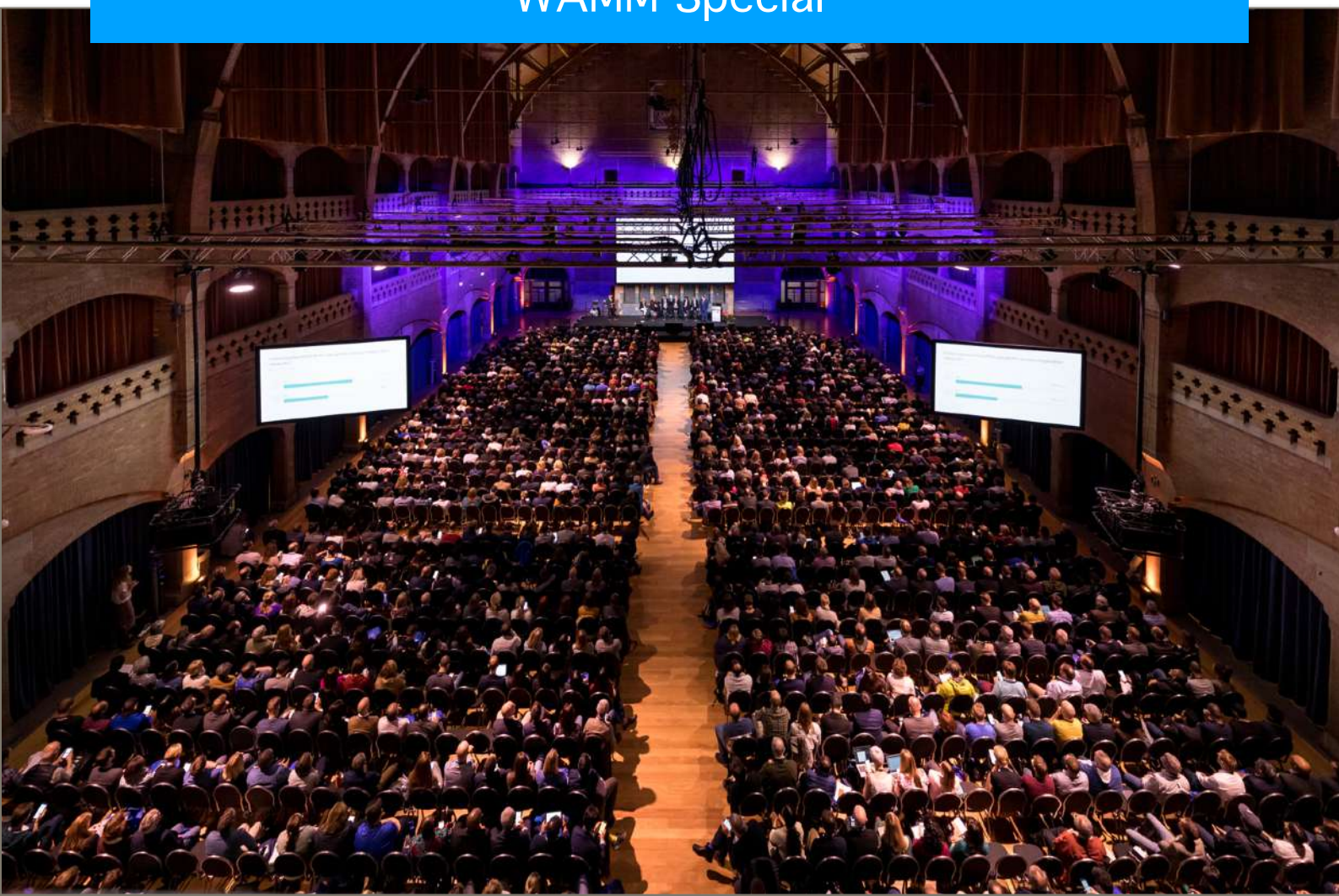
Difficult Airway Society Newsletter

January 2020

WAMM Special



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| Vassilis Athanassoglou | Kimberley Hodge | Ned Gilbert-Kawai | Valerie Lan-Pak-Kee |

Dear Reader,

Welcome to the winter edition of the DAS newsletter.

We would like to welcome everyone back from WAMM in Amsterdam! What a great conference, with a lot of educational content. Moreover, the new Awake Tracheal Intubation guidelines were very successfully launched with some impressive technological innovations!

Another exciting development is that this newsletter is the first DAS EZine. This signals a new and refreshing direction. In this edition, you will read all the latest mouth-watering news involving our society. There has been a lot of work going on behind the scenes that we would like our membership to learn about. Our trainee representatives are truly great and are becoming increasingly involved in our society which is an exciting development.

In this newsletter, you will hear from our executive committee members. They will give you a taste of what is going on in their respective areas. From my point, we have two main developments. The first is the newsletter, its new role and its future. The second is the website.

Regarding the newsletter, we asked the membership's opinion as to what direction we should take and what information they would find interesting. We have taken all your comments on board and we hope this first edition of the EZine demonstrates this.

The next big project involves the society's website. You will be happy to know the long-awaited website upgrade has started and we ask for your patience. We have been working hard to deliver a revamped, upgraded website with increased functionality and mobile capabilities. We invite you to send us your comments about the new website and what you think needs changing or upgrading.

Moreover, in this issue we announce the trainee essay competition winner. I am sure you will find it stimulating and thought-provoking. It refers to a topical subject and we look forward to hearing your opinions.

As we have mentioned before, we are trying to make this society more about you, our membership, and we are looking forward to working with you towards this goal.

So, I hope you enjoy reading through this winter edition of our newsletter and I look forward to receiving lots of comments at: newsletter@das.uk.com (newsletter) and webmaster@das.com (website).

Vassilis Athanassoglou
DAS Newsletter editor and Webmaster

WE WANT TO HEAR FROM YOU

DAS encourages member participation - we would love to read your comments, contributions and suggestions for future newsletters. Have you been involved in an interesting airway case? Is there an article that has changed your practice? Do you have an idea for improving airway anaesthesia that you would like to collaborate on? All formats welcome: text, video, photo, infographic… We know you are a creative bunch! Send us your thoughts at newsletter@das.uk.com.

@dasairway

@dastrainees

PRESIDENT'S REPORT

| Barry McGuire |

With two pivotal events for DAS approaching simultaneously, we have all been working pretty hard to cross every t and dot every i. Many have been working considerably harder than me and I have witnessed regular emails sent at unhealthy hours! The second World Airway Management Meeting in Amsterdam and the launch of the DAS Awake Tracheal Intubation Guidelines will have both occurred by the time you read this, but right now they are in 'full steam ahead' mode.

WAMM will of course further strengthen the internationality of airway management as venues for subsequent world airway meetings are considered and enthusiasts from around the world share ideas and proposals. PUMA (Project for Universal Management of Airways) will feed into this global progress and we expect developments from this group in 2020.

DAS continues to promote its overseas work in several continents, including Africa, teaching in Uganda, and Asia, both in India and Vietnam. We are heavily involved in *Facing The World*, a charity set up to promote the care of maxillofacial deformity in Vietnam. As well as facilitating the visits of Vietnamese anaesthetists to the UK for training in advanced and specialised airway management, DAS will be integral in the implementation of High Flow Nasal Oxygen systems into Vietnam and our ex-President, Anil Patel, is travelling to Vietnam to provide world-class education to the lead players in this exciting development. I expect this to have a major impact in terms of safer anaesthesia in Vietnam.

Closer to home, DAS continues to work on several projects. Soon, we expect the release of a joint RCoA-DAS document titled *Your Airway and Breathing under Anaesthesia*, which has been produced to aid clinicians explain airway management to their patients and shall be available on the DAS website. As well as making steady progress on guidance on the Human Factors and Ergonomics of Airway Management and the Ethics of Airway Management, DAS has started making plans with the Association of Paediatric Anaesthetists to produce revised APA-DAS guidelines for management of paediatric airway difficulty.

The first big announcement of 2020, however, will not be new guidelines but the eFONA Database. This is a RCoA-DAS project aiming to prospectively collect data on 'neck rescue' cases around the UK with the aim of providing data on the issues and key

factors in this rare and unwanted procedure. Airway leads who attend the AWLs meeting at the College in March next year will hear all about it in detail, but there will be plenty of communication on this by other means. DAS hopes that this national audit will be a 'game-changer', a la NAP4, in the management of critical airway compromise. Of course, the DAS Difficult Airway Database (and Airway Alert Card system) continues to progress extremely well and will hopefully provide us with some data in due course.

The second big thing will be the new DAS website, which currently is still in development, but we hope will be up and running by the new year. We aim to step up everything on the website in terms of presentation, content and functionality. This will be evolution, not revolution of course, but please feed back your thoughts on the good and bad bits. There is a plan to update our educational material on the website and we will also raise our profile in social media, which will clearly have to involve someone other than dinosaurs like me.

In terms of personnel, not too many changes this year. We have added Ravi Bhagrath to the committee, as RCoA-DAS Airway Workshop Lead, which is fantastic news as it will help DAS increase its ability to spread the DAS word in practical teaching provided by a variety of sources around the UK. We say farewell this month to Elana Owen, one of our trainee reps. Elana has been gold dust. She is fantastically positive, creative and enthusiastic, contributing in many areas, including the newsletter, DAS essays, trainee perspective and representation in airway events and overseas teaching. Her replacement is Valerie Lan-Pak-Kee, who we are also quite excited about as she looks like someone who can offer DAS new ideas and perspective.

SECRETARY'S REPORT

| Imran Ahmad |

I have now completed one year as DAS honorary secretary and a lot has happened at DAS during this time! I will summarise some of these achievements in my report below.

The total DAS membership has grown to 3400, with a steady rise in full members. We have been working on additional resources such as education tools, videos, cognitive aids and website upgrades for our members which we hope will be going live during 2020. I would like to ask our existing members to encourage your anaesthetic trainees and anaesthetic assistants to also join DAS and benefit from the resources available.

The DAS committee has gained two new members over the past year. The first, Dr Ravi Bhagrath, is now our airway workshop coordinator. Over the past few years we have been receiving an ever increasing number of local, national and international requests for DAS approval and so we are delighted that Ravi has agreed to join us and help with coordinating and facilitating these requests. He will also be involved in organising DAS-run airway workshops at national meetings, such as the Association and Trainee Conferences. He will also be the link person between DAS and the Royal College of Anaesthetists with all matters regarding airway workshops. So an exciting and busy time ahead!

The second new member that I would like to welcome is Dr Valerie Lan-Pak-Kee, as the new DAS trainee rep. We had 11 excellent applicants for this position from trainees across the country. Myself, Barry and Andy had the difficult task of shortlisting and interviewing the applicants, all of whom were of a very high calibre. Valerie impressed us all with her enthusiasm, interest in medical education, communication skills, publications and ideas for what DAS can provide trainees in the future. So Valerie has done extremely well in being appointed to what is the most competitive position held on the DAS committee!!!

As two new members join the committee, sadly we have to say goodbye to two others. Dr Elana Owen and Paul Martin have come to the end of their respective terms on the committee and so will be leaving us. Elana has really helped raise the profile and membership of DAS amongst anaesthetic trainees, reflected by the impressive numbers of applicants for trainee rep position. Elana has also contributed to editing of the DAS Newsletter and running the DAS trainee essay competitions and DAS photography competitions. One of the highlights for me has to be the joint EAMS/DAS/SAM trainee session which Elana helped organise at WAMM this year, this was an excellent, educational and fun session of 'Airway Jeopardy' attended by nearly 100 trainees and hosted (badly) by yours truly! I would like to thank Elana on behalf of the committee for all her hard work over the past two years and wish her the best for the future.

Paul Martin was appointed to the DAS committee 4 years ago as its first lay member. The Society recognised the importance of having a lay member on the committee and fortunately for DAS Paul took up the position. During his term, Paul has been involved in many important DAS projects to which he has offered his invaluable experience and expertise. These include the ADEPT project, DAS Airway Alert card project, the DAS Ethics guidelines and other numerous DAS committee matters. Thank you Paul for your contributions to DAS and I hope you enjoy your future ventures.

DAS has also provided academic and charitable support to a numbers of causes in 2019, such as the excellent Facing The World charity which promotes life-changing surgery for patients with maxillo-facial conditions in Vietnam, airway workshops in countries such as Uganda and India and funding for NIAA and IRC grants.

There was also the official launch of the publication of the DAS ATI Guidelines at WAMM in November this year. The open access paper has been available for early viewing on the Anaesthesia Journal website since November and will be officially published in early 2020. So far the interest in the paper has been staggering! The current Altmetric score is 465, putting it in the top 10 outputs from Anaesthesia ever and in the top 5% of all research outputs ever tracked by Altmetric. The paper had over 60,000 downloads by the end of the conference. I would like to thank the ATI group members for all their time, commitment and hard work in making these important guideline such a huge success.

This moves me on nicely to WAMM. What a successful meeting we had in Amsterdam. Over 1700 delegates from all around the world attended an excellent conference. There was a prominent DAS presence with DAS members being heavily involved in the WAMM organising committee, programme, workshops, abstracts and trainee sessions. We look forward to the announcement of dates and venue for the next WAMM in 4 years. Many congratulations to Elizabeth, Ellen and Anil for yet another successful WAMM!

As a result of WAMM we did not have our own DAS ASM this year and decided to wait until 2020 to present the Macewen medal, Industry award and Ralph Vaughan cup, all of which will be presented at the DAS ASM in Birmingham. The DAS committee is grateful to the Birmingham LOC for accepting the opportunity to host the 2020 Silver Jubilee ASM at short notice and we are all looking forward to a great meeting. For more details please follow on @DAS_2020 and look out for website details. The venue, workshops, provisional programme and social events look great and I am certainly looking forward to attending next year.

Finally, I take great joy in congratulating Anil Patel for being awarded the title of DAS Professor. This highly competitive title is only awarded to applicants who have demonstrated excellence in a number of categories and Professor Patel excelled in every category. We are delighted that all of his contributions to DAS, the speciality, airway research and improved patient care has been recognised in this way, many many congratulations Anil.

So that's what happened in 2019! Lots more to look forward to in 2020- including more DAS guidelines, more website upgrades, more trainee material, more for associate members and more education material. Bring on 2020!

SCIENTIFIC OFFICER REPORT

| Kariem El - Boghdadly |

Since inception, DAS has held an important position in anaesthetic practice. However, the global role of DAS has once again been demonstrated in the last few months. We have published high-impact guidelines, have helped run one of the most exciting anaesthetic meetings, and have awarded another exceptional DAS Professorship.

In 2019, DAS has agreed to contribute a total of £20,000 to the National Institute of Academic Anaesthesia (NIAA) Grant rounds, split between large Project Grants and Small Grants. In Round 1, we received applications requesting nearly £50,000, and agreed to fund one clinical trial that should have tremendous reach. In Round 2, we have received one application that is yet to be assessed. We have yet to receive any new applications for the DAS PhD Scholar this year, but we welcome any interested researchers seeking support.

It was with absolute pleasure we announce the appointment of the latest DAS Professor: Anil Patel. This name is familiar the majority of anaesthetists in the UK and beyond, having been a former DAS President, invented a videolaryngoscope that many of us use, and pioneered the transnasal, humidified, rapid insufflation ventilatory exchange (THRIVE) technique that has changed practice. We congratulate Professor Patel and continue to work with him closely here at DAS.

The DAS awake tracheal intubation (ATI) guidelines have finally been published, to great fanfare. The launch at the World Airway Management Meeting (WAMM) was introduced by Alexa, with myself and Imran presenting the guidelines for the first time to an audience of thousands. The guidelines went viral on social media, with more than half a million impressions and 60,000 full-text downloads in the first day, and they are currently one of the highest impact publications in anaesthetic research.

In a similar vein, guidelines on human factors and ethics in airway management are expected to follow suit and are likely to be ground-breaking documents to refine all of our practice. Still in their early stages, a project on nomenclature in airway management is in the early stages of development and will also play an important role in how we practice and research airway management.

Finally, there has been much discussion about the possibility of a new DAS Journal focusing on airway management and related sciences. As previously, plans and development of this possible project are ongoing—watch this space!

I would once again like to take this opportunity to remind our members about several opportunities available. Firstly, we would like to invite all members to consider the DAS PhD Programme. This Programme gives support to researchers who have a list of publications that may be suitable to put together as a PhD. DAS will support applicants throughout the process of a PhD by publication, including funding support. Secondly, DAS will also be funding suitable grant applications in the first NIAA Grant round of 2020. If you have any projects that you would like to fund, bear this date in mind. Finally, the DAS Faculty of Professors is an untapped resource that is open to any DAS Member to reach out to for guidance, support or advice on any academic matters, including grant applications and study design. If any of these opportunities are of relevance to you, please feel free to reach out to me any time!

Our long-term vision is to take DAS to the next level academically, and begin to harness, design and develop our own projects with our able, enthusiastic, creative and brilliant membership. Watch this space and do not hesitate to reach out and get involved!

Scientific-officer@das.uk.com

PHOTOGRAPHY COMPETITION WINNER

| Tamryn Miller | The Crucial Moment

"Simulation training in a mixed reality environment; pictures from our hospital were projected as a backdrop in the VR suite. To make it as real as possible we added our anaesthetic machine, difficult airway trolley, and staff. It was a great training day!"

MEMBER'S SURVEY

| Sam Perera |

Thank you to everyone who completed the DAS member survey in May-June 2019. 1825 UK members and 380 overseas members were sent the survey. The response rate was 17%. The committee studied the results in detail and aims to shape the future of DAS in tandem with the views of its membership.

The majority of respondents (79%) were consultants. We would like to encourage our trainee members to contact our trainee reps with ideas and suggestions at trainee@das.uk.com.

Joining a community/network of fellow enthusiasts was the most popular reason for joining DAS (77%), followed by access to educational resources (32%), recommendation by a colleague (26%) and member discounts for events (24%).

Our survey identified a need to upgrade our website both in terms of functionality and content, which we are now in the process of doing. Common suggestions include increased content in the form of case discussions, debate, photo and video training material, summaries of airway articles, updates on medical mission experiences, ADEPT and guideline progress. 'How-to' guides for developing courses, conducting M&Ms and developing non-technical skills were also requested. 71% of respondents felt that forums should be member-only access. Should you wish to make website suggestions please contact webmaster@das.uk.com.

We asked for comments on our Annual Scientific Meeting. Workshops, content, debates and sessions with audience participation were specifically praised. A common suggestion for improvement was to have greater appeal to the "non-airway specialist" anaesthetist and to include standard airway dilemmas. Suggestions for future ASMs can be directed to president@das.uk.com and secretary@das.uk.com.

Most respondents (90%) wanted DAS to keep producing our newsletter, with 70% stating it should be online only. Comments included appreciation of clinical articles, the size and the frequency of production. If you have ideas or articles you would like to see, please email newsletter@das.uk.com.

We asked for views on an open access online journal on airway management. 84% of respondents were in favour of such a journal (45% definitely and 40% probably in favour). Desired content included case reports/case series, original research, guidelines, expert opinion and quality improvement initiatives. Respondents who did not want a journal cited the following: information/journal overload; concerns over the quality of the articles; that airway management should not be segregated from mainstream journals; and cost implications to members with better use of resources elsewhere.

When asked about a rise in membership fees, 48% thought a rise from £25 to £50 was acceptable and 52% did not. Of those who wanted to limit the rise in fees, 48% would rather not have a journal but keep other initiatives such as the website upgrade and the newsletter, versus 27% who would prefer the journal over other initiatives, and 25% who would rather limit a rise as much as possible without any initiatives.

Once again thank you for the time taken to complete this survey and having your say in the future of DAS.

NIAA RESEARCH AWARD

The National Institute of Academic Anaesthesia (NIAA) will be familiar to many anaesthetists and those academically interested in airway management. The NIAA was established in 2008 with a vision to improve patient care by promoting the translation of research findings into clinical practice; to facilitate high profile, influential research; and to facilitate and support training and continuing professional education in academia. The NIAA is the umbrella organisation for the Health Services Research Centre (HSRC), National Audit Projects, and Perioperative Quality Improvement Programme (PQIP), amongst others.

The NIAA held its first combined meeting with the Anaesthesia Research Society, BJA Research Forum, and UK Perioperative Medicine Clinical Trials Network (POMCTN) in York in December 2019, featuring a wide variety of presentations and topics from active researchers. The meeting incorporated the Annual NIAA Research Award, awarded to an individual who has demonstrated excellence in scientific research relevant to anaesthesia, perioperative care or pain. Applicants were invited to present a body of work typically the equivalent of two or more research papers on a subject area or from a higher degree or thesis (MD/PhD).

DAS has been supporting and enabling clinical staff with an interest in airway research to develop themed bodies of work into academic proposals for DAS PhD Scholarships for a number of years. Dr Brendan McGrath from Manchester was selected as DAS PhD Scholar in 2017, completing his PhD by published works in 2018. This themed body of work comprised several papers relating to understanding problems with tracheostomy care in the NHS, developing and testing strategies to address educational and infrastructure shortfalls, and then large scale evaluations of quality improvement interventions to change practice. Brendan's work is typical of a clinical academic who has increasingly engaged in research alongside his NHS consultant role, and the DAS PhD program is designed to support people like him. You can read about Brendan's experiences as a DAS Scholar in the October 2018 DAS newsletter:

https://das.uk.com/files/2018/page/DAS Newsletter-October18-updated.pdf

Despite being a little older than some of the other applicants, Brendan's work was shortlisted for presentation at the NIAA Research Awards 2019. Brendan won the award with his presentation entitled 'Improving Tracheotomy Care: an evidence based approach' - something that would not have been possible without the support of DAS and the mentorship of their Scientific Committee and faculty of DAS Professors.

So congratulations to Brendan - and if this article has piqued your interest in what you could achieve by formalising your academic achievements into a DAS PhD, get in touch...

TRAINEE UPDATE

Kimberley Hodge | Ned Gilbert-Kawai | Valerie Lan-Pak-Kee |

Together with EAMS and SAM, DAS hosted a fantastic trainee event at WAMM. A Jeopardy style game took place, and Kariem El-Boghdadly's team managed to throw away a convincing lead allowing Imran Ahmad's team to snatch success from the jaws of defeat. Unlucky Kariem....rematch at DAS Birmingham? Thanks to all of the trainees that took part in the session; over 100 joined us which was fantastic, and a good time was had by all.

Congratulations to François Lemay, who, despite some stiff competition, triumphed in the trainee essay competition. His essay is included in this edition - and makes for fascinating reading.

DAS are keen to support trainees in gaining airway experience during their training. We are compiling an airway fellowship database, which will be launched with the new website. Please get in touch if you are currently undertaking an airway fellowship: trainee@das.uk.com.

You may have noticed the new-look newsletter. We want to expand the newsletter to incorporate interesting case reports, letters to the editor, inspiring articles....We know you lot are a creative bunch, get writing in, and get published in the DAS Newsletter! Contact us at newsletter@das.uk.com

We've had a great time meeting you and hosting the session at WAMM. Next stop - the AAGBI Annual Trainee Conference in Newcastle (July 2020). DAS will be running a workshop and hosting a social session... so look forward to seeing you then!

@dastrainees

AIRWAYS ABROAD

| David Nesvadba | Aberdeen Royal Infirmary

In May 2019 I had the opportunity to travel to Accra in Ghana to observe, learn and participate in the delivery of anaesthesia for complex airway pathology. My involvement in this project came down to a healthy slice of luck – an email from a colleague asking if I wanted to come along. An offer too good to refuse. As an anaesthetist, airway management is a natural area of interest. I have had plenty of exposure to a variety of challenging airway scenarios throughout my training. However, I was not sure of the level of complexity I would encounter in my one-week trip to Ghana and how I would adjust to a completely different working environment.

I was invited to attend with two other clinicians from the UK, Professor David Howard (a head and neck surgeon) and Ned Gilbert-Kawai (an anaesthetist/ intensivist and origin of my invitation). David Howard has been travelling to the Korle-Bu Hospital for over ten years building partnerships, exchanging skills and supporting surgical development. The Ghana project is just one of a few hospitals David has worked with throughout Africa. Our visit to Korle-Bu was a gentle introduction to African healthcare. The intention is to travel to Tanzania next year and provide teaching and support in a similar way.

Pre-trip preparation: travel visa and a formal invitation from the ENT department in Accra was coordinated by David. With vaccinations and departmental leave organised I was ready to go. I was extremely grateful to have flights and accommodation funded by the Rhinology and Laryngology Research Fund, an organisation that promotes the development of head and neck surgery worldwide.

Upon arrival in Accra we were met by Dr Ken Baidoo who dispatched us to our basic but functional on-site accommodation at the Korle-Bu Hospital guesthouse. The hospital site is a sprawling mass of 1960's style concrete buildings, colonial architecture, the occasional modern structure - the heterogeneity providing a certain charm. Korle-Bu is a tertiary teaching hospital affiliated with the University of Ghana Medical School. It provides multi-speciality postgraduate training in all major specialities including cardiothoracic surgery, neurosurgery and paediatrics. The obstetric unit deals with over 12000 deliveries each year, many of the mothers high risk. A maternal mortality rate in the

region of 900/100000 tells its own sobering story.

The ENT department welcomed us warmly and invited us to observe the Monday outpatient clinic. With no discernible appointment system, patients waited with incredible levels of tolerance to be seen in 1 of around 10 consulting rooms. They were attended to by a team of nurses and specialists all day. Nobody complained. The patients we saw made up our operating caseload in the coming days, a few of whom were already known to Prof Howard from previous visits.

The operating theatre environment was dated but clean and functional. We were introduced to Brenda Phillips, the senior anaesthetist usually attached to the ENT theatre. She explained that they have a range of airway equipment, most of which is cleaned and reused including 1st generation supraglottic airway devices. There is access to a videolaryngoscope and fibre-optic equipment from the intensive care unit. The formulary is relatively limited. Each patient is advised on the drugs they require prior to surgery, they must be purchased and brought on the day of surgery. The advised drug list is restricted to essential medicines in order to keep costs low. There is limited access to vasoactive agents, fluid and blood products are often donated in advance by family members in cases of predicted blood loss.

Operating lists were constructed in a similar way to the UK and the WHO check-list was used with varying levels of participation. The team at Korle-Bu had some years previously acquired a LASER with help from Prof Howard. Its use has increased in recent times as training and familiarity grows. The bulk of the case mix we saw were cases of subglottic stenosis secondary to traumatic injuries. Most of these patients undergo emergency tracheostomy when they initially present and are then brought back for EUA, LASER treatment and balloon dilations. Unfortunately many of the patients we saw were young men with long-term tracheostomies and significant subglottic scarring. The social implications of this were clear to see and these patients were ever hopeful of decannulation.

Of the many cases we were involved with the one that made the biggest impact was a 13 year old boy with a large neck mass. The neurofibromatous lesion had been slowly expanding over years but now causing cervical cord compression. Anteriorly there was striking radiological compression of the oropharynx, submandibular space and nasopharynx. This young boy who, rather incredibly, had very little in the way of any symptoms, was felt to be close to coming to serious harm. He underwent a 14 hour procedure which included a piecemeal resection of the mass that had engaged the cervical nerve roots and brachial plexus. He had a tracheostomy placed and was gently woken in the ICU the following day with no neurological deficit. The gratitude of his

family was humbling and this was a case that I would likely never encounter in the UK.

Since my trip to Ghana I have been approached many times by trainees about the possibility of travelling to Africa on similar projects. There are multiple ways to become involved, many schemes are now very established and doing a huge amount sustainable work. The Association of Anaesthetists has become involved with the SAFE Africa campaign raising sponsorship for the SAFE (Safer Anaesthesia from Education) project in conjunction with the World Federation of Societies of Anaesthesiologists. The Royal College of Anaesthetists also offer multiple fellowship opportunities to countries in Africa through their Global Partnerships department.

My short experience of observing clinical practice in Ghana was fascinating and satisfied a desire to share some of my skills with healthcare colleagues abroad. The openness of the people I met and willingness to engage and learn was refreshing and inspiring in equal measure. The standard of healthcare, depth and variety of case mix went far beyond my expectation. I remain in contact with anaesthetic and critical care doctors at Korle-Bu and we hope to create an opportunity for Ghanaian trainees to train in Scotland as part of their programme. On to Tanzania and the challenges it will bring!

UGANDA AIRWAY COURSE

| Elana Owen | Kimberley Hodge |

In early December 2019, a team from the Difficult Airway Society left the UK for Uganda. The purpose of the trip was to run a two day Advanced Airway course specifically designed for Ugandan anaesthetists. This team comprised of Professor O'Sullivan, Dr Barry McGuire, Dr Andy Higgs, Dr Elana Owen and Dr Kimberley Hodge. We were also joined by 3 members of the Global Capnography Project (GCAP) – Dr Rachel Jooste, Dr Fiona Roberts and Dr David Whitaker.

GCAP in action....

The CoRSU rehabilitation hospital, where the course was held, is situated between Entebbe and Kampala, on the shores of Lake Victoria. Established in 2006, it's a non-profit organisation with a primary focus of orthopaedic and plastic surgical care of children with physical impairment. Dr Sarah Hodges is the lead anaesthetist at CoRSU, and without her the course could not have taken place.

The appreciation that anaesthetists in Uganda often work under much more difficult circumstances than ourselves was at the forefront of our minds when putting this course together. We were acutely aware of the limitations they experience daily due to lack of resources and staff, and also of their vast experience with difficult clinical cases, often due to advanced disease presentation.

The 23 Ugandan delegates arrived at the course full of enthusiasm, and very keen to learn. Teaching was delivered in a variety of formats, including lectures, group discussions and workshops. There were many opportunities for delegates to discuss treatment options with the faculty and formulate plans for potential difficult cases.

During the lectures on the first day, the topics of awake fibreoptic intubation, can't intubate can't oxygenate, capnography, and current DAS guidelines were covered. We were lucky enough to get Dr Alistair McNarry to deliver his lecture from his home in Scotland, which we're sure was quite a few degrees colder than Kampala!

The five workshops, kindly supported by Stortz, covered capnography, videolaryngoscopy, fibreoptic skills and front of neck access. They gave the anaesthetists hands-on experience and teaching with equipment that they may not be familiar with in their place of work. Often in Uganda, equipment is donated to hospitals but the

staff are not appropriately trained in its use, so this was an excellent opportunity for practice and questions. A lot of the trade representatives at WAMM had donated a large amount of equipment to be left in Uganda, which we are extremely grateful for!

Following the workshops we were all treated to an expert demonstration of how to do an awake fibre optic intubation on the DAS president! Dr Andy Higgs gave step-by-step instruction to the delegates whilst demonstrating perfectly how awake tracheal intubation can be performed using topicalisation without sedation. Many of the delegates hadn't observed this procedure before, and the opportunity to do so was greatly appreciated.

Day two covered the DAS ICU guidelines, obstetric airways, paediatric airways and a mix of case presentations that were provided both by faculty and delegates. This stimulated a huge amount of discussion, particularly as to how to manage difficult airways in a resource-poor environment. We finished with a human factors session, using an excellent video made by Dr Nick Chrimes and his team in Sydney, which was showcased at WAMM.

The weekend was a fantastic one, with great opportunities for learning for both delegates and faculty, and we look forward to supporting the course again in the future!

DUNDEE FELLOWSHIP

| Naveeta Maini |

What led to your interest in airway anaesthesia?
I developed an interest in airway anaesthesia very early on in my training whilst working as an ST1 in Monklands Hospital, Lanarkshire. There we performed both ENT and Maxillo-facial surgery, and the clinical challenge often posed by these patients really peaked my interest. As a result, I became involved in airway related projects over the early years of my anaesthetic training. I moved to Dundee at ST3 grade, and working there with such a fantastic group of airway anaesthetists (including Dr Barry McGuire), cemented my desire to become an airway anaesthetist. I applied for the Airway Fellowship with the hope that I would gain the skills needed to pursue a career in this field.

What does the Fellowship entail?
The Fellowship is a 6-month post as part of your Advanced Training, and it is only open to local trainees. There is an interview as part of the selection process. The Fellowship is based in Ninewells Hospital, a large teaching hospital in Dundee with over 800 beds, but spending a short period gaining experience elsewhere is actively encouraged. The hospital houses many surgical specialities and has close links with the University of Dundee which allows for research opportunities.

During the Fellowship, the Fellow will largely cover Head and Neck surgery lists. The cases that we perform include free flap surgery, laryngectomies, laser surgery and microlaryngoscopy. These techniques allow you to become more comfortable with awake intubation, jet ventilation and THRIVE. Teaching and research are encouraged, and the department is often flexible if you wish to organise a short period of time in another hospital. The benefit of working in Dundee is that you are primarily based in Ninewells, which means that any projects commenced during your Fellowship are easier to continue and complete during the rest of your Higher/ Advanced training.

What did I get out of the Fellowship?
During my six months, I gained experience in advanced airway management techniques including awake intubation, jet ventilation and apnoeic ventilation. I attended several ENT clinics in order to perform flexible nasendoscopy without topicalisation. This improved my knowledge of nasopharyngeal anatomy. I was often asked to pre-assess patients in the Maxillo-facial Surgery clinic prior to major free-flap surgery; this was a joint clinic with Oncology which provided me with insight regarding the multifaceted approach to the care of these patients. I also got the chance to scrub for two elective tracheostomies, and this has changed how I view the challenge of emergency

What led to your interest in airway anaesthesia?
I developed an interest in airway anaesthesia very early on in my training whilst working as an ST1 in Monklands Hospital, Lanarkshire. There we performed both ENT and Maxillo-facial surgery, and the clinical challenge often posed by these patients really peaked my interest. As a result, I became involved in airway related projects over the early years of my anaesthetic training. I moved to Dundee at ST3 grade, and working there with such a fantastic group of airway anaesthetists (including Dr Barry McGuire), cemented my desire to become an airway anaesthetist. I applied for the Airway Fellowship with the hope that I would gain the skills needed to pursue a career in this field.

What does the Fellowship entail?
The Fellowship is a 6-month post as part of your Advanced Training, and it is only open to local trainees. There is an interview as part of the selection process. The Fellowship is based in Ninewells Hospital, a large teaching hospital in Dundee with over 800 beds, but spending a short period gaining experience elsewhere is actively encouraged. The hospital houses many surgical specialities and has close links with the University of Dundee which allows for research opportunities.

During the Fellowship, the Fellow will largely cover Head and Neck surgery lists. The cases that we perform include free flap surgery, laryngectomies, laser surgery and microlaryngoscopy. These techniques allow you to become more comfortable with awake intubation, jet ventilation and THRIVE. Teaching and research are encouraged, and the department is often flexible if you wish to organise a short period of time in another hospital. The benefit of working in Dundee is that you are primarily based in Ninewells, which means that any projects commenced during your Fellowship are easier to continue and complete during the rest of your Higher/ Advanced training.

What did I get out of the Fellowship?
During my six months, I gained experience in advanced airway management techniques including awake intubation, jet ventilation and apnoeic ventilation. I attended several ENT clinics in order to perform flexible nasendoscopy without topicalisation. This improved my knowledge of nasopharyngeal anatomy. I was often asked to pre-assess patients in the Maxillo-facial Surgery clinic prior to major free-flap surgery; this was a joint clinic with Oncology which provided me with insight regarding the multifaceted approach to the care of these patients. I also got the chance to scrub for two elective tracheostomies, and this has changed how I view the challenge of emergency front of neck access. Perhaps what I found most beneficial over the six months, was developing my understanding of head and neck pathology, the impact of this on the airway, and the subsequent decision making as part of a multi-disciplinary team. This has proved particularly useful during my on-call shifts when faced with a variety of airway and tracheostomy related emergencies. I now feel that I am able to manage them considerably better than I would have previously, including performing a lead role.

On top of clinical commitments, I led several airway teaching sessions with both medical and nursing staff. Additionally, I became involved in research involving non-technical skills, and in a project assessing new airway related equipment. I was fortunate enough to spend two weeks at Guy's Hospital with the team of airway anaesthetists working in a tertiary centre. I was interested to see robotic airway surgery and their local technique employed for awake intubations.

In summary, my fellowship was a really enjoyable six months and I was a bit

disappointed to have to return to non-airway lists when it was over!

What the future holds

I have been very fortunate to have obtained the position of Facing Africa Anaesthetic Fellow. Facing Africa is a charity which visits Ethiopia twice a year to provide free facial reconstructive surgery for Noma survivors. I will be travelling in October for two weeks with the team, and I hope to build on my experience of the management of complex airways. I am interested to see how these techniques are performed with the more limited equipment and drugs available, alongside the language barrier and cultural differences. I know I certainly wouldn't have had the confidence to apply for this job were it not for my experience doing the Airway Fellowship.

I am in my final year of training and will CCT next summer. I am currently finishing my Higher training and tying up loose ends in my portfolio. I have been thinking about what I want from a future career, and I strongly feel that I now have the desire and skills to apply for a consultant job which includes airway anaesthesia. It's a slightly nerve-wracking but also an exciting time!

Fellowship details

Application

Open to local trainees only.

For anyone considering moving to the East of Scotland, I can strongly recommend training here. It's a big, busy department with a lot going on. General training is very good, and the team of airway anaesthetists and surgeons are fantastic.

Supervisor

Dr Simon Crawley

Further information

naveeta.maini@nhs.net

WAMM REPORT

| Kimberley Hodge| Elana Owen |

The much-anticipated second World Airway Management meeting (#WAMMsterdam) had something for everyone, and was a credit to its organisers Prof Ellen O'Sullivan and Dr Elizabeth Behringer. It was held in the impressive Beurs Van Berlage in the centre of Amsterdam. The nature of the venue, with a large plenary hall and multiple smaller rooms, including one with a video link to the main hall, allowed delegates to design their own educational programme, and sample a wealth of expert sessions as well as attend the main lecture programme.

The packed programme commenced on the Wednesday with the optional interactive workshops, which were staffed by international airway experts. These were varied in content and very well attended. The workshops allowed attendees to have hands on experience with a variety of practical techniques. Delegates were able to test their skills with the ORSIM, practice emergency front of neck access, refresh themselves with paediatric airway management and practice using ultrasound to identify the cricothyroid membrane to name but a few.

Throughout the event there was plenty of time to peruse the vast selection of posters on display. Congratulations to all of the winners!

The main conference started on Thursday with the veritable Dr Archie Brain kicking off proceedings with a welcome address delivered via video link.

The opening session took the form of a symposium on human factors. An excellent, relatable video took the audience through a real-life airway scenario. The audience were encouraged to participate via online polls and twitter, which allowed the panel's discussion to be tailored to the focus of the audience. The panel, led by Nicholas Chrimes, provided key learning points for the audience relating to how human factors plays such a large role in patient safety, particularly in an emergency setting with an unfamiliar team. These videos are essential viewing for all airway practitioners and can be found at https://wamm2019.com/hf/videos/.

Carin Hagberg chaired the next session – management of the full stomach. Peter van de Putte described the usefulness of ultrasound in determining gastric contents, Massimiliano Sorbello took us through the controversies of RSI (spoiler...there are many!) including the use of cricoid pressure. Whilst many advantages, and disadvantages have been postulated, the evidence simply isn't there either way.

Professor Tim Cook closed the session by discussing the ethical and medicolegal implications of a patient suffering from aspiration. He reiterated the message that emerged from the 2011 National Audit Project 4, that aspiration is the commonest cause of death under anaesthesia, and this has not changed in 60 years!

Session three was chaired by Elizabeth Behringer – and focussed on oxygen. Anil Patel took us through the benefits of oxygenating using THRIVE, and Dan Martin reminded us all of the problems of giving too much oxygen – and suggested risk assessing our patients as to who would (and would not) benefit from a high fraction of inspired oxygen.

John Kheir and Brian Polizzotti showed a glimpse of the future with a presentation on their work developing intravenous oxygen. Whilst their product requires refining before it would be suitable for clinical trials – the potential is there.

Lorraine Foley chaired the last session of the day, on learning opportunities. The international panel of Paul Baker, Alistair McNarry, Tino Grief and Adam Law covered a range of topics. Key points included the benefit of simulation as an adjunct to in-situ education, expertise is developed by deliberate and distributed practice, the advantages of having an airway lead, and how to develop airway courses.

A welcome reception followed the opening ceremony and brought a packed day to a close.

Friday was launched with a bang with the airway event of the year - Kariem El-Boghdadly and Imran Ahmad talked through the newly released Difficult Airway Society Guidelines for Tracheal Intubation.

The second session featured keynote speakers from DAS (Prof Mary Mushambi), EAMS (Giulio Frova), and SAM (Richard Cooper). From here on out, the huge programme diverged, with each delegate choosing whether they would like to remain in the plenary sessions, or choose their own track in the expert sessions. The expert sessions featured everything from jet ventilation, anaesthesia for thoracic surgery, and extubation, whereas the plenary sessions covered controversial topics such as is succinylcholine outdated (NO).

Next, Hans Huitnik chaired the session on emergency airway practice, wherein Richard Levitan, Jasmeet Soar, David Lockey, and Lorenz Theiler shared their expertise. Richard kicked things off, with his take on how emergency airway management differs with the pressures of time and consequence. His take home message, of perfecting the first attempt, is an important lesson. Jasmeet discussed airway management in the context of resuscitation. The difference in outcomes between SGA and ETT are largely due to the differences in first pass success. If one is in a setting where a high tracheal intubation success rate is likely, then an ETT may be considered; else an SGA will suffice. David discussed how pre-hospital teams exclusively practice emergency airway management, and are well drilled in this with established SOPs,

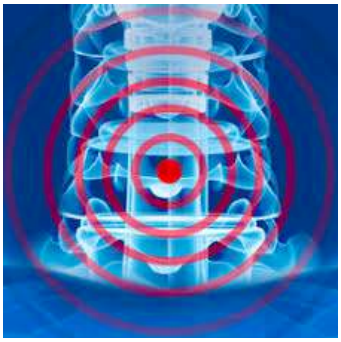
pre-allocated roles, pre-drawn drugs, and use of checklists to facilitate the process. Finally, Lorenz closed the session with a reminder of how different mountain rescue airway management can be – with kit limitations, dealing with extreme environments, long extraction times, and winching to name but a few!

Next, the World Airway Management Meeting took a global perspective, with Huageng Wei and Tino Grief chairing an airway education with speakers from China (Wuhua Ma), South Africa (Ross Hoffmyer), Brazil (Daniel Perin), India (Sheila Myatra) and the Middle East (Nabil Shallik). Wuhua discussed China's unified approach to airway education with the adoption of algorithms, courses, cases discussions – and competitions in fibreoptic skills! Ross Hoffmyer reminded us of the challenges faced in low income countries, with almost 25% of obstetric anaesthetic care being provided by non-physicians, and with disease presentation often being late and therefore advanced. Sheila discussed how the case load is much higher in India than in western medicine, which provides a large amount of experience for clinicians, but again the advanced disease presentation can make clinical work very challenging.

The scientific programme was closed with an impressive keynote from Kevin Fong OBE which had the audience spell bound. His keynote, 13 Minutes to the Moon (which had the best (and possibly longest) theme tune entry of any keynote). He described how the Apollo mission was conceived, executed, and detailed the final phase of the descent to the lunar surface. There were a lot of parallels that could be drawn between the way NASA develops its astronauts and how anaesthetists are trained. NASA adopts graded exposure, putting astronauts at risk of harm in the Talon fast-jet trainer to allow them to experience a high stakes environment. Teams were kept small, with the number of lines of communication minimised, and the importance of system was recognised – engineer out risks when you can rather than expecting a human being to be better, faster, smarter.

The Gala Evening, at the sumptuous Dutch Opera House and Ballet, was a fitting end to a wonderful day.

The packed programme commenced bright and early the next morning with the Top 12 Oral Abstracts being presented. Congratulations to the winner, Julian Meyer, and the winner of the oral innovation project – Naveeta Maini.



Next, Andy Higgs chaired the intensive care session. Brendan McGrath was able to showcase his excellent work with the Global Tracheostomy project. The NTSP smartphone app is essential to download – with videos with tips and tricks for how to manage a patient with a tracheostomy.

Jarrod Mosier then discussed the physiologically difficult airway, and stressed that your oxygenation strategy needs to

adapt depending upon the needs of the person. The safe apnoea time will be reduced in the critically ill, particularly those with ARDS. Checking a pre and post oxygenation arterial partial pressure of oxygen will give you an indication of how much oxygen is actually available in the blood stream.

The morning closed with an assortment of airway cases which ranged from hanging, to foreign body inhalation. The lessons learned from the cases stressed how planning is key, you must always plan for rescue, consider marking the cricothyroid membrane in anticipated difficult cases, and don't forget to use a SGA if necessary.

The next session featured the Principles for Universal Management of Airways (PUMA) , who are trying to produce a set of principles that reflects the consensus of existing published airway guidelines, which can be applied internationally. Universal principles for rapid sequence intubation were presented (note cricoid pressure was optional!).

The penultimate session, prior to prize giving, was the most important airway papers from 2015-2019, with the newly released DAS awake tracheal intubation guidelines being in the illustrious list.

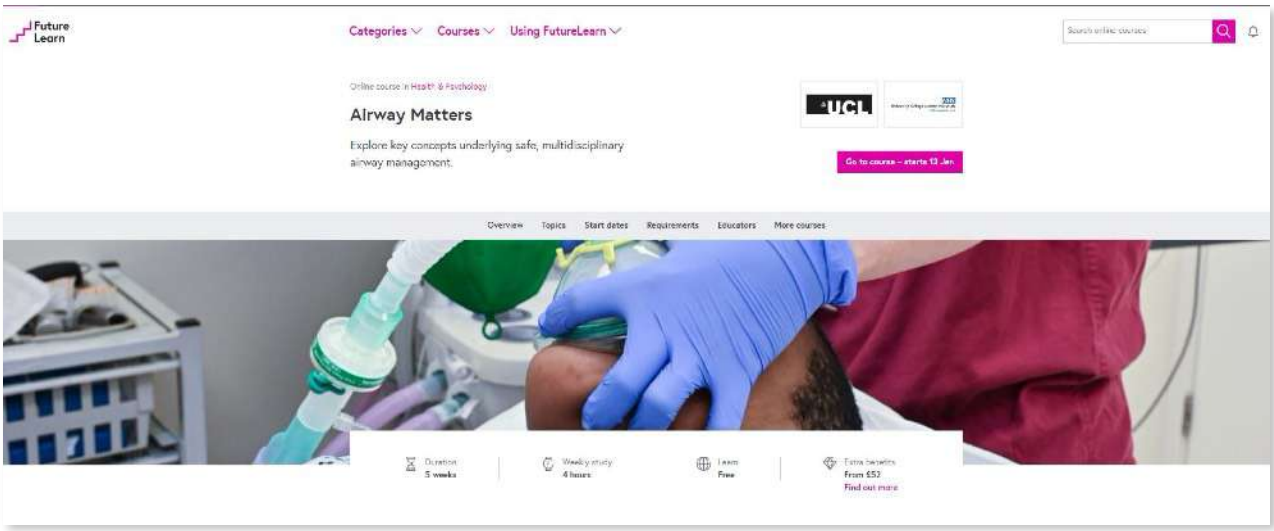
The fantastic conference was sadly brought to a close, the next WAMM event will be in 2023. Before that there's Birmingham 2020 22-24 November! Looking forward to seeing you there!

Winner	Category
Andrew Norris	Poster Winner - Audits & Survey
Henry Lewith	Poster Runner Up - Audits & Survey
Mael Zuercher	Poster Winner - Equipment
Jinbin Zhang	Poster Runner Up - Equipment
Bill Walsh	Poster Winner - Basic & Clinical Science
Jacob Rosen	Poster Runner Up - Basic & Clinical Science
Shimin Ong	Poster Winner - Education & Training
Thilo Schweizer	Poster Runner Up - Education & Training
David Olvera	Poster Winner - Quality Improvement & Human Factors
Chandar Maheshwari	Poster Runner Up - Quality Improvement & Human Factors
Yeshith Rai	Poster Winner - Case Reports
Stephen Shepherd	Poster Runner Up - Case Reports
Ross Hofmeyr	Poster Winner - Innovation

WAMM GALLERY

AIRWAY MATTERS

| A Massive Open Online Course| Laura Elgie | Emilie Hoogenboom |



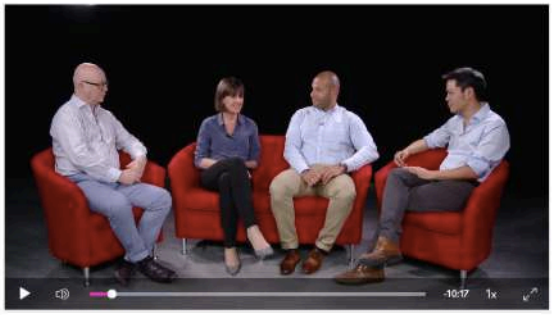
Securing the airway is a complex task, requiring technical expertise and, as is becoming increasingly recognised, attention to non-technical skills and an appreciation of the human factors contributing to the operator's and team's behaviour and decision-making.

The 4th National Audit Project of the Royal College of Anaesthetists and Difficult Airway Society [1] (NAP4) concluded that poor education and training contributed to 49% of the 184 cases of major airway complications that were reviewed. Steps have since been taken across many areas of anaesthesia and critical care, aiming to improve education and training in airway management and ultimately patient outcomes. These include the recommendation for each anaesthetic department to have a designated "Airway Lead"[2], the campaign "No Trace – Wrong Place" [3], the development of new or updated Difficult Airway Society (DAS) Guidelines [4] and guidelines on the management of tracheostomy and laryngectomy airway emergencies [5].

Training in airway management relies heavily on experiential learning under the guidance of a clinical supervisor, but other educational interventions are also required to develop expertise. Rehearsing specific skills on mannequins or models, and being immersed in multidisciplinary simulated airway scenarios, allow us to practise skills and drills in a non-clinical environment. Importantly, they provide an opportunity to go through the process of implementing the guidelines and algorithms referred to above.

Though securing the airway is a practical skill, there is a large amount of theoretical knowledge anaesthetists (and other professionals who are trained in securing the airway) must have at their fingertips in order to provide safe airway strategies for their patients. This includes an understanding of the advantages and limitations of the equipment we use, sound knowledge of airway anatomy, being up to date with current evidence and guidelines, and having insight into the human factors and ergonomics that affect our practice. Airway management is hardly ever

performed in isolation; it is therefore vital to learn, rehearse, plan and discuss airway management strategies in a multidisciplinary setting, to allow the development of a shared-mental model.



Download video: standard

Experts' Top Tips

0 comments

In this video, Prof Kevin Fong, Consultant Anaesthetist at UCLH is joined in a panel discussion by four other experts in Human Factors and Ergonomics (HFE): Dr Fiona Kelly, Consultant Anaesthetist and Intensivist at Royal United Hospitals Bath and lead of the Difficult Airway Society (DAS) group on HFE, Prof Chris Frerk, Consultant Anaesthetist at Northampton General Hospital and CHFG Trustee, and Mr Clinton John, Operating Department Practitioner and Head for Clinical Education at UCLH. They will discuss and share their top tips about HFE in the context of airway management.

We have combined the non-technical, technical and theoretical aspects needed to develop safe airway strategies in the form of a Massive Open Online Course (MOOC) on multidisciplinary airway management: "Airway Matters".

A MOOC is a free, flexible, online course with an unlimited number of learners, who can access the course content over a specified time period. Apart from the educational material itself, MOOCs offer a platform for participants from across the globe to actively contribute to forum discussions and learn from each other.

Endorsed by DAS, "Airway Matters" has brought together patients, international experts on airway management and human factors, and frontline members of the clinical multidisciplinary team to create a unique, evidence-based and up-to-date course that anaesthetists and other health professionals, of all levels of experience, will find useful. The key learning points of NAP4 and the importance of human factors and ergonomics, multidisciplinary teamwork from preassessment to extubation, and reference to DAS Guidelines are emphasised throughout the course.

The content is delivered through a mixture of patient stories, videos, articles, interviews with experts and interactive activities. "Airway Matters" runs over 5 weeks with a flexible 4 hours of learning per week, and is structured as follows:

Week 1: Safety, Human Factors and Ergonomics, Airway Anatomy
Week 2: Planning, Equipment, Airway Rescue
Week 3: Airway Obstruction and Advanced Management Techniques
Week 4: The Shared Airway, the Critically Ill Patient, Tracheostomies
Week 5: Paediatrics, Obstetrics, Obesity, a Global Perspective

The first Airway Matters MOOC will start on **13 January 2020** and we invite you to join us! Please sign up at www.futurelearn.com/courses/airway-matters to participate in a global multidisciplinary initiative to make airway management safer for all patients.

Laura Elgie
Airway Fellow, University College London Hospitals

Emilie Hoogenboom
Consultant Anaesthetist, University College London Hospitals

Lead Educators for Airway Matters

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Jen Taylor during her hospital stay © Jen Taylor

The Treacherous Tracheostomy

0 comments

Over the course of this activity we are going to learn about altered airways: tracheostomies and laryngectomies. We met Jen Taylor at the start of this week. Here she kindly shares with us her personal experience of awakening with a tracheostomy after her major Head and Neck surgery.

Waking up from an extensive 16 hour surgery, being sedated and in pain is hard enough, let alone adding the inability to tell anyone what's going on. They say that most patients are scared of the anaesthetic rather than the surgery. Well I think the tracheostomy is probably at the top of that list for anyone who has to have one,

DIFFICULT AIRWAY DATABASE - UPDATE

| Achuthan Sajayan| Co-Lead, DAS Difficult Airway Database

The DAS difficult airway database was officially launched during the DAS Annual Scientific Meeting 2018 in Edinburgh. Since then, the number of participating hospital sites has increased from 45 to 84 and others are in the process of getting approval. The database currently has more than 420 submissions. Though it is quite ambitious, our aim is to get all hospitals in the UK where anaesthesia services are provided to be part of the project by 2021.

The main obstacle we faced in the beginning was concern from the information governance departments about data sharing. But as more and more hospitals join the project, this has now become less of an issue. All the patients whose data was submitted since the start of the project have been contacted recently to get their feedback and we will publish the result of this survey soon.

If your hospital is not yet part of this project and you are interested in taking the lead role locally, please do get in touch. If you work in a hospital which is already a part of the project, please encourage your colleagues to submit the data promptly and let us know if you have any feedback about the project or the process of submission.

Some useful links are given next.

Database main page: https://das.uk.com/dad

List of Trusts currently taking part in the project: https://das.uk.com/content/dad_sites

Join the project: https://das.uk.com/files/2019/page/How_to_join_the_project.pdf

FAQ for Doctors: https://das.uk.com/files/2019/page/FAQs_for_doctors.pdf

FAQ for Information Governance: https://das.uk.com/files/2019/page/FAQs_for_information_gov.pdf

Information leaflet & consent form: https://das.uk.com/files/2019/page/Patient_Information_and_Consent_form_Nov_18.pdf

dad@das.uk.com

TRAINEE ESSAY WINNER

| François Lemay|

Ethical Dilemmas in Airway Management

Bioethics are inherently part of the various scopes of airway management. From teaching to generation of knowledge, core principles such as autonomy, justice, beneficence and non-maleficence must be applied to ensure the safety and respect of the patients and the population.[1] This essay explores some of the specific ethical issues related to airway management. The aim is to reach the broad spectrum of audiences concerned with airway management.

Teaching and maintaining skills in airway management

Skills in airway management need to be learned and maintained, often with the laudable objective of successfully mastering the challenging airway with ease and safety when the time will come to confront it. Various teaching programs have included a quota for techniques relevant to airway management. In anaesthesia, the number required to achieve proficiency at flexible bronchoscopy (FIS) was thought to be 20 procedures, but decreased to more realistic levels.[2, 3] This quantity of FIS is still difficult to achieve, and practitioners might not be aware of the limit of these suggested numbers. This might give them a false sense of expertise while they may still be in the apprentice zone.[4] More importantly, there are the ethical considerations of the pressure and means to achieve those intended quotas and the safety of performing them while still being in the learning curve.

Important questions need to be answered when teaching or practicing a technical skill. *Is this technique still relevant?* Unnecessary care should be avoided, and techniques that historically have been useful might not be indicated anymore as airway management progresses. *What is the appropriate environment to practice such skills?* Manikins tend to be more realistic that they used to be, although still have many limits.[5] The use of recently deceased patients requires appropriate consent or body bequest programmes.[6] Simulation in medical education has become widely available, and there is growing evidence of its benefits. Virtual reality bronchoscopy simulator appears useful in developing FIS skills.[7, 8] A meta-analysis evaluating technology-enhanced simulation, including airway management procedures, has found positive effect of simulation on skilled performances.[9] Cricothyrotomy has been compared on live animal tissues and simulation models. No statistical difference has been demonstrated between groups in latest studies.[10-12] From the most recent evidence available, the pressure has now switched against the proponents of live animal airway teaching to prove that their strategy is still ethical and relevant.

For the same reasons, with the various educative tools available, it must be ensured that pre-patient learning is adequate, i.e. teaching using the patients comes at the right time in the

curriculum.[13] Trainees need gradual exposure to more difficult conditions and intimate supervision to ensure that risks to the patients are kept minimal. Consent of the patient should also be sought when non-routine management or higher than usual risk procedures are proposed. Various challenges in airway consent have been recently discussed in the literature and specific recommendations have been published in respect with teaching airway management.[14, 15] A survey has shown that patients are willing to be informed when non-routine airway technique are being used, in contrast with anaesthetists opinion.[16] In another survey in the United Kingdom, a majority of trainees would seek consent for awake FIS, but not in asleep patients for teaching purposes.[4] This same study cites that asleep FIS might mimic adequate training for awake procedures, as it features increased complexity and increased procedural time. However, if a procedure is more challenging and not part of the usual care, it might have a different profile of complications that need careful comparison to routine management and disclosure. It must be remembered that patients have the right to decline a procedure or to be involved in teaching. Deliberately modifying a patient's anatomical features to create a difficult laryngoscopy can result in harm and non-maleficence must be preserved. Inadequate safety drill at the expense of the patient has resulted in disciplinary actions.[17] Finally, practicing airway skills among participants of workshops might be considered. Complications during such FIS training courses have been published.[18] Such teaching sessions should solicit external approval to ensure that there is no subtle form of coercion felt by participants and that safety issues are not overlooked.[19] In the context of limited resources and aiming at respecting the principle of justice among the population, means to avoid overusing expensive equipment during airway management and training should be carefully considered.

> "Patient's rights and basic principles of bioethics must remain in the core concepts of our medical considerations"

Difficult airway plan decisions

Patient's right to decline treatment can have a major impact on potential complications, and there is still an obligation to respect patient's autonomy. For example, informed refusal of an awake intubation might expose the patient to major morbidity and mortality risks. Opinion from a colleague or from an institution's Ethical team might be of support, provided that the situation is elective.[19] It is also the practitioner's duty to inquire and clarify *Do not attempt resuscitation* decisions related to intubation, and to ascertain that they are fully informed and aware of the potential consequences. Advanced directives regarding airway management might need to be adapted to the clinical context. Added to the available guidance and literature from various organizations, there is very limited reason not to consider these decisions in an airway plan.[15, 20 21]

The palliative airway

Ethical difficult extubation can be experienced during palliative care. There is great variability among ICU professionals on the perception of the dying process and steps of adequate care when it comes to withdrawing life support therapy related to endotracheal intubation.[22] Perception is

also crucial for caregivers to preserve this moment as untroubled as it can be. *Should the endotracheal tube be removed? Should ventilatory assistance be weaned? How should medication by titrated?* Algorithms for weaning mechanical ventilation have been proposed, but might not consider ethical issues.[23] In his review, Truog addresses some of the ethical controversies surrounding sedation for terminal extubation, such as pre-emptive general anaesthesia and insufficient analgesia.[24] He argues that the double effect (which roughly consists in weighting pros and cons of a therapy that can result in good and bad outcomes) might be well-intentioned but sometimes unrealistic. He concludes that treatment of the patient in those circumstances is not objective, but mainly subjectively titrated in accordance with the patient values. The principle of autonomy thus applies until the very end of a patient's life, and although no clear-cut answers exist on the best management of terminal extubation, applying ethical principles to the best knowledge of the patient implies that an effort to respect the patient's dignity will reduce potential harm. Such care needs individualization and cannot be hastened.

Airway research

When discussing research bioethics, there has been growing interest in providing guidance specific to airway management, ensuring that concepts such as non-maleficence respect the highest standards.[5] While safety is surely an important issue, Cook et al. advocate that airway research should aim at answering questions that need high quality data for implementation on clinical grounds, including high acuity situations such as difficult intubations and care in remote locations.[25] This refers to the principle of justice. Clinicians must also be vigilant to respect ethical principles even when performing work that might not be primarily intended to be published. McGuire and Dalton have described their own experience with airway ethics through what had started as a service evaluation project.[26] Their findings led them to submit their findings for publication, but 'serious ethical issues' had been raised. Concepts of autonomy, beneficence and non-maleficence were insufficiently observed. This example is not unique, and serves as a strong reminder that any airway project involving human subjects should question its basis and impacts through ethical assessment.[27] On the individual scale, practitioners can infer that when they test a new technique, they must reassess on which grounds they perform it. From a surgical perspective, Broekman et al. performed a systematic review on ethics in surgical innovation concerning four aspects: regulation, consent, learning curve and vulnerable patients.[28] Although recommendations had been previously proposed,[29] they found that surgeons had heterogeneous opinions on the management of those topics, and expressed the need for a change in culture. There is probably a need for the airway community to have such a thoughtful glance at what represents 'airway management innovations' and how it should be dealt when implemented in clinical care.

Conclusion

As for difficult airway trolleys, ethical perspectives in airway management must be carefully considered and follow logical reasoning. Patient's rights and basic principles of bioethics must remain in the core concepts of our medical considerations, whether medically general or airway specific. We must ensure that we teach and maintain our skills diligently. Difficult decisions need to be made when intubation or extubation come with life or death consequences. Individualising our care to the patient's best interest is probably our best option in those situations. There has been ongoing debate on the best strategies to ethically conduct airway research. As for other issues related to airway, there is need for broad discussion and consensus on managing all the features of the ethically challenging airway.

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