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Safety issue:

Rethinking patient safety

Effective learning from serious incidents

Healthcare safety investigations as a vehicle for improving patient care

Standardisation, syringe labelling and prefilled syringes

'In Safe Hands' by Stuart Brown. ©Skipper Press LTD

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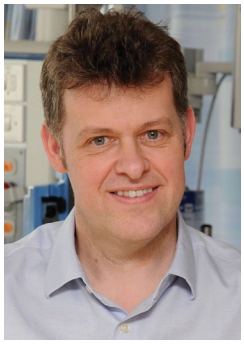
Welcome



Safety is so fundamental to our specialty that the Association motto is 'In somno securitas' ('Safe in sleep'). At the foundation of the Association in 1932, the mortality from anaesthesia was 1:1000. In 1963, Clifton reported an improvement to 1:4000. His paper, however, makes sobering reading describing poor pre-operative assessment and provision of anaesthesia by non-specialists. Deaths followed gastric inhalation, airway obstruction, anaesthetic overdose, persisting block and oxygen supply failure. Lienhart reported an improvement in mortality to 1:13,000 by 1980 and 1:145,000 in 1999, and the latest figure is about 1:185,000. This means that for 185 patients dying in the 1930s, it would be 1 today - an 18,500% reduction! These remarkable improvements have followed improved standards, better drugs and equipment, and the creation of the specialty. The Association has contributed with the provision of education and guidelines; the Standards of Monitoring guideline, first published in 1988, is undergoing a sixth update.

However, 3 million anaesthetics are performed in the NHS, so sadly, we may still expect to see a death solely due to anaesthesia every three weeks. In this issue we explore the gains from rethinking patient safety in terms of improvements in culture and compassion when tragedy occurs. There should be fair and intelligent investigations with emphasis on learning, prevention and system change rather than blame. David Whitaker, a past President of our Association, promotes safety improvements from standardisation of syringe labelling and prefilled syringes. Two entrepreneurs describe their innovation journey: a third party app has been developed by Dr Round to facilitate access to the QRH resource; and Dr Fawsy's SAFIRA device, designed to prevent pressure-related nerve blockade injury, has achieved commercial success after a helping hand from the Association Innovation Awards. There is a report from our SALG scholars from across the pond, and an important oxygen/ fire safety update following fires in ICUs during COVID-19.

We should keep striving for safety, while recognising the vast majority of occasions when things go right. So: plenty to learn, and plenty to celebrate.

Peter Young
Elected Board member
Chair of Safety and Anaesthesia Equipment Standards Committees

Cover illustration: 'In Safe Hands' The Medical Emergency Response Team aboard a CH47 Chinook above Southern Afghanistan, battles to save the life of an injured soldier by Stuart Brown. With permission, Skipper Press LTD, www.skipperpress.com

The original painting was donated to the Royal College of Anaesthetists by Colonel Peter F Mahoney OBE, TD, MSc, FRCA, L/RAMC Defence Professor

Contents

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Rethinking patient safety

How many of us would survive the microscopic scrutiny of our actions? There is almost no human action or decision that cannot be made to look more flawed and less sensible in the misleading light of hindsight. When something has gone wrong, it is probably true to say it has gone right many times before, and that it will go right many times in the future, yet people are judged by one error or incident for the rest of their careers. This is at the heart of a poor safety culture, and we need to urgently address this.

The first thing we need to do is recognise that healthcare is a complex adaptive system, explained as a dynamic network of 'agents' acting in parallel, constantly reacting to what other 'agents' are doing, which in turn influences behaviour and the network as a whole. Complexity is a way of thinking about, and analysing, situations by recognising patterns and interrelationships. However, safety science has often viewed these in linear terms with simple rules of cause and effect, often relying on the Swiss cheese model and root cause analysis to assess what has happened. This is doomed to fail in a system that is constantly working in parallel and always changing, so that even in the days after an incident the functioning may have changed beyond recognition [1].

The second thing that we need to do is to find out what people's lives are really like, not what we envision or expect. Human factors terminology refers to 'work as imagined'/ 'work as prescribed' on the one hand, and 'work as done' on the other. In order to learn about 'work as done' it is crucial that there is a culture of disclosure, that is the ability for people to describe what they actually do, and not what policy states. This requires a psychologically safe environment where people feel accepted and respected, able to use their judgement, and able to challenge. It is achieved when team members feel safe to be vulnerable in front of each other, ask questions and ask for help. It has been shown in a study by the company Google to be one of the most important factors for successful high performing teams [2].

The third thing we need to do is build a just culture: the fair, proportionate and consistent response for when things do not go as planned or expected. This is the balance of learning, support for staff, and accountability for actions taken and decisions made. It provides a framework that shifts the focus from blaming individuals to the wider system, and understanding why things went wrong on this particular occasion when they have normally gone fine. Ultimately, it helps us understand why it made sense for people to do what they did at the time [3].

In healthcare, numerous studies have tried to quantify the scale of the problem with regard to safety, with a recurring figure of 10% - 10% of patients are affected by patient safety incidents when care did not go as planned or expected. Like all statistics there is an opposite figure, which is that 90% of things go right; however, we don't notice and study this. We rarely ask ourselves "How many patients were not harmed today, or how many patients' lives were saved by our actions?" [4].

We therefore need to rethink our approach to safety, from a relentless focus on the negative ('Safety I') to the positive ('Safety II'). The true picture is the combination of Safety I data i.e. the 10% of incidents, serious incidents, never events, learning from deaths and so on, with Safety II data from the 90% [5].

There are a number of ways in which we can do this including ethnography and video reflexivity, when we study our existing practices and pay attention to the mundane, the implicit routines and habits. We have to pay attention to the invisible day-to-day work that keeps our patients safe, and ask appreciative questions such as: what do we like about what we see; how often do we think it goes as planned like this; and how can we keep replicating what works [6]?

In summary we need to:

- Combine Safety I and Safety II thinking and methods.
- Build psychologically safe teams.
- Learn to be non-judgemental, neutral in our inquiries, and seek to minimise our natural biases.
- Study how people adapt and adjust every day to the conditions they face, and learn how things normally proceed in order to understand why things failed.
- Use the learning to replicate good practice and strengthen the system, but be cautious about making changes based on small numbers.

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Back to contents

Effective learning from serious incidents

The article by Suzette Woodward above, sets out very eloquently the need to examine how things go right in healthcare. Of course, things go right far more commonly than they go wrong but, when the latter happens we have a duty (both contractual and moral) to patients and their families to investigate properly, and design robust and sustainable interventions to prevent similar future events.

How we investigate incidents in healthcare

I remember very well the first serious incident that I investigated. It took approximately 60 hours, including the research into interview techniques and human factors methods about which I knew little at the time, and caused me to lose sleep. Many of my colleagues have described similar experiences, and while things are better now there remains much room for improvement. A review of existing methods of investigation in healthcare commissioned by the Health Technology Assessment (HTA) programme in 2005 revealed that there was [1]:

- little standardisation in methods used to analyse incidents in healthcare
- limited information on training provided for investigators
- a noticeable absence of human factors techniques and
- little evidence of techniques used to design, implement and monitor interventions

Over a decade later, a House of Commons Select Committee report reinforced this viewpoint and stated that *"…processes for investigating and learning from incidents are complicated, take far too long and are preoccupied with blame or avoiding financial liability"* [2]. As a direct consequence, the Healthcare Safety Investigation Branch was established in 2017 with the stated aim of improving safety through "effective and independent investigations that don't apportion blame or liability".

How human factors approaches improve incident analysis

Too often, the questions asked about an incident focus on "Who did that?" rather than "How did that happen?", with the result that individuals rather than systems are targeted and blamed. High reliability organisations have recognised the need to move away from a culture of blame that leads to reluctance to report incidents, and have developed a 'just culture' where learning from incidents, including near misses, is encouraged and expected. The paradigm shift in these organisations is outlined in Table 1 but, unfortunately, is not yet well developed in healthcare.

Table 1: Critical incident paradigms [3]

Old view	New view
Human error is seen as a cause of failure	Human error is seen as the effect of systemic vulnerabilities deeper inside the organisation
Saying what people should have done is a satisfying way to describe failure	Saying what people should have done does not explain why it made sense for them to do what they did
Telling people to be more careful will make the problem go away	Only by constantly seeking out vulnerabilities can organisations enhance safety

Recently, in Thames Valley, the Patient Safety Academy was funded by Health Education England to undertake a project to improve training in incident analysis. This was an eye-opening experience and revealed, not surprisingly, very similar findings to the HTA report. During the project we compared internal investigations with external investigations using human factors methods of the same cases. Without exception, we found that the internal reports focused heavily on the staff involved, often junior members of the team, with very little consideration of the contribution of systems, environmental and cultural issues.

Recommendations after serious incidents

The same focus on systems should apply to the design of recommendations after serious incidents. Too often they include 'having a meeting' or 'giving a lecture' which does nothing for the flawed work system. The hierarchy of recommendations in Figure 1 highlights the importance of using physical rather than procedural interventions after serious incidents i.e. putting barriers in place to make it difficult to do the wrong thing. This, of course, is far more straightforward in a factory setting where physical barriers can be designed to prevent harm from heavy machinery. In healthcare, we rely more on procedural interventions such as SOPs and checklists. This hierarchy would also suggest that training interventions are weak, because they are not designed properly. All the evidence supports the use of low dose high frequency training (e.g. regular simulations of emergencies in theatre) but we persist in using less effective, didactic forms of training (e.g. lectures).

Back to contents

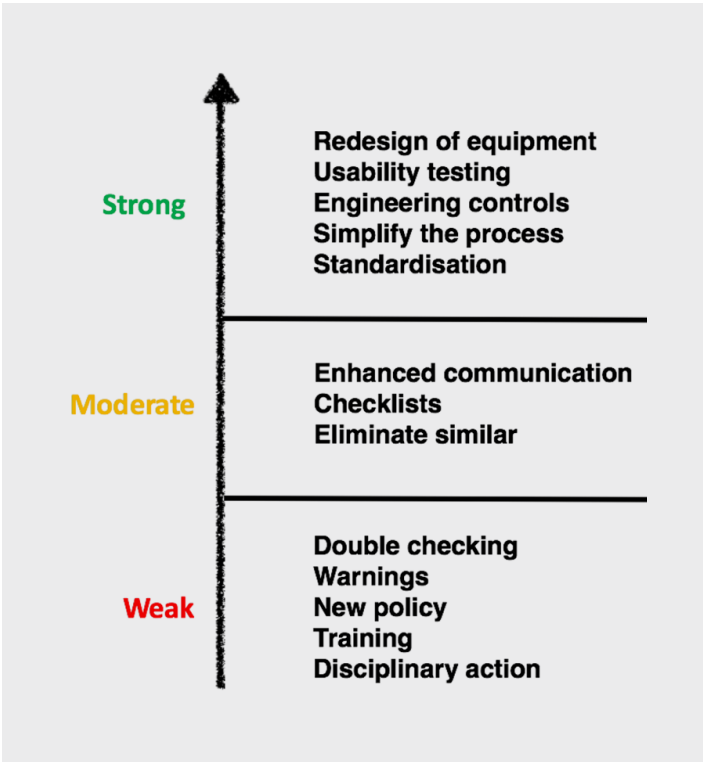

Figure 1: Examples of potential interventions graded according to effectiveness in preventing recurrence of a similar incident (adapted from the Canadian Incident Analysis Framework https://www.patientsafetyinstitute.ca).

The use of cognitive aids such as checklists is categorised as a more effective intervention than training. However, it is important to acknowledge that the use of checklists is not intuitive, and design, implementation and training must be a collaborative undertaking involving the team that will be using them. As anaesthetists, we regularly observe variability of engagement in the use of the WHO checklist in different theatres, but we know it only works properly with buy-in at all levels. The Association's Quick Reference Handbook [4] is an example of good checklist design that we are currently emulating in primary care, where there are few cognitive aids [5].

The importance of compassion

Recently there has been an increased focus on the benefits of compassion in healthcare [6]. Whilst it may seem counterintuitive to require evidence that compassion is important in healthcare, the data are compelling. The feelings of guilt and self-blame that are so evident when someone has been involved in an incident are very difficult to counteract without compassion. It is a vital component of a successful investigation; without it you are likely to discourage honesty, reduce learning, and amplify a culture of blame.

While there is much work to be done on improving learning from serious incidents and near misses, there is cause for optimism. HSIB's work has just begun and, by drawing on existing expertise in the NHS and embedding a culture of compassion when things do not go well, we will move closer to the widely shared ambition of learning from the past to improve the future.

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Back to contents

Healthcare safety investigations as a vehicle for improving patient care

The investigation of safety incidents is a central component of a safety management system. In transportation, the investigation of incidents is mandated by law and is carried out by independent state funded bodies. The oldest of these, the Air Accident Investigation Branch, has been in existence since 1915. No such body existed in healthcare anywhere in the world until the creation of the Healthcare Safety Investigation Branch (HSIB) in 2017.

Background to HSIB

HSIB undertakes independent investigations of patient safety incidents in NHS-funded care in England. We work cooperatively on patient safety with NHS central bodies, but are functionally separate and act independently. Our aim is to encourage the improvements in patient safety and safety culture that have been achieved in other industries. It is important to note that investigation alone is insufficient to bring about improvements in safety, and other elements of a safety management system must be effective to enable positive change [1].

HSIB's purpose is to identify safety risks, follow the evidence, and develop effective safety recommendations. We do not apportion blame or liability to individuals, instead we focus on identifying patient safety risks at a system level that are consequences of misalignment between policy, regulation, and the realities of caregiving at the frontline.

We carry out investigations through two programmes (Figure 1). The national programme uses individual incidents to explore national patient safety risks and make recommendations to national bodies. These investigations do not replace local incident investigations, and are published on our website (www.hsib.org.uk). The HSIB maternity programme investigates all maternity incidents that meet our criteria. By October 2020 HSIB had completed 1260 maternity investigations in 130 acute trusts.

HSIB investigators have diverse backgrounds: NHS, aviation and military investigations, human factors and other safety critical industries. This brings a rich perspective to our investigations. HSIB investigations are supported by subject matter advisors and 'experts through lived experience' where appropriate.

What we have learnt about investigating healthcare safety incidents

HSIB has identified three key elements to safety investigation: involvement of patients and families; provision of a safe space for staff to give evidence; and the application of a systematic process to evidence collection and analysis.

Incident investigation must be multidisciplinary and inclusive. Family engagement is something that has been lacking in healthcare investigations [2], leading to a lack of trust and missed learning opportunities. HSIB has demonstrated high levels of family engagement (national: 89% of families engaged; maternity: 87% of families engaged) and satisfaction with our investigations. HSIB has published principles for effective family engagement in a recent report (Figure 2) [3].

Back to contents

Figure 1.

National investigations programme	Maternity investigations programme
Diverse range of healthcare services and safety risks	Focus on NHS maternity services in England
Criteria: we decide • scale of risk and harm • potential for learning to prevent future harm • impact on individuals and public confidence in the healthcare system	**Criteria: set for us** • RCOG Each Baby Counts programme • Direct maternal deaths • Indirect maternal deaths while pregnant or within 42 days of giving birth
Up to **30** investigations a year	Circa **1000** investigations a year
Do not replace local investigations	Replaces the local investigation
Recommendations made to healthcare and beyond	Recommendations made only to the trust
Reports published on HSIB website	Reports belong to the family and the trust

Healthcare staff are also critical for our investigations. Unlike transport accident investigation, it is unusual for us to be able to rely on technical data. Witness testimony has increased importance, alongside written records and workplace observations. HSIB uses recognised interview techniques designed to put staff at their ease and record full, reliable accounts. HSIB strives to protect witness evidence under the 'safe space' principle. We will only share such information if required to do so by a court, or where there is an overwhelming public interest. In transport investigations, such evidence has statutory protection and requires an order of the High Court for disclosure. Currently, HSIB evidence does not have statutory protection, though we are hopeful that planned legislation will include appropriate safeguards for protected disclosure. Staff often report to HSIB how stressful it is to be involved in a patient safety investigation, and HSIB will shortly be publishing its observations on staff support mechanisms available from organisations.

The final key to investigation is in applying a process to collect and analyse evidence that focuses on work systems rather than individuals. There are many tools and models to provide this structure, and HSIB chooses the best model for the circumstances. One that we are adapting to become the standard in our maternity programme is the System Engineering Initiative for Patient Safety (SEIPS 2.0) [4]. This was developed to study systems of work in the complex socio-technical environment of healthcare. Adaptation of SEIPS allows evidence to be collected and analysed to demonstrate how people, tools/ technology, tasks, environment and organisation interact to result in outcomes for a patient, professional and organisation. It is crucial that investigations focus on systems and human interaction to truly understand why an event occurred. Human factors are central to our investigations, with a particular focus on design of equipment, systems of work and engineering; this tends to produce the most effective measures to prevent patient safety incidents.

Figure 2.

Principle	Descriptors
Personalised	• All families are given a choice about whether and how they wish to be involved in an investigation. • Families have a voice and are heard during investigations with opportunities to ask their questions.
Accessible and inclusive	• Families are integral to investigations by providing significant inputs. • Any family member is included, should this be appropriate and their wish. • Families are given a named contact within the investigation team and this continuity is kept wherever possible. • Staff are suitably trained and supported to undertake their family engagement activities.
Open and transparent	• Investigators are open and honest with families about what they have found.
Respectful	• Investigations are conducted compassionately. • The effects that incidents may have had on families are considered and support is provided or signposted to throughout.
Timely	• Investigations are undertaken efficiently. • Regular updates and feedback are provided to families with their agreement.

Anaesthesia and HSIB investigations

Anaesthesia has long been at the forefront of patient safety and human factors. The anaesthetic machine has a wealth of design features that we now take for granted, such as the Selectatec vapouriser and pin index systems, and the oxygen/ nitrous oxide interlock. Anaesthesia has also been at the forefront of simulation, which allows the psychological and sociological elements of human factors to be explored. HSIB has investigated a number of incidents related to anaesthesia and critical care including: confirmation of nasogastric tube placement; safety of 'smart' infusion pumps; and risks from residual drugs in cannulae. Some of these incidents were referred to us by anaesthetists. Our website allows anyone to make a referral to HSIB, and access to all our national investigations.

Back to contents

Our national investigation recommendations are aimed at national bodies with the power to make system changes, for example we recommended that the UK Injectable Medicines Guide develop a national electronic drug library for smart infusion pumps. We are pleased to have worked with the Association and the RCoA in relation to our investigation of undiagnosed cardiomyopathy in a young person with autism [5]. Our recommendations were in relation to consent for MRI scans, pre-operative assessment, and the dissemination of the Association Quick Reference Handbook. The full recommendations and responses are also available on our website.

HSIB now aims to share what we have learnt about healthcare safety investigations to increase the investigation capacity and capability of the NHS. To achieve this, HSIB are developing a curriculum and training programme in investigation science, with a view to professionalising the role of the healthcare safety investigator. Alongside this, HSIB will continue to investigate important healthcare safety issues in the NHS, and work with staff, patients and families to improve outcomes.

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'Just knowing my Mum's death may not be in vain and may prevent similar incidents happening to other families. That is the best legacy I can think of in memory of my wonderful Mum and it is what she would've wanted.'
Family member

Back to contents

Patient safety in the COVID era; an update from the SALG-BIDMC Safety Scholars

The Safe Anaesthesia Liaison Group (SALG) offers scholarships at Boston's Beth Israel Deaconess Medical Center (BIDMC) for trainees with an interest in patient safety. This two-year fellowship allows SALG-BIDMC scholars to complete a fully-funded Master's degree in Healthcare Quality and Safety (MHQS) at Harvard University and work clinically at BIDMC. We, the current scholars (Liana Zucco, ST6, London; Matthew Needham, ST7, Yorkshire), provide an update on our experiences.

LZ: Predictably my inaugural fellowship year was dominated by COVID, as Massachusetts coped with its first surge in the spring. While elective operating activity was suspended, I played a key role in developing standard operating procedures and site-specific peri-operative workflows to care for COVID patients requiring surgery [1]. These urgent changes were implemented through the use of 'just-in-time' in-situ simulation, which facilitated successful training for over 400 peri-operative staff members across the network. This work was well received by peri-operative staff, and led to further multi-disciplinary collaborative efforts across the hospital to standardise COVID care in remote areas such as endoscopy [2], interventional radiology and obstetrics [3]. The skills learnt on the MHQS course such as process mapping, failure modes effect analysis, and change management were therefore put into practice at the earliest opportunity [4].

Beyond COVID, the department of anaesthesia at the BIDMC has an active safety committee, and as quality and safety fellows, we are included as faculty, contributing to weekly anaesthetic morbidity and mortality presentations, and providing training and guidance on root cause analysis to all the anaesthesiology residents who undertake the investigation of a real adverse event. This role reinforces concepts from the safety component of the MHQS, and helps us become proficient in assessing and clarifying systems issues that result in adverse events, and understand how best to develop strategies to mitigate those risks.

The remainder of our non-clinical time is spent engaging in research on safety-related topics, and operational work developing guidelines for the implementation of new devices and initiatives. This work included a retrospective cohort study evaluating the risk of post-operative pulmonary complications using desflurane, resulting in its removal overnight from BIDMC [5]. Further research with a focus on peri-operative quality and safety is ongoing in several areas, for example, the development of accurate safety measures to assess the impact of a change in use of a primary airway device, implementing a framework for multi-disciplinary debriefing after major adverse events in theatre, and the use of team-based in-situ simulation training to assess latent safety hazards in remote sites within the hospital. We are also in the midst of implementing high-flow nasal oxygenation throughout the entire peri-operative service, and are responsible for developing guidelines, educational materials and an operational plan to facilitate its introduction.

The SALG-BIDMC scholarship is a fantastic opportunity for trainees approaching CCT. We have gained skills in research, quality improvement and safety science that we are eager to bring back to our NHS work on return to the UK. Despite the pandemic, Boston has remained a vibrant and dynamic city offering exceptional sites to explore during the changing seasons. We are thankful for all the help given to us by SALG and the BIDMC, who have been generous in providing this opportunity and supportive of all our academic and clinical work.

More information on the scholarship and the Harvard MHQS course can be found at:
https://www.salg.ac.uk/salg/salg-bidc-fellowship
https://postgraduateeducation.hms.harvard.edu/masters-programs/master-healthcare-quality-safety

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Back to contents

Standardisation, syringe labelling and prefilled syringes

'Medication Without Harm' is the WHO third Patient Safety Challenge [1]. Much of the knowledge is available, but needs to be consistently implemented. WHO's three targets - high risk medications, polypharmacy and transitions of care - are what anaesthetists do all the time. Martin Bromiley, chair of the Clinical Human Factors Group, says *"Standardisation has been shown to be an effective mechanism for reducing human error in complex processes or situations"* [2]; medication processes are an area ripe for standardisation.

Labelling

The first medication standardisation in UK anaesthesia was introducing standard user-applied syringe labels in 2003, before which at least six different coloured label systems were in use [3, 4]. The specialty recommended standardisation using the existing Australian/ New Zealand/ USA labelling standards [5], and a survey of Association Linkpersons 12 months later found that more than 90% of hospitals were using them without any serious incidents during the change. This was a notable speciality-led achievement, with no lengthy regulation from the Department of Health or MHRA.

Label positioning

In 2007 the National Patient Safety Agency (NPSA) standard operating procedure for preparing injectable medicines advised labelling the syringe only after filling, not before [6]. This is logical as a label on an empty container can never be correct. It is consistent with other labelling practice, for example many serious incidents of incorrect blood samples for cross matching have occurred when the name label was placed on an empty sample tube [7]. The European Board of Anaesthesiology recommendations state: the syringe should be labelled immediately after filling and before leaving the operator's hand; the label should be matched with the ampoule; this should be done one medication at a time [8]. In a recent survey 61% of anaesthetists labelled syringes after filling, 21% before, and 18% had no standard process [9].

The syringe should be labelled so that the syringe contents can be identified before the clinician picks up the syringe. It is best practice to stick at least one label longitudinally along the barrel of the syringe so it can be read while the syringe is on the work surface. Similarly, syringes should always be placed oriented sideways so that they can be read easily. Standardised work trays using this orientation have been shown to reduce medication incidents [10].

A syringe label may be orientated either 'left handed' (nozzle pointing right) or 'right handed' (nozzle pointing left (Figure 1). Standardisation to 'right handed' is recommended, as this conforms with the orientation of syringe driver pumps, and labelling of prefilled syringes.

Prefilled syringes

When in the 1990s AstraZeneca produced both 1% and 2% propofol in prefilled syringes with a recognition tag in the flange to create a safety identity link to the Diprifusor syringe driver [11], anaesthetists thought that this the way all our drugs would be supplied in 10 years time. However, the specialty failed

Figure 1.

Back to contents

to grasp the initiative despite the NPSA recommending 'purchasing for safety' policies. There is probably no other healthcare area where so many human factor errors can be completely removed as with the adoption of prefilled syringes. Astonishingly, the NHS Specialist Pharmacy Service that advises hospitals on medicines purchase has no reference to human factors in their procurement overview [12].

All drugs used in routine anaesthesia can now be supplied in prefilled syringes. Besides ensuring the correct contents, they can have a tamper-evident facility [13]. Sterility is also guaranteed; up to 6% of the syringes drawn up in operating theatres have bacterial contamination [14].

The latest Royal Pharmaceutical Society medicines guidance now includes a section for operating theatres [15]. The overriding themes are that manipulation of medicines in clinical areas should be minimised, and medicines should be presented as prefilled syringes or other 'ready-to-administer' preparations wherever possible. Using prefilled syringes permits the standardisation of drug concentrations for medicines that require dilution. Notably the London Nightingale Hospital pharmacy established a prefilled syringe compounding area [16], saving nurses time while wearing cumbersome PPE.

'Wrongly prepared high-risk injectable medication' used to be a Never Event, but none were reported and it was removed in 2015 [17]. NAP5 identified six ampoule labelling errors associated with awareness during general anaesthesia [18], but sadly this was never used to demonstrate the need for the robust systemic barrier of prefilled syringes.

In 2020 the WHO World Patient Safety Day was dedicated to health worker safety and proposed five goals for healthcare organisations [19]. One was 'Prevent sharps injuries', including maximising the use of needle-less intravenous systems. If intravenous access is already established, using safety-engineered devices such as prefilled syringes offers this possibility. Preparing medicines with needles during transfers can often be difficult (Figure 2), and the Association transfer guidelines have recommended the preferential use of prefilled syringes since 2009 [20, 21].

The specialty of anaesthesia has been left far behind in the use of prefilled syringes. Of the 10 billion units of injectable medicines sold annually, 28% are supplied in ready to administer or prefilled preparations, yet in the acute sector this is only true for 4%. Surely anaesthetists, as the specialists in intravenous practice, should now be demanding this. Anaesthetists are accustomed to the standardisation of controls on anaesthetic machines and other equipment, but many have their own foibles or quirks for arranging the medication work surface. Standardisation is a powerful safety tool, and particularly potent when working in teams; I believe now is the time to introduce standardisation into peri-operative medication practices.

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Figure 2.

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Back to contents

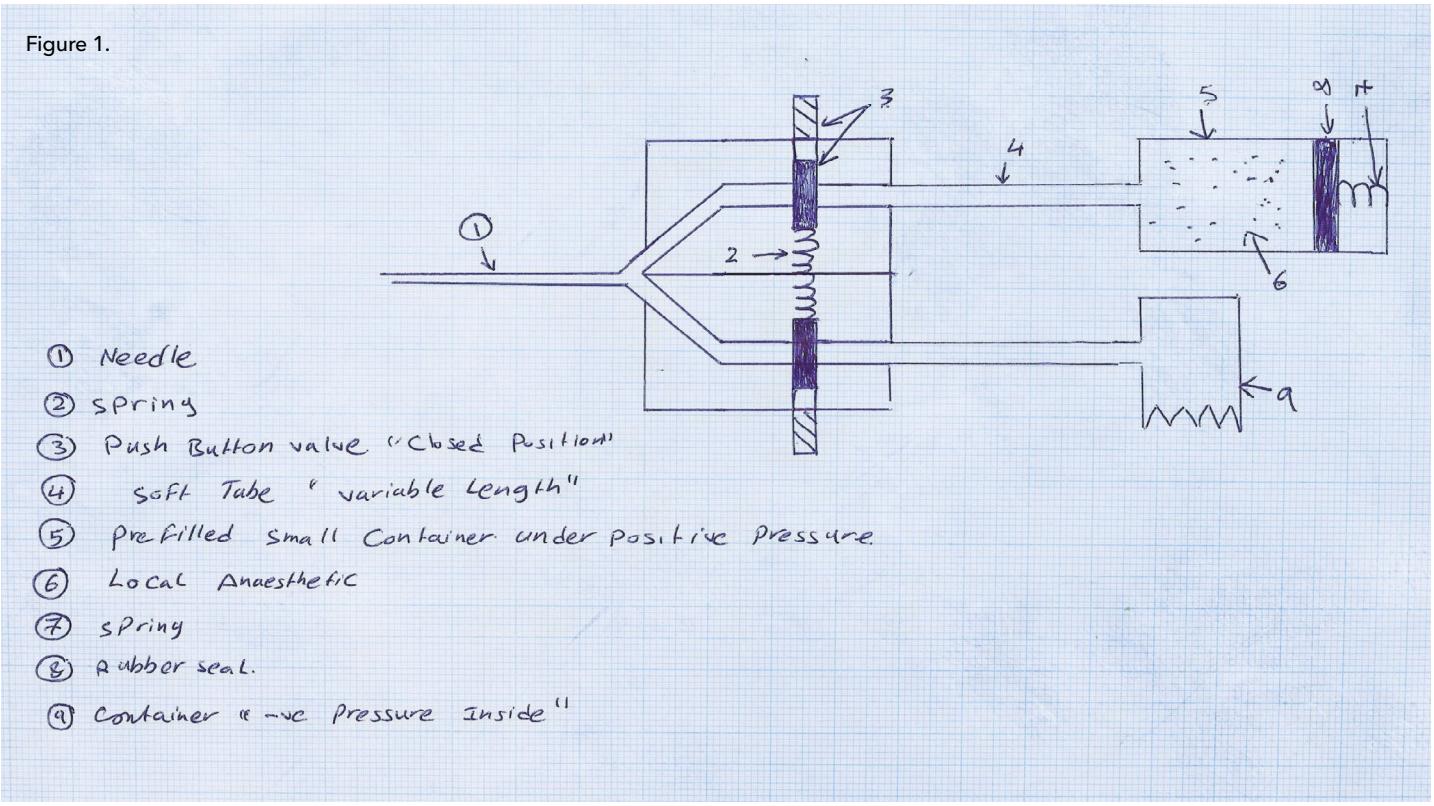
SAFIRA®: From a sketch to clinical practice, eight years of an innovation journey

Innovation is always challenging, but particularly so in medicine. There has been a noticeable shift over the years, with more innovations coming from big corporate companies and less from clinicians. The current pandemic has illustrated that, now more than ever, it is important to enable those at the front line with bright ideas to come forward and be supported throughout the long and arduous innovation journey.

Our journey with SAFIRA® (SAFer Injection for Regional Anaesthesia) started in 2012 in a small office in Queen Elizabeth Hospital, King's Lynn, with a simple diagram (Figure 1). The concept was devised by myself Dr Emad Fawzy, Dr Peter Young, Dr Joseph Carter and Dr John Gibson, all clinicians in the NHS. Our aim was to develop a device that reduces the risk of nerve damage during regional anaesthesia, whilst giving the anaesthetist control over the procedure themselves. SAFIRA can be operated by a foot or hand actuator depending on clinician preference, and cannot generate pressures associated with nerve injury. We developed the first prototype on a bench top (Figure 2), and the second with the help of Health Enterprise East, the NHS Innovation Agency (Figure 3).

Innovation projects require enthusiasm from the originators, but external recognition is a huge boost. The second prototype was awarded the Association of Anaesthetists Innovation Award in 2014. This not only sparked interest within the anaesthesia community, but triggered a series

Figure 1.



Back to contents

Figure 2.

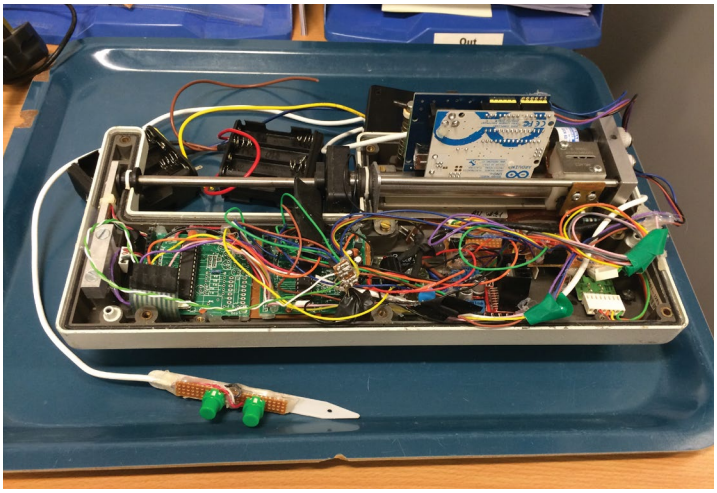
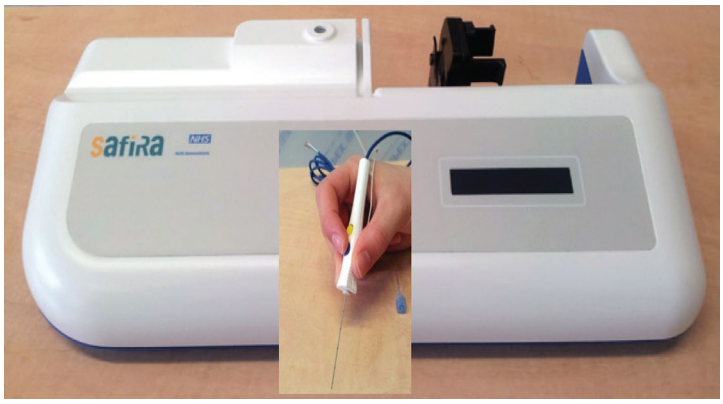


Figure 3.



of events such as a grant being awarded from a Medtech Accelerator to help boost development. Crucially, in 2018 a license agreement was signed with Medovate Ltd, a medical device manufacturing company 'spin off' from the NHS, and in just two years the design was finalised and regulatory approvals secured.

Fast forward to 2020, and SAFIRA is now commercially available across three continents (Figure 4). Despite 2020 being a year of challenges and restrictions, Medovate secured FDA clearance and successfully launched SAFIRA in the USA. European CE Mark certification followed and a key agreement was signed with Vygon – a global leader in the regional anaesthesia market – to make SAFIRA available across 60 countries, including the UK. To make things even more exciting, SAFIRA has just been awarded 'Best regional anaesthesia safety solution 2020' at the Global Health & Pharma 'Healthcare and pharmaceutical awards 2020'. In some ways this is just the beginning of another journey; global distribution and implementation is perhaps just as, if not more, challenging.

We remain grateful that our Association supports bedside clinical innovation so actively.

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Figure 4.

Back to contents

Anaesthesia 2019, 74, 211–224 doi:10.1111/anae.14428

Guidelines

Guidelines for the safe practice of total intravenous anaesthesia (TIVA)

Joint Guidelines from the Association of Anaesthetists and the Society for Intravenous Anaesthesia

A. F. Nimmo,[1] A. R. Absalom,[2] O. Bagshaw,[3] A. Biswas,[4] T. M. Cook,[5] A. Costello,[6] S. Grimes,[7] D. Mulvey,[8] S. Shinde,[9] T. Whitehouse[10] and M. D. Wiles[11]

Summary

Guidelines are presented for safe practice in the use of intravenous drug infusions for general anaesthesia. When maintenance of general anaesthesia is by intravenous infusion, this is referred to as total intravenous anaesthesia. Although total intravenous anaesthesia has advantages for some patients, the commonest technique used for maintenance of anaesthesia in the UK and Ireland remains the administration of an inhaled volatile anaesthetic. However, the use of an inhalational technique is sometimes not possible, and in some situations, inhalational anaesthesia is contraindicated. Therefore, all anaesthetists should be able to deliver total intravenous anaesthesia competently and safely. For the purposes of simplicity, these guidelines will use the term total intravenous anaesthesia but also encompass techniques involving a combination of intravenous infusion and inhalational anaesthesia. This document is intended as a guideline for safe practice when total intravenous anaesthesia is being used, and not as a review of the pros and cons of total intravenous anaesthesia vs. inhalational anaesthesia in situations where both techniques are possible.

doi:10.1111/anae.14428

75th ANNIVERSARY Anaesthesia
from the Association of Anaesthetists

Back to contents

Risk of fire in ICUs, theatre suites and ICU escalation areas

Following a fire in the Bath ICU in 2011 caused by an oxygen cylinder [1], guidelines from the Association of Anaesthetists and the Intensive Care Society for improving fire safety and carrying out an emergency evacuation of operating theatres and ICUs are due for publication shortly.

During the COVID-19 pandemic, concerns have been raised regarding inadequate oxygen supply because of additional demands [2], as well as the risk of oxygen enrichment of ambient air from use of high flow nasal oxygen (HFNO), facemask continuous positive airways pressure (CPAP) and non-invasive ventilation (NIV). Sadly, there were ICU fires in Russia in May 2020, in which five patients died [3], and Romania in November 2020, in which 10 patients died, six patients were seriously injured and one doctor suffered 40% burns [4]. This prompted NHS England, NHS Improvement and the MHRA to release a statement for all NHS Estate and Facilities teams in November 2020 [2]. Key points from this statement that are relevant to frontline clinicians are as follows:

Ventilation of clinical areas: ventilation of areas where HFNO, CPAP and NIV are in use should be more than 10 air changes per hour; this is also recommended for good infection prevention and control. While this is true for recently built and refurbished ICUs and theatre suites, especially those equipped with negative pressure isolation rooms, older hospital buildings and COVID-19 escalation areas may not have such good ventilation.

Ambient oxygen levels: in well ventilated clinical areas (as above), a rise in ambient oxygen levels is very unlikely, even with additional patients receiving HFNO, CPAP and NIV therapy. In clinical areas where oxygen use is high and air changes are less than 10 per hour, NHS England recommend that ambient oxygen levels are measured on at least a daily basis and estates and infection prevention and control colleagues are contacted urgently if measured oxygen levels are greater than 23% [2].

Electrical safety: it is believed that the ICU fires in Russia and Romania in 2020 were caused by electrical faults, possibly within ICU ventilators [3, 4]. It is recommended that all hospitals check the safety of electrical devices used in ICUs and clinical areas with high oxygen use, bearing in mind that the need to regularly clean and disinfect such devices has the risk of fluid ingress into plugs and wiring if their integrity is not intact.

Oxygen cylinder safety: oxygen cylinder bed brackets should be used and the manufacturer's instructions for use followed (Box 1).

Plans for emergency evacuation of ICUs, theatre suites and COVID-19 escalation areas: plans should be drawn up locally with the hospital fire safety officer for emergency evacuation, and these should be practiced regularly.

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Box 1: Safe use of oxygen cylinders [5]

Oxygen cylinders should be stored, handled and used according to the gas supplier's instructions for use.

Oxygen cylinders should be set up in an upright position, away from the patient and using the following sequence:

- first, open the cylinder valve slowly.
- second, select the flow rate.
- third, once the oxygen is flowing freely start administering the oxygen to the patient.

Always use an oxygen cylinder bed bracket and avoid placing the cylinder on the bed unless there is no alternative. If placing the cylinder on the bed, ensure that the cylinder has been set up and the gas is flowing freely before placing it on the bed.

Back to contents

Mobilising the Quick Reference Handbook: development of a QRH App

The Association of Anaesthetists Quick Reference Handbook (QRH) is an invaluable resource that will be familiar to all members [1]. The structured approaches to crises can focus attention and interventions during pressurised emergency situations. However, its usefulness lessens if it is not immediately accessible, or habitually referred to when needed.

Over the last few months, I have been working on a mobile version of the QRH for both Android and iOS platforms. With apps available for practically everything, talk of more can become tiresome; still, the QRH was an area that seemed to be lacking and could genuinely benefit from 'appification'. If accomplished, it could boost convenient access to the QRH even in remote sites without paper copies, reduce the cost and environmental burden of printing, and - in the COVID-19 era - minimise items at risk of contamination. So: how did this project come about; what stage has it reached; and how can others get involved?

When first entering into anaesthesia training, I dutifully loaded all the QRH PDFs onto my phone for quick access. However, the one occasion I reached for these, I found the files had been cleared from storage and refused to download again in the brief moment this hindrance was allowed. Following this, and recognising that the PDFs were nevertheless awkward to browse on a small screen, I resigned myself to relying on the ring-bound copies.

Fast-forward to a summer of discouraged socialisation and restricted pastimes, and I found myself revisiting a forgotten hobby of software development. Having initially set my sights on digitising a departmental handbook, I raised my ambitions to something that could be more far-reaching - the QRH. Armed with the free Android Studio integrated development environment [2], I set to work on the first iteration of the app. At this point, it is necessary to highlight the foresight of the Association in releasing the QRH under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International licence that permits modification and redistribution within specific terms [3], and thus opened up the opportunity to repackage the QRH content into this different format.

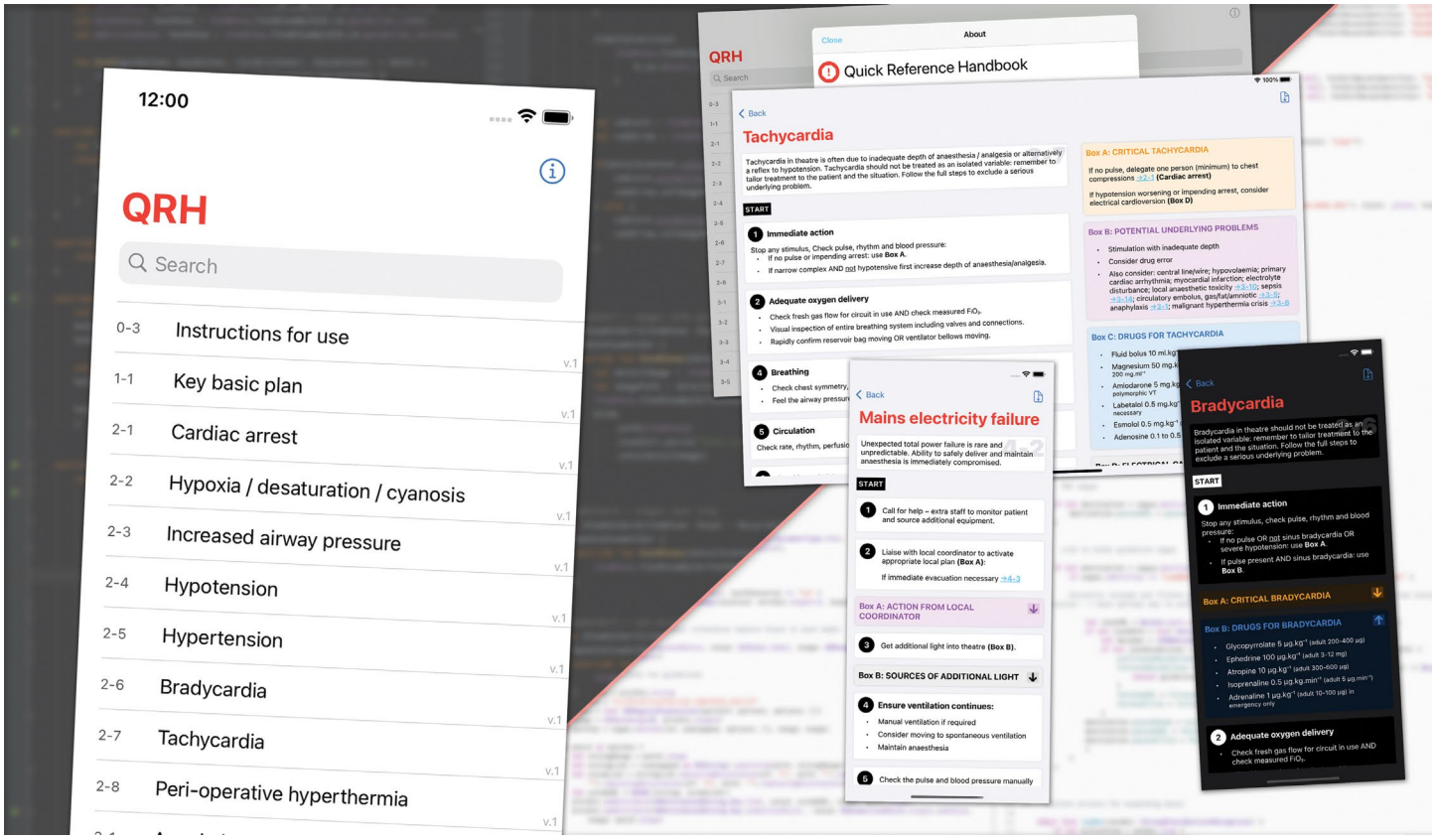
Within a week - despite a few false starts and wrong turns - I had a working prototype. The code was simple, possibly laughably-so to a professional programmer, but it achieved the goal and laid a basic framework upon which to build. As anaesthetists, we are used to performing at the first-and-only opportunity; while we can reflect on and learn from events, we can't rewind a given case to correct mistakes and optimise the process for that particular patient. In contrast, the ability to err and tweak the same code over and over, with no consequences until it functions precisely as intended, can be both endlessly frustrating yet satisfying.

However, once past the naive excitement of having a working prototype, I began to realise there were many more improvements and considerations to address. Were there any regulatory ramifications? How would it be updated? Would the Association have any objections?

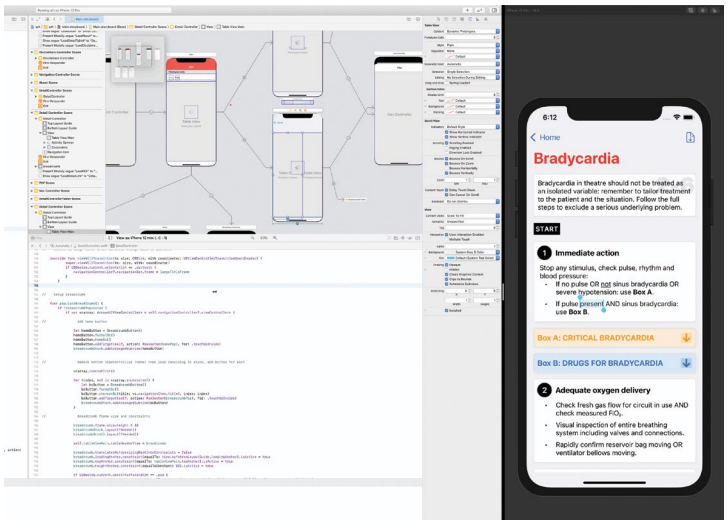
Luckily, the app falls outside the remit of medical device regulations and CE marking, as it serves only to replicate existing reference material. Early versions of the app included the ability to enter location reminders to mimic certain QRH pages; I later removed this functionality, however, as storing user input introduces onerous data protection and security obligations. Keeping the app simple minimises stumbling blocks and makes writing the obligatory privacy policy straightforward - it doesn't collect any personal data! My focus since has been on the quality rather than quantity of features, hopefully leading to a simple, fast and consistent user experience.

Presenting the project at the 2020 Safe Anaesthesia Liaison Group Patient Safety Conference garnered positive interest and provided the motivation needed to push forwards. The elephant in the room remained the lack of an iOS version, but how would this come into existence when I had no experience of the platform nor own any Apple devices? Thankfully, there is a wealth of reference material to draw upon when faced with an unfamiliar programming language. Using a rented 'cloud' Mac

Back to contents



and Xcode [4], I was able to build an app for iPhone and iPad that shared equivalent functionality and - importantly - common content files with the Android version, minimising replication of work that might be needed for future updates.



It is essential to stress that the app currently remains an unofficial home-grown project that is presented as a community effort, rather than something professionally developed and released. I trust that colleagues will heed the disclaimers and potential limitations, and make their own pragmatic judgements about appropriate use. Certainly, it should only complement and not replace the official QRH.

Lastly, how can others get involved, besides trying it out and providing feedback? Because of its open-source nature, anyone can review the code, make suggestions or modify it for their own needs. Those new to programming can follow the logic that builds up the content displayed to the user, which I have tried to signpost with comments throughout the project. Experienced programmers can scrutinise my novice work, find and fix bugs, and maybe enhance functionality for future versions.

I hope that others will find this project useful, and I look forwards to any comments and feedback. Further information and source code for the apps can be found at github.com/anaes-dev/qrh-android and github.com/anaes-dev/qrh-ios, and please look out for links to download on Google Play and the App Store.

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Back to contents

Mersey Region Starters Introduction: preparing future core trainee anaesthetists for their novice period

For most novices, the first few weeks in anaesthetics can be incredibly daunting, as they try to get their head around new drugs, equipment, and an unfamiliar environment. For many, the initial learning curve is steep, both academically and clinically. The COVID-19 pandemic has posed many difficulties over the last few months, and the prospect of starting a new training programme in the current climate, when communication difficulties and anxiety are rife, seemed incredibly challenging. As a group of anaesthetic trainees finishing core training, we wanted to share our experiences with the next generation of anaesthetists starting in Merseyside, providing them with information and tips to make the novice period more enjoyable.

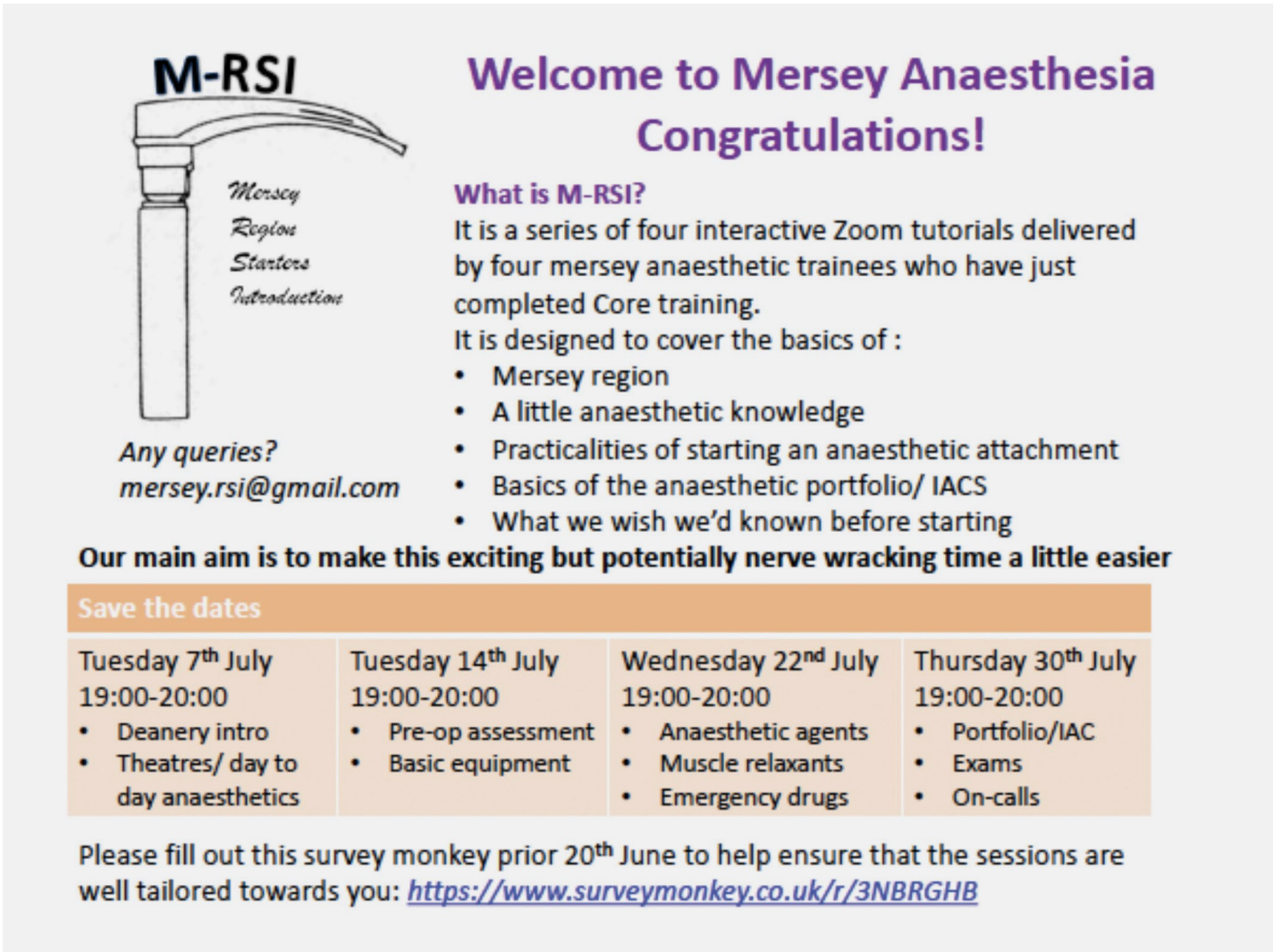
We utilised a virtual platform to provided an online lecture series, the Mersey Region Starters Introduction (MRSI) course, in the weeks leading up to changeover. Our aim was to address some of the more stressful aspects of being a new anaesthetic trainee, and familiarise new anaesthetists with the deanery. We surveyed the current CT1s to identify the concerns they had had before starting, and information "they wished they had known". We also surveyed the new starters to determine their current level of experience, and any particular aspects causing them anxiety. Almost all of our new trainees had experience of intensive care medicine after their foundation years, so the course level was targeted accordingly.

The course was divided into four hour-long weekly lectures (Figure 1). In Week 1 we discussed some key characters they would meet, courses they would be expected to attend, and some of the challenges of the Mersey hospitals. Week 2 covered the important aspects of pre-operative assessment and a picture round-style presentation about anaesthetic equipment, with Week 3 informing them about common anaesthetic and emergency drugs. In the final week we familiarised them with clinical and academic expectations of core training, highlighted their role on call, navigated through a portfolio, and introduced the concept of the Primary FRCA. In this session we also drew on our experience to cover some of the common bleeps and scenarios they might encounter, and how to approach these (Box 1). Our over-riding messages were that there is always support available, escalate early, and always act within your competencies.

Although running a course through an online platform has its challenges, it also presented us with unanticipated advantages. In particular, as more than half of the new trainees were from outside the region, attending a face-to-face course might

Back to contents

Figure 1



Box 1

Common bleeps to get as a new on-call anaesthetist

- "I've booked a [insert procedure here] on the emergency list"
- Airway assessment
- Cardiac arrest and trauma calls
- Seizures
- Low GCS
- Problems with a patient in recovery
- Failed lumbar puncture/ failed cannula
- Uncontrolled pain

have proved difficult with work commitments. Overall, the course has been met with enthusiasm, and the benefits will undoubtedly become apparent as changeover occurs and the new trainees enter their novice period. The adjunct handbook 'Mersey anaesthesia: a guide to being a novice' has been produced as a complement to the course, expanding the content and providing some clinical anecdotes, and thus giving better insight into the role of a junior anaesthetist. We have no doubt that the MRSI course will help new trainees to get the most out of their novice period, and welcome them to a great career choice.

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Back to contents

Using innovative 'slime' models to teach central venous cannula insertion

COVID-19 hit North-West London especially hard, leading to redeployment of non-acute trainees to critical care. Novice inductions were rapidly organised to train juniors from myriad specialties, ranging from ophthalmology to clinical genetics. A number of trainees expressed a wish for additional central venous access training after their one-day induction. We found that demand for this training outstripped supply of both teachers and CVC models, and an innovative solution to this resource problem was required.

Commercial models are traditionally used in low-fidelity CVC insertion training sessions, before supervised practice on patients. These models provide reasonable realism, but are expensive, difficult to transport and rapidly lose integrity. Historically, alternative teaching methods have included use of animal models, which are expensive, culturally insensitive, a risk for cross contamination, and difficult to store. The use of cheaper but very low-fidelity agar jelly models is another possible alternative.

In conversation, the idea of experimenting with 'slime' to try and simulate human tissues arose. Most people's prior experience of slime comes from their childhood - the toy maker Mattel came up with a green, gooey, stretchy substance in the mid-1970s that has provided simple entertainment for many generations. From a scientific perspective 'slime' is a non-Newtonian fluid that can be produced very cheaply and quickly from recipes available online, using water and PVA glue in a 50:50 ratio with added sodium tetraborate from contact lens solution. This creates a viscous, safe to handle, and easy to store substance, which has similar physical properties to organic matter (i.e. skin over flesh) when it sets. The consistency of slime can be altered by changing the ratio of borate, glue and water; more borate and less water will result in a stiffer slime. We experimented with different ratios to find an ideal middle ground between stiffness, texture, durability, and the ability of the slime to 'reset' to the shape of the container (Box 1).

Box 1

- 250 ml PVA glue
- 250 ml water
- 1 tablespoon bicarbonate of soda
- 10-20 ml contact lens solution (borate-containing brands only) titrated to stiffness of layer

Once happy with our recipe, we combined this in a 'dual layer' system with another separate layer of slime, before placing fluid-filled water balloons at a depth of 1-2 cm to replicate basic anatomical structures. This was refrigerated in order to 'set' in simple rectangular (food takeaway) plastic containers. The total cost to make four models was under £10 using high street-sourced materials, which could be reduced if batch-purchased from a non-commercial vendor.

Once created, we used our model to teach landmark CVC insertion. The model itself was invaluable in giving trainees a realistic feel when puncturing skin, needling through flesh, and getting flashback from the water-filled 'veins'. The model was resilient enough for multiple puncture attempts, swiftly

Back to contents

regaining its set shape afterwards. The Seldinger technique and dilation could also be practiced using the body of the slime. We found the models were realistic when sutured, providing an authentic skin-like feel on the surface. Though we didn't use the models in ultrasound sessions, from our own tests the 'veins' can be visualised using ultrasound.

In summary, more expensive equipment is not always better! In an environment where resources are limited, creative thinking can produce low cost alternatives. The technical and procedural skills gained from such sustainable training programmes outweigh the drawbacks of using lower-fidelity models.

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Anaesthesia Digested

February 2021

A quantitative evaluation of aerosol generation during tracheal intubation and extubation

Brown J, Gregson FKA, Shrimpton A, et al.

At the start of the COVID-19 pandemic, demand for knowledge and science far outstripped supply. It was only later that high-quality science began to emerge, and this new experiment by Brown et al. is an excellent example of science biting back. There have been many who have long suspected that tracheal intubation and extubation do not generate aerosols to the same degree as a cough. Now we have observations under strict experimental conditions that seem supportive. Nevertheless, do not throw away your FFP3 masks or visors just yet; another study by Dhillon et al., also in this issue, reports very different findings. The uncertainty is weighed up in the associated editorial by Nestor et al., and you can listen to both groups settle their differences in #TheGreatAerosolDebate podcast!

The use of intravenous lidocaine for postoperative pain and recovery: international consensus statement on efficacy and safety

Foo I, Macfarlane AJR, Srivastava D, et al.

When we use local anaesthetic agents in clinical practice, we usually go to great lengths to avoid local anaesthetic systemic toxicity, so injecting local anaesthetic agents intravenously might seem counterintuitive. That said, any anaesthetist who has used intravenous lidocaine as part of their peri-operative analgesic strategy will no doubt stand by the safety and efficacy of its use. This new guideline is the first of its kind, which is surprising as the use of intravenous lidocaine for analgesia seems to be widespread. It will hopefully provide a framework for hospitals and departments to write their own protocols, as well as standardising practices more generally. In the associated editorial, Pandit and McGuire discuss the evidence as well as the issues raised by using intravenous lidocaine as an unlicensed medication. They instead provide 'a license to stop an infusion' if a clinician encounters a patient in their care and they do not believe the drug to be efficacious. You can listen to both groups of authors debate the arguments for and against on the relevant podcast, which is available at https://anaepodcasts.podbean.com.

Guideline for the management of hip fractures 2020

Griffiths R, Babu S, Dixon P, et al.

Which is best for patients with hip fracture, spinal or general anaesthesia? Although anaesthetists may forevermore more see this as an interesting talking point, thankfully guidance and expert opinion has moved beyond the debate of superiority of one mode of anaesthesia over another. Instead, nine years since the last guideline iteration, focus has moved onto areas such as anaemia, anticoagulation, and getting patients to theatre in a timely manner. Direct oral anticoagulant agents seem to be the new major issue facing anaesthetists, and many will be pleased to see some written guidance. Again, there is an excellent accompanying podcast where you can listen to Iain Moppett and Ciara O'Donnell take us through all the peri-operative considerations and controversies.

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

Mike Charlesworth, Editor, *Anaesthesia*

Back to contents


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Particles

M. B. Blackburn MB, S. C. Wang SC, B. E. Ross BE, et al.

Anatomic accuracy of airway training manikins compared with humans

Anaesthesia 2020 https://doi.org/10.1111/anae.15238

Background

Successful airway management is highly dependent on skills training [1]. Airway manikins are vital tools for clinicians seeking to practice airway management skills, and are also used in industry for the development of airway devices. The authors sought to identify whether these manikins were accurate anatomically in comparison to the human airway. Other studies have examined high fidelity manikins, but not the lower fidelity models that are also extensively used.

Methodology

The authors selected 33 participants who had head and neck CT scans between 2009 - 2017 at the University of Michigan Hospital. Their characteristics were: age range 18 - 47 years; 18 male; 25 Caucasian, 3 African American, 1 Asian, 4 other; BMI range 20.9 - 40.6 $kg.m^{-2}$.

Upper airway CT images were taken of three low fidelity training manikins (SynDaver® Standard Adult Airway Trainer, Laerdal® Airway Management Trainer and AirSim® Advance Model). Nine measurements were taken on each image from participants and manikins.

The percentile that manikin measurements fell within the distribution of participant measurements was calculated. A percentile of 0.5 was deemed accurate to the human airway.

Results

Ten of 27 CT measurements (nine measurements for each of the three manikins) were > 2 SD from the mean of participants. Three measurements were > mean + 1 SD of participants for all three manikins. In particular, the airway space between the epiglottis and posterior pharyngeal wall, through which airway devices must pass, was too large in all three manikins. The study size did not allow for subgroup analysis of age, sex and ethnic origin of the human participants.

Discussion

The authors concluded that these relatively cheap low fidelity airway training manikins were not anatomically accurate. They noted that time to secure the airway and first pass success rates are often used in studies evaluating airway equipment, and the larger dimensions of the manikins might positively skew results. Comparisons of airway device performance can be affected by manikin selection [2].

Conclusion

It is important to question whether tools used to practice airway skills and evaluate equipment are accurate in their representation of human anatomy, and the evidence presented here shows that this is often not the case. However, only three airway trainers were examined in this study. The authors acknowledged that anatomical accuracy is not the only factor in simulating the human airway., for example manikins are stiff and lack secretions.

It is difficult to quantify how much of an impact these anatomical differences might have on clinical success or failure. Simulation training has been proven to be a successful teaching technique to practice procedures as well as skills, where the accuracy of the model itself is of less importance [3].

A similar study considering emergency front of neck access trainers would also be of interest.

Sneha Prasad
ST7 Anaesthetics
Freeman Hospital, Newcastle Upon Tyne

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3. Kennedy, CC, Cannon EK, Warner, DO, Cook DA. Advanced airway management simulation training in medical education. *Critical Care Medicine* 2014; **42:** 169-78.

Back to contents

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

GlideScope Auto Power Off – a nasty surprise

We used a GlideScope (Verathon Inc., Bothell, WA, USA) for a difficult tracheal intubation in a patient with severe burns to the head, neck and chest. As a bougie was being inserted into the mouth, the screen went blank, leading to a delay while the instrument restarted; however the oxygen saturation remained > 96%.

Like many other instruments that have limited battery back up, the GlideScope has an adjustable Auto Power Off function to conserve screen and battery life, with a factory default of 30 min. In this case, the ODP had turned the machine on (and plugged it into the mains supply) considerably in advance while preparing the equipment for anaesthetic induction. However, we did not realise the Auto Off was set at 20 min (Figure 1), nor did we notice the imminent shut-down message on the instrument screen (Figure 2).

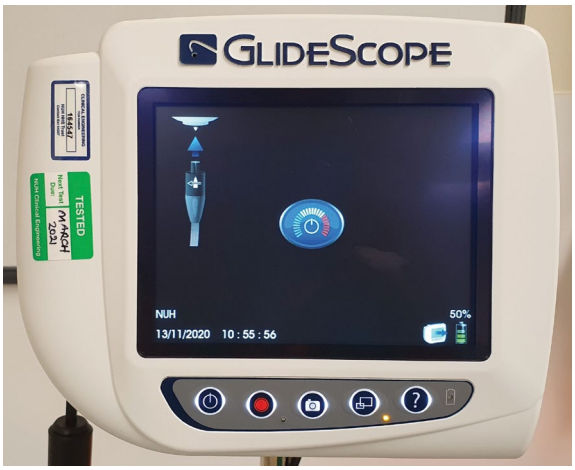
We all know the old adage "Know thine enemy". It is also important to get to know your friends thoroughly.

Toby Ma
Anaesthetic Clinical Fellow
East Midlands Deanery

Congratulations to Toby Ma for winning February's Letter of the Month prize.

Figure 1. Screen showing Auto Power Off menu

Figure 2. Warning screen before shut down



Dear Editor

COVID-19 airway assessment: public masks = anaesthetists' angst

I wish to highlight a hitherto unreported, but *highly* significant, consequence of COVID-19 on the wellbeing of anaesthetists. The recently mandated wearing of facemasks in enclosed public spaces, in particular on public transport, has robbed us of a favourite anaesthesia pastime - "How would I manage his/her airway?" (insert random passer-by/ fellow passenger).

I strongly recommend anaesthetists affected by these new government regulations seek immediate professional help from their local anaesthesia coffee room support group. It is crucial to acknowledge the effect this may be having on morale, and to share any negative emotions with others, who may be experiencing similar feelings of loss and emptiness!

Fortunately, there is still at least one pastime to keep us anaesthetists happy - "What size cannula could I insert into his/ her vein?"

Patrick Alexander Ward
Consultant Anaesthetist and Airway Lead
Chelsea & Westminster Hospital, London

Back to contents

Your letters

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Dear Editor

The COVID Novice

I have a confession; I am a senior anaesthetic trainee who has never cared for a COVID patient. By a peculiar twist of fate, I have 'dodged' working during the biggest healthcare crisis for 100 years. I do have a healthy (and rather large) baby boy to show for it, born two days into lockdown, while COVID guidelines pummelled my WhatsApp inbox.

Return to work reading

Soon, however, I will return to work. The world has changed. When we leave the house, we check for our facemask as we do our keys or phone, and to 'Zoom' is a verb. Lost in a shop's inexplicably complicated one-way system, I wonder how I will navigate the new hospital landscape.

Fortunately, I am part of a supportive School of Anaesthesia, with an excellent return-to-training programme. However, I cannot help but think that there will be subtleties and nuances that cannot be taught or simulated, and theatre etiquettes that have evolved organically and are now embedded in hospital culture. All of these will be alien to those who have watched the pandemic from the side lines.

Returning to work has a new dimension. Not only do we need to remember how to do the job we know, we need to learn to do a job that we never did. So, if you see a COVID-novice, staring at a cannula, wondering not only whether they can still put one in, but also what attire they should don to do so, offer some pointers and socially distanced reassurance. Also, if anyone can explain the one-way system in my local WH Smith, that too would be appreciated!

Emma Jenkins
ST7 Anaesthetics
Southmead Hospital, Bristol

Dear Editor

With reference to the letter by Kler et al. on Page 30 of the December issue of *Anaesthesia News*, 'How many times can one prone a patient with COVID-19 pneumonia?':

'Prone' is an adjective. Can I also be 'supined'?

I am iPadding this thought. Or should I be iPading it?

With respect

Robin Weller
Retired amateur editor
Sent from my iPad

PS In no way, I would emphasise, is this a criticism of the authors of the letter in which this new verb appeared. I remain amazed how the ICUs have managed throughout this dreadful year. Makes me quite proud to be an Honorary Member of the Association to which so many anaesthetists belong.

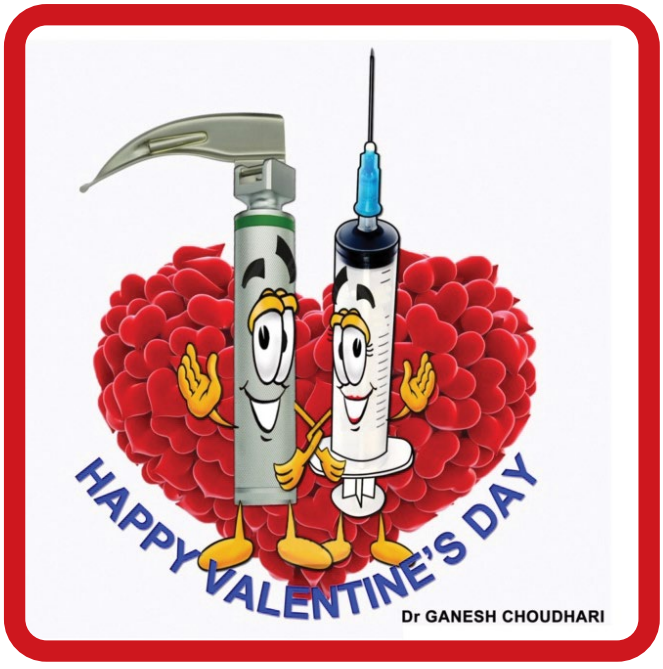
Editor's reply

Like Dr Weller, I don't like the tendency to change nouns or adjectives into verbs, but I'm not going to get into an ipaddy about it.

Prone/ proning/ proned is much easier for communication purposes than 'turn/ turning / having turned the patient into the prone position'. In support of its current use, Google Scholar finds the terms 'proned' + 'covid' in > 17,000 places.

I am with King Canute on this one.

What do our readers think?



Back to contents

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Back to contents

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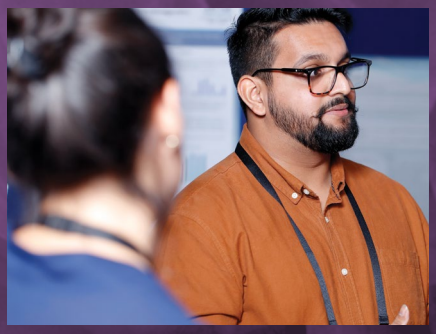

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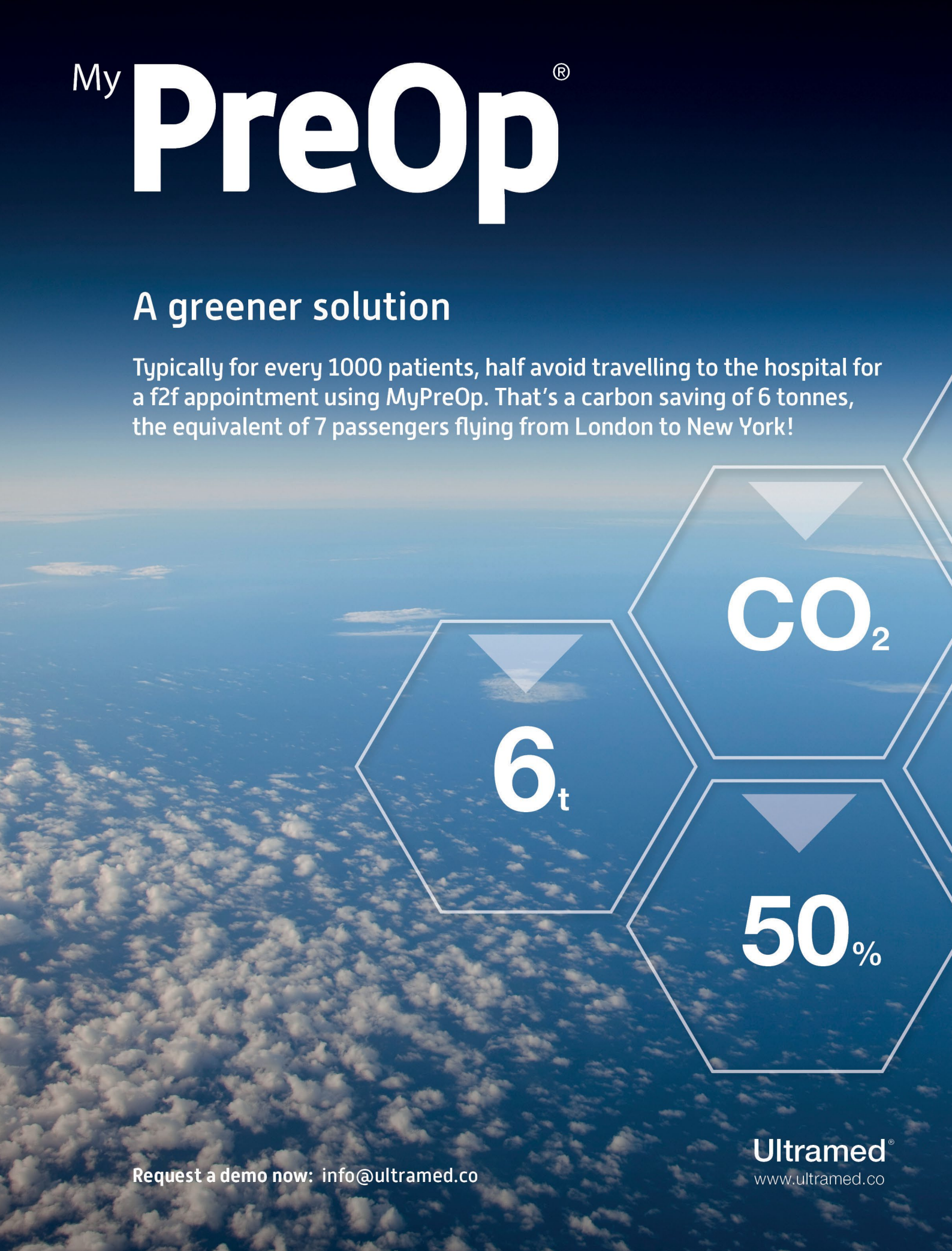
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