

Anaesthesia News

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Environment issue:

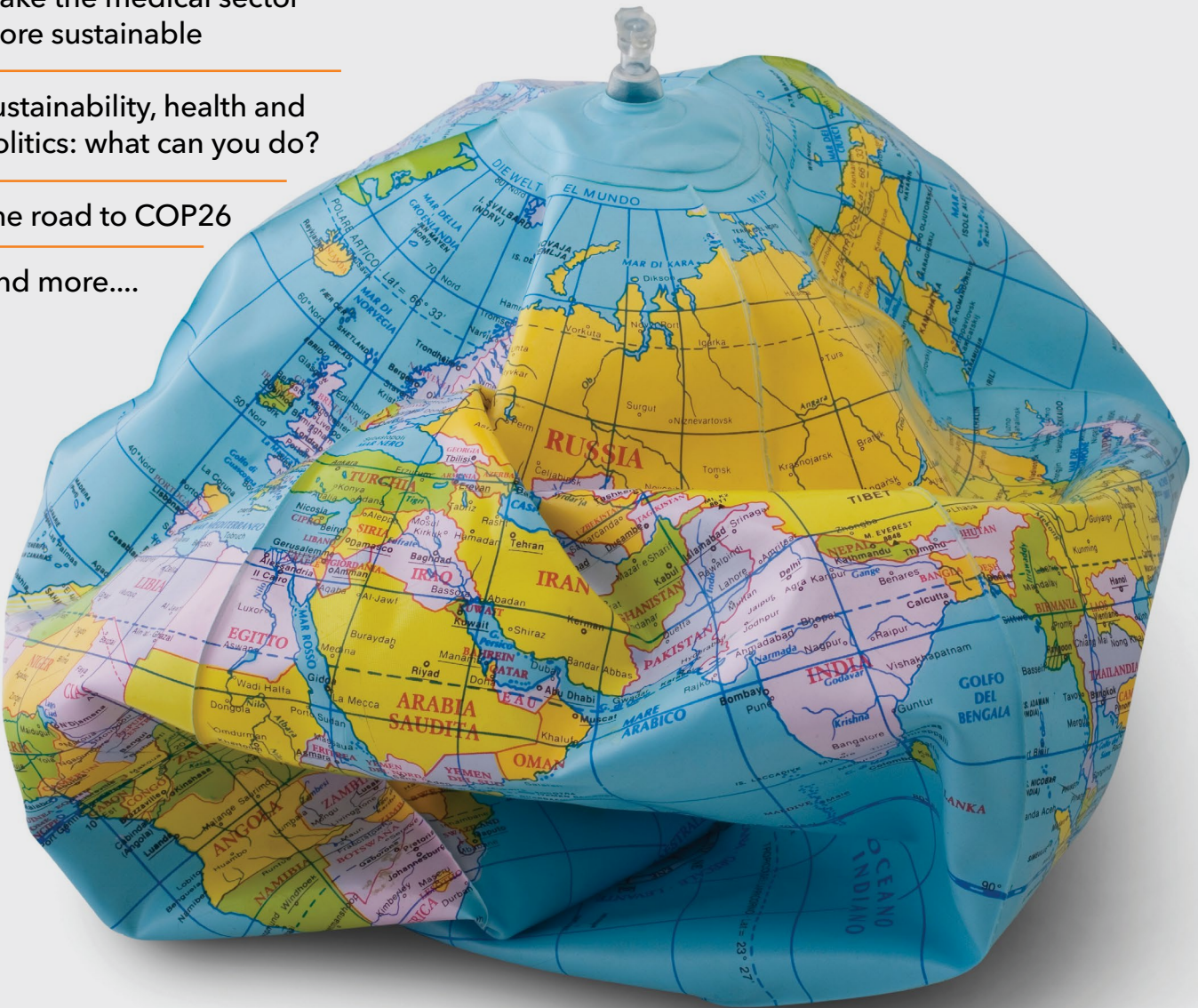
Anaesthesia - is it really pain free for the environment?

How bioplastics can help to make the medical sector more sustainable

Sustainability, health and politics: what can you do?

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Welcome

First listen, then act

Climate change is a huge and multi-factorial crisis that affects each and every one of us. Many of us feel helpless: lost in the face of inevitability, blaming unethical behaviour by government and corporations, and some even developing climate anxiety. An effective therapy for this inertia is to listen to the evidence, find an area of interest, and then act on it to influence change. A positive step forward for our future.

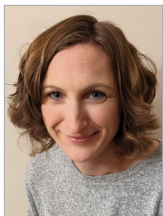
In this environment and sustainability issue you will find articles about the effect of medicines on our environment, and the fate of those thousands of pieces of plastics we use every day. In response, there are reports on how to best educate our young doctors, and how to engage politicians and civil servants on the topic of sustainable healthcare. Chris Allen explains how to stop using a pollutant that has a lifespan of 110 years, and how technology can improve environmental outcomes. Finally, the issue has contributions detailing attendance at COP26, raising our profile and spreading the news of what has already been achieved in healthcare, and a first-hand account of getting involved in Doctors for Extinction Rebellion. If these conversations interest you and you want to get involved, or just want some guidance, please consider joining the growing band of the Association's Environmental Champions.

Whatever steps we take, no matter how big or small, it needs every one of us to make a positive impact in this essential work.



Jason Gandhi

Association of Anaesthetists and Centre For Sustainable Healthcare Fellow in Environmentally Sustainable Anaesthesia Newcastle University Teaching Hospitals



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Anaesthesia – is it really pain free for the environment?

Asbestos was finally banned in the UK in 1999, 102 years after the first health related issues were detected. It was linked to mesothelioma as far back as the 1930s. In fact, if you've just recovered from your annual Christmas 'Wizard of Oz', you might be surprised to learn that the snow used in the 1939 film was pure asbestos, used because it was fire retardant. Despite the obvious health risks, it took decades for asbestos to be regulated and removed from use. As a result, we are still seeing asbestos-related disease deaths today, with over 5000 reported in 2021 [1].

Fast forward a century and we are in a similar position with the issue of pharmaceutical pollution of the environment. In *Anaesthesia News* last year Allen et al. asked "But what about the fish?", introducing the topic of ecotoxicology and the provision of sustainable healthcare to anaesthetic practice [2]. The discharge of pharmaceuticals into the aquatic environment by wastewater treatment plants across the UK and globally has been well documented [3, 4]. Most wastewater treatment plants were not designed to remove the increasing variety of novel and often complex organic pollutants efficiently, and many medicines undergo limited degradation and/ or transformation during treatment [5, 6].

Reports of harm from pharmaceuticals in the environment have been around since the 1960s. Despite rapid advancement in research techniques and knowledge since the late 1990s, the fate of pharmaceuticals, their metabolites and transformation products once introduced into the aquatic environment remains relatively unclear and means that we still cannot definitively state an impact on human or environmental health. In addition much of the research is performed on individual compounds, and of course our rivers and oceans contain a cocktail of drugs that may be reacting with each other and other contaminants. They also bond onto microplastic particles, which can concentrate their effect and deliver a bigger dose when eaten by aquatic life.

The pharmaceuticals used in anaesthesia and across healthcare have a clear potential to harm the environment in terms of toxicity, persistence and bio-accumulation. Of specific interest to anaesthetists may be:

- Propofol is an environmental hazard because it does not degrade, has the potential for significant bioaccumulation and persistence, and is toxic to aquatic life [7].

- Lidocaine has a short half-life in the environment, but its regular use and constant excretion results in pseudo-persistence [8].
- Diclofenac is suspected of causing damage to the inner organs in rainbow trout [9], and has led to the near-extinction of vultures on the Indian subcontinent, caused by birds feeding on the carcasses of cattle treated with the drug [10].
- Pyridostigmine and neostigmine are potentially toxic to *Daphnia magna* at concentrations in the order of μl^{-1} [11].
- Ketamine has been widely detected in surface waters. It is absorbed by shallow water fish, and marked changes were seen in the bacterial community in aquatic sediment [12].
- Recent work examining the practice of anaesthesia has resulted in dramatic reductions in carbon emissions from anaesthetic gases as well as improvements in the solid waste stream; however the potential aquatic impacts remain relatively unexplored. Given the benefits that pharmaceuticals confer in anaesthesia, potential strategies to mitigate their environmental impact must be directed to prevent, reduce, and manage their use without compromising patient care.

During the pandemic we have repeatedly heard the phrase "We will be led by the science". Science drives policy, but despite science, policy development and regulation can take more than a generation to have an impact. So what are we to do in the meantime to reduce risk for human and environmental health from our clinical practice? The current year-on-year increase in the use of medicines means that while we are trying our best to make our patients healthier, we are potentially making our planet sicker. The NHS across the UK has committed to net zero healthcare with respect to carbon emissions - but shouldn't we also be committing to net zero pollution and net zero harm to biodiversity?



This is the vision of the One Health Breakthrough Partnership, a unique collaboration between Scottish Water, the Scottish Environment Protection Agency, the Environmental Research Institute of the University of the Highlands and Islands and NHS Highland [13]. Together, we have a vision for a Highlands where non-toxic and sustainable healthcare is delivered. We are working together, sharing skills, data and perspectives, to reduce the impact of pharmaceuticals in the environment and slow the rise of antimicrobial resistance. While the evidence grows we are working using a precautionary principle, taking a public health upstream approach and using this as an opportunity to improve healthcare while reducing the load of pharmaceuticals on the environment. We are taking a 'realistic medicine' approach to the use of medicines, asking the patient "What matters to you?" (it may not always be that they want a medicine), and educating the public on the environmental effects of medicines and how to dispose of medicines waste. We are also educating clinicians across all professions, and 'greening' our formulary to offer prescribers less toxic choices that work for patients and the environment.

Of course, in anaesthesia, the perfect future would be one where much of the need for anaesthetic agents and surgery was reduced secondary to improved health of our population. In the meantime, being aware of the potential for environmental harm from the medicines we use should help us balance the priorities of clinical effectiveness and patient need versus protecting and restoring nature as the foundation of health. What will you do in your own life and practice?

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How bioplastics can help to make the medical sector more sustainable

Bioplastics (Figure 1) are nothing new in the medical sector. In fact, they have been in use for a very long time because they offer significant benefits in terms of specific properties and functionality. They also provide opportunities to make applications and processes more sustainable – an aspect of innovation that is only slowly developing in the sector.

Sustainable feedstock is key for bio-based plastics

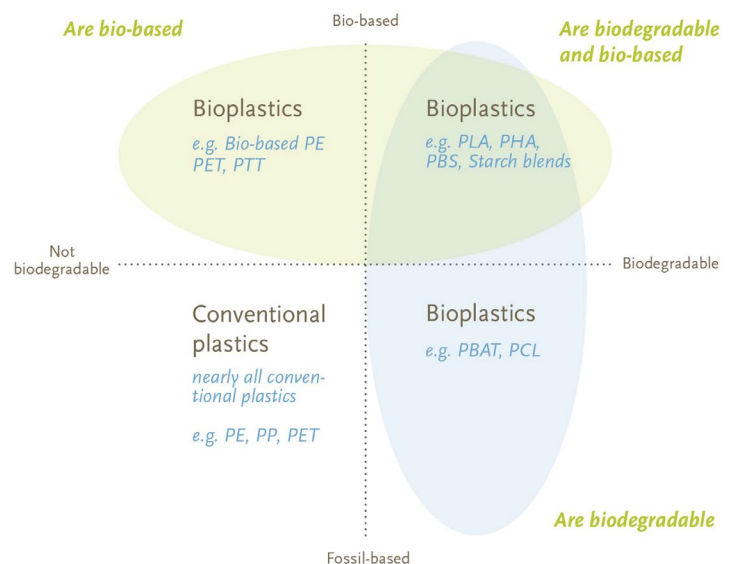
Bioplastics are produced from renewable resources, mainly from crops such as corn, sugar beet or castor; however ligno-cellulosic feedstock from wood is used as well, and other feedstock options such as organic waste or algae are also being explored. The use of agri-based feedstock to produce bioplastics is the subject of rather emotional debate, but globally the agricultural area currently used to cultivate crops for bioplastics amounts to less than 0.02% [1]. To guarantee sustainable sourcing of feedstock, dedicated certification schemes are in place that specifically focus on environmental and socioeconomic aspects along the entire biomass value chain. Life cycle assessment is another tool that is used to assess the environmental sustainability of bioplastics, ensuring that potential impacts on the environment from feedstock sourcing to end-of-life options are minimised [2]. Compared with fossil-based plastics, the use of bio-based plastics helps to reduce the dependency on non-renewable resources and reduce emission of greenhouse gases, and increase resource efficiency through closed 'resource cycle and use' cascades. Additionally, bioplastics offer established and new end-of-life options [3].

The choice of materials and correct end-of-life options

Biocompatible materials have gained lots of interest for medical applications; for example, surgical sutures made of polylactic acid are already well-established [4], and starch-based materials are used in scaffolds for tissue engineering [5]. When choosing the right bioplastic material to be used for a medical application, looking at available end-of-life routes is crucial. This aspect is often overlooked but is an essential factor in making the medical sector more sustainable. While standard ISO 10993 provides test methods for the biological evaluation of medical devices, biocompatibility needs to be distinguished from biodegradability. Claims for biodegradation of plastics outside the human body require a clear designation of timeframe, environment and purpose [6]. Since most medical applications are single-use, biodegradation in industrial composting or anaerobic digestion facilities (requirements for so-called 'organic' recycling are laid down in EN 13432) could be a potential end-of-life route for some products as long as waste is collected and sorted properly [7].

Figure 1. Bioplastics coordinate system. Source: European Bioplastics and IfBB Hanover

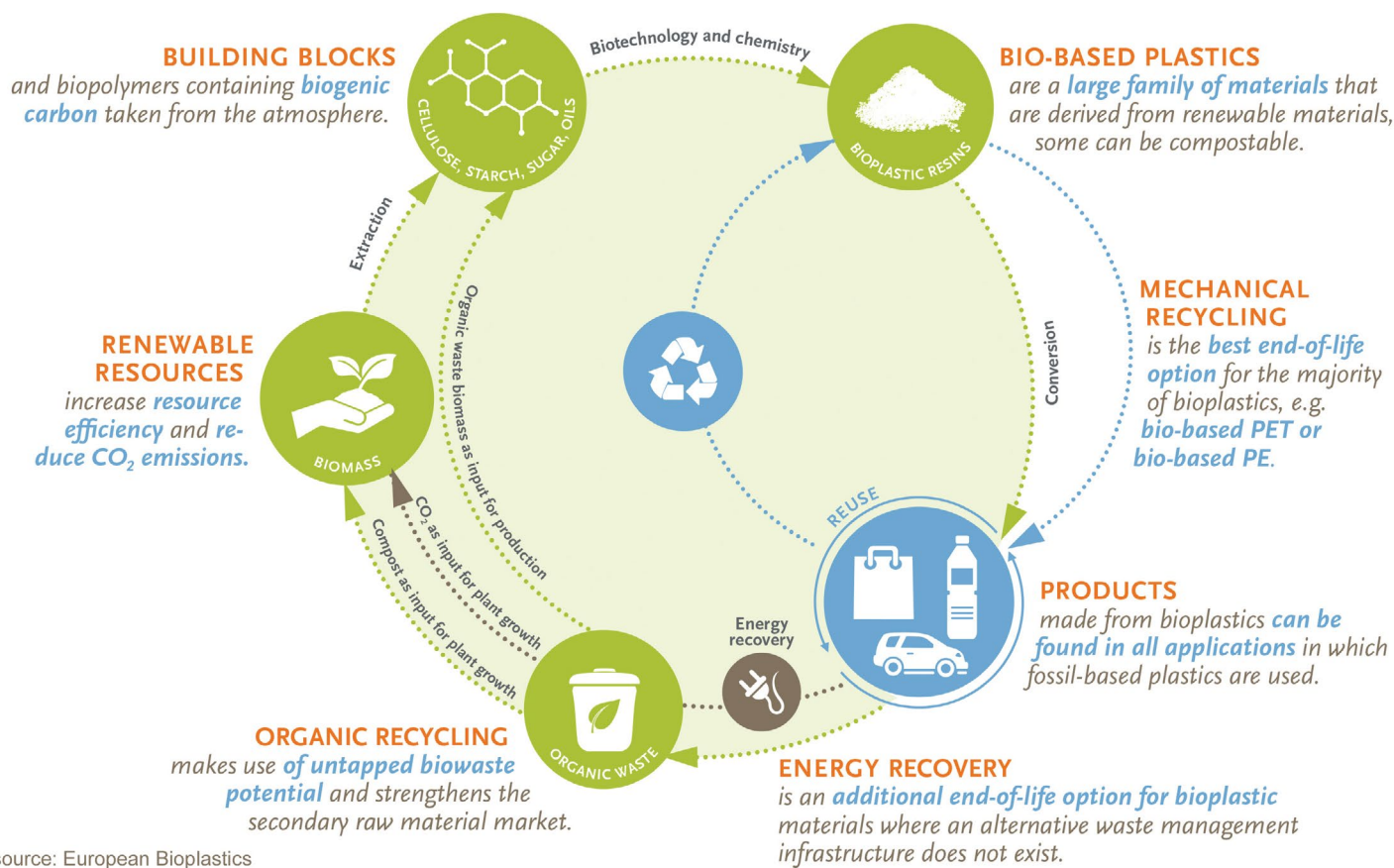
Bioplastics are bio-based, biodegradable or both.
(European Bioplastics)



There have been successful approaches with on-site anaerobic digestion systems in hospitals for the organic recycling of bedpans and urine bottles made of polyhydroxyalkanoates.

Most waste from hospitals and medical applications will have to be incinerated due to contamination. Here bioplastics are advantageous due to their bio-based content. Materials such as non-biodegradable, bio-based polypropylene (used for ventilator breathing circuits), bio-based thermoplastic elastomers and many biodegradable polylactic acid plastics are produced using crops or their waste products. Their carbon is biogenic, so even if incinerated the carbon cycle stays closed and overall greenhouse gas emissions are not increased.

Bioplastics – closing the loop



Independence from non-renewable resources, sequestration of biogenic carbon, a potential for closed-looped systems, combined with innovative properties that meet the demand of the medical sector, are strong arguments for a long-term change to sustainable bioplastics.

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Faculty of Sustainable Healthcare, Health Education England North East and North Cumbria – educate to reduce the environmental impact of healthcare.

The NHS net zero target requires NHS organisations to achieve a zero-carbon footprint by 2040 for direct and 2045 for indirect emissions. As healthcare professionals, one of the pillars of medical ethics is 'do no harm'. Current provision of healthcare and our clinical decision-making is having a negative impact on planetary health, and contributing to chronic health conditions and premature death.

Many doctors and dentists in training and those established in their careers have limited awareness and understanding of the relevance of climate change to human health, and methods available to reduce the environmental harm of clinical care. Education is the first key step to ensure that we all understand how our daily decision making can be made more environmentally friendly and sustainable – alternatives are often available!

Health Education England North East and North Cumbria (HEENE & NC) launched the Faculty of Sustainable Healthcare in September 2021, the first of its kind in the UK. The Faculty is responsible to the Postgraduate Dean and incorporates doctors from primary and secondary care, dentists and pharmacists. The aims are to

1. Improve awareness of the environmental impact of healthcare to all staff (clinical and operational) within HEENE & NC.
2. Provide education that outlines best practice for sustainable healthcare, improving knowledge on carbon literacy and environmental impact.
3. Develop a network of sustainability champions across the North East, so best practice and case study examples can be shared.

The Faculty of Sustainable Healthcare is at the start of its journey – without education how can healthcare professionals be expected to make decisions incorporating environmental health? In order to achieve this, we have partnered with the Centre for Sustainable Healthcare and developed a series of workshops covering a range of topics pertaining to sustainable healthcare and sustainable quality improvement (SusQI). Clinical placements are also being used to develop SusQI projects and ensure theory is converted into practice. We want to lead the way by embedding sustainable practice within the everyday decision-making of all healthcare professionals, and hope that we can provide support and guidance to other HEE regions in setting up similar faculties across the UK.



Moving forward, we will use annual events to showcase examples of sustainable practice in the North East, sharing ideas and practices that have demonstrated a reduction in the environmental footprint of care.

As undergraduate and postgraduate programmes and curricula incorporate sustainable healthcare within them, we need to ensure that we are all educated in what sustainable healthcare looks like and how we work together to achieve it. The climate emergency is a healthcare emergency and we all must act now!

Elaine Winkley

Chair of Faculty of Sustainable Healthcare Health Education, North East and North Cumbria Consultant Anaesthetist Northumbria Healthcare NHS Foundation Trust

Cathy Lawson

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Sustainability education in anaesthesia

The WHO recognises climate change as the single biggest health threat facing humanity, leading to thousands of additional deaths and threatening to widen existing health inequalities [1]. It is now widely understood that large scale action is urgently needed to reduce global carbon emissions and their climate impact to protect both people and planet [2].

Anaesthetists have an important role to play in tackling the climate emergency, as their work contributes significantly to healthcare-related global warming and environmental destruction. Anaesthetic gases are responsible for approximately 5% of an acute NHS organisation's carbon footprint [3], and other aspects include: choice of intravenous pharmaceuticals and equipment; drug management and disposal; waste and recycling practices; energy usage; peri-operative care pathway design; and the personal travel footprint.

Education plays a key role in altering behaviour and policy, which is why sustainability education in anaesthesia is vitally important. Recent inclusion of the environmental impacts of healthcare and principles of sustainable clinical practice as key capabilities in the RCoA 2021 training curriculum demonstrates a commitment to tackle climate change [4]. This addition to the curriculum aligns well with national policy: the NHS is committed to having net zero carbon emissions from direct patient care by 2040, with inclusion of the supply chain by 2045.

When planning sustainability education, trainers must be cautious not to forget other sustainability challenges in anaesthesia whilst aligning with wider NHS net-zero emissions targets. We must include other harms such as air quality, pollution, biodiversity, and climate justice. Carbon equivalent (CO₂e) emissions reductions may be prioritised because they are tangible and more easily measured than some of these others. There is a risk that as the 2040 net-zero target deadline approaches, all focus will be shifted to this and we may miss our opportunity to make positive change in other areas.

How we deliver sustainability education is important. Teaching principles of sustainable practice from the beginning of training is key to embedding it into future practice, however senior colleagues must also be educated to prevent these principles being undermined by contradictory culture, implicit social norms and traditional practices. The RCoA has created online learning resources to support anaesthetists wanting to learn more about sustainable practice, and departments should encourage all staff to engage in learning on this topic and provide time for this [5]. Departments must also ensure infrastructure is in place for anaesthetists to put their learning into practice, for example through ensuring provision of training and equipment for total

intravenous anaesthesia, ensuring availability of alternatives to desflurane, and including principles of sustainability in the writing and review processes for departmental policies and care pathways. We should also be mindful of how we host educational events and training, for example considering the environmental costs of travel to events and printing paper resources.

Teaching anaesthetists of tomorrow about sustainable practice is an important part of the solution, but it is not enough in isolation. Changes to the curriculum will take time to embed into practice, but the climate crisis is a health emergency that requires action now. As doctors, we promise to 'do no harm'; we must urgently adapt our practice to reduce its environmental damage, recognising that that which is bad for the planet is also bad for our health and that of our patients.

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SEAUK

Sustainability, health and politics: what can you do?

Many of you are fantastic clinicians, educators, academics, or quality improvement and patient safety advocates. Perhaps you never fitted neatly into any of those descriptions, but amongst the vast range of interests within medicine most of us find a home. In 2018 one of us (FB) became curious about the field of sustainable healthcare, a subject that aligned professional with personal ones. Increasing knowledge gave empowerment to focus attention on sustainability issues within healthcare but recognition that to affect the status quo at management level, more political drive would be required.

What can you do?

Fascinating research has been undertaken by political scientists into how to make the participation of ordinary people possible, probable and powerful [1]. Action can happen when motivation and authority align. Start by paying attention to the political, social and environmental context in which you are living and working. There are a plethora of resources available about planetary health [2], sustainable healthcare, sustainability in quality improvement (susQI) [3], and carbon literacy. The great news is that many of these topics overlap, so it takes just a little curiosity to translate knowledge into practice. Knowledge empowers and enables individuals and teams to enact transformational change within the clinical or political sphere.

Find strength in numbers; recognise that sustainable healthcare needs dedicated time and resources. In 2019, FB met Dan Morris, a local ophthalmologist, who had been working to reduce the carbon footprint of cataract surgery since 2012. They wrote a proposal and secured funding for a Sustainable Healthcare Leadership Fellow, utilising Health Education Improvement Wales leadership programme. This was 'clearing stones' so that others can lead the way. AF-W was the first fellow in 2020, SH the current incumbent. They have worked on reform of the undergraduate curriculum, health board sustainability action planning, the Nitrous Oxide Project, and susQI education.

Make friends

Tom Downs, in his Foundation years, undertook a Bevan Commission Exemplar project, harnessing the Well-being of Future Generations Act (Wales) 2015 [4] to explore the connections required to create a sustainable hospital, resulting in the inspiring Ysbyty Gwynedd Green Group.

Learn about the structure of the system in which you work to uncover how to align authority with motivation. Reach out to senior leaders to discuss pressing issues relevant to your healthcare setting



Raise awareness of the climate and health crisis amongst those around you.

Embrace the opportunity to talk on the subject and encourage curiosity and interest. For example, FB and team presented at public health sessions, engaging health board executives and established the Welsh Environmental Anaesthesia Network (WEAN).

Advertise your successes. In 2019, a senior figure on a hospital visit spotted a curious poster describing WEAN's Project Drawdown: our volatile agent reduction initiative. The environmental impact of healthcare was new to him. He and FB now sit on the same NHS Wales Decarbonisation Programme Board.

In 2021 NHS Wales published its strategic decarbonisation plan [5]. The net zero NHS Policies and our Future Generation Act were helping to align authority with our own personal motivation. With support from the Centre for Sustainable Healthcare, the Bevan Commission, and fledgling green groups, we launched Green Health Wales, a network for sustainable healthcare in Wales with three aims: 'Learn, Connect, Transform', aiming to break down traditional silos within the healthcare sector to develop collective action through distributed networks underpinned by compassionate leadership [6].

Every anaesthetist has authority and support from their organisations (Association of Anaesthetists and RCoA) who have published sustainability strategies, the NHS decarbonisation policy, and COP26. Seize the moment, create opportunities, and follow every connection that comes your way.

The Association of Anaesthetists recognise that our actions have an impact on the environment, and we see sustainability and climate change as key strategic issues. Find out more about what we do, and get advice and information on green anaesthesia.

www.anaesthetists.org/Environment

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An interview with Dr Chris Allen.

Jason Gandhi our current Environment Fellow talked to his predecessor....

JG: Can you tell us a bit about yourself?

CA: Sure, I'm an anaesthetics and intensive care medicine trainee and I was fortunate enough to be the Fellow in Environmentally Sustainable Anaesthesia for the Association of Anaesthetists, Centre for Sustainable Healthcare and Newcastle Hospitals last year. I had a fantastic time in that role and have come out with some really interesting projects.

JG: The Nitrous Oxide Project was one of them, but why did you choose to get involved with this?

CA: I took over from the wonderful Cathy Lawson who, with others, had done some fantastic work on the use of volatiles. I was thinking what else could we look at? Obviously the next thing in line if you look at carbon hotspots in anaesthesia is nitrous oxide. I was fortunate that the opportunity came up to get involved with this project, started by Alifia Chakira who is a pharmacist in NHS Lothian. She had been doing ground-breaking work with nitrous oxide waste in theatres in Edinburgh, and she was wanting to promote this nationally.

JG: Why is nitrous oxide bad in the first place?

CA: It is a greenhouse gas with a global warming potential 265 times greater than CO₂. It is ozone depleting with a life span > 100 years once in the atmosphere. It is cheap and effective, meaning it is in widespread use not just in anaesthesia but in maternity, dentistry, emergency departments and pre-hospital. We could be using alternatives with a reduced carbon footprint; but if we are going to use it, how can we stop it getting into the atmosphere? I realised the cracking technology in use in Sweden might be very effective.

JG: You mentioned nitrous oxide waste. Do you feel this is an issue in all Trusts or only a few?

CA: The Nitrous Oxide Project has shown that it's a widespread problem. Most hospitals would find that they have some degree of nitrous oxide waste if they investigated. If you look at how much each hospital is buying from the manufacturer and then how much they are using, there will be a discrepancy. In NHS Lothian, there was considerable leakage. All you need is one

point in a manifold supply to be leaking a small amount, say a litre a minute, every hour, every day, every week, and this accumulates to hundreds and thousands of litres long term. Plus stock was being mismanaged - for example full cylinders were reaching their expiry date and then being sent back to the manufacturer to be vented into the atmosphere.

JG: What is the strategy going forward?

CA: The next step is to implement solutions, including decommissioning manifolds as most anaesthetists don't use nitrous oxide. We also anticipate that if there is a problem with nitrous oxide loss, the same will apply for Entonox.

JG: You have mentioned nitrous oxide cracking. What is this?

CA: This is well established in Scandinavia. A catalytic processing unit breaks nitrous oxide down into nitrogen and oxygen. Interestingly, it was initiated over 15 years ago due to safety concerns of staff exposure to nitrous oxide. The additional benefit is nitrous oxide isn't released into the atmosphere.

JG: With this cracking technology, is there just one device?

CA: There are several manufacturers based in Scandinavia. At Newcastle Hospital maternity unit we've been working with Medclair. A mouthpiece or facemask collects the exhaled nitrous oxide and takes it to a mobile cracking unit in the room. We were the first in the UK to start using these devices, and we had our first baby delivered a few months ago with mum using Entonox that was captured and destroyed, which is just fantastic! The next step in Newcastle is getting one of the larger central units built into the infrastructure so it serves all the labour rooms.

JG: This is great, but it sounds expensive?

CA: To purchase one outright? Yes, but you can say that with all sorts of medical equipment. Sustainability in the NHS is a key topic now, and the NHS has set itself a target to reach net zero for direct emissions by 2040. To reach this we are going to have to invest, and some of that investment will be in technology like this. In anaesthesia we can stop using desflurane or nitrous oxide and there are perfectly safe alternatives. In maternity it's different, and I don't think at the moment Entonox is likely to be removed from clinical use.



JG: How have the patients adapted to the face masks rather than using mouth pieces?

CA: In theory, the mask can collect a bit more exhaled nitrous oxide. Women have been happy to trial the mask, and we've had positive feedback. But the devices will work with a mouthpiece if that is preferred.

JG: That's interesting to hear! Have you been able to monitor the levels of nitrous oxide in the workplace around healthcare workers?

CA: Yes, that is exactly what we are doing at the moment. Our project is still ongoing, with one strand looking at staff exposure to nitrous oxide and the other to understand how effective these devices are here in the UK.

JG: Did you have to change the outlook and attitudes of individuals to say this was an issue?

CA: We luckily haven't had much resistance with any of these projects. The good thing so far is that we haven't asked staff or patients for a huge change in practice.

JG: Onto our last question! If you were a trainee new to sustainability, what suggestions would you give them?

CA: In anaesthesia we're very well placed to get involved with many things in and beyond the hospital. We should first look at our own clinical carbon footprint and try to build sustainability into everything that we do. There are many things that need changing and people should rightly feel concerned by the worsening climate crisis, but we don't want people to shy away and ignore the problem. Instead, act. In whatever way, we must all act and act now.

Acknowledgement: very many thanks to Louise Swan for her editing assistance.

Jason Gandhi

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The Association of Anaesthetists is looking to appoint three new Editors for *Anaesthesia Reports*.

Anaesthesia Reports is the case report journal of the Association of Anaesthetists. The journal takes the traditional case report to the 21st century by including clinical and educational articles, multimedia pieces, and social media engagement. *Anaesthesia Reports* was indexed in PubMed Central in February 2020.

The role of the Editor is mostly email and web-based and involves reviewing submitted manuscripts and multimedia items and editing them in preparation for publication. The successful applicants should have a history of publication, be able to write coherent and elegant English, and have good time management skills. Previous editorial experience is not necessary, but experience of acting as a reviewer for papers submitted to peer-review journals is desirable.

The term of office is three years with up to two extensions by mutual agreement. As well as the opportunity to work with an excellent and cohesive editorial team, rewards include free registration at major Association of Anaesthetists' meetings.

Applicants should submit a short essay of up to 500 words on 'The value of the patient voice in case reports' by email to the Editorial Co-ordinator, Claudia Welburn (anaesthesiareports@anaesthetists.org), together with a short curriculum vitae (no more than two A4 pages). Shortlisted candidates may be asked to perform a small number of editorial tasks as part of the selection process.

We would particularly welcome applications from senior trainees and consultants / SAS doctors who are within the first 10 years of their substantive appointments and looking to develop their reviewing and editing skills.

Applicants who wish to discuss this post are advised to contact the Executive Editor, Dr Cliff Shelton (c.shelton@lancaster.ac.uk).



Association
of Anaesthetists

The closing date for applications is **11 March 2022**

The road to COP26

Along with the rest of the world, the anaesthetic community has become more aware of its environmental impact. In 2018 a number of interested colleagues founded the Scottish Environmental Anaesthesia Group (SEAG) in order to share ideas and practice and to improve all aspects of peri-operative sustainability. In 2017, Raigmore Hospital in Inverness introduced the first 'green theatre project', looking at aspects of peri-operative practice that could be altered to reduce the carbon footprint. This has now been adopted by the Scottish Government as the National Green Theatre Programme. SEAG is made up of enthusiastic and passionate individuals who support and learn from each other, and from small beginnings we now number over 70 individuals with representation from every Health Board in Scotland.



On the background of this work, we applied to present at the COP26 UN Climate Change Conference. In February 2021 the official COP26 website opened for organisations to present their work within the Green Zone. Groups from all over the world exhibited their work, initiatives and actions to the public and official delegates. There were many categories but, rather surprisingly given the large contribution of healthcare to global pollution, not one specific to healthcare. We proceeded with our application under 'Adaptability and resilience'. We believed this was a unique opportunity to present important work on an international platform. There was also an awareness that this might be a powerful step in negotiations with our Health Boards, and we hoped to inspire the wider healthcare community to become involved in projects of their own.

There was great excitement when we were shortlisted in August 2021! After an official UK government briefing, we created a video of our work across various Scottish Health Boards on topics including the reduction of desflurane use, the nitrous oxide project and waste segregation [1]. Strict criteria ensured sustainable materials were used and no handouts were permitted. Our members worked together to create posters for the event and a QR code for our SEAG website [2].

When the day arrived, we were situated in an area alongside seven other organisations in the Glasgow Science Centre just across the Clyde from the main Blue Zone. SEAG members travelled from different Scottish cities by train and electric buses – our carbon footprint was being documented by the COP26 organisers! Many of us met for the first time in person and had the opportunity to share stories of our work. It was clear from the list of exhibitors that there were only three healthcare-related organisations out of 96 attending over the 12 days.

Over two incredible days we talked to many people from all over the world. We took photos and posted our story on social media to help spread the message. There was genuine interest in our work, and the positive feedback we received went a long way towards reassuring us that what we were doing was indeed necessary and important. We shared contact details with many individuals: academics; industry representatives; policy makers and members of the public; and we reflected that healthcare appeared to be under-represented given that the climate crisis is above all a health emergency. Hopefully we did a little to redress that imbalance.

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Lisa Manchanda
Consultant Anaesthetist
Queen Elizabeth University Hospital, Glasgow

Ewan Wallace
Consultant Anaesthetist
Royal Hospital for Children, Glasgow

Twitter: @GreenAnaesScot

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Trainees, first year consultants and medical students, let's come together at

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Last call to submit your abstracts!

There are many fantastic opportunities for you to be recognised at Trainee Conference 2022 for your work, projects and research. You can submit an abstract and take part in the following:

- Draeger Trainee Oral and Case Presentation Prizes
- Poster Prize Competition
- Medical Students Poster Prize Competition

The deadline to submit your abstract is **23:59 on Wednesday 9 February 2022**.

Thomas Boulton Anaesthesia History Prize

You could win a cash prize of £500 and a prestigious award when you submit an original essay of 4000-6000 words on a topic related to the history of anaesthesia, intensive care or pain management. Open to trainees and medical student members of the Association, the deadline to enter the Anaesthesia History Prize is **23:59 on Wednesday 9 February 2022**.



Still time to enter the Trainee Wellbeing Initiative Award

Recognising projects or campaigns led by trainees, that have had a measurable beneficial effect on the wellbeing of anaesthetists. The deadline to enter the Trainee Wellbeing Initiative Award is **23:59 on Wednesday 6 April 2022**.

Trainee Conference 2022 will be held in Bristol. It will also be streamed online for those who are unable to attend in person.

"Thanks for an epic conference. Learned loads and had a great time"

Tom Johnson, attendee at Trainee Conference 2021



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Why I joined Doctors for Extinction Rebellion

“Doctors for Extinction Rebellion (DRXR) is a doctors’ collective who, appreciating that climate change is an impending public health catastrophe, have decided to undertake civil disobedience with Extinction Rebellion.”

DRXR is a collective of concerned health care professionals who have made personal decisions to take part in ‘non-violent direct action’ to demand that governments and lately, private corporations, take urgent radical action to combat climate change. Although it operates under the banner of Extinction Rebellion, DRXR undertakes its own executive decisions. It approaches climate change from the perspective of the unprecedented threats to human health that will be caused by the projected rise of 2.7°C. These have been detailed elsewhere, and excellent work has been done by the *Lancet Commissions*.

My own epiphany came as a result of my life-long and abiding interest in environmental sustainability and conservation. As an MSc student at the Centre of Alternative Technology, one of my modules included modelling the various convergence and contraction scenarios for carbon emissions. The longer the delay the more drastic the changes will have to be, and as our carbon budgets contract the risks of societal breakdown increase. It is also apparent that there is no political will to undertake the transition from a fossil-fuel based economy to a net-zero carbon economy, even though all the solutions are already available. There was a sense of helplessness and despondency amongst my fellow students at the Centre of Alternative Technology.

Then came Extinction Rebellion in 2018, and out of a sense of ‘nothing to lose, everything to gain’, I joined. I hung about on the periphery, joining in a protest here, going to a few meetings there, but never really taking part in any of the organising – until the middle of 2019, when I came across DRXR, and I found a home in the movement together with many other HCPs.

DRXR have now spearheaded many disruptive and non-disruptive non-violent direct actions. It has used theatre to draw attention to the deaths caused by inaction on climate change, by performing mock Coroner’s inquests outside Parliament Square, at the G7 and elsewhere. It has led disruptive actions outside the offices of JP Morgan, the biggest private financier of fossil fuel companies. It has been reported in the *Independent*, the *Guardian* and the international press.

What of the ethics surrounding medical professionals and non-violent direct action, especially actions that are undertaken with full knowledge of a possible custodial sentence or criminal charge? The GMC states:

“Like all citizens, doctors are entitled to their own personal political opinions, and there is nothing in the standards we set that prevents them from exercising their rights to lobby government, or campaign on issues” and “If we receive a complaint about the actions of a doctor involved in a protest, or a self-referral, we have a legal duty to consider the issues raised. However, as with all complaints, we would make our decision based on the specific facts of the case” [1].

Several doctors have been arrested for taking part in non-violent direct actions. No disciplinary action has been taken by employers or the GMC. Nevertheless, the concern is always there that some employers may take a more heavy handed approach. What are my own hopes? The obvious one is that once the Overton window has moved and there is overwhelming civilian support for radical, concerted action to mitigate the worst outcomes of climate change, governments will finally be forced to take effective action. On a personal basis: hope doesn’t come into it as much as moral duty. It is time to pick a side.

Hoon Seong Teo

*Consultant in Anaesthesia and Intensive Care Medicine
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Publication of this article does not imply endorsement by the Association of Anaesthetists of the opinions contained therein.

International grant application process has now re-opened

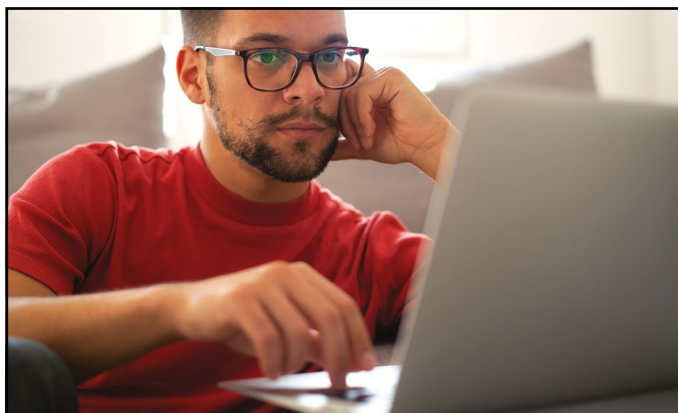
The International Relations Committee (IRC) would like to receive funding applications for international anaesthesia education or research related projects.

- Travel grants
- Project grants
- Volunteer grants
- e-Education grants

The safety of applicants and participants must be considered in all projects. Funding for travel will only be considered where it complies with current government guidance, and where the submitter can demonstrate that due diligence has been followed.

All applications must be submitted by an anaesthetist based in the UK or Ireland and all projects must have a UK partner. Travel must comply with current government travel guidance.

<https://anaesthetists.org/Home/Get-involved/Grants-awards-and-prizes/International-e-education-grant-award>



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The Barema & Association of Anaesthetists Environment Award for anaesthesia 2022

The Association of Anaesthetists recognises that our actions have an impact on the environment and regards global warming and climate change as pressing issues.

The Association have once again linked with Barema, the Association for Anaesthetic and Respiratory Device Suppliers, representing companies that manufacture or supply anaesthetic and respiratory equipment in or to the UK to award the Barema & Association of Anaesthetists Environment Award for anaesthesia 2022. The award recognises excellence in sustainability within the specialty and engages with industry partners to further develop a greener anaesthesia agenda.

The Barema & Association of Anaesthetists environment award is an annual award for the single best initiative or project related to anaesthesia,

intensive care or pain management that has had and will continue to have a measurable beneficial effect on the environment.

The winner will receive a cash prize and a grant for further support and development of the project and will be invited to present their work at Annual Congress 2022.

For more information on the award and how to submit, visit <https://anaesthetists.org/Home/Get-involved/Grants-awards-and-prizes/Barema-Association-Environment-Award>



Submit your application by the deadline of **23:59 on 1 June 2022**.

Northumbria Healthcare's personalised reusable cloth theatre caps

People have a 30% chance of recalling a person's name after an initial introduction [1]. This is worse under stress. In operating theatres, we regularly work with unfamiliar colleagues because of multiple combinations of teams, transient staff, agency staff and working in multiple locations.



The 'cocktail party effect' describes the phenomenon whereby we can shut out multiple conversations in a noisy room but focus on people that use our own name. Functional MRI demonstrates unique brain activation specific to hearing one's own name [2]. This is especially useful during critical incidents when specific tasks are allocated to individuals. Given that 70% of adverse events in operating theatres come from communication errors, the WHO developed guidelines that require us to introduce ourselves at the start of each session [3]. Despite this, name recall in theatre is poor. A survey performed in a local hospital showed that only 2% of respondents were able to correctly recall the name and role of all members of their particular theatre on that day.

The Theatre Cap Challenge is a movement started in 2017 that encourages theatre staff to display names in large font on theatre caps. This overcomes the problems of name badges being concealed by gowns and only being legible at close distance. A staff survey in our Trust showed that 88% thought displaying names on theatre caps would be helpful.

In addition to the above benefits, there are environmental gains from using reusable theatre caps. Disposable caps are made from viscose, a substance derived from the bleached cellulose ('wood pulp') of trees, thereby contributing to deforestation. Numerous hazardous chemicals are used in its production [4]. Disposable theatre caps are either incinerated or sent to landfill after use, neither option being environmentally friendly.

After confirming local support for this venture through our staff survey, and demonstrating that the literature showed no evidence of adverse infection rates associated with reusable hats, we commenced production. Northumbria Healthcare NHS Foundation Trust opened its own PPE factory in early 2020 (now called the Northumbria Healthcare Facilities Management Ltd (NHFML) factory) in response to nationwide PPE shortages caused by the COVID-19 pandemic. We were now in the position to produce our own hats, thereby reducing the carbon footprint associated with transportation and also supporting our local economy.

We had male and female hat styles designed considering different head sizes. A selection of fabrics was considered and we chose

polycotton as it is durable, maintains its colour when washed, and doesn't irritate skin. Embroidery of names was done in large white font to ensure text was easily readable at a distance. We selected hat colours based on the national NHS uniform work currently underway, with different colours indicating different roles in theatre, for example green for doctors, light blue for Band 5 staff, royal blue for Band 6 staff.

Our hats are cost-effective compared with disposable single use hats: within one month, the cost of providing one reusable hat per staff member is recouped. We issued staff with five hats, a wash bag, and washing instructions.

Informal feedback from staff shows that communication within our five separate theatre suites has improved. Staff shortages caused by the pandemic mean that colleagues are often moved between sites at short notice, and many have commented that the hats make it easier to fit into an unfamiliar team. Positive patient feedback has also been received, with several reporting that knowing staff members' names and roles makes them feel safe as they come to theatre. We are in the progress of obtaining formal feedback from both staff and patients.

Jordan Minns
Consultant Anaesthetist

Elaine Winkley
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Northumbria Healthcare

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Anaesthesia

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Anaesthesia Digested

February 2022

Why does oesophageal intubation still go unrecognised? Lessons for prevention from the coroner's court

Pandit JJ, Young P, Davies M.

Three papers in this month's issue of *Anaesthesia* demonstrate the wide range of interesting and topical manuscripts that we accept for publication and I have highlighted an editorial, a guideline and an original article. In the editorial by Pandit et al., the ongoing issue of unrecognised oesophageal intubation is discussed. As a trainee I was taught 'If in doubt, take it out', and more recently we have had the waveform capnography campaign 'No trace - wrong place', yet unrecognised oesophageal intubation still occurs. Human factors play a

huge part in these types of errors, and it is timely that the Association is shortly publishing a human factors ergonomics guideline. Here, Pandit et al. offer three approaches to 'prevent unrecognised oesophageal intubation'. This is the same as enhancing the practice of 'confirming correct tracheal tube placement' and includes the need for education and training, adopting clinical rituals into personal practice, and devising engineered solutions. This is essential reading for all anaesthetists.

Principles of environmentally-sustainable anaesthesia: a global consensus statement from the World Federation of Societies of Anaesthesiologists

White SM, Shelton CL, Gelb AW, et al.

The Association is at the forefront of environmental issues and sustainability. White et al. present a global consensus statement on environmentally sustainable anaesthesia. A Working Group of 45 anaesthesia providers from around the world, all with a recognised interest in sustainability, was convened and used a three-stage modified Delphi consensus process to agree on principles of environmentally sustainable anaesthesia that are achievable worldwide. The Working Group agreed on the following three important underlying statements: patient

safety should not be compromised by sustainable anaesthetic practices; high-, middle- and low-income countries should support each other appropriately in delivering sustainable healthcare (including anaesthesia); and healthcare systems should be mandated to reduce their contribution to global warming. We can each play our part, for example by ditching the desflurane, re-using drug trays and disposing of propofol for incineration. Global warming is an issue we must address today, not tomorrow.

The effect of patient ethnicity on the accuracy of peripheral pulse oximetry in patients with COVID-19 pneumonitis: a single-centre, retrospective analysis

Wiles MD, El-Nayal A, Elton G, et al

Wiles et al. have looked at the issue of patient ethnicity and its effect on pulse oximetry readings, conducting a retrospective observational study in nearly 200 patients comparing paired measurements of arterial oxygen saturation measured by co-oximetry (SaO₂) during arterial blood gas analysis and the corresponding peripheral oxygen saturation measured by pulse oximetry (SpO₂). Could skin pigmentation and/or ethnicity cause errors in SpO₂ measurement, related to the wavelengths at which haemoglobin and melanin absorb light? Haemoglobin's peak absorbance is in the green wavelengths,

and high levels of melanin may affect the path taken by the red light of the pulse oximeter. Whilst white patients tend to have lower levels of melanin, there is intra-population variation in skin pigmentation. 'Melanin index' is a quantitative estimate of melanin content and more accurate than assigning ethnicity, defined as a social group sharing common culture, religion and language. Nevertheless, the authors found that, reassuringly, skin tone did not significantly impact on the accuracy of oximetry.

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

C.R. Bailey, Editor, *Anaesthesia*

Your letters

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

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

Dear Editor

Videolaryngoscopy and the Magill curve: going full circle

Harking back to the origins of tracheal intubation, Sir Ivan Magill recognised the importance of applying a curve to a tracheal tube in order to facilitate its smooth passage to the glottis, thus obviating the need for a metal instrument to guide it. He achieved this by cutting his tracheal tubes from the tail ends of industrial rubber that came in 'little coils' [1], and this anatomical curvature with a radius ~140 mm is eponymously termed the Magill curve to this day.

Fast forward to the present day, this 'natural' curvature is often insufficient to facilitate easy passage of the tracheal tube to the glottis when using videolaryngoscopy. A coudé-tipped bougie may be necessary when using a Macintosh-type blade, whereas a J-shaped stylet is almost always required if a hyperangulated blade is employed.

To overcome this issue I would recommend *going full circle* prior to undertaking videolaryngoscopy, both metaphorically and literally: optimising the curvature of the tracheal tube as Magill advocated, but this time by placing the tracheal tube in a circle configuration (Figures 1-3) for a minimum of 3 min. This reduces the radius of curvature to 70 - 100 mm, thus facilitating passage of the tracheal tube through the glottis when using a Macintosh videolaryngoscope blade - reducing the need for a bougie, time to intubation, and potentially airway trauma.



A standard tracheal tube is only likely to retain the additional curvature for a single attempt at intubation due to the limited intrinsic memory of the constituent material, so an appropriate airway adjunct should be utilised if repeated attempts at tracheal intubation are required.

Patrick Ward

Consultant Anaesthetist
St John's Hospital, Livingston

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Dear Editor

Let's stop recycling breathing systems!

No, really. With one year to go until retirement, I am probably in the last cohort of UK anaesthetists to remember vulcanised black rubber breathing circuits. Heavy, cumbersome and opaque but *washable*. There were enormous circuit washing machines in the sluice. I think circuits were washed once a month, no HME/pathogen trapping filters either!

We changed to lightweight plastic circuits mostly on cost grounds as nobody needed to be paid to do the washing; freeing up space in the theatre complex was another justification. Infection control and commercial interests mandated that the new circuits were 'single patient use'. Happily we now ignore this; having faith in our filters, we dispose of the circuits after an arbitrary time in use.

Shouldn't we demand *fully reusable* anaesthetic tubing, given the ongoing carbon cost of the disposable stuff, not to mention lurking worries about plastic waste contaminating the world's ecosystem. The solution is currently available: tubing and facemasks made of silicone come in various standard and custom-made lengths, and both adult and paediatric diameters. Silicone is very stable, with a shelf life of around 10 years at room temperature. It is structurally stable up to 200°C, but deteriorates faster under hot conditions; however it still has 190 days shelf life at a continuous 134°C. Thus silicone equipment may be autoclaved at 134-137°C and reused an indefinite number of times.

There are at least four manufacturers: Intersurgical (<https://www.intersurgical.com/info/alterna>); Flexicare (<https://www.flexicare.com>); Create Biomed (<https://www.create-biotech.com>); and Galemed (<https://www.galemed.com>).

By the way, don't get me started on red rubber tracheal tubes!

Graham Walker

Consultant Anaesthetist

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Reusable tubing in use (courtesy of Diamedica)

Dear Editor

How many things can go wrong?

..... during a simple general anaesthetic? Here is the list during a Friday afternoon when we had one elbow MUA:

1. The cannula from the ward tissues after induction (we had checked it).
2. i-gel takes multiple attempts to site.
3. When we do succeed, there is no capnograph trace (sampling line issue is soon resolved).
4. The second cannula is sited but i.v. fluid starts leaking from the site of the first cannula.
5. The third cannula that was inserted proximally to previous two (all on same arm because surgery required on opposite arm) is now in the way of the BP cuff.
6. The BP cuff is placed on leg; the BP is unrecordable; metaraminol is given.
7. The surgeons make no mistake with their operation (I've included this in the list because it is so improbable).
8. The SAP is > 200 near the end of the case for no apparent reason; midazolam is given.
9. The BP remains high in recovery despite the patient waking up pain free and alert (I hang around because I am a diligent anaesthetist, not because I want to rule out a CVA).
10. A brilliant recovery nurse notes that the BP is always high at this time of day and the patient is due an evening dose of diltiazem, but we don't stock it here.
11. I chivalrously offer to fetch it myself from the medical ward but I spend hours (OK maybe not quite) looking for the preparation that matches the ward prescription.
12. As I continue my chivalrous quest to administer it myself (because I am a diligent anaesthetist, not because I feel guilty for a bodged anaesthetic), I drop the tablet on her bed.

Hasan Shamsi

ST3 Anaesthesia

East Midlands

Congratulations to Graham Walker for winning February's Letter of the Month prize.



Anaesthesia is the official journal of the Association of Anaesthetists, published by Wiley. The job of the Editor-in-Chief (EiC) is primarily the production and development of the journal, and in addition acting as a Director, Trustee and Officer of the Association of Anaesthetists. The EiC also leads the strategic direction of the journal, in consultation with the Editorial Board of the Association of Anaesthetists.

The role of the EiC is mostly email and web-based, but also involves attendance at Editorial Board meetings and in-person promotion of the journal. The term of office is 6 years and the position will start from September 2023 with the preceding year spent as Editor-in-Chief Designate. The EiC heads up a team of Editors (currently 15). The team also includes the Editorial Co-ordinator who is employed by the Association of Anaesthetists. The EiC with the assistance of the Editorial Co-ordinator is responsible for oversight of the workload of all Editors and the day to day running of the journal.

Person Specification

The applicant must be a consultant (or equivalent) anaesthetist/intensivist/pain specialist and a member of the Association of Anaesthetists in good standing.

Skills required

- Exceptional communication skills, both verbal and written
- Experience of writing, proofreading, scientific language editing, and previous editorial work

- Knowledge, experience and skills in clinical anaesthesia, peri-operative medicine, pain medicine and/or critical care medicine
- Good time-keeping and ability to meet deadlines
- Exceptional leadership skills, with vision to develop the Journal

Application process

Applicants should submit a curriculum vitae (maximum 3 pages) by email to secretariat@anaesthetists.org and should include sections headed:

- Summary of current activities;
- Professional areas of interest;
- Previous editorial and assessor experience;
- Summary of publications including your 10-15 most important/recent ones

In addition, please submit a one page summary addressing the question "Is there a future for subscription journals in the Open Access era?" If shortlisted for interview, you will be required to give a presentation on this topic.

Following short-listing, successful candidates will be invited to interview by an appointment panel. Please direct any queries for further information to the Editor-in-Chief at anaesthesia@anaesthetists.org

The closing date for applications is **31 March 2022**.

For more information and the full role description go to anaesthetists.org/Home/About-us/Staff-vacancies

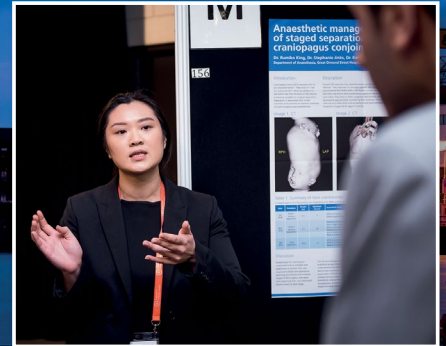


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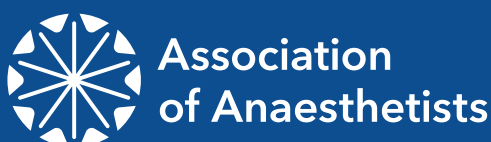
- Audit and quality improvement
- Case reports
- Original research
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SAS audit poster prize open: Calling SAS and NCHD anaesthetists! Submit an abstract for the SAS Audit Poster Prize.

Roddie McNicol Patient Safety Prize: Submit your safety in anaesthesia projects. Open to Association members.

All accepted abstracts will be published in a special online supplement of *Anaesthesia*.

The closing date for submissions is 23:59 on Wednesday 13 April 2022.



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Find out more
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