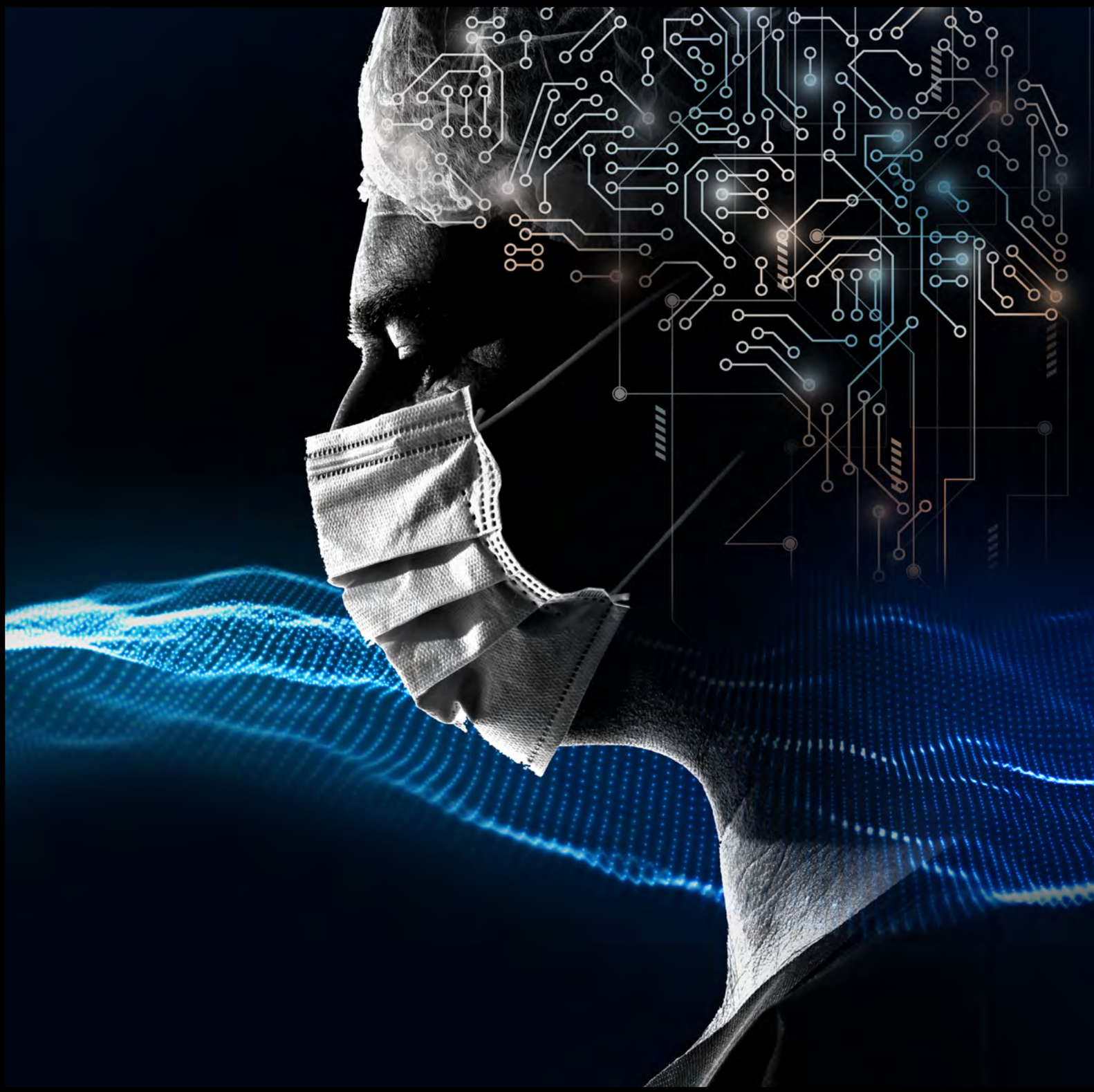
SurgicalNews

Volume 21 | Issue 01 | **January-February 2020**

SurgicalNews Volume 21 | Issue 01 | January-February 2020



Royal Australasian College of Surgeons

surgeons.org

Two tragedies push burn surgeons to the limit

Australian and New Zealand burn surgeons have been working around the clock this summer with multiple critically ill patients.

Summer had barely begun when New Zealand's most active cone volcano Whakaari/White Island erupted into the Bay of Plenty. With only 30 per cent of the volcano visible above sea level, it's easy to underestimate its size. Built up by 150,000 years of continuous volcanic activity, it is the largest volcanic structure in New Zealand.

When Whakaari/White Island erupted on 9 December 2019, a reported 47 people, mostly tourists, were on the volcano. Twenty-one people were killed or have since died (at the time of writing); the youngest was 13 years old. Twenty-six people remain seriously injured.

Volcanic burns are rare and complex, and it remains extremely challenging for burns surgeons providing care in New Zealand (Auckland, Waikato, Hutt Valley and Christchurch) and Australian (Sydney and Melbourne) hospitals. Much of what they are dealing with is unprecedented from both their hands-on surgical experience and the medical literature. Mr Jeremy Rawlins FRACS, plastic surgeon and president of the Australian and New Zealand Burns Association (ANZBA) said it "was a unique set of circumstances that would have tested my colleagues, particularly in Auckland and across New Zealand, when they were first faced with these horrible injuries".

Plastic surgeon Mr Richard Wong She FRACS, is the clinical leader for burns at the National Burn Centre at Middlemore Hospital in Auckland. On the morning of the volcanic eruption he was in a meeting with management expressing concern about his burn team. In the previous week, they'd worked long hours and were suffering from "sheer exhaustion", he said. But later that day when Whakaari/White Island erupted it redefined what he'd called 'busy' and 'overworked'.

Looking back on the days that followed, Mr Wong She said:

"We all made a point of looking after each other – of sending each other out for breaks and trying to get each one of us to have some 'time out' to recharge and refuel."

And looking ahead, he explained "It's a marathon and we are still far from finished, but I will never, ever complain about being busy or overworked again."

People caught up in the volcanic eruption suffered extreme burns, as well as inhalation burns to their lungs and airways from breathing chemicals such as sulphur dioxide and methane. They also suffered substantial blast injuries. "When a volcano goes off, it's like a bomb going off," Mr Rawlins said. "It's a big blast injury – a blast load of air hits the body, along with all the rocks, rubble and so forth that erupt out of the volcano."

Blast injuries, regardless of the nature or size of the missile, can cause major damage. "The depth of some of the blast injuries with volcanic ash blasted through the skin of the back down to spinous processes was hard to comprehend," Mr Wong She said. What complicated the burn injuries, he added, "were a combination of thermal and chemical insults on a background of physical trauma associated with the blast, along with associated degrees of inhalational injury."

Not only were the burn injuries "incredibly challenging to treat, requiring more than anticipated debridement", but in the early days after the eruption the treating medical teams were also at risk of harm themselves, Mr Wong She said. "Words cannot describe the physical discomfort and exhaustion of trying to breathe super-heated air through an N95 mask in a hot (30°C+) operating theatre while fully gowned and performing physically demanding surgery," he explained. Despite the physical discomfort and potential risk to personal safety, "people worked ▶

Images, from top:
Mr Richard Wong She; Mr Jeremy Rawlins.

around the clock – and I do mean around the clock – without complaint," Mr Wong She added.

While the time since 9 December has been difficult and often problematic, it hasn't been without the occasional uplifting moment. "The sight of an 80 per cent plus burn patient sitting up and alert, and wanting ice-cream in an ICU bed at the end of a week of surgery was also hard – but in a nice way," Mr Wong She said.

The role of the Australian and New Zealand Burns Association

The remarkable coordination and camaraderie between the Australian and New Zealand burn surgeons is part of the ANZBA ethos, according to Mr Rawlins. "We're a really close-knit group of people, irrespective of whether we're working in Auckland or Perth or anywhere in between," he said. "We know each other; we're a small group" and this comradeship is of enormous value when things like this happen because "the connections are already there", he explained. "The phone numbers are already in the mobile."

That support extends to video-conferencing, emailing and picking up the phone to ask 'How are you going?' and 'Can we help?' to 'I think you're doing the right thing,' Mr Rawlins said. "It's very important to have back-up from your colleagues because we're all human and, in this case, it helps to deal and cope with the Whakaari/White Island burns." This active support continues, Mr Rawlins said, because in the weeks after the volcanic eruption, when patients were transferred to Sydney and Melbourne hospitals, "we were able to really come together because we knew what our colleagues were dealing with."

For Mr Wong She, the support of his fellow burn surgeons was immeasurable. "Surgeons came to Middlemore Hospital from Brisbane and Adelaide to provide additional support at different times, for varying lengths, since the beginning of the incident," he said. "These 'fresh' minds, hands and eyes provided a much-needed boost to the team, which has had to deal with an unprecedented volume of additional work." More locally, Mr Wong She's fellow burn surgeons delayed holiday travel plans to "help operate when we needed them most at the beginning of the disaster". Other plastic surgeons within the department came to assist as well, by taking over responsibilities, such as acute on-call Plastic Surgery commitments and clinics, to allow the burn team to focus solely on Whakaari/White Island patients. The demands on busy acute hospitals continued regardless.

The Australian bushfires

When Whakaari/White Island erupted, bushfires in Australia were already causing significant damage. By mid-January, 28 people across the country had died and 10 million hectares had burned. "Every year we prepare ourselves for bushfires," Mr Rawlins said. "We anticipate that people will want to protect their properties; that firefighters will succumb to a number of burn injuries associated with bushfires."

While the size and scope of the 2019–2020 bushfires has been labelled unprecendented, and the fatalities tragic, thankfully, the number of fatalities has not matched the might of the fires, when compared to the 2009 Black Saturday fires and the 1983 Ash Wednesday fires. "What we've learned is that, for the most part, we're dealing with the walking wounded ambulant burns, rather than massive burn injuries," Mr Rawlins said of the recent bushfires. People have either lost their lives or have had smaller burns that can be treated as outpatients. It still requires ongoing vigilance, he added, as well as looking out for colleagues in other states to ensure they're coping.

The Emergency Management of Severe Burns (EMSB) course

The surgical and operational principles taught in the EMSB course were thoroughly tested during the Whakaari/White Island eruption and the Australian bushfires. Two simultaneous tragedies across the two countries pushed the burn teams to their limits, and, from all accounts, the principles of the course held true. Mr Rawlins, Mr Wong She and others in the burn community have no doubt that the EMSB course was invaluable in having multiple teams across two countries working together so effectively.

"It's vitally important that when tragedies like this happen and we've got a lot of patients with major burns, we're all speaking the same language and doing the same things," Mr Rawlins said. "It's well-recognised that it minimises death and maximises positive outcomes when major burns are managed in the standardised EMSB way."

The EMSB course is recognised as the best course in the world for the education of healthcare professionals dealing with major burns. It was created by ANZBA surgeons and is mandated by the boards of Plastic Surgery and Paediatric Surgery. Many general surgeons undertake the course as well.

Collaboration between specialties

While the double tragedy of the New Zealand volcanic eruption and the Australian bushfires has pushed the ongoing workload of burn surgeons to the next level, they are supported by the remarkable work of ANZBA. One of the key reasons burn surgeons across the two countries operate as a "tight-knit group of people" who "look out for each other" is because they're "a group of surgeons who have smudged the boundaries between General Surgery, Plastic Surgery and Paediatric Surgery – and we are burn surgeons," Mr Rawlins said.

The relationship shared by ANZBA's burn surgeons is unique, Mr Rawlins added. "I can learn a lot from a general surgeon or a paediatric surgeon and they can learn from me and, between the three of us, we are able to offer, I think, a far better standard of surgical care than if a single specialty were looking after these patients."

"Collaborative care is the 'norm' for burn care in Australia and New Zealand," Mr Wong She said. However, with the Whakaari/White Island patients the teamwork extended beyond surgical specialties to include "intensive care, anaesthetics, nursing, radiology, infectious diseases, hospital management, procurement, and New Zealand and Australian government officials – the number and diversity of skills truly beggar belief," he said.

Mr Wong She added that "collaborative care is also the 'norm' for the care of any patient, and the importance of teamwork, communication and respect, which RACS has been championing through the Operating with Respect program for the past few years, has been personally highlighted to me over the past few weeks".

Lessons learned and contributing to the medical literature

There is very little in the available literature regarding human survival in volcano eruptions. Historically, most deaths were caused by pyroclastic surges and wet debris flows, and rescue was deemed impossible from the central points of eruptions. These days, modern warning systems and continuous monitoring provide greater warning of volcanic eruptions although, sadly, a number of people believed to be on the floor of Whakaari/White Island's crater perished when it erupted.

Mr Wong She said many valuable lessons had been learned in their response to the disaster. While the academic observations and experiences are of vital importance to the global literature, there are also other lessons of a more personal nature that are important in both emergencies and everyday life.

The National Burn Service of New Zealand was developed using the experiences and lessons learned from disasters around the world, and this system was able to cope with "two, ten or in this case, 31 simultaneous referrals… so some things worked as planned", Mr Wong She said. However, the burns team encountered other challenges that required new solutions. "We also learnt the value of teamwork, communication, compassion, treating others with respect, and resilience – things that need to be reinforced as an integral part of surgery in 2020, rather than a tick-box exercise," Mr Wong She said.

"All of us who work in burns are passionate about what we do, and we want to help our colleagues," Mr Rawlins said. The burn surgeons who are looking after the Whakaari/White Island patients will present their findings at the ANZBA meeting in October this year. More importantly, he added, "those papers will be written up for the international literature so that next time this happens there will be a greater understanding of how to manage it." ■

The 2020 EMSB Program

The course is for healthcare professional who may be involved in the care of a severely burn-injured patient within the first 24 hours.

- 29 February – CHW Sydney
- 21 March – Darwin
- 28 March – Adelaide
- 4 April – Auckland
- 4 April – Melbourne
- 6 June – Perth
- 20 June – RNSH Sydney
- 20 June – Brisbane
- 25 July – Hobart
- 8 August – Townsville (tbc)
- 15 August –Christchurch, NZ
- 19 September – Sydney (Concord)
- 7 November – Brisbane
- 21 November – Melbourne
- 21 November – Wellington
- 28 November – Sydney (RNSH)

For further information, email info@anzba.org.au or phone +61 7 3325 1030.