

LIFE IS FULL OF ITS BUMPS AND BRUISES. Who among us does not have a knee or elbow scar from a fall off a bike? I remember a phase where I must have fallen every few weeks running on a sidewalk, with a scarred up knee to show for it.

The healing response from these sorts of injuries usually occurs in a predictable sequence. First, the tissues respond with inflammation that can last anywhere from 7 to 14 days. The increased circulation caused by inflammation brings in a flood of specialized cells to clear out wound debris. The next phase, fibroplasia, lasts for 7 to 10 days, and may overlap part of the inflammatory response. Fibroplasia is critical for establishing the presence of cells that begin to produce the foundation for new tissues. The final phase, remodeling, can last for weeks as tissues mature and regain their strength.¹

This is not the case when complex regional pain syndrome (CRPS) is involved, since nerves misfire and normal healing processes that are necessary do not occur. Although one study of 1,006 patients found that less than 7% of people with CRPS are affected by chronic open wounds², this small percentage does not diminish the importance of addressing this issue. When left untreated or treated insufficiently, the wound can rapidly move to an infected state that jeopardizes the rest of the limb. Yet, because of the small proportion of people with both CRPS and chronic open wounds, there is very little literature to guide clinicians in the best practice.

Looking closer at issues that complicate skin integrity, vascular changes are the ones most reported, and the most problematic. Vascular changes have

shown varying relationships between changes in the sympathetic nervous system and temperature differences.³ By assessing skin samples, others have noted changes in nerve innervation of hair follicles, sweat glands, and blood vessels.⁴

For those who have issues at the skin surface, chronic edema is frequently encountered. Using the same population as



Wounds that Won't Heal

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previously mentioned, 40% of those with complications presented with infection, 35% with ulcers and 36% chronic edema. Chronic edema has been consistently linked to further development of infection and additional complications. In the general population, edema can be managed with compression garments or other mechanical compression treatment, but with CRPS, this treatment is frequently intolerable without additional pain interventions.

Therefore, other strategies are employed, which can include lumbar sympathecto-

my, sympathetic blocks, or other similar treatments that have not only provided a degree of pain relief, but also assisted in healing the lesions.^{4,5} Some have even resorted to indwelling epidurals to provide a tolerance for mechanical compression to aid in healing.^{6,7} In addition, hyperbaric oxygen has been used in wound treatment.⁸ Although research is still in progress, some results are promising. None of the studies, however, involved the wounds of those with CRPS.^{8,9}

Aggressive treatment may also include surgical reconstruction to aid in arterial blood flow. This even has its challenges in those not affected with CRPS.¹⁰ As with any surgical intervention, the surgery itself can pose a risk of increased pain for those with CRPS. It is estimated that 6% to 10% of patients with CRPS will require surgery on the affected extremity for various reasons.¹¹ If provided with appropriate interventions, the probability of negative consequences can diminish. The recurrence rate of those receiving a stellate ganglion block with a surgical procedure was only 10%. This was also seen in those with intraoperative intravenous

regional anesthesia using clonidine and lidocaine. The intravenous anesthesia was felt to be superior, given the inherent difficulty and complications with a stellate ganglion block.¹¹

Other skin conditions include ulcers, bullae and other types of wound formation. Infection is a frequent complication of any skin lesion. Typically infections are addressed with antibiotics. However, topical treatments and oral antibiotics have been minimally effective in those with CRPS.⁷ Laan et al noted treatments