



THE NEWSLETTER  
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ASSOCIATION  
OF ANAESTHETISTS  
OF GREAT BRITAIN  
AND IRELAND

# ANAESTHESIA NEWS

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## ENVIRONMENT ISSUE

**Human health  
depends on nature:  
why doctors must  
become eco-warriors**

**Environmental initiatives  
in a new build hospital**

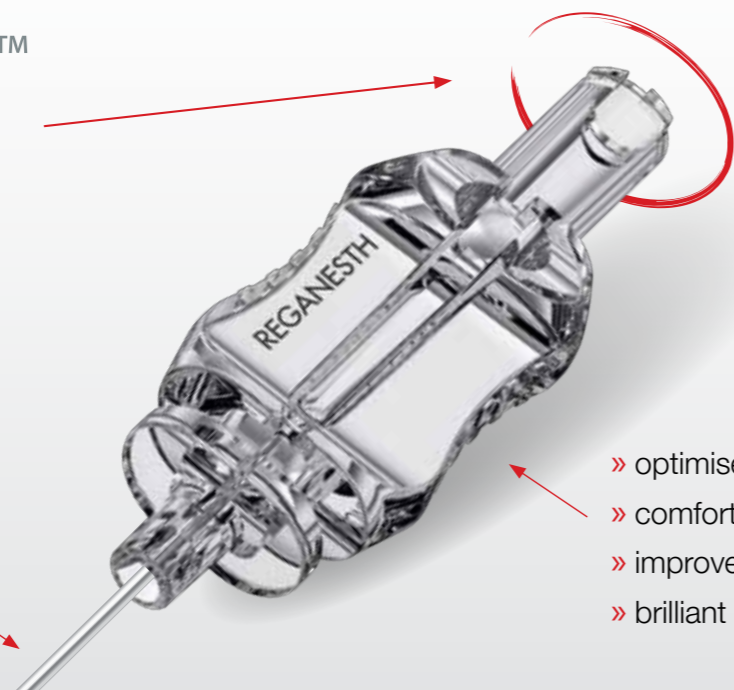
**Metal recycling in  
healthcare waste  
management**



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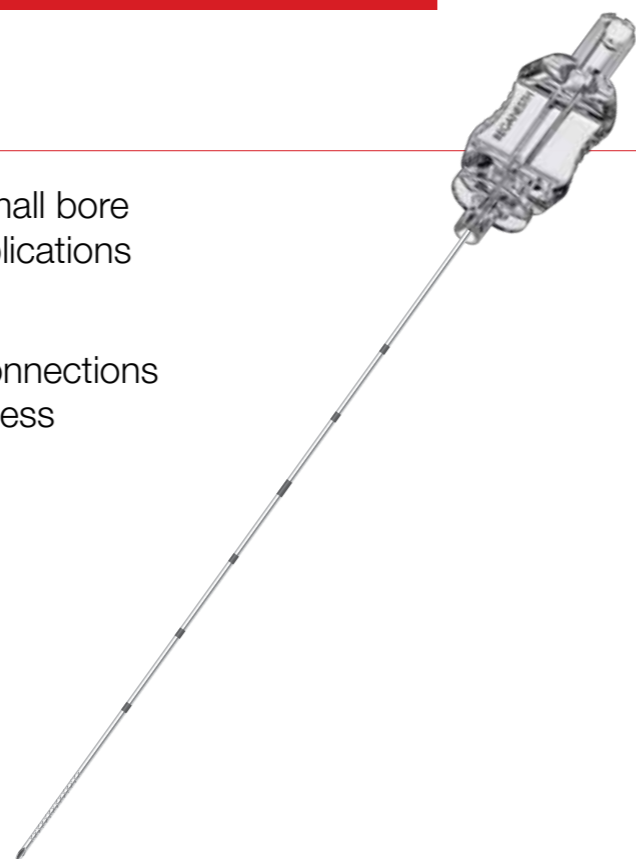
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# Editorial



Welcome to the Environment issue of *Anaesthesia News*. This is my second year as Chair of the Environment Task Group (ETG), and in those two years we have achieved so much. We produced an environment statement, available on the AAGBI website, jointly badged by the RCoA and CAI and thus making us a powerful voice for our members. This statement encapsulates our commitment to promoting sustainable healthcare, reducing individual and institutional waste, and positions our organisations as leaders in promoting sustainable healthcare. On page 18 you can see what we have been doing at 21 Portland Place to improve our carbon footprint, and on page 31 all the amazing things the Education committee has done to make our meetings more environmentally friendly. The Association is a fun, responsive, 'can do' organisation and is willing to try all sorts of things to make a difference (from a meat-free lunch at Annual Congress, to recyclable plantable seed paper advertising the first Environment prize). I am delighted that, following a recommendation from the ETG, the Board has agreed that all AAGBI committees will now report routinely on their environmental impact as part of their workstream. We have co-opted representatives from the RCoA and CAI onto the ETG, and in March, jointly with the RCoA, we ran the second seminar on 'The Environment and Anaesthesia'. This seminar was fully booked and we will update you on the key messages and outcomes in the coming months. We have started working with the Centre for Sustainable Healthcare to look at ways to fund a fellowship in the 'Environment and Anaesthesia', and are establishing a network of environmental champions around the country.

This issue celebrates a lot of what we have achieved and is bursting at the seams with all sorts of exciting initiatives, projects and ways to reduce our carbon footprint. Look out for inspiring articles from Frank Swinton, who is doing a one-year masters degree in Strategic Leadership Towards Sustainability in Sweden, and Tim Smith, who has done a masters in Environmental Management. Cathy Lawson gives a great account of being a trainee on the ETG and what she has learnt, and Tom Pierce tells us how we can make a difference in the workplace. I am particularly proud of the article from Esther Coffin-Smith, the Sustainable Development Manager from my hospital, Southmead, North Bristol Trust. We are a new build hospital, so this gave the sustainability team a great opportunity to embed a culture of greenness into the building and the working lives of its staff.

Being Chair of a committee is easy with a great team, huge thanks go to Karin, Gemma and Natalie, our in-house support, to Cathy Lawson (GAT rep), Catherine Max (our enthusiastic lay member), Paul Sim (Barema representative, and partner for Environment prize), Mike Nathanson, Stu White, Frank Swinton, Tei Sheraton, Lucy Williams (RCoA), Kevin Clarkson (CAI) and especially Tom Pierce whose boundless energy for all things green makes me green with envy!

I hope reading this issue will inspire you to think about an environment themed project/idea/audit for a poster or presentation at one of our meetings, apply for the AAGBI/Barema Environment award, or consider being an Association environment champion. If you have any ideas or questions for the ETG, drop me an email to [secretariat@aabgi.org](mailto:secretariat@aabgi.org). We are an organisation with a voice and we are here to represent you.

**Samantha Shinde**  
Chair of the Environment Task Group  
Vice President, AAGBI

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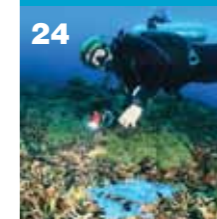
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# Domestic energy consumption

I would guess that almost all of you reading this have a smartphone, and a significant proportion of you will have an app installed that allows you to remotely monitor your domestic energy consumption or control the ambient temperature in your home. Not so much a fancy toy but a way in which you could reduce your energy bills. As most of our homes are heated with gas and the majority of electricity in winter is from fossil fuel combustion, saving money also saves CO<sub>2</sub>.



The automatic anaesthesia machine self-test may not include the AGSS



In most modern operating rooms the AGSS control is on the theatre control panel

So how much is that CO<sub>2</sub> saving? DEFRA quotes that 1 kWh of electricity from natural gas combustion releases 430–530g CO<sub>2</sub> per kWh and burning natural gas to heat our homes produces 185 g/kWh. A kWh is a unit of energy and is equivalent to 3.6 MJ.

Domestic energy consumption is only one aspect of the CO<sub>2</sub> footprint we leave in our daily lives, but it is one that is easy to describe, albeit in kWh, and your utility company can provide annual consumption and seasonal comparative data. In his book, *How Bad Are Bananas?* [1], Mike Berners-Lee scales up everyday activities, considers many behaviours and choices and resolves them in terms of CO<sub>2</sub> production. For those interested, the amount of CO<sub>2</sub> produced by air freighting asparagus from Peru in the UK winter, for example, is at least ten times the mass of the asparagus. Conclusion: look forward to eating British asparagus when in season.

Turning to the workplace, our budget holders and clinical directors would wish us to use isoflurane at about a seventh the cost of the other two inhalational agents, and neostigmine/glycopyrrolate in preference to sugammadex. Aside from these extreme examples, cost is poorly appreciated. Further, unlike the domestic gas supply, we are not issued with a personal annual financial summary, or an annual summary. Trying to understand the energy consumption of the operating room is a concept but not reality; until recently.

MacNeill, Lillywhite and Brown are the first authors to quantify the greenhouse gas emissions from the entire surgical suite [2]. By comparing operating theatres in three very different locations and with different anaesthetic practices (Vancouver, Canada; Minnesota, USA; and Oxford, UK) over the calendar year 2011, their paper provides useful quantifiable measures to minimise work-related CO<sub>2</sub> emissions from the surgical suite.

Energy consumption varied considerably from 3.4 g/kWh per annum in Vancouver to 10.6 g/kWh per annum in Oxford. Indexed for floor area, Vancouver outperformed both the other centres at 2.0 MWh m<sup>-2</sup>. This was attributed to the greater use of 'set-back' of air handling units out of hours and wider use of titration of ventilation based on occupancy in Vancouver. Older building stock in Oxford consumed nearly twice as much energy – 3.5 MWh m<sup>-2</sup>. The operating theatres used 3–6 times more energy per m<sup>2</sup> than the rest of the hospital.

Carbon intensity refers to the amount of CO<sub>2</sub> produced for each unit of energy consumed. In Vancouver, most electricity used was hydro-electric and the total emissions were 158.9 kg CO<sub>2</sub> per MWh vs. 408 kg CO<sub>2</sub> per MWh in Oxford where, at the time of the study, most electricity use came from fossil fuel combustion.

There were different practices at the three institutions for segregating waste and handling domestic and clinical waste. This was reflected in the CO<sub>2</sub> intensity of waste being higher in Oxford at 2.7 kg CO<sub>2</sub> per kg waste vs. only 1.8 kg CO<sub>2</sub> per kg waste in Vancouver. However, indexed per case, Oxford generated only 7.6 kg waste per case (20.5 kg CO<sub>2</sub> per case) compared with 16.39 kg waste per case (29.5 kg CO<sub>2</sub> per case) in Vancouver.

The Global Warming Potential (GWP<sub>100</sub>) of desflurane is 2540 times that of CO<sub>2</sub>. A 240 ml bottle once vaporised has the equivalent global warming effect of 860 kg CO<sub>2</sub>. At the time of the 2011 study, the use of desflurane was limited to North America, and this is reflected in the differences of the CO<sub>2</sub> equivalence (CO<sub>2</sub>e) per case. In Oxford, this amounted to 7.0 kg CO<sub>2</sub>e per case compared with 92.5–118 kg CO<sub>2</sub>e per case in North America.



Nitrous oxide is also a potent greenhouse gas (GWP<sub>100</sub> 295), but its use was minimal at all three centres.

So how should this paper be interpreted to modify our practice? Recognising that operating theatres are very energy hungry, it is not enough just to accept the status quo even if the UK Government is keen to de-carbonise electricity generation. The nation is still reliant on fossil fuel combustion for electricity generation especially at peak periods. There is no reason why our speciality should not encourage our estates and facilities to invest in set-back for our theatre ventilation and air handling units. At a simpler and more achievable level, how many of us honestly turn off the Anaesthetic Gas Scavenging System (AGSS) at the end of an operating day? The typical AGSS suction pump is 500–800 W, and older versions 2.2 kW. Left on overnight, unnecessarily, will add 3.6–15.8 kg CO<sub>2</sub> to the atmosphere per theatre, depending on the pump.

Waste stream management in the UK is focused primarily on cost rather than CO<sub>2</sub> intensity. Domestic waste costs about £100/tonne for disposal, while sharps waste cost about £600/tonne. Extrapolation from the Oxford figures shows that domestic waste generates 3.9 kg CO<sub>2</sub> per tonne while sharps waste generates 4.5 kg CO<sub>2</sub> per tonne. Recycling cardboard reduces the CO<sub>2</sub> emissions by 280 g per kg of waste cardboard.

Returning to the smartphone, there are apps capable of calculating the financial cost and CO<sub>2</sub>e of inhalational anaesthetic and making comparison with the other agents [3]. As the atmospheric life-time (particularly the tropospheric life-time) of sevoflurane is shorter than desflurane, sevoflurane has a lower GWP<sub>100</sub>. For example, at a fresh gas flow of 1 litre, and a vaporiser setting of 2% sevoflurane, the cost is £1.57/h and the CO<sub>2</sub>e is 1 kg. Switching to desflurane 5% with the same fresh gas flow costs £4.29/h and the CO<sub>2</sub>e rises to 52 kg CO<sub>2</sub>e.

Money is tangible and we need it to pay our bills. CO<sub>2</sub> is invisible and CO<sub>2</sub>e a concept foreign to many, yet both are closely linked to warming of the planet and climate change. Mike Berners-Lee provided us with CO<sub>2</sub> reduction strategies in our everyday life and MacNeill et al. provide valuable evidence to encourage us to modify our behaviour at work.

## Key messages

- Turn off AGSS out of hours
- Work with estates and facilities to encourage installation of theatre ventilation set-back
- Separate at source and recycle
- Don't place domestic waste in the clinical waste stream
- Sevoflurane is the inhalational agent with the lowest GWP<sub>100</sub>
- If you use desflurane, use it with low or very low flow to keep the CO<sub>2</sub>e to a minimum

## Tom Pierce

Consultant Cardiac Anaesthetist, University Hospital Southampton, and Environmental Adviser, Royal College of Anaesthetists

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## The Environmental Task Group: a trainee perspective – more than low flow anaesthesia

I've always been a keen recycler and like to think I do my bit environmentally but, I have to admit, was unsure what to expect of the Environmental Task Group (ETG) [1] ahead of my first meeting just over two years ago. When I chat to my friends and colleagues about sitting on this Group most of them ask if all we talk about is low-flow anaesthesia and limiting use of our most harmful anaesthetic agents. This was my, totally naïve, preconception too but I'm pleased to say I couldn't have been proved more wrong. My eyes have been well and truly opened as to how we can adapt our practices with countless benefits including environmental protection, sustainability and, perhaps more importantly in the cash strapped environment that is our current NHS, saving money!

The ETG was established in 2013 to lead our speciality on environmental matters and green anaesthesia, including the impact of our clinical actions on climate change and sustainability. There are currently 14 members representing a variety of organisations – the AAGBI, RCoA, CAI, Barema (the Association for Anaesthetic and Respiratory Device Suppliers [2]) and a lay representative.

A few highlights and outputs of the group over the last couple of years have included:

- The AAGBI membership environmental survey (WSM 2016 and electronic data collection) with subsequent revision of the scope and remit of the group along with the joint environmental statement [3] based on these results.
- Promoting the ETG and environmental work of the AAGBI at the GAT Nottingham 2016 networking event.
- Development of the environmental sessions at every Annual Congress.
- Hosting a stakeholders meeting in 2017 for anaesthesia national bodies, industry representatives and other groups and charities with an interest in the environment and healthcare, to discuss issues related to anaesthesia and see where joint action could help.
- Organisation of the AAGBI and RCoA seminar on Environmentally Sustainable anaesthesia at the AAGBI headquarters on 22 March 2018.

For me, being part of the ETG has greatly enhanced my awareness, understanding and knowledge of how our speciality impacts on the environment and sustainability and the seemingly countless ways that we all, as individuals and departments, can make a positive difference in these areas. I'm enthused and brimming with ideas that I've been able to take back to my School of Anaesthesia to make our departments and hospitals greener. These ideas include enhancing sustainability and making cost savings, helping departments meet financial targets as well as ensuring the maximal funds from the public purse can be used to deliver front line healthcare services instead of being siphoned off to use for waste management and product procurement.



There are a variety of ways you too can get involved. A great place to start is by having a look through the information on the AAGBI environment pages [4], watching previous environmental sessions on the Learn@AAGBI [5] platform and attending events such as the Environmental Session at Annual Congress, and AAGBI and RCoA joint seminars.

You can even express an interest in becoming an environmental champion in your hospital. Send your details to [secretariat@aagbi.org](mailto:secretariat@aagbi.org) to become part of a network of enthusiastic, environmentally minded anaesthetists across the UK and Ireland and be kept up to date with the actions of the ETG and how you can implement ideas and projects in your department and local area.

**Cathy Lawson**  
*GAT Committee Member and Trainee representative,  
Environmental Task Group*

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THE ASSOCIATION OF ANAESTHETISTS  
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## Call for nominations for the Featherstone Professorship

Nominations are sought for the AAGBI's 2018 Featherstone Professorship, which is awarded to practising clinicians and scientists who have made a substantial contribution to anaesthesia and its related subspecialties in the fields of safety, education, research, innovation, international development, leadership, or a combination of these.

The AAGBI's Honours and Awards Committee will consider nominations at its meeting on 08 June 2018, and will make recommendations to the Board of Directors, which will determine the recipient of the 2018 Featherstone Professorship (if any) at its meeting on the same date. The successful nominee will be informed shortly afterwards. The award will be made at the AAGBI's Annual Congress in Dublin (26-28 September 2018).

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

Applications should be submitted using the application form available on the website [www.aagbi.org/about-us/awards/featherstone-professorship](http://www.aagbi.org/about-us/awards/featherstone-professorship). The closing date for applications, which should be sent to [honsecretary@aagbi.org](mailto:honsecretary@aagbi.org), is **25 May 2018**.



# You're going where? To do *WHAT?!*

I've written two articles ten years apart in this magazine about my slightly unorthodox career [1, 2], and in both of them I have urged readers to be bold if they think they might like to do something a little off the beaten path.

Never one to ignore his own advice, I am currently on a one-year sabbatical from my Consultant post at Airedale Hospital in Yorkshire. I'm spending it in Sweden with my wife and two kids (6 and 9). We decided to make this move for four main reasons:

1. We'd been in Yorkshire for six years which is by far the longest I've ever lived anywhere and my itchy feet got the better of me.
2. We wanted to give our kids the experience of living in a different country before they reached a stage at school when it would be very detrimental if they had a year away.
3. I wanted to learn more about sustainability and gain a qualification. By roaming around the internet I found a course that seemed to suit me. It's a 1-year masters degree in Strategic Leadership Towards Sustainability ([www.msll.se](http://www.msll.se)).
4. I wanted to have a year away from medicine.

Having made the decision to try and have a year abroad, there were two sets of administration to navigate: leaving the UK and studying in Sweden.

Leaving the UK involved quite a lot of admin but we spread it out over a year so it was never overwhelming. The 2003 Consultant Contract says that a consultant may apply for sabbatical leave in accordance with the employing organisation's current arrangements. So I went down to my HR department and asked for a copy of the special leave policy. They looked a bit suspicious but emailed it to me and I discovered I was entitled to a sabbatical of up to a year at the discretion of the General Manager. I discussed it with her, my Clinical Director and the Medical Director (it's a small hospital so we all know one another) and, thankfully, they were all willing to let me go. I never quite worked out if they were sad or glad to see the back of me for a year – maybe I'll find out when I return?

As for studying in Sweden, that was a bit of an adventure because they only allocate university places about three months before the course starts so I had to line everything up ready to go, apply in the spring and hope like fury they would accept me to start in the summer. Having spoken to the course director I was confident about this part, but our experience of finding housing, a job for my wife and school places for the kids was much more frustrating because Swedes don't seem very keen on email communication and international phone calls are expensive. In the end, we had the house sorted before we arrived – and did have confirmation of school places, but my wife still hasn't managed to get a job despite many, many hours of trying. She's a secondary school English teacher and Sweden has a desperate need for teachers but it would seem that the paperwork is just too daunting for anyone to even attempt when we're only going to be here for a year.

## So what's next?

There are several answers to that. First I have to finish my masters and travel home. Then there'll be all the admin to re-establish life as a doctor in the UK and moving all our stuff out of storage and back into our house, which is currently let to tenants. Hopefully the kids will slot back into the UK system without too much trouble – there will be some catching up to do in terms of curriculum areas that they've missed but I'm confident they'll manage. They have undoubtedly grown in confidence, resilience and courage this year, which will aid their transition.

The really tricky bit though is what am I going to do with my new-found knowledge, experience and skills if I'm working as an anaesthetist in a small hospital in Yorkshire? The answer to that is still not clear. I have a few aces up my sleeve, most of which involve working part-time as an anaesthetist and part-time on sustainability, change management, or organisational development etc. I'm regarding this as the first adventure when I get home. One thing is for sure, history would indicate that, whatever I do, it's unlikely to be boring!

## Is it worth it?

Definitely. When I think about the four reasons for going to Sweden, I've achieved them all:

1. I've seen a new part of the world, met some amazing people and learned a lot about the Swedish way of life.
2. The kids have learned a new language and have discovered for themselves that there are other people in a different country who are just like them – same hopes and fears, same love of ice cream and sledging, same expectations for the future. This has been really hard though because there is no international school in town so they had total immersion in Swedish language as well as Swedish culture. The Swedish school system is very different from ours (they start later and have very little pressure at first) and although their outcomes are probably about the same as in the UK, switching back and forth is definitely turbulent for kids and parents alike. That said, we've been here for six months and the kids are now conversing with their new friends (and each other) in Swedish and the big one has just passed a test they use to ensure that primary school children's Swedish is good enough.
3. The course is fantastic and I would recommend it very highly. That said, doing a masters in one year turns out to be quite a lot of work (they aim to keep us occupied for 40 hours a week) so there isn't much sitting around drinking coffee and chatting. There are two parallel threads all along; sustainability, which addresses social and economic as well as environmental factors, but also leadership in complexity. This element has been the most enjoyable and educational in many ways for me – there's a focus on systems thinking and wicked problems, as well as how to get the best out of teams, embracing diversity, how to care for yourself in times of stress, and conflict resolution, among others. In short, loads of transferable leadership and management skills. About ten times a week I say, 'Why did no-one teach me this at med school?!'

4. Having a year away from medicine was a bit of a vague concept before I left the UK but really quickly became a big benefit of the sabbatical for me. Only when I stepped away in a very determined manner (I relinquished my GMC licence for the year so I'm not tempted to locum) did I really have a chance to think hard about where I am in my career, what the costs are, where I want to be, and how I might get there. It took me two or three months before I really felt rested and stress free and I could start to see the world as someone who is not a medic. Now I feel really excited about getting back to clinical practice and very much recharged in terms of what I want to do in my career. I can really see again what a privilege it is to work as a doctor and I think all of my learning and viewing the job through fresh eyes will help me shrug off more of the day to day irritations.

That's not to say it hasn't been without its moments. We saved hard for a year before we got here but living in Scandinavia as a family of four with no income is still going to knock quite a dent in the 'Swinton Benevolence Fund'. Moving to a new country where you don't know anyone, don't speak the language and don't understand the social/cultural rules is not to be underestimated and is not for the faint-hearted – it is hard, frustrating and lonely at times. All in all, we're having a wonderful life-affirming experience which we will look back upon fondly for many years to come. It won't surprise me if we do something similar again in the future but I might wait until we get home before I start trying to convince my wife, kids and hospital that it's a good idea!

## Frank Swinton

Consultant anaesthetist, Airedale Hospital, West Yorkshire

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## Call for nominations for the AAGBI & AAGBI Foundation Awards



THE ASSOCIATION OF ANAESTHETISTS  
of Great Britain & Ireland

### Nominations are sought for the following awards:

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

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

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

- The advancement of public education in and the promotion of those branches of medical science concerned with anaesthesia, including its history.

- The promotion of study and research into anaesthesia and related sciences and the publication of the results of all such study and research.
- The advancement of patient care and safety in the field of anaesthesia and disciplines allied to anaesthesia in the UK, Ireland and anywhere else in the world.

Nominations should take the form of a short description of the nominee's contributions (no more than one side of A4 paper\*). Self-nomination is acceptable. If you nominate someone else, you should gain their approval for your nomination. The closing date for nominations, which should be sent to honsecretary@aagbi.org, is 25 May 2018.

The AAGBI's Honours and Awards Committee will consider nominations at its meeting on 08 June 2018, and will make recommendations to the Board of Directors of the AAGBI and the Board of Trustees of the AAGBI Foundation, which will determine the recipients of the 2018 AAGBI Awards and AAGBI Foundation Awards. The successful nominees will be informed shortly afterwards. The awards will be made at the AAGBI's Annual Congress in Dublin (26-28 September 2018) or at WSM London 2019 (09-11 January 2019).

\* Minimum font size = 12 pt



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# Environmental initiatives in a new build hospital



Why does a hospital 'do' sustainability – what's it got to do with patient care? We've been asked many times by public and staff, and at first glance it may not be obvious. However everything we do is designed to benefit staff and patients, whether directly or indirectly, while simultaneously protecting and enhancing the environment in which we live. For example, by encouraging staff to commute by bicycle, this is better for their health, reduces air pollution and congestion, and helps the local community and those accessing our site. Encouraging people to turn off lights and close doors results in a better use of hospital funds on things other than energy consumption and makes for a better, more comfortable patient environment. Encouraging the use of locally-sourced, organic and fresh ingredients means better quality food (more nutritional value for patients), better for biodiversity and better for the local economy. These changes also deliver financial savings in many cases, which means funds to re-invest into patient care.

So what exactly do we do? The elements of our work include encouraging sustainable and active travel (TravelSmart), energy/water/waste reduction, healthy and sustainable food, staff and public engagement, biodiversity enhancement, air quality improvement, climate change adaptation, sustainable models of care, and through all of this we try to develop innovative approaches to capture people's interest and enthusiasm. We have even been known to dress up in a giant peapod costume to attract visitors to the stalls at our annual sustainability fair! We are also in the process of introducing the environmental standard ISO14001 within the Facilities Directorate.

We work with other NHS organisations within the city as part of the wider Bristol Health and Sustainability Group and join University Hospitals Bristol and the University of Bristol in a joint annual Green Impact award ceremony to share good practice and recognition. Within the Trust we work with our Fresh Arts lead and colleagues in HR and occupational therapy to design and deliver projects that demonstrate and deliver the co-benefits of sustainability and health and wellbeing (e.g. the Wellbeing Pathfinders map which will include green gym equipment, measured routes, biodiversity points of interest and public art trail).



## Some of the Trust's sustainability highlights include:

- Our most exciting event of the year is the annual sustainability fair on NHS Sustainability Day, with over 15 stalls promoting all areas of sustainability, health and wellbeing and workshops to engage people (e.g. making insect hotels and recycling accidentally shrunken woollen garments into 'sustainability monsters'). Publicity for the 2017 fair at Southmead Hospital reached 16,000 and 82,000 people via Twitter and Facebook, respectively.
- The Soil Association Food for Life award for patient (Silver) and staff (Bronze) meals – freshly prepared on site using organic, fairtrade, locally-sourced ingredients. We also provide travel mugs and re-usable salad bar boxes to reduce the use of disposables.
- An award-winning travel plan with the provision of excellent sustainable travel options and facilities, e.g. monthly free bike safety checks, e-bike loans, pool bikes, electric pool cars, car-share bays, free bus taster tickets for new starters, 600+ space secure central cycle facility with showers and lockers, 33 buses coming onto site every hour, electric vehicle charging points).
- An amazing, water and energy-efficient light and airy hospital building which links patient rooms with views of green space and the outdoors (the Brunel Building at Southmead Hospital) – this alone is a catalyst for behaviour change as it features so many efficient design features and provides us with the public spaces to promote what we do. It's also been the recipient of multiple awards in recognition of its credentials, including the European Healthcare Design and Building Better Healthcare Awards 2017.
- 2017 saw the third year of our Green Impact scheme. Green Impact 2016/2017 saved an estimated £51k and achieved carbon savings of 289 tonnes of CO<sub>2</sub>e. The scheme saw an increase in staff engagement during 2016/2017 with a total of 30 teams (197 staff) across clinical and administrative services achieving 913 actions ranging from energy, waste and water efficiency campaigns through to health and wellbeing by encouraging healthy lifestyle choices such as active travel, healthy eating and lunchtime walks.
- A site rich in biodiversity and green spaces which is registered as an NHS Forest site (750 trees and shrubs planted for the hospital redevelopment) and on part of which we're planning a staff and patient allotment. We're creating large-scale insect hotels



to provide a refuge for the multitude of creatures that our green space caters for. These are built during lunch breaks to tempt staff outside for some fresh air and team building. We also encourage staff to hold meetings outside.

- With the help of Jekka McVicar, the author and organic gardening and herb specialist, we have transformed our staff restaurant roof garden into a therapeutic and sensory sanctuary providing habitat for pollen-loving creatures and herbs for patient meals. The Trust provides free sun cream too so that staff don't burn while enjoying the garden! We work with the Trust's Move Maker volunteers to harvest lavender from the roof terrace and across the site together with donations from staff, and use it to create lavender bags which we then sell to raise funds for more projects.
- We're saving on average £52k a year through avoiding waste and unnecessary procurement using an internal furniture/equipment reuse platform (Warp-it) to redistribute unwanted items. We also work with our onsite retailers such as Costa to help them divert waste (e.g. 70 kg of coffee grounds per day!) away from landfill and encourage staff and public to return disposable cups to them for recycling.
- NHS Sustainability Awards winners in 2015 (food) and 2016 (water, behaviour change and Overall Winner).
- Travelwest award winner in 2016 – Most Improved Workplace, Organisation of the Year

**Simon Wood<sup>1</sup>, Esther Coffin-Smith<sup>2</sup>, Monica Baird<sup>3</sup>**  
<sup>1</sup>Director of Facilities, <sup>2</sup>Sustainable Development Manager,  
<sup>3</sup>Deputy Medical Director, North Bristol NHS Trust,  
 Southmead Hospital, Bristol

More information is available from our website, particularly in our annual reports which are published every October (Sustainable Development Management Plans): [www.nbt.nhs.uk/about-us/our-standards/sustainable-development](http://www.nbt.nhs.uk/about-us/our-standards/sustainable-development)

The team can be contacted via [SustainableDevelopment@nbt.nhs.uk](mailto:SustainableDevelopment@nbt.nhs.uk)

If you want to support the team you can volunteer with us or make a donation to our Sustainable Healthcare fund via the Southmead Hospital Charity: [www.southmeadhospitalcharity.org.uk](http://www.southmeadhospitalcharity.org.uk)

# Particles

Venkatesh B, Finfer S, Cohen J, et al.

## Adjunctive glucocorticoid therapy in patients with septic shock

*New England Journal of Medicine* 2018; **378**: 797–808.

### Background

Sepsis is one of the most common reasons for intensive care admission and carries a mortality of 35–40%, equating to 44,000 deaths per year in the UK [1]. There have been multiple trials of steroids in sepsis that have produced conflicting results [2]. Current guidelines give a weak recommendation for the use of steroids based on the limited evidence available [3]. The ADRENAL trial was designed to investigate the impact of steroids on mortality in patients with septic shock.

### Methodology

The ADRENAL trial was a double-blind, randomised controlled trial comparing hydrocortisone infusion vs. a placebo infusion in patients with septic shock. Adult patients with a diagnosis of sepsis, undergoing mechanical ventilation and inotropic support for at least 4 h but less than 24 h were considered eligible. The Sepsis 2 definition of two or more SIRS criteria with suspected or confirmed infection was used. Patients received a continuous infusion of 200 mg/day hydrocortisone or placebo for a period of 7 days, until ICU discharge or death, whichever endpoint occurred first. The primary outcome was death at 90 days. Secondary outcomes included ICU length of stay, time to resolution of shock, shock recurrence, time to discontinuation of mechanical ventilation and blood transfusion in ICU.

### Results

A total of 3800 patients were enrolled between March 2013 and April 2017 across 69 sites in five countries. There was no difference in 90 day mortality between the groups (OR 0.95,  $p = 0.5$ ). Of the secondary outcomes, time to resolution of shock, initial duration of mechanical ventilation and time to discharge from ICU were all shorter in the steroid group. Fewer patients in the steroid group received blood transfusion. The rates of adverse events were low but significantly higher in the steroid group (1.1% vs. 0.3%,  $p = 0.009$ ).

### Discussion

In patients with sepsis, hydrocortisone does not impact mortality but does reduce the duration of shock, initial episode of ventilation and ICU length of stay. The reduced need for transfusion in the treatment group merits further investigation.

### Conclusion

This trial has several strengths. It was a large, randomised double-blind trial with a robust methodology and high levels of protocol adherence. Importantly the outcomes, both primary and secondary, and the statistical analysis plan were published prior to trial completion. This trial supports the findings of earlier trials where the duration of shock was less in the steroid group. The optimum duration and dosing strategy for steroids in sepsis still remains to be identified. At a systems level, reduced ICU bed occupancy may have a significant impact, but a cost benefit analysis is needed to further evaluate this.

**Bryan Reidy**

SAT3, Mater Misericordiae University Hospital, Dublin

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3. Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2016. *Critical Care Medicine* 2017; **45**: 486–552.



Mizota T, Yamamoto Y, Hamada M, Matsukawa S, Shimizu S, Kai S.

## Intraoperative oliguria predicts acute kidney injury after major abdominal surgery

*British Journal of Anaesthesia* 2017; **119**: 1127–34.

### Background

The risks of excessive fluid administration and the benefits of restrictive fluid therapy intra-operatively in some patient groups are well recognised. Although oliguria, traditionally defined as a urine output  $< 0.5 \text{ ml.kg}^{-1}.\text{h}^{-1}$ , is considered a risk factor for acute kidney injury (AKI), the clinical evidence for this is limited. The most recent update of the Surviving Sepsis Campaign guidelines has removed the previous target value of urine output.

This Japanese team felt that the identification of an 'optimal threshold' for intra-operative urine output in patients undergoing major surgery would be useful to optimise fluid management. They set out to conduct a large scale study investigating the relationship between intra-operative urine output during major abdominal surgery and the development of postoperative AKI, as well as identifying a urine output threshold at which the risk increases.

### Methodology

This was a single-centre retrospective cohort study conducted at Kyoto University Hospital (a 1121-bed teaching hospital in Japan), which took place over a 7-year period. It included 3560 adult patients undergoing major abdominal surgery: liver, colorectal, gastric, pancreatic, or oesophageal (open and laparoscopic). Patients with end stage renal disease (eGFR  $< 15$ ) or who received diuretics during surgery were excluded. The relationship between intra-operative urine output and postoperative AKI (KDIGO definition – increase in creatinine of  $\geq 26.5 \mu\text{mol.l}$  within 48 h, or  $\geq 1.5$  baseline within 7 days postoperatively) was examined using logistic regression to adjust for confounders.

### Results

AKI prevalence was 6.3% – there was a significant increase in in-hospital mortality in these patients (6.6 vs. 0.8%;  $p < 0.001$ ) and prolonged hospital stay (median 26 vs. 15 days;  $p < 0.001$ ). Generally, it was noted that the patients who developed AKI had a higher AKI risk index, had more blood loss, and were more likely to receive intra-operative vasopressor infusion. The key finding was that a threshold of  $0.3 \text{ ml.kg.h}^{-1}$  urine output was associated with an increased risk of AKI (OR 2.62, CI 1.77–3.97,  $p < 0.001$ ).

### Discussion

These results indicate that an intra-operative oliguria of  $< 0.3 \text{ ml.kg.h}^{-1}$  is independently associated with postoperative AKI in these cohorts. Patients were found to be 2.7 times more likely to develop AKI with an intra-operative urine output below this level.

### Conclusion

This study makes use of the electronic data collection used in the Kyoto hospital, and therefore its accuracy depends on the accuracy of the data entered – this wasn't validated. However, the study is simple yet effective in design, with a large number of subjects likely comparable to UK cohorts, with clearly defined investigatory questions. Further work is needed for the findings to be useful clinically, to show whether targeting the defined threshold of urine output decreases AKI risk.

**Katie Samuel**

Peri-operative Medicine Fellow, UCLH



# Metal recycling in healthcare waste management

Over recent years, many of us will have noted the ever-increasing electricity bill, thought about installing loft insulation or started separating waste at home. There is increasing recognition that we should be making an attempt to be more environmentally friendly at work too. Not unsurprisingly, the NHS produces 4% of all UK waste, and one-third of this is from peri-operative areas. It is thought that at least 40% of anaesthetic waste could be reclassified as domestic waste or recycled [1].



Our trial looked at the potential for recycling single-use metal items which are frequently used in theatres. Examples include forceps, laryngoscopes and scissors. Following use, these items have traditionally been deposited into sharps containers which are then incinerated and sent to landfill. This disposal route has a significant economic and environmental impact. As an alternative, we postulated that single-use metal items could be collected in a reusable container, appropriately treated and then recycled. This would hopefully reduce costs and carbon footprint.

Our trial started with a period of logistical planning and staff education. We then deployed specific reusable recycling containers in locations within our theatre complexes for use over a 6-week period. At the time our hospital had 23 theatres producing appropriate waste. Locations included specific theatres (e.g. ophthalmology, paediatrics) plus recovery areas. Once full, these containers were transferred to larger 770 litre bins. The bins were transported to a local treatment plant and then to another company for analysis and recycling. After the initial two weeks, the Sterile Services department (dealing with defective and old instruments) also joined in the project.

Over the project period, 0.14 tonnes of metal were saved from incineration from theatres and 0.23 tonnes from Sterile Services. Extrapolating that over a year, we would estimate saving approximately 1.18 tonnes from theatres and 3.04 tonnes from Sterile Services. It has been predicted that recycling 1 tonne of anaesthetic metal waste equates to saving 1480 kg of carbon emissions [2]. Therefore, our carbon emission savings from theatres over a year would equate to approximately 1746 kg. Furthermore, we would reduce

the use of plastic sharps containers and their contribution to incineration weight (estimated at 0.21 tonnes annually). Disposal of full sharps containers in our health board currently costs £467 per tonne so this would represent ongoing savings. In addition, there would be further savings from rebate on recycled metal, which varies with market value.

Our project definitely demonstrated a sustainable solution for the disposal of metal single-use items from theatres. It may be that other hospital departments could also contribute to the waste stream. We are delighted that other health boards in Scotland have been trialling and implementing similar strategies since our project originally started.

We acknowledge Health Facilities Scotland for their funding, and the Healthcare Environmental Group for their input.

**Amy Sadler<sup>1</sup>, Philip Wilde<sup>2</sup>, Pavan Raju<sup>3</sup>, Grant Rodney<sup>4</sup>**  
<sup>1</sup>ST5 Anaesthetics, East of Scotland; <sup>2</sup>Property Environmental Quality Manager, NHS Tayside; <sup>3</sup>Consultant Anaesthetist, Ninewells Hospital

## References

1. AAGBI. What about anaesthetic waste? <https://www.aagbi.org/about-us/environment/what-about-anaesthetic-waste> (accessed 10/02/2018).
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# Anaesthesia Trainee Fellowship

Applications are invited for a one-year Fellowship attached to the Journal, starting at the AAGBI Annual Congress in September 2018.

The appointment will run concurrently with the Fellow's usual anaesthetic training programme.

The Fellow's roles will include involvement in general journal business including handling submissions (but not with direct responsibility). The Fellow must also:

- Attend the 6-monthly Editors' away days and Editorial Board meetings during their term;
- Attend at least one Committee on Publication Ethics forum/meeting;
- Attend the AAGBI Annual Congress in September 2018, AAGBI Winter Scientific Meeting in January 2019, and either the GAT Annual Scientific Meeting in July 2018 or Annual Congress in September 2019, and assist in the programmes as required.

The Fellow will be answerable to and supervised by a designated Editor and thence the Editor-in-Chief and Editorial Board. There will be no payment or honorarium but reasonable travel expenses to attend the above meetings will be met, according to usual AAGBI policy.

The Fellow and Editor/Editor-in-Chief will compile a brief report at the end of the Fellowship, to be submitted to the Editorial Board and School of Anaesthesia/Deanery as appropriate.

Suitable applicants must:

- Be post-FRCA (or equivalent);
- Not have a substantive non-training appointment offered or accepted at the time of taking up the post;
- Be an AAGBI member;
- Have an interest in, and commitment to, advancement of the specialty via the areas described in the AAGBI research strategy (<http://www.aagbi.org/research>);
- Undertake to maintain strict confidentiality regarding all journal/AAGBI activities;

Selection will be by a panel consisting of the Editor-in-Chief, an Editor and a GAT Committee representative.

Applications must be received via email by midnight on 31 May 2018 to [anaesthesia@aagbi.org](mailto:anaesthesia@aagbi.org), and should consist of:

1. A brief (max. half-page) CV, to include your current position, AAGBI membership number and CT date;
2. A summary (max. 300 words) of a) how you meet the criteria; b) what you can bring to the Fellowship; and c) what you hope to gain from it;
3. In your covering email, please include: i) the name and email address of your current or immediate past Educational Supervisor, who must be available to respond within a few days if contacted shortly after the closing date; ii) a statement that you hereby commit to informing the Editorial Office if you are offered or take up a non-training position between the date of application and the beginning of the Fellowship.

## 21 Portland Place goes greener



Here are just a few of the things we have been doing at the AAGBI headquarters 21 Portland Place to improve our carbon footprint.

- We have installed energy efficient lighting and secondary glazing.
- We are reducing paper usage and printing and have set ongoing challenges to each of the staff teams.
- Recycling bins are in all the offices, meeting rooms and kitchens
- As well as recycling paper, we also recycle all redundant PC equipment, toner cartridges and batteries.
- We are fortunate that Westminster City Council's waste disposal is zero to landfill – any waste that cannot be recycled is sent to a waste-fired power station and is used to generate electricity and heat for 50,000 London homes every year.
- We have chosen caterers who buy locally sourced produce and who recycle all glass, cardboard and oil used in their kitchens. Our fish supplier is fully accredited by the Marine Stewardship Council.
- Every year a report on the carbon footprint of 21 Portland Place is presented to Board for discussion.
- As of 2018, environmental awareness is going to be the norm for all AAGBI workstreams and committees. Committee chairs will report annually to Board detailing how they are trying to reduce their carbon footprint.
- Under the national government scheme set up in 1999, we offer staff a cycle-to-work scheme, to promote healthier journeys and reduce environmental pollution.



## Dräger wins the 2017 AAGBI Green Exhibitor Award

Environmental protection is of great importance to Dräger, and we are constantly looking at ways to protect the climate on both a global and local level.

To mark the launch of Software 2.0 for the Dräger Perseus A500 anaesthesia workstation, at the AAGBI Annual Congress 2017, we decided to team up with the Trees for Cities charity, and offer delegates the opportunity to donate a tree when visiting our stand. As this initiative and our environmental policy was a perfect fit with the AAGBI Green Exhibitor Award, we made an application and are thrilled to have won.

The tree donation initiative was carried through to the AAGBI Winter Scientific Meeting 2018, and we are very proud to have donated a total of 90 trees to date, which have been planted in London through community volunteering projects.

To find out more about Dräger's commitment to environmental protection, visit [www.draeger.com](http://www.draeger.com).



**Dräger**



# SAFE Africa fundraising – one year on

We are nearly one year into the SAFE Africa campaign and so much has been achieved



Launched in May 2017, the SAFE Africa campaign aims to:

- raise **£100,000** over two years
- scale-up the delivery of three-day **SAFE obstetrics and paediatrics** training courses
- **sustainably** improve anaesthesia **education and care** across Africa in the long-term

Thank you to every SAFE Africa supporter that has helped raise a total of **£35,000** so far!



## New SAFE Africa fundraising activities for 2018!

### GAT Three Peaks Challenge

A group of AAGBI GAT Committee members are taking on the Three Peaks prior to **GAT ASM 2018** in Scotland.



### London to Dublin Cycle for SAFE Africa

Join our annual charity cycle ride, this year to **Dublin** ahead of **Annual Congress 2018**.

### Royal Parks Half Marathon

Represent the AAGBI and fundraise for SAFE Africa by taking part in this prestigious half marathon through four of London's royal parks.

**Want to get involved?** Email [safeafrica@aagbi.org](mailto:safeafrica@aagbi.org) to express an interest in joining a challenge event.



## How can your department get involved? Here are some ideas to get you started...

### Get baking

Hold a bake off competition and cake sale in your department, donating the proceeds to SAFE Africa. You could combine it with a coffee break and a chance to chat with your colleagues.

### Dedicate SAFE Africa

If you're taking part in a running or cycling event such as the London Marathon, why not use the opportunity to fundraise for SAFE Africa? Visit the SAFE Africa donation page and click 'start fundraising' to set up your own sponsorship page.

### Get in touch

Thinking of fundraising at your next social event? We're here to help make your ideas a reality and provide you with anything you might need for an event, such as fundraising tins and promotional materials.

## How your donations are spent

SAFE courses are delivered by volunteers, making them very cost effective. The **£100,000** this campaign aims to raise will enable us to deliver at least **5 to 6 new SAFE courses** in Africa, training around **200 more anaesthetic providers** to deliver safe and competent anaesthesia.

Just one SAFE trained anaesthesia provider will go on to treat an estimated **1,500 patients** every year. Therefore, if we can reach the **£100,000** target the safety of approximately **300,000 patients** will be improved every year.

**£10**

Could pay for all training material for one SAFE course, including a USB for each participants.

**£50**

Could pay for one rural anaesthetic provider in Africa to travel to a SAFE course.

**£500**

Can pay for an anaesthetic provider in Africa to complete a SAFE obstetrics or paediatrics training course.

## Looking back over the first year of SAFE Africa...

### London to Liverpool Cycle

22 anaesthetists and friends cycled from London to Liverpool in just three days, raising over **£8,500** for SAFE Africa.

### In memory of J-P van Besouw

Thank you to everyone who has donated to SAFE Africa in memory of J-P van Besouw, past President of the Royal College of Anaesthetists, raising over **£11,500** to date. Special thanks to J-P's family for their kind support of the campaign.

### Winter appeal 2017

Over **£2,000** of donations were received in response to our 2017 winter appeal. Thanks to everyone who showed their support.

### 'Feeling safe' photography

Congratulations to Ian Skelton who won the 'feeling safe' photography competition for SAFE Africa with his fantastic image of a baby elephant. Thank you to all the entrants, plus everyone that visited the exhibition at **WSM London 2018** and voted for their favourite.

**Donate today** [www.aagbi.org/SAFEAfrica](http://www.aagbi.org/SAFEAfrica)

**Donate today**  
[www.aagbi.org/SAFEAfrica](http://www.aagbi.org/SAFEAfrica)





# Anaesthesia Heritage Museum in London

Free entry



A unique medical science museum devoted to the history of anaesthesia and pain relief.

## Brave Faces

Powerful stories of facial reconstructive surgery during World War I

Exhibition open until November 2018



Opening hours: Monday to Friday 10am-4pm (last admission 3:30pm). Closed on Bank Holidays. Booking recommended.

Visit [www.aagbi.org/heritage](http://www.aagbi.org/heritage)



Find us at: The Anaesthesia Heritage Centre, AAGBI Foundation, 21 Portland Place, London W1B 1PY



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Barema & AAGBI Environmental Prize, GAT Annual Scientific Meeting 2017

## Insensible (non-sensible) water loss

Society needs to work towards sustainable health and social care for all, now more than ever. One particular aspect of sustainability is to recognise the importance of the environment and our place within it. As anaesthetists and intensivists, we work on the front line of the NHS and have the ability to influence greatly the impact we have on the environment. Whether that be encouraging the use of recycling, or turning off electricals when not in use, we can all make a difference

We decided to look at the use of water in our Trust [1] because one of our group was frustrated at seeing leaking theatre taps every day. We thought this was wasteful, so decided to quantify the problem with a small study.

The NHS uses a vast amount of water, around 40 million m<sup>3</sup> in 2007/2008. With over 7 million operations a year, and at least two people scrubbed for each, the potential for water wastage is large. Our Trust alone spends over £134,000 each year for roughly 139,000 m<sup>3</sup> of water. The Sustainable Development Unit requires all NHS organisations to measure and monitor annual water consumption, to improve efficiency and lower their environmental impact [2].

We placed measuring jugs under each lever tap in theatres, and measured the 'as found' water for 3 minutes. We then turned them off and repeated the measurement. We did this twice a day for 8 weeks. The total water wasted 'as found' was 11.4 litres. This was reduced to around 1.3 litres by simply turning off the taps: a nearly 90% reduction. The worst offending theatres were orthopaedics. These numbers don't sound vast, but this is just for the taps in six theatres for 6 minutes of a day. Imagine this problem scaled up to all the taps in the hospital, to all the hospitals in the country, all day. In the worst 3-minute collection period over the study, we collected 2.2 litres of water. That's 45 litres/hour of water *literally* going down the drain.

What our small dataset indicated was that human behaviour was the key. Taps were just not being turned off. We presented our data at various audit meetings to get the message across to the various groups who use theatres. People had been intrigued as to what we had been doing with measuring jugs and stopwatches in the sinks for the past few months and seemed receptive to the idea. Some of the problem was clearly mechanical. We still had a litre of water wasted despite taps being optimally 'off', so we discussed getting the faulty taps fixed with Estates.



Like all good researchers, we wanted to see if our interventions had made a difference. We repeated the study, using the same methodology, and found some improvement. We hadn't managed to get anywhere with maintenance yet, but people were taking note and trying to turn taps off. We found we had reduced 'as found' wastage from 11.4 litres to just under 9 litres, a modest but statistically significant reduction. Unfortunately, we still found we could reduce this by nearly 80% simply by turning taps off.

What did we learn and what could be changed? We considered that tap design was a problem. The operators and scrubbed staff cannot de-sterilise by turning taps off. Some units have used foot-operated taps to reduce water use, with good effect [3]. Other hospitals use sensors to provide water only when hands are under the tap. These are big investments and clearly disruptive to implement. A continued cycle of education should help promote good practice and maybe a few washers to tighten up the leaky taps.

P Douglass<sup>1</sup>, L Jeanes<sup>2</sup>, SM Yentis<sup>3</sup>  
<sup>1,2</sup>CT2 Anaesthetics, North West London rotation; <sup>3</sup>Consultant Anaesthetist, Chelsea and Westminster Hospital, London

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Applications for the Barema & AAGBI Environmental Award at Annual Congress 2018 close 23:59 on Tuesday 08 May 2018

[www.annualcongress.org](http://www.annualcongress.org)



# Human health depends on nature: why doctors must become eco-warriors

***As we destroy nature, we destroy ourselves. It's a selfish thing to want to protect nature***

**Yvon Chouinard, American climber, environmentalist and businessman**



If there's one thing I've assimilated from studying for a Masters in Environmental Management, it's that humans do not exist in isolation from the rest of the biosphere; we are utterly dependent on it for our survival, health and happiness.

My initial motivation for doing another degree was simply to get a better insight into environmental issues. It was refreshing to study an area completely unrelated to medicine; quite a different experience to studying for undergraduate and postgraduate medical exams, no doubt because my career wasn't riding on the results! The only downside was that, once you start delving more deeply into environmental problems, rather than looking the other way as we usually do, the world never appears the same again. Or as Aldo Leopold, the American ecologist put it:

***One of the penalties of an ecological education is that one lives alone in a world of wounds***

The Scottish Highlands (which I love) went from seeming like one of the last unspoilt wilderness areas of Europe, to a mostly barren landscape of heather moorland, stripped of its ancient Caledonian Forest by centuries of deforestation and overgrazing, its keystone species long since extirpated. I saw the Great Barrier Reef for what it has become, rather than the way it is portrayed: its coral bleached by climate change-related ocean warming; the water polluted by farm run-off and industrial activity along the coastline, to the extent that the reef is now in danger of losing its UNESCO World Heritage Status.

It was depressing to learn just how deeply the issue of climate change has been manipulated by the fossil fuel industry in order to prevent attempts at mitigation. It has obfuscated, sown doubt and manufactured the appearance of a debate among the scientific community about the existence, cause, and catastrophic consequences of climate change. There is no debate; we are decades beyond that point. And as serious as the threat of climate change is, it is by no means the only environmental crisis we face. Air and water pollution, biodiversity loss, deforestation, industrial fishing, plastic waste and intensive farming are all life-threatening problems that urgently need to be addressed. Closer to home, it became clear that the healthcare industry is no longer making a wholly positive contribution to human health. We are unwittingly contributing to environmental degradation via carbon dioxide emissions, waste and pollution generated by our hospitals.

If all this sounds rather bleak or melodramatic, don't worry, environmentalism often has this effect on people, paralysing them into inaction with negative, extinction-based messages,



or provoking a psychological backlash. But I also learnt that the existential threats we face provide an opportunity for humanity to take a giant leap forward into the next phase of our development, as long as we don't procrastinate much longer. We can decide to adopt progressive solutions such as: steady state economics; agro-ecology; renewable technologies; urban redesign with green spaces; rapid mass transport and walking/cycling networks; an ecosystem approach to decision making.

Alternatively, we can continue with business as usual, caught in our progress trap, hoping that the market and technological fixes will bail us out. However, given that these are the mechanisms that created our problems in the first place, this is unlikely to be a successful strategy.

If we do decide to embrace these new ideas, it will be a difficult transition, since underpinning them is the need to dispense with the established economic model of limitless growth, rampant consumerism, and the philosophy of exploitation and dominion over nature. Instead, we must start to think and act in ways that reflect the fact that we have only one planet, with finite resources, and that our health depends on protecting and restoring its ecosystems.

When we view environmental problems in this way (i.e. as a public health emergency), it becomes apparent that doctors have a pivotal role to play in helping to address them. Indeed this 'health frame' has been shown to be an effective tool for communicating climate change to the general public. We are one of the few remaining professions that is still largely trusted by society, which means we're uniquely placed to educate patients, students and the public about the inextricable links between the environment and human health, to promote sustainable, low carbon behaviour, and to convince policy makers that robust environmental legislation is urgently



required, as is health promoting infrastructure, such as active travel networks and access to urban green spaces.

If we're going to start engaging in environmental advocacy, we'll have to adopt an evidence-based approach where possible. However, in the face of life-threatening problems, it is inappropriate to postpone preventive measures while we wait for full scientific certainty. This is known as the precautionary principle, and it is a key component of environmental decision making. We may not recognise it by this name, but it is something we practice every day when treating our patients.

It's well established that our survival and physical health depends on intact ecosystems and biodiversity. They provide life-supporting services such as food, clean air and water, healthy soil, medicines and disease regulation. However, there is also an emerging evidence base that our mental health and wellbeing is dependent on interaction with nature. A growing number of studies suggest that contact with nature reduces mortality from all causes, alleviates stress, improves mood and self esteem, increases levels of physical activity, improves healing, increases concentration and reduces symptoms in mental health patients and children with ADHD. Urban green space (i.e. any vegetated land such as parks, gardens, woods and wetland within an urban area) has also been shown to increase social interaction, reduce health inequality, reduce crime rates, and improve air and noise quality. Interestingly, the psychological benefits of contact with urban green space increase with the species richness (biodiversity) of the area.

Conversely, environmental degradation is very bad for human health. Air pollution, for example, causes cardiovascular disease, asthma and lung cancer. Climate change is the biggest global health threat of the 21st century, causing food and water insecurity, morbidity and mortality from heat waves, droughts and floods, and mental health problems arising from such extreme events. Biodiversity loss is a less well-publicised, yet incredibly important health crisis. Biodiversity, or the variety of life on earth, underpins ecosystem function and thus facilitates the life-support services mentioned above. However, it also represents a huge, mostly untapped source of potential pharmaceuticals and medical research.

Over half of all drugs developed during the past 25 years are either derived directly from, or modelled after, natural compounds. Some examples of widely used medications that have been developed from plants include: morphine, aspirin, warfarin, vancomycin, cyclosporine, sirolimus and paclitaxel. Microbial derived medicines include penicillin, aminoglycosides, tetracyclines and anti-fungals. The polymerase chain reaction was developed from a thermostable DNA polymerase, isolated from the bacterium *Thermus aquaticus*, which was found in a hot spring in Yellowstone National Park. Cone snails, from which the potent analgesic agent ziconotide was derived, are the source of an estimated 70,000 biologically active compounds, only a fraction of which have been studied so far. They are thought to be one of the greatest potential sources of medicines in nature, yet they are in danger of being lost forever, as ocean warming and acidification are destroying their coral reef habitats.

Indeed, the sheer scale of global biodiversity loss is massive and unprecedented, mainly due to extensive habitat destruction both on land and in the oceans (e.g. by deforestation, bottom trawling, damming and dredging of rivers, draining of wetlands).

Pollution, invasive species and climate change are also major drivers. We've barely begun to scratch the surface of what nature has to offer mankind, but who knows how many potentially life-saving discoveries we've already wiped from existence.

Of course, if we're going to take a leadership role in advocating environmental protection and promoting sustainable, healthy, low carbon behaviour, then we need to get our own house in order. The NHS is a major emitter of CO<sub>2</sub>, and is responsible for approximately 25% of total public sector emissions. It also generates huge amounts of waste, the vast majority of which ends up in landfill.

The healthcare industry has the opportunity to set an example to the rest of the population. We could build energy efficient hospitals powered by renewable sources, incorporating green space for patients, staff and the local community to use for exercise, rest and relaxation. We can significantly reduce our waste through more appropriate procurement, waste segregation and recycling. Hospitals could source healthy, seasonal, local food, promote active travel and public transport for staff and patients, and provide incentives for staff to reduce their ecological footprint.

Let me leave you with a final quote to ponder:

**The future will be green, or not at all**

**Bob Brown, Australian politician, environmentalist and doctor**

**Tim Smith**  
Consultant Anaesthetist (locum), Perth Royal Infirmary, NHS Tayside

### Suggested reading

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## Cognitive decline in the middle-aged after surgery and anaesthesia: results from the Wisconsin Registry for Alzheimer's Prevention cohort

Bratzke LC, Koschick RL, Schenning KJ, et al.

This month's *Anaesthesia* includes a paper that should give all of us pause for thought, if we can remember to! The Wisconsin Registry for Alzheimer's Prevention (WRAP) cohort of middle-aged subjects without existing cognitive dysfunction was studied to determine whether surgery and anaesthesia had any effect on neuropsychological tests of memory and executive function. This investigation was undertaken following the OPTIMA study, previously reported in the journal, which showed that elderly patients showed cognitive decline after regional or general anaesthesia; the authors opined that it would be unlikely to be the case in younger subjects. The median age of the WRAP subjects at enrolment was 54, so if that sounds dangerously like you, read on and tremble. Cognitive testing was undertaken at that time, and four years later, and the investigators categorised participants according to whether they reported one or more operations with at least 25 min of cumulative anaesthetic duration – with general anaesthesia or neuraxial blockade – during the nine years preceding the second assessment.

In participants who were aged from a mean of 54 years to 58 years, they found a decline in immediate memory over four years that was associated with having one or more intervening surgeries, and with the overall number of surgeries. Subjects who had had surgery also showed declines in executive function associated with longer cumulative operations and ASA status. Surgery was associated with a rate of decline below normal limits for immediate memory and verbal learning and memory double the rate of participants who did not have surgery; although the effect was small, it is plausible that it is causal. We cannot, of course, know whether it is the surgical insult or the effects of anaesthesia that are associated with these memory impairments, as there will never be an anaesthesia-only comparator group. The knowledge that middle-aged people are at risk of more rapid cognitive decline after surgery and anaesthesia is sobering, to say the least. Should we be telling our patients this, or do so only if we remember?

## Systematic review of benefits or harms of routine anaesthetist-inserted throat packs in adults: practice recommendations for inserting and counting throat packs

Athanassoglou V, Patel A, McGuire B, et al

There are certain things that have become established in medical practice almost unquestioningly as an obviously good thing; to challenge them is akin to suggesting the trial of exiting an aeroplane with or without a parachute. In anaesthesia, one of these is the insertion of throat packs, which tradition has taught us are essential to safely allow dental, maxillofacial, nasal or upper airway surgery. However, fear of the 'coroner's clot' has not been without consequence – throat packs have been left in situ on 21 occasions between 2013 and 2016, and these are now classified as Never Events. They have contributed to serious postoperative airway obstruction, and at least one death. But what if they weren't used in the first place, and what is the evidence that supports their use? The authors of this study conducted a systematic review and literature search to assess the evidence base for benefit, and also the extent and severity of complications associated with throat pack use. Strikingly, there were no studies of the efficacy of throat packs, and little detail on whose responsibility it was to insert and remove. None focused on anaesthetic requirements for throat packs. Most, instead, focused on complications related to them and how to avoid them. Surveys

showed that about a third of anaesthetists and surgeons never used them, while half of respondents had either experienced problems with retained throat packs or were aware of others who had. So we routinely use an intervention that we know is potentially harmful, with no evidence for its efficacy. This doesn't seem sensible, and the consensus view of the authors is that anaesthetists should no longer place throat packs, and if deemed essential by the operating surgeon, should be placed by that person, who should then additionally be responsible for removing it – it should be treated like a surgical swab, just like any other. The only exception should be when the oral cavity lies outside the surgical field, for instance in nasal surgery. In that case, the team should decide whether the anaesthetist should insert it. If so, the packs should be included in the swab count, and the anaesthetist should be responsible for removing it and checking the airway using direct laryngoscopy. A simple flow diagram helps show the reader that the routine practice of inserting throat packs after induction should be abandoned by anaesthetists.

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



### 'Feeling safe' photography competition winner

Congratulations to Ian Skelton who won the 'feeling safe' photography competition for SAFE Africa with his fantastic image of a baby elephant. Thank you to all the entrants, plus everyone that visited the exhibition at **WSM London 2018** and voted for their favourite.

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# AAGBI INNOVATION



## The annual AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain

The Association of Anaesthetists of Great Britain and Ireland invites applications for the 2019 AAGBI Award for Innovation in Anaesthesia, Critical Care and Pain. This prize is open to all anaesthetists, intensivists and pain specialists based in Great Britain and Ireland. The emphasis is on new ideas contributing to patient safety, high quality clinical care and improvements in the working environment. The entries will be judged by a panel of experts in respective fields.

Three prizes will be awarded at the discretion of the judging panel and the winners will be invited to present their work and collect their prizes at the Winter Scientific Meeting in London on 11 January 2019.

The closing date for applications is **Friday 28 September 2018**.

Applicants should submit the application form that can be found on the AAGBI website [www.aagbi.org/innovation](http://www.aagbi.org/innovation).

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

**2018 - Little Journey app:** a novel virtual reality preparatory tool for children undergoing ambulatory surgery. Developed by Dr Chris Evans (University College London), Ramani Moonesinghe (University College Hospital), and Flora Roumpani (University College London).



Dr Chris Evans winner of the AAGBI Award 2018

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

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

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

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

**2013 - 'The Mobile Capnograph'** by Safe Anaesthesia Worldwide.

Find out more about the AAGBI Innovation Award visit [www.aagbi.org/innovation](http://www.aagbi.org/innovation)

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## Undergraduate elective funding 2018

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Applications are invited from medical students studying in Great Britain and Ireland (subject to confirmation of eligibility) to apply to the AAGBI Foundation for funding towards a medical student elective period taking place between October 2018 and March 2019. A further round of funding will be advertised in the spring for electives taking place from April 2019 onwards. Overseas students should ensure that they are permitted to apply for charitable funding. Grants will only be awarded to applicants who intend to spend time away from their base academic institution and whose travel, accommodation and subsistence costs are increased as a result.

Preference will be given to those applicants who can show the relevance of their intended elective to anaesthesia, intensive care or pain relief. A key focus of the AAGBI is support for projects in the developing world, hence elective placements supporting work in low and low-resource income countries are given priority.

For further information and to apply please visit our website: [www.aagbi.org/undergraduate-awards](http://www.aagbi.org/undergraduate-awards), email [secretariat@aagbi.org](mailto:secretariat@aagbi.org) or telephone 020 7631 1650 (option 3)

**Closing date: 13 July 2018**  
for consideration at the Sept 2018  
Research & Grants Committee meeting



## EVELYN BAKER MEDAL



### AN AWARD FOR OUTSTANDING CLINICAL COMPETENCE

The Evelyn Baker award was instigated by Dr Margaret Branthwaite in 1998, dedicated to the memory of one of her former patients at the Royal Brompton Hospital. The award is made for outstanding clinical competence, recognising the 'unsung heroes' of clinical anaesthesia and related practice. The defining characteristics of clinical competence are deemed to be technical proficiency, consistently reliable clinical judgement and wisdom and skill in communicating with patients, their relatives and colleagues. The ability to train and enthuse trainee colleagues is seen as an integral part of communication skill, extending beyond formal teaching of academic presentation.

Nominations are now invited for the award, which will be presented at WSM London in January 2019. Members of the AAGBI can nominate any practising anaesthetist who is also a member of the Association. Nominees should normally still be in clinical practice. The award is unlikely to be given to someone in their first ten years as a consultant or an SAS doctor, and the nominee should not be in possession of a national award. Nominations should include an indication that the nominee has broad support within their department.

Last year the award was won by Dr Michelle Soskin. Details of previous award winners and further information can be found on the website [www.aagbi.org/about-us/awards/evelyn-baker-medal](http://www.aagbi.org/about-us/awards/evelyn-baker-medal)

**The nomination, accompanied by a citation of up to 1000 words, should be sent to the Honorary Secretary at [HonSecretary@aagbi.org](mailto:HonSecretary@aagbi.org) by 17:00 on Friday 31 July 2018.**

## Education goes green



Annual Congress and WSM London programmes have shrunk from 60 pages of A4 to 20 pages of A6 (and we plan to shrink this further for GAT ASM).

We no longer produce conference bags – even though they were made of recyclable products – as a lot of people were still throwing them away.

Conference programme and speaker details are available via the website and event app, which has allowed the reduction of printed literature, and also cut out bag inserts, which were usually thrown away.

We collect and reuse delegates plastic wallet badges (which now contain the smaller paper programme).

We choose conference venues with strong environmental policies for waste, sourcing of local food, and energy and water consumption, e.g. Liverpool CC uses rain water collected from the roof to flush the toilets.

We have milk alternatives for tea and coffee at all our conferences.

We had a meat free-lunch at Annual Congress 2017 on the same day as the Environment session.

Attendance certificates are only available online and we no longer print a paper version for delegates.

Evaluations are now online, saving > 6000 pieces of paper per year.

The Art exhibition was traditionally held at Annual Congress, but to minimise the carbon footprint transporting art from London to a conference centre, the exhibition is now held at WSM London.

We deliver a lot of our education digitally (e.g. Learn@AAGBI with > 650 videos), and via webinars, thus reducing the carbon footprint of travel for our members and speakers, as both parties can be at home and, time zone permitting, abroad!

To reduce the carbon footprint of delegates, we deliver Core Topics meetings, and now six seminars, regionally for the 2018/2019 financial year.

We run a 3 lecture session at Annual Congress on environmental issues; this is now in its third year.

At Annual Congress in Liverpool, we webstreamed one lecture live for the Environment session. The speaker was from the USA.

At Annual Congress in Dublin this year, we are webstreaming the three Environment sessions live. The speakers will be from Australia, Scotland and Sweden.

For the third year running, one out of three Education Committee meetings is virtual, with all of Council dialling in, saving > 30 hours of travel and energy.

In 2017 we presented our first Green Exhibitors award at Annual Congress, encouraging industry to demonstrate examples of good practice in environmental sustainability by reducing their environmental impact at our conferences and using inventive environmental ideas for merchandise and giveaways.

In 2015, Barema and the AAGBI launched an annual award for the single best initiative, project or activity demonstrating how the work (relating to anaesthesia, intensive care medicine, pain management) has and will continue to have a measurable beneficial effect on the environment (£200 prize and a grant of £800 for support and development).

Huge thanks go to all the Chairs of Education over the years, especially Steve Yentis for driving so much of the change, and particular thanks to our in-house team: Zack Puttock (Events), Andrew Mortimore (E-education) and Gemma Campbell (Environment staff lead) for making all of this possible.

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### Updates in anaesthesia, critical care and pain management

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## AAGBI WEBiNAR

**Never Events**  
Tuesday 1 May at 14:00

**SAS Webinar for SAS doctors - Safety, survival and sleep**  
Tuesday 19 June at 16:00

**National Safety Standards for Invasive Procedures (NatSSIPs) and other patient safety issues**  
Friday 16 November at 13:00

**Recordings or previous webinars are also available**

Keep an eye on the website for more webinars as they are added [www.aagbi.org/webinars](http://www.aagbi.org/webinars)



## Dear Editor

A



Healthcare professionals are humans, and like all humans we are fallible. We all make mistakes in the things we do, or may forget to do. In the healthcare setting there is always the chance the consequences could be catastrophic. It is awareness of this that often prevents such incidents as we purposefully heighten our attention and vigilance when we encounter situations we perceive to be risky. It is when these situations occur when we are stressed, fatigued or distracted that potential risks are more likely to result in errors and harm. To optimise human factors in healthcare, systems are put in place to prevent mistakes. These systems provide a 'defence' in the Swiss Cheese Model of accident causation [1]. For example, colour-coded drug labels used nationally allow us to recognise a class of drug quickly, reducing the risk of administering the wrong one [2].

B



In our hospital, drugs, including anaesthetic drugs, are ordered by Pharmacy on the basis of cost and national availability. This results in regular changes in drug packaging depending on the manufacturer. Here we share a case series where potential errors could have occurred because of changes in drug packaging.

**Case 1** Rocuronium and oxytocin, both agents commonly used in anaesthesia, share the same style and colour of box and are stored in the anaesthetic room drug fridges (Image A).

**Case 2** The air freshener is a pink liquid found in a white spray bottle. This has many similar physical characteristics with chlorhexidine spray used as an antiseptic prior to anaesthetic procedures (Image B).

**Case 3** The similarity between the emergency drugs ephedrine and adrenaline, especially when used in a time critical situation, is clearly a safety issue (Image C).

These potential risks were picked up and mitigated by a vigilant anaesthetist and shared with the theatre team. We are currently trying to organise a governance structure to reduce future risk in our hospital.

**Katie Wilson<sup>1</sup>, William Peat<sup>2</sup>, Katharine Jepp<sup>3</sup>**

<sup>1</sup>CT1 Anaesthetics, <sup>2</sup>Consultant in Anaesthesia and Intensive Care, <sup>3</sup>Consultant Anaesthetist, Anaesthetic Department, Harrogate District Hospital

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C



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## 'AAGBI PRESIDENT'S BLOG'

For those who are happy to get their AAGBI news via Twitter, the official President's Twitter account is @AAGBI\_President and the blog is at [www.aagbipresidentsblog.wordpress.com](http://www.aagbipresidentsblog.wordpress.com). I hope you will follow both.

# your Letters

SEND YOUR LETTERS TO:

The Editor, *Anaesthesia News* at [anaenews.editor@aagbi.org](mailto:anaenews.editor@aagbi.org)  
Please see instructions for authors on the AAGBI website

## Dear Editor

I write to highlight the increasing use of leadless pacemaker systems which many Trusts are now implanting. These pacemakers are small capsules directly inserted into the right ventricle where they become embedded in the ventricle wall and deliver rate responsive ventricular pacing (VVR). They do not have a replaceable battery; once the battery life declines the patient requires a new system to be implanted. The two systems currently being used are Nanostim™ by St Jude Medical and Medtronic Micra TPS. However, Nanostim™ insertion is currently suspended due to battery issues. Medtronic report an average battery life of 12 years in the Micra system.

There are several differences from a standard pacing system, the most relevant to anaesthesia is the different effects of a magnet. A standard system will revert to asynchronous pacing, at a preset rate, on application of a magnet. All other changes have to be made by interrogating and reprogramming the device using a machine specific to the manufacturer.

The Medtronic Micra system does not have the ability for programming alteration upon application of a magnet. This is due to the pacemaker not containing a Halls sensor or a magnetic reed switch. Should a patient present for surgery, the advice regarding use of electrocautery remains the same as for a standard system: pacemaker check as per local protocol, ensure temporary pacing and a defibrillator are available, use bipolar electrocautery where possible, unipolar return pad should be placed 15 cm minimum from the pacemaker and if needed use in short bursts, monitor the ECG continuously and use other methods, e.g. saturation probe or arterial line trace, if ECG suffers interference. However, if oversensing occurs, a magnet will not revert the patient to an asynchronous mode and you will require a technician to reprogramme the device, using a Medtronic machine, for example reprogramming to VOO.

The Nanostim™ has a magnet mode and becomes responsive to a magnet if this mode is switched on when initially programmed. Application of a magnet will revert the device to VOO pacing at 100 bpm then dropping to 65 bpm. The response may be less predictable than a standard system so it is recommended to apply two magnets if one alone is not sufficient.

Both systems report MRI compatibility. The Micra manual reports the device does not need to be removed post-mortem if proceeding to cremation; however, local policies may dictate its removal for environmental reasons. It is recommended that the Nanostim system be removed, but not essential.

Both systems have small amounts of dexamethasone in the tip to reduce inflammation so are contraindicated if hypersensitive to this drug.

**Jessica Webster**  
ST7 Anaesthetics, Bristol Heart Institute

## Dear Editor

### FOREVAR

We have come up with a new term – FOREVAR. This is for those EVARs (EndoVascular Aneurysm Repairs) that seem to take a long time (forever) to do.

According to the Urban Dictionary [1], 'forevar' means 'forever but longer'.

We felt this perfectly captured our sentiments.

**Beena Parker and Rakhee Nathwani**  
Consultant Anaesthetists, West Hertfordshire NHS Trust

### Reference

- Urban Dictionary. Forevar. <https://www.urbandictionary.com/define.php?term=Forevar>

## Dear Editor

We present a process intended to enhance safe drug administration within the paediatric population. As simulated by our colleague in the image, we propose the attachment of a wristband to each child stating their measured body weight.

The enhanced visibility of an individual's weight permits a visual reminder to the health professional at the time of drug administration during the peri-operative period. Furthermore, in the context of a clinical emergency either in theatre or the recovery room, where additional clinicians not previously involved in the patient's care may attend them, this process provides immediate information to guide safe emergency drug dosing.

We would suggest it should be placed on the cannulated limb and be annotated appropriately if patient allergies exist. In our local Trust this is indicated by a red wristband. The wristband is intended for use in the peri-operative period only.



We welcome any comments or feedback from similar processes to help us understand the potential utility of this proposal.

**Hugh Cutler<sup>1</sup>, Supriya Ghurye<sup>2</sup>, Helen Bryant<sup>3</sup>**  
<sup>1</sup>ST5 Anaesthetics, <sup>2</sup>Speciality Registrar Oral Surgery, <sup>3</sup>Consultant Anaesthetist, Department of Anaesthesia, Queen Alexandra Hospital, Portsmouth

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Ramani Moonesinghe  
Professor of Peri-Operative  
Medicine, UCLH, London



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18th Peri-Operative POETTS CPET Course: London, 2nd & 3rd July 2018 see [www.EBPOM.org](http://www.EBPOM.org)

## Current Controversies in Anaesthesia and Peri-Operative Medicine

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Newcastle, UK



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John Hunter Hospital,  
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