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The 5 years since the last Wound Healing Supplement have brought changes in our understanding of the wound-healing process, both diagnostically and therapeutically. Applying evidence-based medicine wherever possible, the approaches to healing complex wounds have become more effective and less costly. This Supplement should outline, review, and update the reader on many of these changes, so that practitioners can modify their approach to wound healing and possibly incorporate this relevant information into their practices.

The Supplement starts with an update on the role of stem cells in wound healing. It provides a balanced view of what is currently available and what one can realistically expect in the future. Using gene therapy, the military has been able to evaluate the contents of wound fluid and determine whether the wound is ready for closure. This has been very effective in treating military casualties with blast injuries complicated by infection. The role of biofilm in inhibiting wound healing is being more clearly elucidated, thereby helping to explain why certain wounds are recalcitrant to healing. The role of nutrition is often overlooked as it pertains to optimizing wound healing, and therefore an update on its role is included in this Supplement; it should prove to be very helpful to the provider who cares for wounds of all types.

Once the wound is clean, there are a number of wound-healing products that can be applied to the wound surface to help it heal. Growth factors and biologics provide many of the missing ingredients to jumpstart the wound so that it can go on to heal successfully. Many of these products were introduced several years ago, and our understanding of how to use them with greater effectiveness has grown. The critical roles of wound bed preparation, addressing senescent cells at the wound periphery, and adequate vascular blood supply are better appreciated and have allowed the use of these products to be more effective. Growth in the use of dermal templates has helped in the coverage of wounds that in the past would have required complex surgical solutions.

Mechanical forces also help in healing wounds, and their role is being better delineated as the use of these adjuncts grows. Electrical stimulation, ultrasound, and subatmospheric pressure all physically affect the wound surface both to control bacterial proliferation and to stimulate wound healing. Ultrasound breaks up biofilm, débrides the wound, and stimulates mobilization of wound-healing components. Subatmospheric pressure wound therapy has been very effective as a primary dressing after treating the wounded combat soldier to ensure a controlled wound environment during transfer from overseas. Its role in stimulating the formation of granulation tissue is better understood. In addition, its use has expanded to include revascularizing dermal templates, helping skin graft take, improving flap survival, and stabilizing skin incisions. Its effectiveness in treating combat wounds has been critical in decreasing infection and saving tissue.

The use of hyperbaric medicine in wound healing has been controversial, although its role in treating radiated wounds is established. Dr. Thom gives an excellent overview of why hyperbaric ox-
ygen therapy might be effective based on ground-breaking research that he and his laboratory have completed. He has shown that hyperbaric oxygen mobilizes stem cells to the wound site. This finding can guide future research to help us better understand how, why, and when it works.

The next articles deal with the pros and cons of the current revascularization techniques of the lower extremity. While traditional open bypass surgery has demonstrated excellent long-term results, endovascular surgery has encouraging short-term results. With improving endovascular techniques, the outcomes have continued to improve. The two articles and the commentary allow the reader to evaluate current evidence and delineate where each technique might be most effective for a given patient.

The next two articles deal with the treatment of bone infection with antibiotics and with surgery. The role of each is defined and the most effective ways of combining their use to treat osteomyelitis is nicely laid out. The role of biofilm in these infections helps explain why these infections are so hard to eradicate. By better understanding how difficult it is to destroy biofilm, the combined use of surgery and antibiotics can be used more effectively to treat osteomyelitis.

The next three articles deal with complex soft-tissue reconstruction of the lower extremity. The added wound-healing options provided by new techniques have expanded the modalities in a surgeon’s armamentarium. It clearly requires a team effort. The orthopedic surgeon and/or the foot and ankle surgeon has to successfully treat the skeletal abnormalities while the plastic surgeon has to deal with the soft-tissue reconstruction. The two articles are written by the world experts on the topic and provide critical insight into how to coordinate care and how to pick the correct solution for various lower extremity problems.

If salvage is not possible, amputation can be the outcome. Amputation need not be viewed as a failure if it yields a better functional limb with prosthesis than a salvaged nonfunctional limb. Understanding the biomechanics of ambulation and its constituent critical components factors into the decision-making algorithm for functional limb salvage. When the final functional result is used as the criterion for deciding on salvage versus amputation, we may give the patient the most realistic way of predicting outcome.

Nerve injury and compression play a large role in the postoperative function of the limb. The article and the following discussions help put nerve surgery in perspective. Restoring some degree of sensation is critical in preventing further injury. Getting rid of pain can render a useless leg useful.

Venous stasis ulcers are frequently seen in wound clinics, and one article elegantly explains how to best address this difficult wound. Compression, venous ablation, and edema control have been the mainstays of care. How to combine all three to achieve a better longstanding result is difficult, and this article deals with this nicely.

We finish with what might be the two most important articles of the supplement. The first deals with the cost of diabetic foot care and how to reduce it while delivering better care. The second deals with how to develop and incorporate evidence-based medicine in the clinical realm.

In sum, this Supplement aims to give the reader an understanding of current concepts in wound healing in 2011. We hope it will provide readers with ideas on how to improve their own health care delivery. It will also educate the wound care specialist in the vast array of treatment options and disciplines that can assist in healing wounds. Finally, we hope this Supplement inspires newer physicians to do the research needed to continue advancing the field of wound healing, the fundamental cornerstone of our specialty.

REFERENCES

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