NEW ZEALAND
Anaesthesia

THE MAGAZINE OF THE NEW ZEALAND SOCIETY OF ANAESTHETISTS • AUGUST 2021

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We welcome your comments on the magazine. If you would like to contribute ideas and/or an article please contact editor: comms@anaesthesia.nz

Level 1, Central House
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PO Box 10691, The Terrace, Wellington, 6143
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PRESIDENT'S COLUMN

We are more than halfway through the year, and it seems to have gone by even faster than usual. This year is significant in terms of impending transformation of our health sector – most notably the Health and Disability Review changes and implementation of the End-of-Life Choice Act (the latter to take effect 7 November). As your professional organisation, the NZSA has been keeping members apprised of developments. As always, we welcome member input to ensure we are representing your views in our advocacy work. I can be contacted at president@anaesthesia.nz.

Health and Disability System reforms

Complex, fragmented, inconsistent and inequitable are just some of the words used to describe New Zealand's health system. Fortunately, the Government is seeking to redress these anomalies and systemic changes to our health sector were announced in April, in response to the Health and Disability Review Report. We anticipated structural changes of course, however they were more far reaching and dramatic than we expected, especially the decision to disestablish all district health boards.

The changes have been welcomed by the vast majority and been greeted with cautious optimism. For those who have worked in the health system for many years and who have experienced previous reforms and structural changes, it is understandable that they may feel some cynicism. However, overall, there is an acceptance that the current system is not working, and we need to make bold changes. In addition to the decision about DHBs, there has been support for the creation of a national health organisation, HealthNZ (likened to the UK's National Health Service), a by Māori for Māori approach through an independent Māori Health Authority with the power to commission health services (and tightly interwoven within HealthNZ), and an overdue greater focus on public health with the creation of a new public health agency.

Commentary from the health sector, which was extensively covered by the media after the announcement, was that the changes reflected the wish list of many – greater centralisation, coordination, and consistency of healthcare services throughout New Zealand to address the variability in patient care; the latter often determined by which part of the country a person happens to live in. There has been concern expressed about how we might lose the 'local voice' in health service decisions, although it has been proposed that the new central agency will have four regional divisions and district offices. Local engagement will be essential in developing health services to meet community needs.

At our annual joint meeting with ANZCA NZ National Committee last month, our guest speakers from the Transition Unit sought to reassure us and described the new model as "centrally planned and regionally managed, a distributed system with local strong operations." I would add that it will be essential to have strong clinical governance to drive decision-making. As part of this presentation, we had a Q & A session where attendees asked about IT infrastructure, data collection and data accessibility, and adequate funding and staffing to implement the reforms. All were acknowledged as priorities and works in progress. The ubiquitous line 'the devil will be in the detail' sums up where we are at for now.

The Ministry of Health is now working with the Transition Unit to implement the changes and the new entities will be formally in place by July next year. It is an opportunity for real change – I sincerely hope that in the years to come we can look back and proudly say that the changes we made were meaningful and made a discernible improvement to the quality of New Zealanders' lives.

Health equity

A major driver behind the health sector reforms is the need to reinforce the principles and obligations of tino rangatiratanga and Te Tiriti o Waitangi to address health disparities and achieve equitable health outcomes. At a recent talk by Professor Dr David Tipene-Leach to GP registrars he spoke about racism and equity in the context of Māori health: "Nobody wakes up in the morning to do a bad job. But when you're working in a system rife with institutionalised racism, which is delivering differential access to goods, services, and opportunities – intentionally or not – depending on who you are, and the colour of your skin, then the statistics start to look grim. And unacceptable." He made the point that we all bring biases to a situation and that the way forward is to "use the language of bias to explain racism and discrimination in an inclusive and non-blaming manner to facilitate change in our behaviour." He recommended some questions for medical practitioners to ask themselves, which provide an excellent way forward:

- When Māori patients are in your practice, can you pronounce their name correctly?
- Can you deal with the 'whole whānau situation'?
- Do you understand the partnership (Treaty) issues?
- Are you doing cultural competence training?
- Do you edit your outcomes by ethnicity?

The NZSA is committed to exploring and actioning the changes we can make as an organisation and as a specialty to address the inequity we see daily. Conversations with ANZCA NZNC are focusing on how we can make our specialty more attractive and attainable to minority groups, so that our workforce may better represent the community it serves. This is a big challenge in a system so enshrined in its ways, but it is one that needs to be tackled head on.

End-of-Life Choice Act implementation

The NZSA took a neutral stance in its submission responding to the End-of-Life Choice Act consultation a few years ago, as we knew it was a contentious issue and when we sought member input it was clear there were strong views on both sides. Instead, we strongly advocated for the right of doctors to be able to conscientiously object to being part of the process if they chose to (now covered in the legislation).

Following the referendum result supporting the End-of-Life Choice Act, the Ministry of Health is now planning for an assisted dying service to be in place by 7 November. MOH is establishing statutory committees, seeking expressions from interested health practitioners to support assisted dying, and putting systems, processes, and guidance in place to implement the roll-out. The Support and Consultation for End of Life NZ (SCENZ) Group will hold a list of all practitioners that are willing to provide this care. If you are a conscientious objector, you do not have to indicate this anywhere or to anyone (the SCENZ Group will only keep a list of practitioners that are willing, not a list of those who are not). However, as a conscientious objector, you still have a legal responsibility under the Act to provide contact details for SCENZ if a patient makes a request to you. I would encourage all doctors to complete the first training module as this highlights your responsibilities under the Act. It can be found on the MOH website here: https://www.health.govt.nz/our-work/regulation-health-and-disability-system/end-life-choice-act/end-life-choice-act-implementation-resources

Guest speakers from MOH also attended our joint meeting to outline the eligibility criteria and process for accessing assisted dying – their key advice was for all doctors to undertake the training module I have referred to, to understand their rights and obligations under the Act (whether they choose to participate or conscientiously object).

Attendees expressed concern to our MOH speakers about the short time frame until the Act goes live and said greater clarity is needed on the process and what is expected of medical practitioners. MOH is adding to its information and resources and the NZSA website now has a page which collates these to make them easily accessible. The NZSA has a twofold role to play based on what members have asked of us: to keep members informed of developments including resources, and for the NZSA to be involved in discussions around the framework and regulatory oversight. It goes without saying that we need clear guidelines, codes of practice, and safeguards in relation to implementing the Act.

Introducing NZSA's new CEO

Our new CEO Michele Thomas comes to us with a wealth of health sector experience and contacts, not to mention great enthusiasm and initiative. She has been busy meeting members and stakeholders, including at our stakeholder function last month. You can read a profile article about Michele on p.8 and hopefully you will have a chance to meet her in person, especially if you are attending the AQUA conference this month or our much-anticipated Annual Scientific Meeting, jointly hosted with ANZCA NZNC and NZATS, in October. The excitement for our ASM in the garden city is certainly building up and I encourage you to read the ASM feature from our convenors on pp. 12-13 to find out why this is a not-to-be missed event.

NZSA hospital visits

Following a cessation of hospital visits last year due to COVID interruptions, members of the NZSA Executive have rekindled their visits. These visits are a great opportunity to connect with members, to hear what is going on at a hospital level and most importantly to find out what you want from us. We have been warmly welcomed by anaesthesia departments in North Shore, Tauranga, Palmerston North, Blenheim, Wellington, and Dunedin so far this year and are also hoping to visit Hutt, Whanganui, Taranaki, Timaru, Gisborne and the Wairarapa before the end of the year. And we will continue next year as we aim for two-yearly cycle of visits to each department. As an example of a suggestion received at a recent visit, we have changed how we do things: a member of the department queried why we needed two nominations for a new NZSA member application. After discussion amongst the Executive Committee, we have now stopped this requirement. A check of vocational registration by our Membership Manager will now be all that is required.

New look NZSA magazine

Finally, you will have noticed that the NZSA magazine is looking brighter and more dynamic. It has been five years since we rebranded, and we thought it timely to refresh the brand and the design of our magazine. We trust you enjoy reading this issue and find it informative – the content always seeks to reflect the breadth of our specialty, the innovation and contributions, and the work NZSA does on your behalf.

We are proud of our achievements, however we are certainly not resting on our laurels – we are always striving to do better, to anticipate and respond to change proactively and to be focused on the future. Thank you to all our members for your support and especially the many who volunteer their time on behalf of the NZSA – your contributions are not taken for granted and are very much appreciated.

Sheila Hart, NZSA President

NZSA President's Award

The NZSA President's Award seeks to recognise an NZSA member who has provided a sustained or specific contribution to the Society and anaesthesia community.

For details on criteria and how to nominate someone please visit the NZSA website:
https://anaesthesia.nz/research-awards-and-prizes/

Fiji's Covid epidemic

An update from NZSA Global Health Committee (GHC) Chair Dr Indu Kapoor.

The Covid epidemic in Fiji has created a health emergency. There has been an escalating need for an on the ground Covid response, as well as an urgent need for healthcare resources including healthcare providers.

The Australian Medical Assistance Teams (AusMAT) is currently in Suva to support our Fijian colleagues with logistics, planning and implementation. Christchurch anaesthetist Dr Wayne Morris (NZSA GHC member and President-elect of the World Federation of Societies of Anaesthesiologists) is part of this team. Dr Morris has been in contact with the New Zealand Government to assist in the Government's response. His advocacy, in conjunction with Lifebox ANZ, has led to a major donation of pulse oximeters by the New Zealand Government. These Lifeboxes will be invaluable in managing Covid patients. Dr Morriss' regular media interviews have also been keeping the New Zealand public informed of developments in Fiji.

Hawkes Bay anaesthetist Dr Tony Diprose is on his way to Suva as part of the New Zealand Medical Assistance Team (NZMAT) to support and strengthen the team on the ground. The NZSA is in regular contact with our Fijian colleagues, the President of the Pacific Society of Anaesthetists, and our members on the ground.

"The Covid epidemic in Fiji has also led to significant disruption to medical education and training in Fiji"

The Covid epidemic in Fiji has also led to significant disruption to medical education and training in Fiji, which is of huge concern to the NZSA. Fiji National University in Suva provides medical undergraduate and postgraduate training for most of the Pacific. This includes training for the Diploma and Masters in Anaesthesia. One of the tragedies of this current pandemic is the delay in training anaesthetists for the Pacific. This will have a significant impact on the already precarious and overworked Pacific anaesthesia workforce. Even pre-Covid, no country in the Pacific was anywhere near achieving the WFSA's targets of five anaesthetists per 100,000 population. The delays in training due to Covid will further aggravate this situation, leading to a significant risk of burnout and loss of workforce.

There will be an urgent need to try and catch up in the recovery phase. A sustainable way to provide support will be to help build the anaesthesia workforce and train more anaesthetists. Unfortunately, the financial burden of sending multiple doctors to Fiji to train as anaesthetists will be untenable for most Pacific countries.

The NZSA recognises these financial constraints, as well as the need to support training during the recovery phase. One of the ways we are supporting this training is through the Pacific Anaesthesia Collaborative Training Fund (PACT).

Dr Brain Spain (Australian Medical Assistance Team, AUSMAT), Dr Luke Nasedra (Fiji Emergency Medical Assistance Team, FEMAT) and Dr Wayne Morriss (NZMAT).

PACT is a NZSA GHC initiative, which was launched last year. To date we have 83 NZSA members and their friends each contributing the equivalent of one or two coffee(s) a week. Find out more here and begin making your contribution in just under five minutes https://anaesthesia.nz/community/global-health-committee/donation

The funds raised through PACT have been used to support our first PACT fellow Dr Cecilia Vaai-Bartley, from Samoa, to undertake her masters in Anaesthesia training in Suva. Cecilia has submitted a report about her training experience in Suva, covering the first six months of this year. I encourage you to read her report on the NZSA GHC website page. If you are interested in the GHC's activities, please bookmark this page to stay updated.
https://anaesthesia.nz/community/global-health-committee/

Unfortunately, due to the unfolding Covid situation in Fiji, Cecilia (along with all international trainees) have been removed from frontline work, and training has been temporarily suspended. Training will recommence when considered safe.

We continue to raise funds via PACT in preparation for supporting the PACT fellow as soon as training restarts. Depending on the amount raised, we may potentially be able to increase the number of PACT fellows. On behalf of the NZSA, I would like to take this opportunity to thank our PACT supporters and to encourage those who have not yet signed up to consider contributing.

The NZSA is grateful to our members for their support of our Pacific neighbours during this pandemic and for their various contributions to help build a sustainable workforce in the Pacific.

Please do get in touch with me if you have any queries or suggestions by contacting the NZSA office in the first instance nzsa@anaesthesia.nz

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VYGON

Value Life

New NZSA CEO Michele Thomas

NZSA's CEO Michele Thomas is excited about her new role, and enthusiastic to embrace the opportunities to support the anaesthesia specialty. Michele says that the Society's trinity of advocacy, community and education resonates with her own values and work ethic, "as well as the focus on collective strength to ensure optimal results, including for our patients in both the public and private sector."

NZSA President Dr Sheila Hart says that Michele comes to the NZSA with many years of experience, having worked in the health sector for almost 30 years. She started out as a Registered Nurse in the UK and gained diverse health experience, working in General Surgery, Medicine, Maxillo-Facial, theatres and ICU.

She moved to New Zealand with her family 18 years ago and transitioned into health management and leadership roles across a broad spectrum of health including primary, secondary, allied health, and the NGO sector.

Her most recent previous role was as CEO of Lake Taupo Hospice Trust, where she had overall responsibility for organisational, operational and community activities.

She also led financial and fundraising operations, including grant applications, community fundraising initiatives, fiscal viability and two shops as part of the hospice retail arm.

Michele's husband Martin is an anaesthetist and the new Medical Director and Quality Lead for System Improvement at the NZ Health Quality and Safety Commission. Being married to an anaesthetist, as well as her own health sector experience, has given her real insight into the specialty, including the personal and professional sacrifices anaesthetists make.

"I understand the challenges and impact these sacrifices often have on wellbeing, especially at pivotal stages such as training and moving into specialist practice."

She commends the NZSA's strong focus on wellbeing and has experience as a mindfulness coach. She is associated with Ovio Mindfulness, an organisation that offers a range of tailored personal and professional development solutions based on modern, science backed mindfulness techniques (https://ovio.co.nz/). "I'm passionate about helping people find balance through mindfulness, and to help them connect to what makes them happy and fulfilled."

Michele was motivated to apply for the CEO role to advocate for anaesthetists at a national level and to support members to ensure their voices are heard. "There are numerous facets to building this voice and influence, but a key one for me is to foster the on-going relationships with associate organisations and membership groups at government and ministry levels and within the community of NZSA members." Since starting at the NZSA in April she has been regularly meeting with our stakeholders, including ANZCA, ACC, ASMS, the NZ Medical Association and the Australian Society of Anaesthetists.

Michele's key priorities and goals for the NZSA include further boosting membership, especially among trainees, maximising the value of being an NZSA member, and supporting anaesthetists with strong advocacy in response to health sector changes such as the health and disability system review and the End-of-Life-Choice Act. She is also passionate about advancing the organisation's commitment to biculturalism, the Treaty of Waitangi and cultural competence. "This is a longer-term project which came out of the Executive's planning session earlier in the year to help the Society be more culturally responsive. Engaging in this conversation and thinking through the areas we need to change are an excellent start." She is looking forward to beginning te reo and tikanga classes with NZSA and the ANZCA operations team.

Outside of work, Michele has been unpacking a lot of boxes. "I can't believe how many books we own!" and settling into her new home, walking her dog Theo, getting to know Wellington (with some help from GPS) and enjoying the capital's café culture.

Michele is keen to hear from members and encourages you to get in touch ceo@anaesthesia.nz

She will be at AQUA this month and looks forward to meeting as many of you as possible!

NZSA stakeholder event

The NZSA stakeholder function, held last month, was an excellent opportunity to introduce our new CEO Michele Thomas to a range of health sector representatives. In her speech NZSA President Dr Sheila Hart described our stakeholder relationships as enduring and vital as we work towards common goals, including improved coordination of healthcare services across the country and improved health equity.

"We appreciate your goodwill and generosity of sharing information and collaborating with the Society." Dr Hart also acknowledged NZSA members who volunteer their time to support the NZSA's work. "We have a growing number who are engaging with us in a range of ways, especially as members of our sub-specialty anaesthesia networks, as well as our sub-committees and of course, our Executive Committee."

Left to right from top: NZSA Immediate Past President Dr Kathryn Hagen, NZSA Vice-President Dr Morgan Edwards and NZSA President Dr Sheila Hart.
ANZCA Executive Director, Professional Affairs Dr Leona Wilson, ANZCA President Dr Vanessa Beavis, ANZCA NZNC Chair Dr Sally Ure and NZSA President Dr Sheila Hart.
NZSA CEO Michele Thomas and ANZCA NZNC Executive Director Kiri Rikihana.
CEO NZ Orthopaedics Association Andrea Pettett, CEO NZ Medical Association Lesley Clarke and NZSA CEO Michele Thomas.
NZSA CEO Michele Thomas and Executive Director of the Association of Salaried Medical Specialists Sarah Dalton.
NZSA staff, from left: NZSA Executive and Network Support Administrator Rebecca Nodwell, NZSA CEO Michele Thomas, NZSA Membership Manager Lynne Mulder-Wood and NZSA Communications Manager Daphne Atkinson.
New Zealand Anaesthetic Technicians' Society (NZATS) Treasurer Leanne Morrison, NZSA CEO Michele Thomas, NZATS Chairperson Kirstin Fraser and NZATS Exam Coordinator Nicola Smith-Guerin.

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NZSA Executive member profile

Dr Renee Franklin is a Consultant Anaesthetist in Tauranga and the clinical lead for the pre-assessment clinic at Tauranga Hospital. She works in both public and private practice and has a strong interest in perioperative medicine.

Renee is a member of the New Zealand Perioperative Network and of the Perioperative Medicine SIG Executive. She joined the NZSA Executive Committee in October 2019.

What led you to choose anaesthesia as your specialty?

As a 4th year medical student, I was lucky to be in the first cohort to be offered a 4th year Anaesthesia run. I loved it! I think it was partly to do with having time to work closely with an SMO. The specialists seemed to enjoy their job and to have balanced lifestyles. I also loved the work – a great mix of procedural tasks, communication, teamwork, and the expert knowledge required.

Where did you study medicine and what training path did you take?

Auckland University. I then went to Rotorua Hospital thinking I would stay for a year to get a good grounding as a House Officer. I stayed for five years. I was fortunate to do my first year of Anaesthesia training at Rotorua in the first cohort of trainees. I then progressed to Waikato Hospital and spent my final year at Tauranga Hospital where I stayed on as an SMO.

Who was most influential during your training?

So many people it would be impossible to name them all. I feel very lucky to have spent time as a 4th year medical student and a trainee intern at Middlemore Hospital working with Alan McLintic. He went on to be a source of occasional help and encouragement from afar during my training.

What is the most satisfying aspect of your work?

Perioperative medicine. I am the Clinical Lead for the Preassessment Clinic at Tauranga Hospital and we have a fantastic Perioperative Medicine team, including preassessment nurses, anaesthetists, geriatricians, physicians, surgeons, physios and Māori health representatives. We work together to provide a high quality service, which is always looking for new ways to improve. I find the innovation side of service improvement energising and exciting.

Currently we are focussed on improving equity in our service and commencing optimisation of perioperative patients at the time of referral to reduce wait times. We already have well established nurse led preassessment, a Shared Decision-Making Pathway, and POPS (Proactive Care of Older Persons Undergoing Surgery) Pathway. We are frequently visited by colleagues from around the country with an interest in seeing what we do.

I have recently taken on the role of Associate Head of Department and am learning so much about departmental management.

What are some of the key issues for New Zealand anaesthetists and our health system?

Current issues include understanding how the new agency Health NZ will impact on our work and understanding the role that an anaesthetist may/may not have to play in the End-of-Life Choice Act. Other issues that are ongoing and very important include working towards equitable healthcare and environmental sustainability.

> *"We work together to provide a high quality service"*

What motivated you to join the NZSA Executive?

I first attended an Executive meeting as an observer and was able to see first-hand all the great things the Executive were involved with. I was keen to jump on board and be part of it.

What career would you have chosen besides medicine?

Something that involved working outdoors – veterinary medicine with large animals.

What are your interests and activities outside of work?

Ashtanga Yoga and running – last year I managed to run for 257 days in a row and should never have stopped...the thought of beginning at day one again is somewhat heartbreaking. I have three neat kids aged 11, 7 and 5 (and a border collie who thinks he's a child!) who keep me busy too.

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Aotearoa New Zealand Anaesthesia Annual Scientific Meeting

Come join us in Ōtautahi Christchurch for the Aotearoa New Zealand Anaesthesia Annual Scientific Meeting. It will be a hybrid meeting, so you can choose either face-to-face or virtual attendance. Naturally, we would love to see you in person as this will a great opportunity to connect or reconnect with colleagues from different centres. If travelling to Christchurch is difficult for you, however, we are promising a seamless virtual experience. In the event of a snap lock-down, the conference will still go ahead as a full virtual meeting.

This year we are reviving the Alan Merry Oration, highlighting work on health quality and safety in anaesthesia. The Alan Merry Oration was introduced during the combined NZSA/ANZCA ASM in Queenstown in 2019. This oration was to be presented annually but unfortunately, because of COVID, we did not have a combined NZSA/ANZCA meeting in 2020.

We are very excited to have the eminent Professor Carol Peden delivering the Alan Merry Oration. Professor Peden will be well-known to many of you and was last in New Zealand in 2016 for the ANZCA ASM in Auckland. She is a co-founder of the National Emergency Laparotomy Audit in the UK. This incredible body of work has revolutionised emergency laparotomy management internationally. More recently, she was first author of the ERAS guidelines for emergency laparotomy, published this year in the World Journal of Surgery. Aside from her expertise in designing and leading improvement and innovation projects, Professor Peden also has an interest in perioperative brain health and is the current Chair of the American Society of Anesthesiologists Perioperative Brain Heath Initiative. Her oration will be one of the major highlights of the meeting, showcasing how her team applied data to clinical practice; the progression from the audit to the development of guidelines.

Joining Professor Peden during the first session of the conference we have Christchurch's own Dr Wayne Morriss. Wayne is President-Elect of the World Federation of Societies of Anaesthesiologists and will assume the role of President in July 2022. He will be sharing his wide breadth of knowledge on quality global perioperative care. Be sure not to miss his talk.

If you are thinking of coming to Ōtautahi Christchurch, check out our workshop program. Outside of the ANZCA emergency response activities, we have a number of highlights including a te reo workshop for beginners and an opportunity to paddle a waka down the Avon River. But book quickly – numbers are limited and registrations are filling up fast.

Early bird registration for the Aotearoa New Zealand Anaesthesia ASM closes 26 September 2021.

Professor Carol Peden.

Dr Wayne Morriss.

ENVIRONMENTAL NEWS

Carbon neutral anaesthesia – can this be a reality?

The NZSA's Environmental and Sustainability Network writes a regular feature for our magazine. For this issue, E & S Network member Dr Paul Currant explores the challenge of carbon neutral anaesthesia and the collective actions we need to take to make it a reality.

The challenge

We have a fiduciary responsibility to mitigate and adapt to the evolving climate and ecological crises. But how can healthcare, and in particular resource intensive subspecialities such as anaesthesia and surgery be 'carbon neutral' and use resources responsibly and sustainably? The New Zealand Government has called for all public services, including healthcare, to reach carbon neutrality by 2025. Is this possible?

The approach

Redefining Value

To be sustainable, 'value' in healthcare needs a much broader meaning than the monetary cost of running the service. The sustainable value 'formula' developed by Frances Mortimer and colleagues[1,2] (Figure 1) prompts us to consider the environmental, social, and financial costs (the triple bottom line) and to consider how our decisions will impact the wider population, present and future. This formula can be applied to any healthcare process, patient pathway, procedure, equipment, or drug.

Approaching the problem from all angles at all levels

Reducing healthcare's carbon emissions can be achieved not only by *reducing the carbon intensity* of our services, but also by reducing activity secondary to *disease prevention* and developing *lean efficient healthcare pathways*[3]. Efficiency in healthcare is complex – total healthcare waste in the US has been calculated to make up 20-35% of the US national health expenditure[4]. Primary drivers of these inefficiencies include failures of care delivery and coordination, overtreatment, administrative complexity, pricing failures, fraud and abuse[4]. Waste in the traditional sense (i.e. in the bin) accounts for a much smaller proportion of total healthcare emissions. Having said this, minimising waste and optimising our use of healthcare waste streams is one of the low hanging fruit that is visible and easy to improve right now (see Table 1).

Measuring and reporting emissions

All DHBs are now required to measure and report their emissions and have a strategic plan for emissions reductions. *Life cycle assessment* (LCA) evaluates the impacts on environmental and human health of a product or process within defined boundaries. Since our primary collective concern is global warming, the most commonly used metric is global warming potential (GWP) relative to the warming effect of CO_2 (CO_2 equivalents in kg CO_2e) over a given time period, usually 100 years (GWP_{100}). Some of the most detailed analyses of healthcare's huge carbon footprint is on data from the National Health Service (NHS), England[5,6] (Figure 2). Data from New Zealand shows very similar contributions (Rick Lomax, Beca, personal communication). Of note is that many of our hospitals still power their process heat using coal or gas boilers and, prior to COVID, a comparatively large proportion of our emissions were from flights for CME. Collaborating with academic institutions, to publish New Zealand specific healthcare LCA and systems research is important to guide our efforts and stimulate innovation.

$$\text{Sustainable value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

Figure 1. The triple bottom line. Formula for sustainable value in healthcare. Reproduced (with permission) from the Centre for Sustainable Healthcare, Oxford, England. Adapted from Mortimer et al[1,2]

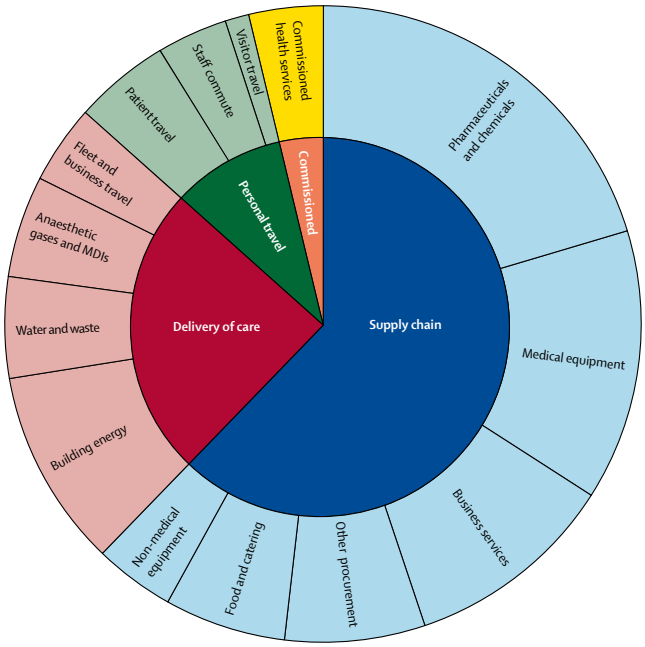

Figure 2. Contribution of different sectors to the greenhouse gas emissions of the NHS England, 2019. Tennison et al, 2021[5]. Reproduced with permission.

Where do we start?

Predictions of emissions savings for the NHS, have been made[6]. This work reveals where the big gains are to be made (power, transport and procurement), disproportionate problems are anaesthetic gases, nitrous oxide and metered dose inhalers, and the shortfall which will need to be made up by 'offsetting' and innovation.

Moving towards a circular economy and product stewardship

Emissions from procurement account for over 60% of healthcare's carbon footprint. Developing legislation such as New Zealand's Product Stewardship Bill and carbon pricing, together with introducing strong sustainability principles into procurement rules for bulk purchasing bodies (e.g. Pharmac)

Table 1.

Initiative	Notes
Choosing Wisely Evidence-based, individualised and optimised treatment/ management[8] Avoidance of unnecessary investigations and medications (e.g. imaging, blood tests, antibiotics etc.)[8] Reducing the use of consumables*	*Much equipment is considered routine but may not be evidence-based or clinically indicated in all situations, e.g. excessive use of gloves, absorbent pads and supplemental oxygen (>2/3 of healthy paediatric day stay patients moving from theatre to recovery maintain adequate oxygenation without supplemental O_2). Other equipment can stay with a patient through their hospital journey, e.g. O_2 delivery devices, IV giving sets, sequential compression devices, 'Hover' mattresses, etc.
Circular economy principles – replace single-use with reusable items Linen, drapes, gowns and hats[13,14] * Sterilisation wraps and trays Hybrid laparoscopic devices[15] Patient warming devices Reusable drug and procedure trays* Laryngeal masks	*Improved if reprocessing uses renewable energy. Reusable alternatives are nearly always cheaper (per use), reduce emissions and improve availability in a world where supply chains are becoming increasingly unreliable[16].
Circular economy principles - Single-use items reprocessed with strict quality control Single-use surgical instruments Sequential (foot and calf) compression devices 'Hover' mattresses	
Low carbon alternatives Total intravenous or regional anaesthesia in place of volatile anaesthetics[10, 17, 18] Streamline single use sets / procedure packs (reduce contents as much as possible / get rid of unused items and replace single-use plastics where possible) Add 'just in case' items to reusable sets. This reduces packaging and handling and incurs no additional energy for the set to be cleaned and sterilised 'Mini' single-use suction sets Single-use compostable procedure and drug trays	
Energy saving Turn off heating, ventilation, air conditioning (HVAC), lighting, IT equipment and scavenging when not in use	
Travel Remote consultation in place of face-to-face clinics[9] * Local and virtual CME** Active transport for commuting	*Many surgical patients require a clinical examination or to be seen face-to-face for other reasons. In this case make sure that their visit is optimised by seeing all the people they need to and have all necessary investigations on that single visit. **Use of regional clusters with expert moderators offers local networking and socialising opportunities.
Waste management Reduce consumption (Choosing wisely and adopting circular economy principles) Anaesthetic volatile[10] and N_2O[11] capture* Safe destruction of toxic drugs** Optimise use of different waste streams[12] *** Encourage manufacturers to use recyclable plastics to make devices and packaging	* Captured gases can either be reused or destroyed. Scaling this technology and funding the infrastructure required for this is still some way off. ** Here in NZ we export cytotoxic waste for destruction by incineration at great cost. Other potentially harmful pharmaceutical waste (e.g. propofol) is not destroyed and may be harmful and persistent in the environment. *** Recycling is cheaper and more environmentally friendly than landfill, which in turn is cheaper and has a lower carbon footprint than clinical waste streams[12]. However, circular economy principles would have us reprocess, reuse, repair and maintain as many times as possible before recycling materials.

could have significant influence; swaying the markets towards more sustainable products. This means low carbon raw materials, manufacture, transport and packaging for products that can be reused, maintained and repaired where possible and careful planning for end-of-life repurposing and recycling. As end users, we are also in a key position to work with and lobby manufacturers and suppliers to provide us with high quality sustainable products. Successful companies will hopefully be those that make rapid moves to go 'carbon neutral', embrace a circular economy and product stewardship, whilst caring for the environment and people along their supply chain[7].

A collaborative effort

The development of Health NZ provides us an opportunity to coordinate a collaborative approach yielding high value, efficient pathways to carbon neutrality for New Zealand healthcare. If you see inefficiency or waste, there's an opportunity for an audit or a QI project, or there may be enough evidence from research carried out in similar settings to implement changes without collecting additional data. Network and communicate; involve everyone at every level; put sustainability on the agenda of hospital meetings. Learn, educate, research; integrate sustainability into medical and subspeciality curricula, QI and research activity.

Will we get there?

The collective actions required to make our lives sustainable on our small precious planet presents the greatest challenge humankind has ever faced. Increasing efficiency and decarbonisation of our economies cannot outrun our present rates of population and economic growth. We cannot have ongoing growth on a finite planet. However, this challenge also promises huge co-benefits to improve the human condition; new levels of collaboration and sharing, reducing inequality, better health and wellbeing and rekindling our relationship with the natural world that sustains us.

It feels as though we are eventually reaching a tipping point in our collective understanding, but we need to turn this into action, NOW.

References on page 23

E kore tātau e mōhio kit e waitohu nui ote wai kia mimiti raw ate puna.

(We never know the worth of water until the well runs dry).

- Te Wharehuia Milroy

NZSA TRAINEE COLUMN

Dr Mikaela Garland
NZSA Executive Deputy Trainee Representative

What does welfare mean?!

The ups and downs of 2020 continue throughout 2021. Yes, I'm talking about COVID again. While we have adapted to zoom meetings, local courses and exams, and the omnipresent threat of lockdowns, this continues to take a toll on everyone including ourselves.

This brings me to the next point – what does welfare mean to a trainee? Can you "achieve" welfare like an exam result? Is there a goal? I have often thought about the recommendations – find a mentor, see your GP, have a healthy work-life balance, nurture your relationships... and while these are all important, what does it mean when you are working, studying, and just trying to keep it all together?

As I sit here petting my cat, reflecting on the last four years of anaesthesia training, I thought I would outline some ideas and strategies I used during training, moving to four different hospitals (in four different cities), exams, and of course relationships.

1. Find what works for you. I think this is crucial as despite us having the same job and exams, we are different. There are lots of ideas – for example:
   - Exercise
   - Movies/Netflix
   - Going out for dinner
   - Ordering dinner in
   - Talking to a friend or family member
   - A nap
   - Reading a (non-anaesthetic) book.

   Do any of these make you feel better? Or have you found something different that works for you? If you are like me, I can feel guilty for taking time out to look after myself, especially with the weight of the ever-growing to-do list. However, that 30-minute nap, or 20-minute all out HIIT exercise session usually has me coming back refreshed and ready to go. It's OK to try a few ideas – they may be from the above list or mentioned by friends. It's OK if you decide something doesn't work for you. Put it in the discard pile and try something else. As a group we are not used to "failure" so another key thought to consider is to be kind to yourself. What would you say to your best friend if they had the same issue? I bet it would be different to the conversation you're having with yourself.

2. I've tried everything, and I'm still super stressed out and welfare isn't helping! This is a really tricky situation. When I get to this point, I usually fall back to two grounding questions.

   a) What is the most important thing to me?
   I decided early on in training to value my relationship with my partner. During the beginning of my Part 1 preparation, I hadn't quite figured this out yet. It was a difficult time. We did long distance and I thought that the most important thing in the world was to pass the Part 1. But as I got closer to sitting the exam, I realised what was the point in passing if I gave everything else away. I started to make more effort (like pre-exam effort) into my relationship and that carried us through the next three years of training and the Part 2.

   This doesn't mean a relationship is the most important thing to you. It might be CrossFit, baking competitions, painting etc. Figuring out your number one and going back to this when it seems too hard can be a reminder and grounding point about who you are, and how much you have achieved in your life so far.

   b) What is the worst thing that can happen?
   I found this question most useful around exam stress. The worst thing that can happen in an exam is not passing. I said not passing as it is not a failure. You have come so far. If you don't pass the exam, what will happen? Nothing. You carry on and go again. While this is daunting, and scary, and something you don't want to consider, it is surmountable.

3. Perfection. We constantly strive for perfection. We are in an excellent training scheme, with incredible mentors, we have a clearly mapped path and why shouldn't we continue being "perfect?" Nobody is perfect. If I were your friend and we were chatting over coffee, I'd tell you it's OK to feel overwhelmed even though it looks like we are on the best trajectory ever. It's OK to not be perfect. It's OK to have your third coffee of the day because you stayed up late last night and woke early this morning to check up on a patient.

Now, back to the beginning. GPs, mentors, relationships. They are in every welfare guideline as they can provide a safe place. Sometimes talking to someone is all that we need. You may only use them once as you develop other tools that work for you. These types of relationships are good to start developing so that when you need them they are already there.

"It's OK to not be perfect."

And no, I don't think you can "achieve" welfare. It ebbs and flows, sometimes you'll feel great and other times the opposite. This is OK as well. We are allowed to not feel awesome 100% of the time. I think the goal of welfare is to develop resilience and ways of coping that are specific to you. During your anaesthesia training this is likely to be a key part of your "training" as you progress towards consultant life.

On a final note – please reach out if you need help. Find what works for you. Remember you are good enough.

Fellowship in Canada

At the height of a global pandemic, it was quite a feat for Dr Mike Webb to travel to Canada with his family to undertake his fellowship in regional anaesthesia and acute pain management. He writes about his experience, including the learning opportunities as regional anaesthesia came to the fore, the challenges of COVID and why the experience fostered a stronger appreciation for wellbeing and trainee mentoring.

Dr Webb's fellowship was made possible by the BWT Ritchie Scholarship, offered by the NZSA and ANZCA NZNC.

A regional fellowship in Toronto, Canada

Canadian fellowships are typically arranged 12-24 months in advance of the start date of the fellowship. The process included formal application documentation, letters from three referees and a relatively informal Skype interview. My main reasons for choosing this fellowship were: to improve my regional skills to the point where this could be something that I could offer an anaesthetic department as a specialist; Sunnybrook Hospital's regional fellowship which offered a high volume regional anaesthesia program; and my wife, our three children, and I all hold Canadian citizenship, plus our extended families live in Toronto and Vancouver.

Sunnybrook Hospital is the second largest hospital in Canada, with the biggest trauma service in the country. A large volume of orthopaedic procedures, both elective and acute, are performed here, so I thought it would be an ideal location to undertake a regional fellowship. With the job awarded, we booked our flights and accommodation well in advance, and made plans for the coming year.

Organising the fellowship

Becoming a clinical fellow in the province of Ontario requires several administrative steps, which take at least eight to nine months to complete. At the midpoint of completing my paperwork, the COVID pandemic broke out, which added more complexity to the application process.

Fellowships are centrally administered through the University of Toronto, which has requirements for documentation and occupational health and safety, however the fellow is the employee of the hospital at which they are working so each of these offices have their own requirements. The fellow must have their credentials verified and accepted by the Medical Council of Canada. Each province also has its own medical council, so I needed to send documentation to the College of Physicians and Surgeons Ontario for their approval. Fellows also need to organise indemnity insurance prior to starting their position.

Travel in the time of COVID 19

International travel in the height of a pandemic is not something I would advise. We had our flights cancelled on several occasions, which required rebooking the tickets over the phone each time. I was set on doing this fellowship and remained assured that we would get to Canada, which had so much promise for us as a family. My wife, irritatingly correctly, was less convinced about whether it made sense to persist in what turned out to be an uphill battle. Multiple anaesthetic departments in Auckland kindly offered to extend me as a registrar or fellow, but I remained steadfast in my goal of getting to Canada. It was a stressful time. With the flights finally sorted out days before we were to leave, we boxed up our belongings into storage, packed and went to the airport. Owing to the nature of flight rerouting/cancellations, we took a roundabout route to Toronto via Los Angeles and Vancouver (stopping for a night in each). There was the latent anxiety about contracting COVID during the flights and layovers, and my poor kids (ages seven, five and two and a half) got very used to constant hand sanitising and wearing a mask. My seven-year-old dubbed me "captain cautious." Those things aside, it was pleasant to travel – no lines, and plenty of seats to stretch out on. We finally made it to Canada on 11 June last year and began our nationally mandated self-isolation. This was an enjoyable time, as we self-isolated at my in-law's family cottage 250 km north of Toronto right at the start of a hot summer. We had made it and we were off to a great start!

The Fellowship

Regional Anaesthesia

There are five regional fellows at Sunnybrook Hospital, and we worked over two sites. One is the hospital main site, and at this location more technically challenging perineural and plane blocks for patients are done. The second site is a satellite hospital for elective orthopaedic procedures. At this location a large volume of simpler perineural catheter blocks is performed. There are "block rooms" at both sites which are staffed by a block fellow, occasionally a resident (Canadian for registrar), and sporadically by a supervising consultant. All blocks for all the theatres for the day are done in these locations. Typically, block fellows can expect two days a week in the block room, with the rest of the days being service provision

for the department. Each fellow initially undertakes a three-week minimum of supervised general work prior to working in the block room, and this is to satisfy the department and the licensing bodies that you are safe for independent practice. I moved quickly off this supervised time, and into practice that was completely independent. I learned immediately that the work as a fellow here is very autonomous, there is very little assistance available to you and especially on your service days opportunistic toileting and eating are essential skills to develop. Thankfully, I had some good regional teaching in Auckland, and could do many basic plane or perineural blocks/simple catheter techniques. My experience is of very independent work in this area, so if you have little regional experience a fellowship of this nature might be challenging.

There were significant rostering issues throughout my tenure. Due to some consultant staffing issues, there was a regrettable habit in the department to move regional fellows off their assigned block room days and to use those days to cover additional service lists. Obviously, this was distressing for fellows who have travelled a great distance, and at considerable expense to come here to do a fellowship in regional anaesthesia. The result, unsurprisingly, was low morale amongst the fellows.

The on-call roster

On-call shifts at Sunnybrook Hospital cover obstetrics and general calls. Obstetric overnight shifts are 16:00 to 08:00 and generally busy. General calls for fellows are at the third and second on call level, meaning that the call ends when the operating theatres go down to two and one theatre respectively. Third call goes home, however, second on call is 24-hour in hospital call and can either operate for that entire 24-hour period or, more typically until two or three in the morning, or be woken to re-open a theatre if required. You are given a sleep day following second call, and then return to the roster the day following. Owing to the nature of the work culture and the Canadian fee-for-service funding model these can be very long shifts where cases that would not be done overnight in New Zealand are routine. There is an average of one overnight shift per week. I had weeks with none, and weeks with three.

It was very interesting working in a pandemic "hot spot" during this unique time. We had excellent access to PPE and sensible protocols were in place to attempt to mitigate the spread of the disease. An N95 is worn for all intubations and extubations/aerosolising procedures by both the anaesthetist and the assisting nurse (there are no anaesthestic technicians in Toronto and I missed them dearly...) as well as eye protection and an over gown. This is worn for all patients regardless of their COVID status. I put my N95 on in the morning and took it off at the end of the day as I was leaving. The bridge of my nose was completely mangled, but I think my modelling career was over long ago anyways!

I managed known COVID positive patients. With many asymptomatic carriers in the population and the middling performance of the COVID PCR as a screening test, I imagine I had several exposures. Some fellows and residents in the department tested positive for the virus – thankfully all asymptomatically.

Interestingly, to avoid general anaesthesia and aerosolising procedures, regional anaesthesia came to the fore. This improved my regional skills as these patients were expected to have their procedure solely under regional blockade and some simple sedation.

Projects

I have interest in research stemming from my background as a clinical epidemiologist. I was often working ~80 hours a week, so there were limited opportunities to undertake projects. That said, I published several textbook chapter sections and have a very exciting piece of original research currently in review. If you make time, there are opportunities to do projects, but you have to really shoehorn it in around your clinical work. Academic days or time were not built into my schedule.

Scientific meetings

As a keen skier, I had hoped to attend the Whistler anaesthesia conference but this and so many other events were cancelled. I would have enjoyed the chance to present some of the great original surgical risk data that we are creating in New Zealand.

Social aspects

With COVID lockdowns and strict limits on gathering size, this was a secondary focus, however, I enjoyed meeting other fellows from around the globe. South Africa, Switzerland, Brazil, Australia, New Zealand, and, of course, Canada. Sadly, we were not able to spend much time together outside of work. My wife and children were living outside of Toronto with my wife's parents and owing to my busy work schedule and potential need for isolation, I lived in a flat near the hospital. As there was nothing to do outside of work, I became very well acquainted with the walls of my apartment!

Returning to New Zealand

My fellowship concluded at the end of June, and I immediately went on a very pleasant fishing trip. I am now having some holiday time with my family in Canada, which is great after such a busy year.

I am very lucky to have obtained a consultant position prior to departing New Zealand and I'm very much

looking forward to returning to Auckland in September to commence my position at Middlemore Hospital. Middlemore was the place that I did most of my medical student training, house officer rotations, and a fair amount of my anaesthetic training so, I am excited to head home!

Lessons learnt

Working in Canada afforded me several experiences that have had significant formative input on how I intend to function as a consultant anaesthetist. I improved my skills in regional anaesthesia to a point where I would be comfortable to perform or supervise/teach most regional procedures at a consultant level of practice. I accrued a large volume of practice of regional procedures in a variety of settings and in a wide range of patient clinical presentations. Additionally, I was responsible for supervising and teaching Canadian resident anaesthesiologists regional anaesthesia and became more skillful in the art of junior staff supervision. I feel like these skills will benefit my department in the immediate sense, and the latter point will benefit the larger anaesthetic community in a longitudinal fashion; through my small role in the creation of safe, competent regionalists for the future.

I think my experiences will make me a more empathetic and caring senior colleague. The conditions were challenging and austere at times, there were very long work hours, and there were instances of being seemingly forgotten, which placed into stark reality how unhelpful and counterproductive these behaviours are. At the minimum, being cognisant of this will help prevent these behaviours being perpetuated by myself in my immediate circle. Furthermore, the experience has fostered a new appreciation for wellbeing and the importance of effective mentoring of trainees.

Lastly, I gained perspective on a different healthcare system and set of behaviours, and the expectations that come with it. From a personal perspective, it has been reassuring to function at a safe and competent level under some duress in a different healthcare system and country. I have come to really appreciate the excellent standard of anaesthesia, teamwork, and patient safety in New Zealand.

My sincere thanks

I am exceedingly grateful for the assistance provided to me by the BWT Ritchie Scholarship and would encourage potential fellows who meet the application criteria to apply for this generous grant.

With my great thanks to the New Zealand Society of Anaesthetists and the Australian and New Zealand College of Anaesthetists New Zealand National Committee.

To find out more about the BWT Ritchie Scholarship visit the website of the Aotearoa New Zealand Education Committee. https://www.anaesthesiaeducation.org.nz/

Visiting Lectureships have gone virtual!

Dr Nick Lightfoot and Dr Rob Burrell will inform and entertain you with the inaugural new-look Visiting Lectureship Series (2 September at 6pm) in a webinar format.

The Lectureships were originally set up to share presentations with smaller regional hospitals. However, now that so many of us are webinar and Zoom savvy, the Aotearoa New Zealand Anaesthesia Education Committee decided to give the whole country the opportunity to see our top researchers and presenters.

Dr Nick Lightfoot – Research. Is it worth it?

Specialist Anaesthetist CMDHB

Can small scale anaesthesia research make a difference? Outcomes from New Zealand (Middlemore Hospital).

Dr Lightfoot was nominated by Clinical Senior Lecturer, Dr Francois Stapelberg, for his presentation on Evidence Based Medicine and Anaesthesia for Orthopaedic Surgery. Dr Lightfoot has been influencing the practice of anaesthesia for orthopaedic surgery at Middlemore and within Auckland, especially Enhanced Recovery, through his research and collaboration interests, as well as clinical practice and training for the trainees.

Dr Rob Burrell – Sustainable anaesthesia. Is it worth it?

Specialist Anaesthetist CMDHB

Sustainability: our world, our country, and our work.

Dr Burrell was nominated by his Clinical Director, Dr John McGann, for his presentation. He has worked tirelessly over several years to monitor the carbon footprint of the Middlemore Hospital anaesthesia department, largely with regards to volatile use. His gentle encouragement and regular data presentations have led to a significant drop through a sustained widespread shift in practice.

Register:
https://www.anaesthesiaeducation.org.nz/visiting-lectureship

Post-polio and anaesthesia considerations

Polio New Zealand is working to raise awareness of how anaesthesia impacts post-polio patients to enhance the quality and safety of patient care in these patients.

Polio results in widespread neural changes, not just destruction of the spinal cord anterior horn (motor nerve) cells, and these changes get worse as patients age. These anatomic changes affect many aspects of anaesthesia care.

1. Post-polio patients (PPS) are nearly always very sensitive to sedative meds, and emergence can be prolonged. This is probably due to central neuronal changes, especially in the Reticular Activating System, from the original disease.
2. Non-depolarizing muscle relaxants cause a greater degree of block for a longer time in post-polio patients. The current recommendation is to start with half the usual dose of whatever you're using, adding more as needed. This is because the poliovirus lived at the neuromuscular junctions during the original disease, and there are extensive anatomic changes there, even in seemingly normal muscles, which make for greater sensitivity to relaxants. Also, many patients have a significant decrease in total muscle mass. Neuromuscular monitoring intra-op helps prevent overdose of muscle relaxants. Overdose has been a frequent problem.
3. Succinylcholine often causes severe, generalised muscle pain postop. It's useful if this can be avoided.
4. Postop pain is often a significant issue. The anatomic changes from the original disease can affect pain pathways due to "spill-over" of the inflammatory response. Spinal cord "wind-up" of pain signals seems to occur. Proactive, multi-modal post-op pain control (local anaesthesia at the incision plus PCA, etc.) helps.
5. The autonomic nervous system is often dysfunctional, again due to anatomic changes from the original disease (the inflammation and scarring in the anterior horn "spills over" to the intermediolateral column, where sympathetic nerves travel). This can cause gastro-esophageal reflux, tachyarrhythmias and, sometimes, difficulty maintaining BP when anaesthetics are given.
6. Patients who use ventilators often have worsening of ventilatory function postop, and some patients who did not need ventilation have had to go onto a ventilator (including long-term use) postop. It's useful to get at least a VC preop, and full pulmonary function studies may be helpful. One group that should all have preop PFTs is those who were in iron lungs. The marker for real difficulty is thought to be a VC <1.0 liter. Such a patient needs good pulmonary preparation preop and a plan for postop ventilatory support. Another ventilation risk is obstructive sleep apnea in the postop period. Many post-polios are turning out to have significant sleep apnea due to new weakness in their upper airway muscles as they age.

   COMMENT: Postop respiratory failure in these patients can be difficult to manage. The patient's pulmonary physician could help by doing a preop evaluation and being involved in postop ventilator management. This situation might call for the resources of an ICU in a major medical center.
7. Laryngeal and swallowing problems due to muscle weakness are being recognized more often. Many patients have at least one paralyzed cord, and several cases of bilateral cord paralysis have occurred postop, after intubation or upper extremity blocks. ENT evaluation of the upper airway in suspicious patients would be useful.
8. Positioning can be difficult due to body asymmetry. Affected limbs are osteopenic and can be easily fractured during positioning for surgery. There seems to be greater risk for peripheral nerve damage (includes brachial plexus) during long cases, probably because nerves are not normal and also because peripheral nerves may be unprotected by the usual muscle mass or tendons.
9. New ideas/thoughts: Spinals: Recent studies demonstrating the presence of cytokines in the CNS of PPS patients lead me to be less enthusiastic about using spinal/epidural anaesthesia. There is no data on this situation, and there are so many benefits to this regional anaesthesia, and it might be suitable in some situations.

Lidocaine would not be a suitable drug choice for PPS patients. It has been shown to cause nerve damage when used for a spinal. Regional anaesthesia: Should the peripheral nerves of PPS patients be exposed to local anesthetics, especially for long periods postop? There is no data, but many PPS patients have atrophied peripheral nerves. Perhaps smaller doses of local anesthetics and avoiding continuous postop infusions would be safer. Above-the-clavicle blocks (supraclavicular and interscalene approaches): These have a high risk for diaphragmatic paralysis and should probably not be used in PPS patients, unless the patient can tolerate a 30% decrease in pulmonary function.

PPS patients can have anaesthesia and surgery safely, with careful preparation. These recommendations are based on extensive review of current literature and clinical experience with these patients. They may need to be adjusted for a particular patient.

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Summary of Anaesthesia Issues for the Post-Polio Patient (abbreviated). Selma H. Calmes, MD, Chairman and Professor, (retired) Department of Anesthesiology, Olive View-UCLA Medical Center, Sylmar, California (Rev. 2014). Presented on 20 September 20, 2014, at the conference "We're Still Here!" Living with the Late Effects of Polio," presented by the California North Coast Post-Polio Group.

Further reading

https://pubs.asahq.org/anesthesiology/article/103/3/638/8686/Postpolio-Syndrome-and-Anesthesia
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3696261/
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World-leading NetworkZ progress

NetworkZ is a world-leading national simulation-based team training programme for operating room teams. A unique feature of NetworkZ is its multidisciplinary focus – a rare opportunity for real healthcare teams to train together in their own workplace. Professor Jennifer Weller, Dr Jennifer Long, and Kaylene Henderson write about NetworkZ's progress.

Those who have attended NetworkZ training attest to its value, see improvements in how teams communicate with each other and work together, and report many instances where they have identified potential threats to safety in their local environment.

NetworkZ represents a successful collaboration between the University of Auckland, the Accident Compensation Corporation (ACC) and the Health Quality and Safety Commission (HQSC), working together to improve the safety of surgery. In partnership with DHBs we can now say that every public hospital in the country has access to high quality simulation-based training and trained simulation instructors.

The Medical and Nursing Colleges and the New Zealand Anaesthetic Technicians' Society support NetworkZ by offering CPD points for attendance.

NetworkZ update

We began rolling out the NetworkZ programme in 2017, introducing courses for operating room teams in five DHBs. Since those early days we facilitated NetworkZ implementation in 19 DHBs, including small satellite hospitals such as Whakatane and Blenheim. We have extended NetworkZ to Emergency Departments and PACU. Over 2050 OR staff and 320 ED staff have attended local NetworkZ courses, and over 350 staff have attended instructor training.

We have a very professional programme package with multiple scenarios, instructor apps for all course resources, animations and videos supporting a range of communication workshops, a surgical model service providing all the physical resources for a course, and a very popular instructor training programme.

Covid-19 presented a challenge, but the team used the time to support simulation training for DHB Covid responses, developing Zoom instructor training materials, and enhancing the IT behind the programme. We benefited from a 'Covid' extension of funding from ACC and will complete our public hospital implementation phase by early next year.

With the end of the ACC contract in February next year, we are working with ACC, HQSC and DHBs to ensure ongoing course delivery, and are also exploring options in private hospitals, new clinical areas, and the international market.

NetworkZ benefits

Our comprehensive evaluation strategy[1] starts with patient outcomes – hundreds of thousands of patient data points recorded in New Zealand's National Minimum Data Set, using a relatively new and exciting holistic measure called Days Alive and Out of Hospital (DAOH) at 90 days, which is exactly that. With our staged roll out we can apply a stepped wedge cluster design to look for improvements in DAOH as DHBs cross from the 'control' to the 'intervention' group. We are eagerly awaiting D-day to press the button on this analysis, in late 2022. Ongoing measures include pre-post theatre observations and teamwork performance surveys, both of which are showing positive trends in our interim analysis.

We've published two qualitative studies on implementation[2] and sustainability[3] of NetworkZ, and a study exploring the types of latent safety threats identified through NetworkZ courses[4].

We've published studies on the pilot[2], implementation[3] and sustainability[4] of NetworkZ, and on the latent safety threats identified through NetworkZ courses[5]. Of note, many participants reported on the benefits to communication, teamwork and staff relationships, with improvements in nurses' willingness to speak up, greater buy-in for briefings and better knowledge and understanding of other members of the team, including their roles and priorities.

NetworkZ provides a real opportunity to identify and rectify threats to patient safety before they cause real harm to patients.

In summary, NetworkZ is a unique, world-class training programme, an opportunity for real interprofessional team training, a chance to test systems and to build resilience in healthcare teams and hospital systems. We welcome enquiries about new or existing courses and instructor training; visit our website at www.networkz.ac.nz.

References

[1] JM Weller, JA Long, P Beaver, P., ...AF Merry. Evaluation of the effect of multidisciplinary simulation-based team training on patients, staff and organisations: protocol for a stepped-wedge cluster-mixed methods study of a national, insurer-funded initiative for surgical teams in New Zealand public hospitals. *BMJ Open, 2020.* 10(2), e032997.

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webAIRS NEWS

A Bowtie analysis of medical device and equipment incidents

webAIRS
Anaesthetic Incident Reporting System from ANZTADC

A Bowtie Analysis has been performed on incident reports involving Medical Devices and Equipment among the first 8000 incidents reported to webAIRS. This main category of incidents accounted for 959 (12%) of the first 8000 reports in an initial interim analysis.

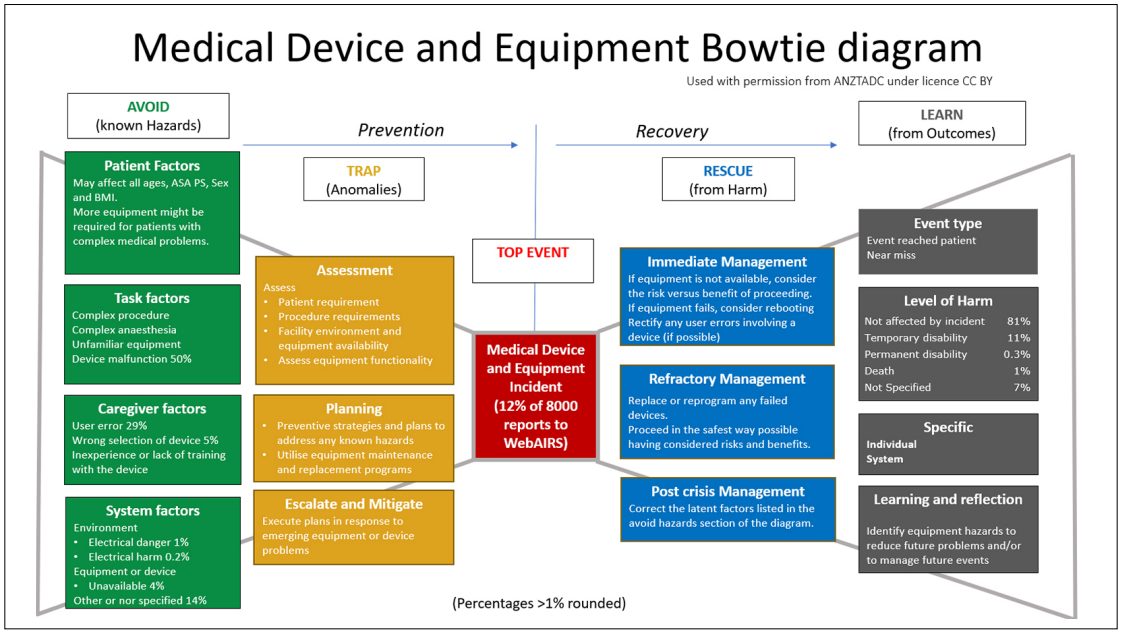

Figure 1. Bowtie diagram for anaesthetic incidents involving a Medical Device or Equipment.

The left side of a bowtie diagram is designed to prevent a critical incident, which is known as a Top Event. This process involves identifying hazards, which might lead to the critical incident category that is being analysed and methods to trap these hazards. The right side of the diagram deals with recovery from the event, which involves management methods to rescue from harm, and the final stage is to learn from the outcomes. The shape resembles a bowtie hence the name for the diagram.

Figure 1 shows an overview of the risk factors anticipated and methods to trap these potential hazards, summarised in a qualitative bowtie diagram. It is also possible to have quantitative diagrams with a single pathway from the Hazards to the Top Event, but these are more difficult to construct in complex situations, such as anaesthesia. Using the diagram above as an overview, it is possible to expand each section with more detail. The detail can be as complex as required. There are five columns in this version of the diagram under the five headings Avoid Hazards, Trap Anomalies, Rescue from Harm, and Learning from Outcomes. Extra information for each of the boxes in the diagram can be expanded into paragraphs with more detail for each of the columns.

Avoid Hazards

Hazards are split into four categories as shown in the green boxes. The results of the interim hazard analysis are shown below with the percentages rounded to one decimal place where the percentage is greater than 1%.

Patient Factors

- This type of incident might affect patients of all ages, ASA PS, Sex and BMI.
- Complex medical history or status

Task Factors

- Device malfunction in 50% of the 959 reports in this main category.
- Cognitive overload or distraction with complex procedures or patient

Caregiver Factors

- User error 29%
- Wrong selection of device 5%

System Factors

- Environment
- Electrical danger 1%
- Electrical harm in two reports 0.2%
- Equipment or device
- Unavailable 4%

Other

- Other or not specified 14%

(Note: it is possible to have more than one subcategory of incident per report so the total of the percentages of the incident subcategories above is 103.2% rather than 100%)

Trap Anomalies

Setting up barriers to prevent incidents involving Medical Devices and Equipment needs to address several sets of potential hazards. The first is incidents due to the device itself, whereby the device might fail or malfunction. The second issue is the use of the device where an error might occur due to unfamiliarity, distraction, or the use of the wrong device for the task. Another problem might be the lack of suitable equipment. There are also several other potential hazards that might occur due to user and equipment interaction. In some cases, the reporter had programmed a syringe pump incorrectly or placed the wrong syringe in the syringe pump. An example of the latter would be to load the propofol syringe in the remifentanil pump and vice versa.

Using the Bowtie diagram as a template, the box labelled "Assessment" will involve patient and task assessment. This should include a check of the equipment before use. For example, checking the laryngoscope light before induction, or the view on a video laryngoscope or flexible bronchoscope, or checking an ultrasound machine and battery before use. In the planning phase, the equipment requirements would be decided based upon patient and task requirements (Plan A). If any equipment required is not available, a decision on whether it is still safe to proceed would be required. Contingency planning (Plans B, C and D) would need to be considered for dealing with equipment problems should they arise.

In the section "Escalate" the actions might involve changing to plans B, C or D in response to emerging problems. Mitigate would be the immediate actions taken just prior to an imminent incident.

Rescue from Harm

Management will depend on the stage at which the Top Event occurs. If the procedure has not begun, a risk versus benefit decision is still possible. It might be possible to locate alternative equipment if a device fails and it should be possible to correct human error associated with the device. If a procedure is already in progress, then strategies may involve the use of alternative equipment or strategies. For instance, if a TIVA pump fails then a change to inhalational technique might be possible until the pump can be reprogrammed, or an alternative pump is deployed. Alternatively, frequent boluses could be used during the period when infusion was not possible.

In cases of electrical danger, the staff and patient should be removed from the area as soon as possible, and when safe to do so based on other risk factors.

Learning from Outcomes

The immediate and final outcomes are shown in the tables over. Although, there is a potential for serious harm or death with failure of a medical device, in most cases harm was mitigated. The immediate outcome was minor or no effects in 87% of the case reports. There was a minority of cases where the procedure was cancelled (0.6%) or prolonged length of stay (1.5%). The levels of harm noted in the final outcomes were also low, with 11% having temporary harm and 0.3% permanent harm. Fortunately, there were no immediate effects recorded in 57.8% of cases. There were 5 deaths (0.5%) in the immediate outcome and 10 deaths (1%) in the final outcome.

Immediate Outcomes	Percent
No effects	57.8%
Minor Effects	29.4%
Case Cancelled	0.6%
Prolonged length of Stay	1.5%
Unplanned ICU/HDU Admission	2.8%
Death	0.5%
Not Specified	6.7%

(It is possible to have more than one immediate outcome per report. Therefore, the total percentage has not been calculated)

Final Outcomes	Percent
Not affected by incident	81%
Temporary disability	11%
Permanent disability	0.3%
Death	1%
Not Specified	7%
Total	100%

(Percentages >1% rounded)

Previous analysis of anaesthetic incident reports in Australia and the UK identified problems with medical devices and equipment during anaesthesia[1,2]. Webb et al identified equipment failure in 9% of the first 2000 reports to AIMS[1]. The equipment included anaesthetic equipment, monitors, gas supply, electrical supply, and other theatre equipment. Fifty five percent of these errors were potentially life threatening but fortunately most of the incidents were detected and corrected before serious harm occurred. In the webAIRS series, medical devices and equipment were involved in 12% of the incidents reported, but harm only occurred in just over 11% of these cases, and death unfortunately in 1% of these cases. No harm was reported in 81% of the cases, and in 7% the outcome was not known or not specified. The degree to which equipment contributed to cases where harm occurred has not been completed at this stage of the analysis. In the UK study by Cassidy et al[2] 1029 reports were identified relating to equipment failure. The most frequent problem was monitoring failure (39.8%) and many of these incidents related to screen failure during anaesthesia. Problems relating to ventilators were noted in 17.9% of the reports. In this study, 89% were associated with no patient harm and only 2.9% were associated with moderate to severe harm, similar to outcomes reported to WebAIRS.

A full analysis of WebAIRS reports relating to failure of medical devices and equipment is underway to determine the relationships between the outcomes and risk factors in the Hazards section of the Bowtie. This will allow a more detailed description of the analysis of each item in the Hazards section and more detailed diagrams depicting each topic.

ANZTADC Case Report Writing Group

ANZTADC thanks all webAIRS users for their contributions to the webAIRS database www.anztadc.net

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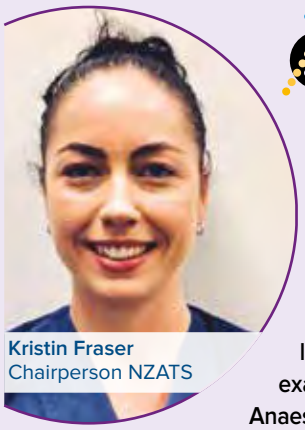
NZATS COLUMN



Kristin Fraser
Chairperson NZATS

New Zealand
Anaesthetic Technicians' Society

Tēnā koutou katoa,

It's been a productive first half of the year. As well as the regular society business, NZATS has held two education days and a CORE advanced day (all rescheduled from last year); the March registration examination; and we celebrated National Anaesthetic Technician Day, which is held every year on the second Tuesday in March.

NZATS has been at the table for two key meetings regarding the program transition to the degree. The first meeting was the AUT inaugural Anaesthetic Technicians Advisory Committee, held at the AUT South Campus where the program is to be based. It is a well-laid out campus with plenty of parking, a rarity in Auckland! It also boasts an impressive simulation suite to provide safe and effective education to our future degree graduates. Whilst the proposed degree is still subject to formal processes, AUT has an open day "AUT Live" scheduled for Saturday 28 August where they intend to showcase the new degree to potential students.

The second meeting was with the Ministry of Health and other key stakeholders, in theory ensuring that there will be no barriers with the transition. NZATS voiced concern that the program will not contain enough clinical hours to meet ANZCA PS08 "Statement on the Assistant to the Anaesthetist," which states the education requirements should include at least 12 months full-time equivalent clinical experience. Any health degree program typically includes 900-1100 hours of clinical placement within the program, meaning a likely deficit of approximately ~740 hours. NZATS will continue to advocate for the profession's safety and production of workforce-ready graduates. Follow-up meetings to both the Advisory Committee and the MOH are scheduled for the next couple of months.

We have three positions on the executive that are currently vacant: Incoming Chairperson, Communications Officer and Registration Examination Coordinator. The NZATS Chairperson term comprises one year incoming, one year as chair, and one year as outgoing. I commenced my incoming year November 2017 and at the 2020 AGM in the Bay of Islands I announced that I would be stepping down from my position as Chairperson at the 2021 AGM to be held in Christchurch. If you know of someone who may be interested in joining the NZATS Executive, please shoulder tap them and ask them to contact nzatschair@gmail.com.

NZATS will cease to exist without volunteers taking up positions on the Executive. This would be a huge loss for the profession, especially in the current climate where advocacy is so important.

Heoi anō tāku mō nāianei,
Kirstin Fraser
NZATS Chairperson, NZATS Acting Communications Officer

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