

A career of research, innovation and surgery

Almost 20 years after the Bali bombings, Professor Fiona Wood talks about her life's work.



In 1985, Professor Fiona Wood was jolted by a realisation that defined her medical career for the next 35 years.

A young child was brought into the hospital where she was working in the south of England. He'd had a cup of hot coffee spilled down the front of his chest. The burns healed, but he was badly scarred and in need of plastic surgery.

"It hit me straight between the eyes that this boy would never move properly again and the scars would be with him for life," she said. "I became increasingly focused on how to make sure that the quality of outcome must be worth the pain of survival."

This led to a decision that her surgical career would be a combination of research, innovation and surgery. Has she achieved this goal? "It's been a long journey," she said, "and it's still a work in progress."

Director of the Burns Service of Western Australia since 1991, consultant plastic surgeon at Fiona Stanley Hospital and Perth Children's Hospital, and Winthrop Professor at the School of Surgery at the University of Western Australia's Faculty of Medicine, Professor Wood packs a lot into her days. But this isn't surprising, considering that she once said, "There's absolutely no mileage at all in getting up in the morning to be average."

"For whatever reason, I've been driven and motivation is contagious but illusive. I feel I'm very fortunate. I found something I'm passionate about, and to work with an amazing multidisciplinary clinical and research team is exciting, exhilarating, exhausting and, at times, overwhelming," she said. "I absolutely get all that, but for me it's a privilege."

The Bali bombings

In October 2002, Professor Wood faced one of the most challenging incidents in her surgical career. One, it turns out, that resulted in her being made a Member of the Order of Australia, being awarded the Australian Medical Association's Contribution to Medicine Award, and being recognised as an Australian Living Treasure. She was also awarded the 2003 and 2004 West Australian of the Year, and was Australian of the Year in 2005.

The Bali bombings left 202 people dead and hundreds injured. Twenty-eight of the seriously injured were airlifted



from Denpasar to Royal Perth Hospital under the care of Professor Wood. She coordinated four operating theatres that ran concurrently for five days, as well as 19 surgeons and 60 nurses, and was able to provide surgery and post-operative care to 28 badly burned bomb victims.

Looking back, Professor Wood said she was grateful that her team had participated in significant disaster planning exercises as a result of the 2000 Sydney Olympics. The plans were then expanded in collaboration with and with the support of Woodside Petroleum, the Royal Flying Doctor Service and the Department of Health. The resulting recommendations were signed off by the Health Minister's Advisory Council two months prior to the bombings. "We had a level of understanding about how to respond and the philosophy 'We do best what we do every day, but we have to work out how to escalate to maintain the quality of care as the number of patients increase'," she said.

The Bali bombing patients received a standard of care that Professor Wood and scientist Marie Stoner had developed over the previous decade. "We started using cell-based therapies in 1993, and by 1995 we were spraying skin cells onto the wounds. By 2000, we were using a point-of-care device, and by 2002 we had invented, developed and built a medical device for the point-of-care harvesting of cells. The autologous cells were used on the prepared wounds in isolation and with traditional skin grafting techniques."

Caring for your team and yourself

On teamwork, Professor Wood said that the time invested in training a team is important because "when push comes to shove, the reliance on each other is extraordinary". The team expands as well, she said, and "because we have such a cohesive team, the hand of friendship goes out to all those in our buddy systems to collaborate".

Beyond teamwork, it's essential to look after your own health, as well as your education, and it's those things that can be uninteresting that are important, such as adequate rest, eating well and sensibly, and staying fit, Professor Wood said. "I was in the ocean this morning in the dark because if I don't go in the dark, at this time of year, then I'll miss that start to the day with exercise," she said. Every day

she does some form of exercise because "by looking after yourself, you have the capacity to look after others."

A broader education

Professor Wood is an advocate for students studying dual degrees, such as science and commerce. "It enables you to look at a single problem through multiple lenses and provides a diversity of solutions that are more likely to have a positive outcome," she explained.

"We live in a complex world with extraordinary technology and knowledge. Translating information to knowledge to experience facilitates innovative solutions," Professor Wood said. "We need to push forward and collaborate and link with people who have a broader view, or a different view to us."

The Fiona Wood Foundation

Since 1995, when Professor Wood began spraying skin cells onto burns patients, she has been working towards scarless healing. Understanding the triggers to regeneration as opposed to scar repair is an ongoing journey, but one she works on continuously.

Along with Stoner, she established the McComb Foundation in 1999. It was named in honour of Dr Harold McComb, and renamed the Fiona Wood Foundation in 2012. The Fiona Wood Foundation is the primary support organisation for the Burns Service of Western Australia, and is affiliated to and collaborates with a range of prominent institutes and organisations. It includes a research hub dedicated to all facets of burn care along the patient journey, including cell-based therapies to rehabilitation. The Fiona Wood Foundation relies on philanthropic support from a generous community to facilitate research, education and innovation.

Collaborating to develop 3D skin

In June 2020, the Medical Research Future Fund awarded a grant to a team of researchers to develop a treatment for acute and chronic skin wounds. Led by Associate Professor Pritinder Kaur, they advance the work on 3D printing of skin by the Burn Injury Research Unit of UWA and Inventure to the next phase – developing a clinical prototype, a 3D bio-printing platform using stem cells to improve the treatment and healing of wounds and scars.

The burn surgery research expertise of Professor Wood and Dr Mark Fear, two of

seven key investigators on the project, is integral to the team's goal of 'in situ tissue-guided regeneration to regenerate skin'. The current method for deep burns is to put a scaffold on, wait a few weeks for it to repair the deeper elements of the skin, and then repair the superficial area with skin grafts or skin cell spray. What the team hopes to do is spray on the dermis, as well as the epidermal cells.

"We're trying to print the whole of the skin – not just the skin cells, but the chemistry of the skin framework. So instead of putting the scaffold at the base of the wound, we want to spray the scaffold onto the wound with the cells," she explained. In a single process they'll be able to tailor the repair to exactly how much is missing.

"It's a collaboration that's built on work already in play and it allows us to do better," Professor Wood said. "We've started the preliminary work, but have a long way to go."

Future plans

"We get to know our patients really well," Professor Wood said. Some have gone on to do remarkable things, and she takes an active interest in their endeavours. Unsurprisingly, when asked about her dream for the future she explains what she'd like for her patients.

"My dream is that we can print in the basic elements within a wound that not only have the raw materials to facilitate regeneration of the tissue, but with analgesic properties and anti-microbial properties, so that we can sort out the pain and infection issues and link that with a visualisation program so that we use the power of the brain to drive a neurologically intact repair. Then I wake up because that's my dream. I often say to the guys – 'One day we'll all be able to think ourselves whole.'" ■

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Main: Professor Fiona Wood

Inset: A recent book on Professor Fiona Wood for 10 to 13-year-olds from Wild Dingo Press ISBN 9781925893281