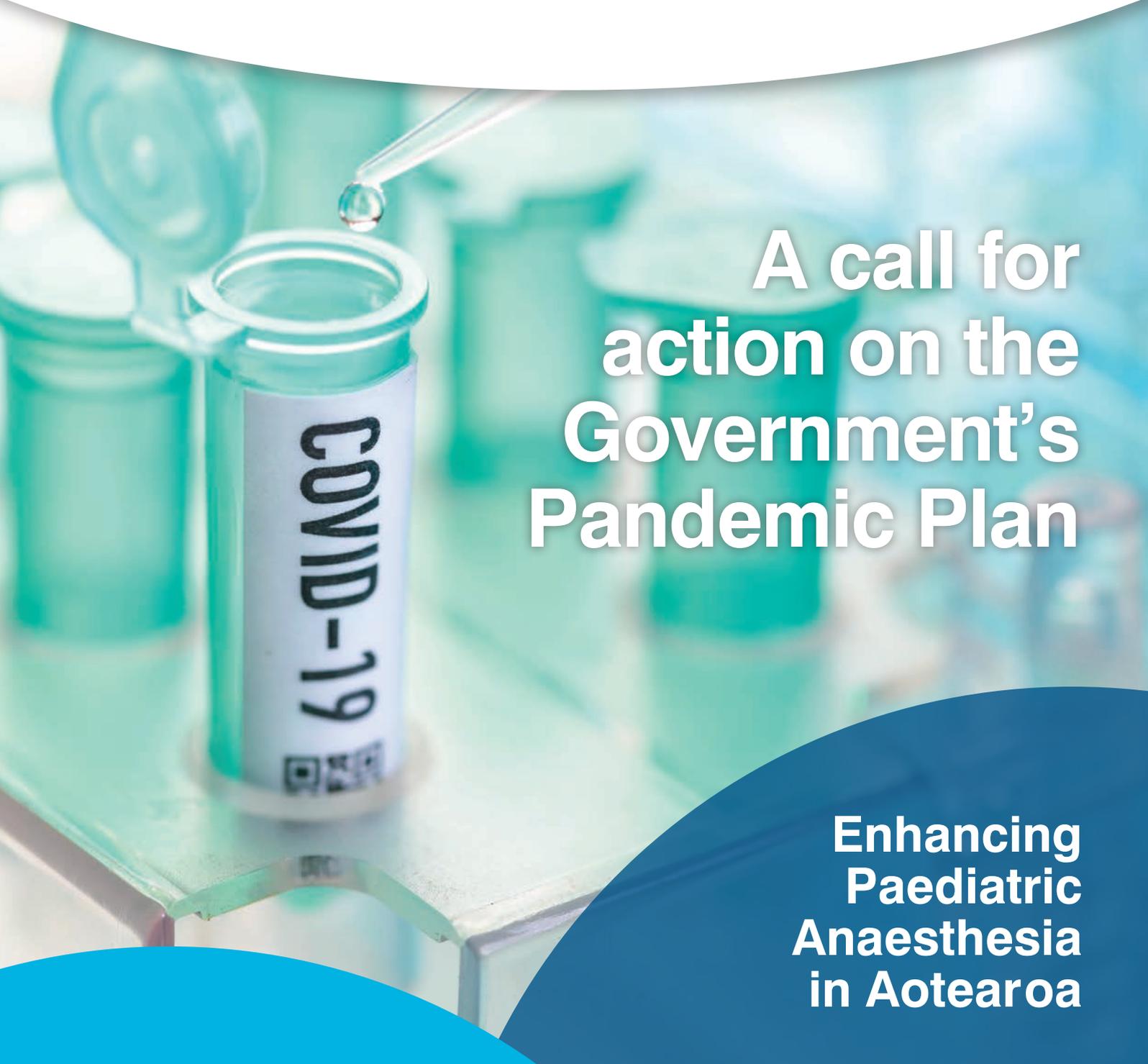


NEW ZEALAND Anaesthesia

THE MAGAZINE OF THE NEW ZEALAND SOCIETY OF ANAESTHETISTS • SEPTEMBER 2020



A call for action on the Government's Pandemic Plan

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NZSA Global Health Committee
Procurement: it is a big deal





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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, Daphne Atkinson: comms@anaesthesia.nz

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President's column

SEPTEMBER 2020

Kia ora koutou katoa,
This is my final column
as President of the New
Zealand Society of Anaesthetists
and gives me an opportunity to
take a pause and reflect on the
last 24 months.

We certainly find ourselves in a very different world to the one we inhabited two years ago. The contrast between the priorities we had in 2019 and 2020 are stark. In late 2018, when I asked the then President, Dr David Kibblewhite, what his focus had been for his three-year term, he replied 'survival.' I now know what he means, although I did not expect this presidential term to coincide with such a literal threat to our survival. Sars-Cov-2 has shaken the foundations of our globalised world and shown us that we need to change the way we do things to ensure human survival; the status quo is no longer an option and we know there needs to be a 'new normal.'

Advocacy

How can the NZSA contribute to this new normal? We can continue to fulfil our core roles to Advocate, Connect and Educate. Over the last two years we have strengthened our relationships with stakeholders such as ACC, the NZ Private Surgical Hospitals Association and we are looking forward to communicating our advocacy work to the Minister of Health after the election. We have engaged with the government agency TAS, which is spearheading a project to bridge shortages of Anaesthesia Assistants and to bolster training places and ensure consistent training standards and competencies are met.

We assisted the Ministry of Health through the initial phase of the COVID-19 response and liaised with top health officials over the frighteningly uncoordinated procurement and distribution of Personal Protective Equipment (PPE). NZSA Executive Committee member Dr Morgan Edwards produced an infographic 'COVID; don't take it home' which received media coverage and continues to be displayed throughout health workplaces. We have been in close contact with Pharmac regarding supply issues of core anaesthesia drugs and we will continue to engage with them to provide input on their medical devices project into the future.

*We can continue
to fulfil our core
roles to Advocate,
Connect and
Educate.*

Community

The NZSA supported Networks have grown and gone from strength-to-strength; connecting specialists from all the over country and giving them a forum to rapidly disseminate and discuss ideas, protocols, guidelines, and evidence-based medicine. We started my term with PANNZ (paediatrics), NOA (obstetrics shared with ANZCA), Airway Leads, Private Practice and the NZSA Global Health Committee (formerly NZSA Overseas Aid Subcommittee) and to these we have supported the formation and running of the Environment & Sustainability, and Inpatient Pain Networks. We continue to contribute to the ANZCA supported NZ networks of Peri-operative Medicine, and Welfare.

These Networks are essentially forums which allow New Zealand anaesthetists to rapidly share information and debate current issues. For example, how to respond to Medsafe's decision to restrict tramadol use in children under 12, what level of PPE we should be wearing in droplet or airborne precautions for labouring women, and what recycling and waste disposal mechanisms are in place across the country's operating rooms. Connecting newly qualified and more experienced anaesthetists creates the opportunity for the retention of institutional knowledge about what has been tried, what has failed and what has succeeded previously, and sharing information across the country means less reinvention of the wheel with new initiatives such as recycling.

Our connections to our global anaesthesia community have also expanded and strengthened. We have continued to build collegial, enduring connections with our Common Issues Group members, hearing first-hand the stories out of Australia, the UK, US, South Africa and Canada about the effects of rampant COVID-19 infections on their health workforce and health system. We have a longstanding relationship with the World Federation of Societies of Anaesthesiologists (WFSA). The WFSA's World Congress of Anaesthesiology, which would have been taking place about now in Prague, has been postponed to September 2021; however the election of WFSA Board and committee members has not been postponed; we successfully supported both Dr Sue Nicoll and Dr Indu Kapoor in their roles on the WFSA Welfare and Paediatric committees respectively, and we are supporting and lobbying for Dr Wayne Morriss' nomination as WFSA President in the coming month.

Education

While our educational offerings were curtailed by COVID this year, we are looking forward to connecting and providing educational opportunities at our 2020 NZSA Conference Emerge, Reflect and Reconnect (15-17 October). Depending on the status of COVID-19 at this time in New Zealand, our organising committee has developed a programme that can be delivered either face-to-face or as a fully virtual option; kudos to the committee for their hard (and speedy work) which has enabled us to offer members some home-grown opportunities for anaesthesia continuing education in 2020. We are excited to be hearing from the Director-General of Health Dr Ashley Bloomfield as well as Dr Kiri Mackersey, one of my medical school classmates who is an Anaesthesiologist in New York City and who worked through the peak of their COVID crisis earlier this year.

***We are now
better prepared,
and may we
not forget the
lessons we have
learnt in 2020.***

Despite the challenge of COVID and varying lockdown restrictions, the NZSA has continued to work with the National Committee of ANZCA through the Aotearoa New Zealand Anaesthesia Education Committee (ANZAEC) to offer educational opportunities throughout New Zealand with the annual Visiting Lectureships; it might be we need to move from an in-person option to a virtual format. Who knew we would all become so zoom proficient so swiftly! While so much of 2020 has been postponed, cancelled or written off, and it can be hard to find the positives among the missed opportunities, the ANZAEC did succeed in helping Dr Mike Webb return to his native Canada with his BWT Ritchie Fellowship in the middle of this year.

On a personal note, COVID has afforded me a wealth of education: learning about P2 respirators, airborne infection, how difficult it is to work in PPE and how to bake sour dough. I have learnt the importance of physical distancing, how masks prevent droplet spread and how poor ventilation can massively increase the risk of airborne transmission of Sars-CoV-2. I know that eliminating COVID in New Zealand is the right and best thing to do; as the first step of hazard mitigation is obviously eliminate the hazard (the second step being replacement; not quite possible here!). PPE is way down the bottom as the last line of individual defence.

I continue to learn 'new normals' like mask wearing in public, and how we cannot effectively physically distance at work – not in our theatres, not in our corridors, not in our offices or in our tea rooms. The recent outbreak with high numbers of healthcare workers infected in Melbourne demonstrates that our hospital and aged care facilities and systems are virtually stacked against us for airborne transmission. We did not appear to use the months between lockdowns' V.1 and V.2 to practise the behaviours that would prevent an outbreak as occurred in Melbourne. We were leaders in getting our departments fit tested, but we were not routinely masking up in Auckland for example. I do not wear a

seat belt only when I need it, and that is how we see handwashing; it should also be how we view mask wearing. We are used to leading teams, and it sends powerful messages to others when they see leadership role models practising these protective new behaviours.

On the topic of survival, another aspect of this is obviously financial survival and sustainability; we were deeply concerned about the impact of private hospital closure on our private practice only members and I was very impressed with how responsively and responsibly the private hospitals and their staff were prepared to facilitate the public sector, should we have had a full-blown COVID crisis of our own. Thankfully, this was not needed, and we have been able to return to private work during levels 2 and 3.

Over the next six weeks or so, I am looking forward to continuing the revision of our Relative Value Guide, participating in my final few zoom conferences with the Common Issues Group, and the Australian Society of Anaesthetist's Council.

Thank you

I would like to thank all of you for your hard work this year. In 2019, I watched in awe as my colleagues around the country responded to the atrocity of 15 March and then Whakaari, White Island in December. I thought 2020 would be an easier year; instead we were confronted with a threat that was felt by every person in New Zealand, but none more keenly or acutely than those of us who routinely perform 'Aerosol Generating Procedures.' The terrifying thought of taking COVID home; to our children, spouses, partners and parents drove us to quickly become experts in 'donning and doffing' – a heartfelt thank you to everyone who developed protocols, simulations, guidelines and promulgated the latest scientific research with unprecedented rapidity. We are now better prepared, and may we not forget the lessons we have learnt in 2020.

I hope to see many of you in Wellington in mid-October; it will truly be a time to celebrate if the stars align and allow us to attend in person.

Nga mihi nui,



***Dr Kathryn Hagen,
NZSA President***

COVID-19 – A call for action on the Government’s Pandemic Plan

Dr Sheila Hart, NZSA Airway Leads Network member and NZSA Incoming President reflects on the impact of COVID-19 on New Zealand’s healthcare system and urges a range of measures to maintain ongoing preparedness.

It seems like a lifetime ago that we were sitting in our local bar enjoying after work drinks. It was Friday 6 March when we heard that Counties Manukau and Auckland DHBs had banned all non-essential travel due to the impact of COVID. Capital and Coast DHB, along with many others, soon followed suit. The following week we were working on COVID intubation and theatre flow plans. Anxiety was beginning to escalate. Within a week we were faced with our first suspected case needing to come to theatre. Over the next three weeks it was like the switch had been flicked; everything was COVID focused, BAU on the back burner, and we were all working super hard to make sure plans and processes were in place for the impending tsunami of cases. We had the benefit of seeing what was going on internationally to know what was potentially coming our way, and we were very worried.

When this article was first drafted we had yet to hear about the community cluster in Auckland, and it felt like we had returned to normal, although the pandemic plan, locally and nationally, was still in need of work. How can we keep that focus when everyone is so busy with the usual machinations of the hospitals we work in? The Auckland community cluster, although very disappointing, has tested the systems put in place and is an opportunity for further refinement and improvement.

The Auckland community cluster, although very disappointing, has tested the systems put in place

The Government’s National Influenza Pandemic Plan was updated in 2017, a beast of a document, clearly in place at high level, but the planning and preparedness phase of this plan was not apparent at DHB and community level. This clearly needs to be improved, with clearer plans and pathways in place that can be initiated in a timely fashion.

As a group, the National Airway Leads Network discussed what happened in various DHBs and, crucially, what we should be doing now to maintain our ongoing preparedness.

Personal Protective Equipment

Not surprisingly this is a huge topic that has caused a great deal of anxiety; the pandemic revealed some very poor practices and systemic deficiencies. There was confusing terminology



(standard, contact, droplet, airborne, full, enhanced, level 1-3 etc.), problems over access and limited information on stock and supply chains. In addition, there was conflict over rationalising the use of N95 masks and what constituted an ‘aerosol generating procedure.’ Variation in supply across and within DHBs was concerning and confusing to frontline staff, with some seen to have ‘better’ or higher level PPE (such as PAPR suits, goggles, or full body overalls) than others. In some DHBs, surgeons and anaesthetists purchased their own PPE, so that team members in the same theatre had unequal levels of protection, and there was little attention on doffing and cleaning processes, leaving users at high risk of contamination.

The Ministry of Health took control of PPE supply in the early phases of this pandemic, and recently released a report (1) with several recommendations on how national PPE supply should be managed. However, problems persist with information and transparency in relation to availability, quantity, and robustness of supply chains. Small companies offered to help, but their voices were lost amongst the larger voices in the supply chain. We need to pursue a solution on how we harness this kiwi ingenuity to our benefit, especially as global supply chains remain precarious.

Universal fit testing is a health and safety requirement, yet few, if any, DHBs seemed to conduct this routinely – as the pandemic progressed this appeared to happen to a variable extent. Mask fit testing should be an annual process, and each DHB should have a supply of alternative masks for those that do not fit the standard disposable in use, along with education and established cleaning processes for re-useable masks and goggles.

Airborne PPE seemed to provide safety against virus transmission for the clinician, but at the same time pose risk to the patient by impeding communication between team members, fogging visors making it difficult for clinicians to see clearly and causing staff fatigue due to being too hot. The restrictions on equipment and drugs in the operating room during COVID cases means all eventualities need to be thought of ahead of time, e.g. what if you need to reintubate? Or there is an anaphylaxis? The decreased personnel and inability to swiftly bring in help is a huge hindrance to delivering the level of care we are used to providing.

As we progress through the pandemic, most hospitals are finding they cannot source gowns, hats, gloves, and even surgical masks. How would we manage if we had a large community outbreak?

Medication shortages

Supplies of chlorhexidine, propofol, fentanyl and suxamethonium have run low (or run out) despite not being overwhelmed with COVID cases. How do we future proof supply? The shortages of propofol, for example, resulted in a return to predominantly volatile based anaesthesia, a step backwards in the fight against climate change, and a substandard technique for some procedures.

Facilities

Access to negative pressure rooms in theatres was variable and limited. Processes were implemented to overcome this where possible (positive airflow changed to neutral pressure, for example) but resources would have been quickly overwhelmed.

Equipment

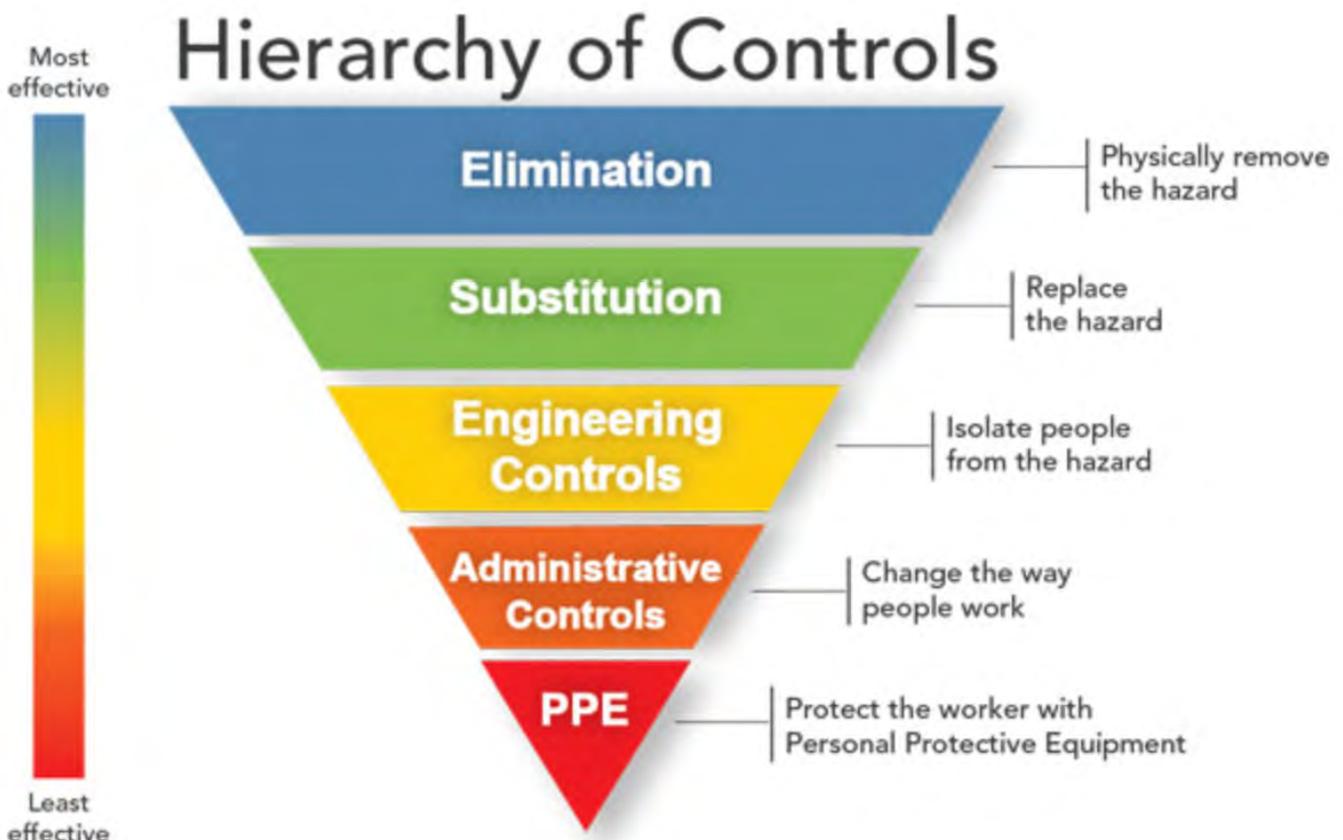
Additional videolaryngoscopes were purchased by many departments but some are still awaiting their arrival. International supply issues of the McGrath battery pack and disposable blades was a potential issue given the large numbers of departments using them as first line for COVID intubations, and we are now seeing this with the McGrath battery packs in short supply. Theft of equipment and supplies was a problem in almost every DHB. From scrubs, to alcohol hand-gel, gowns, and of course face masks. Entire stock rooms were cleaned out early in the piece, prior to such items being locked away.

Policy and guidelines

There was, and possibly remains, confusion as to when a patient should be treated as a suspected COVID case or not. When are there enough cases to determine reasonable community spread, and when should we move from treating the majority as normal versus assuming potentially infected? National agreement on this was found to be lacking. And then came

further confusion about high risk procedures in low risk patients. We found ourselves in a position of performing a procedure in Airborne PPE, with full face respirator or PAPR, but then the patient being sent out to recovery and managed normally.

There was, and possibly remains, confusion as to when a patient should be treated as a suspected COVID case or not.



This caused a huge amount of confusion for the staff involved. There were conflicting recommendations from various societies and colleges (e.g. ANZCA, Dental, Head and Neck) and guidelines and policies from internal DHB departments (e.g. infection control, perioperative unit, anaesthetic department, surgical subspecialties). Everyone was doing their best to rapidly appraise the huge volumes of information being disseminated daily, however the conflicting directions resulted in angst and consumption of energy. Now that things are relatively calmer, we can see how quickly the situation can escalate again (our current cluster, and the unfortunate experiences in Australia) and we should revisit these policies and recommendations to ensure they are robust, agreed to, and ready to be re-implemented promptly.

Testing in the early phases was not adequate, although with the latest cluster, testing capability and response seems greatly improved. This is essential to ensure correct PPE is utilised (and not wasted by being worn unnecessarily). ANZCA, the Royal Australasian College of Surgeons and other organisations have released a joint position statement on surgery post COVID (2), a useful reference as those with recent infection will undoubtedly present for surgery.

Training and education

Many commented on the usefulness of simulation-based training to practice donning and doffing, simulating a patient moving through theatre, and practicing the intubation drill for airway management in a COVID patient. This is time and personnel intensive. How do we maintain this preparedness? We will need to incorporate COVID drills into our annual training plan to ensure staff maintain familiarity and confidence. It is essential that airway knowledge and procedural skill is maintained in the face of new challenges in airway management that COVID presents.

Rostering

A variety of set-ups were used across New Zealand. Some DHBs had airway teams, COVID and non-COVID teams and anaesthesia staff to help with ICU staffing as patient numbers and preparedness increased. Vulnerable workers were re-deployed to non-clinical areas.

Wellbeing

How we look after our staff is a huge concern. After the initial period of stress and anxiety we are now faced with a low level of anxiety and concern, and difficulty connecting with family overseas. On top of this is the constant worry about when the next cases will arrive, whether we will be overwhelmed, and of course the disappointment with every step up in lock down levels and measures. Exacerbating the situation is the pressure to catch up on work missed during lock down, which will escalate with each period of reduced service provision.

Airway Leads

The role of the airway lead during all of this was variable. Some felt well utilised in forming policy and training; others did not.

There was good feedback from hospitals that had a functioning airway committee as a means of coordinating airway planning and training.

WhatsApp proved an effective way for the Airway Leads Network to share ideas, ask questions, and distil pertinent issues from the overwhelming volume of information that was being presented.

Key recommendations

1. Urgent need for national policy, planning and supply of essential resources
2. Standardisation of terminology around PPE
3. Standardisation of PPE supplied across DHBs
4. Annual fit test and provision of alternate respirators at every DHB
5. DHBs should align and strengthen the policies developed, have the conversations about the areas of conflict when anxiety was high, and look to resolve them so there is an agreed plan to implement each time it is needed.

Clearly PPE has been a focus for many, but it is important to remember that PPE is a last line of defence. There is a lot of work to be done to improve how we work as a means of reducing transmission – distancing, hand hygiene, working from home, regular surface cleaning, and patient flow. The best PPE will not be effective at reducing spread if we all catch the virus in the tearoom between cases!

Footnotes

1. *Ministry of Health: Management of personal protective equipment in response to COVID-19* <https://oag.parliament.nz/2020/ppe>
2. *Guidance on delays to elective surgery post recovery from SARS-COV 2 infection (5 August 2020)*

New NZSA Website

We were excited to launch our new website this month (www.anaesthesia.nz) with easy to find information, regular new content and visually appealing design. We worked closely with the Executive Committee and took on board member feedback on how to improve the site including having an easier, more streamlined login, joining and renewal process. The new design is also mobile friendly, and has a refined search function. While most of the site is accessible to everyone, we continue to have a members' only section which includes key member resources. As the site is quite different to our previous one we have developed a guidance document to help you navigate the site and to give some explanation for the changes we have made. This has been emailed out to members and can also be accessed on our site <https://anaesthesia.nz/membership/nzsa-website-guidance/>

We hope that you find the new website easy to use, and we welcome your feedback and suggestions. We will use your suggestions to make continuous improvements and to keep you connected to the work we do on your behalf. To provide feedback, or for assistance, contact Lynne Mulder-Wood, our Membership Manager membership@anaesthesia.nz.

Part 3 Course a great opportunity for senior trainees



Dr Michael Ng
NZSA Executive Trainee
Representative

During my time as an anaesthetic trainee, I was regularly focused on ticking off things to finally achieve this goal of becoming a consultant specialist. Tick. Get onto training scheme. Tick. Give a basic anaesthetic without killing the patient. Tick. Primary exam. Tick. Scholar role. Tick. Final exam. Tick. But what is all this for? Why have I sacrificed time away from friends and family, other life hobbies and pleasures, and those “heated discussions” with my partner on why I am doing more things for work?

Attending the Part 3 Course in Auckland last year was a great opportunity to help answer that. It was an opportunity to hear what life is like ‘on the other side’ of training. One of the highlights for me was hearing from anaesthetic consultants on life as a Senior Medical Officer (SMO), and hearing from those at the beginning

of their SMO career, as well as those who are more established. Learning about the other roles they have in a department was hugely valuable, along with how they balance work life and home life, and opportunities beyond anaesthesia.

The full-day Part 3 Course is held every second year and hosted by the NZSA. However, this year we have a unique opportunity for trainees to attend a “mini-Part 3 half-day workshop” in Wellington on Thursday 15 October. This is part of the NZ Anaesthesia Conference 2020 Emerge, Reflect and Reconnect; however, there are options for trainees to attend the “mini-Part 3 workshop” without attending the conference. It provides an opportunity for those who may have missed out on previous Part 3 events, or who are interested in attending the full event next year, to gain insight and ask questions on what life will be like as a consultant anaesthetist. Topics on CV, interviews and overseas fellowships will also be covered during the workshop.

This is a fantastic opportunity for advanced trainees and provisional fellows to get that final tick off their checklist, and find out what all the hard work during training was for.

Register now at www.nzanaesthesia2020.nz

NEW ZEALAND ANAESTHESIA 2020 **EMERGE REFLECT RECONNECT**

NZ PART 3 COURSE
15 OCTOBER 2020 WELLINGTON, TSB ARENA

HALF DAY COURSE FOR ADVANCED ANAESTHESIA TRAINEES:

- CV and interview skills workshop
- Interactive presentations on career opportunities and topical issues facing new consultants:
 - Rural anaesthesia
 - Private practice
 - NZSA and ANZCA roles
 - Work life balance
- Networking
- Meet the panel involved in recruitment and selection processes for fellows and SMOs
- Registration also includes complimentary attendance to the Trainee’s Function

Places are limited.
For further information visit:
nzanaesthesia2020.nz/programme

MINIMUM PRODUCT INFORMATION MAXIGESIC® IV paracetamol 1000 mg/ibuprofen (as sodium dihydrate) 300 mg in 100 mL solution for infusion. **THERAPEUTIC INDICATIONS:** Maxigesic® IV is indicated in adults for the relief of mild to moderate pain and the reduction of fever, where an intravenous route of administration is considered clinically necessary. **DOSE AND ADMINISTRATION:** **Dose:** Administer one vial (100 mL) Maxigesic® IV as a 15-minute infusion every 6 hours, as necessary. Do not exceed a total daily dose of 4000 mg (4 g) paracetamol. **Special populations** *Paediatric population:* The safety and efficacy of Maxigesic® IV in children aged under 18 years have not been established. *Elderly:* Dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy. Elderly patients are at increased risk for serious GI adverse events. **Method of administration:** Maxigesic® IV should be administered as a 15-minute intravenous infusion. Maxigesic® IV should be used in one patient on one occasion only. It contains no antimicrobial preservative. Unused solution should be discarded. To facilitate administration, the label attached to the vials of Maxigesic® IV allow for hanging. **CONTRAINDICATIONS** Maxigesic® IV is contraindicated in patients with hypersensitivity to the active substances or to any of the excipients listed in the approved Product Information; in patients with active alcoholism, as chronic excessive alcohol ingestion may predispose patients to paracetamol hepatotoxicity; in patients who have experienced asthma, urticaria, or allergic-type reactions after taking aspirin or other NSAID; for the treatment of peri-operative pain in the setting of coronary artery bypass graft (CABG) surgery; in patients with impaired kidney function, impaired liver function, heart problems or heart failure; in patients with active gastrointestinal bleeding, peptic ulceration or other stomach disorders; in patients with spinal cord injuries; during pregnancy or in patients planning to become pregnant; during breastfeeding. It is recommended to use a suitable analgesic oral treatment as soon as this administration route is possible. In order to avoid the risk of overdose, check that other medicines administered do not contain paracetamol. Doses higher than the recommended entail a risk of very serious liver damage. **SPECIAL WARNINGS AND PRECAUTIONS FOR USE:** Maxigesic® IV should be used with caution in cases of Glucose 6 Phosphate Dehydrogenase (G6PD) deficiency (may lead to haemolytic anaemia); anorexia, bulimia or cachexia; chronic malnutrition (low reserves of hepatic glutathione); dehydration, hypovolemia. **Maximum daily dose:** The total dose of paracetamol should not exceed 4 g per day. It is important to consider the contribution of all paracetamol-containing medications. If the daily dose of paracetamol from all sources exceeds the maximum, severe hepatic injury may occur. **Duration of dosage:** Use the lowest effective dose for the shortest duration consistent with individual patient treatment goals. Use of the recommended maximum dose of Maxigesic® IV of 100 mL every 6 hours has only been studied for a period of up to 2 days. **Hepatic injury:** Patients with hepatic insufficiency, chronic alcoholism, chronic malnutrition or dehydration may be at a higher risk of liver damage following administration of Maxigesic® IV. **Cardiovascular thrombotic events:** All NSAIDs have been associated with an increased risk of cardiovascular and thrombotic adverse events when taken long term. Patients with known CV disease or risk factors for CV disease may be at greater risk. There is no consistent evidence that concurrent use of aspirin mitigates the increased risk of serious CV thrombotic events associated with NSAID use. The concurrent use of aspirin and a NSAID does increase the risk of serious gastrointestinal (GI) events. **Hypertension:** NSAIDs can lead to onset of new hypertension or worsening of pre-existing hypertension, either of which may contribute to the increased incidence of CV events. Use NSAIDs with caution in patients with hypertension. **Congestive heart failure and oedema:** Fluid retention and oedema have been observed in some patients taking NSAIDs. **Gastrointestinal effects: risk of ulceration, bleeding, and perforation:** Serious GI toxicity such as bleeding, ulceration, and perforation of the stomach, small intestine or large intestine, can occur at any time, with or without warning symptoms, in patients treated with NSAIDs. Minor upper GI problems, such as dyspepsia, are common and may also occur at any time during NSAID therapy. Therefore, physicians and patients should remain alert for ulceration and bleeding, even in the absence of previous GI tract symptoms. Studies have shown that patients with a prior history of peptic ulcer disease and/or GI bleeding and who use NSAIDs, have a greater than 10-fold higher risk for developing a GI bleed than patients with neither of these risk factors. Pharmacoepidemiological studies have identified several other co-therapies or co-morbid conditions that may increase the risk for GI bleeding such as: treatment with corticosteroids, treatment with anticoagulants, longer duration of NSAID therapy, smoking, alcoholism, older age, and poor general health status. Most reports of spontaneous fatal GI events are in elderly or debilitated patients. To minimise the potential risk for an adverse GI event in patients treated with a NSAID, use the lowest effective dose for the shortest possible duration. **Serious skin reactions:** NSAIDs can cause serious skin adverse reactions such as exfoliative dermatitis, Stevens-Johnson Syndrome (SJS), and toxic epidermal necrolysis (TEN), which can be fatal. These serious events may occur without warning. **Pre-existing asthma:** Maxigesic® IV is contraindicated in patients with aspirin-sensitive asthma and should be used with caution in all patients with pre-existing asthma. **Ophthalmological effects:** Blurred or diminished vision, scotomata, and changes in colour vision have been reported with oral ibuprofen. **Hepatic effects:** Borderline elevations of one or more liver tests may occur in some patients taking NSAIDs. These laboratory abnormalities may progress, may remain unchanged, or may be transient with continuing therapy. Notable elevations of ALT or AST (approximately three or more times the upper limit of normal) have been reported in small numbers of patients in clinical trials with NSAIDs. In addition, rare cases of severe hepatic reactions have been reported, including jaundice, fulminant hepatitis, liver necrosis and hepatic failure, some with fatal outcomes. **Renal effects:** Long-term administration of NSAIDs has resulted in renal papillary necrosis and other renal injury. Patients at greatest risk of this reaction are those with impaired renal function, heart failure, liver dysfunction, those taking diuretics, ACE inhibitors, or angiotensin receptor antagonists, and the elderly. Caution is also recommended in patients with pre-existing renal disease; Maxigesic® IV has not been studied in patients with advanced renal disease. **Aseptic meningitis:** Aseptic meningitis with fever and coma has been observed in patients on oral ibuprofen therapy. Although it is probably more likely to occur in patients with systemic lupus erythematosus and related

connective tissue diseases, it has been reported in patients who do not have underlying chronic disease. **Haematological effects:** Anaemia may occur in patients receiving NSAIDs. This may be due to fluid retention, occult or gross GI blood loss, or an incompletely described effect on erythropoiesis. NSAIDs inhibit platelet aggregation and have been shown to prolong bleeding time in some patients. **Masking inflammation and fever:** The pharmacological activity of ibuprofen in reducing fever and inflammation may diminish the utility of these diagnostic signs in detecting complications of presumed non-infectious, painful conditions. **Anaphylactoid reactions:** As with other NSAIDs, anaphylactoid reactions may occur in patients without known prior exposure to ibuprofen. Maxigesic® IV is contraindicated in patients with the aspirin triad. **Patients receiving spinal or epidural analgesia:** As potential bleeding around the spinal cord has serious consequences, caution should be exercised when treating patients undergoing spinal and epidural analgesia. **Special precautions:** In order to avoid exacerbation of disease or adrenal insufficiency, patients who have been on prolonged corticosteroid therapy should have their therapy tapered slowly rather than discontinued abruptly when products containing ibuprofen are added to the treatment program. **In-house compounded solutions:** Maxigesic® IV has been specifically formulated to provide a stable solution of paracetamol and ibuprofen. Commercially available formulations of each active ingredient alone should not be mixed together in order to produce a substitute for Maxigesic® IV, as precipitation may occur. **Effects on laboratory tests:** Using current analytical systems, paracetamol does not cause interference with laboratory assays. Paracetamol in therapeutic doses may interfere with the determination of 5-hydroxyindoleacetic acid (SHIAA), causing false-positive results. **Use in pregnancy:** There are no adequate, well-controlled studies in pregnant women. As there is insufficient information on the use of Maxigesic® IV during pregnancy, its use during pregnancy or in patients planning to become pregnant is contraindicated. **Use in lactation:** It is not known whether ibuprofen and/or its metabolites are excreted in human milk. Because many drugs are excreted in milk and because of the potential for serious adverse reactions in nursing infants from IV ibuprofen, Maxigesic® IV is contraindicated for use in nursing mothers. **INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTION:** **Aminoglycosides:** NSAIDs may decrease the excretion of aminoglycosides. **Anticoagulants:** e.g. warfarin - users of both warfarin and NSAIDs together have a higher risk of serious GI bleeding than users of either drug alone. **Antidiabetic medicines:** interact with ibuprofen. **Aspirin:** reduces ibuprofen's protein binding, although the clearance of free ibuprofen is not altered. The clinical significance of this interaction is not known; but concomitant administration of NSAIDs and aspirin is not generally recommended. **Busulfan:** concomitant use with paracetamol may result in reduced busulfan clearance. **Cardiac glycosides:** NSAIDs may exacerbate cardiac failure, reduce glomerular filtration rate and increase plasma cardiac glycoside levels. **Chloramphenicol:** paracetamol may increase chloramphenicol plasma concentrations. **Combination use of ACE inhibitors or angiotensin receptor antagonists, anti-inflammatory drugs and thiazide diuretics:** NSAIDs may diminish the antihypertensive effect of ACE inhibitors and beta-blockers, with possible loss of blood pressure control. The combined use of the three classes of drugs all at the same time increases the risk of renal impairment. **Corticosteroids:** increased risk of gastrointestinal bleeding. **Cyclosporine or Tacrolimus:** increased risk of nephrotoxicity when used with NSAIDs. **Diflunisal:** increases paracetamol plasma concentrations and this may increase hepatotoxicity. **Diuretics:** ibuprofen can reduce the natriuretic effects of furosemide and thiazides in some patients. During concomitant therapy with NSAIDs, observe patients closely for signs of renal failure, as well as to assure diuretic efficacy. **Enzyme-inducing agents (such as barbiturates, isoniazid, anticoagulants, zidovudine, amoxicillin + clavulanic acid, carbamazepine and ethanol):** induction of metabolism of paracetamol from enzyme inducers may result in an increased level of hepatotoxic metabolites. **Herbal extracts:** Ginkgo biloba may potentiate the risk of bleeding with NSAIDs. **Lithium:** NSAIDs have produced elevations of plasma lithium levels and a reduction in renal lithium clearance. **Methotrexate:** NSAIDs may enhance the toxicity of methotrexate. **Mifepristone:** NSAIDs should not be used for 8-12 days after mifepristone administration as NSAIDs can reduce the effect of mifepristone. **Phenytoin:** may result in decreased paracetamol effectiveness and an increased risk of hepatotoxicity. Phenytoin may also interact with ibuprofen. **Probenecid:** causes an almost 2-fold reduction in clearance of paracetamol by inhibiting its conjugation with glucuronic acid. Probenecid may also interact with ibuprofen. **Quinolone antibiotics:** NSAIDs can increase the risk of convulsions associated with quinolone antibiotics. **Zidovudine:** increased risk of haematological toxicity when NSAIDs are given with zidovudine. There is evidence of an increased risk of haemarthroses and haematoma in HIV (+) haemophiliacs receiving concurrent treatment with zidovudine and ibuprofen. **ADVERSE EFFECTS (UNDESIRABLE EFFECTS):** Clinical trials with Maxigesic® IV have not indicated any undesirable effects other than those for paracetamol alone or ibuprofen alone. In a phase III study in 276 patients undergoing bunionelectomy surgery, the most common treatment emergent adverse events (TEAEs) were gastrointestinal disorders (38.8%), followed by nervous system disorders (28.6%). TEAEs observed in ≥5% of any treatment group (Maxigesic® IV, paracetamol, ibuprofen, or placebo) were nausea, vomiting, dizziness, infusion site pain, pruritus, somnolence, constipation, headache, hyperhidrosis, infusion site extravasation, decreased appetite, muscle spasms, hot flush. TEAEs are consistent with the postoperative setting and the use of paracetamol or ibuprofen for analgesia. The incidence of TEAEs was comparable between the Maxigesic® IV, ibuprofen, paracetamol and placebo groups, with the exception of vomiting which was significant for the comparison between Maxigesic® IV and ibuprofen or placebo (but not paracetamol), suggesting that the vomiting reported by patients in the Maxigesic® IV group is attributable to the paracetamol component of the combination, rather than an effect unique to the combination. **SPECIAL PRECAUTIONS FOR STORAGE:** Store below 25°C. Do not refrigerate or freeze. Protect from light. **NATURE AND CONTENTS OF CONTAINER:** Maxigesic® IV is supplied in 100 mL clear glass vials, closed with a grey rubber stopper and an aluminium flip-off cap, in a pack size of 10 vials. **MEDICINE SCHEDULE:** Prescription Medicine (Schedule 4). **SPONSOR:** AFT Pharmaceuticals Ltd, Level 1, AC Nielsen House, 129 Hurstmere Rd, Takapuna, Auckland 0622. Phone: 0800 423 823. **PATENT NUMBERS:** 552181/609727/604009. **DATE MATERIAL PREPARED:** July 2020.

MAXIGESIC® IV

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Maxigesic® IV provides approximately **DOUBLE** the pain relief than that provided by paracetamol IV or ibuprofen IV alone*¹.



Maxigesic® IV provided **significantly greater pain relief** than paracetamol IV and ibuprofen IV over a 48 hour period**¹.



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*Based on time-adjusted SPID[®], calculated from VAS pain intensity scores recorded up until the time of consumption of the first dose of rescue¹. **According to VAS pain intensity, Pain Intensity Differences and Pain Relief scores at the majority of scheduled time points over a 48 hour period. Dosed as one vial every 6 hours over 48 hour period¹. ***Based on the total oral Morphine Milligram Equivalent (MME) dose of all rescue medication over the full 48 hour study period¹.

Reference: 1. Daniels, S.E., Playne, R., Stanescu, I., Zhang, J., Gottlieb, I.J., Atkinson, H.C. (2019). Efficacy and safety of an intravenous acetaminophen/ibuprofen fixed-dose combination after bunionectomy: A randomized, double-blind, factorial, placebo-controlled trial. *Clinical Therapeutics* 41 (10): 1952-1965. Research sponsored by AFT Pharmaceuticals.

AFT Pharmaceuticals Ltd, Auckland. TAPS PP6110

Environmental Q & A Procurement: it is a big deal

While procurement is extremely resistant to change, with multiple barriers to overcome, the environmental and economic benefits of doing it better are significant write Drs Rob Burrell and Sallie Malpas of the NZSA's Environmental and Sustainability Network. Anaesthetists are ideally placed to take a leadership role in procurement decisions to maximise the value for New Zealanders.

What is procurement?

Procurement is the process by which your hospital decides to buy something and makes that purchase. It is the stuff you may or may not choose, the stuff you use, or throw away. It is huge, and it is a big deal.

Procurement is responsible for between 60%-70% of all carbon emissions related to healthcare (1) (2). This is the carbon emitted whilst extracting, manufacturing, packaging, storing and transporting pharmaceuticals and supplies (3) – roughly 4% of New Zealand's total carbon release. Healthcare procurement is carbon-intensive, and a significant proportion of it goes to landfill after a moment's use. If we could do it better, we could save money, reduce environmental harm, enhance the local economy, and extract more value from healthcare dollars.

Procurement is responsible for between 60%-70% of all carbon emissions related to healthcare

Procurement resistant to change

The difficulty with procurement is that it is extremely resistant to change.

At an individual practitioner level, changing a purchasing decision may not seem difficult. Whenever we see a doctor with a new toy, we are seeing a change in procurement. But when we want to see a change for all doctors, we inevitably encounter resistance.

While substituting item A for item B may sound simple in theory, there may be many barriers to overcome.

Seldom does the decision lie with a single individual – you cannot just convince one person of the need for change. There are boards, committees and groups and often multiple vested interests whose needs for information or reassurance must be met.



Dr Sallie Malpas
NZSA Environmental and Sustainability Network



Dr Rob Burrell
NZSA Environmental and Sustainability Network

The web of organisational elements affected by a single purchasing change may not be up to the task. Can your CSSD (central sterile service department) cope with an explosion of reusable items?

Your interest in making a procurement change may be sapped by the bureaucratic process you encounter. How many of us will persist in the face of demands for a cost analysis, a business case, and a raft of paperwork? Making even the smallest change is fraught. How hard has it been to stop purchasing a colour coded Clausen ring with every anaesthetic facemask?



How procurement works in NZ's health system

The individuals who do the procurement may not even work for your organisation. The four northernmost DHB's have outsourced their procurement to HealthSource, i.e. clinician input is even more remote. If the item is not available in the purchasing software system, you cannot get it. Often, an item is "bundled" with another. Buy enough disposables, and you get the pump/blower/heater/machine "free"! Companies make the total costs opaque and lure the purchaser with the Ginsu 2000 effect. (Just how much would you expect to pay? Not \$29.99, not \$19.99, but only.....) And if the item is locally produced, hospital managers are reluctant to purchase it over an established international name. Even though local spending is better for the environment and beneficial for local employment and our economy, buying from a big name can be reassuring with respect to quality control, legal liability, and guaranteed delivery. The game is rigged against the little guy, the local company, the clever idea. Innovation in New Zealand takes second place to global corporations, third world manufacture, and extended supply chains.

Barriers to better procurement

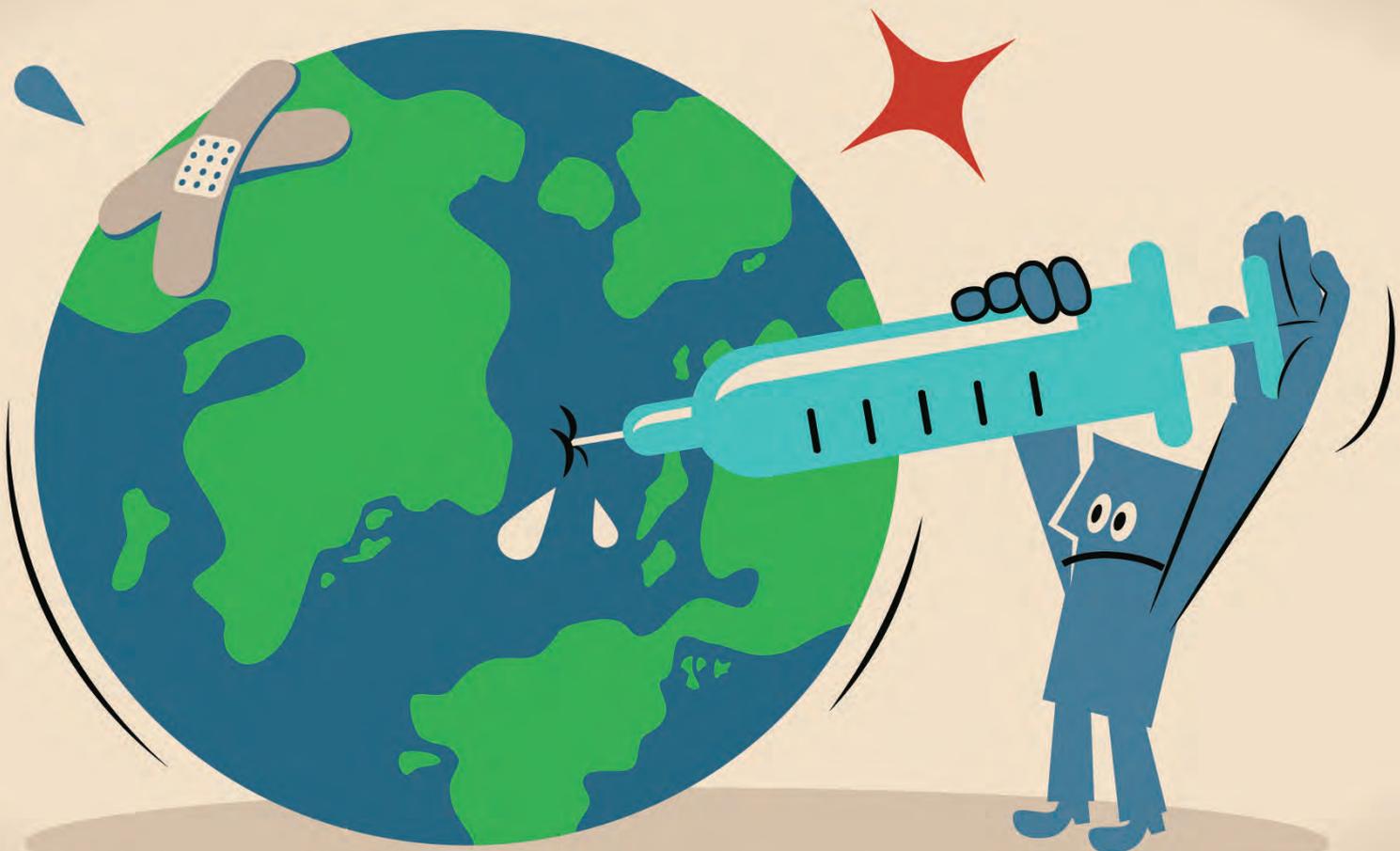
The ultimate barrier to better procurement is that an operating expense is usually easier to achieve than a capital expense, so the system is perversely rigged for total spending to rise. Your clever idea to buy washable long-life anaesthetic circuits may have to get past resistance from your own colleagues, technicians' reluctance to change, infection control, sterile supply staffing budgets, various hospital committees, and then fall at the final hurdle: the total spending will go down, but we can't "afford" to buy these because a reusable item comes from the very contested and limited pot of money labelled "Capital."

It is easier to buy a product where the purchasing contract has been negotiated by PHARMAC. In 2017, DHB chief executives approved the Procurement Operating Model which made the NZ Health Partnership (NZHP) responsible for the DHB National Procurement Service. NZHP work with organisations such as PHARMAC and the Ministry of Business and Innovation (MBIE) (4) PHARMAC manages the purchasing of all "hospital medical devices" as well as pharmaceuticals. "Hospital medical devices" could mean almost anything, from pillows to pacemakers. If your hospital is buying nappies for new-borns, it will probably buy the Huggies or Treasures brands using the PHARMAC contract. You may want to buy a more environmentally friendly nappy, such as a NZ manufactured compostable one, however you'll be restricted to buying the one imported from Denmark, because PHARMAC struck a deal with them.

Are we making progress on better procurement?

While progress is slow, it is happening. In 2010 the NZ Government produced a guide to sustainable procurement (5). Whilst not specific to healthcare, it was designed to help all agencies "integrate sustainable procurement into practice." In 2019 the Ministry of Health released a document "Sustainability and the health sector: A guide to getting started." (3) This outlines the benefits and importance of procurement when considering our carbon emissions, as well as recommending some actions we can take to promote sustainable procurement. And at the time of writing this, Practice Greenhealth, Healthcare Without Harm and Global Green and Healthy Hospitals, released an excellent, collaborative 77-page document specifically addressing sustainable procurement in healthcare globally. It outlines the benefits of sustainable procurement as well as laying out a step-by-step, comprehensive guide to implementation (2). There is ongoing work with key suppliers (BD, J&J, F&PHC, Baxter etc.) to reprocess products at the end of their life, as well as a lot of small scale work going on.

Your clever idea to buy washable long-life anaesthetic circuits may have to get past resistance from your own colleagues



Examples include removing polystyrene cups from tearooms and cafeterias, and reducing our volatile gas use in favour of TIVA and regional anaesthesia. There are deep threads of promise running through organisations such as the Sustainable Health Sector National Network, with some members being part of DHB procurement departments. Good people are building up complex relationships and processes. The various agencies (MBIE, PHARMAC, NZHP, HealthSource) are coming to terms with sustainability being part of the model by which they must work. The United Nations is doing its part, and several agencies such as Health Care Without Harm enable global networks of like-minded health systems to interact, cooperate, and cross-pollinate.

And how are we doing? If we take a very long view – out to 2050 – NZ is doing well. In the short-term, we lack alignment of goals. Nobody is conducting the orchestra, possibly because we are scared we won't be able to afford to pay. There is plenty of room for leadership. If your vision of procurement is one where your Sterile Supply Department is king, where everything is washable, reusable, or compostable, where supply chains are short because businesses and manufacturers and re-processors are local, do not hold your breath.

How do we make better procurement decisions?

To make better procurement decisions, we need to look at our purchases through a sustainability lens. We need to examine more than just purchase price; we need to look at any purchase with a consistent life-cycle approach and ask ourselves questions such as:

...we need to look at our purchases through a sustainability lens.

Where is this made? By whom? With what? How much harm/pollution/extraction was required? How many times can we use it? By what means do we effect disposal?

Does it add to the local economy? (If the only employment from the item is a bulldozer driver at the dump, we could possibly buy better.)

In short, we must ask about how much value we can obtain from the purchase. Not simply value for money. The value equation (and our decision making) needs to look more like this:

$$\text{Value} = \frac{\text{social} + \text{environmental} + \text{health} + \$ \text{outcomes}}{\text{social} + \text{environmental} + \text{health} + \$ \text{costs}}$$

Anaesthetists can fill the leadership vacuum

The best people to ask these questions, the best people to really explore sustainability through decision-making, are people such as ourselves. Anaesthetists understand the practical aspects of procurement. We also understand health equity, environmental

and social concerns, complex systems, and we are very good at establishing what is value and what is not. We can fill the leadership vacuum.

We should take every opportunity to inveigle ourselves into the decision-making processes at every level of procurement. Anaesthetists need to be amongst those who assess products. We need to scrutinise the process of purchasing and we can help make nuanced decisions based on more than just what is cheap.

Procurement is a big deal. With anaesthesia embedded in the system, the purchasing process can be robust, the decisions sound, and the value maximised for all New Zealanders.

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Notice of NZSA Annual General Meeting



The NZSA's Annual General Meeting will be held in Wellington on Friday 16 October 2020 at midday, at TSB Arena, where we will also be holding our NZSA Conference Anaesthesia 2020: Emerge, Reflect and Reconnect. The agenda and papers will be made available to members in due course via our website members only pages. All members are welcome to attend. Please note that if we cannot go ahead with a face to face AGM, we will offer a virtual format.





Pacific news

Keep updated on Pacific news through their Facebook page [f pacificsocietyofanaesthetists](#)

NZSA Global Health Committee

Support for overseas training and development, especially in the Pacific region, is a key focus of the NZSA's Global Health Committee (previously known as the NZSA Overseas Aid Sub-Committee). Dr James Dalby-Ball writes about the breadth of the Committee's work and opportunities for members to engage with supporting the Pacific.

Role and key aims of the GHC

Since 2007, the GHC has facilitated the NZSA's commitment to supporting the development of anaesthesia in the Pacific region by enabling the NZSA to prioritise and coordinate these activities.

With an increased global focus on anaesthesia by many organisations, the NZSA has decided to change the name of the subcommittee to the NZSA Global Health Committee. This more accurately reflects our activities and aligns with the World Health Organisation's aims of ensuring safe surgery and anaesthesia as part of Universal Health Care.

Within Australasia, the NZSA GHC works with two other committees: the Overseas Development and Education Committee (ODEC) of the Australian Society of Anaesthetists (ASA) and the ANZCA Global Development Committee (previously the Overseas Aid Committee). Together, these organisations work with the wider Pacific to coordinate training and engagement with the global anaesthesia community.

The NZSA GHC's focus is on the South West Pacific area – our local neighbourhood. Although there are many ongoing projects, these fall into two main categories – supporting training within the Pacific and facilitating opportunities for anaesthetists in the Pacific to develop their skills and engage with other colleagues.



PSA Refresher Course 2019

Supporting Training

Samoa MMED Programme

The NZSA GHC is now jointly (with the ASA) funding and supporting a Pacific trainee to undertake the Masters Training Programme. Clinical anaesthesia training commences in a trainee's native country with the final requirements for the programme taking place in Fiji through the Fiji National University. Both NZSA and ASA are supporting the current candidate Dr Cecilia Vaai-Bartley with the annual training fee. She, as well as other trainees in the Pacific, are facing many challenges due to the COVID-19 pandemic.

The NZSA and ASA are working together with the Samoan Ministry of Health to create a sustainable anaesthesia workforce in Samoa. This type of activity presents many challenges and is being led by Committee member Dr Alan Goodey.

Locum support

The annual Pacific Society of Anaesthetist's (PSA) Refresher Course is the only opportunity for many anaesthetists in the Pacific to meet face-to-face. The NZSA GHC organises locum cover for doctors who would otherwise be unable to attend. In 2019 we provided the largest ever contingent of NZSA locums, which for the first time included Provisional Fellows from New Zealand, working under the oversight of NZ SMOs in Suva, Fiji. Unfortunately, the 2020 PSA Refresher Course was cancelled due to COVID-19, however we hope to provide this service again in 2021.

Outside of the PSA Refresher Course, we have also been approached to provide locum cover for Samoa and the Cook Islands to support colleagues who are overworked and have no chance of relief otherwise. We are waiting for border restrictions to ease before committing to this request.

The new ASMS MECA clause 36 makes specific allowance for NZ members to spend time supporting these activities as part of annual or sabbatical CME allowances.

Pacific trainees and NZ rotations

The Committee supports Pacific trainees to come to New Zealand for work experience and training (Hawkes Bay and Christchurch rotations). The Pacific trainees who have been selected to come to New Zealand in 2021 are from Vanuatu and the Cook Islands, with the current Christchurch-based anaesthetist returning to Fiji where she plans to develop the pain service in Suva. Previous trainees who have undertaken these training rotations have become leaders in their anaesthesia communities and maintained strong links with their NZ training hospitals.

We also support Pacific trainees in NZ to attend EMAC in Wellington (Wellington Hospital provides a 50% discount of the registration fee, the NZSA contributes \$1000 towards flights and accommodation and Hawkes Bay DHB pays the remaining registration and other costs).

Engagement opportunities for NZ trainees

With growing interest amongst trainees to become involved in supporting initiatives in the Pacific, the committee has recently appointed a trainee representative (Dominic Johnpillai).

The NZSA has always encouraged trainees to become involved and members can apply for the annual Overseas Aid Trainee Grant, which goes towards paying the costs of attending the PSA's Annual Refresher Course. It provides an opportunity to gain perspective on anaesthesia services in the Pacific, to network with anaesthesia colleagues in the Pacific and to assist with the meeting, if required. While we have been unable to offer the grant to trainees this year, we hope to do so in 2021.



Drs James Dalby-Ball, Richard Collins, Wei-Lyn, Melvin Chong, Jane Carter and Lisa Barnett with Dr Luke Nasedera (HOD Colonial War Memorial Hospital, Fiji, second from left) and Fiji National University trainees.

Supporting Anaesthesia Practice

COVID-19 support for the Pacific

We have been in regular contact with the PSA and other regional organisations, sharing information and offering support during the COVID-19 pandemic. Earlier this year, Dr Ted Hughes was based in the Cook Islands directly supporting their efforts.

Practical assistance was also offered via the donation of Lifebox Pulse Oximeter units. NZSA joined with the ASA and ANZCA, providing funds for 150 additional units, which were delivered across the Pacific Islands, Papua New Guinea, Laos and Micronesia. These units are very useful in guiding treatment of COVID-related respiratory illness in settings where ventilators are a very limited resource.

Role within the World Federation of Societies of Anaesthesiologists

The NZSA is an associate member of the WFSA and sponsors a Pacific anaesthetist to attend the annual WFSA World Congress. In addition, Indu Kapoor (Chair of GHC) has been appointed to the WFSA Paediatric Anaesthesia Committee.

Future activities

Through the support offered by the NZSA and generous donations from the Hugh Spencer Education Fund, the GHC is actively planning future activities.

The pandemic has placed many of the routine activities on hold however on a more positive note, it has given us time to reflect on how internet-based education/support could be developed. Over the next year we hope to support the PSA to deliver the 2021 Refresher Course, to develop training opportunities within the Pacific and to engage more NZSA members to support our neighbours.

We have our own webpage on the NZSA website and post regular updates on our work activities and engagement opportunities.

Further reading

Dr Alan Goodey, member of the NZSA GHC, has written a comprehensive article about the Lancet Commission's ambitious goals for 2030, which include a minimum of 80% coverage of essential surgical and anaesthesia services per country. A second indicator which is more easily measured but still extremely challenging is 100% of countries having a minimum of 20 anaesthesia physicians per 100,000 population and equal numbers of surgeons and obstetricians. How can the NZSA and its members help to achieve these goals in the Pacific? Read his article on our website: <https://anaesthesia.nz/community/global-health-committee/>

Committee members

Indu Kapoor (Chair), Wayne Morris, James Dalby-Ball (new member, Nov 2019), Alastair Mark, Petra Linden-Ross (new member, August 2019), Alan Goodey, Ted Hughes, Maurice Lee, and Dominic Johnpillai (trainee representative)





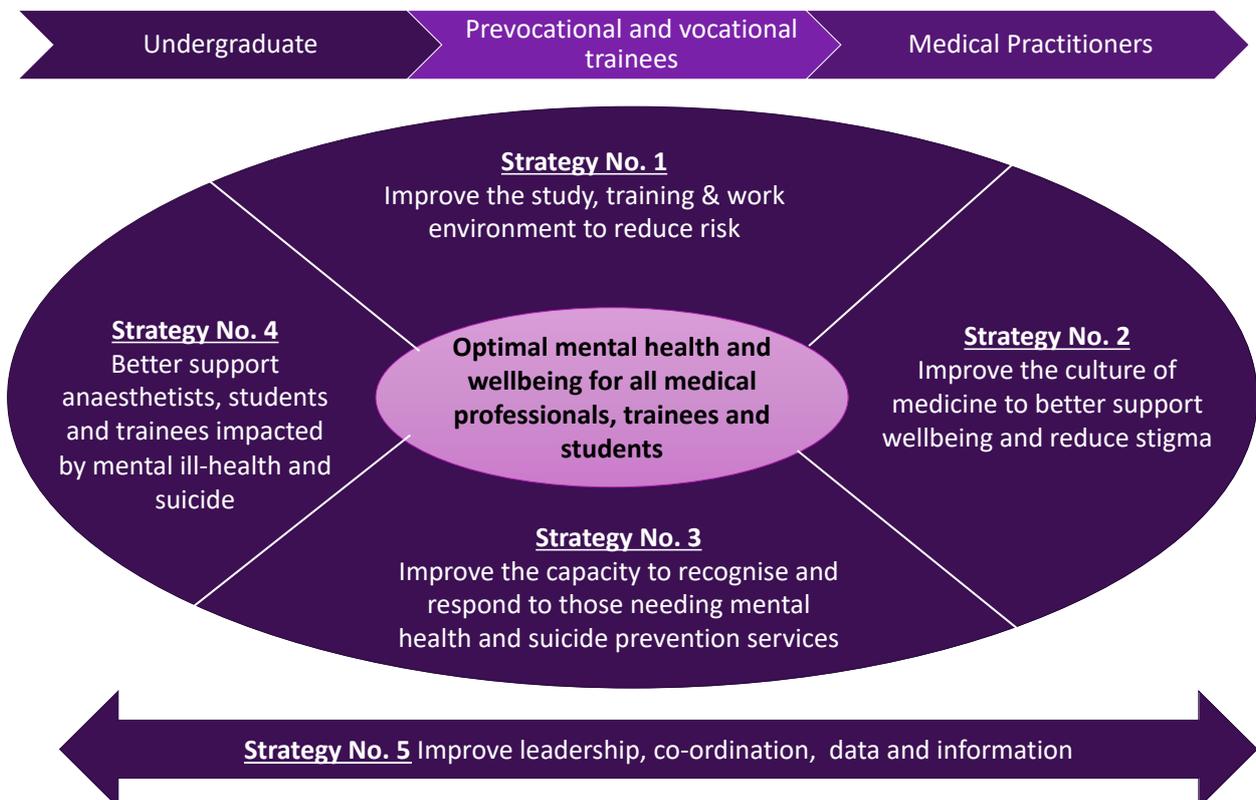
“Long Lives, Healthy Workplaces” Toolkit for Anaesthetists

The Long Lives, Healthy Workplaces (LLHW) toolkit has been designed for anaesthesia departments to support good mental health and prevent mental ill-health and suicidal behaviour amongst anaesthetists and anaesthetic trainees. Strongly evidence-based, it recognises the unique challenges faced by anaesthetists in their day-to-day work and encourages anaesthetic departments to take a strategic and integrated approach to wellbeing and mental health. The toolkit includes practical suggestions on how to implement initiatives, such as having a wellbeing officer for every department, and forming peer groups for colleagues to get together and reflect on cases, mostly covering non-technical areas.

The toolkit is an initiative of the Wellbeing of Anaesthetists Special Interest Group (SIG) and Everymind (a leading institute dedicated to the prevention of mental ill health), with support from the Australian Society of Anaesthetists (ASA).

Just before this resource was launched in 2018, the NZSA was fortunate to have ASA President Dr Suzi Nou as a guest speaker at our wellbeing focussed forum to provide insight about the value of the toolkit for our specialty. She identified the correlation between the wellness of anaesthetists and high-quality patient care when she said that the wellness of anaesthetists is “paramount to the safety of our patients.”

Dr Nou acknowledged that while someone’s employment often contributed to happiness, it could also lead to ill health and it was recognised that anaesthetists faced unique challenges in their everyday work. She cited a previous Australian study which surveyed about 14,000 doctors, and the finding that Australian doctors (including anaesthetists) and medical students had greater psychological distress and higher attempted suicide rates than other professionals, and the general population. Compounding the problem is “an incredible stigma, especially for medical practitioners to seek help for mental health.”



The toolkit was piloted in two hospitals in Australia before it was launched, and feedback had been very positive. Doctors had also expressed that it would be helpful to have time allocated within work hours to plan and implement initiatives in the toolkit.

Dr Nou subsequently formed an implementation group to help develop and promote the toolkit further, and to create resources to make it easier for departments to implement some of the evidence-based strategies recommended in the toolkit. This group is now chaired by NZSA member Dr Joanna Sinclair and comprises a strong group of anaesthetists from Australia and New Zealand who are dedicated to improving the wellbeing of ANZCA trainees and fellows. Dr Sinclair has developed a New Zealand edition of the resources' sections of the toolkit, as these are largely Australian resources in the online toolkit. The toolkit is available on the NZSA website under the community tab on the homepage. We encourage members to access this comprehensive, innovative resource.

The implementation group has sought feedback from wellbeing advocates over the past two years and taken on board that for some, the toolkit's level of detail has been overwhelming. To address this hurdle, they have compiled a resource kit to help wellbeing advocates get started and were due to relaunch a pared down toolkit and the resource kit at the ANZCA ASM in Perth this year. In the novel situation in which we now find ourselves, the group are rethinking what a relaunch might look like. In the meantime they will be releasing a significantly shorter version of the toolkit which they hope wellbeing advocates will find more manageable, along with a how-to guide for conducting a needs assessment or wellbeing survey, slide packs for those who want to present the toolkit to their departments, and a few other implementation ideas so there is something there for everyone.

Doctors Nou and Sinclair both agree that the key steps at the beginning of any journey to change practices in your department, "are to find colleagues who share your goals so you have some moral support, and to gain leadership or executive support for the changes you want to make, and the resources needed to do so." Moral support may come from other anaesthetists at your own or another hospital, or via the Wellbeing Advocates Network of NZ, coordinated by Dr Sue Nicoll from Canterbury DHB.

The toolkit implementation group recommends doing a wellbeing survey, such as the Wellbeing Index developed by the Mayo Clinic, as a means to collect data to demonstrate the need for change – it is often a good way to make your case to the leadership team. It is then recommended you decide who will make up the team that drives the change and work out an action plan.

The benefits of effective mental health action at work

Despite the availability of effective treatments for mental ill-health, the evidence suggests that many people, and anaesthetists in particular, either do not seek treatment, or when they do seek treatment it is after lengthy delays, in which time the health, social and work consequences can accumulate. The benefits of effective mental health action at work can include improved staff morale, increased work performance and productivity, improved patient safety, fewer work absences and reduced turnover of staff. Given the nature of anaesthetists' work, there are significant public health benefits if performance is increased and adverse outcomes are reduced.

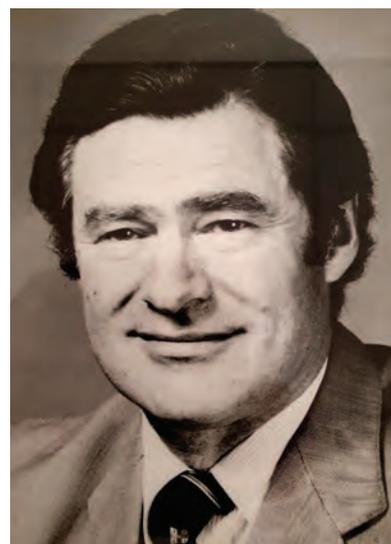
The J. Campbell Barrett Wellington Trust

The JCBW Trust has an established record of supporting anaesthesia related activities.

During the late 1980s the inadequacy of anaesthesia monitoring equipment hit the headlines (The Dominion Sunday Times, October 23, 1988 and The Evening Post February 25, 1989). By January 1990 reports indicated that anaesthetists might decline to take part in elective surgery at Wellington Public Hospital because of lack of progress about the availability of pulseoximeters. These circumstances triggered the establishment of the Trust by a number of interested parties; after Cam's death it was renamed to honour his significant role in founding the Trust and his support of anaesthesia safety research.

In 1991, the JCBW Trust donated six patient controlled analgesia pumps with the help of donations from Toyota, REM Systems and from grateful patients. We would still appreciate any gifts or endowments that could assist us with making future donations.

In 1997, a major contribution was made towards the establishment of a patient simulator in Wellington which has helped many to train for responses to adverse events. Since then researchers have been helped with grants for their research, anaesthetic technicians



helped with course fees and anaesthesia trainees' presentations at conferences have been supported.

Perioperative medicine is now the domain of the anaesthetic fraternity and the JCBW Trust supports a wide range of anaesthesia related activities.

The JCBW Trust is developing a website that will make applications

more streamlined and can be found at www.jcbtrust.com and our email is barrettanaesthesiatrust@gmail.com.

The Trust looks forward to supporting further anaesthesia developments in the future.

Lifebox: Working for a world where safe surgery is not a luxury

All of us will have a moment in our lives when either we, or a loved-one, will need surgery. Whether due to an accident, illness or giving birth, many of us will take this access to safe surgery as a given. This is not true for the vast majority of our world's population – globally, five billion people lack access to safe surgery.

Surgical teams across low- and middle-income countries face significant challenges in providing the best possible quality care to their patients. Either from a lack of adequate training or resources, the risk of death following surgery in some parts of the world can be 22 times higher than in a high-income country like New Zealand. Despite the scale of the global surgery crisis, Lifebox is the only NGO dedicated to making surgery and anaesthesia safer in low-resource contexts.

Lifebox was founded in 2011 by four of the world's leading medical professional and academic organisations (the Association of Anaesthetists of Great Britain and Ireland, Brigham and Women's Hospital, Harvard T.H. Chan School of Public Health and the World Federation of Societies of Anaesthesiologists). Lifebox was launched with the simple aim of providing pulse oximeters to operating rooms that lacked this critical monitoring device.

...the risk of death following surgery in some parts of the world can be 22 times higher than in a high-income country...

Pulse oximeters

A pulse oximeter is the only piece of equipment included on the WHO Surgical Safety Checklist and yet, at Lifebox's launch, it was estimated that 77,000 operating rooms around the world lacked this essential piece of medical equipment. The Lifebox pulse oximeter has been specifically designed for use in low-resource settings – with robust construction and rechargeable batteries that stay on even when the power fails. To date, more than 20,000 Lifebox pulse oximeters have been placed into the hands of anaesthesia providers globally to increase the volume of vital patient monitoring.

Lifebox's area of work has now expanded across three core pillars of safer surgery – improving anaesthesia safety, reducing surgical infection rates, and strengthening surgical teamwork. By working alongside local partners, Lifebox provides the training and tools needed to save lives through safer surgery. All this work is rooted in the WHO Surgical Safety Checklist, which is a simple communication tool that has been proven to reduce complications and deaths from unsafe surgery by up to 40%. It has been 10 years since the development of the checklist, and it remains a transformational force in the global surgery movement.

"It is not enough to say we are just doing surgery. If it's not safe surgery with proper quality, then we're doing nobody any good. Our focus and mission is to assure that when patients have that surgery, that it's safe and that it's effective."

Atul Gawande, Lifebox Co-Founder and Chair

Since the early days of Lifebox, its work has been supported by the New Zealand Society of Anaesthetists (NZSA) and led by Professor Alan Merry, a life member of NZSA and a founding board member of Lifebox.

Lifebox Australia and New Zealand

In 2015, NZSA registered Lifebox Australia and New Zealand (Lifebox ANZ) alongside Interplast Australia and New Zealand, the Australian and New Zealand College of Anaesthetists (ANZCA) and the Australian Society of Anaesthetists (ASA). This consortium of partners collaboratively works together to strengthen anaesthesia and surgical safety in the Asia-Pacific region through raising funds and implementing projects such as pulse oximetry distribution and training. To date this work has included projects in Myanmar, Papua New Guinea, Philippines and most recently in Bangladesh.

"After doing this course, I know how to use pulse oximeters. I have learnt what hypoxia is – before giving anaesthesia, the SpO2 is 95. If it is 94% I will manage the hypoxia. If I maintain the surgical checklist in the theatre, I will protect the patient and ensure it is the right operation and the right side of the patient. This course was very useful, all technicians and anaesthesiologists should be given this training course."

Dr Bullet, Dhaka, Bangladesh, Lifebox Workshop



Papua New Guinea - Vanimo General Hospital - Oximeter



Lifebox pulse oximeter in the OR - credit Lauren Anders Brown

COVID-19 response

Lifebox ANZ has pivoted its activities to support Lifebox's response to this global health emergency, adapting and developing tools and strategies for healthcare providers on the frontline to continue to provide safe care. This work has spanned:

- securing the supply of over 6,500 Lifebox pulse oximeters for partners working in high-risk COVID-19 regions
- developing a Decision-Making-Tool to help rapidly identify patients in need of oxygen therapy
- a COVID-19 Surgical Checklist to provide prompts for key infection prevention strategies during surgery.
- distributing Personal Protective Equipment (PPE) to partners in Ethiopia, Burkina Faso, and Uganda and funding the purchase of local supplies in Honduras.

Alongside the development and distribution of tools, Lifebox has provided guidance on COVID-19 preparedness for surgical systems (published in the *Annals of Surgery*), and PPE Best Practice on its decontamination and reuse. To underpin all this work, Lifebox has hosted a series of webinars with clinical leaders in surgery, obstetrics and anaesthesia to provide perspectives and guidance from frontline providers.

Lifebox ANZ is supporting the COVID-19 response with the distribution of 100 pulse oximeters across Fiji,

...Lifebox has provided guidance on COVID-19 preparedness for surgical systems...

Papua New Guinea, Kiribati, and elsewhere for frontline use. Pulse oximeters are a crucial tool in the detection and triage of COVID-19 patients. "Silent hypoxia" has been a defining feature of the disease, with patients slowly starving of oxygen without the usual shortness of breath that would see them seek care. By the time many COVID patients have trouble breathing they are already critically ill – the best tool to detect these patients is a pulse oximeter.

"I am enormously proud of Lifebox's response to address COVID-19. Oximetry is essential in diagnosing COVID. Patients are becoming hypoxemic and because their CO2 is normal it is only through checking their oxygen saturation levels in the blood that we are able to identify how sick they are. Thank you to NZSA for supporting Lifebox in the effort to keep providers and their patients safe. Please keep up this incredible support. We are still only at the start of this pandemic and there is much work to do."

Kris Torgeson, Lifebox Global CEO

NZSA will continue its work with Lifebox ANZ over the next year with large-scale oximetry distribution and training in Myanmar.

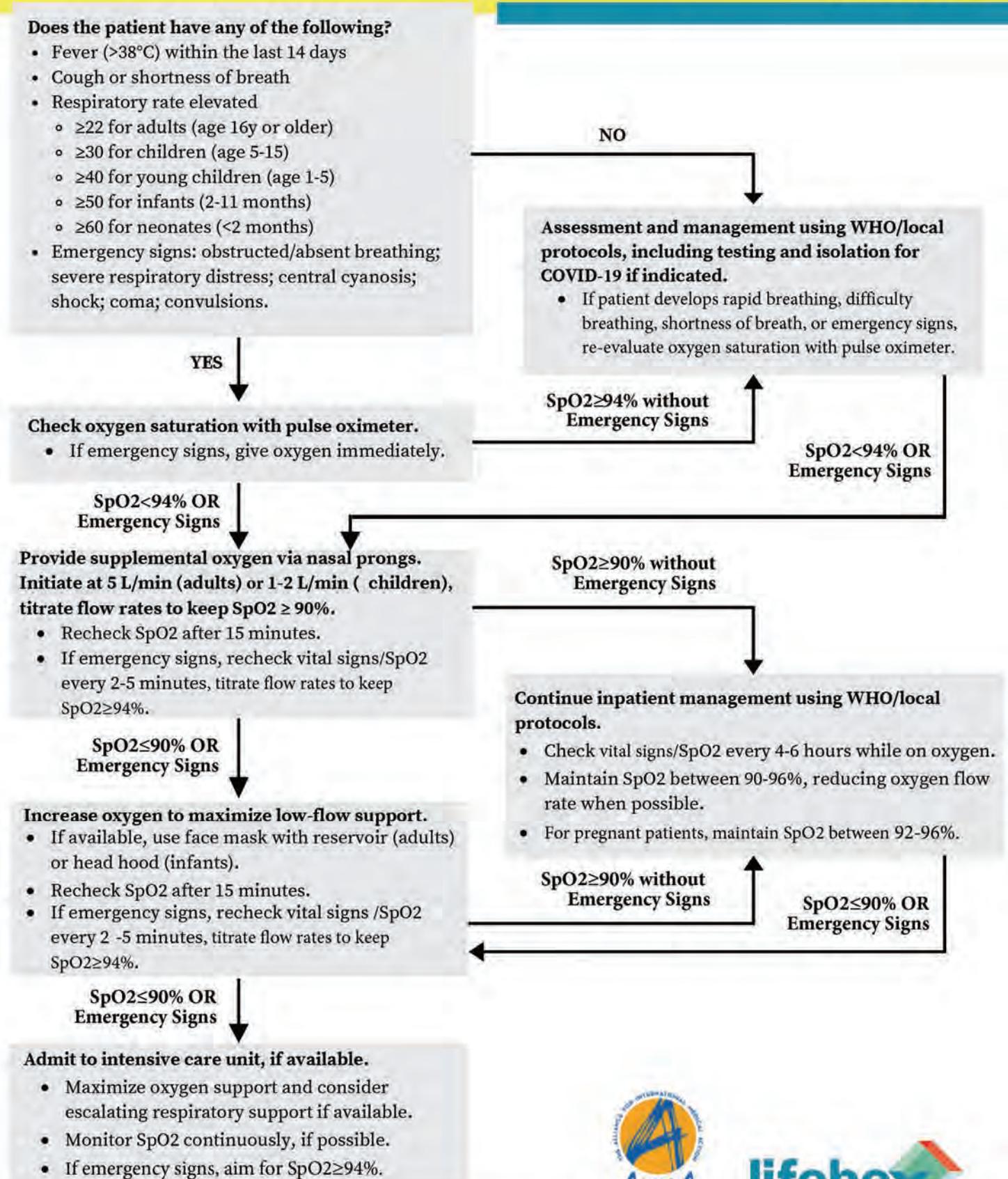
Want to find out more?

Visit www.lifebox.org/covid-19 to learn more about Lifebox's COVID-19 response.

Support this vital work and ensure healthcare providers have the tools they need at www.interplast.org.au/donate/donate-now/ and select Lifebox from the menu.

Using pulse oximetry for decision support for COVID-19

Updated: 11 April 2020



Created by Lifebox and ALIMA with guidance from the World Health Organization.



Enhancing paediatric anaesthesia in Aotearoa

Dr Allanah Scott, the new Chair of PANNZ (Paediatric Anaesthesia Network of New Zealand) provides an overview of the network's role, aims and key work to enhance the delivery of anaesthesia care to children throughout New Zealand.



Dr Allanah Scott
Chair of PANNZ

Role and origins of PANNZ

The Paediatric Anaesthesia Network of New Zealand (PANNZ) is moving strongly into its fifth year. The network links regional and larger centres to provide a communication, education and resource platform to deliver high quality anaesthesia care for children across the country, irrespective of geographic location.

The network is the brainchild of Dr Indu Kapoor, who presented the idea to an open forum at the SPANZA ASM in 2015. With unanimous support for the network to be established and an incredible amount of work by Dr Kapoor behind the scenes, the inaugural meeting was held in early 2016. The initiative is jointly supported by the NZSA and the Society of Paediatric Anaesthesia in New Zealand and Australia (SPANZA).

The NZSA and SPANZA signed a memorandum of understanding, which enabled some welcome financial and administrative support for PANNZ, although the network remains a non-financial entity.

PANNZ structure and representation

PANNZ membership includes representation from 19 of the 20 District Health Boards, the Private Hospitals Network, mobile surgical services, as well as members from NZSA and SPANZA. We have had excellent engagement and commitment from the hospital link people – their contributions and active participation contribute to the success of the network.

Information flows via the link person to anaesthetic departments and from the departments to PANNZ. This way, relevant updates related to paediatric anaesthesia can flow quickly through the country and experience and knowledge can be shared.

...relevant updates related to paediatric anaesthesia can flow quickly through the country...

Key activities and initiatives

Network members have been active and strongly committed to making progress on a range of issues, some of which are highlighted below. PANNZ meets both face-to-face and via video conference during the year, as well as communicating important updates or issues via email.

Annual PANNZ Update Meeting

Credit must once again go to the founder of PANNZ, Dr Indu Kapoor, who saw a need for a dedicated paediatric anaesthesia meeting within New Zealand and also for this meeting to be relevant and accessible to all anaesthetists who care for children. The annual PANNZ Update Meeting focuses on CPD activities related to paediatric anaesthesia for anaesthetists as well as anaesthetic technicians and perioperative nursing staff. The meeting has gained a loyal following and since 2017 it has been hosted in both the North and South Islands covering a range of topics – from emergence agitation to critical airway management.

The much anticipated PANNZ Update Meeting for 2020 had to be postponed. The meeting has been rescheduled for 6 March 2021, with workshops to take place on 5 March and will remain in Rotorua. The organising committee has worked hard to provide a range of relevant and topical presentations and workshops. We have had excellent feedback from past update meetings and registrations now fill quickly. Registrations for the 2021 meeting will open in October.



Founder of PANNZ and its first Chair Dr Indu Kapoor

Paediatric audit

PANNZ has conducted two national audits to gain knowledge of how many children require anaesthesia intervention and where their care is being undertaken. The 2018 data on paediatric anaesthesia numbers across the country is near completion, and we hope to continue to collect denominator data every two years. The audit results have been useful in providing an insight into where children are cared for in New Zealand and to advocate for increased education and training opportunities across the country. We know from our 2016 audit that at least 25% of paediatric anaesthesia is performed in private hospitals, and this looks to have increased in the 2018 audit.

PANNZ during the COVID era

PANNZ has met more frequently during the COVID -19 era via Zoom (we are thankful to NZSA for allowing us to use this platform). We have had a record attendance at these meetings to discuss and share ideas, knowledge and experience on the management of children requiring anaesthetic intervention who are COVID confirmed or probable. It has been very valuable in enabling us to plan for this care. Our SPANZA representative, Dr David Linscott, also presented a review of international experience at a recent teleconference.

IT and communication challenges

The sharing of resources and increased communication has brought to light some of the difficulties in having a shared online platform. A small group of PANNZ members is currently trialling Health Forum (an online platform for health professionals) as a possible solution to overcome these challenges. We plan to share our experiences with the other anaesthesia networks within New Zealand. Also, within the IT realm, we are planning to improve and update the PANNZ webpage on the NZSA website to include information for both anaesthetists and patients.

Secondments

The Association of Salaried Medical Specialist's (ASMS) DHB MECA allows a period of two weeks every three years for secondment to develop and upgrade skills. This is a great opportunity to refresh and update in paediatric anaesthesia at one of the larger hospitals with dedicated paediatric facilities. PANNZ has put together a list of department link people and passport systems for credentialling to make this process easier and accessible to all. Starship Children's Hospital, Wellington Hospital and Waikato Hospital all have a passport system for credentialling SMO's for secondment – the links to these and to the relevant department contacts are on the PANNZ webpage of the NZSA website.



PANNZ meeting

Information and guidance on paediatric anaesthesia

Several subspecialist anaesthetists have made themselves available through the network to answer specific questions relating to the clinical care of children outside of their own institutions. If you have a question related to paediatric pain, cardiac surgery, or complex airway problems, we may be able to provide advice – please contact PANNZ through the NZSA office nzsa@anaesthesia.nz or alternately visit the NZSA website to find out who the PANNZ link person is at your hospital.

Contribution to ANZCA professional documents

Two of our members were involved in the creation and revision of the ANZCA Professional Document PS29 'Guideline for the provision of anaesthesia care to children.' The document is nearing the end of its pilot period, and ANZCA is currently seeking feedback from departments throughout the country so improvements can be made if needed.

Looking ahead – what is next for PANNZ?

PANNZ is going from strength-to-strength. We are aiming to increase the number of PANNZ representatives with a particular focus on bolstering engagement from the private sector (currently we only have one private sector member). As mentioned earlier, our 2016 audit showed that at least 25% of paediatric anaesthesia is performed in private hospitals, and this looks to have increased in the 2018 audit. A letter to private hospital medical advisory committees has been drafted in relation to this and PANNZ members have been encouraged to reach out within their regions. We look forward to seeing PANNZ grow and evolve with the challenges that lie ahead and we hope our contributions will mean continued provision of the best possible anaesthesia care for children in New Zealand.

Thank you to NZSA for its commitment to PANNZ, including administrative support and hosting a PANNZ webpage on the NZSA website.

New Chair Dr Allanah Scott

Dr Allanah Scott took on the role of PANNZ Chair in April of this year. She is a consultant anaesthetist at Hawke's Bay DHB and Royston Hospital and completed a paediatric fellowship at Royal Children's Hospital in Melbourne. She is passionate about the PANNZ goal of providing excellent quality anaesthesia services for children in New Zealand, regardless of location. Allanah is also a Supervisor of Training and a member of the Airway Leads Network. She has a strong interest in supporting the return to work for anaesthetists and trainees after prolonged leave. Outside of her professional commitments, she is kept busy with four children, a few chickens and a hectare of lawns and gardens!

Guest column: The New Zealand Private Surgical Hospitals Association



Steve Soufflot
NZPSHA Vice-President
and Workforce Lead

The private surgical hospital sector has played a key role throughout the Covid-19 lockdown and beyond, with many NZPSHA members providing backup capacity and support to local DHBs, working with the Ministry under its National Hospital Framework. Fortunately, this backing was largely unneeded but the benefits of working closely together in planning and support roles has cemented relationships.

Most private hospitals are now assisting the public sector to catch-up on the outstanding backlog of cases. NZPSHA now has 29 member hospitals/hospital groups located over 41 surgical facilities throughout the country.

NZPSHA remains strongly committed to ongoing collaboration between the public and private sectors and takes the view that the two systems should be working more closely together to meet the country's surgical needs. A whole-of-sector partnership approach will assist the government in its elective surgery planning and performance. The utilisation of private hospital capacity reduces the need for additional government capital infrastructure investment.

The pandemic recovery period also provides the environment for a refreshed approach to workforce planning and development. NZPSHA appreciates the valuable input of the expertise of the anaesthetic workforce during the Covid-19 response period, including the overarching Colleges and NZSA. Ongoing impacts of Covid-19 (such as drug shortages) will be experienced for an unknown length of time as we charter this unprecedented territory. Delivery of optimal care for patients is a shared goal by all hospitals and its workforce.

In recent times, private hospitals have been invited to provide regional representation on NZSA subgroups such as the Paediatric Anaesthetic Network of New Zealand. This involvement is appreciated and allows us to ensure that those anaesthetists working solely in the private sector are kept well informed.

It is pleasing to see the constructive approach being taken by all involved parties to explore opportunities to relieve current Assistant to the Anaesthetist shortages and future-proof this key workforce. It is great to see public and private employers and the various workforce groups working together on a common direction. The transition by AUT to an Anaesthetic Technician degree course is supported; with the private sector committed to contributing to clinical placement training. In time, NZPSHA

is keen to investigate a second location for the degree course to ensure a wider geographical spread of graduates.

Maximising the flexibility of our Anaesthetic Assistant workforce is a key goal. This brings many benefits including greater job satisfaction, new career progression pathways, and more efficient use of staffing within our operating theatres. Greater workforce flexibility enables employers to take on additional staff which relieves workforce pressures and enables individual AA staff to take sick and holiday leave as needed.

Having appropriately trained Registered Nurse Assistants to the Anaesthetist to complement (not replace) the Anaesthetic Technician workforce adds to the flexibility model that the Association seeks. Those facilities that have progressed with RNAA placements and training are now seeing the benefits which are generally strongly supported by the on-site Anaesthetists and Anaesthetic Technicians (both in DHBs and private surgical hospitals).

NZPSHA is welcoming of the growing relationship with NZSA and the opportunity to work more closely together as both organisations move to ensure a safe and sustainable private surgical sector, to deliver elective surgery with a whole of sector approach for the benefit of all New Zealanders.

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Dear colleagues: Our opening plenary session will reflect on COVID-19 through a variety of lenses, including our keynote Dr Ashley Bloomfield.

From teamwork, to reflections on bias, culture and welfare we invite you to reconnect and reflect on what it means to be an Anaesthetist in NZ in 2020 and beyond.

We are also excited to bring you updates in Perioperative Medicine and Research, alongside recent reflections on Trauma and interesting case presentations.

Get in quick to secure a spot in our comprehensive Workshop Programme on Thursday 15 October.

No matter what lockdown level we will be at, this conference will go ahead as we have organised for a virtual option for the 16-17 October programme.

It will be an informative and thought-provoking meeting – we invite you to join us.

David Kibblewhite, Convenor, NZSA Immediate Past President

Register today at nzanaesthesia2020.nz

POSTPONED TO 2022
See you in Wellington!



Prof. Denny Levett



Prof. Steven Shafer



Prof. P.J. Devereaux

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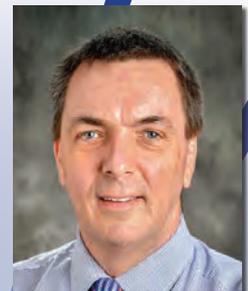
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2.2 min* (Range 1.2–7.4) (n=48) Adults (18–64 years)	2.6 min (Range 0.9–8.8) (n=62) Elderly (65–74 years)	2.9 min* (Range: 0.9–9.9) (n=102) Elderly/old-elderly combined (65 years or older)	3.6 min (Range 1.0–9.9) (n=40) Old-Elderly (75 years or older)
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Median time from start of administration of BRIDION 2 mg/kg (at reappearance of T2) to recovery of the TOF ratio to 0.9.² *p=0.022

- No dose adjustment is needed for the elderly¹
- Conditions associated with prolonged circulation time, such as cardiovascular disease, old age, or oedematous state may be associated with longer recovery times¹
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Study Design: A phase 3a, multicentre, parallel-group, comparative, open-label study enrolled 162 patients (≥18 years and categorised as ASA class I-III) to compare the efficacy, safety, and pharmacokinetics of 2 mg/kg of BRIDION for the reversal of moderate rocuronium-induced NMB in adult (18–64 years) vs elderly (≥ 65 years) patients. The primary efficacy variable was time from the start of BRIDION administration to recovery of the TOF ratio to 0.9 in the intent-to-treat group.²

BRIDION® (sugammadex) 200 mg/2 ml & 500 mg/5 ml solution for injection

Before prescribing BRIDION, read the Data Sheet for information on dosage, contraindications, precautions, interactions and adverse effects available at www.medsafe.govt.nz or on request from MSD.

BRIDION is a Prescription Medicine and is funded under Section H of the Pharmaceutical Schedule – restrictions apply.

Indications: Reversal of neuromuscular blockade induced by rocuronium or vecuronium. **Contraindications:** Hypersensitivity to sugammadex or to any of the excipients. **Precautions:** Repeated exposure in patients; immediate reversal following vecuronium blockade; recurrence of neuromuscular blockade; respiratory function monitoring during recovery; use for reversal of neuromuscular blocking agents other than rocuronium or vecuronium; coagulopathy; severe renal impairment; severe hepatic impairment; interactions due to the lasting effect of rocuronium or vecuronium; anaesthetic complication; marked bradycardia, use in ICU; hypersensitivity reactions (including anaphylactic reactions); pregnancy; lactation; infants less than 2 years of age including neonates; prolonged neuromuscular blockade (sub-optimal doses) and delayed recovery. **Interactions:** Potential identified with toremifene, hormonal contraception, IV fusidic acid. Could interfere with progesterone assay and some coagulation parameters. **Adverse Reactions:** Procedural pain, wound complication, postoperative anaemia, airway complication of anaesthesia, anaesthetic complication, procedural hypotension & hypertension, post procedural & procedural complication, procedural vomiting, wound secretion, nausea, vomiting, constipation, diarrhoea, pain, pyrexia, chills, peripheral oedema, arthralgia, back pain, cough, oropharyngeal pain, headache, sleep disorder, insomnia, haematoma, hypotension, anaemia, dysgeusia, recurrence of neuromuscular blockade, hypersensitivity reactions varying from isolated skin reactions to serious systemic reactions i.e anaphylaxis, anaphylactic shock (severe hypersensitivity reactions can be fatal), bronchospasm, isolated cases of marked bradycardia and bradycardia with cardiac arrest. **Dosage & Administration:** Administered intravenously as a single bolus injection. Immediate reversal in adults, elderly, obese patients, patients with mild and moderate renal impairment, patients with hepatic impairment: 16 mg/kg, three minutes following administration of rocuronium (1.2 mg/kg). Routine reversal in adults, elderly, obese patients, patients with mild and moderate renal impairment, patients with hepatic impairment following rocuronium or vecuronium-induced blockade: 4 mg/kg if recovery has reached 1-2 post-tetanic counts; 2 mg/kg if spontaneous recovery has occurred up to reappearance of T2. Routine reversal in children and adolescents (2-17 years) following rocuronium induced blockade: 2 mg/kg at reappearance of T2. Reversals other than reversal of blockade by rocuronium are not recommended in children and adolescents. Based on Data Sheet prepared 22 June 2020.

References: 1. BRIDION Data Sheet, 22 June 2020. 2. McDonagh DL, et al. Efficacy, safety, and pharmacokinetics of sugammadex for the reversal of rocuronium-induced neuromuscular blockade in elderly patients. *Anesthesiology*. 2011;114(2):318–329.

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