systems supported. A binomial test of proportions compared observed versus predicted risks (significant at the 5% level). Median duration of organ support/monitoring (whole days [interquartile range]) was reported.

Results
24780 patients were included. The table summarises observed versus expected mortality and duration of support for patients having basic cardiovascular (invasive arterial pressure/CVP monitoring and/or single vasoactive agent), basic respiratory support (>50% oxygen, NIV), neither of these and all CCU patients after EL (including ventilated).

	Number	Observed 30-day mortality (%)	Expected 30-day mortality (%)	O:E mortality ratio	pvalue	Median duration [IQR] (days)
Basic CVS only	8495	4.38	8.34	0.525	<0.001	2 [2-3]
Basic Respiratory only	307	6.84	6.32	1.082	0.724	2 [1-2]
Both Basic CVS and RS support	5120	8.50	9.78	0.869	0.002	3 [2-4]
Neither	334	5.99	6.16	0.973	1	-
All patients	24780	13.27	12.43	1.067	<0.001	3 [2-4]

The population receiving only basic cardiovascular support, comprises 33% of patients in our cohort. Their observed 30-day mortality rate was 4.38%, nearly half their predicted mortality (8.34%). Furthermore, they have a relatively short requirement for the CVS support (median [IQR]: 2 [2-3] days).

Conclusions:
The ideal EL enhanced care cohort would require less intervention than offered in HDU/ICU but more than in a ward and need this for a relatively short time. We have identified a cohort of EL patients who receive single organ cardiovascular support, that have a considerably lower than predicted mortality and comprise nearly one third of our cohort. Many of these patients would be appropriate for an enhanced care unit.

While this cohort has a lower than expected mortality, it is by no means low risk. Decisions surrounding care will continue to be guided by clinical judgement, objective risk stratification and local circumstances.

References:

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EL203.1/8

Authors: Fiona Breckenridge, Harry Kerr & Dr Genevieve Lowe
Institution: Queen Elizabeth University Hospital

Title:
Prehabilitation: patient education and attitudes towards pre-operative lifestyle modifications

Introduction:
Preoperative assessment (POA) offers the opportunity to address modifiable risk factors at a time where patients may be psychologically receptive to lifestyle changes. Prehabilitation has been shown to reduce perioperative morbidity and mortality. All patients should receive lifestyle advice relating to alcohol, smoking and exercise advise pre-operatively[1], however this is not always the case. Lifestyle factors are recorded at our POA clinic, but intervention is not currently part of our POA proforma. Successful behavioural change also requires patient engagement. We therefore aimed to assess patient understanding and attitudes towards pre-operative lifestyle modifications within our population.

Methods:
We surveyed all patients attending our POA clinic over a two-week period in March 2020. Categorical questions examined patient understanding of prehabilitation, motivation for behavioural change and interest in support to improve modifiable risk factors.

Results:
There were 82 respondents. A significant percentage were unaware of the benefits of reducing alcohol intake (33%) and increasing physical activity levels (43%) (Figure 1). The majority expressed motivation to improve all behaviours. Fifty-seven percent were interested in support to improve lifestyle. Within this, written information was favoured (66%) followed by advice from a healthcare professional (36%) and app-based support (32%). Overall interest in support did not vary across age groups, however younger patients (18 – 59 years) were significantly more likely to favour app-based support (48%).

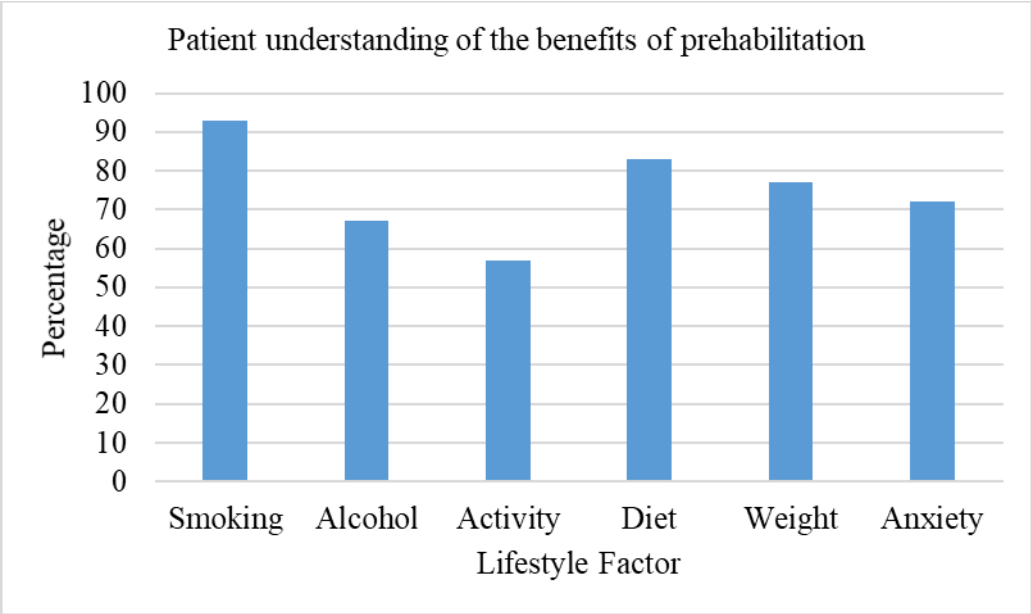

Figure 1: Patient understanding of the benefits of prehabilitation

Conclusion:
This work identifies a lack of patient understanding around key modifiable lifestyle factors affecting perioperative risk in our patient cohort. We must utilise the opportunity at POA to provide advice regarding lifestyle choices however patients must also be motivated to change and receive support in a format they find engaging. Information and support must be provided in multiple modalities rather than a one size fits all. POA staff are able to undertake a very brief intervention[2], providing patient education and signposting to available support.
We have responded to patient request for further written information by giving the RCOA 'Fitter, Better, Sooner' leaflet[3] to all patients at POA. Additionally, the corresponding videographic will be displayed within our POA to aid engagement. Addressing communication and language barriers remains key to all patients having access to prehabilitation.

References:

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EL203.1/9

Author: Dr Kim Caulfield, Dr Sohail Bompoe, Dr Peter Odor, Dr Kariem El-boghdadly, Dr Justin Kua & Dr Reshma Patel
Institution: University College London Hospital

Title:
ObsCOVID a cohort study and international registry of maternity staff logged encounters with suspected or confirmed SARS-CoV-2.

Introduction:
Coronavirus infection 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2), has resulted in a global pandemic. The World Health Organisation (WHO) has confirmed 5.7million cases with greater than 350,000 deaths worldwide. (1) As of the 16th of April, data from the NHS shows that 16.2% of positive cases were in healthcare workers (HCWs). In the SARS 2002-03 outbreak HCW infection was a significant issue. Reducing transmission in hospitals and amongst HCWs remains vital to resolving the outbreak (2). The aim of this study is to better understand the current impact of undertaking clinical procedures in COVID-19 parturients, on the risk of developing COVID-19 in maternity HCWs both nationally and internationally.

Methods:
This study is endorsed by the Royal College of Obstetricians and Gynaecologists, the Royal College of Anaesthestists, The Royal College of Midwives, The Obstetric Anaesthetists Association and the Chief Midwifery Officer for England. ObsCOVID is a registry created for maternity HCW's to determine whether or not they develop symptoms after encounters with confirmed or suspected COVID-19 patients. This is achieved by HCWs creating an account and self-logging these encounters on an encrypted, anonymous database: obscovid.org. Questions are asked at time of encounter, at 7days and 14days post encounter. The main objective is to understand if there is any difference in contracting COVID-19 between maternity staff groups. Are certain procedural encounters more of a risk to HCWs? What is the compliance with national PPE guidelines? What personal characteristics (age, ethnicity) of staff are associated with contracting COVID-19?

Results:
The registry has over 1000 participants with greater than 400 encounters logged from 15 countries over the world. Data is continuously being collected and our database is expanding Nationally and Internationally. 48.5% of encounters have been with confirmed COVID-19 cases. 51.5% of encounters have been with suspected cases. 72.4% of encounters were by midwives and obstetricians. 20.92% of encounters were by anaesthetists. 84.5% were White Caucasian, the most predominant ethnic group represented. To date 1.67% of our participants have tested positive for Coronavirus at 14 days post encounter. All of whom were obstetricians and midwives.

Summary:
Until the introduction of Obscovid.org registry, the current impact of undertaking clinical procedures in COVID-19 parturients remained understudied. To date the database has served to address this issue, but is also addressing current PPE practices across different maternity units and helping to further understand if HCW's from different ethnic groups are at greater risk post exposure to COVID-19. The database continues to expand nationally and internationally.

References:

1. World Health Organisation. WHO COVID-19 Dashboard. https://covid19.who.int/ accessed 29th of May 2020.
2. The Centre for Evidence Based Medicine develops, promotes and disseminates better evidence for healthcare https://www.cebm.net/covid-19/covid-19-how-many-healthcare-workers-are-infected/. Accessed 29th of May 2020

EL203.2/1

Authors: Shaun Oram, Dr Geraint Ress, Sophie Roberts, Gavin Talbot & Caroline Lewis
Institution: Prince Charles Hospital, Merthry Tydif

Title:
Anaesthetic Emergency Trolley, Preparing for Crisis

Introduction:
The aim of this audit was to assess knowledge of the location of anaesthetic emergency drugs and equipment and to introduce a quicker alternative in the event of an anaesthetic emergency.

Methods:
An initial survey was conducted to ascertain if people knew the location of the anaesthetic emergency equipment and drugs required to treat anaphylaxis, local anaesthetic toxicity, bronchospasm and malignant hyperthermia. After the results were analysed the anaesthetic emergency trolley was created and a further survey was conducted.

Results:
The initial survey revealed that 59% of those surveyed did not know where at least one item from the emergency equipment or drug list was located. We then introduced a trolley which has all equipment and drugs required to treat anaphylaxis, bronchospasm, local anaesthetic toxicity and malignant hyperthermia. After the introduction of the emergency trolley 100% of those surveyed knew the location of all items required to treat the anaesthetic emergencies on the trolley.

Conclusion:
Death caused by anaesthetic is a very rare occurrence with an incidence of 1.1 per million of population. That being said anaesthetic emergencies have a varying incidence rate, of 1 in 4000 for anaphylaxis up to 1 in 100,000 for malignant hyperthermia. As a general statement this makes anaesthetic emergencies a rare occurrence. That being said it makes it all the more important that we are well drilled and know where all the equipment and guidelines are that we require in an emergency situation. Trainee anaesthetists are a transient group in any hospital setting as we are constantly rotating between hospitals but are often left in small district general hospitals to anaesthetise patients out of hours on our own. If an anaesthetic emergency were to occur out of hours with minimal immediately available assistance the lack of knowledge as to where required equipment is not only makes the situation more stressful, it could potentially result adverse patient outcomes. Using the AAGBI QRH guidelines we created the anaesthetic emergency trolley which has all the drugs, equipment and guidelines to be able to treat anaphylaxis, bronchospasm, local anaesthetic toxicity and malignant hyperthermia.[1]We believe that the creation of this trolley has improved safety when treating potentially life-threating but rare conditions and feel that every anaesthetic department should have one.

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EL203.2/2

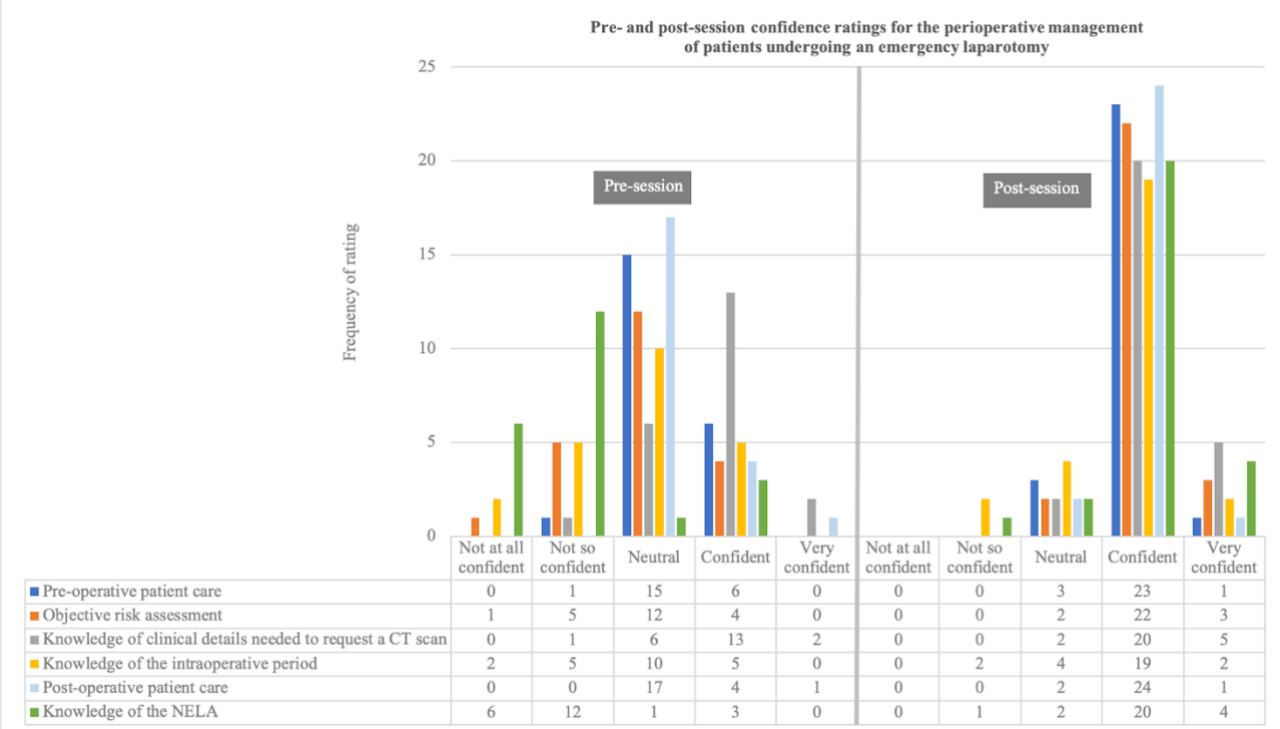
Authors: Dr Jignash Patel, Dr Isra Hassan, Dr Nia Williams & Dr Margaret Coakley
Institution: University College London Hospitals NHS Foundation Trust

Title:
Perioperative management of patients undergoing emergency laparotomy: An education initiative for Foundation Programme doctors

Introduction:
Patients undergoing emergency abdominal surgery are amongst the highest risk for perioperative morbidity and mortality.[1,2] Foundation Programme (FP) doctors have an important role in the prevention, recognition and treatment of complications around the time of surgery. Furthermore, it is hoped that many of these doctors will become future perioperative specialists. Our project aimed to improve knowledge and confidence amongst FP doctors in the management of patients undergoing emergency laparotomy.

Methods:
Our multidisciplinary faculty delivered a half-day multi-modal education programme to 27 second year FP doctors at the Cardiff and Vale University Health Board. We used lectures, small group workshops and simulated scenarios to offer an overview of the perioperative management of patients undergoing emergency laparotomy. The learning objectives were mapped to professional competencies within the FP curriculum. The clinical content largely focused on objective risk assessment, management of pain and common postoperative complications, the local emergency laparotomy pathway and the National Emergency Laparotomy Audit (NELA). We used pre- and post-course questionnaires based on a 5-point Likert scale (1 = not at all confident, 5 = very confident) to assess confidence with aspects of perioperative care.

Results:
Overall confidence ratings improved following the delivery of the teaching session. The most frequent post-session rating, across all six categories assessed, was “confident”. The greatest improvement in confidence was in relation to knowledge of the NELA.



	Pre-session					Post-session				
	Not at all confident	Not so confident	Neutral	Confident	Very confident	Not at all confident	Not so confident	Neutral	Confident	Very confident
Pre-operative patient care	0	1	15	6	0	0	0	3	23	1
Objective risk assessment	1	5	12	4	0	0	0	2	22	3
Knowledge of clinical details needed to request a CT scan	0	1	6	13	2	0	0	2	20	5
Knowledge of the intraoperative period	2	5	10	5	0	0	2	4	19	2
Post-operative patient care	0	0	17	4	1	0	0	2	24	1
Knowledge of the NELA	6	12	1	3	0	0	1	2	20	4

Conclusions:

Our education initiative improved the confidence of FP doctors in managing patients undergoing emergency laparotomy. This session adds to an already successful general perioperative medicine teaching programme for foundation trainees at the Cardiff and Vale University Health Board by paying particular attention to a well-recognised high-risk group of surgical patients.[3] Plans are already underway to expand our education project to other sites in England and Wales.

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3) Hassan I, Buckwell E. Introducing foundation doctors to perioperative medicine. RCoA Bulletin. 2019 Nov;118:50-51.

EL203.2/3

Authors: Amy Turnball, Katrina Knight, Dr Sarah Sullivan, Dr Myra McAdam & Dr Sonya McKinlay
Institution: Glasgow Royal Infirmary

Title:
The Relationship between Preoperative Serum Markers of Systemic Inflammatory Response and CPET Variables in Patients Proposed for Major Pancreatic Surgery

Background:
Pancreatic surgery remains a high risk undertaking with significant perioperative morbidity. Cardiopulmonary exercise testing (CPET) can be used as a risk stratification tool. Preoperative serum markers of systemic inflammatory response (SIR) are also associated with outcome. We wished to investigate the characteristics of patients scheduled for major pancreatic surgery who attended the High Risk Anaesthetic Clinic (HRAC) with the aim of identifying factors which may be optimised by prehabilitation.

Methods:
Demographic, clinicopathologic and CPET data of patients proposed for pancreatic surgery who attended the High Risk Anaesthetic Clinic at Glasgow Royal Infirmary from 2017 to 2020 were extracted from a prospectively maintained database. Preoperative FBC, CRP and albumin levels and postoperative complication data were extracted from patients' medical e-record. Neutrophil-to-lymphocyte ratio (NLR) and modified Glasgow Prognostic Score (mGPS) were subsequently calculated. The modified Glasgow Prognostic Score was calculated using serum CRP (>10) and albumin levels (≤35).

Results:
In total, 100 patients who attended the HRAC were included. Median age was 68 (33-82) years. 77% presented with malignancy, 80% of whom were proposed for a Whipple's resection. Of those reviewed, 48% were managed surgically. CPET was performed in 57/100 patients, with 24/57 proceeding to surgical resection. Patients with a low anaerobic threshold (AT<10.1 ml/kg/min^{-1}), were significantly less likely to proceed to surgery (p=0.02). NLR was elevated in 33/100 patients, CRP was raised in 15/100 patients and 10/100 patients had an mGPS >0. There was no significant association found between CPET variables and serum markers of SIR. Elevated NLR was significantly associated with postoperative morbidity (p=0.03). A trend towards significance for albumin and postoperative morbidity was noted (p=0.054).

Conclusion:
Our results show that preoperative indices of SIR were significantly associated with postoperative morbidity. Furthermore, CPET was shown to be a useful objective measure in determining which patients would be at lower risk of developing complications and derive most benefit from proceeding to surgery. From this initial cohort, however, there is insufficient evidence to suggest a relationship between preoperative SIR and CPET variables. Further studies are required to determine whether tailored prehabilitation including individualised exercise and nutritional support may improve cardiorespiratory fitness and systemic inflammation in this cohort of patients. Validation in a larger cohort is required to determine optimum threshold values for CPET and inflammatory markers and their association with perioperative risk in the population undergoing major pancreatic surgery.

EL203.2/4

Authors: Baven Balendran & Dr Famila Alagarsamy
Institution: Addenbrooke's Hospital

Title:
Perioperative management in Tangier disease, a rare genetic disorder - A case report

Background:
Tangier Disease is a rare autosomal recessive disorder characterised by significantly reduced levels of plasma high-density lipoprotein (HDL). Mutation of the ABCA1 gene, which encodes the protein required for efflux transport of cholesterol and phospholipids across cell membranes onto apoA-1[1], causes excessive intracellular accumulation of cholesteryl esters resulting in enlarged orange tonsils, neuropathy (relapsing/remitting or chronic progressive) and cardiovascular disease. It is an extremely rare condition, with around 100 cases currently diagnosed worldwide[2]. However, this disease presents with its own unique perioperative anaesthetic challenges in the management especially with respect to airway management (atrophy of nasal columella causing difficult mask ventilation), high risk for cardiac events, bleeding risk due to low platelet count and careful positioning due to peripheral neuropathy.

Case:
We report a case of a 48-year-old man diagnosed with Tangier disease who presented for an elective open splenectomy. He had massive splenomegaly, ischaemic heart disease (quadruple coronary artery bypass surgery in the past), peripheral neuropathy and complete atrophy of his nasal columella all secondary to Tangier disease. A diagnosis of Tangier Disease was suggested earlier and later confirmed via fibroblast studies, followed by a progressive development of peripheral neuropathy with weakness of hands and facial muscles, splenomegaly, intermittent visual blurring and ongoing ulcerated skin eruptions. Genetic analysis revealed a mutation of the ABCA1 gene in heterozygous state, with no second mutation identified. His sister was diagnosed with Tangier disease as well.

Blood results demonstrated a history of persistently elevated triglyceride levels. Other past medical history included mild COPD, asthma, hypercholesterolaemia and thrombocytopaenia ($30x10^9$/L).

The patient underwent general anaesthesia with a propofol/fentanyl/rocuronium intravenous induction, maintained with desflurane and remifentanil infusion. Rectus sheath catheters were inserted for post-operative analgesia. He received platelet infusions pre, intra and post-operatively, with minimal blood loss during the procedure and steady increase in platelet count. Observations remained stable and the procedure was uneventful, with no postoperative complications from an anaesthetic perspective.

Discussion/conclusion:
This is a rare case of an inherited metabolic disease presenting with significant anaesthetic challenges, who was managed by an effective multidisciplinary team approach (metabolic, haematology, surgery, anaesthesia) with a successful outcome.

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1 Hobbs HH, Rader DJ. ABC1: Connecting yellow tonsils, neuropathy, very low HDL. J. Clin. Invest. The American Society for Clinical Investigation; 1999. p. 1015–1017.
2 Tangier disease - Genetics Home Reference - NIH [Internet]. [cited 2020 May 30]. Available from: https://ghr.nlm.nih.gov/condition/tangier-disease

EL203.2/5

Authors: Dr Dominic Knight, Dr Rhys Volk & Dr Cerys Richards
Institution: Royal Gwent Hospital

Title:
Cardio-Pulmonary Exercise Testing (CPET) – Introduction of a new service at a district general hospital

Introduction:
CPET enables clinicians to access objective evidence of a patient's exercise capacity pre-operatively. This can aid both patient and clinician decisions regarding surgical management. In an expanding NHS trust spanning three geographically distant sites, highlighting patients who may benefit from post-operative HDU/ICU admission is important when considering the location of elective general surgery operations. CPET was therefore introduced to help identify these patients. A quality improvement project was developed to best initiate a new CPET service in terms of both the referral pathway and patient education.

Methods:
A steering group of clinicians met to discuss potential referral method options and to formulate an appropriate referral form. In addition to this, discussions were held with patients surrounding an education leaflet to better enable them to engage and perform well with the test.

Results:
There is ongoing data collection surrounding the ease of use of the referral form. Overall, there has been good feedback and no issues identified during the first 6 months of use. The patient information leaflet has also been well received and questionnaires are being completed by patients surrounding the pros/cons of the leaflet to improve it further for the future.

Conclusions:
Gather all results from both clinicians and patients – this is now underway following a pause in data collection due to covid-19 pandemic. The aim would be to alter both the referral form and patient leaflet as required.

EL203.2/6

Authors: Dr Farheen Ali, Dr Madhav Pendyala, Dr Alfred Mahumani, Dr Claire Kim, Dr Katherine Phillips, Katherine Chatten, Rajdeep Basu Roy & Jessie Ly
Institution: Westmead Hospital, NSW, Australia

Title:
Westmead Hospital Perioperative Medicine Service – a Shared Decision-Making Model of Care: Retrospective review of demographics, risk profiles, decision and clinical outcomes for High Risk Surgical Patients between 2017 and 2019

Introduction:
Significant advances in medicine and technology in the last 30 years have led to complex and highly invasive surgical procedures, which were once deemed to be of more harm than benefit, now being performed on increasingly older and multi-morbid patients [1,2].
At Westmead Hospital the Perioperative Medicine Service was established in late 2016 to cater to the unique demands of these high risk surgical patients. The service is a collaborative, anaesthetist-led, shared decision-making model of care. It provides multi-disciplinary preoperative assessment and optimisation as well as postoperative follow up aimed at reducing perioperative morbidity and mortality, and preventing non-beneficial surgery.

Methods:
Patient medical records for patients assessed by the service between January 2017 and December 2018 were examined for demographic, risk prediction, decision and clinical outcome data. Perioperative risk stratification was performed using the ACS NSQIP Surgical Risk Calculator and the Edmonton Frail Scale (EFS). Statistical analyses was performed using SPSS software.

Results:
249 patients were assessed by the High Risk Perioperative Service of which 235 patients were included in our analyses. 31% patients had a shared decision made for non-operative management and 69% for operative management. Moderate to severe frailty on the EFS was 26% in the non-operative group and 4% in the operative group. Mean predicted morbidity, mortality and length of hospital stay were 26%, 11% and 8 days in the non-operative group and 20%, 5% and 6 days in the operative group. Reversal of decision was 4% for the non-operative group and 2% for the operative group. 30 day mortality was 4% in the non-operative group and 2% in the operative group.

Conclusion:
Predicted mortality and frailty score were predictors of a shared decision for non-operative management.

Reversal of decision in both groups was reassuringly low. 30 day mortality for the operative group was less than predicted. This may indicate that the combination of preoperative optimisation and postoperative follow up are helpful in reducing postoperative complications and preventing failure to rescue events.

A significant proportion of patients with a shared decision for non-operative management highlights an important role of the service in preventing non-beneficial surgery.
Health economics analyses to determine if there are potential cost savings to the health system and a prospective review to ascertain patient reported outcomes and experience measures is planned for the future.

References:

1. Khuri SF, Henderson WG et al. Determinants of long-term survival after major surgery and the adverse effect of postoperative complications. Annals of Surgery 2005; 242: 326–41
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EL203.2/7

Authors: Emma Barlow, Trish Duncan, Dr Isra Hassan, Michael Ware, Dr Silas Fuller, Dr Emily Buckwel & Dr Anton Saayman
Institution: University Hospital of Wales, Cardiff

Title:
Factors affecting morbidity and mortality in a multi-specialty high volume Post Anaesthetic Care Unit

Introduction:
The Post Anaesthetic Care Unit (PACU) at the University Hospital of Wales (UHW) is an elective unit for patients requiring level 2 or 3 care following high-risk, often cancer, surgery. It aims to provide excellent standards of care, identify and manage post-operative problems in high-risk individuals, recognise patients requiring prolonged care at this level and prevent cancellations due to Critical Care capacity. The objective of this study was to examine morbidity and mortality in this patient group and identify factors potentially linked to poorer outcomes.

Methods:
Patients admitted to PACU (December 2016-November 2017) were identified using a departmental database. Demographic and physiology data were prospectively collected using the Intensive Care National Audit and Research Centre (ICNARC) database and retrospectively reviewed. Data not previously documented in ICNARC was added. This included: demographics; pre-operative haemoglobin, albumin, renal function and HbA1c; pre-operative risk stratification; length of stay; readmission to ITU; post-operative complications and morbidity; and, 30- and 90-day mortality. Patients admitted who underwent emergency surgery were excluded. In total 513 patients were included.

Results:
This study demonstrated a low mortality rate (0.97% at 30-days) despite a high-risk population. However, a number of other factors were observed. One third (33.7%) of patients suffered from post-operative complications with Clavien-Dindo grades <3 (predominantly respiratory), demonstrating high rates of post-operative morbidity. Pre-operative anaemia was identified in a third of patients (33.8%). This, and unrecorded or low pre-operative albumin, appeared to correlate with higher rates of ITU re-admission. We identified that risk-stratification is poorly documented and not standardised, even within the same surgical specialty, with approximately 25% of patients undergoing pre-operative Cardiopulmonary Exercise Testing (CPET). Review of CPET results demonstrated we are operating on patients with lower anaerobic thresholds compared to other centres. Cancellation due to capacity was less than 7%.

Conclusion:
Despite serving a very co-morbid population, this data demonstrates that a high level of care can be delivered with low mortality and good outcomes. It highlighted multiple areas for improvement in the peri-operative pathway which should subsequently reduce morbidity and improve outcomes.

Local evaluation and presentation have led to various improvements in pre-operative assessment and peri-operative care, including: the introduction of IV iron therapy; engagement with primary care for community optimisation; and an online PACU booking proforma to help identify high-risk patients. On-going data assessment and feedback to multi-disciplinary teams for sustainable standards of care will ensure continued improvement as our unit develops.

EL203.3/1

Authors: Rosemary Wall & Andrew Grazette
Institution: University Hospitals Coventry and Warwickshire

Title:
An ABC approach to improving orthopaedic post-op plans

Introduction:
Post-operative instructions form a vital link between the theatre and ward environments, clarifying and thereby optimising on-going patient care. The Royal College of Surgeons (RCS)[1], World Health Organisation (WHO)[2] and British Orthopaedic Association (BOA)[3] offer guidance on operative note content. We audited the quality of orthopaedic opnotes in our tertiary referral centre, devising an ABCDEF memory prompt with the aim of improving the detail of post-op instructions and hence clarifying onward patient care.

Methods:
Using BOA, WHO and RCS guidance, we created an ABCDEF orthopaedic postop plan prompt. This consists of the following: **A**- Antibiotics; **B**- Bloods; **C**- Check X-ray and Clips; **D**- DVT prophylaxis; **E**- Exercise and weight baring; **F**- Follow up. We undertook retrospective review of the operative reports for all orthopaedic procedures across two sites over two single weeks, before and after introduction of this prompt. A proforma was constructed for data extraction including analysis of the grade of surgeon creating the operative report.

Results:
132 and 184 patient operative notes were reviewed pre and post the introduction of our ABCDEF prompt. Almost half (46%) of all op-notes were constructed by an orthopaedic trainee. Improvements were seen universally with regards to inclusion of key instructions within the operative note (see table 1). For example, instructions for post-op radiographs were documented in 83% of op notes; a significant increase from 65% prior to the prompt being created. Documentation of need for antibiotics increased to 81% of relevant post-op plans from 65%; and need for DVT prophylaxis 81% up from 69%. The biggest improvements were seen in plans written by orthopaedic trainees.

Conclusion:
Post-op plans were improved by the introduction of a simple ABC memory prompt, facilitating the ongoing care of the patient. The improvement was particularly marked when the op-note was written by a trainee, suggesting this is a particularly helpful tool for surgeons in training.

References:

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2. World Health Organisation. Post-operative care. 2003. https://www.who.int/surgery/publications/Postoperativecare.pdf
3. British Orthopaedic Association and British Association for Surgery of the Knee. Knee Replacement: A Guide to Good Practice. 1999, update 2019.

Table 1. Comparison of the items of key information included in a post-op plan before and after the introduction of ABCDEF prompt			
Plan	**Cycle 1 pre-prompt (n=132)**	**Cycle 2 post-prompt (n=184)**	**p-value**
Antibiotics	65%	81%	p=0.110
Bloods	-	63%	
Check XR	65%	83%	p=0.017
Clips/ROS	80%	89%	p=0.079
DVT prophylaxis	69%	81%	p=0.083
Exercise/WB status	85%	92%	p=0.097
Follow up plan	89%	97%	p=0.004
ROS= Removal of Sutures; DVT= deep vein thrombosis; WB= weight baring			

EL203.3/2

Authors: Vishaka Kerner, Dr Bhagya Gunetilleke, Dr Dileepa Ediriweera, Prof Rohan Siriwardana, Prof Madunil Niriella & Prof Janaka De Silva
Institution: Colombo North Teaching Hospital

Title:
Prevalence of Frailty, and Effectiveness of Home-Based Exercise Regime in Patients with End-Stage Liver Disease in Sri Lanka

Introduction:
Chronic Liver disease leading to End-stage liver disease (ESLD) is a major health care issue worldwide. Frailty has been identified as a predictor of adverse outcomes in patients with ESLD undergoing transplantation1. After the introduction of the liver-specific frailty index, it has been identified as one of the most important tools for screening and optimization of patients with ESLD2. However, liver-specific frailty index and effect of home-based prehabilitation have not been studied in the South Asian population. Because of the ethnic, socio-economic differences, it is important to study these aspects in the Asian cohort of patients.

Methods:
Sixty-three patients with ESLD attending the liver transplant clinic at the North Colombo Liver Transplant service were studied on the liver disease-related frailty index and quality of life index. All the patients were advised to be on a home-based exercise regime and followed up for 6 months.

Results:
The Mean age was 56.67 years(SD-8.48). 55 (87%) were males. 31(49.2%) were diabetics. 24(38.1%), 36(57.1%), 3(4.8%) patients were Child-Pugh class A,B,C respectively. Aetiology of ESLD in 34 (54%) patients was alcohol. The mean MELD*Na* was 15.68(SD-5.03) and the mean BMI 26.3kg/m2(SD-4.6). Forty-one (88.9%) were having portal hypertension.

The mean liver-specific frailty index was 4.13(SD-0.49). The lowest index was 3.37 while the highest was 5.5. There were 13(20.63%) frail individuals, 38(60%) pre-frail individuals, and 12(19%) robust individuals. (Figure 1)

The mean 6-minutes-walk distance was 386.3m (SD-96.3) corresponding to a MET of 2.8. Quality of life was assessed using the SF 36 questionnaire. Only 8 (12%) patients have complied with the exercise regime at home in 2 weeks review. The commonest reason for non-compliance was poor exercise tolerance and tiredness.

Conclusion:
Pre-frailty and frailty are common in this cohort of patients with ESLD. Exercise capacity and quality of life are significantly impaired in these patients. Because of that, they should be routinely screened for Pre-frailty, and frailty and measures should be introduced to reduce pre-frailty/ frailty. The failure of a home-based exercise programme was a significant finding of this study. It is most probably related to poor exercise tolerance and cultural reasons. This emphasises the importance of further research on this field in this setting.

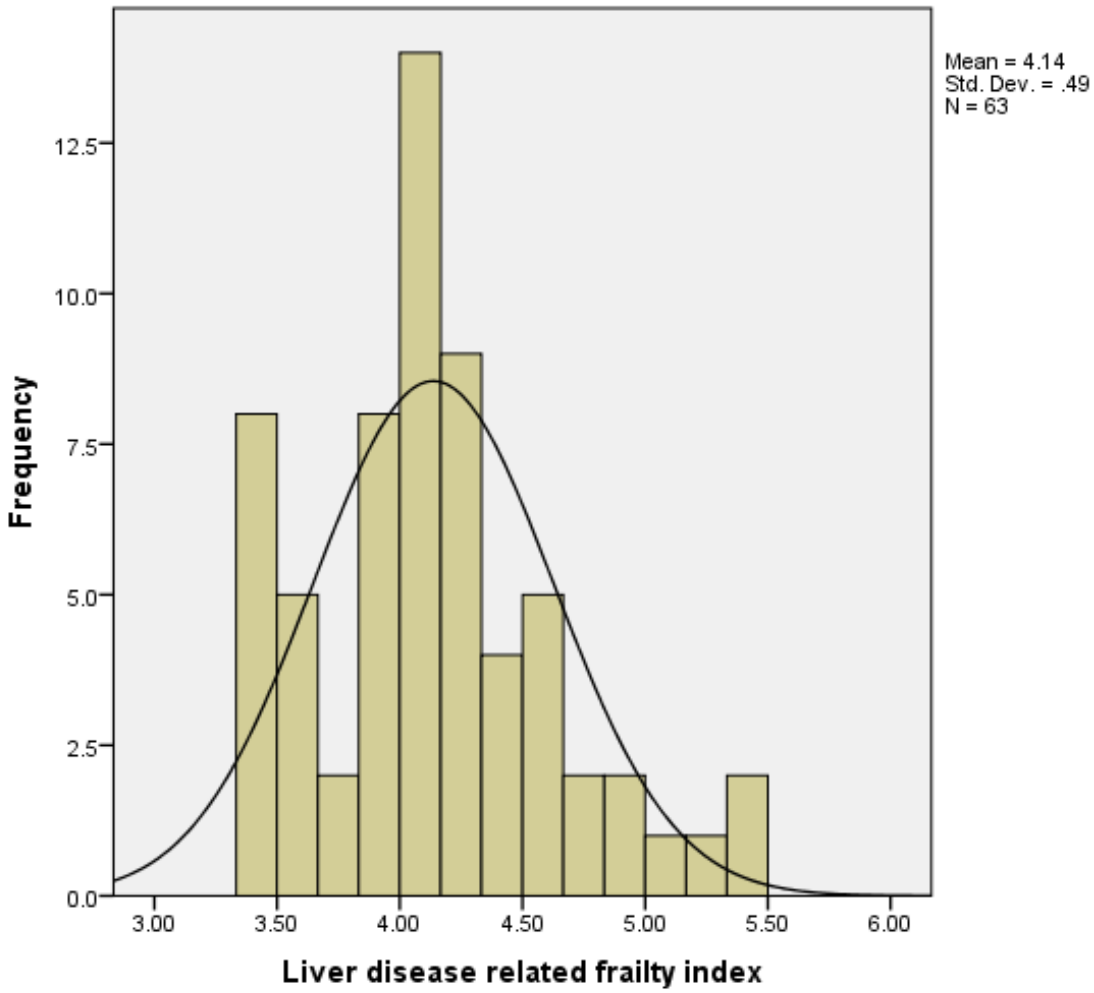

Figure 1 : Distribution of Frailty, pre-frailty in the study population. The frail and robust group was defined by the 20th and 80th percentile of the frailty index which was 3.61 and 4.51 respectively.

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EL203.3/3

Authors: Hywel Rawlins, Dr Meghan Jones & Dr Elizabeth Speirs
Institution: East Suffolk North Essex Foundation Trust, Ipswich

Title:
Merits of a Mobile Emergency Response Intubation Team (M.E.R.I.T) during the COVID-19 pandemic

Introduction:
COVID-19 has overwhelmed critical care resources in many affected countries. In response NHS England advised the formation of M.E.R.I.Ts as part of its clinical strategy[1] Here we discuss implementing this multidisciplinary team in a UK district general hospital during COVID-19 and its future application.

Methods:
The initial development of a 'COVID' roster, allowed staff redeployment to M.E.R.I.T. Following a health questionnaire to identify those 'at risk,' staff were allocated to new roles. The team included senior and junior anaesthetists, an Operating Department Practitioner (ODP) and a runner[2] Staff were issued role-specific pagers, standard operating procedures and M.E.R.I.T trolleys, consisting of personal protective equipment (PPE) and advanced airway equipment. M.E.R.I.T attended any patient requiring emergency intubation. In addition, they performed transfers and completed procedural work in the Intensive Care Unit (ICU). Following COVID guidelines from the UK Resus Council[3] regarding CPR this expanded to include cardiac arrests and trauma calls. M.E.R.I.T call data was recorded concurrently including time, date and reason for activation.

Results:
From 22nd March to 26th May 2020 M.E.R.I.T responded to 91 calls. 56 patients required ICU admission[Fig 1] with a significant proportion (69.6%, p value = 0.003) occurring in the first half of the time period. 72 transfers were performed and M.E.R.I.T. responded to 13 cardiac arrests and 9 adult trauma calls. Although the team assisted with additional ICU procedures no data was recorded.

Conclusion:
The benefit of M.E.R.I.T during the pandemic is clear; providing care to critical patients that would have fallen to overburdened ICU staff. The implementation has provided us with a blueprint for future pandemic response and raised questions regarding our pre-COVID structure. Redeployment also resulted in up-skilling of theatre staff and a renewed push to fund ODPs on cardiac arrest teams. However, following resolution of COVID-19 the workload would likely no longer necessitate its ongoing existence as a four-person team, demonstrated by declining ICU admissions.

References:

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2. Adult critical care novel coronavirus (COVID-19) staffing framework. www.england.nhs.uk. *Publications approval reference:01559.* 3rd April 2020
3. UK Resuscitation Council: Updated statement on PHE PPE Guidance. www.resus.org.uk/media/statements 28th April 2020

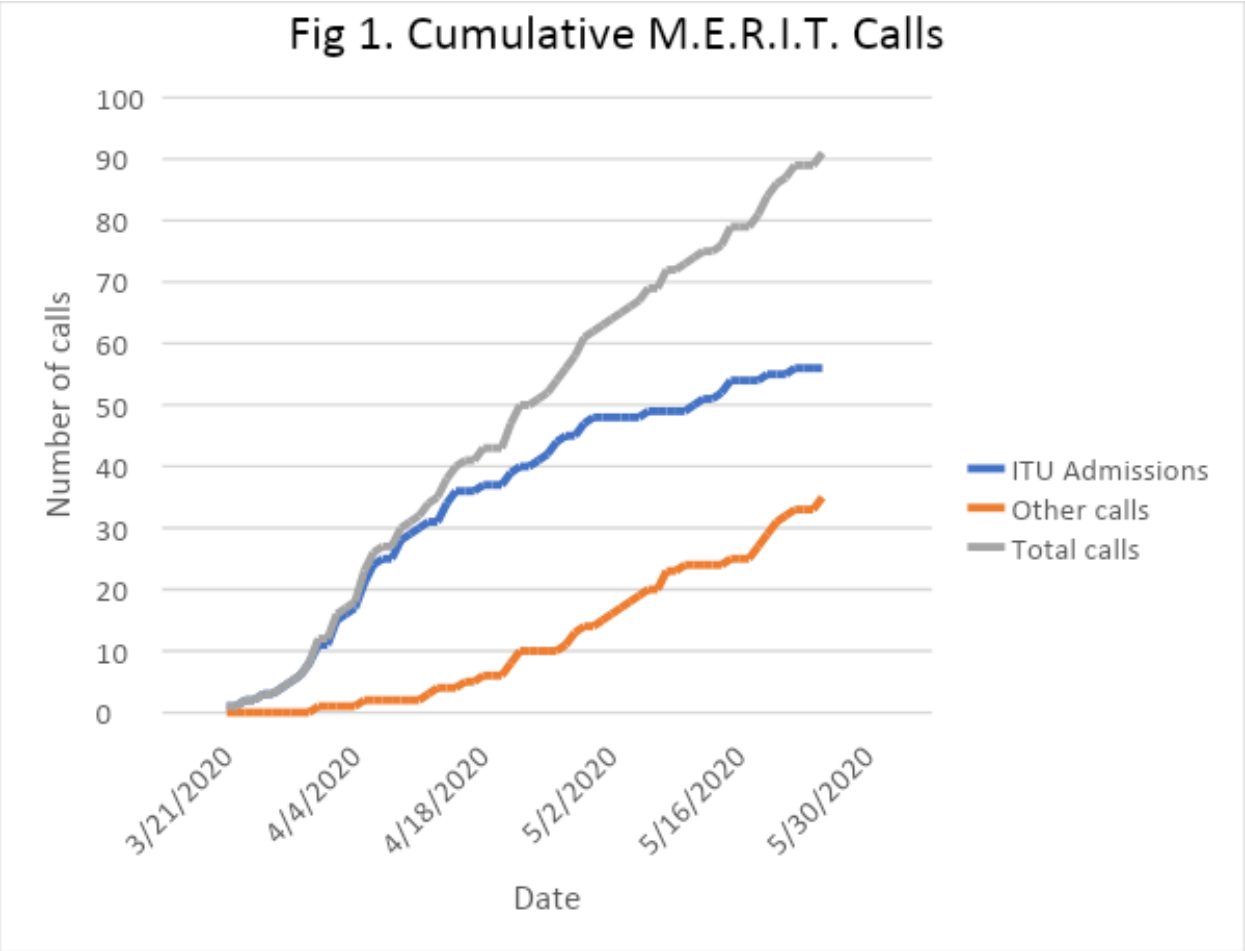
Fig 1. Cumulative M.E.R.I.T. Calls
100
90
80
70
60
50
40
30
20
10
0
Number of calls
3/21/2020
4/4/2020
4/18/2020
5/2/2020
5/16/2020
5/30/2020
Date
ITU Admissions
Other calls
Total calls

EL203.3/4

Authors: Martin Knight, Dr Ahilanandan Dishianthan, Dr Peter Russell & Prof Mike Grocott
Institution: University Hospitals NHS Foundation Trust

Title:
Goal directed haemodynamic therapy (GDHT) in surgical patients: systematic review and meta-analysis of the impact of GDHT on post-operative pulmonary complications

Introduction:
Perioperative goal directed haemodynamic therapy, defined as administration of fluids with or without inotropes or vasoactive agents against explicit measured goals to augment blood flow, has been evaluated in many randomised controlled trials (RCTs) over the past four decades. Post-operative pulmonary complications are common, but despite the substantial clinical literature in this area, it remains unclear whether their incidence is reduced by GDHT. This systematic review aims to determine the effect of GDHT on respiratory outcomes in surgical patients.

Methods:
We searched the Cochrane Central Register for Controlled Trials (CENTRAL), MEDLINE, EMBASE and clinical trial registries up until January 2020. We included all RCTs reporting pulmonary outcomes. The primary outcome was post-operative pulmonary complications and secondary outcomes were specific pulmonary complications and intra-operative fluid input. Data synthesis was performed on Review Manager and the study was registered with the PROSPERO registry (reference: CRD42020170361).

Results:

We identified 66 studies with 9548 participants reporting pulmonary complications. GDHT resulted in a significant reduction in total pulmonary complications (OR 0.74, **Fig 1**). Pulmonary oedema and pulmonary infections were significantly lower in the GDHT group (OR 0.47 and 0.72 respectively, **Table 1**). There were no differences in the incidences of pulmonary embolism or acute respiratory distress syndrome. Due to clinical and statistical heterogeneity, we downgraded this evidence to moderate. There was more use of colloid (280ml) and less of crystalloid (375ml) solutions in the GDHT group.

Figure 1. Forest plot of post-operative pulmonary complications

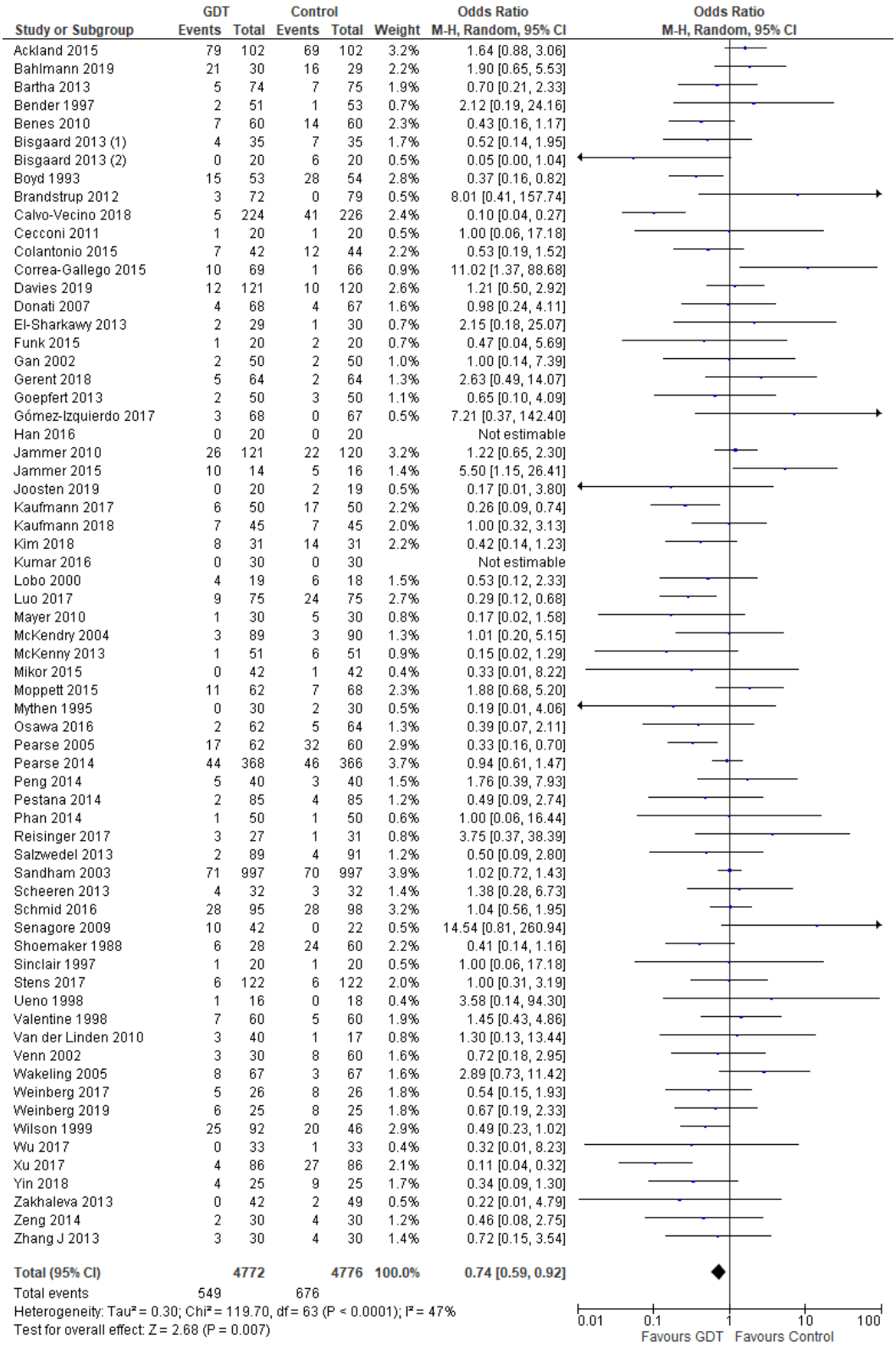

Table 1: Secondary outcome for specific pulmonary complications. ARDS, acute respiratory distress syndrome; CI, confidence interval; M-H, Mantel-Haenszel.

Outcome	No. of studies	No. of patients	Analysis	Effect (95% CI)	P-value
Chest infection or pneumonia	45	6969	M-H Odds ratio	0.72 (0.60 – 0.86)	P = 0.0003
ARDS	15	2491	M-H Odds ratio	0.57 (0.31 – 1.02)	P = 0.06
Pulmonary oedema	23	3205	M-H Odds ratio	0.47 (0.30 – 0.73)	P = 0.0008
Pulmonary embolism	28	5430	M-H Odds ratio	1.08 (0.59 – 1.95)	P = 0.81

Conclusions:

This systematic review and meta-analysis suggests that the use of GDHT in surgical patients reduces the development of post-operative pulmonary complications, with significant reductions in the incidence of respiratory infections and pulmonary oedema. Incorporating its use into surgical pathways may have a role in reducing perioperative morbidity.

EL203.3/5

Authors: Nicola Kelly & Dr Stephen Tricklebank
Institution: Guy's and St Thomas' NHS Foundation Trust

Title:
Appraising the pathway of high-risk patients undergoing emergency laparotomy: a service evaluation and quality improvement project using NELA data

Introduction:
The National Emergency Laparotomy Audit (NELA) provides annual reports detailing necessary improvements in perioperative care amongst patients undergoing emergency laparotomies. These data allow implementation of Best Practice Tariffs offering financial incentives if targets are met. One such target, highlighted by the 2019 report, is that patients with 'high' preoperative mortality risk (≥5%) should be admitted directly to critical care postoperatively.

We set out to establish the incidence of 'high-risk' patients being inappropriately transferred from theatre to level 1 recovery, rather than directly to a critical care environment, and improve pathways to reduce this occurrence.

Methods:
The study was conducted at St Thomas', a 1100 bed University affiliated London hospital. All patients who had NELA surgeries between 16th October 2018 and 16th October 2019 were included. Data were extracted from the NELA database and electronic medical records.

Results:
Amongst the 152 included cases mean preoperative NELA score was 14.9% (median 8.3%). 77 patients (50.7%) had a score ≥5% and 61 (40.1%) a score <5%, in the remaining 14 score was unknown. Overall 30 day mortality was 7.9%; 14.3% (11 deaths) in the high-risk, 7.1% (1 death) in the unknown and no deaths in the low-risk groups, respectively.

70 'high-risk' patients (90.1%) proceeded directly from theatre to a level 3 environment; 7 (9.1%) went to level 1 recovery, from which 2 patients were escalated to a level 2 and 1 to a level 3 bed. Of those with unknown NELA score, 4 (28.6%) proceeded to level 3 beds and 10 to level 1 recovery; all those in recovery subsequently went to the ward.

Conclusions:
Our results demonstrate that the majority of patients with mortality risk ≥5% are admitted directly to critical care postoperatively. However, a minority of patients travel via level 1 recovery en route to critical care potentially impacting patient outcomes and success in meeting NELA Best Practice Tariffs. Furthermore, a substantial number of patients do not have NELA scores calculated at all - the 'unknown group'. To mitigate against this we have developed a new pathway (Figure 1) requiring all high-risk patients to be discussed with the on-call ICU consultant and admitted to a level 3 bed, prior to de-escalation when appropriate. NELA scoring has been added to theatre protocols and checklists. Further work will include educational sessions for surgical and anaesthetic teams focusing on preoperative scoring and empowering junior staff to highlight deviation from NELA best practice.

References :

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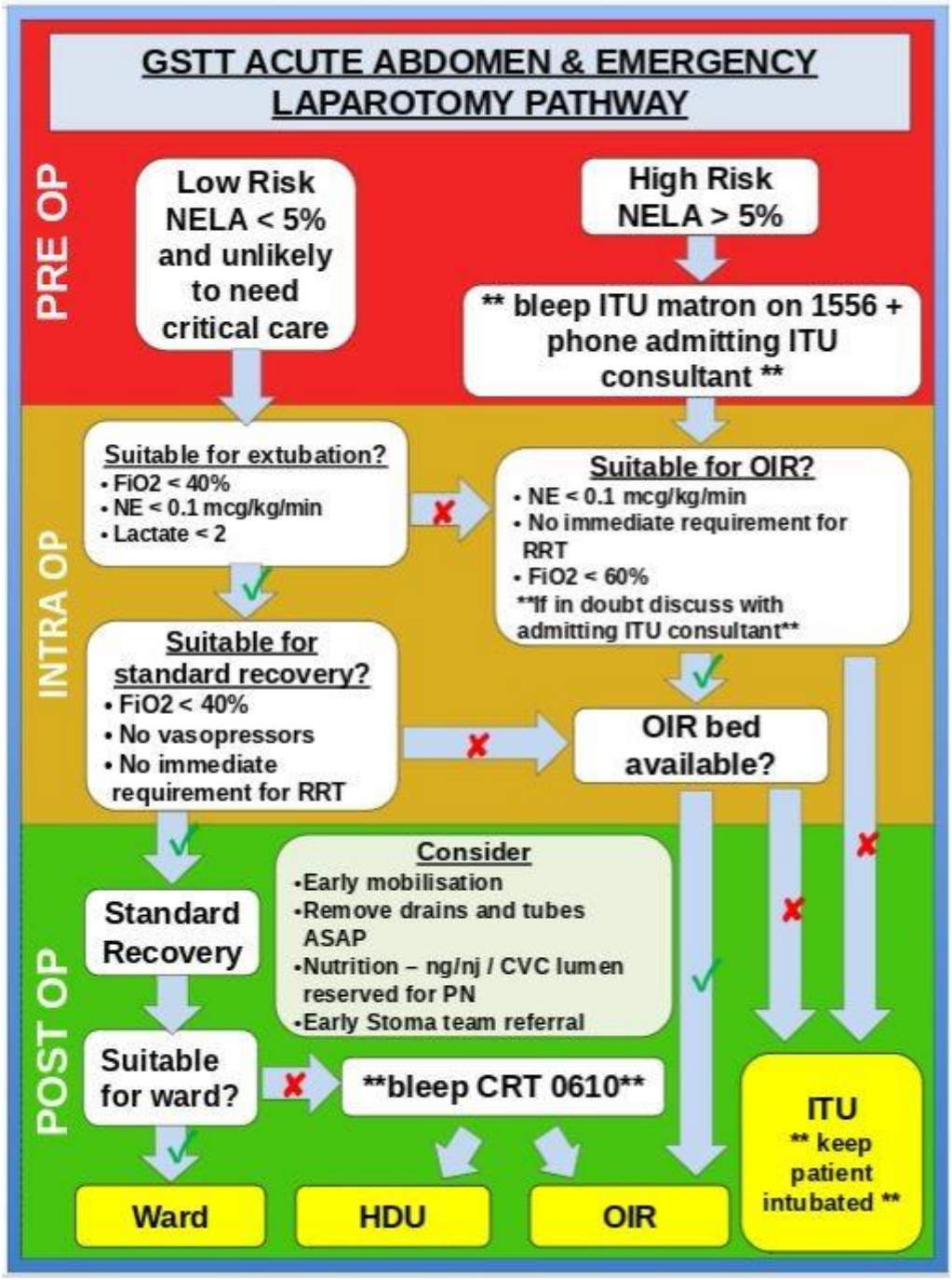

Figure 1. *Guys and St Thomas's NHS Trust Acute Abdomen and Emergency Laparotomy Pathway. ITU; Intensive Therapy Unit (level 3). OIR; Overnight Intensive Recovery (level 3). HDU; High Dependency Unit (level 2). FiO2; Fractional Inspired Oxygen Concentration, NE; Norepinephrine, RRT; Renal Replacement Therapy, CRT; ITU outreach registrar - critical care response team.*

EL203.3/6

Authors: Christina Beecroft, Dr Julie Christie & Peter Ross
Institution: Ninewells Hospital, Dundee, DD1 9SY, Scotland

Title:
Consent in the Time of Corona…

Introduction:
Shared Decision Making (SDM) is a process in which doctors and patients work together to select tests, treatments and care management based on clinical evidence and patients' informed preferences and values.[1] Consent for surgery is a process underpinned by the principles of SDM. Detailed consent for surgery during the novel SARS-CoV-2 coronavirus pandemic is fundamental.

Perioperative COVID-19 infection after planned surgery is associated with significant morbidity and a perioperative mortality of approximately 23%.[2, 3] This is in addition to the usual perioperative surgical risks. However, with the 'flattening' of the infection curve hospitals are being urged to re-start planned urgent surgery, otherwise patients will suffer adverse outcome *as a result of*, rather than *with*, SARS-CoV-2 infection.[4] Mindful of this, recommendations now exist for the safe commencement of planned surgery[5, 6], bringing appropriate patient consent to the fore in these challenging times.

Method:
NHS Tayside has developed a 'green pathway' for the safe commencement of planned urgent surgery. Following a 14 day period of pre-surgical isolation (PSI), and 2 negative SARS-CoV2 swabs, patients are admitted to a dedicated surgical suite which sits as a 'hospital within a hospital'. As the pathway was developed, we quickly realised both the importance of consent and the support clinicians and patients would need.

Results:
A patient information leaflet introduces the risks of surgery in the COVID-era and emphasises the importance of PSI to reduce the risk of perioperative COVID-19 infection. When discussing management plans, surgeons are encouraged to use the 'BRAN' (Benefits, Risks, Alternatives, Nothing) structure to frame their consent discussions. A Clinical Prioritisation Group of senior surgeons and anaesthetists meets weekly to discuss case selection and support clinical decisions. Finally, a detailed COVID-specific consent form has been developed with support from the Scottish Central Legal Office and is now an NHS Tayside document used in addition to the surgical consent form. Since the 'green pathway' started on 4th May 2020 over 100 patients have followed, or are currently on, the pathway. We have no positive SARS-CoV-2 tests to date which is in part a testament to the success of our consent process in emphasising the importance of patient participation in their surgical preparation.

Conclusion:
We feel that we have developed a framework and supporting resources that support both clinicians and patients contemplating surgery in this difficult time and look forward to refining our pathways to the benefit of the patient journey.

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EL203.3/7

Authors: Dr Simon Davis
Institution: University College Hospital at Westmoreland Street Hospital

Title:
Pre-operative screening for iron deficiency prior to expedited surgery in a central London cancer hub.

Background:
In 2018 the Association of Anaesthetists released an International consensus statement on the peri-operative management of anaemia and iron deficiency, in which it highlighted the increased morbidity and mortality risk associated with pre-operative anaemia. Key recommendations included setting a target haemoglobin concentration ≥ 130 g/L in both sexes, investigating and treating anaemia in all surgical procedures with expected moderate-to-high blood loss and a suggested regime for iron replacement, dependant on timing until surgery.
University College Hospital at Westmoreland Street Hospital (WMS) routinely carries out major urology surgery. Since March 2020, select major gynaecology and renal procedures have been carried out at WMS as part of the North-Central and North-East London cancer hub response to the COVID-19 pandemic. A retrospective cohort study of this population was conducted in order to assess the compliance of our practice to current guidelines.

Methods:
We reviewed all patients having elective Cystectomy, Nephrectomy or Hysterectomy, representing high-risk procedures by each surgical service, which were performed in May 2020.
Primary outcomes were; the proportion of patients identified as anaemic before surgery, the number of anaemic patients who had iron studies conducted, the number of patients with identified iron-deficiency anaemia (IDA) treated with iron before surgery, haemoglobin concentration on the day of surgery in patients treated with iron, and the incidence of in-patient transfusion. Secondary outcomes were the duration between identification of anaemia and date of surgery, and the route of administration of iron replacement.

Results:
Results for 51 patients are presented (Hysterectomy n=35, Nephrectomy n=11, Cystectomy n=5). Median (IQR) age was 60 (53-70.5) years. 71% (36/51) of patients were female. From the cohort, 17 (33.3%) patients had a Hb <130g/L measured before surgery. 9/17 (52.9%) anaemic patients had pre-op iron studies conducted. Two patients had iron studies consistent with IDA, one of whom received oral iron. In this patient, IDA was identified 12 days before surgery and Hb was 102g/L on the day of surgery. 11.8% (6/51) of all patients and 23.5% (4/17) anaemic patients received a transfusion during their admission. The interval between identification of anaemia and surgery was median (IQR) 9 (4.5-14) days.

Conclusions:
Using Hb <130g/L as a definition of anaemia, one third (17/51) of patients presenting for major cancer surgery were anaemic. Screening for iron-deficiency anaemia occurred in 53% of this group. Of the two patients identified as having IDA, just one was treated before surgery with oral iron when IV therapy was indicated.

References
Munoz M, et al. International consensus statement on the peri-operative management of anaemia and iron deficiency. Anaesthesia 2017, 72, 233–247

EL203.4/1

Authors: Matthew Burton, Dr Adrienne Lee, Dr Samuel Mcaleer & Dr Paul Moor
Institution: University Hospital Plymouth

Title:
Damage Control Surgery in a Regional Trauma Centre – Defining the Population: A Pilot Study

Introduction:
Trauma has a major disease burden, causing death and morbidity through physiological disruption.[1] Damage Control Surgery (DCS) minimises physiological disruption.[2,3] At present the demographics of patients who undergo DCS surgery within our institution are unknown. This study aims to characterise our DCS cohort and potential for prospective study.

Methods:
Our hospital has developed a DCS protocol[4] and ORSOS data capture paperwork. This ensures the appropriate patients are safely transferred to an adequately prepared operating theatre in a timely manner. All available DCS protocol and corresponding ORSOS data were captured from Nov 2017 – Sep 2019. Data was reviewed, and patient demographics analysed.

Results:
The DCS protocol was put on stand-by 42 times and activated in 21 cases. Patient data was held for 38 cases, 30 male and 8 female, median age 37 years (IQR 22-64). Data deficits were identified for future process refinement.

Median Injury Severity Score was 29 (IQR 0-36), with patients sustaining injuries from RTCs (37%), falls (26%), unknown mechanism (21%) and other (11%), Figure 1. DCS patients remained as inpatients for a median of 12 days (IQR 7- 26.5), with a 29% 30-day mortality.

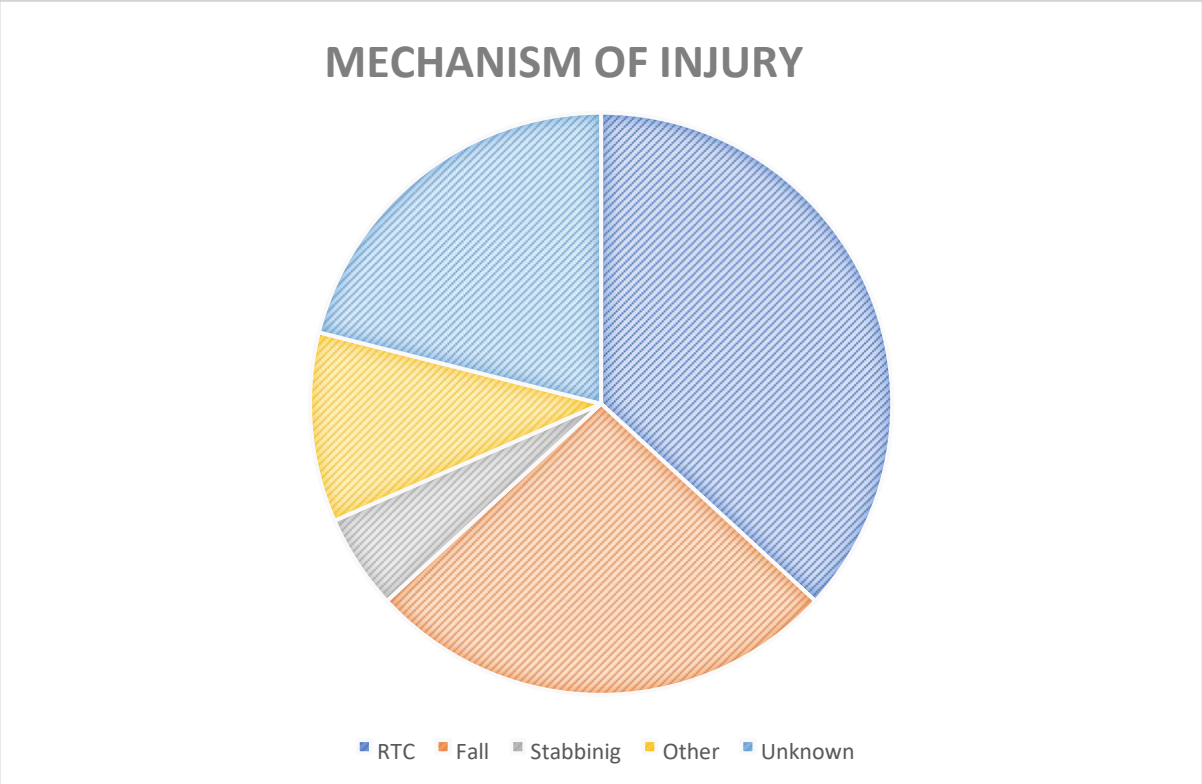


Figure 1 Mechanism of injury triggering DCS protocol

Together this shows that despite prompt surgical intervention, in a young patient cohort carries a significant mortality.

Conclusions:

We have established the demographics of those who trigger DCS protocol use in a regional trauma centre. The resultant database will enable prospective data collection for future DCS patients. Data deficiencies were identified and future mitigation strategies implemented. Such data will afford our region a greater understanding of the DCS population.

References:

1. Polinder S, Haagsma JA, Toet H, van Beeck EF. Epidemiological burden of minor, major and fatal trauma in a national injury pyramid. British journal of surgery. 2012 Jan;99(S1):114-20.
2. Schreiber MA. Damage control surgery. Critical care clinics. 2004 Jan 1;20(1):101-18.
3. Rotondo MF, Schwab CW, McGonigal MD, Fruchterman TM, Kauder DR, Latenser BA, Angood PA. 'Damage control': an approach for improved survival in exsanguinating penetrating abdominal injury. The Journal of trauma. 1993 Sep;35(3):375-82.
4. Moor P, Droog S, Adams S. Damage Control Surgery (Online). Peninsula Trauma Network. University Hospital Plymouth. 2016 Feb [2019 December]. Available from: https://www.plymouthhospitals.nhs.uk/download.cfm?doc=docm93jijm4n3410.pdf& ver=4326

EL203.4/2

Authors: Dr Emma Radcliffe, Kerry Archer, Steven Henwood, Amber Ritchie, Dr Thomas Knapp & Dr Thomas Collyer
Institution: Harrgate District Hospital

Title:
A Case Study in Perioperative Oncology Exercise Referral: The Active Against Cancer Service

Introduction:
Cancer patients who are more physically active experience less fatigue, anxiety, depression and fewer sleep disturbances [1]. Undertaking exercise is also known to reduce length of stay [2], postoperative complications [3] and in some instances reduce the chance of cancer recurrence [4]. Consequently, being able to support patients to become physically active before, during and following cancer treatment is a valuable tool. The aim of this study is to demonstrate the feasibility of establishing a perioperative exercise referral service for cancer patients, in a secondary care setting.

Methods:
Harrogate and District NHS Foundation Trust obtained funding from Yorkshire Cancer Research (Registered charity: 516898, Award ref: HDFT001B) and following a three month implementation period, the Active Against Cancer service was opened. All service activity and performance measures, including referral management, time to first appointment, exercise capacity and service usage were monitored for the first six months of opening (period 15th July 2019 to 15th January 2020).

Results:
Within the first six months of opening the service received 476 patient referrals of an estimated potential of approximately 650 within the trust. Of these referrals: 48 (10.1%) patients declined, 7 (1.5%) referrals were declined by the service as inappropriate, 86 (18.1%) were awaiting or unable to be contacted 13 (2.7%) were booked and awaiting their first appointment and 322 (67.6%) accessed the service. For patients accessing the service, 319 (99.1%) were offered an initial appointment within 3 working days of contact. Following an initial assessment, 109 (33.9%) patients were initiated onto a prehabilitation programme, 67 (20.8%) onto an in-treatment exercise programme and 146 (45.3%) onto a rehabilitation programme. The service was able to expand service provision from 92 to a maximum of 334 exercise places per week during the six month period. During this time the service saw a total of 3,164 exercise visits, and ran at a weekly capacity of 21.7 – 89.5%. For patients using the service, the number of visits per week ranged from 1 – 7, with a median of 2 exercise visits per week.

Conclusions:
It is feasible to embed a perioperative exercise referral service within cancer pathways, with high levels of referral and patient uptake. Patient outcome data is anticipated following the COVID-19 pandemic.

References:

1.Mishra, S.I., et al., *Exercise interventions on health-related quality of life for people with cancer during active treatment.* Clinical otolaryngology : official journal of ENT-UK ; official journal of Netherlands Society for Oto-Rhino-Laryngology & Cervico-Facial Surgery, 2012. **37**(5): p. 390-2.

2.Santa Mina, D., et al., *Effect of total-body prehabilitation on postoperative outcomes: a systematic review and meta-analysis.* Physiotherapy, 2014. **100**(3): p. 196-207.
3.Barberan-Garcia, A., et al., *Personalised Prehabilitation in High-risk Patients Undergoing Elective Major Abdominal Surgery: A Randomized Blinded Controlled Trial.* Annals of surgery, 2018. **267**(1): p. 50-56.
4.Lahart, I.M., et al., *Physical activity, risk of death and recurrence in breast cancer survivors: A systematic review and meta-analysis of epidemiological studies.* Acta oncologica, 2015. **54**(5): p. 635-54.

EL203.4/3

Authors: Heather MacKinnon, Sarah Ryder, Dr Nathan Ware, Dr Kathleen Wolff, Dr Robert Williams & Dr Andrew Packham
Institution: University Hospitals of Leicester

Title:
Developing the Fit4Surgery Prehabilitation pilot service for Leicester, Leicestershire and Rutland (LLR).

Introduction:
Reduced physical fitness is associated with increased risk of complications and more difficult recovery after major surgery. This new service aims to optimise patients physically, nutritionally and mentally before surgery, to enable them to have the best chance of a successful recovery, as advocated by the Prehabilitation for People with Cancer guidelines.

Methods:
A 2 year pilot clinical service in LLR has been developed to provide multi-modal prehabilitation for up to 300 patients undergoing major surgery. This longitudinal cohort project offers patients a comprehensive assessment of physical fitness, nutritional state and emotional wellbeing to produce a Personalised Prehab Care Plan. This includes 6 weeks exercise (aerobic + resistance), dietetics advice, psychological support and healthy lifestyle advice.
Patients being enrolled are those listed for major cancer surgery with ≥6week between referral and surgery. Patient groups include oesophagogastric cancer, rectal cancer (after radiotherapy), bladder cancer, liver metastases (after primary resection) and ovarian cancer requiring major resection. Patients are offered episodes of Prehabilitation both during neo-adjuvant chemotherapy and in the pre-surgery phase.

Before the COVID-19 pandemic struck, the exercise component was delivered as a supervised session combining high intensity interval training (HIIT) aerobic exercise and strength training in community venues. Exercise supervision was planned to be provided by qualified exercise instructors or physiotherapists based on location and patient presentation.

The service has now been adapted for remote delivery to provide pragmatic, safe exercise and support for patients during this time of uncertainty. Assessment sessions are conducted using a telephone clinic approach augmented by video-conferencing, where possible, to include a measure of physical function (Sit-To-Stand60). Patients are provided with a co-developed exercise prescription of aerobic and resistance training, supported by written material and weekly supportive telephone calls.

Risks for this conversion include the unavailability of CPET for objective exercise capacity assessment to guide exercise prescription, and restricted access to objective outcome measures.

Results:
38 referrals have been processed since February 2020 as shown in the table. All active patients transferred successfully to home exercise.

	Service Phase at patient referral	
Patients	**Face to face service**	**Home-based service**
Referrals processed	19	19
Assessments completed	14	17
Service declined	3	2
Change of surgical plan	2	0
Exercise		
Operated before exercise	1	0
Face to face exercise	13	n/a
Home exercise (transferred or commenced)	13	17
Current outcome status		
Transfer to palliative care	2	1
Operated	2	1
Continuing to exercise	9	15

Conclusion:
This project has successfully initiated a Prehabilitation pilot service for people preparing for major cancer surgery in Leicester, Leicestershire and Rutland. Engagement has remained high during conversion to remote delivery support due to COVID-19.

EL203.4/4

Authors: Jakub Chmelo, Alexander W Phillips, Dr Alastair Greystoke, Dr Sarah J Charman, Dr Leah Avery, Dr Kate Hallsworth, Jenny Welford & Dr Rhona C F Sinclair
Institution: Newcastle upon Tyne Hospitals NHS Foundation Trust

Title:
ChemoFit: A feasibility study to investigate the utility of a home–based exercise intervention during and after neoadjuvant chemotherapy for oesophago-gastric cancer

Introduction
Treatment of locally advanced oesophago-gastric (OG) adenocarcinoma usually entails neoadjuvant chemotherapy (NAC), and surgery. Surgery is associated with high morbidity and mortality (1). Cardiopulmonary reserve of patients undergoing major surgery is related to postoperative outcomes. NAC has a deleterious effect on patients' fitness (2, 3) and thus may impact on complications, prognosis and quality of life. Preventing a decline in fitness is desirable. The aim of this study was to determine feasibility and impact implementing a pragmatic home-based exercise intervention.

Methods
The ChemoFit study is a non-randomised, single-arm, single-centre pilot study designed to investigate the feasibility of a home-based prehabilitation exercise intervention for OG patients (4). Patients were recruited to this study (REC 18/WA/0427) between February 2019 and March 2020. They enrolled in a personalised, simple exercise intervention targeting an increasing daily step-count during and after NAC and in the weeks leading up to surgical resection of the cancer. Patients performed bouts of walking to target a step count and strengthening exercises on a daily basis. Pedometers were used to monitor participants' step count and exercise diaries were used for self-reported exercise activity. A research team member contacted each study participant on a weekly basis by telephone. The primary outcomes are reported here: the recruitment rate, completion rate and individual compliance with the intervention.

Results
Thirty-nine patients were recruited over 13 months. The recruitment rate was 71%. The completion rate was 91%. The individual compliance with the intervention (wearing a pedometer and recording step count data) achieved a median value of
97.32% intervention days (IQR=92.51-100.00%). The individual patients' engagement with a weekly telephone contact reached median of 100% of phone calls (IQR=93.10-100.00%). No exercise related adverse events were reported.

Conclusion
The ChemoFit prehabilitation regimen is safe, well tolerated and achieved excellent patient engagement. Our data shows patients are willing to participate in such a programme and that it is therefore feasible to recruit a pragmatic study which may be a cost-effective method of maintaining patient fitness during chemotherapy: this is an attractive proposal.

References
(1) National Oesophago-Gastric Cancer Audit 2019.2019.
(2) Navidi M et al. Br J Surg. 105(7):900-6.2018
(3) Jack S et al. Eur J Surg Oncol. 40(10):1313-20.2014
(4) Chmelo J et al. Pilot Feasibility Stud. 6:50.2020

EL203.4/5

Authors: Olivia Coleman, Dr Amelia Steel, Benjamin Thompson, Dr Douglas Johnson, Dr Kwang Lim, Dr Andrew Brett, Dr Irene Ng, Dr Jeffery Presneil, Dr Timothy Fazio & Dr Ned Douglas
Institution: Royal Melbourne Hospital

Title:
Incidence and characteristics of patient deterioration and medical emergency team activation in the early post-operative period

Deterioration after surgery is common despite high quality pre and intra-operative care. Identifying patients at risk of deterioration in the post-operative period is important for provision of intensive care beds and ensuring procedures are undertaken at centres with an appropriate level of care. This study aimed to characterise the burden of acute deterioration in the early post-operative period in a tertiary academic centre. Additionally, it highlighted outcomes including mortality, unplanned ICU admission and return to theatre.

A retrospective audit was performed of all Medical Emergency Team (MET) call events between 1st January and 31st December 2018 that occurred within 48 hours of a surgical procedure at the Royal Melbourne Hospital, Victoria, Australia. Patients were excluded if they had a minor cardiac procedure, or cerebrovascular clot retrieval.

The analysis of 26643 surgical procedures identified 401 MET calls and Code Blues, which accounted for 13.7% of 2935 hospital-wide MET calls in the study period. The median age of patients was 66 years old, 164 patients (68.4%) had an American Society of Anaesthesiologist's (ASA) score of 3 or greater, and 228 patients (57.1%) underwent emergency theatre cases. The major comorbidities identified pre-operatively were cardiovascular (41.8%) and respiratory diseases (32.2%).

MET calls were primarily due to hypotension (29.9%), tachycardia (18.5%), hypoxia (10.0%) and altered GCS (11%). They resulted in unplanned ICU admission in 40 patients (10.0%), 7 returned to theatre (1.8%), 4 were transferred to an HDU (1%), 1 to cardiac angiography (0.3%) and 2 patients died during the event (0.5%). There were 48 patients who had greater than 1 MET call in the 48-hour post-operative period, accounting for 26.7% of all post-surgical MET calls.

While the proportion of patients experiencing a post-operative MET calls was low, there was a small group of who accounted for over a quarter of MET calls. This group represents an opportunity to identify and select a group of patients who might be better cared for in an ICU or HDU environment. Future projects should focus on identifying risk factors for post-operative MET calls from easily identifiable pre-operative factors, as well as interventions that can reduce the frequency of MET calls. Specific priority should be given to interventions targeting hypotension and tachycardia given the high rate of such problems in the study.

EL203.4/6

Authors: Elizabeth Ashton, Dr James Wright & Dr Phillip Keane
Institution: Royal Sussex County Hospital, Brighton

Title:
Successful development of a new novice anaesthetist teaching day

Introduction:
Anaesthetics is a well supported specialty and the novice period provides an excellent grounding in the basis of anaesthesia. However, being unleased on the on call rota can be daunting particularly with regard to anaesthetic emergencies outside of the theatre environment. As a group of trainees we all experiences this significant step up and felt out of our depth when attending these emergencies. We therefore organised a trainee-led teaching course for novice anaesthetists about to embark on the on call rota with a particular focus on the non-theatre emergencies

Methods:
We developed the "SCAN course" (South Coast Anaesthetic Novice Course), a deanery wide teaching day delivered by senior trainees from the region. The day comprised of lectures followed by practical sessions. The lectures focussed on the management of the acute severe asthmatic, status epilepticus, how to intubate a head injured patients, cardiac catheter lab emergencies and cardiac arrests. We also covered topics on managing acute pain referrals and how to conduct safe transfer of critically ill patients. The practice sessions included how to use the oxylog ventilator, setting up an arterial line, insertion of central lines, sedation and anaesthesia outside of theatre.

Results:
Attendees were surveyed before and after the course. Prior to the course over 80% did not feel confident going in to their first on call shift compared to 100% feeling more confident after the course. Feedback by each individual session was either rated as good or very good. 100% of attendees would recommend the course to future trainees.

Conclusion:
Through a trainee led course focussing specifically on the role of the first on call anaesthetist we helped to improve the confidence of novice anaesthetists. We suggest that this improvement in knowledge of core topics will also benefit patients exposed to our junior colleagues.

EL203.4/7

Authors: Kang Yue K Liu, Dr Andrew Packham, Dr Dale Esliger & Dr Andrew Kingsnorth
Institution: University Hospitals of Leicester

Title:
Criterion Validation of Non-exercise VO_2peak Prediction Equations for Cardiopulmonary Exercise Testing in a Sample of UK Abdominothoracic Surgery Patients

Introduction:
Cardiopulmonary exercise testing (CPET) provides vital information for clinical decision-making and risk stratification in perioperative settings. CPET protocols require a prediction of peak oxygen uptake (VO_2peak) to calculate the patient's ramp slope. The purpose of this study was to assess the criterion validity of common non-exercise prediction equations as few have been validated on surgical populations and anecdotal evidence suggests they tend to overestimate patient VO_2peak.

Methods:
Perioperative abdominothoracic surgery patients' cycle ergometer CPET data from the University Hospitals of Leicester anaesthetic clinics from 01/2015 to 08/2019 were analysed. Patient VO_2peak was predicted using five common non-exercise equations (see table) requiring age, sex, height, and weight. Paired-sample t-tests were conducted to determine significant differences ($p \leq 0.05$) between equation-predicted and CPET-measured VO_2peak values.

Results:
882 maximal tests were analysed: 675 Males aged 40-94 (mean=71.3±8.7) mean VO_2peak 1476 ml/min and 207 Females aged 32-90 (mean=71.0±10.8) mean VO_2peak 947 ml/min. All paired-sample t-test results were significant. For males, all five equations overestimated mean patient VO_2peak with Neder et al. the closest to measured VO_2peak (1476 ml/min). For females, Jones et al. underestimated mean VO_2peak whilst the other four equations all overestimated. Jones et al. was closest to measured VO_2peak (947 ml/min) but 22 patients achieved >200% of their predicted value (highest 2864% of predicted) and negative values were predicted for 4 patients (all aged beyond the sample population).

Table 1. Mean VO_2peak (predicted and % predicted) by sex

Sex	Mean VO_2peak (ml/min)	Jones et al.[1]	Wasserman et al.[2]	Neder et al.[3]	Cooper & Storer[4]	Gläser et al.[5]
Male	Predicted	2152	2039	1691	1851	1921
	% Predicted	69%	72%	87%	80%	77%
Female	Predicted	889	1200	1091	1144	1305
	% Predicted	107%	79%	87%	83%	73%

% Predicted = measured VO_2peak / predicted VO_2peak x100

Discussion:
The results support anecdotal evidence that perioperative patients' VO_2peak tends to be overestimated by non-exercise prediction equations. As recommended by current perioperative CPET guidelines, a reduction from equation-predicted VO_2peak should be considered when calculating patients' ramp slope. Clinicians should consider which equations have reference values that best reflect their patients.

References:

1. Jones NL, et al. Am Rev Respir Dis. 131(5):700–8; 1985.
2. Wasserman K, Hansen JE, Sue DY, Whipp BJ. Principles of exercise testing and interpretation. Philadelphia: Lea & Febiger, 72-86; 1985.
3. Neder JA, et al. Eur Respir J. 14(6):1304–13; 1999.
4. Cooper CB, Storer TW. Exercise Testing and Interpretation: A Practical Approach. [Online] Cambridge: Cambridge University Press; 2001.
5. Gläser S, et al. Eur J Prev Cardiol. 17(4):469–76; 2010.

EL203.4/8

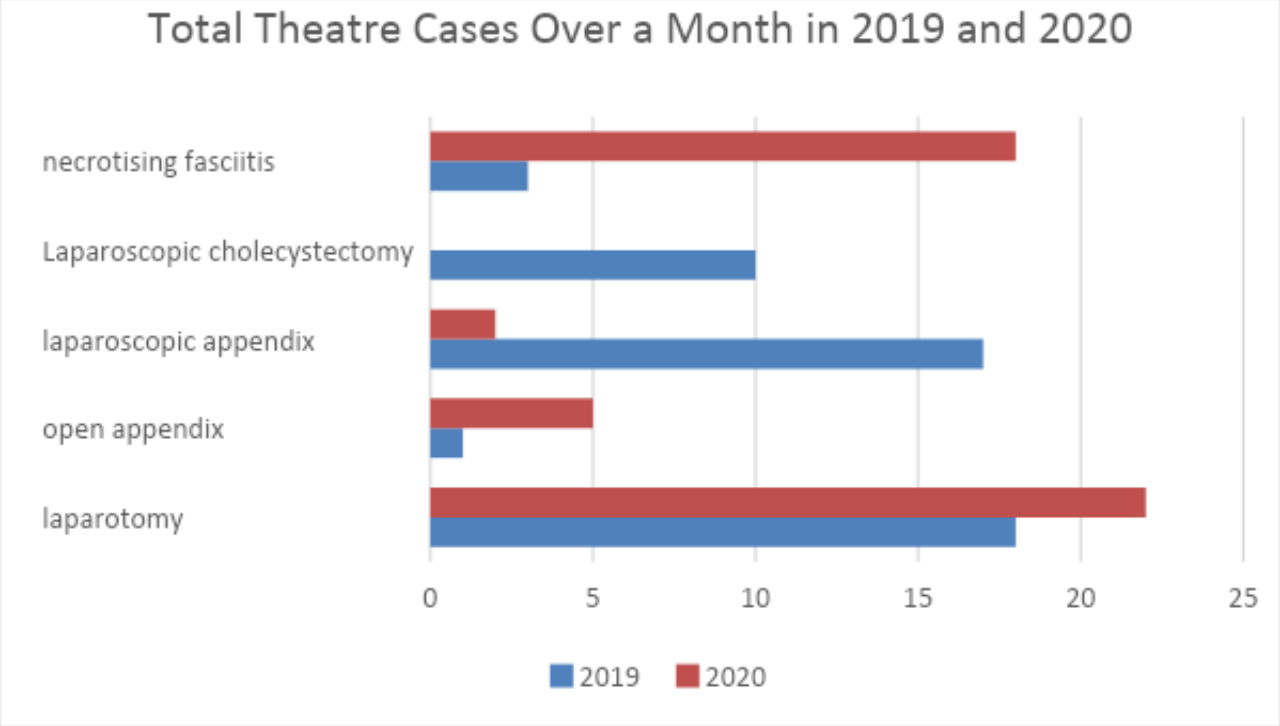
Authors: Samuel Passey, Dr David Stuckey & Dr Ciara Fenton
Institution: Royal Shrewsbury Hospital

Title:
A comparison of emergency theatre cases during the covid-19 lockdown 2020 and the same time period 2019

Introduction:
The Royal Shrewsbury Hospital (RSH) has eight elective operating theatres and a CEPOD emergency theatre. In the first month of public lockdown due to Covid-19 we noticed a change in the type of cases being seen in the CEPOD theatre at RSH. We felt there was an unusually high number of cases of necrotising fasciitis, and suspected this might be evidence of patients delaying accessing healthcare due to the fear factor of Covid-19.

Method:
We recorded every case from the CEPOD theatre at RSH for four weeks from the start of lockdown (23/3/20) using the theatre case register, noting the surgical specialty, what operation was being performed, and noting each case of necrotising fasciitis. We did the same thing for the same time period the previous year, recording the same details.

Results:
In 2019, 130 patients had an emergency operation in the CEPOD theatre, with seven of these patients having to return to theatre (an additional 12 times in total). Of these cases there were 17 laparoscopic appendicectomies, one open appendicectomy, 10 laparoscopic cholecystectomies and 18 laparotomies. There was only one case of necrotising fasciitis, and this patient returned to theatre twice. In comparison, in 2020 there were 67 distinct patients who had an operation in CEPOD, a decrease of 48.5%, with five cases that returned to theatre an additional 13 times in total. There were only two laparoscopic appendicectomies, a drop of 88.2%, but five open appendicectomies (400% increase); in total this represented a 61% reduction in the number of appendicectomy cases. There were six cases of necrotising fasciitis who came to theatre a total of 18 times, with one being palliated on the ward without making it to theatre. There were no laparoscopic cholecystectomies and 22 laparotomies.



Conclusions:
The Royal College of Surgeons produced guidance for surgeons on safe operating during the Covid-19 pandemic on 26/3/2020, this was updated on 7/4/20. It states "Laparoscopy is considered to carry some risks … and considerable caution is advised"[1]. These guidelines help explain the large decrease in laparoscopic surgeries, and the associated increase of open appendicectomies performed in the 2020 data set. The large increase in cases of necrotising fasciitis that was seen in this period in 2020 (compared with 2019) would seem to agree with evidence[2] that patients were not accessing healthcare as promptly as they would have done had the lockdown not been in place.

References:
1. The Royal College of Surgeons of England, 2020, *Updated Intercollegiate General Surgery Guidance on Covid-19*, The Royal College of Surgeons of England, 26/5/2020, https://www.rcseng.ac.uk/coronavirus/joint-guidance-for-surgeons-v2/

2.NHS England, 2020, *A&E Attendances and Emergency Admissions April 2020 Statistical Commentary*, NHS England, 27/5/2020, https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/05/Statistical-commentary-April-2020-jf8hj.pdf

EL204.1/1

Authors: Madhavi Gudipati, Dr Veera Gudimetla, Dr Parul Chandra, Dr Albion Augustine & Dr Nagaraj Rao
Institution: University Hospital of North Midlands

Title:
Strong for surgery"-prehabilitation school patient experience feedback

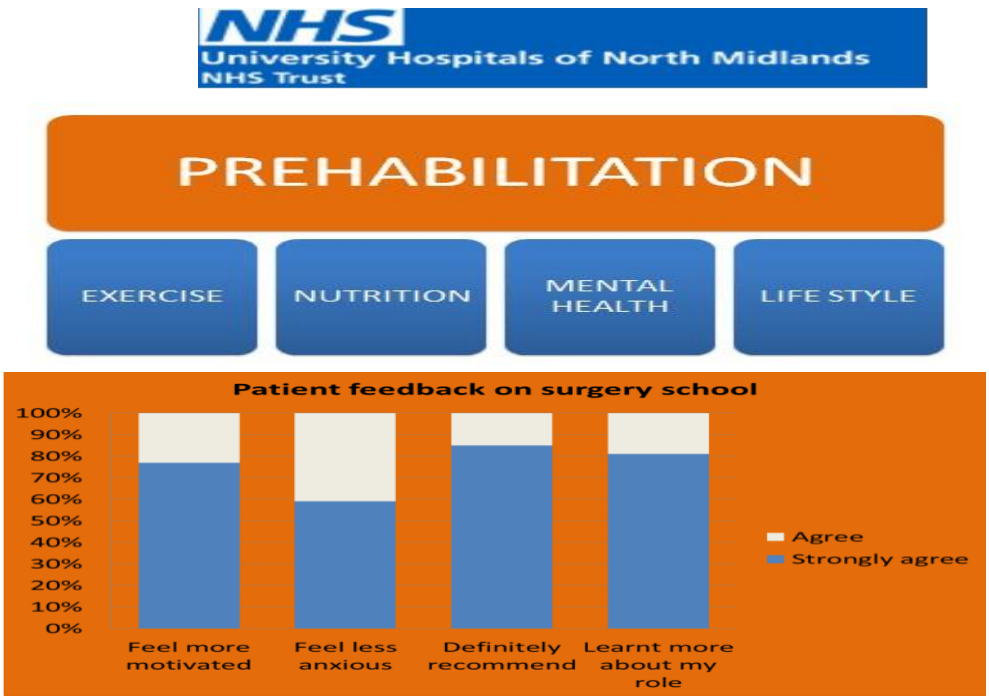
Multimodal Prehabilitation of high risk surgical patients
Face to face patient education sessions on

- Prehabilitation principles (Anaesthetist)
- Preop exercises and incentive spirometry (Physiotherapist)
- Mental Health and mindfulness (Specialist nurse)
- Perioperative journey and ward visit (Specialist nurse)

Feedback from first 100 patients:
Major colorectal, upper GI resections, urology, vascular and hepatobiliary procedures
Patient feedback questionnaire at the end of session:

- 98% patients feel more motivated to get fitter for surgery
- 92% patients agree they are less anxious about surgery
- 98.7% feel more informed about their role in surgery
- 100 % patients would recommend surgery school to others

A single face to face Prehabilitation session can significantly improve patient motivation, preparation and reduce anxiety.



EL204.1/2

Authors: Dr Elena Stanton, Dr Heloise Hayakawa, Dr Shivani Amdekar, Dr May Chan, Dr Ciara Donohue, Dr Charlotte Kingsley, Dr Su Mallory, Dr Rosie May & Dr Arun Menon
Institution: University College London Hospital

Title:
Critical Care Transfer Hub: an example of best practice in London during COVID-19 times

London Critical Care transfers often represent a challenge to referring hospitals; having to conduct both the logistics of finding beds and providing adequately trained staff for the crew at the expense of services in house (1).

Our aim was to create a clinician coordinated transfer hub developing close working relationships with referring and receiving local critical care units and utilising dedicated consultant lead transfer teams. Ultimately, freeing up staff and creating intensive care beds in non-surge hospitals.

In North East & North Central London (NCL), pre-SARS-COV-2 there were 892 critical care transfers conducted during 2018-2019 (ICNARC). The hub was established on 3rd April 2020 following the peak in COVID-19 cases. It facilitated the safe decompression of intensive care units that had been overwhelmed.

During peak activity, seven critical care patients were transferred daily from peripheral units to newly reconfigured critical care beds in tertiary surge centres. Three consultant led teams dispatched from University College London Hospital (UCLH), Royal National Orthopedic Hospital and Great Ormond Street, worked twelve hours every day, supported by senior trainees. A new partnership has been established with London Ambulance Service to match ambulances with transfer teams at each center, an arrangement we continue to benefit from today. During times of crisis we were privileged to work with our neighboring sectors allowing for effective use of staff, equipment and resources (2).

81 transfers (57 in sector) were performed within the first 30 days. Throughout this process, natural adaptations to the hub have permitted the formation of recognized standard operating procedures. The hub continues to provide a central gateway through which activity and outcomes can be recorded for quality improvement. Considering stringent NHS data security governance, we partnered with InforceHub, a data analytics company to create a bespoke data collecting app deployed securely within the protected UCLH network.

We have been provided with a unique opportunity to develop and pursue a permanent strategy to deliver this essential service. We would like to present our experiences and highlight key learning points gained over recent weeks. London is now planning for potentially multiple COVID surges and doubling its critical care bed capacity (3). It has become clear that there is a real need for a dedicated transfer service with quality, safety, governance, training and the patient at its very core. We propose our model as an example of how this may be achieved.

References:
1. Wong DJ, Harris SK. Interhospital critical care transfer delays result from organisational not geographical factors: secondary analysis of deteriorating ward patients in 49 UK hospitals. Critical Care. 2015;19(1):P510.

2. Grier S, Brant G, Gould TH, von Vopelius-Feldt J, Thompson J. Critical care transfer in an English critical care network: Analysis of 1124 transfers delivered by an ad-hoc system. J Intensive Care Soc. 2020;21(1):33-9.
3. Neville S. London's hospitals aim to double intensive-care bed capacity. Financial Times. 21st May 2020.

EL204.1/3

Authors: Dr Flora Pollok, Dr Paul Traynor, Dr Dinesh Das, Dr Lucy Evans, Tracey Nevin & Thomas James
Institution: Princess Alexandra Hospital

Title:
Iron Deficiency Anaemia and Major Elective Surgical Procedures

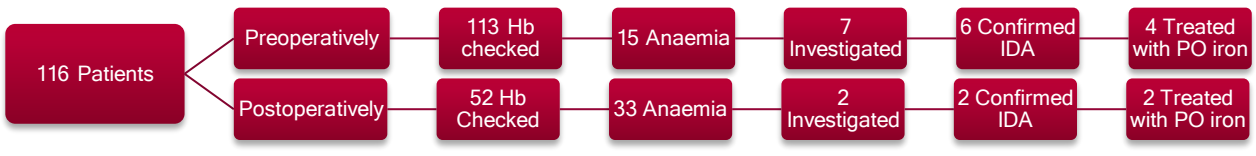
Aim:
To assess prevalence of iron deficiency anaemia (IDA) in patients undergoing major elective surgery with a view to instating a formal preoperative pathway for diagnosing and treating this condition.

Introduction:
The wide range of detrimental outcomes associated with perioperative IDA has been extensively shown through observational studies. These include increased length of stay, greater use of blood products and increased morbidity and mortality. Given this, recommendations in the form of an international consensus statement[1] and guidance published by the national institute of clinical excellence[2], outline standards for perioperative management of IDA and have specific recommendations for the diagnosis, treatment and timing of major elective surgery. This service evaluation assesses practices at our trust against these recommendations in order to identify shortcomings and implement improvements including a pathway for the peri-operative treatment of iron deficiency.

Methods:
Retrospective analysis of all adult patients undergoing major elective colorectal and gynaecological procedures between August 2019 to October 2019. Included were any elective procedures in which the abdominal cavity was entered. Different hospital information systems were employed to source data. Data collected incorporated; patient demographics, haematological results, intraoperative details, administration of iron and use of blood products. Use of NICE definition of anaemia; Hb <130 in males and <120 in females.

Results:

Table:



97% (n. 113) of the cohort had a preoperative full blood count. 13% (n. 15) of these patients were anaemic. Of these 47% (n .7) had pre-operative iron studies with 6 patients having confirmed IDA. On discharge 28% (n. 33) were anaemic with 10 having a haemoglobin level of less that 100g/dL. Overall 9% (n.11) of patients received some form of iron replacement in the perioperative period. On outpatient follow up 16% (n. 19) had a full blood count carried out with 58% (n. 11) showing anaemia. Of interest 12% (n.16) of the cohort had an unplanned representation to secondary care.

Conclusion:
Results identify that 13% of elective major surgical patients were anaemic pre-operatively and 28% of patients had moderate anaemia on discharge. The diagnosis and management of iron deficiency anaemia falls short of national recommendations. Improvement in the diagnosis and treatment of IDA including implementation of preoperative iron pathway would be beneficial in reducing the complications that occur from this treatable disease.

References:

1. M Muñoz, Anaesthesia. 2017 Feb;72(2):233-247
2. NICE, Evidence review of preoperative management of anaemia, Nov 2019

EL204.1/4

Authors: Dr Fiona Windsor, Dr Jo Hardwick, Dr Lauren Richardson, Dr John Nathan Spence & Dr Shvaita Ralhan
Institution: Oxford University Hospitals NHS Foundation Trust

Title:
Trial of Perioperative Medicine within elective colorectal surgery

Introduction:
Oxford University Hospitals is a split-site Trust with elective colorectal surgery based at a different hospital to acute medicine and emergency surgery. Medical provision across the elective colorectal ward is unscheduled and reserved for acutely unwell patients. Complex, co-morbid patients do not routinely receive physician input. A survey of the colorectal multi-disciplinary team had identified a need for improved access to medical opinion and areas for education including delirium and fluid management.

Methods:
Following discussion with the lead for colorectal surgery, a 4-week trial integrating perioperative medicine was implemented. For this period, all admissions received an initial perioperative review with further input guided by clinical need or staff concerns. Perioperative specialists were present at board rounds and 'Morbidity and Mortality' meetings. As a comparator, notes of patients admitted over a 4-week period prior to trial commencement were reviewed with data collected on number of out-of-hours and specialty medical referrals. Feedback was sought after the trial.

Results:
During the trial 53 patients were seen. 24/53 (45%) were reviewed more than once. No out-of-hours medical reviews were needed and no patients required escalation to Intensive Care. 8 specialty reviews were requested (excluding microbiology advice) and these were all at the request of the perioperative team for conditions such as Addison's disease and complex diabetes mellitus. Notably, we identified and acted on incidental radiology findings and managed medical conditions which may have been overlooked including heparin-induced thrombocytopenia.

In the 4 weeks preceding our trial, 54 patients had been admitted. Whilst there were no differences seen in rates of out-of-hours medical input or specialty medical referrals, we hypothesise that some aspects of care could have been optimised to reduce some unscheduled referrals whilst also identifying other issues requiring medical attention.

Other positive aspects of our presence included shared learning on fluid prescriptions, electrolyte disturbance and medication reviews including the conversion of 'time-critical' oral medications in patients nil-by-mouth. Subsequent feedback highlighted improved nursing and junior doctor confidence in management of common medical conditions. Surgical consultants found the presence of a perioperative physician increased awareness of issues affecting frail and co-morbid patients.

Conclusion
We demonstrate the feasibility and clinical benefit of integrating routine perioperative care within elective colorectal surgery in our Trust. Discussions are ongoing about a permanent perioperative presence within this service.

References

1. Perioperative Medicine: The Pathway to Better Surgical Care. https://www.rcoa.ac.uk/sites/default/files/documents/2019-08/Perioperative%20Medicine%20-%20The%20Pathway%20to%20Better%20Care.pdf [Accessed 29 May 2020]

EL204.1/5

Authors: Dr Lauren Richardson, Dr Fiona Windsor, Dr John Nathan Spence, Dr Shvaita Ralhan & Dr Jo Hardwick
Institution: John Radcliffe Hospital, Oxford

Title:
Best Practice Tariffs in Trauma– only half the battle for Geriatricians

Introduction:
The introduction of the Best Practice Tariff (BPT) for Major Trauma, alongside that for proximal femoral fractures (PFFs)[1], has improved geriatrician input for elderly patients. However, there are patients who do not fulfil BPT criteria but would benefit from a Comprehensive Geriatric Assessment (CGA). We aimed to establish if there was a service gap in our current model and to determine if expansion was needed.

Methods:
We reviewed the electronic records of patients over 65 years admitted under the trauma team during January 2020. We excluded patients that met the pre-existing BPT for PFFs or Major Trauma. We retrospectively calculated frailty scores using the Rockwood Clinical Frailty Scale (CFS). Notes were reviewed by two senior geriatric medicine trainees with experience of Orthogeriatrics and use of the CFS. We determined which patients would have benefited from geriatrician input during or after their admission.

Results:
Of the 109 admissions, 51 were PFFs and 9 fulfilled the criteria for the major trauma BPT and so were excluded. Of the remaining 49 patients, 22/49 (45%) would have benefited from geriatrician review. Reasons identified for this were polypharmacy (16/22), frailty (10/22), falls (11/22), pre-existing immobility (5/22) and cognitive impairment (5/22). Increasing age was associated with an increasing need for geriatrician input (Table 1).

Age (years)	Number of patients	Patients benefiting from CGA (%)
Under 70	22	5 (23)
70-79	19	10 (53)
80 or over	8	7 (88)

Table 1: Patients benefiting from CGA by age

Conclusion:
The introduction of BPTs in trauma has facilitated geriatrician input for a group of patients with a high level of morbidity and mortality. Arguably, however, they may have created further divisions in care. There remains a cohort of complex, older patients who are only seen by a physician if they deteriorate acutely. In this context review is reactive rather than preventative and often not by a trained geriatrician. Whilst these patients are deemed to have comparatively less severe injuries, we suggest that CGA at the point of their index presentation is key in order to reduce falls risk and prevent repeated admissions. We propose that Orthogeriatric services will need to expand and adapt to meet the growing needs of this population.

Reference:

1. Payment System – A consultation notice: Annex DtD Guidance on best practice tariffs A joint publication by NHS England and NHS Improvement. January 2019

EL204.1/6

Authors: Chris Tomlinson
Institution: Surrey & Sussex Healthcare NHS Trust

Title:
Wearables for Home Post-Operative Monitoring: Proof of Concept

Introduction:
We hypothesise that wearables could transform perioperative care, including through facilitating early-discharge, a key tenant of Enhanced Recovery After Surgery (ERAS), by enabling remote patient monitoring of physiological & functional variables.

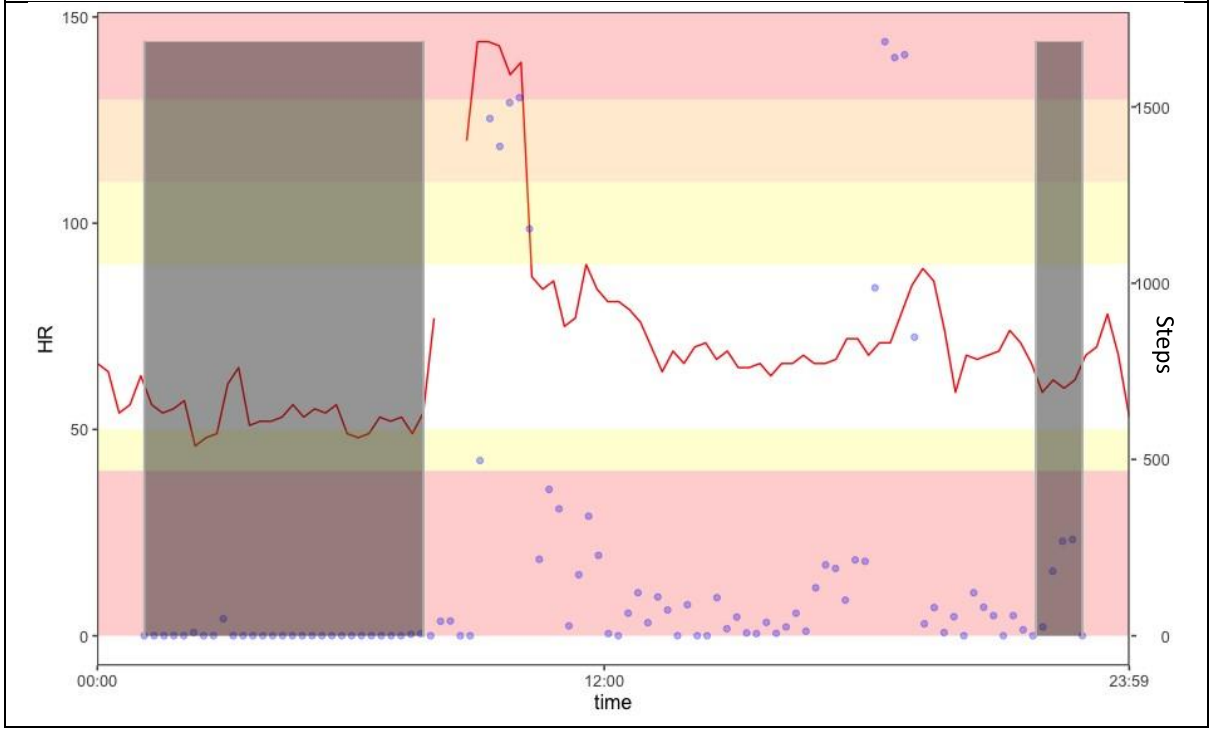
Methods:
Utilising a commercially available fitness tracker (Charge 4, Fitbit ®) and Application Program Interface (API) it was possible to import measured data into R for further statistical computation.

Both physiological (heart rate (HR)) and functional (sleep duration, step count) variables were accessible. Whilst the device includes a pulse oximeter, this is unavailable via the API.

Owing to COVID-19 this methodology was trialled on a volunteer and serves only as proof of concept.

Results:
Figure 1 displays Heart Rate (red), Steps (blue) 15-minutely and sleep (grey) over 24 hours. HR reference ranges from the National Early Warning Score 2 are represented by yellow, orange & red horizontal ribbons, corresponding to NEWS scores of 1, 2 & 3, respectively (RCP, 2017).

Figure 1: Heart Rate, Step Count and Sleep Time



Once can easily 'eyeball' a resting HR of ~53, a peak of ~145 during exercise and that HR was generally within normal limits on the NEWS2 score. They undertook two periods of exercise, lasting ~90 & ~60 mins, respectively, and slept for ~7.5 hours, with little disturbance.

Discussion:
From the recorded parameters we may expect to see patterns of abnormalities consistent with post-operative complications, for example pain illustrated by a tachycardia and reduction in activity and sleep (Table 1). This could be greatly enhanced with SpO2, via an API update.

Table 1: Hypothesised Parameter Abnormalities

	HR	Steps	Sleep	SpO2*
Pain	↑	↓	↓	-
Infection	↑	-/↓	-	-/↓
Pulmonary Complication	↑	-	-	↓
Reduced Movement	-	↓	-	-

**not available via API at present*

Other methods of outlier detection could include reference ranges (e.g. NEWS2 – visualised in Figure 1) or comparison with peers (e.g. 95th centiles). Following identification this may prompt increased follow-up, e.g. telephone call or 'push-notification' to patient outcome reporting app.

Furthermore, captured data contributes to a core & extended perioperative outcome set (Myles et al., 2016) for further high-quality research.

Conclusions:
Remote patient monitoring, via wearable fitness trackers, is achievable and has potential to provide meaningful benefit, by facilitating early discharge and detection of complications, as part of an ERAS pathway. Following proof of concept we hope to trial this tool clinically.

References:
Royal College of Physicians. *National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS*. Updated report of a working party. London: RCP, 2017.

P. S. Myles, M. P. W. Grocott, O. Boney, S. R. Moonesinghe, on behalf of the COMPAC-StEP Group, Paul Myles, Michael Grocott, Bruce Biccard, Oliver Boney, Matthew Chan, Lee Fleisher, Cor Kalkman, Andrea Kurz, Ramani Moonesinghe, Duminda Wijeysundera, J. Bartoszko, W. S. Beattie, R. Bellomo, D. Buggy, L. Cabrini, J. Canet, T. Cook, D. J. Cooper, T. Corcoran, P. J. Devereaux, R. Eckenhoff, L. Evered, T. J. Gan, T. Gin, H. Grocott, G. Haller, S. Howell, M. Jayarajah, C. Kalkman, K. Karkouti, B. Kavanagh, A. Klein, G. Landoni, K. Leslie, D. R. McIlroy, D. Mazer, A. Moller, M. Mythen, M. Neuman, M. Neuman, R. Pearse, P. Peyton, J. Prowle, T. Richards, D. A. Scott, D. Sessler, A. Shaw, T. Short, M. Shulman, B. Silbert, M. Singer, J. R. Sneyd, D. Story, D. van Dijk, W. van Klei, on behalf of the COMPAC-StEP Group, Standardizing end points in perioperative trials: towards a core and extended outcome set, *BJA: British Journal of Anaesthesia*, Volume 116, Issue 5, May 2016, Pages 586– 589, https://doi.org/10.1093/bja/aew066

R code for data import & analysis freely available at:
https://ctomlinson.net/tag/EBPOM2020/

EL204.1/7

Authors: Dr Dominic Knight, Dr Gianluca Trisolini Longobardi & Dr Daniel Helme
Institution: Royal Gwent Hospital

Title:
Don't think Nil by Mouth - Think Pre-op

Introduction:
The phrase 'nil by mouth' is commonly used pre-operatively. However, the phrase can be interpreted differently but different doctors, nurses, wards and hospitals. During trauma lists, it was noted that some of our frailest patients had essential cardiac medications withheld whilst listed as 'nil by mouth'. This prompted a quality improvement project aiming to investigate the management of pre-operative patients on the ward awaiting trauma surgery.

Methods:
Two questionnaires developed.

An Anaesthetic survey was completed prospectively over a 2-month period (March-May 2019) for all patients undergoing an anaesthetic in the trauma theatre. This assessed the length of time fasted for food and fluids as well as to document whether medications were given appropriately pre-operatively.

A nursing survey was completed over two weeks for nurses working on any ward with trauma inpatients. This survey asked nurses what they would administer to a 'nil by mouth' patient (fluid, food, regular medications, acute analgesia etc).

Results:
Anaesthetic Survey: 43 completed forms over the two-month period. Fluid and food fasting times ranged 0-22 hours with mean fluid fasting time 11 hours 8 minutes and mean food fasting time 13 hours 25 minutes. 42% of patients did not have IV fluids prescribed. 69% (30/43) had analgesia prescribed. 32/43 patients were on regular long-term medications. Of these, 41% were not given their regular medication appropriately. There were 5 diabetic patients, 2 of these did not receive any diabetic medication or insulin infusion when it was indicated. There were no serious adverse effects found from pre-operative management.
Nursing Survey: 22 forms completed. 82% (18/22) would hold oral fluids for a patient 'nil by mouth' even if surgery is due to start in greater than 2 hours time. 45% (10/22) would not give long acting insulin to a 'nil by mouth' diabetic patient.

Conclusion:
These two surveys highlight inconsistencies in the management of pre-operative trauma patients. There are concerns surrounding the medical management of diabetic patients and oral fluids being withheld from 'nil by mouth' patients. These results led to a notion of patients being labelled as 'pre-op' as opposed to 'nil by mouth' along with education of both clinicians and nurses surrounding current guidelines when managing patients pre-operatively. Further re-audit underway to assess for change in practice following these implementations.

EL204.1/8

Authors: Jennie Lambert & Dr Tim Hughes
Institution: King's College Hospital, London

Title:
Cancellations on the Day of Surgery at King's College Hospital: Who, Why and What can we do?

Introduction:
On the day of surgery cancellations are distressing for patients and costly for Trusts. The aim of this service evaluation was to reduce on the day cancellations in Day Surgery at King's College Hospital by establishing reasons for cancellations and identifying training needs and areas for improvement in patient and colleague communication.

Method:
Retrospective analysis of all on the day cancellations in Day Surgery at King's College Hospital over the 6-month period from April to September 2019.

Results:
94 patients had their operation cancelled on the day of surgery across 13 surgical specialties. 48% of cancellations could have been prevented during their surgical pre assessment. 21 patients required further pre-operative optimisation, with main areas being diabetes and hypertension. A pre-optimisation package was developed in line with Trust and PQIP priorities to improve patient pre-surgical optimisation and as a staff training resource. An A4 summary sheet prompts individual risk, functional capacity and frailty assessments with recommended action depending on the outcome of each of these assessments. The sheet then prompts the user to review the patient's anaemia, diabetes, OSA, hypertension, memory loss, nutrition and smoking status, including investigation and any required action. The bundle includes detailed information on how to conduct the assessments and pathways for action and/or referral if needed.

Anaesthetic cancellation also included 11 patients deemed not fit for day surgery and 12 patients who were cancelled due to management of anti-coagulation across all surgical specialties. A recent updated anti-coagulation policy was re disseminated to the MDT. 25 patients were cancelled due to active infections, most commonly upper and lower respiratory tract and urinary tract infections. A plan has been made to improve patient education surrounding pre-operative infections and highlight contact details for advice if required. 17 patients were cancelled for surgical reasons including Urology patients requiring further investigations and Ophthalmology patients listed for a Registrar or wrong Consultant lists. A specialty specific report was presented and disseminated locally.

Conclusion:
94 patients had their operation cancelled on the day of surgery over a 6 month period at the Day Surgical Unit at Kings College Hospital. The majority could have been prevented. By improving patient and college communication and introducing a pre-assessment optimisation bundle we hope to improve patient outcomes and reduce cancellation costs.

EL204.1/9

Authors: Dr Lauren Richardson, Dr Fiona Windsor, Dr John Nathan Spence, Dr Shvaita Ralhan & Dr Jo Hardwick
Institution: John Radcliffe Hospital, Oxford

Title:
Clinical Coding – Is this the way to fund a Geriatrician within a Major Trauma Centre?

Introduction:
The elderly will soon represent the largest group of patients suffering major trauma[1]. In 2019, new criteria were added to the Major Trauma Best Practice tariff (BPT), stating that all patients aged 65 or over with an injury severity score (ISS) of >15 should have a clinical frailty scale (CFS) completed by a geriatrician within 72 hours of admission.

A geriatrician-led service was introduced into the Major Trauma Centre, Oxford, UK in September 2019. This service aims to provide frailty assessment of all patients meeting the BPT criteria and comprehensive geriatric assessment (CGA) to a sub-set.

We sought to determine whether our service would have an additional impact on depth of clinical coding; the method by which a Trust receives payment for all admissions and attendances. The more complex the patient and/or the admission the higher the assigned tariff and the greater the revenue.

Methods:
Demographic data, CFS and assigned clinical code were analysed for the first 6 weeks of service. Codes for a comparable patient cohort admitted prior to the introduction of our service were also reviewed. The proportion of codes being assigned the highest tariff based on comorbidities and complications was documented.

Results:
32 patients were identified with an admission ISS of >15. 13 (41%) were frail. 16 (50%) received a CGA during their admission. Of these 16, 14 (81%) received the top clinical code on discharge. Comparatively, in the pre-implementation group, this proportion was only 36% (4/11). Recurrent themes identified within coding included hyponatraemia, delirium, constipation, osteoporosis and pneumonia.

Discussion:
Introduction of this service represents the first phase of our trust's aspiration to implement comprehensive, geriatrician-led multidisciplinary care to its elderly major trauma patients. As well as fulfilling BPT criteria, we suggest that, via more comprehensive documentation and recognition of perioperative complications, Geriatrician input has improved depth of coding. This represents a potential net income for the trust. Whilst the value of perioperative services has traditionally been measured via qualitative means, this approach demonstrates an additional monetary benefit which we hope will feed into future business cases as we continue to grow our service.

References:

1. Kehoe A, Smith J E, Edwards A, Yates D and Lecky F. The changing face of major trauma in the UK. Emergency Medicine Journal 2015; 32: 911-15

EL204.1/10

Authors: Marta Grynovska, Dr Volodymyr Protas, Dr Oleksandr Chekan, Dr Oleksandra Tymchuk & Dr Tanya Savyn
Institution: Ivano-Frankivsk Regional University Hospital

Title:
Adult patient experience of elective surgery in the university hospital setting in Ukraine

Introduction:
Patient experience is one of the three pillars of quality in healthcare[1].

Improved patient experience is not only linked to increased satisfaction but also leads to better outcomes in terms of patient safety and clinical effectiveness[1]. Understanding the patient perspective on healthcare is central to the evaluation of quality[2]. Our study aimed to investigate the reality of patient experience of elective surgery and identify factors related to it

Methods:
The focus of the study were the adult patients admitted to university hospital for elective surgery over the period of 2019-2020. Data collection was performed with the help of patient satisfaction surveys and semi-structured interviews. To explore further, the patients were questioned across the topics of communication gaps, fear and anxiety, hunger and thirst, waiting and fasting times. The interview transcripts were analysed to evaluate patient feedback.

Results:
Our study showed that 68 % of patients rated their experience as “satisfactory” or “completely satisfactory”. We found that 74% of those who rated their experience as “completely satisfactory” had had their surgery scheduled before 14:00”. In contrast, 82% of patients scheduled for surgery after 14:00 rated their experience as “not satisfied”. This suggests patients who wait longer in line are more likely to report a negative experience ($p<0.05$) We also found that 55% of respondents were “completely not satisfied” with amount of information and explanation about the operation, which highlights the need for shared decision-making. The most common factor of positive experience was caring and attentive staff.

Conclusion.
In our study the overall patient experience was satisfactory. Prolonged waiting time and poor communication proved to be a key factor in low patient satisfaction. These factors are modifiable and should be addressed to enhance patient satisfaction. In future we hope to improve our patients’ experience by using the data behind it to implement changes and adopt a multidisciplinary approach strategy. We also expect to raise awareness of the importance of quality-driven experience as well as patient engagement into the quality improvement projects.

Reference(s):

1. Fregene T et al. Making the experience of elective surgery better BMJ Open Quality 2017;6:e000079
2. Walker EMK et al. Patient reported outcome of adult perioperative anaesthesia in the United Kingdom: a cross-sectional observational study Br J Anaesth. 2016;117(6):758-766.

EL204.2/1

Authors: Kate Millar, Dr Hoon Lau & Prof David Walker
Institution: University College London Hospital

Title:
3-Year Review of Readmission to ICU: Incidence, Risk Factors, Patients' characteristics, and Outcomes.

Introduction:
Readmission to the intensive care unit (ICU) is associated with poor clinical outcomes, increased duration of ICU and hospital stay, and higher costs(1). Currently a Peri-Operative Medicine Service for High-Risk Surgery: Implementation Pilot **(**POM-SHIP) is underway within our trust and work is ongoing to evaluate its impact on patient care and experience. Reviewing and analysing the risk factors, patients' characteristics and outcomes of this complex patient group would enable feedback of important information to navigate further quality improvement projects in perioperative care.

Methods:
A retrospective case-note review of adult patients re-admitted to a tertiary centre surgical ICU between June 2015 to June 2018 was performed using electronic medical records system ICIP (Philips IntelliVue Clinical Information Portfolio Critical Care).

Results:
During the 3 years, there were 2616 ICU discharges and 123 readmissions (66% male and 34% female) meeting the inclusion criteria, with overall readmission rate of 4.7%. The specialty mix was urology (40%) and thoracic surgery (60%). The median age was 70 and 44% within the 64-75 age range. 96% of the group scored ASA 3. The top 3 pre-existing medical conditions reported were cardiac diseases, cancer and respiratory diseases. Main contributors to thoracic readmission were from thoracotomy (30) and video-assisted thoracoscopic surgery (VATS – 29) while urology had 21 readmissions from cystectomy. Highest number of readmissions happened within the first 48 hours of discharge from ICU (46% -56). 60 (49%) of the readmitted stayed for less than 72 hours while 28 (23%) patients readmitted stayed for more than 7 days. We observed a trend of prolonged ICU stay of the readmitted patients compared to initial admission. Readmission was associated with higher rates of sepsis; mainly hospital acquired pneumonia leading to respiratory failure especially thoracic surgical patients. This was followed by readmission due to surgical complications. 15% (18) of this group died during their ICU readmission where the risk factors noted were intraoperative rhythm changes and confusion during initial post-operative period.

Conclusions:
Elderly men with multiple cardiorespiratory co-morbidities undergoing thoracic cancer surgery are at higher risk of ICU readmission. This is possibly due to age, heavy smoking, high alcohol consumption, presence of underlying lung diseases and the extensive surgical procedure itself. Therefore, engaging perioperative medicine team to embed enhanced recovery after surgery in thoracic patients would help to improve patient experience and outcome as positively shown in urology patients.

References:
1. Rosenberg AL, Watts C. Patients readmitted to ICUs: A systematic review of risk factors and outcomes. Chest. 2000;118(2):492–502.

EL204.2/2

Authors: Alexandra Hogan, Sammra Ibrahim, David McCormack, Dr Melanie Moylan, Ann-Marie Openshaw & Alex Shipolini
Institution: Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

Title:
Nocturnal, not daytime oxyhaemoglobin saturation predicts systemic inflammation in cardiac surgery patients: A preliminary analysis.

Introduction:
Oxyhaemoglobin desaturation in cardiac surgery patients can be acute and severe leading to stroke. More subtle desaturation causes sympathetic nervous system activation and systemic inflammation, potentially complicating recovery. In patients with stable heart failure desaturation occurs nocturnally more than during the daytime[1]. Indeed, 63% of patients presenting for coronary artery bypass graft (CABG) surgery had nocturnal desaturation due to moderate-severe sleep apnoea hypopnoea syndrome (SAHS)[2]. Moreover, SAHS is associated with higher C-Reactive Protein (CRP), supporting the link with inflammation[3]. It remains unclear if nocturnal oxyhaemoglobin saturation is associated with inflammation independently of daytime saturation, and if underlying comorbidity, e.g. infection, contributes to the relationship. Data from a subgroup of patients in our Sleep & Heart Surgery Study[2] allowed simultaneous assessment of the contribution of nocturnal and daytime oxyhaemoglobin saturation to systemic inflammation in patients presenting for CABG surgery.

Methods:
Sleep & Heart Surgery Study main methodology/results are published[2]. We investigated a sub-group of 60 patients (57-male; mean 66.9-years [46-85]; BMI 28.3kg/m$_2$ [20.6-40.4]; median EUROScore-4 [0-10]) presenting for CABG+/-valve surgery who had a pre-operative CRP, daytime (single reading) and nocturnal (mean value derived from multiple-channel sleep study) pulse oximetry (SpO_2) and white cell count (WCC) value. Hierarchical linear regression modelling was performed with the dependent variable CRP. Mean nocturnal SpO_2 was entered as the first predictor variable followed by daytime SpO_2 and WCC. Output was explored for co-linearity and bias, and bootstrap-results checked (regarding data normality assumptions).

Results:
The regression model results are tabulated. The first model with one predictor (nocturnal SpO_2) was significant but accounted for a small proportion of CRP variability (16%). With three predictor variables (model 3) more CRP variability (24%) was accounted for. Nocturnal SpO_2 remained a significant predictor of CRP, whereas this was not the case for daytime SpO_2 or WCC.

Conclusion:
Our preliminary analysis suggests that nocturnal oxyhaemoglobin saturation significantly predicts systemic inflammation in patients presenting for CABG surgery. Lower nocturnal SpO_2 was associated with higher CRP. A similar relationship was not present for daytime oxyhaemoglobin saturation or for a marker of infection (WCC). We advise that further work is needed: to confirm this finding using high-sensitivity CRP (greater variance at low values); to apply the model to larger populations allowing for inclusion of post-operative outcome variables; and, to identify other potentially-modifiable variables (e.g. haemoglobin) that may contribute to the relationship between oxyhaemoglobin saturation and inflammation.

References:
1.Tamsier. Respiration.2019;97:213-222.

2.Hogan. JCVS.2020(in press).
3.Fukuoka. Sleep Med.2017;29:29-34.

	B (95% CI)	SE B	β	T (df)	p
Model 1 (F=11.27(1,58), p=0.001; R^2.163; R^2-change .163, p=0.001)					
Constant	58.81 (26.11, 91.52)	16.34	-	3.60 (56)	0.001
Nocturnal SpO_2	-.58 (-.93, -.24)	.17	-.40	-3.36 (56)	**0.001**
Model 2 (F=6.80(2,57), p=0.002; R^2.193; R^2-change .030, p=0.152)					
Constant	86.52 (32.42, 136.62)	25.02	-	3.46 (56)	0.001
Nocturnal SpO_2	-.48 (-.86, -.11)	.19	-.34	-2.60 (56)	**0.012**
Daytime SpO_2	-.38 (-.91, .16)	.26	-.19	-1.45 (56)	0.152
Model 3 (F=5.83(3,56), p=0.002; R^2.238; R^2-change .045, p=0.073)					
Constant	71.59 (19.80, 123.40)	25.85	-	2.77 (56)	0.008
Nocturnal SpO_2 *[Mean 93.9, SD1.9]*	-.42 (-.79, -.05)	.19	-.29	-2.26 (56)	**0.028**
Daytime SpO_2 *[Mean 96.9, SD1.3]*	-.32 (-.84, .21)	.26	-.15	-1.21 (56)	0.231
White Cell Count *[Mean 7.5, SD1.9]*	.32 (-.03, .66)	.17	.22	1.83 (56)	0.073

Non-bootstrapped values reported; *pattern* of significance unchanged.

EL204.2/3

Authors: Charlotte Oliver, Dr Mike Adamson & Prof Richard Davies
Institution: University Hospital of Wales

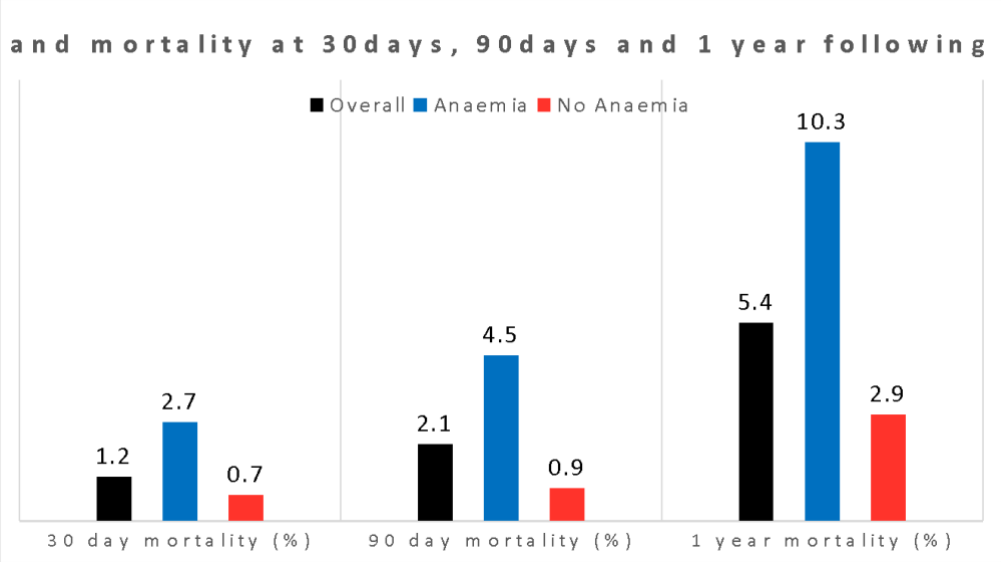
Title:
A retrospective cohort review of pre-operative anaemia and postoperative outcomes in 1,751 colorectal surgical patients

Introduction:
Our study aimed to identify anaemia prevalence in our colorectal surgical population and evaluate the association of anaemia with outcomes including; red cell transfusion rates, mortality rates, length of hospital stay and critical care admission.

Methods:
We conducted a retrospective review of 1751 patients who underwent major colorectal surgery between January 2011 and December 2016. Patients were identified using our colorectal surgery database. Ethics approval was deemed not necessary for this service evaluation study. Data was recorded for patient sex, operation type (benign vs cancer), pre-operative haemoglobin (Hb) and ferritin levels. Anaemia was defined using WHO criteria as Hb<12g/dl in females and <13g/dl in males. Outcome data was recorded for peri-operative red cell transfusion, postoperative mortality (30 days, 90 days and 1 year), length of hospital stay and need for critical care admission. Data was analysed using SPSS software package.

Results:
1751 patients were included in the study, 919 male (52%) and 832 female (48%). The overall rate of pre-operative anaemia was 33%. Only 161 patients (27.9%) had ferritin studies performed pre-operatively and of these patients, 96 (59.6%) had a ferritin of <30 mcg/L thus meeting the criteria for iron deficiency anaemia.

Rates of blood transfusion were higher in anaemic patients (28.4%) compared to non-anaemic patients (8.9%) ($p<0.001$). Hospital length of stay was longer in anaemic patients (12.1 days) compared with non-anaemic patients (9.2 days) ($p<0.001$). Critical Care admission rates were higher in anaemic patients (24.4%) compared with non-anaemic patients (14.7%) ($p<0.001$). Mortality at 30 days, 90 days and 1 year following colorectal surgery were higher in anaemic patients (Figure 1).



Conclusion:

Our study demonstrates a prevalence of pre-operative anaemia in our colorectal population of 33%. Our outcome data showed that anaemia is linked with higher mortality rates up to 1 year postoperatively, higher blood transfusion rates, greater need for postoperative critical care and longer hospital stay. This data correlates with other studies that show anaemic surgical patients are at increased risk of postoperative morbidity and mortality and are more likely to be transfused red cells[1]. This study supports the further development and implementation of a patient blood management system and peri-operative anaemia optimisation pathway in our institution.

References:

1. Musallam KM, Tamim HM, Richards T, et al. Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study. Lancet 2011; 378:1396–407.

EL204.2/4

Authors: Emily Young, Dr Caroline Nicholas & Dr Michelle Leemans
Institution: National Hospital for Neurology & Neurosurgery

Title:
Blood transfusion practice in elective neurosurgical cases within a tertiary neurosurgical centre - can we be more efficient with cross match requests?

Introduction:
Blood transfusion is a recognised complication of elective neurosurgery [1,2]. Blood group and presence of antibodies must be assessed before transfusion can proceed. Two group-and-save samples (G&S) must be provided at separate timepoints before blood is issued. Second G&S are considered valid for between 2 and 60 days depending on the hospital.

Providing a valid second G&S often requires patients to reattend hospital or have G&S taken on day of procedure. This increases costs and can delay start of surgery causing patient distress, particularly if the pathology lab is off site.

We investigated the incidence of blood transfusion for various neurosurgical procedures to ascertain the need for second G&S.

Methods:
We retrospectively examined data on transfusions in adults undergoing elective cranial, transsphenoidal or cerebrospinal fluid (CSF) diversion and intracranial pressure monitoring procedures 01/11/16-31/10/18.

Results:
1.9% (22/1156) of elective/expedited craniotomies and 1.6% (5/298) of transsphenoidal procedures involved transfusion.

<0.2% (1/>600) of CSF diversion and intracranial pressure monitoring procedures involved transfusion, for reasons unrelated to the procedure.

Conclusions:
For elective cranial and transsphenoidal procedures where no atypical antibodies were identified in the first G&S and no blood has been transfused since, we consider it reasonable to take the second G&S in the anaesthetic room and commence surgery directly thereafter.

For elective CSF diversion and intracranial pressure monitoring procedures where no atypical antibodies were identified in the first G&S and no blood has been transfused since, we suggest a second G&S is unnecessary. This change in practice would generate a saving of £13,446.00 over two years in sample costs and reduce number of hospital visits and day-of-surgery inefficiencies.

O-negative blood should be administered in a rare emergency where second G&S results were not available.

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EL204.2/5

Authors: Dr Luke Fletcher, Dr Tim Coulson, Dr Richard Hiscock, Nada Marhoon & Dr Justin Nazareth
Institution: Austin Health

Title:
The association between post-anaesthetic care unit length of stay and postoperative deterioration

Introduction:
Surgical patients are admitted to the post-anaesthesia care unit (PACU) to monitor for immediate post-operative complications and to facilitate timely intervention in the event of deterioration. Despite the PACU being a routine part of the peri-operative journey, the significance of an unexpected prolonged PACU length of stay is unclear.
This study aims to determine whether there is an association between PACU length of stay and post-operative deterioration, as defined by rapid response team (RRT) activation within 7 days of surgery [1], as well as other adverse post-operative outcomes.

Methods:
We conducted a single-centre retrospective cohort study of adult patients undergoing surgery between 01/07/2017 and 30/06/2019, who stayed at least one night in hospital, and were not admitted to critical care immediately post-operatively. Patient and surgery details were extracted from the hospital's electronic medical record system.
The primary outcome measure was whether PACU length of stay is associated with RRT activation. Secondary outcomes included whether PACU length of stay is associated with predefined complication, unplanned ICU admission, and re-admission, return to theatre and mortality.

Ethics approval and a waiver of consent was obtained from the Austin Health Human Research Ethics Committee (Audit/19/Austin/78).

Results:
A total of 11,885 cases met criteria for analysis. Patients who stayed in PACU for less than one hour had a 3.7% baseline absolute risk of RRT activation. On univariate analysis, PACU length of stay was significantly associated with post-operative RRT activation (OR=1.56 $hour^{-1}$, 95%CI=1.45-1.69, $p<0.001$).

On multivariate analysis, PACU length of stay remained significantly associated with post-operative RRT activation within 7-days of surgery (OR=1.41 $hour^{-1}$, 95%CI=1.28-1.55, $p<0.001$), and was also associated with pre-defined complications on discharge (OR=1.39 $hour^{-1}$, 95%CI=1.30-1.49, $p<0.001$), and unplanned ICU admission within 30-days (OR=1.47 $hour^{-1}$, 95%CI=1.28-1.68, $p<0.001$).

There was no association between PACU length of stay and 30-day re-admission, return to theatre or mortality.

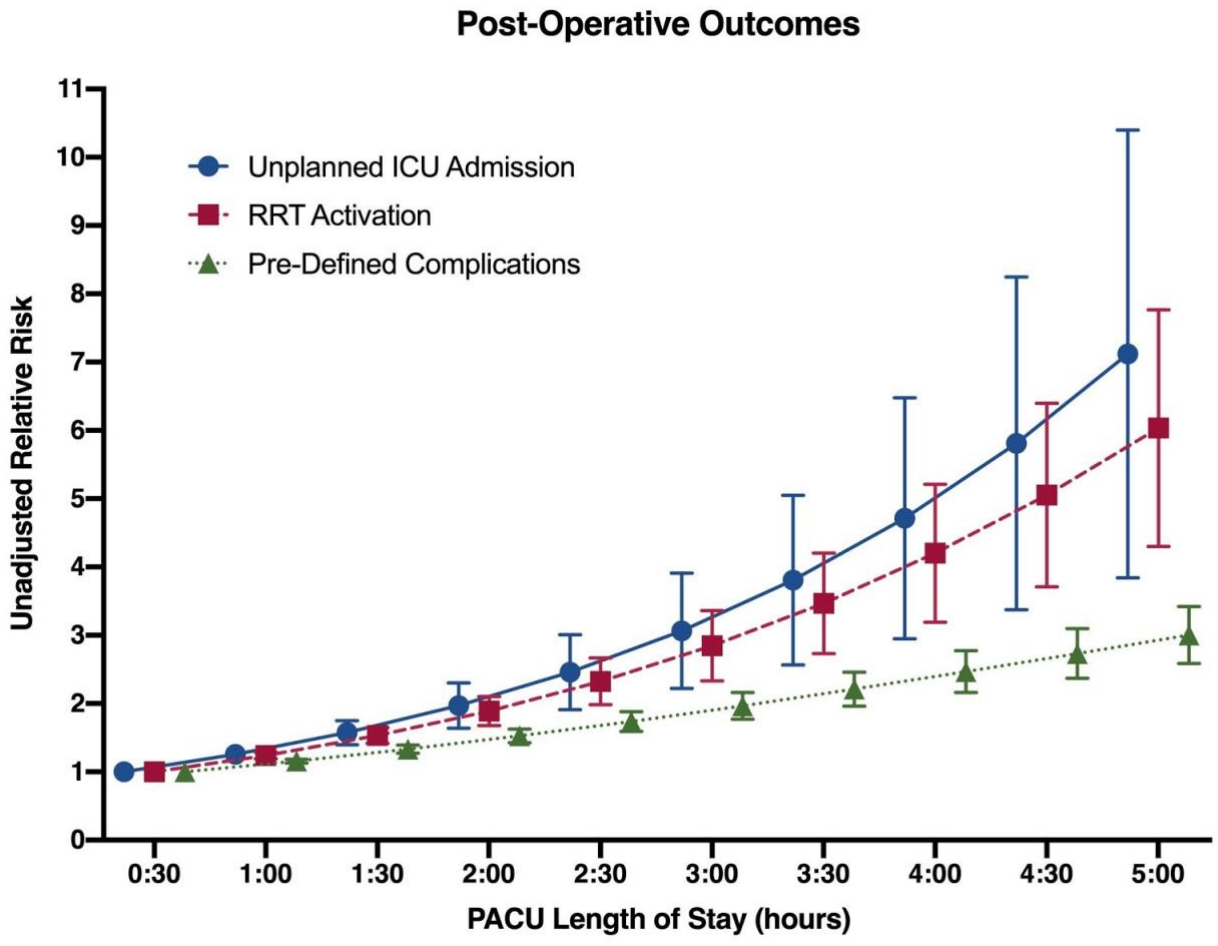
Conclusion:
PACU length of stay is a strong predictor of post-operative deterioration and is independently associated with a significantly higher risk of post-operative RRT activation, pre-defined complications and unplanned ICU admission within 30-days. It may be a useful marker in identifying high risk post-operative patients.

Table – Post-Operative Outcomes by PACU Length of Stay

		0-1h	1-2h	2-3h	3-4h	4-5h
	All Cases (%)	6680 (56.2%)	3951 (33.2%)	839 (7.1%)	287 (2.4%)	128 (1.1%)
RRT Activations	# (%)	246 (3.7%)	246 (6.2%)	78 (9.3%)	36 (12.5%)	17 (13.3%)
	RR [95%CI]	1.0 [Ref]	1.5 [1.4-1.6]	2.3 [2.0-2.7]	3.5 [2.7-4.2]	5.0 [3.7-6.4]
Pre-Defined Complications	# (%)	1138 (17.0%)	806 (20.4%)	259 (30.9%)	102 (35.5%)	45 (35.2%)
	RR [95%CI]	1.0 [Ref]	1.3 [1.3-1.4]	1.7 [1.6-1.9]	2.2 [2.0-2.5]	2.1 [1.8-2.4]
Unplanned ICU Admission	# (%)	147 (2.2%)	91 (2.3%)	48 (5.7%)	20 (7.0%)	17 (13.3%)
	RR [95%CI]	1.0 [Ref]	1.6 [1.4-1.8]	2.5 [1.9-3.0]	3.8 [2.6-5.1]	5.8 [3.4-8.2]

RR = Relative Risk. 95%CI = 95% Confidence Interval.

Figure – Post-Operative Outcomes vs PACU Length of Stay



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EL204.2/6

Authors: Alexandra Hogan, Sammra Ibrahim, David McCormack, Melanie Moylan, Ann-Marie Openshaw, Francesca Cormack & Alex Shiplini
Institution: Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust

Title:
'Sleep Apnoea' and the Airway: Defining the Relationship in Patients Undergoing Cardiac Surgery.

Introduction:
Sleep apnoea predicts a difficult airway[1]. However, this term is often used colloquially to describe a diagnostic spectrum from simple snoring, to 'sleep apnoea-risk' on screening questionnaire, to sleep-study diagnosed Sleep Apnoea Hypopnoea Syndrome (SAHS), reflecting apnoeic events with oxyhaemoglobin desaturation (SpO_2). Furthermore subtypes of apnoeas are associated with different underlying pathophysiology. Obstructive Sleep Apnoea (OSA) follows upper airway obstruction, often related to obesity and/or adenotonsilar hypertrophy. Central Sleep Apnoea (CSA) is seen with neuropathology but also with heart failure including in cardiac surgery patients[2]. Desaturation Index (DI) represents SpO_2-dips irrespective of apnoea-type. OSA and CSA detection requires a multiple-channel sleep study and expert scoring, whereas the DI is a count of desaturation events on overnight pulse-oximetry. We explored snoring, OSA, CSA and DI rate in cardiac surgery patients to relation to anaesthetist-perceived airway difficulty.

Methods:
The East London Sleep & Heart Surgery Study methodology and main findings are published[2]. Herein we include a subgroup of 73 patients who had an overnight multiple-channel sleep study prior to coronary artery bypass graft+/-valve surgery and a subsequent anaesthetist rating of airway difficulty recorded at time of endotracheal intubation. Anaesthetic charts invite anaesthetists routinely to rate the overall airway experience as 'easy', '(not easy but) manageable' and 'difficult', alongside Cormack & Lehane[3] grade[3]. Anaesthetists were unaware of sleep-study results. Non-parametric statistical tests were utilised.

Results:
Mean age was 65.4y (SD 10.1, range 46-84y); most (69/73) were male. Descriptive data and statistical results are tabulated. Intubation grade yielded no significant group differences, so this variable was not examined further. No airway was described by these experienced anaesthetists as 'difficult', but a quarter (19/73; 26.0%) were only 'manageable'. Only OSA was significantly associated with a non-easy airway; interestingly, perhaps not solely due to body weight (OSA and body mass index correlation: Rho.140,P=0.238, *ns*).

Conclusion:
SAHS represents variable underlying pathophysiology, probably bringing different challenges at each stage of the perioperative pathway. At anaesthetic induction the presence of OSA specifically is relevant to airway management. This supports a recent meta-analysis which relied on pooled cases of diagnosed and suspected OSA, but did not delineate apnoea-type further[4]. However, the inclusion of more difficult airway cases may allow less sensitive relationships with snoring, CSA and non-specific desaturation (DI) to also emerge. The influence of all SAHS variables on other perioperative outcomes also deserves further consideration.

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2.Hogan. JCVS.2020(in press).
3.Cormack. Anaesthesia. 1984;39:1105-11.

4.Nagappa. PLoS-One. 2018;13: e0204904.

	Snore Loudly* N=63	Obstructive Sleep Apnoea Index N=73 (median events/hr; median split to no. high/low)	Central Sleep Apnoea Index N=73 (median events/hr; median split to no. high/low)	Desaturation Index N=73 (median events/hr; median split to no. high/low)
Whole Group	No – 31 (47.7%) Yes – 34 (52.3%)	5.1 (0-51.2)	0.9 (0-28.8)	4.8 (0.2-69.1)
Airway:				
'EASY'	Snore: 26 (53.1%) Vs. Don't Snore: 23 (46.9%)	Median 3.9 (0-44.4) High OSAI: 23 (42.6%) Vs. Low OSAI: 31 (57.4%)	Median 0.9 (0-28.8) High CSAI: 28 (51.8%) Vs. Low CSAI: 26 (48.1%)	Median 3.8 (0.2-69.1) High DI: 25 (46.3%) Vs. Low DI: 29 (53.7%)
'NOT EASY BUT MANAGEABLE'	Snore: 8 (50%) Vs. Don't Snore: 8 (50%)	Median 7.8 (0.1-52.1) High OSAI: 5 (73.7%) Vs. Low OSAI: 14 (26.3%)	Median 0.7 (0-8.2) High CSAI: 9 (47.4%) Vs. Low CSAI: 10 (52.6%)	Median 7.9 (0.2-62.5) High DI: 12 (63.2%) Vs. Low DI: 7 (36.8 %)
Group Difference	Chi^2 0.045, ns	Mann-Whitney U=303.5, P=0.008 Z=-2.63; 0.3[z/√N] Chi^2 5.44, P=0.032 (Fisher's Exact)	U=510.0, ns Chi^2 0.11, ns	U=373.5, ns Chi^2 1.60, ns

*First question of the STOP-BANG Screen: Chung. Anesthesiol. 2008;108:812-21.

EL204.2/7

Authors: Famila Alagarsamy & Shannon Bernard Healey
Institution: Cambridge university hospital NHS trust, Cambridge

Title:
Peri-operative anaesthetic implications in VLCADD - a rare genetic disease- A case report

Background:
Very long-chain acyl-CoA dehydrogenase deficiency (VLCADD) is a rare genetic disorder of fatty acid metabolism. Mutations affect the first enzyme required for β-oxidation of fatty acids and vary in severity, producing three sub-types: early-onset, hepatic, and late-onset. The sub-types share a common propensity to episodes of hypoglycaemia and rhabdomyolysis, which can be triggered by catabolic states of fasting, exercise, illness and stress.

The primary aim of perioperative management in these patients is the avoidance of hypoglycaemia, metabolic decompensation and rhabdomyolysis. This is achieved with a perioperative dextrose infusion, avoidance of suxamethonium, and measures to minimise both emotional and physiological stress, such as premedication and adequate analgesia, respectively. Non-depolarising paralytics, benzodiazepines, local anaesthetics, regional anaesthesia and opioids are considered safe. However, within the limited literature, there is direct disagreement upon the use of volatile gases and propofol.

Case Presentation:
We anaesthetised a 38-year-old female with late-onset VLCADD for parotidectomy under General Anaesthesia, using propofol for induction and maintenance, without adverse effects.

The history was typical of late-onset VLCADD: intermittent myalgia and hypoglycaemia on exertion; and infrequent episodes of rhabdomyolysis and myoglobinuria triggered by stress. There was no cardiac history or symptoms.

The patient was admitted the previous day for Creatine Kinase, glucose monitoring and an infusion of 10% dextrose at 2ml/kg/hr, which was continued throughout peri-operative period. To avoid the additional risk of rhabdomyolysis with volatile anaesthetics, we used remifentanil and propofol TIVA technique, for both induction and maintenance. Atracurium was given at induction to enable intubation. The operation proceeded uneventfully and there were no complications.

Conclusions:
The use of volatile gases and propofol in VLCADD remain controversial. While volatile gases are independently associated with rhabdomyolysis in the general population, it is unclear if they exert an additive or interactive effect on the risk of rhabdomyolysis in VLCADD. Propofol is a lipid emulsion; it has previously been avoided in VLCADD due to the increased lipid load, but there are no reports of adverse effects. The literature is scarce and conflicting, and includes cases of varying age and disease severity. There is a need for perioperative dextrose and adequate depth of analgesia to prevent hypoglycaemia and minimise the surgical stress response. This case demonstrates that in adults with VLCADD, with a good team approach (metabolic, surgery, anaesthesia), close monitoring of glucose and 10% dextrose infusions , use of TIVA technique (propofol/Remifentanil) and post-operative CK monitoring will result in a successful outcome.

EL204.2/8

Authors: Sophia Butt & Dr Umar Ahmad
Institution: Hillingdon Hospital

Title:
Learning from each other's mistakes: Theatre high fidelity simulation improves patient safety during Coronavirus 19 pandemic

Introduction:
Our aim is to improve patient safety peri-operatively within the theatre setting. We aim to identify any system errors that may occur due to the change in theatre environment during the coronavirus 19 pandemic. We also aim to enhance team working, cross disciplinary communication and knowledge of all staff within the theatre team.

Methods:
Staff survey and interviews were performed to derive a database of common and serious critical incidents experienced. High fidelity simulation sessions were devised based on these critical incidents. High fidelity simulation sessions were held in theatre and the anaesthetic room. The sessions were attended by the CEPOD theatre team of the day; including scrub nurses, operating department practitioners, surgeons, porters, theatre co-ordinator, recovery staff, anaesthetists and cardiac arrest team. Staff questionnaires were conducted before and after a series of high-fidelity simulation scenarios of emergent situations. Main learning points disseminated to department.

Results:
The majority of theatre staff involved in the simulation sessions felt more prepared if a similar situation arose in the future. The majority of staff felt more empowered to speak up to all members of the theatre team after simulation sessions. Any system errors identified were investigated and changes made to improve patient safety in the future; this included location and access to critical drugs and equipment. Staff reported better awareness of previously unencountered rare but critical safety incidents.

Conclusion:
High fidelity simulation, involving all members of the theatre team leads to improvement in communication and teamworking between staff. Staff feel more empowered to speak up and ultimately leads to improved patient safety. It also provides opportunity to tackle any system problems identified. We recommend, given the change in theatre environment secondary to coronavirus disease 2019 and ongoing transition to elective surgery, trusts consider use of high-fidelity simulation to improve teamwork between all theatre staff and identify any potential system errors that may arise.

EL204.2/9

Authors: Michael Cooper, Dr Anthony Funnell, Dr Rhidian Jones, Dr Sean Tobin, Prof Richard Davies, Dr Daniel O'Donovan, Dr Kathryn Brown, Dr Lydia Osborne, Dr William Jones & Dr Alice O'Donnell
Institution: Princess of Wales Hospital, Bridgend/ University Hospital of Wales, Cardiff

Title:
Does Echocardiography After Cardiopulmonary Exercise Testing Add to Perioperative Decision Making in Major Gastrointestinal Surgery?

Introduction:
Cardiopulmonary exercise testing (CPET) is an established pre-operative assessment tool that can identify previously undiagnosed cardiac pathology [1]. We sought to determine if echocardiography adds important information to CPET findings and if echocardiogram influences decision-making when functional capacity from CPET is already known. This would better define when preoperative echocardiography is useful.

Methods:
We retrospectively analysed data from patients undergoing major upper gastrointestinal and colorectal surgery, in two centres, that were referred for an echocardiogram following CPET. CPET data for VE/VCO_2, oxygen pulse and delta VO_2/work rate was correlated with echocardiogram abnormalities. The indication for echocardiogram and impact on perioperative management were explored.

Results:
Data from 2089 CPETs were reviewed between September 2014 and May 2020; 116 patients (6%) had echocardiograms prompted by CPET.
The pre-operative management of 93 (80%) patients was unaltered by the addition of echocardiography following CPET. Five patients were reviewed by cardiology (of which 2 were optimised and 3 had their management unaltered). One patient was prescribed prehabilitation exercise, 8 patients declined surgery and 12 (10%) patients were deemed unfit for surgery based on CPET and echocardiogram results. (Figure 1).

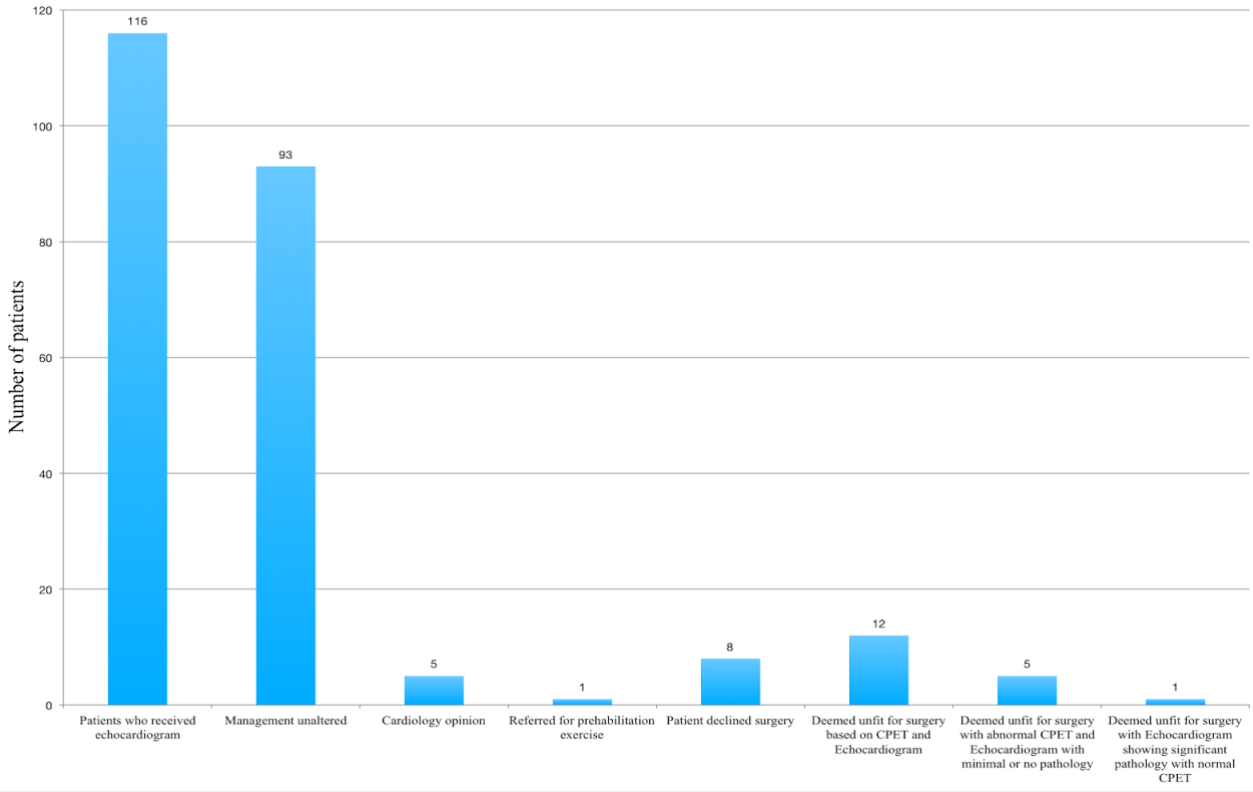
Individual case review of the 12 patients deemed unfit for surgery by CPET performance revealed 5 patients had echocardiograms with little or no pathology. Only 1 patient had echocardiography displaying significant pathology that was not identified during CPET.

The most commonly documented reason for echocardiography was a heart murmur (38); 8 echocardiograms requested for a murmur had a normal CPET and 2 patients with a normal CPET had significant valve disease.
Of note, the magnitude of VE/VCO_2 abnormality did not seem to correlate with severity of echocardiogram pathology.

Discussion:
Abnormalities on CPET were corroborated by echocardiography findings 20-45% of the time, most likely due to the dynamic nature of CPET (Table 1). Although the identification of these pathologies rarely changed the pre-operative management of these patients, identification was important for safe perioperative care. Surprisingly, 25% of echocardiograms investigating a murmur following a normal CPET were significantly abnormal. This might be explained by the limited duration of these specific CPETs and an unwillingness to interpret plots based on limited data.

Echocardiography frequently narrowed the differential diagnosis of CPET abnormalities and occasionally guided optimisation. CPET can guide the appropriate use of pre-operative echocardiography and has reduced our reliance on echocardiography as a first line investigation.

Figure 1: A Graph Demonstrating the Outcomes of Patients that were Referred for Echocardiogram Following CPET



	Number of patients who had echocardiography (total 104) Number (%)	Correlating echo pathology	Pathology present on echo Number (%)
Patients unable to complete a meaningful CPET	4 (4)	Heart failure / valve abnormalities	4 (100)
Raised VE/VCO_2 (>34)	66 (63)	Heart failure / pulmonary hypertension	23 (37)
O2 pulse deemed abnormal (flattens or dipping)	40 (38)	Aortic stenosis / LV outflow obstruction / reduced ejection fraction / Mitral regurgitation (reduced stroke volume)	18 (45)
DeltaVO_2/Work Rate slope deemed abnormal (low gradient, flattens or dipping)	25 (24)	Regional wall motion abnormalities / LV systolic dysfunction (reduced stroke volume)	5 (20)

Echocardiography requested for new Atrial Fibrillation (AF)	11(11)	Mitral valve stenosis / LA dilatation / LVH / LV systolic dysfunction	5 (45)
Echocardiography requested for murmur alone (normal CEPT parameters)	8 (8)	Valve abnormalities (moderate severity or worse)	2 (25)

References:

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EL204.2/10

Authors: Sadia Choudhury
Institution: University College Hospital

Title:
Delivering virtual pre-assessment during COVID-19 pandemic

Introduction:
The evolving nature of the global coronavirus (COVID 19) pandemic has challenged the healthcare community in a scale of unprecedented magnitude. This has led to almost complete cessation of theatre activity and preoperative assessment. Conventionally preoperative assessment is performed in person. However, due to the existing constraints of this pandemic we should look at novel ways to assess patients listed for urgent surgeries using an innovative assessment tool, whilst minimising risk to both patient and staff. Virtual assessments have been around for many years and used extensively across the health service. Trainees can play a key role in rebuilding the service through virtual pre-assessments, however there is a lack of guidance on how to effectively carry this out. The objective of this study is to provide guidance for trainees and assess its utility in delivering this model of healthcare.

Method:
A pre-survey was released to all trainees within a single centre asking about their confidence in virtually assessing the American Society of Anaesthesiologists (ASA) grade, knowledge of appropriate preoperative investigations, and ascertaining which complex patients require in person assessment. A video training session along with a detailed guide explaining how to use the current electronic pre-assessment record will take place. This will also include appropriate pre-operative management required for certain co-morbidities and medications, and effectively screening patients with suspected or established COVID-19. Two post-training questionnaires will be sent, immediately and four weeks after to gauge any improvement in trainee knowledge, confidence when carrying out preoperative assessments and the opportunity to highlight any difficulties encountered.

Results:
Data will be analysed from pre- and post-surveys to determine the effectiveness of the training provided.

Conclusion:
This study addresses the gap in maintaining an effective pre-assessment through safe delivery during uncertain and unstable times. Using the results from the surveys, we hypothesize that it will show a need for guidance during virtual pre-assessments. It will also identify difficulties encountered in the implementation period. Auditing the process with sub-analysis into avoidable on the day cancellations will help improve the service. Hopefully the results of this study can be taken forward in generating further work to create a consensus for a national guidance on virtual pre-assessment.

References:
1. Iyengar K., El-Nahas W., A brief guide to telephone medical consultation, British Journal of Healthcare Management 2020, 26:4, 1-3

EL204.3/1

Authors: Dr Edward Davis, Jigna Shah, Prof David Walker & Dr Sohail Bampoe
Institution: University College Hospital

Title:
Improving Multi-Disciplinary Care of Laparotomy Patients

Introduction:
Since the National Emergency Laparotomy Audit was introduced there have been significant improvements in mortality and length of stay in this high-risk cohort. This has been brought about by protocol driven peri-operative care.

Interventions focus on the period before, during and immediately after surgery, when the patients are usually cared for in high dependency areas. After time in critical care patients are discharged to surgical wards where they are managed by junior doctors, often not well versed in management of complications.

This quality improvement project aimed to assess whether a peri-operative service for emergency laparotomy patients could be improved by the addition of a bundle of interventions designed to enhance inter-disciplinary working.

Methods:
Through initial consultations via stakeholder meetings and surveys, several interventions were designed and then implemented:

- Introduction of new perioperative ward review documentation to enhance communication between perioperative medicine fellows and ward staff
- Delivering a teaching program for foundation level doctors to improve understanding of non-surgical complications and how to recognise, manage and escalate them effectively
- Instigating a weekly multi-disciplinary meeting to discuss the ongoing management of all post-operative emergency laparotomy patients on the surgical wards

The impact of these measures was assessed using the Post-Operative Morbidity Survey (POMS) score as well as with audit of meetings and further surveys.

Results:
Surveys conducted before and after the teaching sessions showed improvement in trainees' confidence recognising, managing and escalating issues with these patients as demonstrated in the table below (statistically significant in 3 of 4 domains).

	Before (n=24)	After (n=22)	Change	p-value
I am aware of the likely complications following emergency intra-abdominal surgery:	16 (67%)	21 (95%)	+28%	0.01
I feel confident recognising these complications and initiating management:	11 (46%)	17 (77%)	+31%	0.03
I know who I can call for help managing non-surgical complications (e.g. LRTI / AKI):	18 (75%)	20 (91%)	+16%	*0.16*
I am confident that I would get the help I was seeking from this person:	12 (50%)	19 (86%)	+36%	<0.01

Morbidity data was successfully collected using the new documentation format for 5 months. There was no statistically significant change in scores over this time.

The MDT meeting was well attended, and feedback was positive

Conclusion:
A weekly MDT meeting and an educational program to improve post-operative management of emergency laparotomy patients were effective and well received interventions. The full impact on patient outcomes needs further investigation.

EL204.3/2

Authors: Dr Despoina Liotiri, Dr James Wright, Dr Jonathan Watchorn & Dr Eva Urbanova
Institution: Brighton and Sussex University Hospitals NHS Trust

Title:
Pre-emptive analgesia with oral Paracetamol: has it got a role in Day Surgery?

Introduction:
The aim of this study was to estimate the difference in carbon footprint and costs between oral and intravenous (IV) administration of Paracetamol, and to evaluate the efficacy and safety of pre-emptive oral Paracetamol in the context of day surgery.

Methods:
We calculated the difference in carbon footprint and costs between oral and IV Paracetamol consumption in theatres over last year based on pharmacy data at Brighton and Sussex University Hospitals (BSUH).

We conducted an audit of 52 adult patients undergoing day surgery or short overnight stay (gynaecology, urology, general, and breast) during January to February 2020 at BSUH. The audit was registered with BSUH anaesthetic audit department. The route and timing of administration of Paracetamol was at the discretion of the anaesthetist. Data collected on patient demographics, type of surgery, analgesics given preoperatively, intra-operatively and in recovery, highest pain scores in recovery, and safety issues. Opioid consumption was converted to IV morphine equivalents (IVME). Anonymised data collated and analysed on Excel and GraphPad Prism 8. We performed Mann-Whitney test to compare opioid consumption and pain scores.

Results:
The annual carbon footprint of IV Paracetamol used in BSUH theatres was found to be equivalent to 1 passenger in a return flight from London to New York. Replacement of IV doses with preoperative oral dose would lead to a reduction in CO_2 production of 608Kg and would also save £9485 a year as shown on Figure 1.

There was no significant difference in opioid consumption and recovery pain scores between patients who had preoperative oral Paracetamol and those who received IV Paracetamol intra-operatively as shown on table 1.

No safety issues with preoperative oral Paracetamol were documented.

Conclusion:
These results indicate that preoperative oral Paracetamol is associated with sustainability benefits, cost savings and similar analgesia compared to intraoperative IV administration. Perhaps pre-emptive effects offset bioavailability difference between oral and IV routes.[1] Our results are promising but limited by study design; further research involving randomised studies is required to generalise conclusions. However, we are planning to display the reminder posters in theatres and pre-assessment areas and introduce standard use of pre-emptive oral Paracetamol in day surgery pathways.

References
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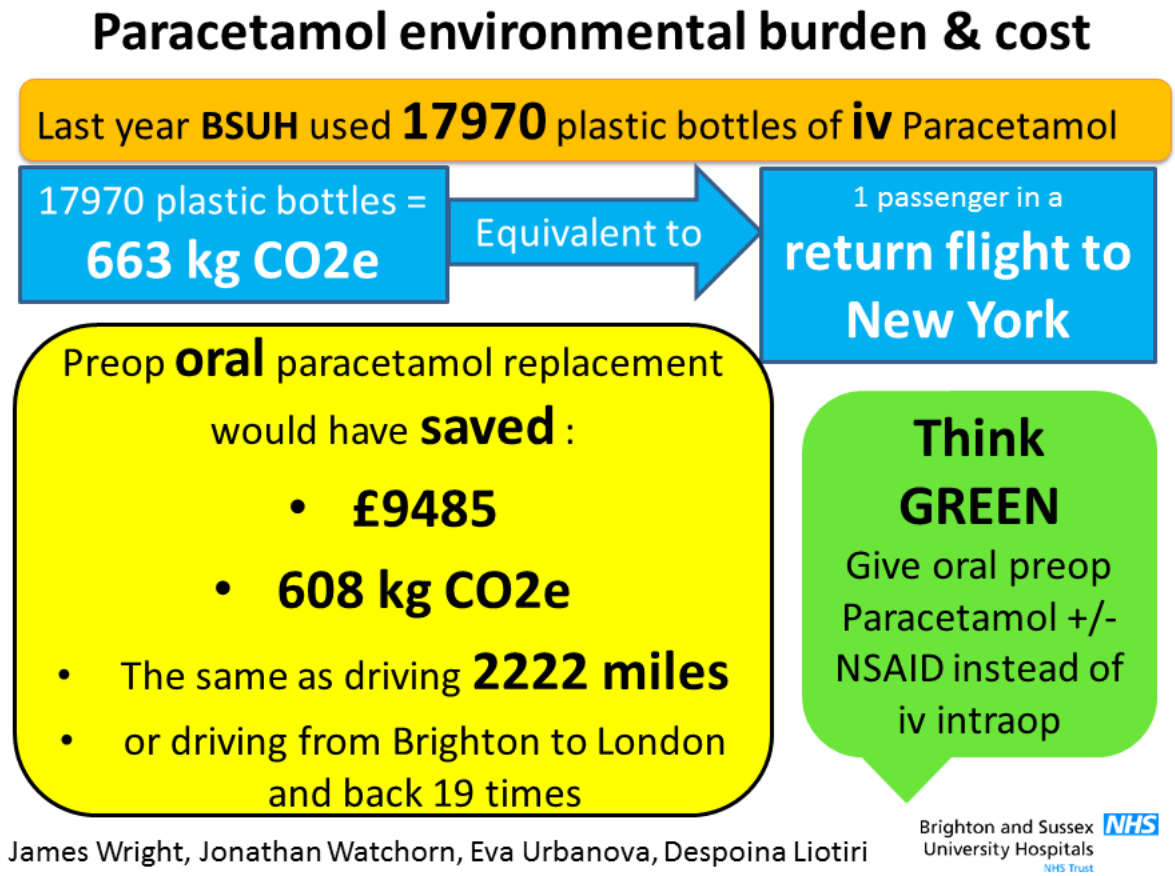

Figure 1. Poster with carbon footprint and costs calculations at BSUH

This poster is displayed in key areas to act as reminder and prompt anaesthetists administer pre-emptive oral analgesia.

	Preoperative oral Paracetamol (n=26)	**Intraoperative IV Paracetamol** (n=26)	**P value**
IVME (mg) intraoperative	13.75 (0-40)	15 (0-30)	0.6172
IVME (mg) PACU	0 (0-20)	4.35 (0-20)	0.6370
Total IVME (mg)	18.6 (0-55)	20 (0-45)	0.4251
Highest PACU pain score (0-10)	3 (0-10)	4.5 (0-10)	0.2984

Table1. Difference in opioid consumption and pain scores between the two approaches

Data are expressed as median (range). P values indicate intergroup comparison between the two approaches (oral vs IV Paracetamol). IVME, IV morphine equivalents; n, number of patients; PACU, post anaesthesia care unit (recovery area).

EL204.3/3

Authors: Stuart Young & Dr Sonya McKinlay
Institution: Glasgow Royal Infirmary, Glasgow

Title:
Incidence of post-operative delirium in major elective surgical patients

Introduction:
Post-operative delirium occurs commonly in surgical patients; the incidence ranging from 10 to 50%. Risk factors such as age, pre-existing cognitive impairment, emergency surgery and use of anti-cholinergic drugs are known to increase the risk of developing delirium. Delirium is known to accelerate the onset of cognitive impairment or worsen the severity of pre-existing cognitive dysfunction, as well as cause an increase in length of stay in hospital and mortality.

Aim:
The aim of this project was to determine the incidence of post-operative delirium in our population undergoing elective major surgery, and to identify potential modifiable risk factors in patients developing delirium.

Method:
Data was collected retrospectively from May 2017 to May 2019 from level 2 admissions to ICU at Glasgow Royal Infirmary. The electronic notes system "Carevue" was used to identify all elective surgical admissions. Any patient who was assessed as CAM ICU positive was deemed to have developed post-operative delirium. Data for a random selection of 50 patients from the non-delirium group was also analysed, the type of data collected is shown in the table below. Anti-Cholinergic Burden (ACB) was calculated using a combination of the Anticholinergic Burden Scale (ABS) and the Scottish Polypharmacy guideline. A score of 3 or more puts patients at a high risk of developing confusion as a result of their anti-cholinergic medication.

Results:
608 elective surgical patients were admitted to level 2 care post-operatively. 50 patients (8.2%) developed delirium during their stay in level 2 care. 34% patients underwent Upper GI surgery, primarily oesophagectomies. 20% were colorectal cases, 10% gynaecology, 14% orthopaedic procedures.

The results are shown in the table below:

	Delirium	Non-delirium
Median age (17-95)	72	74
Median ASA (1-4)	3	3
Pre-existing cognitive impairment	12% (6)	0%
Median Length of stay (4-140 days)	18	8
Median ACB score (0-9)	3	0
SDI (1-10)	3.5	5
12 month mortality	24%	4%
Referral (no of patients)	26% (13)	2% (1)

Conclusion
We demonstrated that patients with a higher anticholinergic burden (ACB) pre-operatively are potentially at higher risk of developing delirium post-operatively. This is one factor which can be

modified pre-operatively by performing pharmacy review and temporarily withholding anti-cholinergic medication during the perioperative period. The data clearly shows that patients who develop delirium have a longer stay in hospital, are more likely to have onward referral to psychiatric/geriatric services and have a higher 12 month mortality.

EL204.3/4

Authors: Dr Raja Palepu, Dr Hannah Wilson, Dr Claire Dowse, Dr Kalpa De Silva, Chloe Masters, Lucy Rogers & Dr Adam Duffen
Institution: Bristol Royal Infirmary

Title:
Collaborative multidisciplinary optimisation: introduction of a preoperative and cardiology multidisciplinary team meeting

Introduction:
The identification and optimisation of cardiovascular risk is a key aim of Preoperative Assessment. While overall mortality for non-cardiac surgery (NCS) is low, approximately 40% of post-operative deaths are due to myocardial infarction.[1,2] In our unit, Preoperative work up is led by anaesthetists and historically, referral to cardiology has been ad hoc with limited systematic cardiology input. We have developed a cardiology-anaesthesia multidisciplinary (CA-MDT) forum to discuss how to optimally manage high-risk cardiovascular patients undergoing NCS. We present the data and a qualitative description for one-year from this service.

Method:
Data from all patients identified as having a high-risk cardiovascular profile from the preoperative assessment clinic (POAC), that were discussed at the weekly CA-MDT during a one-year period (2019) are presented. Data collected include the proportion of cases discussed, nature of discussion (Table 1), the MDT outcome (Figure 1), the number and type of referrals for non-invasive imaging, ischaemia testing and/or angiography, and all-cause mortality.

Results:
During the 2019 calendar year, n=2509 patients were assessed in the POAC, with 7% (n=184) deemed high-risk requiring discussion at the CA-MDT. 67% (n=123) were deemed fit for surgery without further investigation. 15% (n=27) had non-invasive imaging prior to surgery, most commonly with stress echocardiography. 7% (n=13) had invasive angiography with 3% (n=6) subsequently undergoing revascularisation prior to surgery (five with percutaneous coronary intervention, one with coronary artery bypass grafting). Of the revascularised group, 83% (n=5) had surgery, with one patient deemed too high risk for operative management. There was no significant delay to treatment with all patients who proceeded to surgery having this within the initially planned timeline. 4% (n=8) did not proceed to surgery due to a change in surgical plan based on risk assessment. Mortality within the entire cohort was 3.8%, with no cardiovascular deaths observed. All deaths were due to disease progression from cancer.

Conclusion:
The development of our CA-MDT demonstrates that a systematic, collaborative approach between cardiology and anaesthesia in the management of high-risk patients undergoing NCS is both feasible and time efficient; with no delay in intended surgical treatment seen in our initial observations. Moreover, this unique MDT forum streamlines and improves risk assessment of complex patients, and ensures optimal guideline-based pharmacological management. Finally, the increased cohesion between specialties provides a more collaborative approach to patient care including communication to primary care of incidental cardiovascular findings and an excellent teaching forum for both consultants and trainees.

References:

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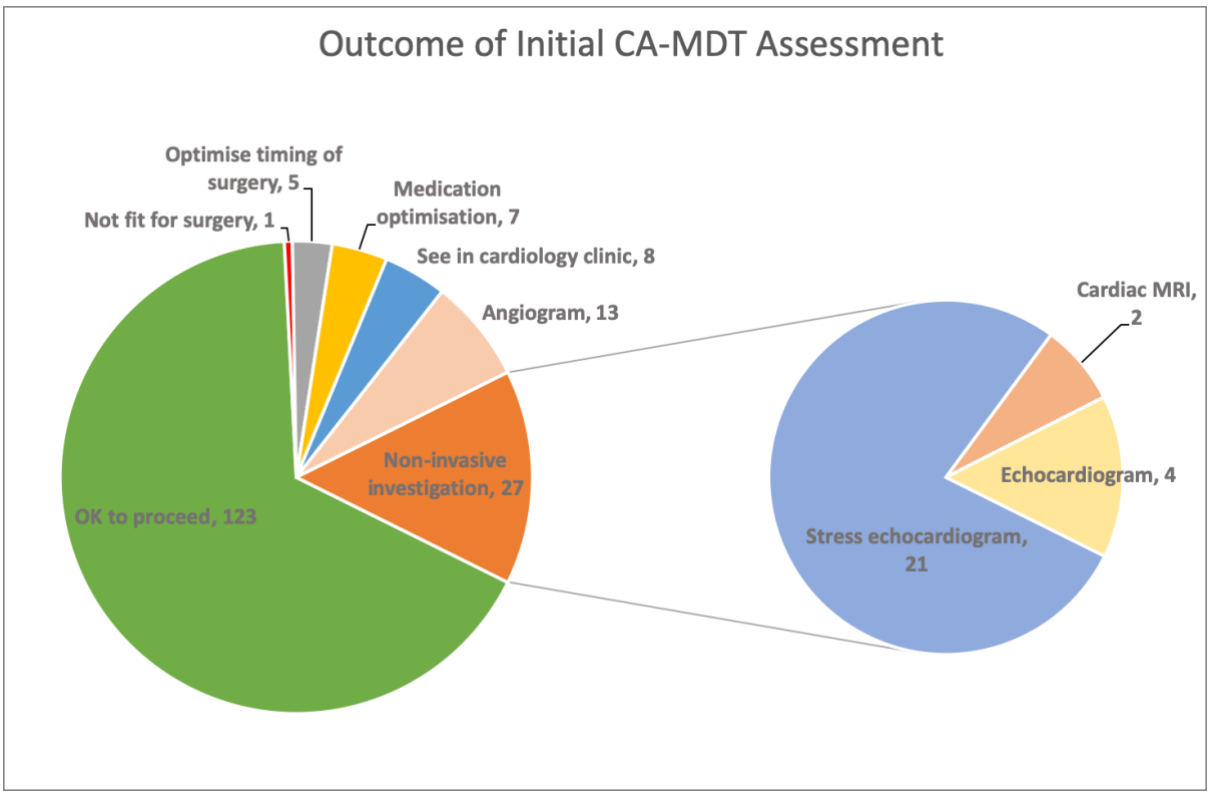
2. Botto F, Alonso-Coello P, Chan MT, et al. Myocardial injury after noncardiac surgery: a large, international, prospective cohort study establishing diagnostic criteria, characteristics, predictors, and 30-day outcomes. *Anesthesiology*. 2014;120(3):564-578.

Table 1:

Nature of Question Asked at CA-MDT		
Nature of Question	**Number**	**(%)**
Advice based on history/risk factors	50	(27%)
Review echocardiogram	48	(26%)
Review ECG	38	(21%)
Discuss multiple investigations	21	(11%)
Review CPET	16	(9%)
Medication advice	8	(4%)
Review angiogram	3	(2%)

Figure 1:



EL204.3/5

Authors: Baven Balendran, Alexandra Hogan & Dr Famila Alagarsamy
Institution: Addenbrooke's Hospital

Title:
Perioperative Oxyhaemoglobin Saturation and Oxygen Therapy in Orthopaedic Patients Undergoing Surgery during the Coronavirus Crisis.

Introduction:
Oxygen supply to hospitals attracted considerable attention during the Covid-19 crisis. This brought guidelines encouraging oxygen therapy only according to need into sharp focus[1]. In view of this we audited oxyhaemoglobin saturation and oxygen therapy in orthopaedic surgery patients, many of whom were emergency admissions who also required perioperative care during the Covid-19 crisis.

Methods:
Clinical audit approval permitted review of electronic notes for adult patients undergoing orthopaedic surgery between 30th March and 26th April 2020. Median pulse oximetry (SpO_2) and oxygen delivery values were calculated within discrete perioperative stages: pre-operatively – most recent value prior to surgery; ward recovery – median postoperative value on day of surgery; and, post-operative days 1-3 (median value across each day).

Results:
A total of 83 patients were identified (excluding 3 COPD and 1 pregnant patient). Mean age was 65.4 years (18-97y), weight 70.7kg (44.0-109.2kg) with equal gender-split (women-43/83, 51.8%). ASA was also evenly split (I-II: 43/83[51.8%]; III-IV: 40/83[48.2%]), and most were emergency surgeries (72/83[86.7%]). Individual patients' SpO_2 values are illustrated in Figure 1. Incidence of desaturation (SpO_2 </=93.9%), irrespective of oxygen therapy, was uncommon: pre-operative-3/82 (3.7%), ward recovery-1/83 (1.2%), day-1: 5/76 (6.6%), day-2: 4/68 (5.9%), day-3: 5/66 (7.6%). Patients with a minimum of two postoperative values were examined separately: most did not desaturate (62/72, 86.1%); of those that did desaturate, 7/72 (9.7%) had an isolated SpO_2-fall during one time-point, and 3/72 patients (4.2%) showed desaturation at two or more time-points, requiring oxygen therapy. Desaturation on the ward (days 1-3) was only found in patients who were prescribed patient-controlled opiate analgesia (PCA; 10/63, 15.9%), perhaps reflecting also more extensive surgery and anaesthesia. The majority of patients on PCA did not desaturate (53/63, 84.1%) (Chi_2 *ns*). Oxygen therapy (typically flow rates 0-4L/min by nasal cannulae) was given judiciously: pre-operatively to 13/82 (15.8%), during ward recovery to 49/83 (59.0%), and during post-operative days 1-3 to 19/76 (25%), 12/68 (17.6%) and 8/66 (12.1%), respectively.

Conclusion:
Adherence to oxygen therapy guidelines across the hospital was important to conserve this important resource during the Covid-19 crisis. This audit largely shows steadfast adherence to those guidelines without high incidence of either oxyhaemoglobin desaturation or non-targeted oxygen administration in our non-Covid-19 surgery patients. Despite healthcare professionals needing to consider more carefully the use of oxygen therapy during this time, we conclude that this occurred without significant impact on the safety of our wider patient population.

References:

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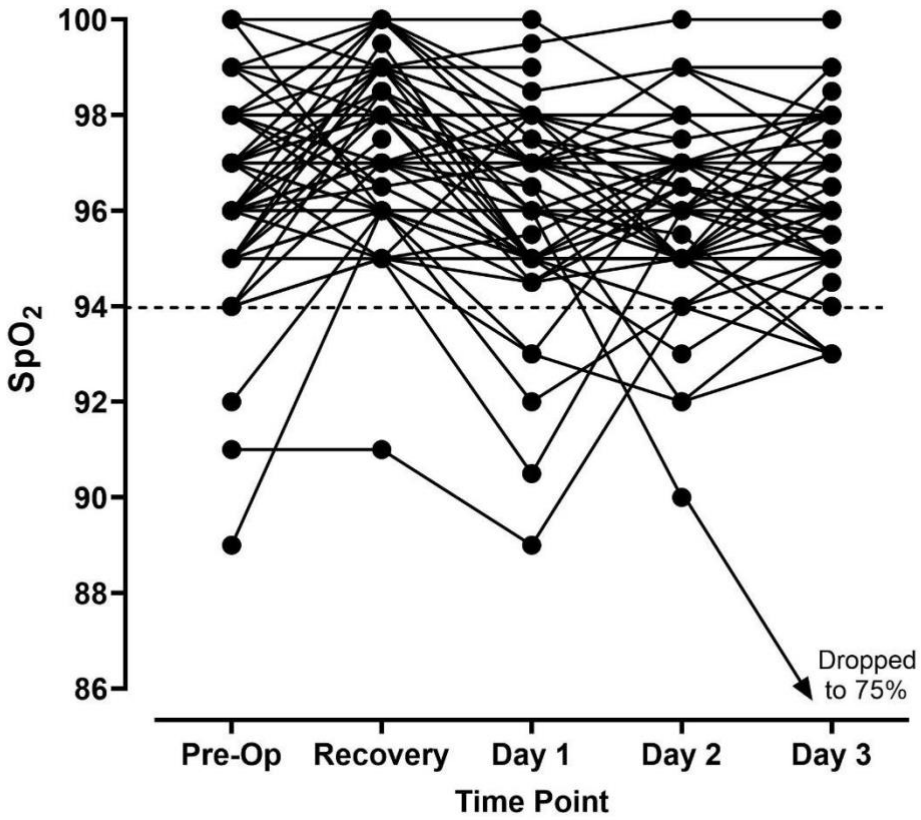
Figure 1: SpO_2 recorded at each time point for each patient.
Each dot-line connection represents an individual patient.
The majority of patients remained at >/=94% SpO_2.



EL204.3/6

Authors: Dr Bethan Lewis, Dr Joseph Vernon, Dr Seng Yeo & Dr Charlotte Small
Institution: Hereford County Hospital

Title:
A comparison between emergency and trauma theatre efficiency at Hereford County Hospital during 'normal' times and during the COVID-19 pandemic

Introduction:
During the COVID-19 pandemic, emergency and trauma surgery continues to be performed at Hereford County Hospital. Prior to the anticipated recommencement of planned surgery (1), it was necessary to assess the impact of system reorganisation and novel infection protection and control (IPC) processes on theatre efficiency. We hypothesised that theatre efficiency had been reduced, with delays occurring at all points in the patient journey.

Method:
We compared all consecutive emergency and trauma cases from the electronic Theatre Management System over a six-week period during the COVID-19 pandemic and the same six-week period in 2019 (30th March-18th April). Total theatre time was defined as time between "patient sent for" and "patient out of recovery."

Results:
Data was collected from 182 cases in 2019 and 121 cases in 2020. There was a mean increase of six minutes in total theatre time between pre-COVID and COVID time periods (58 and 64 minutes respectively). There were significant increases in time between sending for the patient and patient arrival in theatre, patient arrival and anaesthetic sign-in, completion of anaesthesia and completion of time out and sign out and patient leaving theatre. Duration of anaesthesia and duration of surgery were unchanged between datasets. Time spent in recovery and the time between being ready for discharge and leaving recovery were shorter in 2020. (Figure 1)

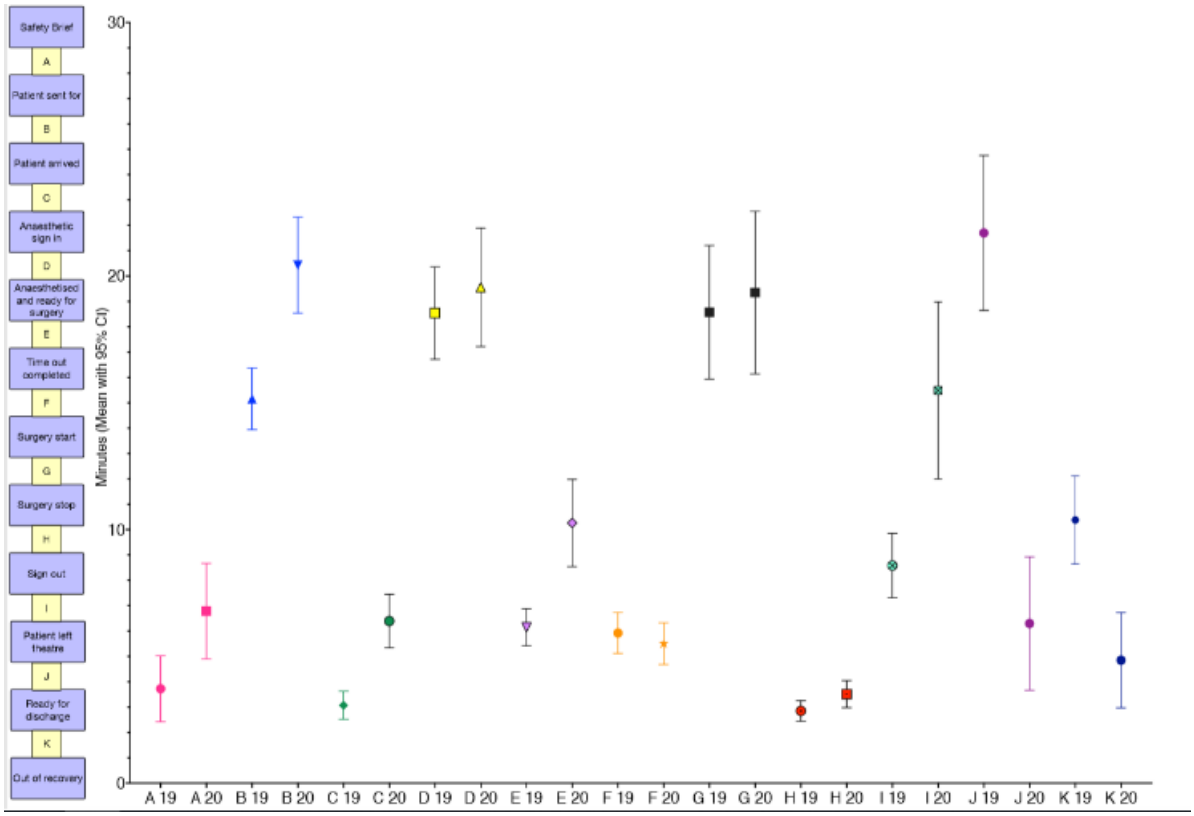


Fig. 1 Theatre journey time stamps pre COVID and during COVID (mean and 95% confidence intervals)

Conclusion:

Contrary to anecdotal experience of the theatre teams, our data suggests that there has been no substantial overall delay in total theatre time during the COVID-19 pandemic. The most significant time increases in 2020 were during the early stages of each case, possibly due to the donning of personal protective equipment and strategies to reduce viral load exposure with an enforced delay between induction of anaesthesia and entry of the surgical team. Nonetheless, it would appear that the adverse impact of these procedures has been mitigated by improved efficiency towards the end of each case. Moving forward in anticipation of the return to elective surgical working, strategies to improve efficiency at the start of each case must be considered alongside awareness that increasing the overall theatre caseload may have a detrimental impact on the ability to return patients in a timely manner to the ward.

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EL204.3/7

Authors: Dr Rebecca Mitchell, Dr Harry Thompson, Dr Jignesh Patel & Dr Megan Griffths
Institution: UCLH

Title:
Using perspectives of the multidisciplinary team to improve perioperative pathways

Introduction:
Regional anaesthesia (RA) has been shown to confer benefits to the patient experience including decreased post-operative pain, nausea and vomiting and increase patient satisfaction[1,2]. Furthermore, the use of a 'block room' with a dedicated team for the delivery of RA to multiple theatres can allow for increased operating capacity and efficiency through the parallel processing of patients.[3] At our institution, a block room service is available five days a week. Currently, suitable patients are identified on the day of surgery and a block room list is produced for the RA team.

Whilst improved efficiency and patient satisfaction have previously been demonstrated with our service, the multidisciplinary team (MDT) opinion has not been sought to guide further improvements. Our aim was to gain the perspectives of the theatre MDT on the current perioperative pathway and any potential areas for improvement.

Methods:
We employed convenience sampling of members of the theatre MDT to complete an online survey over a 2 week period. The survey Table 1 shows the questions asked. There was also a free text section.

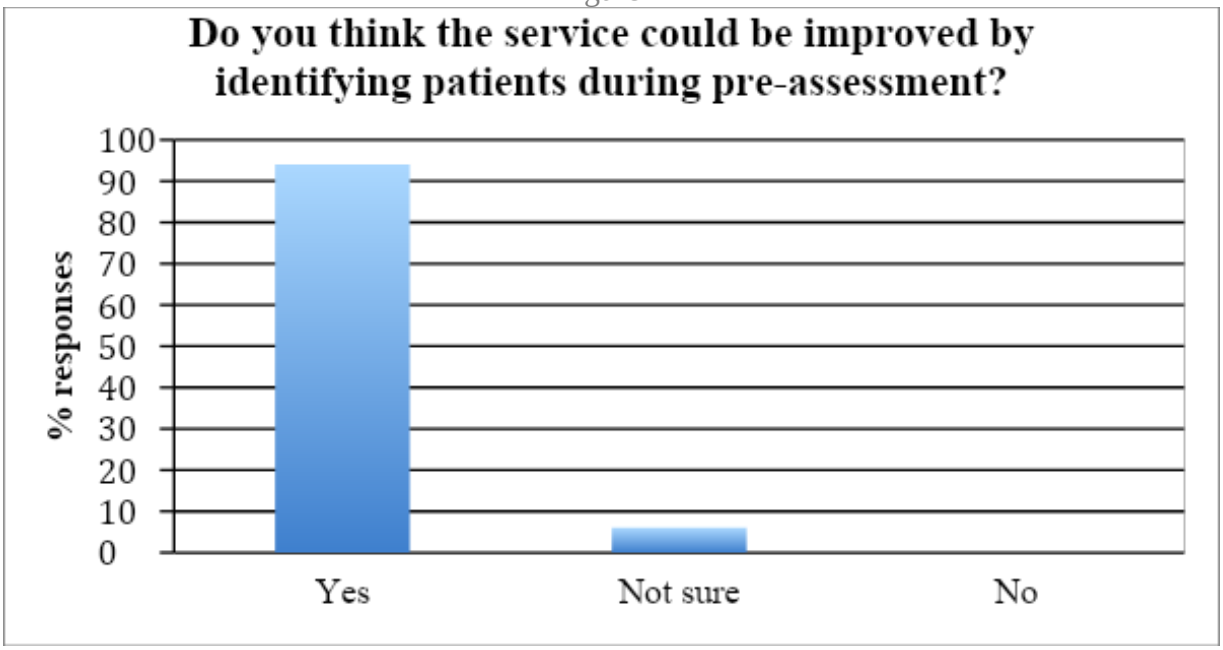
Table 1

MDT opinion on block room at UCH
1. Has the care of your patients' involved regional anaesthesia in the block room?
2. Do you prefer to include regional anaesthesia in the care of your patients?
3. Do you think the block room has improved efficiency for the emergency list?
4. Do you think the block room has improved efficiency for your elective list?
5. Do you think the block room has improved anaesthetic efficiency?
6. Do you think the block room improves patients' surgical experience?
7. Do you think the service could be improved by patient identification during pre-assessment?
8. Have you any other comments positive/negative about the block room?
9. Which specialty team do you work for?
10. What role do you have within your team?

Results:
46 members of the MDT provided responses including surgeons, operating department practitioners (ODPs) and anaesthetic and theatre nurses. The vast majority of respondents believed that the block room improved efficiency and had a positive impact on patient experience. However, free text comments consistently demonstrated concern that the identification of appropriate patients was

done ad-hoc on the day of surgery and this may result in suboptimal efficiency. When specifically asked if the MDT believed that identification during pre-assessment could further improve efficiency there was a positive majority consensus (displayed in figure 1).

Figure 1



Conclusion:
A novel approach to improving the 'block room' using MDT opinion is demonstrated. Recognition of improved efficiency and patient experience was in-line with previous research and projects. However, there was a consensus that this could be improved further with identification of patients during pre-assessment clinic and this represents our next focus.

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EL204.3/8

Authors: Sophia Butt, Ashik Zala, Alpen Shah, Martin Cohn, Lucy Foote & Nigel West
Institution: Hillingdon Hospital NHS Foundation Trust

Title:
Audit of Peri-Operative Iron Optimisation for Major Elective Orthopaedic Surgery

Introduction:
The World Health Organisation (WHO) defines anaemia as haemoglobin (Hb) <130g/L in males and <120g/L in females[1]. There is a well-recognised association between anaemia and poor post-operative outcomes[2]. Patients with iron deficiency and anaemia should be optimised prior to major surgery with a proposed cut off Hb of 130g/L irrespective of gender[3].

We audited pre-operative optimisation of iron deficiency against standards set by The Perioperative Association Guidelines[4] and reviewed associated perioperative outcomes.

Methods:
Retrospective data of pre-operative anaemia and iron optimisation was collected for 100 consecutive patients during 2019 undergoing major elective orthopaedic joint surgery in our trust, to assess compliance with standards set by The Perioperative Association Guidelines. Data was collected from patient electronic records and analysed using Chi-squared and Mann-Whitney U tests.

Results:

	Anaemic (Hb <130g/L)	**Non-Anaemic (Hb≥130g/L)**
Total Patients (n = 100)	44 (44%)	56 (56%)
Hb Range (g/L)	106-129	130-167
Mean Hb (g/L)	121	142
Iron Studies		
Ferritin <30µg/L (%)	36.4 (16/44)	17.9 (10/56)
Ferritin 30-100µg/L (%)	38.6 (17/44)	39.3 (22/56)
Ferritin >100µg/L (%)	18.2 (8/44)	37.5 (21/56)
Ferritin not available (%)	6.8 (3/44)	5.4 (3/56)
Further iron studies available (transferrin sat) (%)	2.3 (1/44)	0 (0/56)
Pre-Operative Iron Therapy		
Oral (%)	11.4 (5/44)	0 (0/56)
IV Infusion (%)	0 (0/44)	0 (0/56)
None (%)	88.6 (39/44)	100 (56/56)
Complications/Outcomes		
Required Blood Transfusion (%)	6.8 (3/44)	1.8 (1/56)
	p = 0.20	
Mean Length of Stay (Days)	5.3	4.7
	p = 0.007	

Table 1: Summary of results of pre-operative blood tests, pre-operative iron optimisation, and post-operative complications/outcomes.

Conclusion:

The prevalence of anaemia in our orthopaedic cohort was 44%, which is consistent with the 39.1% quoted for major surgical patients by Fowler et al[5]. Of our anaemic patients, 16 (36.4%) were iron deficient with a ferritin of <30µg/L and would have benefitted from iron therapy prior to surgery. 38.6% of anaemic patients had a ferritin of 30-100µg/L, unfortunately there was insufficient testing to establish if they had iron deficiency in combination with anaemia of chronic inflammation. 5 anaemic patients were prescribed oral iron by their general practitioner but remained anaemic. No patients received an iron infusion.

6.8% of anaemic patients went on to require a blood transfusion compared to 1.8% of non-anaemic patients, this was not statistically significant, which may be due to sample size. Length of stay was longer in the anaemic cohort, at 5.3 compared to 4.7 days ($p = 0.007$), corresponding with a previous study[6].

Major orthopaedic joint replacements are arguably among the most appropriate surgical cases for pre-operative optimisation of anaemia[7] as intra-operative blood loss is likely[8], and the majority of cases are elective, allowing for correction in advance of surgery. Furthermore, studies have shown that treatment of pre-operative anaemia reduces the need for blood transfusion[9,10].

Given the well-established association between pre-operative anaemia and increased morbidity and mortality[2], it is important we address the issue of pre-operative optimisation in our department. In order to improve our iron optimisation practices, we are introducing a peri-operative iron optimisation care pathway in the Trust which adheres to national guidelines, and plan to re-audit the department following implementation.

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4. Nicholas Lavies and Alwyn Kotze. Guidelines for the pre-operative management of anaemia in patients having major orthopaedic surgery. Evidence-based Guidelines for Preoperative Assessment Units: A Practical Guide 2017 Edition; 26-30
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EL204.4/1

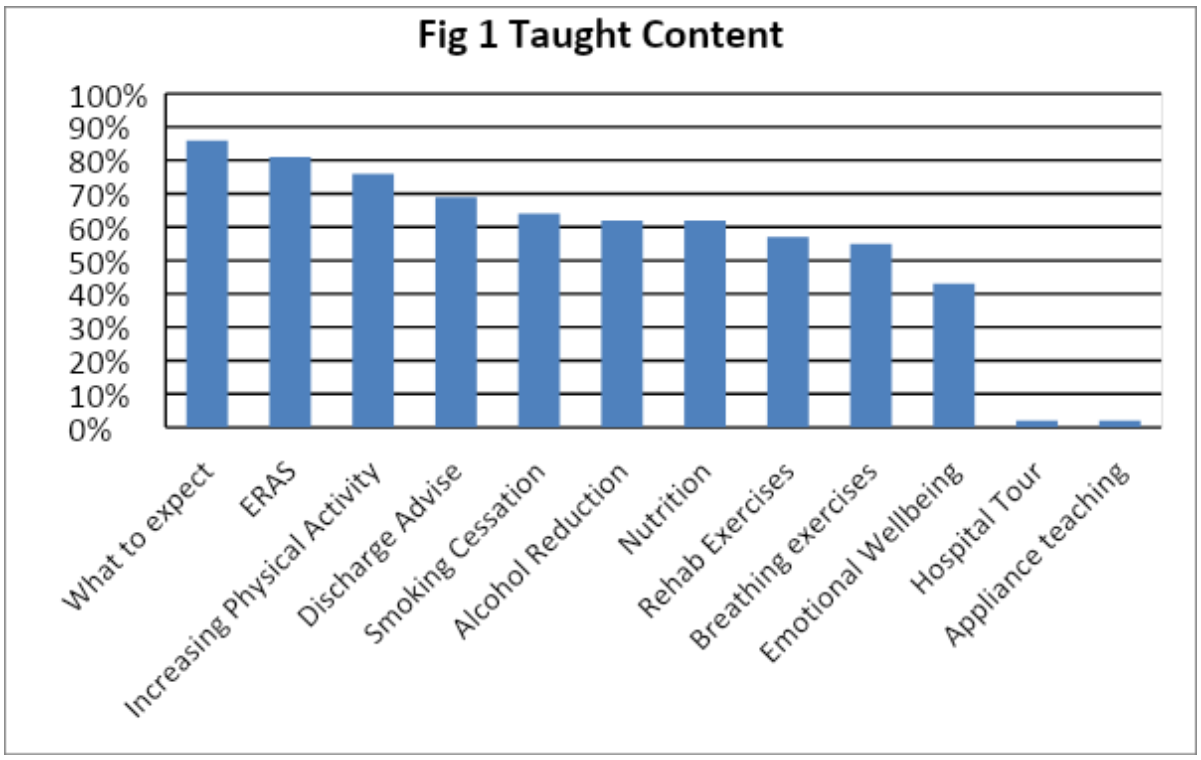
Authors: Imogen Fecher-Jones, Dr Fiona Carter, Prof Denny Levett & Dr John Moore
Institution: University Hospital Southampton NHS Foundation Trust

Title:
Fit for Surgery Schools: A National Picture

Background:
The last decade has seen a growth in group preoperative education in the form of "Surgery Schools" used to prepare patients for major surgery. Initially a forum for teaching patients the principles of Enhanced Recovery After Surgery (ERAS) (1), they now incorporate many aspects of prehabilitation including promotion of physical activity, improving nutritional status and managing emotional wellbeing (2). Despite surgery schools being a regular feature of conference programs, clinical outcomes remain unreported in the literature. The aim of this survey was therefore to establish a national overview of what surgery school activity is taking place and what is being measured.

Materials and Methods:
The survey consisted of 25 questions aimed at health care teams delivering surgery schools. It was delivered via Survey Monkey and was circulated by the UK Centre for Perioperative Care to all perioperative medicine leads, by the ERAS UK Society to all their members and via social media (Twitter, Facebook). The survey opened on 13/9/2019 and closed on the 16/12/2019.

Results:
There were 80 responses from 59 different locations across the UK, describing 42 surgery schools. Over 50% of the responses were from consultant anesthetists. Schools were described as being delivered predominantly by nurses, physio's, OT's and anesthetists, to 12 different surgical specialties, often in mixed groups. 64% of the schools had started within the last 4 years. Most schools were one off sessions of 1-2 hours for 5-20 patients and reported good levels of attendance. The taught content varied considerably (See Figure 1), but 85% covered "What to expect" and 80% ERAS Principles.



With regard to prehabilitation, 75% of schools covered the benefits of increasing physical activity, 62% nutrition and 43% emotional wellbeing. Just over half reported using established behavior change techniques such as goal setting and patient diaries.

Sixty four percent of teams collected outcome data following surgery school (See Figure 2), length of stay, morbidity and mortality, followed by patient satisfaction were most commonly reported outcome measures.

Figure 2

Data Collected	% of Schools
Length of Stay	38%
POM Score	5%
Morbidity and Mortality	31%
Pt Satisfaction	21%
ERAS Dataset	10%
PQIP Dataset	10%
PROMS	7%
Behaviour Change	5%
Other	7%

Schools were funded from a range of sources, 50% only had fixed term funding, 80% were supported by their own Trusts, 20% from other sources including charities, national innovation funds and local government. As well as delivering the program, over 50% of centers reported working with outside agencies including gyms, charities and local councils to support patients to make lifestyle changes.

Conclusion:

Surgery schools are gaining in popularity within UK hospitals as a means of preparing patients for surgery and promoting behaviour change, across all major surgical specialties. Evidence of their effectiveness remains primarily anecdotal, given the lack of funding for these interventions, there is

a need for a consensus on outcome measures, taught content and behaviour change mechanisms for the future of this type of intervention is to be sustained.

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EL204.4/2

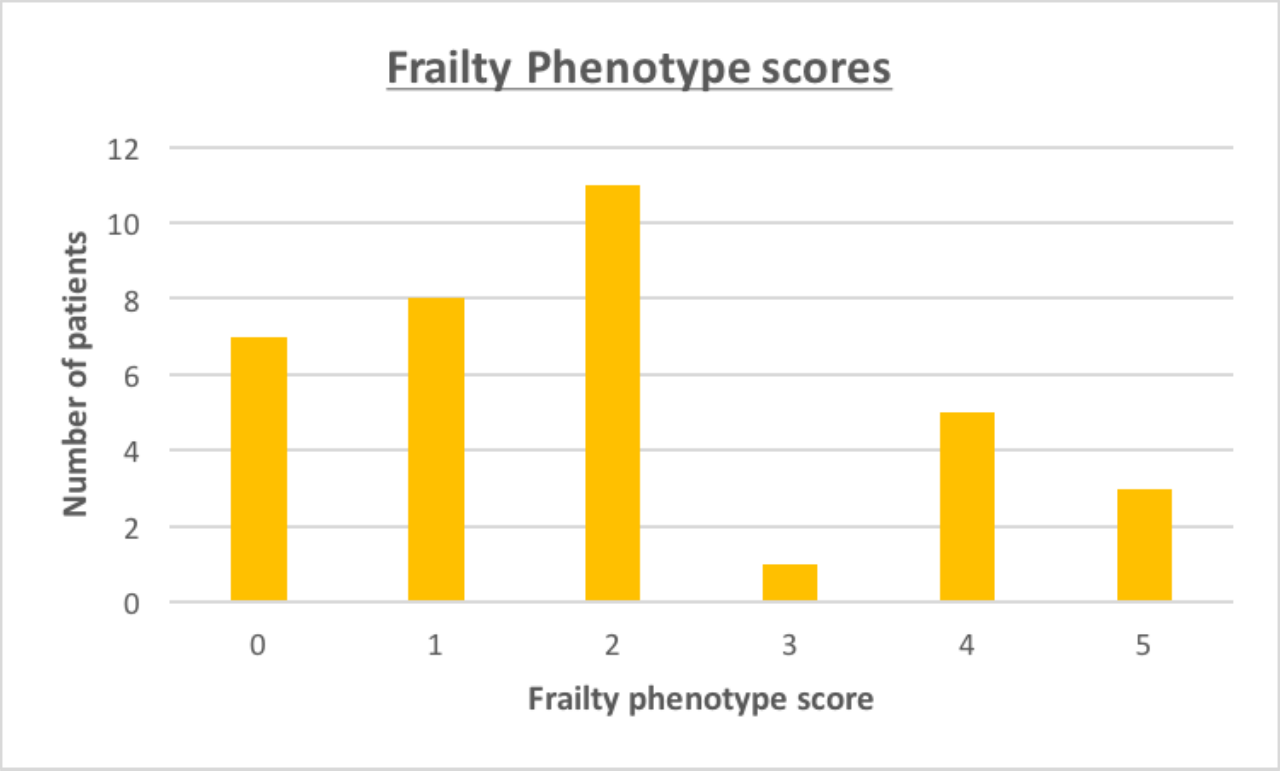
Authors: Gemma Scotland, Dr Myra McAdam & Dr Sonya McKinlay
Institution: Glasgow Royal Infirmary

Title:
Introduction of Frailty Phenotype Score to High Risk Anaesthetic clinic.

Introduction:
Frailty is well recognised as a significant risk factor for mortality and morbidity following surgery. However, it can be difficult to assess and is often poorly documented. The commonly used Rockwood Clinical Frailty Scale is only validated for patients age >65 years.

Methods:
We introduced the frailty phenotype score into our assessment of all patients at the high risk anaesthetic clinic (HRAC) within a busy city hospital. This scoring system involves the objective measurement of grip strength along with 4 patient reported lifestyle questions (weight loss, exhaustion, walking pace, physical activity) . This score was selected as it has been validated in a wider patient age group and is easily reproducible in the clinic setting.

Results:
Since Jan 2020 we have assessed and documented the frailty phenotype of 35 patients in the HRAC. A score of 0 is not frail, 1 or 2 pre-frail and 3-5 is frail. 54%(19/35) of patients seen since Jan 2020 were age less than 65 years.



The HRAC historically used the Rockwood Clinical Frailty Scale, however, this has the limitations already discussed. We looked retrospectively at 314 patients seen in clinic which showed 29% (92/314) were age less than 65 years and only 5% (5/92) of this group had a formal frailty score documented. The advantage of the Frailty Phenotype is that is can be applied across the whole

patient demographic. Also this will allow us to assess patients not traditionally thought of as frail and detect this prefrailty state (scores1&2).

Patients in the pre-frail group (scores 1&2) represent a real opportunity for pre-habilitation and optimisation of the patients' condition prior to surgery. This objective score will help to frame the conversation with patients and possibly help with motivation. Patients in the frail group (scores 3-5) may also benefit from pre-habilitation and this added information will also be useful for shared decision making and risk discussions with these patients and their relatives.

Conclusion:
The introduction of this new scoring system will further aid targeted pre-optimisation, risk stratification and shared decision making of patients at the HRAC.

EL204.4/3

Authors: Gemma Scotland, Dr Joanne Bell & Dr Sonya McKinlay
Institution: Glasgow Royal Infirmary

Title:
Patient reported outcomes measures (PROMs) in preoperative anaemia treated with IV iron infusion.

Introduction:
Preoperative anaemia is associated with a compromised quality of life1. It is a common feature among preoperative cancer surgery patients. Patients with iron deficiency anaemia who cannot absorb or tolerate oral iron or in whom surgery is urgent and cannot wait 6-8 weeks may benefit from IV iron infusion.

Methods:
We used a quality of life (QoL) assessment tool modified from the FACIT tool to assess patient reported measures before and after iron infusion. We correlated the FACIT scores with Hb concentration prior to surgery.

Results:
We collected FACIT QoL questionnaires2 which were completed at the time of iron infusion, from 19 patients from January 2020 onwards. The median pre-treatment score was 20/64; range of (4-55). The Hb concentration before treatment did not correlate with QoL scores. There was no significant different in the Hb concentration between the patients with poor QoL scores (>75$_{th}$ quartile score>37/64) mean Hb 106g/l and those with good QoL scores (<25$_{th}$ quartile score <14/64) mean Hb 107g/l.

Patients were then asked to complete and return the same questionnaire via post 2-3 weeks after the treatment and these scores were analysed.11 patients have returned a post treatment questionnaire so far. 73%(8/11) of those patients reported an improved score from their pre-treatment score.

Conclusion:
It is our aim to continue to collect patient reported outcomes from IV iron infusion patients which will enable us to gain further information about QoL impact from IV iron infusion.

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EL204.4/4

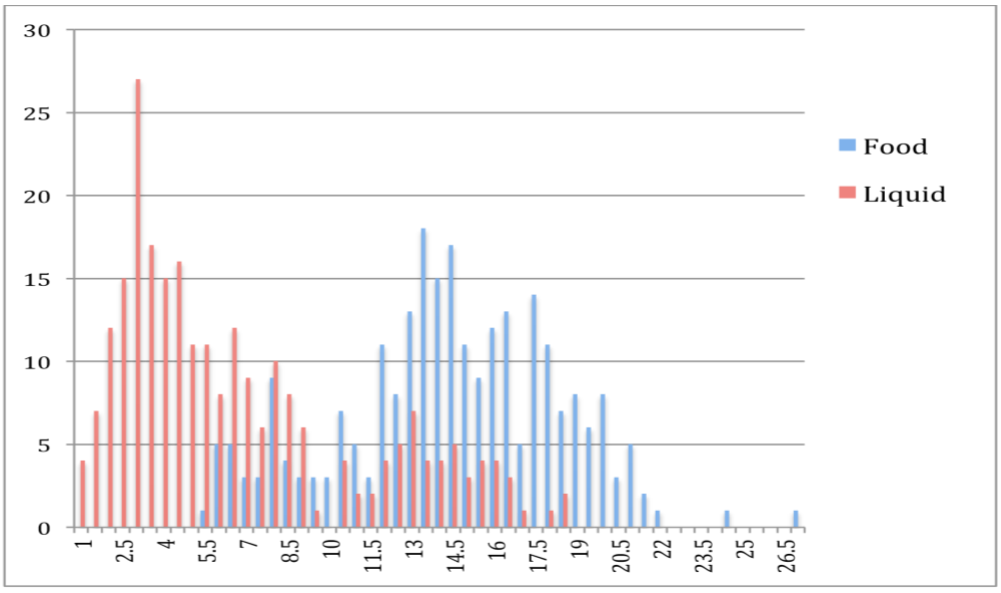
Authors: Claire Rose & Dr Sarah Bowman
Institution: Queen Elizabeth II Jubilee Hospital

Title:
Preoperative Fasting Times in Elective Surgical Patients

Introduction:
Conventional preoperative fasting advice prior to current practice was to keep patients nil by mouth from midnight before the day of surgery. This was intended to decrease residual gastric volume and acidity and thereby reduce the risk of aspiration during anaesthesia.[1] Much of the research has shown, however, that healthy patients who ingest clear fluids 2 hours and solid food 6 hours before anaesthesia do not have larger gastric fluid volumes or lower stomach pH than those who fast from midnight or longer, and are not at increased risk of aspiration.[1] Furthermore, studies have *not* demonstrated a delay in gastric emptying in obese patients.[1] Fasting 2 hours for clear liquids and 6 hours for solid food pre-operatively is considered safe and is recommended by the Australian and New Zealand College of Anaesthetists.[2] Prolonged fasting has actually been associated with a number of adverse effects including hypoglycemia, hypotension prior to surgery, increased post-operative nausea and vomiting, muscle wasting and hyperglycemia.[3,4]

An audit was conducted at an Australian Brisbane City hospital to determine elective surgery fasting times. The results are intended to promote implementation of practices that can help hospital departments meet fasting guidelines more effectively and reduce length of patient stay due complications from prolonged fasting.

Method:
Data for the audit came from all elective surgeries (264 patients) conducted in the month of January 2020 at the Queen Elizabeth II Jubilee Hospital. Data was collected using the perioperative electronic record in which the time of last liquid and time of last food is recorded. The time arrived in the operating theatre was then used to calculate the total number of hours fasted for liquids and solid food. BMI status was also recorded for each patient, with bariatric elective surgeries being those with a BMI >30.



Results:
The results demonstrated that fasting hours far exceeded that recommended by guidelines. Only 4.5% of the cohort received fluids up to 2 hours prior to surgery and 2% were fasted 6 hours for solid food. The spread of fasting times for bariatric vs. non-bariatric patients was fairly similar (1.6% vs. 2.2% fasted 6 hours of solid food).

Conclusion:
Prolonged fasting times are associated with a number of adverse metabolic and systemic effects which can prolong patient stay. Audit data identifies that fasting guidelines are not been met in elective surgical patients.
This audit should direct future interventions aimed at rectifying prolonged fasting times.

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2. Australian and New Zealand College of Anaethetists. Guidelines on Pre-Anaesthesia Consultation and Patient Preparation. 2017; http://www.anzca.edu.au/documents/ps07-2008-recommendationsfor-the-pre-anaesthesia.pdf. Accessed May, 2020.
3. de Aguilar-Nascimento JE, Dock-Nascimento DB. Reducing preoperative fasting time: A trend based on evidence. *World J Gastrointest Surg*. 2010;2(3):57-60.
4. Gul A, Gul A, Andsoy II, Andsoy II, Ozkaya B, Ozkaya B. Preoperative Fasting and Patients' Discomfort. *Indian Journal of Surgery.* 2018;80(6):549-553.

EL204.4/5

Authors: Dr Helen Howes, Dr Hannah Wilson, Dr Adam Duffen & Carole Phillips
Institution: University Hospitals Bristol and Weston NHS Foundation Trust (UHBW)

Title:
Chest CT in screening for COVID-19 infection in urgent elective cancer patients: The UHBW experience

Introduction:
During the initial surge of COVID-19 infections, there was a need to maintain urgent cancer procedures as defined by NHS England as Priority 2 cases[1]. Additional risks of surgery included asymptomatic incubation/infection with COVID-19, with increased mortality and morbidity after surgery, and introducing potential infective patients onto the postoperative ward. To mitigate against this the Royal College of Surgeons of Edinburgh produced guidance[2] regarding preoperative screening of patients that included the use of CT chest in a select group. This included those requiring level II/III care postoperatively or other specific high-risk patients. The use of CT chest for diagnosis of COVID-19 infections is debated[3]; its low sensitivity has led to the view that it should be used with caution in this setting. On 14th May the Intercollegiate guidance was updated, and receded its previous recommendation for preoperative CT imaging, in light of emerging data that the investigation "does not add to the detection of COVID-19 in an asymptomatic, isolated and tested patient".[4]

Method:
In our hospital all elective surgical patients are asked COVID-19 screening questions prior to admission. Surgery is delayed in the event of any positive responses. In response to the initial guidance, and in lieu of access to viral PCR swabs for patients, we introduced day of surgery non-contrast CT scan for all major intracavity resections at UHBW on 1st April 2020.

Results:
To date, 82 patients have had screening CT scans, with none demonstrating evidence of COVID-19. 96% patients had their planned surgery, 4% had their surgery delayed for non-COVID-19 clinical reasons. One patient had a repeat screening CT preoperatively following rescheduling.

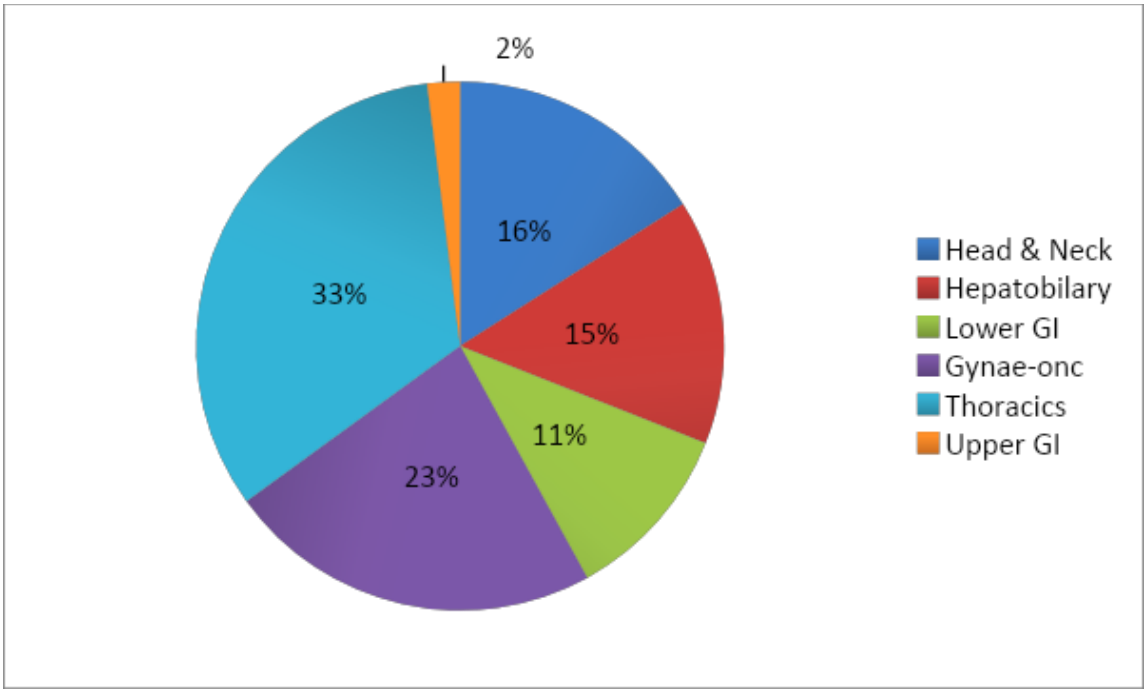

Figure 1: *Chest CT COVID-19 screening by speciality*

Postoperative chest imaging was performed in 62% cases (CXR) and 11% cases (CT) respectively. A further 6% patients' had subsequent abdomen/pelvis imaging for postoperative acute deterioration. One CXR was requested for investigation of a possible infective source, with a subsequent non COVID-19 diagnosis; all others were for routine postoperative imaging. 6% patients had COVID-19 viral PCR swabs postoperatively for investigation of fever +/-raised inflammatory markers; all were negative. There are no clinical diagnoses of COVID-19 to date.

Conclusion

Our data would support the changes to the updated intercollegiate guidance, with all patients with negative screening questionnaires on admission to hospital having negative CT chest scans. We have updated our screening processes in response to the most recent guidance, and have stopped performing CT chest scans routinely.

References:

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3. Hope M, Raptis C, Shah A, Hammer M, Henry T. A role for CT in COVID-19? What data really tell us so far. The Lancet Vol 395, Issue 10231, P1189-1190. April 20 https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30728-5/fulltext
4. Royal College of Surgeons of England. Intercollegiate guidance for pre-operative chest CT imaging for elective cancer surgery during the COVID-19 pandemic. May 2020 https://www.rcseng.ac.uk/coronavirus/preoperative-chest-ct-imaging-guidance/

EL204.4/6

Authors: Dr Emily Gott, Dr Gianluca Longobardi, Dr Sara Churchill & Dr Farah Dadman
Institution: University Hospital of Wales, Cardiff

Title:
Pre-operative risk assessment in University Hospital of Wales

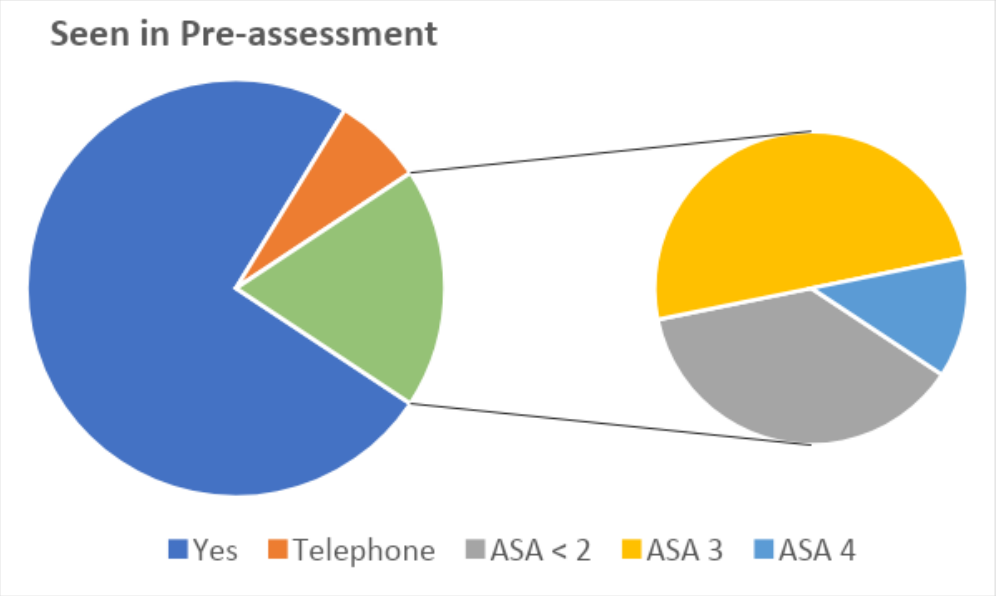
Background:
The annual report of the Perioperative Quality Improvement Programme (PQIP) highlighted that only 54.5% of patients in UHW had a documented individual risk assessment prior to surgery. This was less than the national PQIP average of 65% (1). Those patients not given a documented risk assessment were found to have an ASA of 3 or more in 61.5% of cases.

Individualised risk assessment allows planning of an appropriate perioperative pathway and encourages shared decision making. For this reason, it is one of the top 5 priorities for improvement this year.

We wanted to review our pre-assessment process and look at how our patients are being risk assessed in order to identify areas of improvement.

Methods:
Over a 2 day period, we prospectively looked at all patients undergoing elective surgery in UHW. We documented whether they were seen in pre-assessment clinic (PAC), what ASA score they were given, how this compared to the ASA given by the anaesthetist on the day, and whether their Surgical Outcome Risk Tool (SORT) score was performed and documented.

Results:
43 patients, across a range of specialties, underwent elective surgery over a 2 day period.
Figure 1 demonstrates the patients seen in nurse led PAC and those not seen how their ASA was scored on the day of surgery.



Of the 32 patients seen in PAC, 11 were referred on to see an anaesthetist, and 1 had a notes review by an anaesthetist. An ASA score was given in PAC only 60% of the time and this was underscored

compared with the ASA given by the anaesthetist on the day in 29%. Only 1 patient was SORT scored during the PAC process.

Discussion:
Our data has supported that of PQIP and highlights that we are not appropriately risk assessing our patients prior to surgery. It identified that high risk patients are sometimes not even seen in PAC and not enough were seen by an anaesthetist. SORT score was not consistently used and not enough patients were given an ASA score in PAC. If it was done, it was often underscored.
We have since produced a guideline to help the pre assessment nurses to ASA score the patients. We feel a patient's frailty is a crucial marker for prognostication and pre op planning. We have therefore produced a sticker (see table 1) to ensure patients are appropriately risk assessed and those deemed higher risk are referred directly to anaesthetic clinic.

Table 1

Pre-assessment Project
(Please stick on front of patient notes)

ASA score	
SORT score	
FRAILTY score	
Refer to anaesthetic clinic?	Yes/No (please circle)

References:

1. Perioperative Quality Improvement Programme annual report 2018-2019. www.pqip.org.uk

EL204.4/7

Authors: Tharusan Thevathasan, Dr Danny JN Wong, Dr Steve K Harris & Prof Ramani S Moonesinghe
Institution: University College London Hospital, United Kingdom

Title:
Postoperative Critical Care Improves Mortality - Causal Inference Analysis of A 248 Hospital Cohort

Introduction:
Without an absolute indication for organ support, there is equipoise over who may benefit from postoperative critical care.[1–3] Utilisation of critical care is correlated with critical care bed availability which varies stochastically.[4] This sets up a natural experiment where we can compare outcomes for those treated when critical care bed capacity is under strain or not, and use this to infer the causal effect of critical care admission on postoperative patient morbidity and mortality.

Methods:
We conducted a prospective, international, multicentric cohort study in 248 hospitals in the United Kingdom, Australia and New Zealand, recruiting patients over seven consecutive days in 2017.[5] We included adult patients undergoing inpatient surgery without an absolute indication for postoperative critical care admission.

We first performed a risk-adjusted analysis using multivariable regression with 29 demographic and perioperative predictor variables to account for observed confounding. We analysed the association between postoperative admission to critical care versus surgical ward on patient morbidity using the Postoperative Morbidity Survey (POMS) on day 7, and on 30-day and 60-day mortality.

To make causal inferences, we accounted for observed and unobserved confounding, by repeating the aforementioned analysis using instrumental variable method with instruments on critical care bed strain (i.e., number of free beds and discharge-ready patients at time of surgery).

Results:
21,935 patients were included in this study, of which 1,960 (8.9%) were admitted directly to critical care postoperatively. Accounting for observed confounding, critical care versus ward admitted patients had an 109% increased risk (95% Confidence Interval, 1.96-2.23, P<0.001) for developing postoperative morbidities on day 7, as well as 91% (95%CI, 1.49-2.32, P<0.001) and 77% (95%CI, 1.38-2.17, P<0.001) higher risks for 30-day and 60-day mortality, respectively.

Accounting for observed and unobserved confounding, critical care admitted patients had a 77% (95% CI, 1.43-2.19, P<0.001) increased causal risk for having POMS-defined morbidity on postoperative day 7. However, 30-day and 60-day hospital mortality risks were 9% (95%CI, 0.81-1.0, P=0.06) and 10% (95%CI, 0.8-1.0, P=0.04) **lower** in critical care patients, respectively (see Table).

Of note, mortality benefits increased incrementally with critical care admission of higher risk surgical patients (see Figure): Critical care patients with Surgical Outcome Risk Tool-predicted 30-day mortality >9% had 35% lower 30-day mortality risk (95%CI, 0.27-1.04).

Conclusions:
Although postoperative critical care admission places patients at higher risk of short-term morbidity (e.g. due to invasive monitoring, ICU-acquired infections or delirium), it confers longer-term mortality benefits (at 30 and 60 days).

References:

1. Kahan BC, Koulenti D, Arvaniti K, et al. *Intensive Care Med*; **43**: 971–9; 2017
2. Grieve R, O'Neill S, Basu A, Keele L, Rowan KM, Harris S. *JAMA Netw open*; **2**: e187704; 2019
3. Thevathasan T, Copeland CC, Long DR, et al. *Anesth Analg*; **129**: 753–61; 2019
4. Wong DJN, Popham S, Wilson AM, et al. *Br J Anaesth*; **122**: 460–9; 2019
5. Moonesinghe SR, Wong DJN, Farmer L, Shawyer R, Myles PS, Harris SK. *BMJ Open*; **7**; 2017

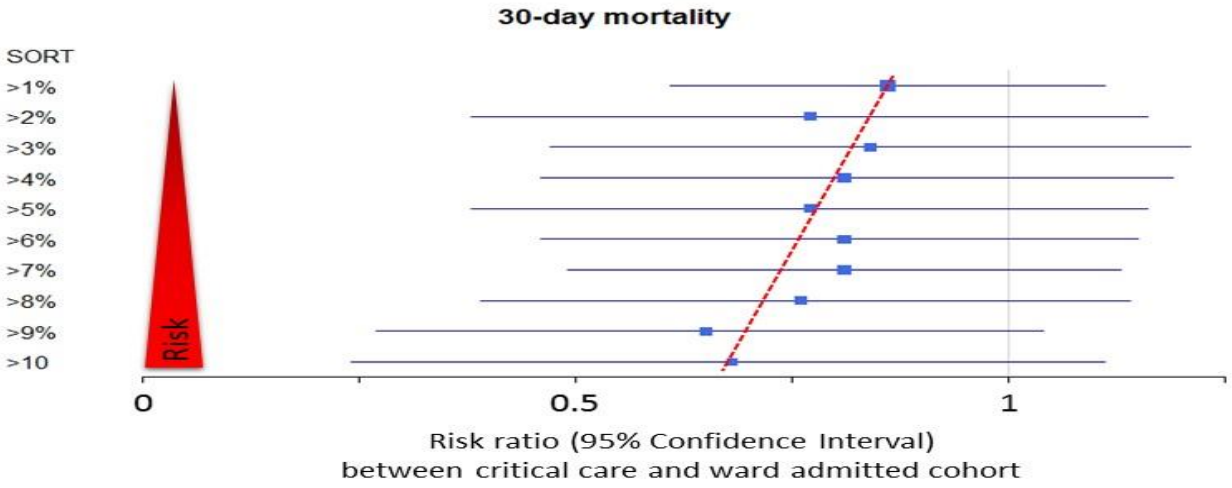
Table and Figure

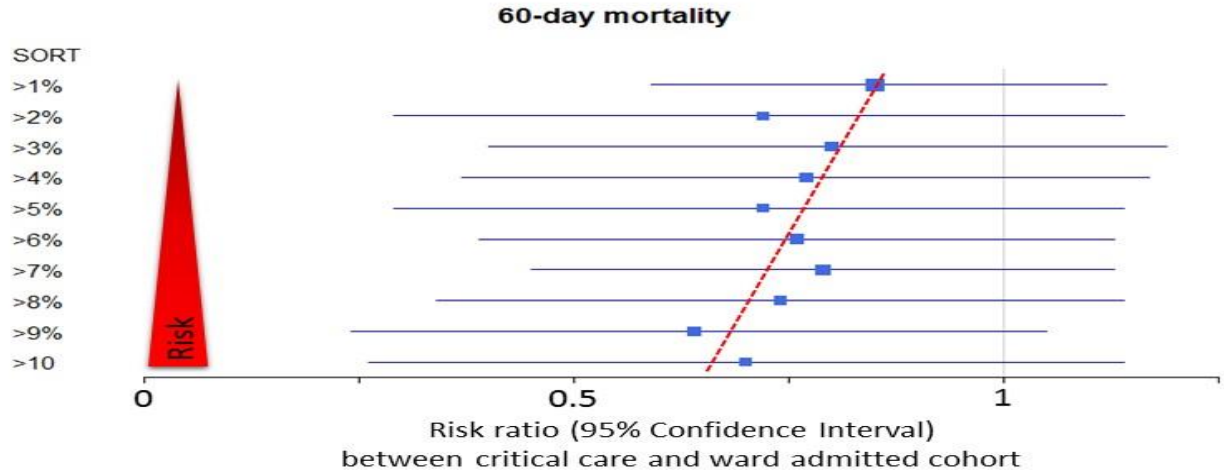
Table: The effect of postoperative critical care versus surgical ward admission on short-term and medium-term outcomes.

7-day morbidity*			30-day mortality			60-day mortality		
Risk ratio	*95% CI*	*p*	*Risk ratio*	*95% CI*	*p*	*Risk ratio*	*95% CI*	*p*
Unadjusted regression (without confounders)								
2.74	2.63 to 2.84	**<0.001**	2.99	2.66 to 3.31	**<0.001**	2.89	2.58 to 3.19	**<0.001**
Multivariable regression (adjusted for observed confounders)								
2.09	1.96 to 2.23	**<0.001**	1.91	1.49 to 2.32	**<0.001**	1.77	1.38 to 2.17	**<0.001**
Instrumental variable method (adjusted for observed and unobserved confounders)								
1.77	1.43 to 2.19	**<0.001**	0.91	0.81 to 1.05	**0.06**	0.9	0.8 to 1.0	**0.04**

*Morbidity status defined by Postoperative Morbidity Survey (POMS)
CI: Confidence Interval

Figure: 30-day and 60-day mortality risk ratio between patients admitted to critical care versus surgical ward after surgery stratified by Surgical Outcome Risk Tool (SORT) risk groups.





EL204.4/8

Authors: Deborah Douglas & Dr AMV Luoma
Institution: National Hospital For Neurology and Neurosurgery, Queen Square, London

Title:
Utility of the Post-Operative Morbidity Survey in Complex Spine Surgery; A Single Center Review of PQIP Data

Introduction:
The Perioperative Quality Improvement Program (PQIP) was established in 2016 to measure the perioperative care of patients undergoing major non-cardiac surgery in the UK. The Postoperative Morbidity Survey (POMS), which records morbidity in 9 organ-system domains, is used by PQIP to assess short-term morbidity (1).
Spine surgery is associated with increased morbidity, reported around 11% (2). It is challenging to capture accurately all morbidity using conventional methods, e.g. pre-defined complications, and a more specific, standardized tool may be required to guide quality improvement.
The aims of this study were to a) identify morbidity associated with postoperative hospital stay ≥7 days after complex spine surgery & b) investigate the utility of POMS to identify this morbidity.

Materials and Methods:
A retrospective review of local PQIP data was performed. Patient records were then reviewed to identify reasons not defined by a POMS domain for hospital admission on post-operative day 7. Ethics approval was not required for this local service evaluation. All patients consented to participation in PQIP.

Results:
108 patients identified; 3 were excluded due to incomplete data (table 1). Mean (SD) post-operative length of stay was 5.6 (5.7) days. 24% were inpatients on post-operative day 7, of whom 44% had morbidity identified in ≥1 POMS domain. The incidence of post-operative complications was 10%. The most common reasons for continued admission at day 7 were mobility related (44%) or need for ongoing medical care (72%). The most common non-POMS defined needs for medical care were dysphagia, pain & wound management.

Conclusion:
POMS does not capture all morbidity after complex spine surgery, in particular related to mobility, wound & dysphagia. Previous studies report an incidence of dysphagia up to 79% after anterior spine surgery, CSF leak ~ 6% & wound complications in 12% (3). Our findings suggest a spine-surgery specific POMS tool should be developed & tested.

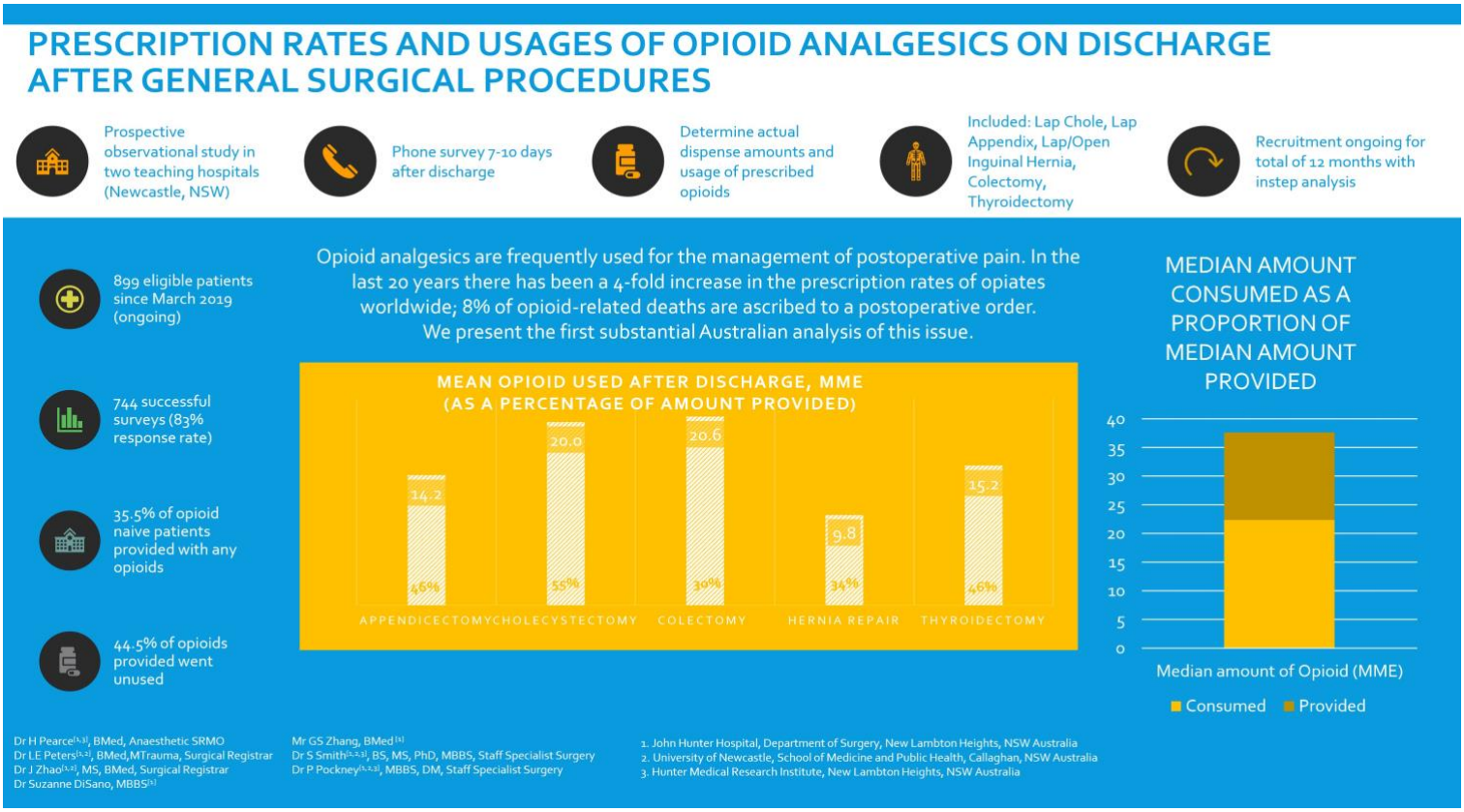
References:
1. www.pqip.org.uk
2. Rock A et al Journal of Neurosurgical Anesthesiology: 2018 ;30 (4): 328–336
3. Farshad MD et al doi: 10.1016/j.spinee.2019.12.013. [Epub ahead of print]

	All (n=105)	Day 7 admission (n=25)	POMS + (n=11)	No POMS + domains (n=94)
Demographics:				
▪ Age (med, range) years	57 (25-83)	57 (25-81)	57 (25-81)	57.5 (26-83)
▪ Female % (n)	47% (49)	36% (9)	27% (3)	49% (46)
▪ ASA-PS 3+4 % (n)	25% (26)	28% (7)	9%(1)	27% (25)
▪ Length of post-operative stay (mean, sd) days	5.6 (5.7)		15.5 (7.5)	4.5 (4.4)
▪ Admitted day 7	24%	N/A	N/A	14 (15%)
Post-operative morbidity and mortality day 7:				
▪ POMS + in at least 1 domain day 7	10 % (11)	44% (11)	N/A	N/A
▪ Requiring ongoing medical/nursing care day 7	17% (18)	72%	82% (9)	64% (9)
▪ Mobility issue day 7	10% (11)	44%	45% (5)	43% (6)
▪ Not returned to baseline mobility day 7	18% (19)	76%		
▪ Social issue day 7	3% (3)	12%	18% (2)	7% (1)
▪ No reason for admission day 7	1% (1)	4%	0%	7% (1)
▪ Mortality	0%	0%	0%	0%
Clavien-Dindo complications: % (n)	16% (17)	52% (13)	73% (8)	10% (9)
• Grade 2 or worse	10% (11)	32% (8)	45% (5)	6% (6)

Table 1: Demographics, complication and reason for prolonged hospital stay

EL205.1/1

Authors: Harry Pearce, Dr Luke Peters, Dr J Zhao, Dr S Di Samo, G Zhang, Dr Stephen Smith & Dr Peter Pockney
Institution: John Hunter Hospital



EL205.1/2

Authors: Thomas O'Dell, Dr Paul Balfour & Prof Gudrun Kunst
Institution: King's College Hospital London

Title:
Delirium assessment in cardiac surgical patients

Introduction:
Post-operative delirium (POD) is common in cardiac surgical patients with incidence ranging from 26-52%(1). POD is associated with adverse outcomes - decreased functional status, cognitive decline, increased long-term mortality, and major adverse cardiac events(2). Hypoactive delirium, often under-recognised, may account for up to 92% of cases. Screening with the CAM-ICU tool(4) is routine in all King's Critical Care Units except the Cardiac Recovery Unit (CRU). NICE recommends that all inpatients are screened for delirium (3). An essential step in addressing POD is early identification.

Methods:
An initial audit of 50 cardiac surgical patients admitted to CRU assessed evidence of POD using Electronic Patient Records (EPR). We introduced post-operative day 1 screening for all cardiac surgical patients, conducted by nursing staff, using CAM-ICU. Due to staff feedback and poor compliance we switched to the 4AT tool (5). EPR were then reviewed to identify POD in screened patients' admissions. This data was compared to our pre-screening group.

Results:

Table 1. Pre-screening baseline audit data.

	No. of patients	Mean Age (years)	Valvular surgery (+/- CABG)	Mean length of stay (days)	Mean cardiopulmonary bypass (CPB) time (mins)	Mean Aortic cross clamp (XC) time (mins)	Mean duration of surgery (mins)
Delirium documented	10/50 (20%)	66.7	9/10 (90%)	20.5	120.8	76.2	284.5
No delirium documented	40/50 (80%)	61.8	12/40 (30%)	9.6	81.7	50.1	266.8

Using the CAM-ICU tool - 30/90 (33.3%) patients were screened, with 2/30 (6.7%) positive results. Of these same 30 patients - EPR review identified 7/30 (23.3%) with POD.

Using the 4AT tool - 54/72 (75%) patients were screened, with 12/54 (22%) testing positive, and POD evident on EPR review in 6/54 (11%). Of those with risk of POD identified by positive 4AT test, 92% had valvular surgery (+/- CABG) and there were increases in mean LOS (13.1 vs 9.8 days), XC time (84.2 vs 56.9 mins) and CPB time (110.1 vs 93.5 mins).

Conclusion:
Detecting POD remains challenging, with a significant hurdle in this project being performing the screening tool reliably. Nursing staff having confidence in completing the tool, with minimum "subjectivity" incorporated, was vitally important. For these reasons we switched from CAM-ICU to 4AT.

We identified that a positive 4AT correlates well with the operative factors associated with POD in both pre-screening and screened groups - longer duration of surgery, CPB and XC time, and valvular surgery.
Out data suggests that the 4AT may over-detect patients at risk of POD. Excess positive 4AT tests compared to documented delirium on EPR may be due to the test not "filtering" out expected postoperative effects of

anaesthesia and opiate analgesia, or due to oversensitivity in its format. A larger sample would be needed to ascertain this. We believe over-identification of POD risk is greatly preferred to missed cases.

References:

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2. Impact of delirium on postoperative frailty and long term cardiovascular events after cardiac surgery https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0190359
3. NICE guideline CG103 – Delirium: prevention, diagnosis and management.
4. Delirium in the Cardiac Intensive Care Unit https://www.ahajournals.org/doi/10.1161/JAHA.118.008568
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