INNOVATION ISSUE:

The needle-free non-injectable arterial connector

RELAX Anaesthetics – an update

OBSCymru – a national quality improvement collaboration for Wales

Surrey Crisis Resource Management Programme

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Editorial

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Once again May’s issue of Anaesthesia News is highlighting innovation in anaesthesia. After a fascinating session at the AAGBI WSM London in January, we asked the winner of the 2017 AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain, Diamedica, to write about their project, what inspired them, and their wider contribution to safe global anaesthesia. The oxygen reservoir was first described in Anaesthesia News in May 2015, where the technical challenges in its development were discussed. The presentation in January allowed Diamedica to show the impact of their invention and how it is beginning to contribute towards solving the problem of enough inexpensive oxygen to deliver continuous flow anaesthesia in resource poor settings. Although draw-over anaesthesia has long been the mainstay of developing world anaesthesia, times are changing and a more modern approach to anaesthetic techniques, even in the most remote settings, has set the Diamedica team and their collaborators on finding innovative solutions.

There is no doubt their experience and fascinating knowledge of the challenges in delivering anaesthesia in such settings continues to enhance safety.

Innovation in anaesthesia is not only about developing and inventing new equipment. We have previously highlighted innovation in teaching and in this issue we have two articles about developing safer processes during emergencies. Anaesthetists have long had a well-deserved reputation of designing systems specifically related to anaesthesia to improve patient safety, and are now at the forefront of working with multidisciplinary teams to develop innovative solutions to improve safety. The Surrey Crisis Resource Management (SCReaM) programme has developed cards that are read out by a pre-specified person in the theatre team during an emergency. They have used lessons learned from the aviation industry including incorporating a multidisciplinary human factors training programme when dealing with a crisis in theatre. The OBSCyru project is closer to home for me. Management of post-partum haemorrhage continues to be a problem in the UK and this project aims to reduce the incidence by getting the right personnel to the mother’s bedside at the right time and dealing with the problem using a step-wise approach. Such an approach has been agreed by all the delivery units in Wales. Measuring blood loss after all deliveries and a standardised approach to post-partum haemorrhage using a call-out protocol is being integrated with point-of-care coagulation, haemoglobin and lactate measurement to improve resuscitation. The

Continued over

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other innovation in this project has been the three anaesthetic trainees, who are currently on an out-of-programme Welsh Deanery management and collaboration in the development of the Welsh Patient Safety Agency. Feedback from any specialty can apply for these posts and I’m pleased to say anaesthesia has embraced this opportunity and trainees are now working on this and other projects so they are equipped to lead innovation and change in the future. The OBSCymru project is in its early days but hopefully will lead to improved outcomes for mothers and babies.

This issue gives us an opportunity to catch up with previous winners of the AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain. In 2015, Maryanne Mariyaselvam won the award for a one-way injector port to prevent medications being injected through arterial lines. She now tells the story of how this innovation has been taken into production. The 2016 winner, Peter Brooks, updates us on ‘Relay Anaesthetics’ – a distraction tool for use in paediatric anaesthesia. If you are a secret inventor or innovator then let us know. Even if it’s at an early stage, Gerry Keenan, our Innovations Lead, may be able to point you in the direction of some help and the innovations competition at the WSM London each year may be a platform for its future development.

Rachel Collis
AAGBI Vice President

The needle-free non-injectable arterial connector

The non-injectable arterial connector (NIC) won the AAGBI Innovation Award in 2015 and now meets the criteria for NHS England’s Innovation and Technology Tariff. From 1 April 2017, all innovations on the Tariff will be centrally funded by NHS England, meaning that every trust in England can use this innovation for free [1].

Applicants are invited from medical students studying in Great Britain and Ireland (subject to confirmation of eligibility) to apply to the AAGBI Foundation Long-Term Strategy funding scheme to commission projects in the developing world.

Background to innovation

Medication must never be given into the arterial line but case reports and incidents of inadvertent injection into the arterial line have been published since the 1940s [2]. In 2008, the National Patient Safety Agency (NPSA) published an alert [3] highlighting this error and recommended that manufacturers should colour code arterial lines red and develop engineered solutions to prevent this mistake [3]. However, despite colour coding and the alert, there have been more than 150 incidents reported to NHS England since 2008, which is the equivalent of around two incidents per month [4] and we know that these errors are under-reported [5].

Why is it not enough to colour code arterial lines and teach people not to make the mistake? The literature states that inadvertent injection into the arterial is as common as 1:3,440 procedures [2], making this a ‘rare’ error. When these types of error occur, institutionally there is a common response: make sure that all staff are aware of the error, re-educate and re-train the individual, write a policy, create a checklist or make sure that two people check the procedure. These measures can be effective, but only in the short term. What we often see is a decline in the efficacy of these interventions over time and this is because ‘re-education and re-training is only as good as the length of time that clinicians remember to do it’ [6] before there is a shift back to previous practice. We also have the problem of frequent staff changes, requiring each clinician to be educated on new equipment or systems every time they move to a new hospital. Therefore, re-education, introducing a checklist and remembering to follow or fill it out to prevent rare events requires ongoing and repeated educational interventions. This is not only time consuming, but very costly for an error that occurs in 1:3,440 procedures.

For rare errors the best solutions are engineered into the system to make the error impossible. This not only protects the patient from the error, but also protects the clinician. It is impossible for us to remember every error possibility, in every procedure and in every situation and mitigate for this, all while appropriately looking after the patient. This has been recognised in the NPSA arterial line alert calling for manufacturers to develop engineered solutions to prevent these errors [3] and by the WHO guidance which states that injection ports on arterial lines are to be avoided [7].

The NIC is an engineered safety solution to prevent the error of accidental injection into the arterial line. It is a standard arterial connector, with a stop-valve and a unidirectional valve in the inner chamber. This ensures the clinic can always aspirate to take the blood sample, but they cannot inject into the arterial line. The physical barrier also prevents bacterial ingress into the arterial line hub and reduces accidental blood spillage during sampling. The NIC has safety features that protect both patients and staff. Clinically it is easy to use and is the same as standard arterial connectors, therefore there is minimal training required. The NIC is attached to the sampling port of the arterial line with a standard Luer connection, making it compatible with any arterial line equipment.

Innovation and Technology Tariff

Winning the AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain 2015, the NIC got the seal of approval from peers. It then won the National Patient Safety Award and was selected for the NHS Innovation Accelerator Programme as a best practice safety innovation that should be implemented nationally. As the uptake of new innovations in the NHS is slow, due to complex and inconsistent local procurement decision-making processes, NHS England has launched the Innovation and Technology Tariff.

This seeks to centrally-fund innovations that meet the criteria, so that every patient in England has access to these safety innovations quickly and easily.

AAGBI Innovation Award

As an innovator and clinician, winning the AAGBI Innovation Award has been fantastic for my career. It has propelled my work onto a national platform, has allowed me to apply and be accepted for the NHS Clinical Entrepreneur Programme and the NHS Innovation Accelerator Programme. The prize has led to further research on the use of engineered solutions to prevent rare errors, such as a solution to prevent arterial glucose error and the WireSafe™, a device which prevents the never event of retained guidewires.

Maryanne Marryaselvam
Clinical Research Fellow, Queen Elizabeth NHS Foundation Trust, Kings Lynn, Norfolk

Declaration of interest

This innovation is owned by The Queen Elizabeth Hospital King’s Lynn NHS Trust

References

5. Personal communication of adverse events data from NHS England.
Tablet-based interactive distraction is an effective technique for alleviating the anxiety and distress that up to 50% of children experience in the peri-operative period. Significant peri-operative anxiety negatively influences children’s anaesthetic and surgical experience, and increases the risk of postoperative abdominal pain and behavioural changes in paediatric patients. Handheld electronic games, smartphones and tablets have become part of children’s and adolescents’ culture. These devices have proved very useful as non-pharmacological interventions for reducing distress during induction of anaesthesia [1] and have been shown to be more effective than midazolam [2], parental presence [3] and traditional forms of distraction, such as toys and books [4].

Together with software developers Imaginear and with funding from our hospital’s arts, research and innovation charity, CW+, we developed the tablet-based app, RELAX Anaesthetics, to facilitate access to a range of child-friendly content, leading to engagement and distraction, and ultimately a smooth induction of anaesthesia. The tablet includes more than 40 games, books and short video clips that provide visual, auditory and interactive engagement for children. The application is easy to use. By entering four ticks on the first screen it matches developmental considerations with the planned induction technique and favoured type of distraction for the child. As RELAX Anaesthetics is simple to navigate, the tablet can be used by anyone in the anaesthetic room and can also empower the parents to help their child during a stressful time. This should allow the anaesthetist to focus on other aspects of the induction process such as cannulation.

Having the RELAX Anaesthetics tablets available in each of our paediatric anaesthetic rooms provides the most efficient access to the technique. Using a bespoke device that only has relevant apps onboard limits the opportunity for exploration of email or other unhelpful applications by curious children who know their way around an iPad. During our study to test the RELAX Anaesthetics app, 65% of children using the tablet had no anxiety during induction compared with 27% using traditional toys and books, despite similar baseline anxiety scores [4]. Providing access to tablets in the anaesthetic room is a low-cost strategy that can be easily implemented; the devices can be easily cleaned, and the impact on preventing a rise in anxiety during anaesthesia induction is significant.

Since winning the AAGBI Prize for Innovation in 2016 [5], we have developed RELAX Hospital for use as a distraction tool outside of the operating theatre. It is having a positive impact at reducing anxiety in children in our hospital during procedures on the ward and in outpatients, for example during eye examinations.

The next big decision for us is how to improve access to the technique – either by making the application downloadable or by sharing knowledge via a website. Watch this space!

Peter Brooks
Consultant in Paediatric and General Anaesthesia, Chelsea & Westminster Hospital

References
OBSCymru – a national quality improvement collaboration for Wales

Introduction
Major postpartum haemorrhage (PPH) is a significant and often unpredictable event in the daily activity of a delivery unit. PPH accounted for around 10% of all direct maternal deaths in the UK between 2008 and 2012 with a mortality rate of 0.49 per 100,000 deliveries [1]. In the Scottish Maternal Morticity Enquiry, the incidence of life-threatening PPH has increased from around 3 to 6 per 1,000 deliveries over the last 12 years, with PPH now contributing to 80% of severe maternal morbidity [2]. The level of PPH-associated morbidity can have an impact on the patient and her baby, their family and wider community for many months after the event [3].

In the light of growing research around obstetric coagulopathy (4–7) and important quality improvement work around PPH being undertaken in the USA (8–11), the Obstetric Bleeding Strategy for Wales (OBSCymru) was launched.

The strategy is focused around four key areas:

1. Universal risk assessment
2. Early identification of PPH
3. Multidisciplinary team approach
4. Point-of-care test guided blood transfusion and blood product management

OBSCymru – how did it happen?
National discussions regarding the burden of PPH-associated morbidity and apparent variation in outcomes led to increasing enthusiasm for change across Wales. The project has benefited from UK-wide and international collaborations (for example, The Scottish Maternity & Children Quality Improvement Collaborative (MCCIQ), Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN) and the Institute for Healthcare Improvement (IH)) and after a successful application to the Efficiency Through Technology Fund (Welsh Government, ETF), OBSCymru was formed. Subsequent to this the project has received ongoing support and promotion from a number of organisations, including:

• The Welsh Government
• 1000Lives Improvement (National Improvement Service for NHS Wales)
• The Welsh Deanery (specifically through the Welsh Clinical Leadership Fellow Training Schemes)
• Maternity Network Wales
• NHS Wales Health Boards
• Werfen UK (supporting the introduction of ROTEM Sigma technology)

This strategic collaboration has been matched by a significant amount of local unit and health board involvement as the project has established local teams within each consultant-led unit. These local teams consist of a midwife, anaesthetist, obstetrician and haematologist and, in some units an ODP who will be championing the implementation of a bundle of initiatives. Briefly, these include the introduction of:

• A universal 4-stage approach checklist
• An obstetric haemorrhage ROTEM Sigma guided blood product replacement protocol
• A national database for data collection
The project has also highlighted a wealth of opportunity for quality improvement training. This is especially important as quality improvement skills become increasingly represented in specialist training curricula. The teams in each of the units involved in the project will be able to develop these skills with further support from 1000lives, The Welsh Deanery (LINCymru), local quality improvement hubs and the HI Open School.

It remains as important as ever to consider each patient as being at the centre of the processes we look to improve. In this regard, OBSCyru will build on and utilise the experience of our patient representatives and the results of our patient experience surveys to continually inform us of the impact of the project on our patients, thus providing further opportunities to improve.

Future work

As the project moves forwards we aim to implement a standardised, multidisciplinary, ROTEM Sigma guided approach to PPH care in all consultant-led units across Wales. Further work will involve scoping and engagement exercises to modify the OBSCyru approach as necessary and to incorporate it into stand-alone midwifery units and community delivered care.

EVELYN BAKER MEDAL

AN AWARD FOR OUTSTANDING CLINICAL COMPETENCE

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 is made for outstanding clinical competence, recognising the ‘unsung heroes’ of clinical anaesthesia and related practice. The defining characteristics of clinical competence are deemed to be technical proficiency, consistently reliable clinical judgement and wisdom and skill in communicating with patients, their relatives and colleagues. The ability to train and enthuse trainee colleagues is seen as an integral part of communication skill, extending beyond formal teaching of academic presentation.

Nominations are now invited for the award, which will be presented at WSM London in January 2018. Members of the AAGBI can nominate any practising anaesthetist who is also a member of the Association. Nominations should normally still be in clinical practice. The award is unlikely to be given to someone in their first ten years as a consultant or SAS doctor, and the nominee should not be in possession of a national award.

Nominations should include an indication that the nominee has broad support within their department.

Last year the award was won by Dr Rob John (Sheffield). Details of previous award winners and further information can be found on the website www.aagbi.org/about-us/awards/evelyn-baker-medal.

The nomination, accompanied by a citation of up to 1000 words, should be sent to the Honorary Secretary at HonSecretary@aagbi.org by 17:00 on Friday 21 July 2017.

The Association of Dental Anaesthetists (ADA) is one of the smaller specialist societies under the aegis of the AAGBI, with a membership of around 200. It was founded in 1977 in an era when dental anaesthetic practice in the UK was rather different from what it is today. Dental sedation was in its infancy – or at least childhood – and most dental treatment was performed either under local anaesthesia (provided by the dentist), or under general anaesthesia provided by a medical practitioner – not necessarily a trained anaesthetist.

The vast majority of dental general anaesthetics were given in the community in local dental practices, often by relatively inexperienced or inadequately trained practitioners, sometimes using outdated and/or inadequate equipment, with the inevitable result that near misses and the occasional death were reported periodically. The ADA responded to this change by devoting increasing time to discussion of dental anaesthesia, with a view to improving standards of practice. However, anaesthetic problems (and deaths) persisted and lead to a range of topics related to dental care, with the focus on patient management using sedation, hypnosis, and allied methods. The ADA wants to see all sedation activities performed under the safest conditions in all areas. It is also actively involved with the development of national guidance on sedation.

The Association holds an annual meeting, usually in London, covering a range of topics related to dental care, with the focus on patient management using sedation, hypnosis, and allied methods. The next meeting will be on Tuesday 28 November 2017.

The ADA is managed by its Council, to which any member may be elected, and welcomes as new members all professionals interested in any aspect of dental anaesthesia, sedation, and allied topics – come and join us! For more information, visit our website: http://www.dentalanaesthesia.org.uk
SCReaM

Surrey Crisis Resource Management Programme: introducing human factor training alongside operating theatre emergency prompt cards

A recent review in Anaesthesia News [1] highlighted the importance of checklists and standard operating procedures that the aviation industry has become so familiar with. In healthcare, checklists are used increasingly, with the WHO Surgical Safety Checklist now associated with reduced morbidity and mortality. This has become accepted as the gold standard of care. However, beyond this, we rarely use checklists in the emergency situation.

Managing critical incidents involves rapid recognition and decision making, often relying on memory alone. Here, professional autonomy is less prominent and, in its place, standardised algorithms are frequently used [2]. Of the 234 million operations per year undertaken worldwide, it is estimated that there are 3 million intra-operative adverse events [3]. Evidence suggests that during these stressful situations, key lifesaving treatment steps are often omitted because human memory and performance can be negatively affected. We have seen how cognitive aids have been adopted by many high-risk industries (aviation, nuclear power) to improve outcomes, and evidence suggests theatre team performance in emergencies improves with cognitive aids [4], thus reducing a major source of variation in morbidity and mortality.

It is an ethos that is now so highly regarded and recognised that it has become regulated and supported at all levels within the industry. The parallels between aviation and medicine are evident: an error in identifying threats and the errors that can arise from these threats, decision making, situation awareness, communication, leadership and teamwork. The skills are often referred to as ‘soft skills’. They are in essence, the ‘why’ and ‘how’ behind the steps. These so-called non-technical skills are sometimes referred to as ‘soft skills’. They are in essence, the ‘why’ and ‘how’ behind

In order for a group of individuals to work effectively together, we must also consider our behaviour, how we think, make decisions and communicate. Drawing from decades of global experience, numerous tools and checklists have been developed in the aviation industry to aid decision making during emergency situations. To date, research has predominantly focused on the application of checklists to improve patient safety by improving team performance. We have designed and implemented the UK’s first operating theatre cognitive aid manual (SCReaM Prompt Cards), which are analogous to those used in the aviation industry by pilots during emergencies to ensure they complete key actions during a crisis. With the focus on 33 critical events, each prompt card contains a series of key lifesaving management steps, designed to take care of the ‘mundane’ stuff so that clinicians can focus on the more complex decisions to be made. This is alongside a rolling programme of human factor training for all permanent theatre team members across both acute trusts (approx. 400 staff).

Critical, for each theatre operating list, there is a nominated and clearly identified (via an orange identity card) ‘Reader of the Card’ (ROC) who has the sole responsibility at the onset of a critical incident to access the cards located on the wall of each theatre and anesthetic room and bring them to the attention of the team leader to ensure all key processes are undertaken. This is based on work undertaken using similar prompt cards which shows even when cards are available, in emergency situations they are often not used because the pressure is great and members of the staff become distracted by the immediacy of the emergency. The ROC ensures the whole team works together and all potentially lifesaving processes are completed.

Our experience at Stanford University in California in 2015, where cognitive aids have already been introduced, highlighted the change management required to embed the checklists into clinical practice, rather than become a book that was left to gather dust in a theatre drawer. Hence SCReaM is a multifaceted initiative which includes a multidisciplinary human factors training programme where we learn and share lessons with the surgical team and the day after the course is jointly delivered by hospital consultants and anaesthetic Resource Management Trainer pilots, delivered through facilitated course. The course focuses on human factors and developing the non-technical skills of communication, threat and error management, situation awareness, decision making, leadership and workload management. These are the skills that if learnt and used would actually help prevent a crisis. This has proved invaluable in developing the role of the prompt cards in the clinical setting, as well as empowering individuals and promoting team working.

Like aviation, constant advances in medicine have meant that clinicians working.

The Surrey Crisis Resource Management (SCReaM) programme is a collaborative effort undertaken by the Royal Surrey County Hospital NHS Foundation Trust, Ashford & St Peter’s Hospitals NHS Foundation Trust, Orchard Training Solutions, and the University of Surrey to enhance patient safety by improving theatre team performance. We have developed and implemented the UK’s first operating theatre emergency cognitive aid manual (SCReaM Prompt Cards), which are analogous to those used in the aviation industry by pilots during emergencies to ensure they complete key actions during a crisis. With the focus on 33 critical events, each prompt card contains a series of key lifesaving management steps, designed to take care of the ‘mundane’ stuff so that clinicians can focus on the more complex decisions to be made. This is alongside a rolling programme of human factor training for all permanent theatre team members across both acute trusts (approx. 400 staff).

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Like aviation, constant advances in medicine have meant that clinicians can do more to improve patient safety and care. To do this requires efficiencies beyond technology alone. The way we think, how we communicate, make decisions, lead our team and act as part of one have to become more effective just to keep up with these advancements. Having awareness of our own capabilities and limitations, but more importantly of those we work with, will improve the overall efficiency of the individual and team with the potential result being increased productivity and a more positive outcome for the patient.

The SCReaM project was launched in September 2015 and we have now introduced the programme in all operating theatres. In addition to the human factors training days, high-fidelity simulation has also been developed and deployed. Using the skills learned in the classroom, the high-fidelity sessions give multidisciplinary team members from the operating theatre environment (namely surgeons, anaesthetists, operating department practitioners and theatre nurses) the vital opportunity to train together as a team rather than in silos and embed the prompt cards into practice in a safe, non-threatening environment, while keeping patients safe.

To date, over 200 staff have been through the SCReaM training programme. Feedback has been universally positive, and we are looking to roll it out into other departments within our Trusts. The next step is to modify the prompt cards for use on the labour ward, and we plan to train 80 midwives and obstetricians in the next phase of SCReaM’s development. Momentum in this area is certainly increasing, and the AAGBI’s human factors group has also developed a process of developing a similar set of cards, the Quick Reference Handbook for unexpected crises in anaesthesia. We would be delighted to hear of other hospitals interested in developing a similar programme.

Acknowledgments
Our thanks to David Gaba and the Stanford Anaesthesia Cognitive Aid Group for their expert advice on checklist implementation and simulation. Our thanks also to Dr Rod Galloway (Emergency Medicine Consultant, Brighton & Sussex University Hospitals NHS Trust) for his untiring enthusiasm and guidance on human factor training. Ann Parker (Senior Graphic Designer) at the Royal Surrey County Hospital, and the University of Surrey for their support and use of facilities.

Wendy King and Suzi Lomax Consultant Anaesthetist and SCReaM Co-Leads, Royal Surrey County Hospital NHS Foundation Trust

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Cally Dean Consultant Anaesthetist, Brighton and Sussex University Hospitals NHS Trust

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References
Call for nominations for the Featherstone Professorship

Nominations are sought for the AAGBI’s 2017 Featherstone Professorship, which is awarded to practising clinicians and scientists who have made a substantial contribution to anaesthesia and its related sub-specialties in the fields of safety, education, research, innovation, international development, leadership, or a combination of these.

Applications should be submitted using the application form available on the website www.aagbi.org/about-us/awards/featherstone-professorship. The closing date for applications, which should be sent to honsecretary@aagbi.org, is 26 May 2017.

The AAGBI’s Honours and Awards Committee will consider nominations at its meeting on 09 June 2017, and will make recommendations to the Board of Directors, which will determine the recipient of the 2017 Featherstone Professorship (if any) at its meeting on the same date. The successful nominee will be informed shortly afterwards. The award will be made at the AAGBI’s Annual Congress in Liverpool (27-29 September 2017).

Featherstone Professorships are held for two years, during which the holder will be required to deliver a Featherstone Oration at a major AAGBI meeting.
Dear Editor

Beyond tubes and cannulae – my anaesthetic tastes

In my FY1 year I developed an interest in a career in anaesthetics and decided to organise a tastes test in the field. I was given a schedule with different types of operating lists, time spent with the pain team and a day in the intensive care unit. During the week I worked closely with the anaesthetists and observed them carrying out highly skilful procedures while sharing their knowledge with myself.

My aim was to learn technical skills like cannulations, mask ventilations and intubations, but I thoroughly enjoyed observing and learning about other important skills, including team working, communication and leadership [1]. I saw how ingrained these skills were in my senior colleague’s behaviour and their day to day activities. It was fascinating to watch as a team brief prior to a surgical list. Briefs always start with formal introduction of each individual member as this helps to strengthen a cohesive team. Information about each case was then shared and discussed, ensuring full awareness of all team members present. This made junior members of the team more comfortable and allowed us to raise concerns if needed.

Following the meeting, the anaesthetist and the ODP prepared the drugs and equipment which could be needed during the case; they were all labelled and checked. I noticed the careful and focused manner in which this task was carried out. The anaesthetist communicated their airway management plans, including a backup plan, to the ODP in order to ensure a good mutual understanding and anticipation of the case.

I observed the use of WHO Surgical Safety Checklist and was impressed to see that this checklist and regime was used before every single case that I assisted on during my last week. I had expected that with experience and confidence, the use of checklists would reduce, but I understand the importance of using these and not just relying on memory and experience for critical tasks. I also appreciate that they simplify the situation and experience of being a doctor to focus on more detailed points and miss an error. I learned to appreciate the importance of being prepared and having a plan in case of an unexpected turn of events, for example double-checking the availability of blood prior to starting the case.

Team working is an important skill for all doctors, which is particularly demonstrated in anaesthetics. I noticed the high frequency of formal introductions. This made me feel part of the team and created a safer environment where everybody’s skills could be used appropriately. Teamwork is the most important aspect of anaesthetic and the anaesthetist. It was plain that everybody was aiming to achieve the same goal, getting through the case successfully and safely.

This taster week provided me with excellent insight into the work of an anaesthetist beyond tubes and cannulae. It allowed me to gain an understanding of the importance of human factors in anaesthetics and the role in patient safety.

Mikala Nordblad
FY2, St Peter’s Hospital, Chertsey

Dear Editor

I was pleased to read your recent article on non-Luer neuraxial connectors [1], and the same week to be visited by a nurse, who was very knowledgeable about local anaesthesia. Some years ago, I was presented with a local anaesthetic bag with the label ‘I’m going to give you the numbing medicine now’.

Midwives trying to reassure may misleadingly state that ‘you won’t feel getting sleepy now’?

On 25 May 1961, President John F Kennedy announced America’s intention to land a man on the moon [2]. That ambition was realised on 20 July 1969 – a little over eight years later. Since then, surgeons have benefited from the original Patient Safety Agency alert was in 2009, what has been achieved regarding neuraxial connectors over roughly the same length of time?

The NSF [3] were originally concerned with two problems:

1. The inadvertent administration of vincristine intrathetically (solution – non-Luer spinal connectors from 1st April 2012).
2. The inadvertent administration of bupivacaine intravenously (solution – non-Luer epidural connectors from 1st April 2013).

The decision to let the private sector come up with non-Luer spinal connectors has resulted in a variety of different designs, while each hospital’s choice (including the original Luer) is largely whimsical. However, none of the designs absolutely prevent you drawing up something awful (e.g. chlorhexidine) into a compatible syringe and injecting it into the CSF. The intravenous bupivacaine danger is even further from something awful (e.g. chlorhexidine) into a compatible syringe and injecting it into the CSF.

The inadvertent bupivacaine danger is even further from a foolproof solution, regardless of when the NSF-™ connectors are implemented. It will still be possible to take a 500 ml bag of bupivacaine solution, attach a standard intravenous giving set and give the whole dose intravenously. Why the proximal bag spike issue has not been resolved defies all common sense. Surely a smaller diameter spike on epidural giving sets, together with a smaller access port on all bags of local anaesthetic solution, could have been a simple cure for the problem?

I wonder how long it will be before our neuraxial systems are genuinely safe from error? Will it be a small step, or a giant, very protracted, leap?

References

Dr Flatt’s own example, most Americans were not supportive of the moon landings, but the benefits and technological spinoffs from that momentous event have revolutionised modern life and seen a pivotal change in opinion [6]. We hope that will be so with our project too.

Nick Flatt Consultant Anaesthetist
Royal Albert Edward Infirmary, Wigan

Reply to Dr Flatt

It is reassuring to hear from Dr Flatt that the NSF-™ products he has seen were self-evident in terms of assembly and of a usable standard. This assessment will indeed be well received by those involved in the design of the ISO standard, its development and extensive use testing before manufacture and marketing. It will also mean that patients will have the maximum benefit of the new products and a drastic reduction in litigation.

Dr Flatt is correct in his opinion that the NSF-™ system does not ‘absolutely prevent you drawing up something awful (e.g. chlorhexidine) into a compatible syringe and injecting it into the CSF’. Indeed, no single system alone is ever likely to do this, this very example being the focus of a recent NHS England Patient Safety Alert on chlorhexidine safety and a subsequent Patient Safety Alert from NHS Improvement on restriction of open systems for injectable medications [2]. It does however add a significant extra benefit to the existing written administration, which has been the case in the clinical catastrophes that have occurred to date with the Luer spinal system.

The inadvertent administration of local anaesthetic intravenously is really made up of two risks, the syringe bulb and the infusion bag. Picking up a syringe of local anaesthetic and administering it intravenously in error, often during stressful situations, is well recognised. The converse has also been reported, where drugs intended for intravenous use have also been administered as epidural bolus doses in error. Please use the NSF-™ system as one of our many safety steps, this accidental wrong route error should again be reduced.

The ability to take an infusion bag and attach it to an intravenous giving set has been removed already by one manufacturer using a proprietary system [4], creating the first bag-to-patient fully compatible system. A generic international standard is currently under consideration which will provide all manufacturers with the single ‘common sense’ solution Dr Flatt refers to. It is thought the system has safety in its design as it is the first to deliver clinical products into the NHS, ‘Yes we could wait for that perfect solution before introducing NSF-™, but that would deny the existing safety benefits of the NSF-™ system during that time. As Colonel George S Patton said, ‘A good solution with vigour applied now is better than a perfect solution applied ten minutes later’ [5].

Our experiences of working on this project for many years has taught us that while the potential solutions to prevent wrong-route injections may initially seem straightforward, they usually bring additional complexities to the clinical and manufacturing environments, which impinge on functionality, clinical safety and patient safety. Any system, no matter how aspirational the requirements, is likely to be congratulated for having delivered a solution that is supported by manufacturers and clinicians.

It is worth remembering that change is not always embraced, especially at the time of change. Using Dr Flatt’s own example, most Americans were not supportive of the moon landings, but the benefits and technological spinoffs from that momentous event have revolutionised modern life and seen a pivotal change in opinion [6]. We hope that will be so with our project too.

Paul Sharpe
University Hospital of Lewisham NHS Trust
On behalf of NHS Improvement Neuraxial Oversight Group

References

For the latest news and event information follow @AAGBI on Twitter
The AAGBI makes videos from its three major annual conferences (Winter Scientific Meeting in January, GAT Annual Scientific Meeting in July, and Annual Congress in September), and occasional other activities, available online on Learn@AAGBI as a powerful educational resource.

The AAGBI has a rigorous Quality Assurance process that includes on-site assessment by a member of Council. In addition, all videos are checked and undergo further Quality Assurance before being added to the Learn@AAGBI platform.

The Education Committee is now seeking to appoint additional members to its Quality Assurance Panel, to assist with this process. We anticipate 1-3 videos to review per Panel member during the few weeks following each conference, using a standardised assessment template. Training/support will be available as appropriate/required.

We welcome applications from all sections of the membership, but Irish and SAS (non-consultant non-trainee) doctors are currently under-represented on the Panel.

Interested candidates must be AAGBI members and can be of any grade; they should have a clear interest in medical education. Applications should be sent by email to learn@aagbi.org and should include a brief (< 300 words) personal statement describing their suitability for the position. Appointment to the Panel is for three years in the first instance.

The closing date for applications is 31st May 2017.

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What’s on at the Anaesthesia Heritage Centre

19 May 2017: Heritage Centre ‘Lates’
A special ticketed evening event (talk and private view) hosted at the Anaesthesia Heritage Centre (18.00-20.30).

5-7 July 2017: Heritage Centre pop-up at GAT ASM 2017, Cardiff

27-29 Sept 2017: Heritage Centre pop-up at Annual Congress 2017, Liverpool

The Price of a Mile
New exhibition running until August 2017

Visit www.aagbi.org/heritage
The Annual AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain

The Association of Anaesthetists of Great Britain and Ireland invites applications for the 2018 AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain. This prize is open to all anaesthetists, intensivists and pain specialists based in Great Britain and Ireland. The emphasis is on new ideas contributing to patient safety, high quality clinical care and improvements in the working environment. The entries will be judged by a panel of experts in respective fields.

Applicants should complete the application form that can be found on the AAGBI website www.aagbi.org/innovation.

The closing date for applications is Friday 29 September 2017.

Three prizes will be awarded and the winners will be invited to present their work and collect their prizes at the Winter Scientific Meeting in London on 12 January 2018.

Previous winning entries for the AAGBI Award for Innovation, Critical Care and Pain:

2017 - An oxygen reservoir for use in difficult environments by Dr Susan Dorsch, Dr Roger Eltringham, Dr Ylva Konsberg, Mr Robert Neighbour and Dr David Peel.

2016 - Relax Anaesthetics by Dr Peter Brooks, Consultant Anaesthetist at Chelsea and Westminster Hospital NHS Foundation Trust.

2015 - The Non Injectable Arterial Connector (NIC) by Dr Maryanne Mariyaselvam.

2014 - SAFIRA - Safe Injection System for Regional Anaesthesia by Dr Emad Fawzy.


2012 - ‘Air-Free Drip Chamber’ by Dr James Limb and ‘Ultrasound-Guided Regional Anaesthesia with an Optimised Ultrasound Transducer’ by Dr Graeme McLeod.

Find out more about the AAGBI Innovation Award visit www.aagbi.org/innovation

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Call for nominations for the AAGBI Awards and AAGBI Foundation Awards

Nominations are sought for the following awards:

The AAGBI Award is awarded by the Board of Directors of the AAGBI to those who have made significant contributions to the AAGBI, its objects and goals, or its members. The award is not restricted to members of the AAGBI. The current objectives of the AAGBI are:

- To advance and improve patient care and safety in the field of anaesthesia and disciplines allied to anaesthesia.
- To promote and support education and research in anaesthesia, medical specialties allied to anaesthesia and science relevant to anaesthesia.
- To represent, protect, support and advance the interests of its members.
- To encourage and support worldwide co-operation between anaesthetists.

The AAGBI Foundation Award is awarded by the Board of Trustees of the AAGBI Foundation, the AAGBI’s charity, to those who have made significant contributions to the AAGBI Foundation, its objects and goals. The award is not restricted to members of the AAGBI. The current objectives of the AAGBI Foundation are:

- The advancement of public education in and the promotion of those branches of medical science concerned with anaesthesia, including its history.
- The promotion of study and research into anaesthesia and related sciences and the publication of the results of all such study and research.
- The advancement of patient care and safety in the field of anaesthesia and disciplines allied to anaesthesia in the UK, Ireland and anywhere else in the world.

Nominations should take the form of a short description of the nominee’s contributions (no more than one side of A4 paper*). Self-nomination is acceptable. If you nominate someone else, you should gain their approval for your nomination. The closing date for nominations, which should be sent to honsecretary@aagbi.org, is 26 May 2017.

The AAGBI’s Honours and Awards Committee will consider nominations at its meeting on 09 June 2017, and will make recommendations to the Board of Directors of the AAGBI and the Board of Trustees of the AAGBI Foundation, which will determine the recipients of the 2017 AAGBI Awards and AAGBI Foundation Awards. The successful nominees will be informed shortly afterwards. The awards will be made at the AAGBI’s Annual Congress in Liverpool (27-29 September 2017) or at WSM London 2018 (10-12 January 2018).

* Minimum font size – 12 pt

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Thursday 27 July 2017 - Monday 31 July 2017

Today's selection

Anaesthesia May 2017

A randomised, crossover simulation study comparing the impact of chemical, biological, radiological or nuclear substance personal protection equipment on the performance of advanced support interventions

Schumacher J, Arlidge J, Garnham F, Ahmad I.

The recent Ebola outbreak in West Africa should be a reminder that personal protection equipment is particularly important for the well-being of caregivers in many challenging circumstances. In this country there are also many situations of chemical, nuclear, radiological and biological hazard that require heavy duty protection. Many protection suits are bulky and unwieldy, and it is inevitable that sooner or later we will be called upon to provide advanced life support while using such equipment, so it may be a good idea to study and consider this before it actually happens to us.

The authors assessed the performance of 30 anaesthetists performing advanced life support in a simulated scenario using a manikin. Times to complete resuscitation manoeuvres were used to assess and compare performance without protection, with protection using the Powered Respiratory Protective Suit (PRPS) and with protection using a more lightweight alternative, Polyprotect 12.

Fortunately, there were no adverse events for either the manikin or the participants who wore protection suits during the simulated exercise. Perhaps unsurprisingly, the unprotected participants performed best. The PRPS was less comfortable than the Polyprotect 12, and time to complete interventions was significantly longer with the PRPS than with the Polyprotect 12. What is surprising is that the Polyprotect 12 is cheaper than the PRPS. This may be one of those rare times when we can improve protection for clinicians, improve patient management and save money all at the same time.

A prospective, randomised trial of pre-oxygenation strategies available in the pre-hospital environment

Groombridge C J, Ley E, Miller M, Konig T.

Pre-oxygenation is a strategy that we use to increase the safe apnoea period after induction of anaesthesia in theatres. It is particularly useful in circumstances where intubation or facemask ventilation may be difficult, and has become a standard of care in operating theatres. In the pre-hospital environment, pre-oxygenation is arguably even more important before induction of anaesthesia, but how best to accomplish it without an anaesthetic machine, using equipment that is generally available?

The authors compared efficiency of pre-oxygenation in healthy volunteers using a non-rebreather mask, bag-valve-mask and a portable ventilator, with ease of breathing as a secondary outcome. The portable ventilator was the most efficient method of pre-oxygenation, particularly where visual attention is a factor.

These results may be due to the typical limitations of design in simulated environments, particularly where visual attention is a factor.

The authors concluded that anaesthesia in simulated environments paid more visual attention to monitoring while using such equipment, so it may be a good idea to study and consider this before it actually happens to us.

The previous two papers used simulated environments to study resuscitation personnel with manikins and pre-oxygenation with volunteers. The assumption underlying both studies is that the results will also be applicable to real-world situations. This paper by Grundgeiger et al. explored these assumptions, and compared anaesthetists’ visual attention and interaction with monitoring in both simulated and real environments.

The authors concluded that anaesthetics in simulated environments paid more visual attention to monitoring than in real cases, and this was unaffected by the experience of the anaesthetist. They highlight the need for caution in extrapolation of results from simulated environments, particularly where visual attention is a factor.

The authors concluded that anaesthetics in simulated environments paid more visual attention to monitoring than in real cases, and this was unaffected by the experience of the anaesthetist. They highlight the need for caution in extrapolation of results from simulated environments, particularly where visual attention is a factor.

These results may be due to the typical limitations of design in simulated training environments, where participant behaviours are driven more by visual and auditory cues from monitors and other sources of data than more diverse and subtle cues in a real-world environment that involves patients rather than manikins.

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

B J Jenkins, Editor, Anaesthesia

Anaesthesia News May 2017 • Issue 358

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The oxygen reservoir was submitted to the innovation awards as it is the first commercially available device to effectively capture and store oxygen from a concentrator at safe pressures for use in hospitals. Diamedica are delighted that the AAGBI has recognised the reservoir system’s importance and its potential to make medical oxygen universally available.

Most hospitals in low resource settings do not have a reliable oxygen supply. Piped oxygen is a rarity and oxygen cylinders are expensive, difficult to transport, and run out. Domiciliary oxygen concentrators are widely used as a low-cost source of oxygen, but they depend on electrical power that is notoriously unreliable in low resource settings. One approach is to provide electrical backup systems to overcome the electrical power failures, but this can be expensive and cumbersome. The novel Diamedica technology enables the storage of oxygen which has been generated by a concentrator when electricity is available. Thus essential oxygen is always available, even during subsequent power cuts.

This versatile system is designed to store oxygen in vessels at a pressure of 5 bar which is adequate to drive a suitable ventilator (Diamedica Helix Ventilator) or anaesthesia machine (Glostavent anaesthesia workstation). The storage of oxygen at these lower pressures does not require sophisticated and complex technology, at the same time the lower pressures ensure the safety of the system for use in a hospital environment.

The stored oxygen can be used for both draw-over and continuous flow anaesthesia, but it should be recognised that a continuous flow machine is likely to use 6 to 8 times the flow rate required by a draw-over machine, and would therefore require the storage of much greater quantities of oxygen to give reasonable backup times. Work is ongoing to enable this. Oxygen stored in the reservoir vessels can also be used for direct supply to patients during power cuts or when the oxygen concentrator is on standby and they are mainly used in emergency and disaster situations.

Kenya

A reservoir system supplied with a low pressure/low flow Glostavent Helix anaesthesia machine has made a considerable impact at a low cost day care surgery centre in Nyeri, Kenya. According to surgeon Dr Mathenge Ndihu, operations do not proceed without the reservoir on standby and they are mainly used in recovery. Without the system the centre would be making round trips to Nairobi to 400 km every fortnight to refill oxygen cylinders. In the long term this will translate into large savings for the hospital that will help to keep their costs lower.

The cost effectiveness of this approach can be illustrated by considering that oxygen per litre generated from concentrators may be as little as 1% of the cost of oxygen provided in cylinders. Generating oxygen at the point of use eliminates the problems of transport and, with the possibility of storing that oxygen in multiple vessels, the approach has great potential for cost savings as well as security of supply.

Liberia

Two oxygen reservoir systems were supplied to hospitals in Liberia by Maternal and Child Health Advocacy International (MCAI), one of the few charities that worked in the country during the Ebola epidemic. MCAI Medical Director, Professor David Southall, confirmed that the reservoir systems had been invaluable at both Phebe Hospital and C.B. Dunbar Maternity Hospital. An oxygen generating plant has now been installed at Phebe, although the reservoirs continue to be used on a daily basis, as a backup supply in theatre and for patients in intensive care. C.B. Dunbar Hospital has no oxygen generator and cylinders have to be transported from Monrovia, some 200 km away. The oxygen reservoir system at this hospital continues to provide an invaluable resource that ensures a supply of oxygen is always on hand when needed.

Mobile hospitals

The reservoir system is used not just in fixed locations but also in mobile hospital units. The Dutch organisation Hospitainer supplies fully-equipped mobile hospitals to the UN, MSF and other organisations in response to emergencies. They now include the Diamedica oxygen reservoir system in their mobile hospitals. CEO Rolof Mulder selected the reservoir system because its mobility, ruggedness, ease of use and independence of cylinders makes it a reliable and practical solution for the challenging conditions in emergency and disaster situations.

Feedback

This original concept and design of the oxygen reservoir system was first described in Anaesthesia News in 2015 [1], since when it has successfully transitioned into wider production and is now in use in 14 countries where supplies of medical oxygen are limited. Feedback has been very positive as the following examples illustrate.

• Issue 358

May 2017
Evidence-based medicine guides practice, but case reports fill the gap where the evidence does not currently exist and are used as a platform to launch formal studies, to document trends in new patient management options and for educating clinicians.

Anaesthesia Cases was launched in January 2013 as an online library of case reports in anaesthesia, pain management and intensive care medicine. These are case reports that previously would have been considered for publication in Anaesthesia. Journals have reduced the number of case reports they publish, or even excluded them altogether. Anaesthesia Cases was created in order to ensure that informative, educational and important case reports continue to be published.

Each case report submission is reviewed by at least two Editorial Board members and the author of an accepted case report will see it published online, usually within a couple of weeks following submission. It will be given a unique digital object identifier (doi) and will soon be listed on PubMed. Exceptional case reports will be considered for publication in Anaesthesia.

Here are just a few reasons why you should submit a case report to Anaesthesia Cases:

- It is free to AAGBI members (and non-members can log onto the website free of charge)
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- It encourages improvement in an individual’s personal understanding of a topic
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The types of case reports we publish include descriptions of new regional nerve blocks, novel oxygenation techniques, as well as unusual complications of general anaesthesia and drugs. Each case report will be considered on its individual merit; all we ask is that it provides an interesting and original learning point. We have already published more than 200 case reports since our launch, a rate of one each week.

Please submit your interesting case report today, or browse our website and comment on case reports that have already been published. The library of case reports and information regarding submissions can be accessed at www.anesthesiacases.org.

Kariem el-Boghdadly, Trainee Fellow
Helen Laycock, Assistant Editor
Serene Chang, Assistant Editor
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For those who are happy to get their AAGBI news via Twitter, the official President’s Twitter account is @AAGBI President and the blog is at www.aagbipresidentsblog.wordpress.com. I hope you will follow both.
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Comparison of oral clonidine, oral dexmedetomidine, and oral midazolam for premedication in pediatric patients undergoing elective surgery

Anesthesia, Essays and Researches 2017; 11: 185–91

Introduction
Peri-operative anxiety can result in challenging management for adults and children alike. Utilisation of premedication, especially in paediatric cases, can help alleviate this issue to promote smooth induction. Oral midazolam is commonly used in the role of premedication of such cases [1]; however, alpha-2 agonists such as clonidine and dexmedetomidine in this role have provided a potential alternative [2,3]. This study reviewed the efficacy of oral midazolam, clonidine, and dexmedetomidine for premedication in children undergoing surgery. Effectiveness of pre-operative sedation, anxiety, parent separation, mask acceptance, and pre-operative haemodynamic parameters were assessed.

Methodology
A prospective, randomised, double-blind study was conducted. A sample of 30 children aged 4–12 years with ASA physical status 1 undergoing ophthalmic surgery was utilised. Patients were randomly split into 3 groups of 10, a group receiving oral midazolam, a group receiving oral dexmedetomidine and a group receiving oral clonidine.

Different aspects including treatment/tolerance of medication, degree of sedation and anxiety levels were each assessed using a scale system, with different levels of each category being allocated a score. Scoring systems including a Likert scale and a parental separation scale were used to assess mask acceptance and parental separation, respectively [3,4]. The clinician who monitored the patient, scored patients’ behaviour, and collected the data was blind to the study drug administered.

Primary outcomes were patient numbers showing acceptable separation from parents and satisfactory mask acceptance. Secondary outcomes included sedation onset time, mean sedation score and mean anxiety score.

Results
All cases were deemed to demonstrate satisfactory acceptance/tolerance of premedication based on scoring system used.

Oral sedation occurred at 15 min from administration for midazolam, compared to 30 min for clonidine and dexmedetomidine. Mean sedation score was additionally deemed more significant with midazolam at 30, 45, and 60 min as compared to clonidine and dexmedetomidine. Mean anxiety score was calculated as being significantly less with midazolam than the other two medications at 60 min.

Acceptable parent separation scores were achieved in 100% of children receiving dexmedetomidine, 90% of those receiving midazolam, and 80% of patients receiving clonidine. All three medications were deemed to be comparable regarding satisfaction levels, such as hypoxia, bradycardia, respiratory depression, oxygen desaturation, or apnoea.

Discussion
All three medications were deemed safe and effective for premedication via oral administration. Midazolam was identified as having faster and higher sedation scores. It additionally demonstrated lower anxiety scores than the other two medications in regards to the primary outcome of this study, dexmedetomidine was described as having comparable results regarding parent separation.

Conclusion
I found this study to be relevant and of good scope. The authors covered multiple aspects to review effectiveness of the medications in question from different perspectives. Compilation of a randomised double-blind study help to reduce bias, but reliance of a scale system might be a degree of subjectivity; although I imagine its usage would be difficult to avoid due to the nature of the study. The report states dexmedetomidine is currently not approved for use in children, however the authors have noted studies/reports of its use. The authors recognise that additional studies would be warranted for further evaluation of this medication in children.

Sadi El-Ghazali
ST5 Anaesthetics, Royal Manchester Children’s Hospital

References
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