

## SPECIALISTFOCUS



# Optimising Outcomes

## Skin Injury, Scars and the Healing Process

Dr Mark Tang, Consultant Dermatologist  
National Skin Centre

The last 20 years have seen phenomenal strides in our understanding of skin injury and the wound healing process. At the molecular level, wound healing is a complex but exquisitely well-orchestrated interplay of many different cells, cytokines and growth factors, progressing orderly through the various stages of wound healing, ultimately culminating in a healed wound. As doctors, the healed wound, or scar, is critically important to our clinical practice as the patient's "treatment outcome" is often judged by how successfully and aesthetically the healed wound appears.

### The Healing Process

Acute skin injury results in the activation of the healing cascade which consists of four main overlapping phases; namely, haemostasis, inflammation, cellular proliferation and wound remodelling. An acute wound progresses linearly through these phases in a predictable fashion. In contrast, a chronic, non-healing wound is "stuck" in one of these phases of healing, and remains unhealed after six weeks. Paramount to the healing process is an adequate blood supply and priority should be given to re-establishing vascular supply as far as possible.

### Moist Interactive Wound Healing

Animal and clinical studies have shown the importance of a moist wound environment to ensure optimal conditions for cell migration and wound healing. New occlusive dressings provide a protective moist environment that facilitates epithelisation, promotes granulation and prevents wound infection. Examples are hydrogels, hydrocolloids and film dressings.

### Acute Wounds – How to Achieve the Perfect Scar

Asian patients are also more keloid-prone, especially over "at risk" sites such as the jawline, chest and upper back. Proper surgical techniques such as incising along skin lines and minimising wound tension by careful undermining and suturing are also important. Post electrocautery and laser wounds that are left to heal by secondary intention can be "chemically occluded" with topical antibiotics or paraffin ointment to maintain moisture balance. The new soft silicone wound contact layers are atraumatic and help

minimise pain during dressing changes. Finally, post-operative scar support using silicone sheets may be helpful in preventing scar widening and hypertrophic scars.

### Chronic Wounds – Back to Basics

Chronic wounds are stuck in a vicious cycle of inflammation, infection and tissue destruction. The approach to the non-healing wound is to establish a diagnosis, prepare the wound bed and maintain a moist interactive environment. A skin biopsy is often useful in the re-evaluation of the diagnosis. Chronic leg ulcers that can mimic venous leg ulcers include vasculitic ulcers, pyoderma gangrenosum and malignancy. A correct diagnosis will allow proper treatment to be instituted. Wound bed preparation can be remembered using the **T.I.M.E** mnemonic; **T** for tissue debridement of necrotic, unhealthy slough, **I** for infection control, **M** for moisture balance and **E** for assessing the wound edge for closure. To this end, the use of advanced dressings such as the multi-functional silver based dressings can provide tissue, moisture and anti-microbial control.

### New Advances in Wound Care

Molecular and technological advances have led to exciting new treatment options for acute and chronic wounds. New advanced dressings are now multi-component and contribute actively to the healing process. Cytokine and growth factor manipulation such as the use of fibroblast growth factor has led to faster healing and better scar outcome for acute surgical wounds. NSC has also embarked on a new research project using autologous non-cultured cellular grafting to treat recalcitrant chronic wounds.

### Putting the Patient First – Holistic Wound Care

The management of acute and chronic skin injury is a dynamic process that requires our clinical input to facilitate endogenous wound healing. Equally central is a patient-centred, holistic approach that focuses on quality of life issues such as pain, cost, caregiver issues, time and patient expectations. Only then, can we ensure the optimal outcome for our wound patients.