Anaesthesia News

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Future of surgery and anaesthesia issue:

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The future of anaesthesia – sustainability

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Welcome

Planning for the future is hard. On 21st October 2015 we were all supposed to be wearing self-adjusting shoes whilst riding hoverboards. Sadly the predictions of 'Back to the Future 2' were way off the mark, although they correctly anticipated that we would still be reliant on the fax machine - so there is that.

Awareness of the passage of time is at the core of our consciousness. We possess the ability for a kind of mental, bi-directional time travel. We can be wistful and draw on our experience, but also anticipate future outcomes. This mental time travel gives us the behavioural flexibility to act in the present to increase our chances of survival. There is a cost though: invest too much time in planning, and inevitably we will fail to match up. We know this intuitively, and uncertainty is a potent fuel for anxiety. As an example, it is a source of anxiety for me that I am not working in the super-hospital that we were promised five years ago.

The future is uncertain - that much we can predict. This past 12 months has been a great example: while we all 'knew' a pandemic was coming, who could have predicted what has unfolded? We need to be careful not to overreact.

I recently read a book that described two groups of people: 'causally-minded', who take a specific goal and use all of the available tools to achieve it, and 'effectually-minded' people [1]. Effectually-minded people consider the resources at their disposal - the chemist who failed to create a super-sticky glue but realised he'd invented the Post-it note, or the cook who uses up the leftovers. The take home message was: start within your means, don't wait for perfect, accept things might fail.

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What might 'intensive care' mean in 2035?

2020 was the tenth anniversary of the creation of the Faculty of Intensive Care Medicine (FICM), and intensive care medicine (ICM) as a stand-alone medical specialty in the UK. The COVID pandemic has been significantly disruptive and there is no going back to how we were; NHS services such as critical care that were so exposed must move forward. Two recent workstreams, Health Education England's 'Future doctor' project of 2019 [1] and the 'Getting It Right First Time' programme [2] provide pointers as to what might change. FICM is also shortly due to release a suite of documents, 'Critical Staffing', that provide a best practice framework for staffing critical care. This is my personal take on what these developments might lead to.

Whilst there is always going to be a necessary relationship between training in ICM and anaesthesia, more people with medical and emergency medicine training will be working in ICM alongside single ICM specialists. Future intensivists will be more likely to see themselves at the heart of all acute hospital care pathways, not just surgical ones, leading and contributing to complex decision making. The Association of Anaesthetists has a distinguished record of supporting self knowledge, leadership training and development opportunities for trainees. These are skills that will need to be embedded across the ICM workforce.

The growth of peri-operative medicine in anaesthesia will redefine a large amount of elective patient work that currently involves ICU. Many surgical patients will be managed exclusively by anaesthetists and surgeons who have the skillset to lead the whole elective pathway, including running enhanced care facilities to ensure patients are kept safe and their surgery takes place as planned. The phenomenal contribution to ICU work made by many anaesthetic colleagues during the peaks of COVID shows the benefits for patients. Greater separation of elective and emergency pathways, with differing groups of specialists managing them, will be cost effective as we finally start to 'get it right first time' in improving patient outcomes.

ICUs will be managing a population that is older, with a higher proportion of medical patients and those who had emergency admission. More of the hospital day-to-day outpatient consulting and care planning will be done off site or remotely, so those coming to hospital will be sicker or have more complex health care needs. Intensivists will therefore be working more outside the physical walls of their units. They will support planning and delivery of patient care in clinics and MDT meetings, helping ensure patients have early treatment escalation plans in place, and working proactively to prevent or detect early deterioration rather than the reactive responses we see currently.

Complex decision making

Doctors working in ICM will need to be highly skilled in complex decision making, comfortable with making decisions with and for patients whose problems do not fit neatly into care pathways and opinions traditionally offered by single-organ specialists. Intensivists will need to be holistic doctors with a strong grounding in decision-making ethics and the scientific and data-knowledge skills to use information in a humane, patient centred way. Helping patients to understand the limits of ICM and the likelihood of achieving treatment goals will need to be built into care pathways much earlier than at present, and intensivists will be required to do this.

COVID has shown the need for widespread involvement in research programmes. Intensivists have always been good at converting research outside the ICM environment into their working practices, but ICUs will also need to collect and review more of their own data. Quality improvement skills, and the

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ability to contextualise research findings for individual patients, will be necessary for all to ensure resources are used correctly and fairly.

FICM will shortly be releasing a report 'Life after critical illness'. As intensivists undertake more of their own patient follow-up and develop greater reach into community and secondary care pathways, this will have a significant impact on future decision making and planning. We will be much better prepared to ask future patients "What matters to you?", and help them achieve it.

The future ICU team will still be medically led, but it will be a wider multidisciplinary team, supporting, teaching and training each other. Doctors and nurses will work shoulder-to-shoulder with advanced critical care practitioners, critical care pharmacists will have a significant patient safety role, and many other allied health professionals will be based in ICUs ensuring patient rehabilitation and recovery is maximised from the point of admission.

ICM has existed for longer than the FICM, but the recognition of ICM training requires us to move further forwards. Recent pandemic experience has shown what can be achieved by a team working together in extremely challenging circumstances. We should not accept that as evidence that what we have at present is enough and resist change, but rather work towards a service and specialty that capitalises on the best of recent experience and welcomes what the future brings. I know the anaesthetist/ intensivist of 2035 will not have trained or work as I have, but she or he will hopefully still see those working in acute services as valued colleagues, to whom they can turn to for advice and support, irrespective of title.

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The future of anaesthesia – sustainability

It is 2040. Global heating has exceeded 1.5°C above pre-industrial temperatures. Polar ice caps continue to melt, extreme weather events are commonplace, oceans acidify, and poverty, famine and mass displacement affect populations globally, disproportionately in low-income countries. In the UK, like everywhere else, the worsening climate crisis is also a worsening health crisis, causing a huge strain on the NHS, while air pollution alone continues to cause tens of thousands of excess deaths.

Meanwhile, I drive to work, spending five minutes trying to find a parking space in the ever-busy staff car park. I'm now running later than planned, and rushing from the car to the hospital entrance on this very hot early summer's day brings me out in a sweat. Those giant hornets that had moved into a corner of the car park were a little disturbing and worth rushing past as well.

My morning list is plastic surgery. Skin cancer rates have increased significantly in the UK, and it's a full list. Someone has left a desflurane vapouriser on the anaesthetic machine, which is great, as I want a quick turn-over of patients to get through the list. I'm conscious of the impact of volatiles on the environment, but since it's there, I'll use it. Anyway, the department is going to invest in vapour capture technology really soon. Apparently.

There remains a shortage of propofol due to flooding in Italy affecting manufacturing, and with the rise in anti-microbial resistance, finding the right surgical prophylaxis for a patient with numerous allergies involves a phone call to microbiology.

Then it's off to pre-assessment clinic. As usual, it's over-booked and under-staffed. Population health overall seems to be declining over the last decade, and there's an associated increased need for surgery. The NHS is certainly feeling the strain.

Once home, I reflect on the current situation and how we could have ended up here. It makes me anxious and I worry what the future will be like, but I feel powerless to do much about it given the scale of the problem. It seems awful, but it almost feels too late to start trying.

I lie down, but I cannot sleep.

It is 2040. After intense and concerted efforts, governments, organisations and individuals have worked together to reduce carbon emissions, and the global average temperature rise has not breached 1.5°C. The NHS is about to announce they have achieved their goal, made in 2020, to be carbon neutral from direct emissions.

Within anaesthesia, through diligence and perseverance, the overall carbon footprint of the speciality has drastically reduced, with no adverse effects on patient care. In fact, there have been many benefits beyond environmental sustainability.

I run into work, past the banks of electric vehicle charging points and through the green space that used to be the giant staff car park. The solar panels don't look too out of place either.

My morning list is plastic surgery. Most of the patients are suitable for regional blocks, which is great, as the block room in theatres is well staffed today, making for a very efficient list. The trainee with me is studying for her Primary viva. We talk about the environmental impact of anaesthetic drugs which is now a common question, even for drugs such as desflurane that has not been used in the UK for over a decade.

The list ends, and as we leave theatre the lights turn off automatically and energy expenditure drops to a minimum. I walk past the waste generated; anything single-use is recycled, with other equipment packed up for re-sterilisation and re-use.

I attend a meeting over lunch about a new anaesthetic machine we're considering buying. There's information on what will happen to the old machines, offsetting the carbon footprint of the new ones, as well as the social impacts of manufacture - making sure those involved are paid a living wage. I recall a time when that was something I hadn't even considered.

My afternoon is spent in pre-assessment clinic. Anaesthetists have expanded their role further into patient management within both the peri-operative period and health promotion. The clinic is virtual of course, so patients don't need to travel, and while it's busy, there's been a slow but steady reduction in patients needing major surgery. Most patients nowadays are empowered to manage their own health in ways that weren't possible before, and it certainly shows.

In the evening I catch up on a webinar. I miss the social element of meetings, but the savings in time, cost, and not least environmental impact makes having most events online an obvious choice.

Settling down to sleep, I reflect on the changes made in the last 20 years. The future is far from certain, and much change still needs to happen, but it certainly feels like progress is being made and a real shift in how we live and work has taken place.

I sleep well.

These two versions of a future are both entirely possible. But time is quickly running out for us to guide ourselves towards a positive future. As anaesthetists, we are well placed to make significant changes to how healthcare is practised and ensure it is as environmentally sustainable as possible. While the second version here may seem somewhat utopian, we must be ambitious in our commitments to tackle the climate crisis and believe that a better future awaits us all.

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Help us write the UK's first peri-operative care 'Green Paper'

In February, the Centre for Perioperative Care (CPOC), of which the Association of Anaesthetists is a founding member, began work on the UK's first ever peri-operative care Green Paper. We are writing this with the intention of influencing national policy on peri-operative care and NHS funding.

What is a Green Paper?

For readers who may not be aware, a Green Paper is a consultation document produced by governments, pressure groups or other agencies to provoke discussion and draw stakeholders together around clear priorities for change and a future direction of travel. Exploratory in nature, they are typically produced at the start of a government's interest in a specific policy area and lay out formative proposals for transformational change.

Our main themes

Following feedback from across Government departments (including H.M. Treasury and the Department of Health and Social Care) and health and care leaders, CPOC is producing a Green Paper on peri-operative care with five main themes.

First, as this is a political document at its heart, we're marshalling our strongest arguments for why the NHS across the UK and the UK Government should prioritise peri-operative care. This involves testing messages with key stakeholder groups, including patients, to find out which arguments resonate the most with specific audiences. We currently have an 'arguments' discussion paper out for consultation where stakeholders can help us get our messaging right. Please visit our project webpage to access the paper and give us your feedback [1].

Second, we'll be producing a very short 'state of the nation' audit, looking at where we are now when it comes to peri-operative care with respect to service provision as well as attitudes towards peri-operative care amongst NHS leaders and the public; this is required for, among other things, benchmarking purposes.

Third, we'll be looking at the top challenges and opportunities facing this agenda in the short- to medium term, and determining priorities to meet or tackle them. As readers will be aware this is a very broad topic area, and we're looking to provide more clarity, direction and focus to this agenda at a national level, grounded in extensive consultation with health and care staff and patients about what matters most.
Fourth, we'll be looking at the long-term future of surgery, setting out 'first thoughts' for how peri-operative care might change radically over the next 25 years.

Finally, we'll be laying out our proposal for the upcoming 2021 Spending Review. In this section, we will identify the top 3-5 peri-operative priorities for future funding, cost up the proposal, and submit it to H.M. Treasury. We'll be looking for help from peri-operative leaders to determine what, from so many potential funding needs, those top priorities should be.

Get involved

The heart of a Green Paper is consultation and sector involvement. We would like to thank all the Association members who have so far fed into this work and helped to shape it by coming along to our events, taking our surveys, giving an interview, or championing this piece of work to your networks. In total our project has engaged with hundreds of people working at different points in the peri-operative pathway, from allied health professionals and public health consultants based in the community, GPs and nurses in primary care, to surgeons, anaesthetists, and the wider secondary care team. And of course, we've been regularly consulting patients, politicians, and policymakers too.

If you would like to help us develop our Green Paper and Spending Review proposal please get in touch with us by emailing CPOCGreenpaper@cpoc.org.uk, and visit our project website to find out about our latest news and events.

Lisa Plotkin
Centre for Perioperative Care Policy Manager

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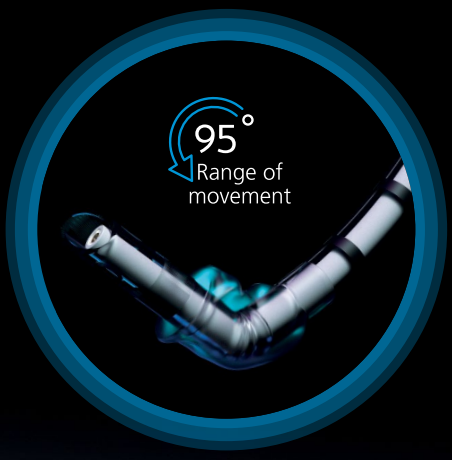

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Giving praise: the instant reward

Hospitals in the UK utilise incident reporting systems to allow investigation of errors. As anaesthetists we invest significant amounts of time trying to prevent things going 'wrong', but how do we encourage things to go 'right'? Is it simply a case of stating when things go well, or is there more to it?

Clinicians use evidence conscientiously when it comes to clinical decision making. We should also use this evidence-based method for non-clinical work, such as education and leadership. Our approach to these non-clinical roles can have significant impact on our colleagues' wellbeing and, in turn, patient satisfaction. We need to consider the role of rewards and positive reinforcement of behaviours. Long-term rewards, such as pay or pension, may influence whether an individual persists with a career but are beyond the control of most anaesthetists. However, immediate rewards such as praise are easily accessible. These may have a stronger influence over repetition of behaviours and short-term satisfaction.

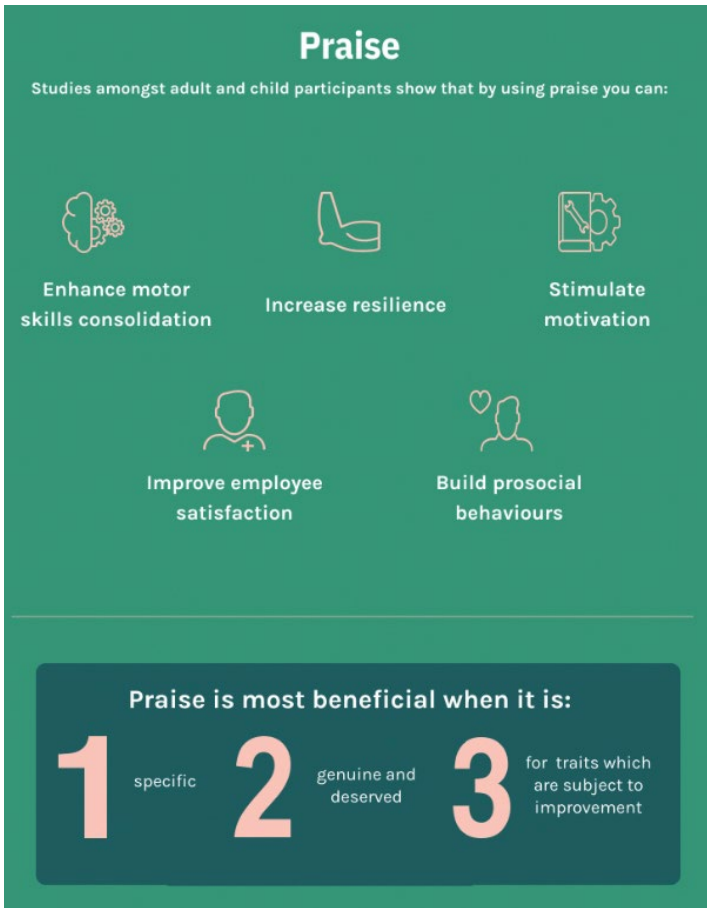
The role of praise in education and the workplace has been extensively studied, and has been found to contribute to increased intrinsic motivation [1] and increased resilience after setbacks in learning experiences [2]. Anaesthetic training is a steep learning curve with many learning setbacks. It is therefore desirable to increase motivation and resilience in junior colleagues.

Desirable behaviours and skills can also be reinforced with praise. There is evidence amongst adult participants that praise enhances motor skill consolidation. This is both indirectly, through motivating further practice, and directly by inducing dopamine transmission in the striatum, resulting in increased 'off-line learning' [3]. Educators can use the evidence available to aid anaesthetic trainees consolidate motor skills.

Praise is also known to increase prosocial decisions [4], which are characterised by a concern for the rights, feelings, and welfare of other people. In a study of children, parental praise was found to be significantly and positively correlated with grey matter volume of the left posterior insular cortex in children, an area of the brain associated with empathy [5]. Empathy is a key driver of patient satisfaction, and should be a central tenet in a specialty borne out of the desire to relieve distress.

Praise is beneficial, but not all praise is deemed to be equal. In children, praise for perceived fixed traits such as intelligence has been shown to result in less task persistence, enjoyment and performance compared with praise for traits that are subject to improvement, such as effort [6]. This idea plays a role in the concept of the 'growth mindset', which is now an integral part of pedagogy in education. Praising effort-driven qualities embeds the belief that skills can be mastered through effort and repeated practice. There is some correlation with these findings amongst adults although findings are somewhat mixed [7], potentially confounded by fundamental differences in study design.

Beyond this, there is evidence that overly positive praise is linked with both low self-esteem (self-deflation hypothesis) and narcissism (self-inflation hypothesis) [8]. Which of these outcomes occurs may be dependent on the receiver's baseline self-esteem. Praise will be far more beneficial if only used when sincere.



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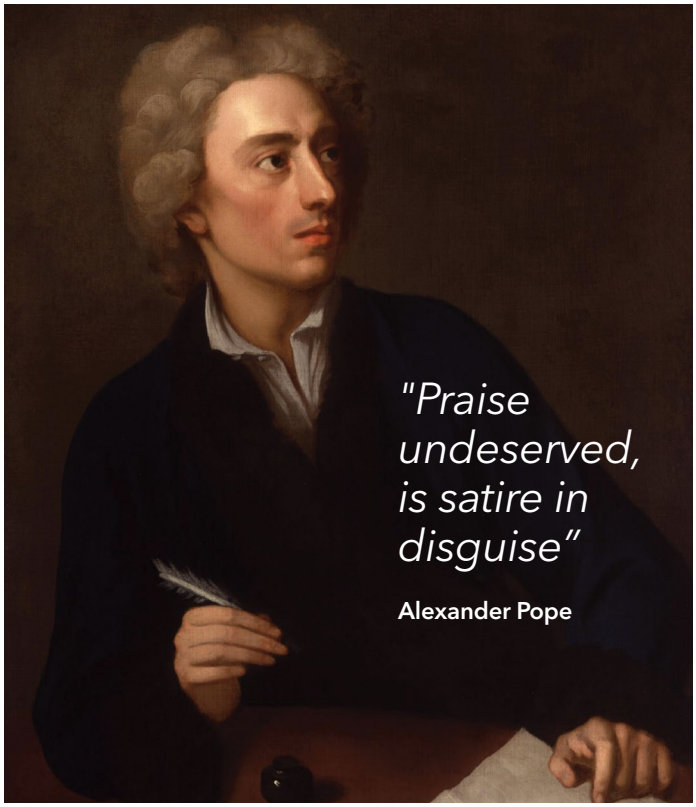

In summary, evidence suggests that appropriate use of praise can be a powerful tool for teaching clinical skills, as well as encouraging juniors to become compassionate healthcare providers. Next time you are teaching or working in a team, assess whether the praise you give is specific, contingent upon success, and directed towards actions or traits that are subject to improvement. Praise is only effective when it is sincerely meant and proportional to the achievement; as Alexander Pope commented, *"Praise undeserved, is satire in disguise"*.

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Learning from what works – why we need positive feedback in healthcare

In their article about praise, O'Sullivan and Dhesi set out the educational benefits of specific, proportional positive feedback. The advantages of reviewing one's work through a positive lens, as a complementary approach to adverse incident reporting, are now realised in many healthcare organisations through the implementation of positive reporting systems such as Learning from Excellence (LfE).

LfE began in 2014 in response to the recognition that we have a tendency to focus on the negatives when giving feedback and learning from our work. The two aims of LfE are to recognise and learn from what is working well, and to provide positive feedback to staff. The intention is that positive feedback and a focus on success will build psychological capital, staff engagement, enhance relationships, and improve performance.

Numerous similar systems are now spreading through healthcare (e.g. Greatix, Excellence Reporting, Favourable Event Reporting) each adapted for the local setting in which they are used. Some celebrate reports openly with certificates and awards, while others use private, personal feedback to encourage intrinsic motivation - both of these are valid approaches. Three national LfE Community of Practice events have united the community around themes such as creating a positive workplace culture, and why our choice of language matters.

Closely linked with LfE is Appreciative Inquiry (AI); the USA spelling reflecting its origins. AI is a strengths-based approach to self- or organisational development rooted in positive psychology. It focuses on what works, what 'could be', and how this might be amplified or achieved, and is grounded in a set of practical tools such as conversation frameworks and techniques. It is a perfect fit for investigating positive reports.

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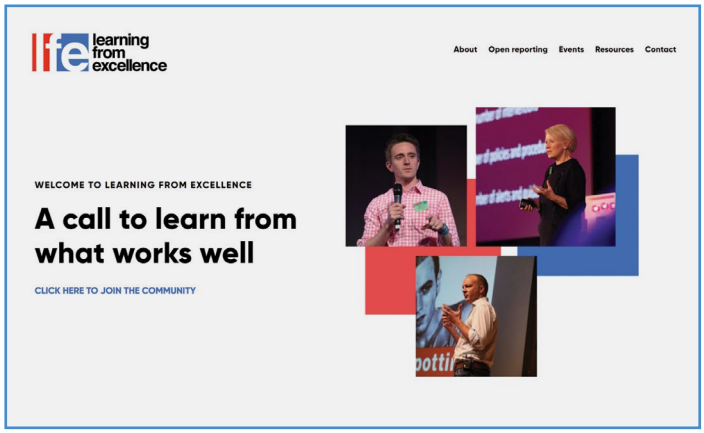
So why take a positive approach?

Humans have an innate negativity bias that enables us to identify and evade threats. We aspire for our healthcare systems to be safe, and therefore wish to understand why things go wrong and take steps to prevent subsequent errors - the traditional 'find and fix' approach to safety (Safety-I). However, only focusing on the negative misses huge learning opportunities, and can contribute to a culture of fear and blame. On a systems level, in addition to understanding failure, we also need to understand success (Safety-II). Reinforcing success and good practice is also beneficial for individual learning, morale and behaviour change, an approach that the LfE team have demonstrated can also be harnessed for quality improvement [1]. Providing positive feedback to colleagues is a prosocial intervention, enabling expressions of gratitude - good for our wellbeing, fostering relationships and improving teamwork [2].



You can find out more about the LfE initiative, including resources to help you introduce your version of a positive reporting system, AI based tools, past and future events, and the LfE Community, at www.learningfromexcellence.com

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learning from excellence

Delivering an asset-based curriculum to anaesthetic trainees

Why I created this curriculum - Amanda Mohabir

Since becoming an anaesthetic consultant, I have been reflecting on my training and how it has, and has not, prepared me for consultant life. My overriding feeling is that the tone of my training was deficit-based and focussed on filling gaps: getting more cases for my logbook, doing quality improvement projects, attending mandatory courses. All my Personal Development Plans (PDPs) were written to address these gaps. The message I received was to improve on the negatives, rather than focus and build on the positives.

My most formative experiences as a trainee were asset based, in particular my involvement with Learning from Excellence and creating the Thames Valley Reporting Excellence (TREx) network. I was welcomed into a community of professionals who championed the positives. It was a revelation to realise this different approach and I am grateful for how they continue to mentor and challenge me.

As a consultant I wanted to change the message for the trainees in our department. Professor Woodward and I created a curriculum that would instil and build on assets within our anaesthetic trainees. We devised five half-day sessions using appreciative inquiry and coaching techniques to reframe aspects of training to focus on assets and strengths, with the aim of allowing these aspects to flourish.

Why the curriculum matters

We started thinking about delivering this curriculum when the pandemic was still a sprint, and not the marathon it has become. Despite the challenges of devising and delivering this programme while coping with the personal and professional concerns of the COVID-19 pandemic, we felt it was more important than ever for us and the trainees to take a moment to focus on the positive, especially when the focus on training had been temporarily paused.

What sessions are in the curriculum

Our sessions use a range of techniques to introduce and explore each new concept. We focus on how the trainees feel about their training and their future, and what has been going right. We discuss their personal development plans, which universally focus on filling a deficit or completing a mandatory ARCP requirement. The trainees are challenged to devise an asset-based PDP entry and to commit to one facet of asset development during their training that year.

The first session looks at strengths, starting with the strengths of the anaesthetic department as a whole and the areas the department has got right. This is achieved by sharing stories about training episodes, identifying those that develop clinical, management and/ or leadership skills. Then we move on to look at personal strengths. We conduct an in-person feedback session where trainees share with their colleagues the strengths and positive behaviours they have seen displayed recently. Individuals hear about an aspect of themselves that their fellow trainees appreciate and value. During the first round everyone reflected that they had never thought about themselves in that way and appreciated hearing from those around them. This session was a chance to share the positives in others, which is rarely done; in fact this was a first for all in the room.

Sessions 2 and 3 introduce the change management tool of Appreciative Inquiry (AI), which is an asset-based philosophy and encourages success to flourish. It identifies what is working well by asking generative questions like "What worked?" "What were you thinking?" "What were you feeling?". We look at the role of AI in quality improvement, and review the PRAISe project from the Learning from Excellence team at Birmingham Children's Hospital [1]. Using The 5D Cycle (Define, Discover, Dream, Design and Destiny) we explore what the trainees would like the personal statement on their consultant job application form to look like. This session also includes a conversation about the language used when discussing and describing trainees and training. We review the language used in communications from various educators, and the variety of responses differing language can provoke.

Week 4 is a Safety 2 training session which focuses on the difference between Safety 1 and Safety 2 and introduces the concepts of 'work as imagined' and 'work as done' [2]. We discuss the impact these concepts have on relationships and outcomes in the workplace, and why human performance and episodes in healthcare succeed in most cases. The trainees use the trio consultancy method to generate conversations and share personal stories about their working life. This session ends with a discussion about how incidents could be reviewed differently using Safety 2 methodology, and how using appreciative inquiry techniques can reframe the critical language associated with the investigation of untoward incidents.

The final session covers communication, behaviours and the impact of incivility. The overriding theme of the curriculum is to focus on the positives, but we want to acknowledge that the reality of working in healthcare can sometimes be fraught with challenges. We want to help the trainees develop strategies to

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deal with unsavoury workplace behaviours. Everyone shares a time or times when they have observed or been on the receiving end of incivility, and the impact this has had on them. We carry out a polarity exercise to further explore the impact of incivility, and then discuss methods of dealing and coping with challenging behaviours.

Soon after, all post-FRCA trainees were invited to a learning series, the terms Appreciative Inquiry, Safety 2 and Civility were unfamiliar and initially uncomfortable to explore. I am pleased to say they are now firmly part of my armoury.

Personal reflection on the sessions - Vandita Ralhan

Having entered the unknown territory of AI, Safety 2 and visual inquiry, I now realise that I have found gold dust. For me, this learning series came at the perfect time as my professional development focus has shifted towards final career polishing post FRCA. The psychologically safe space gave me the freedom to explore issues related to the approaches to patient safety, incivility and other matters such as training and has warned off the possibility of burnout, which is very close for many of us. Using AI, this learning series has provided an open avenue for discussion of many enriching aspects that are integral to our personae and development as doctors and leaders.

Feedback

After overcoming the initial awkwardness associated with unfamiliar concepts, the trainees all commented on how practical, safe and thought provoking the sessions were. We have delivered one round of the curriculum so far, with plans to run the series twice a year within our trust.

"This is such a different approach to thinking about training and how we function at work. I have already been utilising some of the techniques. I honestly believe this is the vision that will truly make a difference."

Amanda Mohabir
Consultant Anaesthetist

Vandita Ralhan
ST6 anaesthetic trainee

Phil Duggleby
College Tutor
Buckinghamshire Healthcare NHS Trust

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A personal narrative from a trainee

The enormity of working in COVID ICU for the last few months was hitting home. I remember walking into the anaesthetic office in obstetric theatres and seeing a board with positive captions and a count of the week's successful deliveries achieved by the team. My thought at that moment was simply 'wow'. I felt energised.

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On the basis of sex 2: gender balance at Association of Anaesthetists events

In 2019 the Association of Anaesthetists published an analysis of the gender of speakers at Association events from 2012-18 [1]. This analysis showed a trend towards increased representation of female speakers, peaking at the Winter Scientific Meeting. The proportions were, however, still low, with a nadir of 14% at one meeting. Since then we have actively encouraged organisers of events to consider the diversity of speakers, and all Association Committees are asked to consider the possibility of any equality and diversity issues as part of standard activity reporting.

Gender equity is a prominent and relevant issue within the medical profession. Disparity has been well documented in recent years with regard to evaluation, hiring, compensation, and career advancement [2]; for example, 55% of UK graduates are women, but < 25% of the most influential global healthcare leadership positions are held by women [3]. There are a multitude of contributors towards this inequity that we cannot hope to fully explore in this article: implicit and explicit bias; cultural elements; and representation of women are but a few.

Visibility is a vital element in narrowing any inequity. The social sciences have found that greater visible female representation reduces elements of bias within the wider community [4]. This can include anything from workplace visibility of women in senior positions to speakers at academic meetings. A low representation of female physicians at academic conferences has been recognised globally over the last decade. A cross-sectional analysis of 701 meetings in the USA and Canada from 2007-17 found an average of 31.8% of female speakers, with the lowest being 24.6% in 2007 [5].

Women in anaesthesia

The proportion of female consultant anaesthetists in the UK increased from 28% in 2007 to 38% in 2020, also reflected in an increase to a 39% female SAS workforce. The gender of anaesthetists in training and non-consultant non-training roles is 47% female [6]. Despite this, women remain under-represented in positions of leadership and academic practice within the specialty. Bosco et al. performed a scoping review of 30 articles to identify gender issues within anaesthesia [7]. They describe the contributions of both micro- and macro-inequities that contribute to gender disparity. Micro-inequities may be daily, intrusive gender biases within the workplace. Macro-inequities, however, are related to systemic issues such as promotion criteria and positions of leadership.

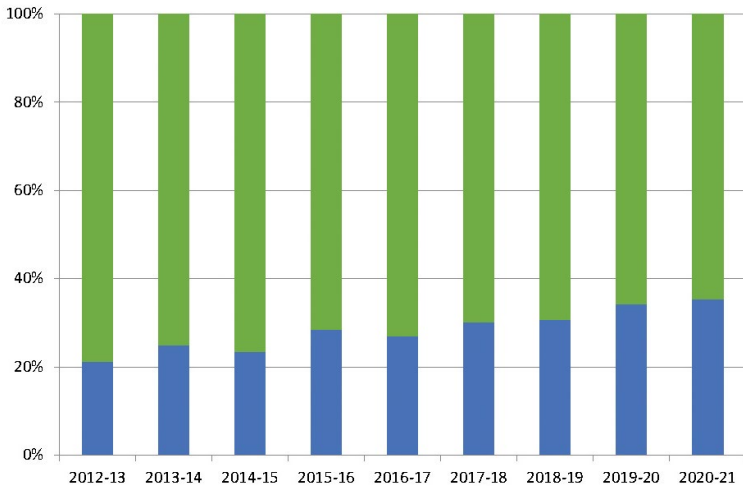
Membership of the Association of Anaesthetists is currently recorded as 58% male and 42% female.

Speakers at Association events

For a number of years, we have targeted a 40% proportion of female speakers at Association events to reflect the overall membership. Through conscious and consistent effort, this has increased over the last nine years from 21% to 35.4% (Figure 1). Four of our events since 2012 have had > 40%, and 12 events have had > 35% female speakers. Our Winter Scientific Meeting in 2021, run as a virtual meeting, enjoyed 41% female speakers, and inspired by the technology industry we are planning a Winter Scientific Meeting 2022 with a 50:50 speaker gender split.

The trainee membership of the Association is 48% female, and we therefore aim for a higher proportion of female speakers at trainee events; however we are yet to achieve this consistently.

Figure 1. Speaker gender balance at Association meetings. Blue - female



[1] Dates are 1st April - 31st March, except 2020 which is 1st April - 31st December.

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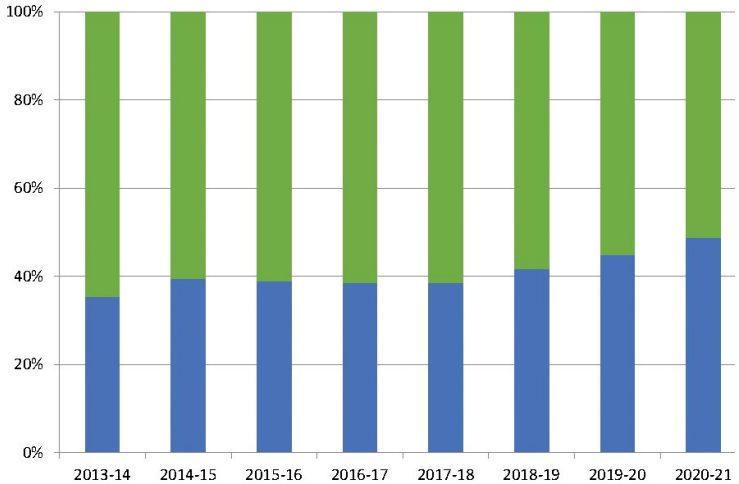
Delegates at Association events

Our proportion of female delegates for all events has increased significantly over the last nine years from 35% to 47% (Figure 2). Notably, female delegates find our webinars, webinar recordings and seminars most popular. Online learning and delivery of CPD appear to attract more female engagement, and this mode of delivery of CPD is likely to stay with us after the pandemic. We will continue to work to make our face-to-face meetings as accessible as possible.

Figure 2. Delegate gender balance at Association meetings. Blue - female



Changes during the COVID-19 pandemic

The Association moved quickly to providing online webinars and educational resources in 2020. The number of delegates increased from nearly 15,000 (2019/20) to > 34,000 (2020/21), and the proportion of female delegates rose from 40% to 47% (Figures 3 and 4).

Figure 3. Delegate gender balance at Association meetings in 2019-20. Blue - female

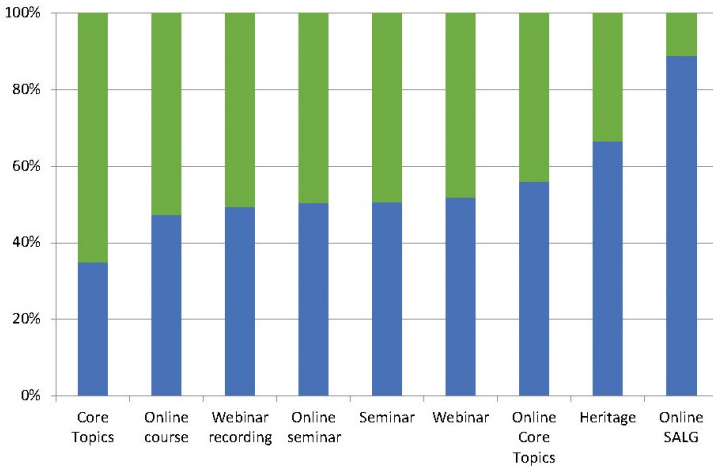
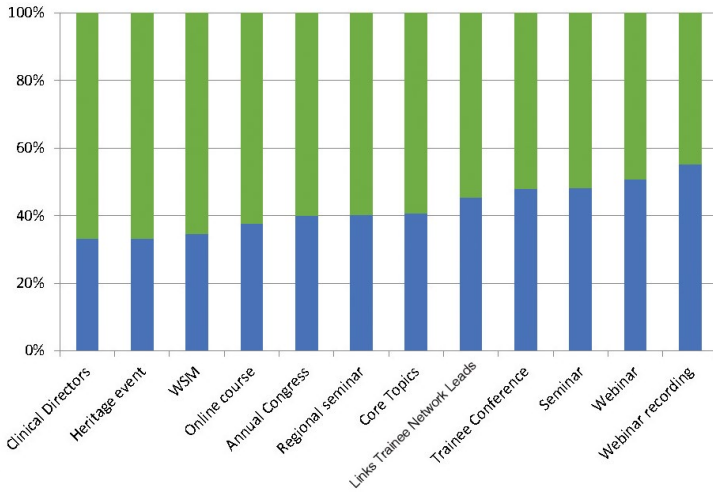


Figure 4. Delegate gender balance at Association meetings in 2020. Blue - female. SALG - Safe Anaesthesia Liaison Group



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While the gender balance of our webinar speakers did not see such a distinct rise, the proportion of females is higher than other comparable education providers. Hall et al. reviewed anaesthesia and intensive care medicine online webinars from March - May 2020. Women were grossly under-represented, however the Association showed the highest female speaker proportion at 36% compared with the lowest value of 20% [8].

The future

From September 2021 the Association will be requesting information from members regarding protected characteristics, which will help us to see where we need to work harder to represent our membership to the best of our ability. The provision of information is voluntary, will be confidential, and secure.

We will continue to promote a range of inspiring anaesthetists from different backgrounds, and look forward to our first 50:50 gender-balanced conference at Winter Scientific Meeting 2022.

Conclusion

Gender equity is a pressing issue within anaesthesia. The Association of Anaesthetists recognises its responsibility in providing a platform for female speakers and delegates alike in order to display the true gender balance within our specialty. The hope is that continued and consistent efforts in this area will improve access and encouragement for a more balanced representation of women in medical leadership and academia ('If you can't see it, you can't be it'). There is always more to do, and we welcome input from our membership in driving the equality and diversity agenda forward.

Stuart Edwardson
Elected Member of Association of Anaesthetists Trainee Committee
ST4 Anaesthetics and Intensive Care Medicine, South East Scotland

Tei Sheraton
Honorary Membership Secretary Association of Anaesthetists
Chair of Equality and Diversity Task Group
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Congratulations to Mr Ansh Tandon, a second-year student at Jesus College, University of Cambridge and the Wylie Essay Prize winner 2021. The annual prize is given to medical students on a contemporary topic chosen by the Research and Grants Committee. Ansh has received his prize and will be presented with his medal at a future Association Council meeting.

Artificial intelligence - threat or saviour for the anaesthesia workforce?

Artificial intelligence (AI) describes the ability of computers to mimic intelligent human behaviour. Machine learning is a subset of AI that analyses data to enable autonomous improvements. Previously it was thought that automation would not replace decision making roles, but this is already becoming a reality in e-commerce, manufacturing and healthcare. Although society has undergone technological progress, one must consider the psychological evidence illustrating humans' resistance to change: the implementation of new technology implies that there were key drivers catalysing the change [1]. The principle of supply and demand must be considered before studying the impact on anaesthesia, where no major requirement for AI currently exists.

Research into AI in radiology can help understand its potential in anaesthesia. A screening programme highlighted that AI can outperform clinicians in cancer detection and reduce false positives [2]. The driving force for AI in radiology is the large demand for image processing. This can be met rapidly by computer vision technology, which is the most advanced area of machine learning in terms of matching, and even exceeding, human performance. AI can reduce workload by flagging images with a high probability of normality, and leaving the rest for clinicians. Workflow efficiency and patient outcomes can be improved by AI, clear reasons for its use in image analysis fields.

The role of an anaesthetist is to provide safe peri-operative care. Safety may be a driving force for change in anaesthetics: the most common error in the field is drug related, which is entirely preventable by using AI. One study reported a frequency of drug administration errors of 0.75% [3]. With the increasing use of electronic health records, AI has even more potential in the operating room. The technology could independently detect the drug about to be delivered, reference it against the medical history, titrate and deliver it, which could prevent errors at multiple levels.

AI may provide assistance by delivering alerts to anaesthetists in advance, for example the integration of AI with EEG recordings may facilitate alerts that indicate changing consciousness. Conscious awareness without pain occurs in 0.5-2% of cases [4]. Currently, maintaining expired volatile agent concentration above MAC should prevent awareness during general anaesthesia [5]. Processed EEG is not sensitive enough to provide a quantitative index for awareness [6], but this might be possible with future software developments. The ability of AI to predict changes in the patient's neural activity could be harnessed, resulting in more accurate and personalised drug dosages for patients. This would not only reduce the burden of awareness, but also may save drug costs by only providing the dose required for maintenance of an unconscious state.

The availability of data is a limiting factor in AI development, but in anaesthesia there is in-depth data collection. However, safety may be compromised if training data is inadequate or AI is inappropriately applied. For instance, AI can be poor at recognising data inputs that are different to the training data, leading to erroneous responses [7]. In addition, black box

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decision making presents further difficulties in identifying when to question the integrity of decisions [7]. The inability to fully understand how artificial neural networks in machine learning make decisions may lead to bias; the model may exacerbate biases in the data set and make judgements based on them, leading to worse outcomes for some patients [8]. Moreover, safety concerns exist as hackers might alter the intended function of machine learning, which would be masked due to the black box nature of certain systems [9]. Before these major safety concerns are addressed, AI will not be threatening the workforce.

There are three forms of anaesthetic automated robots: pharmacological (maintaining patient homeostasis), mechanical (tasks such as tracheal intubation and regional anaesthesia) and cognitive (supporting clinical decision making) [10]. Pharmacological robots using machine learning can minimise the gap between a desired level of a variable and the actual level, while maintaining physiological parameters [10]. Furthermore, the Kepler study demonstrated that a robot could perform tracheal intubation with a success rate of 91% [11]. Decision-making robots offer clinical suggestions based on expertise derived from patient data [10]. Technological advances may result in a fusion of these systems into one such that some anaesthetic responsibilities can be fulfilled by technology, morphing the role of the anaesthetist to one focused more on patient communication and supervision.

However, the key issue is one of responsibility. Technological advances are never without pitfalls and unexpected outcomes. With AI in anaesthesia, the issue of accountability after mistakes is unclear while doctor's decisions are scrutinised by the GMC. To mitigate this, AI might be integrated into current practice to relieve the workforce from repetitive tasks, alleviating stress and allowing more time for analytical decision making; in this case, decisions are still made by the anaesthetist. However, over time the workforce may trust decisions made by AI programmes over their own expertise, illustrating the complexity of responsibility. This issue requires regulators from anaesthetic and technological backgrounds to collaborate and form regulations that are fit for purpose.

The lexical choice 'saviour' in the title implies that the workforce is dysfunctional and requires intervention, which is untrue. For new technology people need time to accept change. AI has the potential to be a highly efficient assistant, provided that safety is prioritised and patients are protected. By welcoming AI, there will be a positive impact not only for patients but also for clinicians who can learn from it. Overall, the future of AI in anaesthesia is uncertain but exciting, and it may become a valued assistant improving the patient experience.

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*Retrospective review of the medical notes of 70 patients undergoing surgery at Royal United Hospital, Bath, UK.[6] †Maximum dose: 20 mg/kg body weight.[7,8] IV, intravenous.

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Note: Before prescribing please read full Summary of Product Characteristics **Pharmaceutical form:** Ferric derisomaltose is a dark brown, non transparent solution for injection/infusion. **Presentations:** Iron in the form of ferric derisomaltose; 100 mg/ml available in vials of 100 mg/ml, 500 mg/5 ml and 1,000 mg/10 ml. **Indications:** Monofer® is indicated in patients ≥18 years for treatment of iron deficiency when oral iron preparations are ineffective or cannot be used or when there is a need to deliver iron rapidly. The diagnosis must be based on laboratory tests. **Administration:** Each IV iron administration is associated with a risk of a hypersensitivity reaction. Thus, to minimise risk, the number of single IV iron administrations should be kept to a minimum. The iron need can be determined using either the Simplified Table, or the Ganzoni formula, or a fixed dose of 1,000 mg can be given to patients ≥50 kg body weight followed by re-evaluation for further iron need, please consult full Summary of Product Characteristics. Monofer® may be administered as an IV bolus injection of up to 500 mg at an administration rate of up to 250 mg iron/minute up to three times a week, during a haemodialysis session directly into the venous limb of the dialyser under the same procedures as outlined for IV bolus injection, or as an up to 20 mg iron per kg body weight infusion. If the iron need exceeds 20 mg iron per kg body weight, the dose must be split into two administrations with an interval of at least one week. It is recommended whenever possible to give 20 mg iron/kg body weight in the first administration. Dependent on clinical judgement the second administration could await follow-up laboratory tests. Doses up to 1,000 mg must be administered over >15 minutes; doses above 1,000 mg must be administered over ≥30 minutes. In case of infusion, Monofer® should be infused undiluted or diluted in 0.9% sodium chloride. For stability, Monofer® should not be diluted to concentrations less than 1 mg iron/ml and never diluted in more than 500 ml. **Contraindications:** Non-iron deficiency anaemia, iron overload or disturbances in utilisation of iron, hypersensitivity to any of the ingredients, decompensated liver disease, or known serious hypersensitivity to other parenteral iron products. **Warnings/Precautions:** Parenterally administered iron preparations can cause hypersensitivity reactions including potentially fatal anaphylactic/anaphylactoid reactions. The risk is enhanced for patients with known allergies, a history of severe asthma, eczema or other atopic allergy, and in patients with immune or inflammatory conditions. Monofer® should only be administered in the presence of staff trained to manage anaphylactic reactions where full resuscitation facilities are available (including 1:1000 adrenaline solution). Each patient should be observed for at least 30 minutes following administration. If hypersensitivity reactions or signs of intolerance occur during administration, the treatment must be stopped immediately. In patients with compensated liver dysfunction, parenteral iron should only be administered after careful benefit/risk assessment. Careful monitoring of iron status is recommended to avoid iron overload. Parenteral iron should be used with caution in case of acute or chronic infection. Monofer® should not be used in patients with ongoing bacteraemia. Hypotensive episodes may occur if intravenous injection is administered too rapidly. Caution should be exercised to avoid paravenous leakage when administering Monofer®. **Pregnancy:** Monofer® should not be used during pregnancy unless clearly necessary. The treatment should be confined to second and third trimester. In rare cases, foetal bradycardia has been observed in pregnant women with hypersensitivity reactions. The unborn baby should be carefully monitored during intravenous administration of parenteral irons in pregnant women. **Undesirable effects:** No very common (≥10 %) undesirable effects listed. Common undesirable effects (1 % to 10 %): nausea; rash; injection site reactions. For information on other undesirable effects, please consult full Summary of Product Characteristics. **Legal Category:** POM. **Package Quantities and basic Prices:** 5 vials of 1 ml, £84.75; 5 vials of 5 ml, £423.75; 2 vials of 10 ml, £339.00. **Marketing Authorisation Number/ Holder:** PL 18380/001, Pharmacosmos A/S, Roervangsvej 30, DK-4300 Holbaek, Denmark. **Date of preparation:** August 2020. Further information is available on request to Pharmacosmos UK.

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Anaesthesia 1946; **1:** 25-35 and 1946; **2:** 28-31.

The anæsthetist and care of the surgical case

J. Beard

75th ANNIVERSARY Anaesthesia
from the Association of Anaesthetists

This is the first significant peri-operative medicine article in an anaesthetic journal, written in two parts and published in the first and second issues of the journal *Anaesthesia*. It was actually reprinted from an original publication in the *British Medical Bulletin* (1946; **4:** 114-20), with an editorial note stating that *"Since few anæsthetists in Great Britain see this admirable production of the British Council, no apology is made for reproducing Dr Beard's exceptionally interesting paper."*

In the 1950s, Dr John Beard was a pioneering cardiothoracic anaesthetist in London at the Brompton, Hammersmith and National Heart Hospitals during the development of cardiopulmonary bypass for open cardiac surgery. He also worked as a GP in Wimbledon until he retired at the age of 70. He was an examiner for 20 years and became the Chairman of the Board of Examiners (Faculty of Anaesthetists of the RCS; then RCoA), President of the Association of Anaesthetists and President of the Anaesthetic Section of the RSM.

The year 1946, recovering from the Second World War while establishing the new NHS, has many parallels to 2021 with our need for a successful NHS reset while also facing the challenge of the massive elective surgery backlog created by the COVID-19 pandemic. There are lines in this paper that are both prophetic and relevant to the current recovery.

The opening paragraph emphasises a key peri-operative aim *"Today there is an increasing emphasis on rehabilitation of the patient after operation. The rapid return of the citizen to full activity is of the greatest importance to national economy, to the overcrowded hospital, and to the patient himself. This demands an increasingly high standard of surgical and anæsthetic care."*

Team working is recognised *"The teamwork of the operating-theatre requires a full co-operation: by extending this outside the theatre, with the anæsthetist taking a larger part in pre- and post-operative care, advantage would be taken of his special training in sedation, in the relief of pain, intravenous techniques, and in the administration of oxygen and other gases."*

Pre-operative care is mentioned including the role of exercise, nutrition and anaemia management alongside early mobilisation after surgery *"When, therefore, a patient has been kept in hospital for any length of time he should be as much as possible out of bed, and invaluable help can be provided by the physio-therapy department in arranging and supervising suitable exercises…."*

The final paragraph perhaps summarises the combined importance of an understanding of anaesthesia and peri-operative medicine for our current roles: *"At the outset of his career the attention of the anæsthetist is focussed almost entirely on the actual administration during operation. With increasing experience he should be able not only to provide satisfactory operating conditions for the surgeon, but also to keep constantly in mind the convalescent period and end-result. The application by the anæsthetist of a special knowledge of post-operative complications should benefit the patient, help the surgeon, and bring a wider interest to the specialty."*

This is an amazingly prescient article covering the direction that our speciality is moving. The only jarring note, from our current viewpoint, is the overuse of the male pronoun he/ his.

Chris Snowden
Getting it Right First Time joint Clinical Lead for Anaesthesia and Perioperative Medicine
Consultant, Department of Anaesthesia, Freeman Hospital, Newcastle upon Tyne

Mike Swart
Getting it Right First Time joint Clinical Lead for Anaesthesia and Perioperative Medicine
Consultant, Department of Anaesthesia and Perioperative Medicine, Torbay Hospital, Torquay

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Join us in person or online for **Annual Congress 2021**

23-24 September 2021, ACC Liverpool

The Association of Anaesthetists' flagship conference, Annual Congress will return this autumn. It will be delivered for the first time as an exciting new hybrid conference, bringing together the UK and international anaesthesia community to learn and network either in person or online via our Annual Congress virtual event platform.

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As one of the UK's leading annual anaesthetic and peri-operative medicine conferences, Annual Congress regularly attracts over 800 attendees from the UK, Ireland and further afield.

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- CATCH UP on the latest developments in anaesthesia, while gaining valuable CPD with sessions such as:
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    - Anaesthesia and the environment
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- MEET WITH industry and key suppliers to the anaesthesia specialty and view our live symposia

Keynote speakers confirmed for Annual Congress 2021:

Prof Hugh Montgomery
Director, UCL Institute for Human Health and Performance

John Snow Lecture
Dr Laura Duggan
Cardiothoracic Anaesthesiologist, Vancouver, Canada

Featherstone Oration
Prof Matthew Wilson
Senior Lecturer in Anaesthesia, Sheffield

Annual Conference 2021 and COVID-19

We are closely following the UK government guidance on mass gatherings. We are planning for a hybrid conference in the hope that guidance allows us to run the face-to-face element by the time the conference is due to take place.

The event will comply with the most up-to-date government COVID secure guidance. This inevitably might change the conference experience, but will not affect the delivery of high-quality educational content.

'The Association is committed to making sure its Annual Congress in 2021 is not just a hybrid replacement but a reimagining of what a conference can be. We're planning an amazing, global hybrid event with more live content, more ways to network and interact, and more educational material delivered in exciting ways.'
Dr Christopher Mowatt, Chair, Education Committee

'Annual Congress 2021 is an exciting new way to learn that puts you in control, you have the flexibility to choose to attend face-to-face or from the comfort of your own home or work. Dip in and out of live sessions, and engage in real time with sessions, speakers, peers and exhibitors. And don't forget, all of this can be viewed on demand, any time after the event. Learning has never been so convenient or flexible'
Mr Zack Puttock, Events Manager

Booking is now open for Annual Congress 2021

Association members benefit from the best booking rates, including an exclusive early booking discount. Whether you attend Annual Congress in person or online, delegates will also have priority access to all of the Annual Congress 2021 conference content and recordings for up to three months after the event has ended. So even if you can't attend all of the conference, you won't miss out.

For booking details and more information on the first hybrid Annual Congress go to anaesthetists.org/AnnualCongress. You can also follow the conversation via social media at #AC2021.

Companies who are interested in exhibition or sponsorship opportunities should contact the Association of Anaesthetists Events Team **events@anaesthetists.org**.

SAS professional development grant 2021

Up to £2,000

The Association of Anaesthetists awards this grant to enthusiastic SAS doctors who are Association members, for training and professional development opportunities.

The grant is intended to enhance the individual's experience, for example in attending clinical management, leadership and other educational skills courses or acquiring new skills which are relevant to the workplace, in particular where this improves the quality of patient care and improves service development. The total fund available is £2,000 and the awarding Committee may decide to grant multiple awards within the total available but in exceptional circumstances may award the full amount to one applicant.

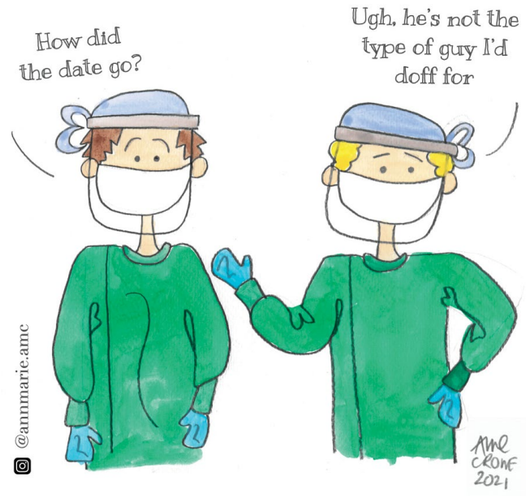
The grant must not fund routine CPD activities which should be funded through normal study leave budgets, nor examination fees, exam preparation courses or college related fees.

For more details and to apply visit the website **http://anaesthetists.org/sas-grant**

Association of Anaesthetists

The closing date for applications is 30 September 2021 for consideration at the autumn meeting of the SAS Committee.

DATING DURING A GLOBAL PANDEMIC



Ann-Marie Crowe
Paediatric Anaesthesia Fellow
CHI, Crumlin, Dublin

Evelyn Baker Award

An award recognising the 'unsung heroes' of anaesthetic departments.

The Evelyn Baker Award was instigated by Dr Margaret Branthwaite in 1998, dedicated to the memory of one of her former patients at the Royal Brompton Hospital. The award recognises the 'unsung heroes' of anaesthetic departments, the often unspoken backbone of the department who is the 'go to' person for clinical or other advice. The award is given to individuals who set themselves apart from peers by demonstrating an exemplary track record in clinical excellence, teaching and training, and supporting colleagues.

To be eligible, a nominee:

- Must be a consultant or SAS doctor in anaesthesia, usually with more than ten years in post
- Must be in clinical practice at the time the nomination is submitted (but can have retired by the time the award is presented)
- Must be a current member of the Association
- Must NOT be in possession of a NATIONAL Clinical Excellence Award.

Nomination is by citation, which:

- Must be submitted by a current member of the Association
- Should include an indication that the nominee has broad support within their department
- May include additional comments from departmental and other colleagues.

The citation which should be of 1000 words or fewer, should explain how the nominee demonstrates outstanding competence that sets them apart from others, under the following headings:

- Clinical excellence (encompassing technical proficiency, consistently reliable clinical judgement and wisdom, and skill in communicating with patients, their relatives and colleagues)
- Teaching and training (encompassing the ability to train and enthuse trainee colleagues is seen as an integral part of communication skill, extending beyond formal teaching or academic presentation)
- Supporting colleagues and co-workers

The Evelyn Baker Award will be presented at WSM London in 2022.
Details of previous winners and further information can be found on the website
https://anaesthetists.org/Home/About-us/Honours-awards/Evelyn-Baker-Medal-recipients

Association of Anaesthetists

The nomination and citation of up to 1000 words, should be sent to the Honorary Secretary at **honsecretary@anaesthetists.org** by **17:00 on 6 August 2021**

Anaesthesia Digested

June 2021

Guideline on the peri-operative management of patients with sickle cell disease. Guideline from the Association of Anaesthetists

Walker I, Trompeter S, Howard J, et al.

People with sickle cell disease may present for elective or emergency surgery in any hospital and are at risk of significant postoperative complications, but most anaesthetists will have little or no direct experience of caring for them. Translating theoretical knowledge of the underlying pathology into the reality of excellent patient care needs guidance. Dr Walker and colleagues from anaesthesia, surgery and haematology have produced a comprehensive, up-to-date guideline on all aspects of peri-operative management of patients with sickle cell disease. Unsurprisingly, the role of early communication with surgical teams, haematology, pain services and critical care is emphasised, alongside practical recommendations for common scenarios such as tonsillectomy, pregnancy and the role of regional anaesthesia. The guideline will be a great resource for trainees preparing for exams, but just as importantly for anyone called to look after a patient with sickle cell disease in the peri-operative period.

Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study

COVIDSurg Collaborative, GlobalSurg Collaborative.

Surgery after a previous SARS-CoV-19 infection: data, answers, and questions

Wijeysundera DN, Khadaroo RG.

COVID-19 has resulted in delays to elective surgery around the world. The question of how to ramp up elective surgery safely is complex and urgent. One piece of that jigsaw is supporting decisions about when to offer surgery after SARS-CoV-2 infection. The COVIDSurg and GlobalSurg Collaboratives have provided important data to underpin those decisions. Using individual data from over 140,000 patients from 116 countries undergoing surgery during October 2020, they report that the risk of 30-day mortality, adjusted for clinically relevant confounders, was increased in the first seven weeks after pre-operative SARS-CoV-2 infection: 1.5% in those never infected; 4.1%, 3.9% and 3.6% at 0-2, 3-4 and 5-6 weeks after infection, respectively; and non-significantly different at ≥ 7 weeks after infection. The impact of SARS-CoV-2 infection appears to be increased by the presence of symptomatic vs. asymptomatic infection, and ongoing symptoms. As with all observational studies, residual confounding cannot be ruled out, but the sensitivity analyses and the consistency of effect across sub-groups of age, ASA and grade of surgery support a causal role of time since infection. How should anaesthetists and patients interpret this information? Keep an eye out for the consensus guidelines on SARS-CoV-2 infection, COVID-19 and timing of elective surgery - already available on Early View.

N.B. the articles referred to can be found in either the latest issue of *Anaesthesia* or on Early View (ePub ahead of print)

Iain Moppett, Editor, *Anaesthesia*

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Particles

Boulton A, Mashru A, Lyon R.

Oxygenation strategies prior to and during prehospital emergency anaesthesia in UK HEMS practice (PREOXY survey)

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2020; **28:** 99.

Background

Pre-hospital emergency anaesthesia is a well-recognised intervention in UK pre-hospital care, supported by national guidance [1, 2]. Patients receiving pre-hospital emergency anaesthesia are often at the extreme end of critical illness, and are at high risk of complications [3, 4].

National guidance recommends that all patients should be pre-oxygenated, although it does not mandate a particular technique, and recognises that there may be a role for apnoeic oxygenation despite limited evidence [2]. It also states that pre-hospital emergency anaesthesia should be delivered to the same standards as in-hospital emergency anaesthesia.

This paper set out to examine current practice regarding oxygenation strategies when delivering pre-hospital emergency anaesthesia.

Methodology

An electronic survey was sent to every UK helicopter emergency medicine service (HEMS). Data was collected on service standard operating procedures (SOPs) for pre-hospital emergency anaesthesia, particularly on specified strategies for pre-oxygenation and apnoeic oxygenation, and the techniques used in individual practice. Individual practice was evaluated by asking two doctors per service, where possible one consultant and one trainee. Clinicians were also asked about differences between their pre-hospital and in-hospital practice.

Results

All 21 UK HEMS and 40 individual clinicians responded. Pre-oxygenation was widely used, with 90% of respondents stating they always used it and the remainder stating they used it very often (75-100% of cases). The main techniques used were bag-mask ventilation without PEEP and non-rebreathing face masks.

Eighty-eight percent of respondents reported using apnoeic oxygenation, mainly with high flow nasal cannulae (> 4 $l.min^{-1}$), although there was wide variation in how frequently it was used. The majority of clinicians ventilated the lungs during the apnoeic phase with over half indicating that this was their routine, otherwise depending on clinical criteria such as desaturation.

Sixty-five percent of respondents reported differences in their pre-hospital and in-hospital practice, mainly in the use of humidified high flow nasal oxygenation or the Mapleson C system. Eight percent responded that they were not able to deliver their preferred pre-oxygenation strategy, relating to the non-availability of bag-mask ventilation with PEEP or a Mapleson C system.

Discussion

The authors recognise that their methodology may introduce recall bias, and does not include information on patient outcomes. However, their results clearly demonstrate that oxygenation strategies used by UK HEMS teams during pre-hospital emergency anaesthesia are varied. There is also deviation from traditional dogmatic teaching [5], particularly regarding apnoeic oxygenation and ventilation, which may reflect clinicians' desire to practise evidence-based medicine. Furthermore, a suggested barrier to clinicians delivering their preferred oxygenation strategy is equipment unavailability.

Conclusion

This paper provides a snapshot of oxygenation techniques used during pre-hospital emergency anaesthesia in the UK and highlights significant heterogeneity in practice across the country. Further research into optimal oxygenation strategies is warranted in order to rationalise equipment carried by HEMS teams and inform best practice for patients.

Thomas Hoather
Intercalating Medical Student (IBSc Critical Care)
University of Plymouth

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Your letters

Send your letters to: The Editor, *Anaesthesia News* at **anaenews.editor@anaesthetists.org**

Please see instructions for authors on the Association's website **www.anaesthetists.org**

Dear Editor

A latent error hiding in plain sight

We anaesthetised an appropriately-fasted young woman for a short procedure under general anaesthesia. After uneventful induction, an i-gel® was placed and the patient began breathing spontaneously. Several minutes later, before surgical stimulation, she began to cough and regurgitate. We decided that she required tracheal intubation, and a prefilled syringe of suxamethonium (ITH Pharma, London, UK) was retrieved from the fridge. These are contained in sterile packaging, but on attempting to access the syringe, it quickly became apparent that the plastic packaging was too thick to be opened by hand! Thankfully, a staff member promptly produced scissors, the patient was intubated and had no further problems.

On checking, it became evident that two forms of packaging are used for the syringes: one with a paper back that is very easy to open by hand (Figure 1 top); and one impossible to open without scissors or additional equipment, which may not be immediately available (Figure 1 bottom).

Figure 1

Ongoing procurement of drugs and equipment often occurs in isolation, and seldom involves end-users. It is worthwhile practising the full process of using pre-made or easy-access medications and equipment to ensure that seemingly simple, but possibly critical, issues do not arise - particularly in an urgent setting. One might also consider carrying one's own pair of scissors, like many of our ODP colleagues!

Justine Burns
Consultant Anaesthetist

Benjamin Green
CT3 Anaesthetics
Airedale Anaesthetic Department, West Yorkshire

Twitter: @BurnsJustine; @AirewaysSimTeam

Congratulations to Justine Burns for winning June's Letter of the Month prize.

ITH Pharma have been contacted for a response.

Dear Editor

Glass particle contamination in propofol

Glass particle contamination, recognised since 1960, is common following opening drug ampoules [1]. Injection of any contaminant into patients carries potential for harm including pain, inflammation and phlebitis; more severe complications include emboli and granuloma formation [2, 3].

Filter needles with 5 µm mesh reduce this effectively [2]. The Royal Pharmacological Society stipulates the use of filter needles for glass ampoules, but similar universal recommendations do not exist in anaesthetic practice. Barriers to adopting such practice include cost, particularly with the lack of literature evidencing harm. The NHS spends ~£7 million on 56 million blunt needles per annum [2]. Filter needles are almost five times more expensive than unfiltered ones [4]. In-hub filters hinder user experience, slowing drug aspiration and increase hand strain [2]. Furthermore, all blunt needles are commonly kept together in preparation areas, and the presence of a filter is not easily identifiable externally, encouraging indifference in needle choice [2].

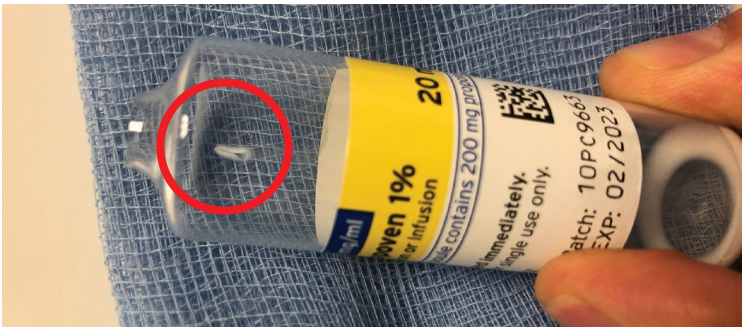

Figure 1. Shard of glass highlighted

To date, there has been an argument to use filtered needles for high risk patients including neonates, and sites such as neuraxial anaesthesia [4]. But should we be considering filter needles for the routine preparation of propofol? Propofol is provided in large ampoules that are at greater risk of glass contamination (Figure 1) [1]. Glass particles provide a route for bacterial contamination, and propofol is a rich substrate for microorganisms [3]. Furthermore, propofol is associated with up to 90% incidence of pain on injection, the cause of which is not fully elucidated [5]. Perhaps glass particle contamination is a contributing factor and filter needles would reduce patient discomfort.

Laura Peltola
Regional Fellow
St George's Hospital, London

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Your letters

Send your letters to: The Editor, *Anaesthesia News* at **anaenews.editor@anaesthetists.org**

Please see instructions for authors on the Association's website **www.anaesthetists.org**

Dear Editor

Repurposing the facemask hook ring for your own mask

The association of plastics and healthcare is profound. There will undoubtedly be many more revolutionary innovations involving plastic technology that improve patient outcomes in the future. However, with innovation and evolution, we have a responsibility as users and drivers for procurement to recognise and speak up about plastic that is no longer needed. There is an increasing movement towards getting rid of the plastic hook rings supplied with anaesthetic face masks, and companies have been challenged on their continued manufacture [1]. Despite this, supply continues, and there has even been a resurgence in use during this COVID era [2].

Healthcare workers are now wearing elasticated masks for extended periods that can be uncomfortable, particularly behind the ears, and this has generated a market for plastic devices to solve this. During an extended case we went searching for a solution for our mask-induced discomfort, and picked up the much-maligned plastic hook ring that was otherwise destined for the bin. We found that when hooked through opposing corners, the pressure of the elastic is relieved from one's ears and one has a well-fitting secure facemask. We also find that the mask is less likely to come off the nose, which is particularly useful when performing sterile procedures.

Although we look forward to plastic rings disappearing sooner rather than later, we hope that for some this little trick makes life a little more comfortable. Also, if one pops it in the plastic recycling each day, its environmental impact can be partially mitigated.

William Malein
Specialist Registrar in Anaesthesia and Intensive Care

Pavan Raju
Consultant Anaesthetist
Ninewells Hospital, Dundee

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Dear Editor

The RCoA and the lost tribe of trainees – a reply

It is my opinion that the role of Past Presidents is to step down and shut up, and that is what I have done for nearly two decades. However, the letter from Neil Soni [1] has prompted a rethink because of the unstable NHS situation created by the COVID pandemic.

The RCoA and the Association of Anaesthetists have become fundamental to the interests of the public through standard setting, educational activities, training and examining. They are also responsible, and vitally so, for the sense of collegiate, professional responsibility we have to ourselves. I am, however, concerned that the profession has been unable to fulfil its public responsibility in relation to the timely examination of trainees. There are many reasons for this, not least that we are the very people needed for front-line treatment of the critically ill.

This causes me concern on two fronts. The first is that whatever the legal position, a group of trainees can now justifiably feel that their progress has been unfairly impeded with respect to their peers. All these young people are our colleagues and all our trainees need to feel included within the fold of the specialty. The second is that if we are seen to be unable to fulfil the expectations delegated to us through the Medical Acts and the GMC, there may be questions asked about our competence to hold such responsibilities. This is relevant because on my watch, the Health Act (1999) gave the Government powers to change legislation with respect to healthcare professionals without Parliamentary scrutiny.

Professional life is full of random tripwires and I do not seek to criticise, but I do want to encourage all of us to think widely and consequentially in these unpredictable times.

If anything I have written is incorrect, then I apologise in advance and will of course send in a public retraction.

Peter Hutton
Council Member, Association of Anaesthetists of Great Britain and Ireland: 1989-92
President, Royal College of Anaesthetists: 2000-03
Chair, Academy of Medical Royal Colleges: 2002-04

References

1. Soni N. The RCoA and the lost tribe of trainees - prioritisation for the Primary FRCA examination. *Anaesthesia News* 2021; **Issue 405:** 25.

Dear Editor

The RCoA and the lost tribe of trainees – a reply 2

I agree with Dr Neil Soni about the prioritisation process for the FRCA examination [1]. Some years ago, the RCoA made the progressive decision that Trust grade doctors would be eligible to take the FRCA examination after a suitable period of experience. I took advantage of this in 2011 as a Trust grade anaesthetic SHO. After passing the Primary MCQ, I applied to sit the Primary OSCE and SOE at the start of the application window. Following the application closing date, I was told by the college that an excess of candidates had applied and as a result, I would be on a waiting list as Training grade doctors took priority over Trust grades; I would only be allowed to sit the examinations if enough candidates withdrew their applications. I continued to revise with uncertainty for a few weeks. Fortunately for me, a number of candidates did withdraw, and I passed both Primary OSCE and SOE and went on to pass the Final FRCA in 2012. My perception after that experience was that the College valued Trust grade doctors less.

In 2020 I assisted three anaesthetic registrars at my hospital in their preparation for the Final FRCA SOE with viva practice on Teams. Unfortunately, a fourth (training grade) anaesthetic registrar was unable to sit the examination at the same time because of the prioritisation process. Trust grades were again deferred, and COVID has created a further backlog. It seems little has changed over 10 years. Going forward, the international pandemic may or may not continue. Surely there must be a fairer and more equitable way of dealing with this situation? Perhaps a small quota for Trust grades?

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References

1. Soni N. The RCoA and the lost tribe of trainees - prioritisation for the Primary FRCA examination. *Anaesthesia News* 2021; **Issue 405:** 25.

Letter of the Month prize

It's your *Anaesthesia News*... and we'd love to encourage more of our readers to share their opinions and experiences. A Letter of the Month prize will be awarded to the best letter each month. The winner will receive a £50 voucher to use against the cost of one of the Association of Anaesthetists educational events.

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The award will be made at the discretion of the Editor, and his/her opinion will be final. No cash alternative will be available. The voucher will remain valid for 12 months.

Send your letters to:The Editor, *Anaesthesia News* at **anaenews.editor@anaesthetists.org**

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Check, mate.

Auntie has noticed something, and it annoys her. Have you noticed it too? It happens, at a guess, several times a week in your operating theatres (if yours are anything like Auntie's). It's so unremarkable, you might not have noticed. But why is it unremarkable? Auntie is going to share it with you - you know what they say: a trouble shared is a trouble spread around to annoy more people.

Let me take you way back into the mists of time, when Auntie was a wee baby anaesthetist, if such a time can be imagined. I think it was day two of her fledgling anaesthetic career, and her first ever anaesthetic tutorial: 'How to check the anaesthetic machine'. It's in Auntie's DNA now, and she continues to check her anaesthetic machines to this day. It's all got a bit more complicated, and most anaesthetic workstations have an electronic self-check system that the anaesthetic assistant will run first thing in the morning. But Auntie ensures this has been done, and always personally performs some pre-use checks - does gas flow when expected? suction? two working laryngoscopes? the vapour you want? secondary oxygen supply? If she's using other equipment such as TIVA pumps, fibreoptic or ultrasound kit, she checks that too.

Our Association thinks it's important - one of its first guidelines was 'Checking the anaesthetic machine', which has been updated over the years to account for the changes in machine technology. Auntie's anaesthetic charts (and probably yours too) have a little tick box to confirm machines have been checked.

So Auntie is reasonably confident that when she wheels her anaesthetised patient through to theatre, the anaesthetic machine will spring smoothly to life. And then what happens? Well, sometimes nothing. Because the surgical equipment is malfunctioning. Laparoscopic stacks that have run out of gas, lavage fluid not flowing, drills with flat batteries, telescopes with a terrible view. And who has checked this? Not the end user, that's for sure. Why not?

We are all familiar with that surgical pose - perched on a stool in corner, fully scrubbed, gloved hands clasped in front of chest as if in supplication, martyred expression on face, nothing to do with me, mate - while increasingly harassed theatre staff run about trying to make the wretched things work. Why is it not the surgeon's personal responsibility?

It's partly cultural - by convention, the scrub staff used to check the equipment that the surgeon was going to use. This was appropriate when the most complex equipment was a self-retaining retractor, but surgical technology has advanced since then. Many theatre staff (despite often being untrained in complex equipment) are extremely skilled problem solvers, but why is it their responsibility? They're not the ones who will cause injury if the equipment is faulty. It's a weird disconnect in psychology - it would be unthinkable for an anaesthetist to shout at other staff (I hope) if things don't work, but many surgeons do so routinely, while having done nothing personally to ensure that their patient's environment is as safe as it can be.

Auntie did once tackle a surgeon directly, while trying to prevent some frail wee soul from dying due to lack of surgical stimulation while staff pressed buttons and twiddled dials randomly. "I was here fifteen minutes before the list started to check my equipment. I didn't see you." Readers, Auntie will not share the reply.

Auntie Cholinesterase

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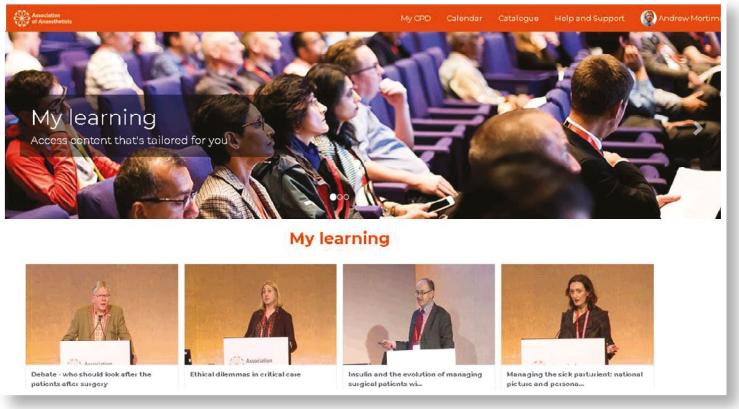

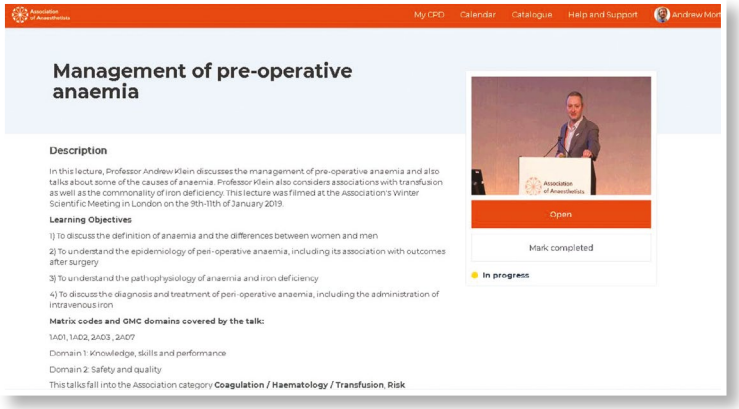

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