Mohs skin cancer surgery has a very high 'cure' rate

Mohs micrographic surgery is a staged surgical approach to managing skin cancers allowing immediate histological assessment of tumour margins while preserving maximal surrounding healthy tissue

Dr Justin Bui, Consultant Dermatologist.

Mohs micrographic surgery has been recognised as a highly effective option for the removal of certain skin cancers, because the very precise surgical technique can achieve up to a 99% success rate in preventing a recurrence of the tumour.

Consultant Dermatologist and Mohs specialist Dr Justin Bui, an AMA (WA) member, says the procedure also preserves the maximum amount of healthy tissue around the cancer and aims to minimise scarring.

Dr Bui says the other advantage is that the patient will leave the surgery with confidence that the histologic examination of their skin cancer has been completed on the day, rather than requiring further follow-up for pathology results. That's because the dermatologist removing the tumour is also able to interpret the tissue samples in the laboratory to ensure no cancer cells remain.

Studies have shown that the recurrence rate for primary BCCs after Mohs surgery is 1.4% to 4.4%, compared to the 4.1% to 12.2% rate for standard wide excision.[1,2,3]

"In the scenario of a recurrent BCC," Dr Bui says, "Mohs surgery is an effective option yielding recurrence rates of 2.4% to 6.7% in comparison to up to 13.5% if repeat wide excision is opted for."

Dr Bui, who is the Honorary Secretary of the WA faculty of the Australasian College of Dermatologists, says an important first step in Mohs treatment is a biopsy of the skin cancer.

"This is so we can confirm that the target tumour is best treated with Mohs surgery," he explains, "because the biopsy may reveal a diagnosis inappropriate for Mohs surgery – for example, lymphoma that's presenting on the skin or an amelanotic melanoma – so you need to know that before proceeding."

In Mohs surgery, the tumour is removed in a series of stages, and the excised tissue is histologically analysed in the laboratory for cancer cells at each step of the procedure.

"The patient has local anaesthetic infiltrated and the tumour is then de-bulked using a curette or a scalpel, and that will provide us lesional tissue to correlate with the margins," Dr Bui explains.

"The tumour is excised conservatively in the first stage, with a 45-degree bevel yielding a dome-like tissue specimen. This enables us to flatten out the tissue for mounting onto slides to examine the peripheral and deep margins.

"That gets prepared, inked and colour-correlated to a map of the area on the patient's skin. This mapping process is critical to enable any residual tumour identified microscopically to be traced back to an exact anatomic location on the patient."

The tissue is sectioned into smaller blocks, rapidly frozen, and then cut using a cryostat in a horizontal plane into very thin sections, five to seven microns. The sections are then stained using haematoxylin and eosin before being mounted onto microscope slides, and the dermatologist examines the tissue margins for cancer cells.

"Once those slides are processed," Dr Bui explains, "and, let's say, the majority of the slides are clear but a small nest of

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tumour cells remain at the nine o'clock mark, then I'd take another separate stage, just focusing on that nine o'clock margin, and continue until I am able to confirm the tissue is tumour-free."

In wide excision for a basal cell carcinoma (BCC), the doctor would apply a conventional margin of 3mm to 4mm all the way around the cancer, excise the entire area, close the defect, and refer the tissue for examination by a pathologist.

"An estimation is made as to where the tumour starts and finishes based on macroscopic and dermoscopic inspection," Dr Bui explains, "and extra surrounding tissue is removed, sacrificing potentially healthy skin in the process of empirically removing tumour and subclinical extension. Definitive pathology results are generally available several days to weeks following the procedure.

"Whereas with Mohs surgery, pathologic examination of the tissue occurs on the day. That's why a fairly conservative first stage can often be utilised and then allow further tissue removal to be directed by the results seen under the microscope.

MOHS FACTS

- **Mohs day surgery is widely regarded as a highly effective modality for the treatment of basal and squamous cell tumours, particularly in anatomically sensitive or high-risk areas. It is also used for rare tumours such as sebaceous carcinoma, extra-mammary Paget's disease, and microcystic adnexal carcinoma.**
- **The staged removal of the cancer is typically performed as a day surgery under local anaesthesia. Due to the staged nature, the day procedure can take several hours or longer, depending on tumour characteristics and the number of stages required.**
- **In WA, there are 14 dermatologists accredited as fellowship-trained Mohs specialists by the Australasian College of Dermatologists.**

"I often explain to patients that the main advantage of Mohs surgery is the conservation of healthy tissue. I am aiming to remove only lesional tissue and stop as soon as the tumour is clear. While we are talking about mere millimetres, these are important to patients when faced with skin cancers in cosmetically sensitive areas such as the nose, lips, around the mouth, eyelids, eyebrows and ears."

While offering a single, definitive treatment episode, the staged removal of the cancer means it is difficult to predict how long the procedure will take – it can range widely from several hours to most of the day. As a result, patients need to be prepared for this and avoid other conflicting commitments.

"To be fair, though, a reasonable amount of time is related to tissue processing," he says. "So, it is important that patients bring activities such as books, magazines or puzzles to keep them occupied throughout the day."

Dr Bui says: "To be recognised as a Mohs specialist in Australia, completion of the four-year dermatology training program is required, followed by an additional rigorous fellowship encompassing surgical skills and pathology."

There are currently 14 doctors in WA accredited as Mohs specialists by the Australasian College of Dermatologists.

Dr Bui cautions that while Mohs surgery has advantages – even for rare cancers such as sebaceous carcinoma and microcystic adnexal carcinoma – patient circumstances, comorbidities, as well as tumour factors all need to be considered before deciding if Mohs surgery is the most appropriate treatment. ■

References available upon request.

Let's mandate sunscreen in schools to save lives

Dr Sarah Page
AMA (WA) Dermatology Representative

Australia has the highest rate of melanoma in the world and it's the most common cancer among young people aged 18-24, so I believe it's well past time for government to make the use of sunscreen mandatory in our schools.

We already have the SunSmart schools campaign and the "no hat, no play" policy – but not every school signs up to it, and I don't think it goes far enough.

I did a talk for my son's Year 1 class a couple of years ago, and there were less than 30% of children who were wearing any sort of sunscreen; and this was in January or February.

I put sunscreen on my children every morning, but then I know it's gone by lunchtime. It's all gone. You can send them to school with roll-on, but your seven-year-old is never going to be able to achieve any sort of effective sun protection from that, even if you try your absolute hardest. They do have sunscreen in schools, but it's not promoted.

They do it in daycare. They put sunscreen on everyone, all day long. They've never had a child getting sunburned at daycare. That's their policy. They know that three-year-olds can't put sunscreen on, so as part of their responsibility to the child they put sunscreen on them.

I don't know why our responsibility for sun protection in primary school only goes to hats.

It needs to be like what happens with Crunch&Sip, which has been going for 20 years. They realised children weren't getting enough vegetables, fruit and water. So they said, at whatever time it is in the day, they all have Crunch&Sip. And we, as parents, make sure our children have water bottles and other stuff. Obviously, that's quite important. And I think it needs to be like that – a time set aside for applying sunscreen.

What I want is maybe three or five minutes every day, just before lunch, dedicated to everyone putting on sunscreen, so that it becomes habit-forming like brushing your teeth. Because that's what I noticed in my own children.

My seven-year-old is getting to the point where he can put sunscreen on himself. My nine-year-old now, after about three years of supervised sunscreen application, just does it without me asking, and applies a reasonable amount. It's like the habit of brushing your teeth, where you have to supervise them for the first three or four years, and the technique's pretty bad to start with. But they know that brushing their teeth is important and eventually they do it without you having to check every single time.

So what I'm proposing is that schools stop at, say, 11.55am – across the nation – and then for three or five minutes everyone does sunscreen, so that it becomes habit-forming.

"What I want is maybe three or five minutes every day, just before lunch, dedicated to everyone putting on sunscreen, so that it becomes habit-forming like brushing your teeth.

I'm trying to get a pilot up in a primary school, so people can see how it can be done. What I'm working towards is having one pilot school, and then surveying the parents and the school for their views on the project – which will hopefully demonstrate implementation was successful.

The key is trying to work out how we can do it in a way that doesn't put a massive onus on the staff of the school. Teachers would just be supervising, though some are going to have to do it for the kiddies.

The next step is how do we get teenagers to do this? In some schools, they get dermatologists or plastic surgeons to come in and 'show and tell' horror stories. It will probably work for a couple of months. A plastic surgeon comes to the high school and talks about people having their ears cut off because of sunburn, and the students would be thinking, "Oh, yeah, I'd better wear sunscreen". But then by the time summer comes again, and all their friends are at the beach trying to get tanned and wearing board shorts and bikinis, they will probably forget about that. Because they're 17 and don't think they'll ever get old or get skin cancer.

I think the really hard thing for teenagers is trying to work out how to make putting on sunscreen and covering up "cool" in some way. Like sunscreen itself, covering up is not that cool. I think the only way you can do it is to start when they're young in primary school where it's habit-forming. I mean, if we suddenly started to get teenagers to

try and brush their teeth, they'd likely say, "Oh, no thanks, that doesn't sound like much fun". Whereas if you've been doing it religiously since you were little... Teenagers are still brushing their teeth, presumably.

There's also the option of bringing in a young person who's suffered the consequences of not putting sunscreen on or not wearing a long-sleeved shirt. I think that's a good idea.

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Having someone going into a high school and saying, "I didn't put on sunscreen and I lost a massive part of my arm, and I'm only 25" would be far more impactful than a plastic surgeon or a dermatologist going in and saying "do this" and "don't do that".

I have mused about another way to make teenagers sit up and take notice of the risks of severe, blistering sunburns which, in younger age groups, are very predictive of having melanomas long term.

My colleague and I do skin checks for Australian Test cricketers, the women's team in Western Australia, and the men's team; and I've done some of the English Test team as well. Cricketers are about 25 years ahead in terms of the damage that's being done to their skin, because they're in the sun 20 times more than anyone else.

We spend a lot of time with the cricketers trying to get them to wear sunscreen because not all of them do so regularly. And the main thing is ears. I talk a lot about ears. Every time they come for checks, everyone's got these terribly freckled ears. That's the bit that nobody puts sunscreen on, ever.

If we could get some test cricketers into schools to promote sunscreen use, that would be amazing. And I look forward to the day when our responsibility for sun protection in schools extends beyond hats. ■

Tooling up with better tech

One of the improvements in laser treatments is that it has significantly reduced the downtime for patients, says **Dr Louise O'Halloran**

Laser technology might have transformed the landscape of dermatology in many ways, but Consultant Dermatologist Dr Louise O'Halloran says it hasn't taken over the day-to-day practice of what she does for patients.

"A lot of what we're doing as dermatologists is managing skin cancer requiring surgical excision or, alternatively, treating someone with psoriasis or eczema who may need to consider topical therapies, oral immunosuppressives, biologics, or narrowband UVB phototherapy.

"Lasers are simply another tool in our toolbox that we use for particular conditions, to assist in managing the conditions we treat in the field of Dermatology. They can be very helpful, with good evidence from published research on their benefits.

"Lasers are far more sophisticated than they were, say 15 years ago, because the technology wasn't as good then. Lasers have been used in Dermatology for some time now. We have used a vascular laser in our Dermatology department at Perth Children's Hospital for many years, for port wine stains and ulcerated infantile haemangiomas."

Dr O'Halloran, an AMA (WA) member, says one of the improvements in laser treatments is that the downtime for patients has reduced significantly.

"This makes it more accessible to patients, because previously with some CO2 laser treatments patients might have a downtime of one to two weeks where their skin was incredibly swollen, which makes that treatment much more undesirable," she says.

"The improved technology, with lower downtime through fractionated CO2, means patients can go back to their usual activities a lot sooner."

Dr O'Halloran says laser treatment can be used as one part of a treatment plan for a lot of patients.

"It's not replacing traditional treatment options, but it certainly can be used as an adjunctive therapeutic treatment for particular skin conditions," she says, "or as an alternative, for example, for patients who don't necessarily want surgery but just want to explore other options that are non-surgical or non-cream-based treatments for pre-cancerous cells.

"You're going to get a longer-term benefit by considering using lasers for something like rosacea. Not all types of rosacea, and it's important to stipulate you're not going to be able to clear all types of rosacea just with a vascular laser. You will do it in conjunction with creams and oral agents. The laser is used as an adjunctive part of a treatment plan."

Dr O'Halloran says there are broadly three types of lasers in dermatological use: vascular lasers that treat redness; pigment lasers that treat pigmentary troubles and pigmentation; and CO2 lasers, a "resurfacing" type that can treat a wide range of conditions. With more modern lasers, however, settings can be changed on these devices, where one device can treat a more diverse range of conditions.

> **"Laser devices are not taking over all the things we do as dermatologists. It's simply another tool to assist in managing the various conditions we treat in the field of Dermatology.**

"An example of a medical condition where you can use a vascular laser would be port wine stains in babies," she explains. "Another would be infantile hemangiomas, which can become ulcerated during their rapid growth phase. Vascular lasers can assist significantly in the treatment of ulceration and also improve erythema.

"Moving on to adults, you can use it for rosacea and it's quite effective especially in erythrotelangiectatic rosacea. You can use it for post-inflammatory erythema after acne has resolved; and following surgical scarring, which would be deemed more cosmetic. So, there are medical conditions and more cosmetic uses.

"If we look at a CO2 laser, you can use it to manage superficial skin cancers and solar keratoses, or a condition called actinic cheilitis where you have precancerous changes to the lip; or for people who have quite severe rhinophymatous rosacea where they get a thickened and swollen nose, due to sebaceous gland fibrosis.

"CO2 lasers also assist in the management of many skin issues, including keloidal scarring and other scars such as

Consultant Dermatologist Dr Louise O'Halloran examines a patient using a MaggyScan Portable LED Magnifier Lamp.

burns scars following surgeries. The Burns Unit at Fiona Stanley Hospital has used one for many years to assist in improving the functional and aesthetic appearance of patients' burns scars."

Dr O'Halloran says another advance in technology over the past decade or more has been to enable the doctor to program the settings on the laser to suit the patient's skin and what you're trying to treat.

"You can make it a stronger setting or slightly less strong depending on the patient's skin colour and the amount of sun damage they have," Dr O'Halloran says. "You can manually change the settings to make it more bespoke depending on the individual patient you're treating; whereas historically, it was harder to change the settings because the machine just wasn't as advanced in its technology."

Another advancement allows for the treatment of darker skin types.

"You classify skin pigmentation through the Fitzpatrick skin type," Dr O'Halloran explains, "so patients with a higher Fitzpatrick skin type will have darker skin. You can now use these lasers, with caution and under the right supervision, on darker Fitzpatrick skin types.

"You still do need to be very careful, ensuring you do a full skin check of the treatment area and the patient, and ensure they've got no underlying skin cancers before commencing treatment. It's very important that you assess this before treating with any laser." ■

"CO2 lasers assist in the management of many skin issues, including keloidal scarring and other scars such as burns scars following surgeries. The Burns Unit at Fiona Stanley Hospital has used one for many years to assist in improving the functional and aesthetic appearance of patients' burns scars.

LASER FACTS

- **Vascular lasers treat redness; pigment lasers treat pigmentary troubles; and CO2 lasers treat a wide range of conditions.**
- **Advances in the technology mean that patients with higher Fitzpatrick skin types can now also be treated.**
- **With these increased technological advancements of the lasers, patient downtime has also reduced significantly, so patients can get back to their usual activities a lot sooner.**

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