

'Problem' scars: keloids, acne and harm scars

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All cutaneous scars result from some form of injury to the skin, whether surgical, traumatic or infective. The pathophysiology and resulting anatomical changes in these scars are diverse, and so must the treatment be.

Three types of scars are often referred to as 'problem' scars – keloids, acne and harm scars. Patients may believe they need to 'just live with the scars' as there aren't reliable treatments available. This paradigm has changed over the past decade and 'problem scars' now have solutions.

CO₂ laser works by vaporising thin columns of scar tissue called micro-thermal zones, leaving undamaged adjacent skin to allow rapid re-epithelialisation within days. This minimises risks while allowing laser energy to penetrate up to 4mm into the scar and stimulate remodelling of deeper scar collagen.

By using this advanced technology with the most powerful medical CO₂ ablative lasers, we can treat scars which previously had very few options or where the risks of treatment outweighed the benefits.

Keloids

Keloid scars are indeed a problem. They are itchy, painful and grow larger if you try to cut them out. Some keloids (such as ear keloids) can be excised and treated with immediate pressure devices and/or radiotherapy.



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However, these adjuvant therapies are not without discomfort or the (however small) risk of malignant change. Many areas such as the sternum or face are much less easy to compress and far less suitable for radiotherapy.

In our experience, CO₂ laser combined with immediate steroid injection provides excellent relief of itch and pain and improves scar thickness significantly. Most patients with keloids require 3-6 treatments for maximal effect (as opposed to hypertrophic scars, which usually require 1-3 treatments) but can get an excellent result with a single treatment as shown in Fig. 1 & 2.

Acne scars

The introduction of isotretinoin has improved the outcomes of many people who suffered with severe acne and reduced the burden of scarring. However, acne scars still occur and can cause significant distress.

Resurfacing full-field CO₂ laser treatments for acne scars, though very effective, were historically limited to paler-skinned people due to very high rates of hypopigmentation caused by the 14 days it took for the skin to re-epithelialise. This prolonged period of raw skin was painful, and risks of infection and scarring were not insignificant.



Fig 1: Pre-laser keloid chest



Fig2: Post laser keloid chest



Fig3: Pre-laser acne scars type 4 Fitzpatrick skin



Fig4: 4m post laser

Key messages

- 'Problem' scars such as keloids, acne scars and harm scars can be significantly improved
- CO2 laser is a game-changer in the treatment of problematic scars
- Improving scarring can require a multi-modal approach, combining laser with surgery.

Modern fractional resurfacing CO₂ lasers result in healing within 5-6 days, meaning tanned and darker-skinned individuals can safely have this treatment for scars as well (See Fig 3 & 4).

Harm scars

Harm scars are very common. In 2023, there were almost 25,000 hospital admissions in Australia for intentional self-harm, and it is estimated that only 10% of all cases are recorded. These injuries are

more frequent in younger people, however, older people often seek improvement of scars that were created when they were younger.

Awareness of the spectrum of mental health issues and the normalisation of seeking help for these conditions has improved dramatically over the past 10 years, though the stigma of harm scars or the reminder of a painful time in their life means that many people with harm scars would choose to improve them if they could.

If harm scars are still raised and/or red they can be reliably improved with CO₂ laser which makes them flatter and paler.

Once flat and pale, cosmetic tattooing can match the colour of the surrounding skin and disguise these fine lines. Colour-match and pigment technology has improved significantly, and this can be an excellent solution once the scars are flat (raised scars won't take tattoo

pigment; they require flattening with CO₂ laser first)

Harm scars which are widened and/or numerous and linear, even when they are flat and the same colour as the surrounding skin, are still obvious as linear scars. These scars may be more appropriate for surgical revision to change the direction of scars to disguise the linear nature (using plastic surgical techniques like z-plasties) or in extreme cases, resurfacing the entire area with a skin graft.

In summary the treatment of scarring has progressed over the past 15 years, and we now have some answers to our 'problem' scars. **MF**

ED: The authors are all specialist plastic and burns surgeons

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