

Introduction to “Current Concepts in Wound Healing: Update 2016”

Jeffrey E. Janis, MD
Christopher E. Attinger, MD
Lawrence Lavery, DPM, MPH

Columbus, Ohio; Dallas, Texas; and
Washington, DC

Wound healing is fundamental to all medical and surgical specialties that treat acute and chronic wounds, whether traumatic, metabolic, infectious, oncologic, or iatrogenic. The history of wound healing dates back to the Egyptians, with the earliest known medical document known as the Smith Papyrus from 1400 BC.¹ Since that time, there has been an ever-increasing understanding of the physiology and pathophysiology of wound healing. We have come to better understand the multiple intrinsic and extrinsic factors and their interplay that help give insight into diagnosis of wounds, their etiologies, and their treatments.²⁻⁶ Despite the advances in understanding, technique, and technology, however, there is still much to learn. This is best exemplified by the millions of acute and chronic wounds reported every year and the fact that no less than \$19 billion dollars are spent annually on therapies to treat these vexing problems.⁷ And despite recent advances in basic science, therapies and surgery, the proportion of wounds that heal is still very low.⁸⁻¹⁰

To consolidate high-level information on wound healing in the context of a rapidly expanding, constantly evolving, increasingly confusing world surrounding the comprehensive care of these wounds, we offered the first wound healing supplement to the *Journal* in June 2006.¹¹ Five years later, we reprised the topic in the second edition of the wound healing supplement, published in January 2011.¹² Now, yet another 5 years later, it is time to we review the current landscape of wound healing yet again to be sure all practitioners have

a “one-stop shop” reference guide to current concepts on associated topics on the subject.

In the following 300+ pages of critically peer-reviewed content, we have invited experts from around the world to address topics, such as the basic science of wound healing, the role of biomarkers, current understanding around stem cells and their role in wound repair and regeneration, and the role of nutrition, infection, and biofilms that can impact outcomes. Internationally renowned experts from the fields of nutrition, infectious disease, podiatry, nursing, physical therapy, vascular surgery, general surgery, and plastic surgery share their evidence and knowledge on high-impact subjects. Overviews, current thoughts and evidence, and expertise are shared on topics like debridement, use of adjunctive modalities, such as ultrasound and hydrosurgery, negative pressure, and the vast array of products on the market designed to impact wound healing, bringing clarity to the reader and practitioner on what has evidence behind it and what does not. Other adjunctive technologies are also reviewed, including hyperbaric oxygen, dermal matrices, bioengineered tissue, pressure offloading, and laser therapy. We have tapped experts to comment on the role of amputation and its place in the reconstructive algorithm—when it is indicated, when it should be used as the most functional option, and when it should be used as a last resort. Furthermore,

Disclosure: Dr. Janis is a consultant for LifeCell, an ACCELITY company, has received previous honoraria from Bard, Pacira, and KCI, an ACCELITY company, and receives royalties from CRC Press. Dr. Lavery is on the speaker's bureau for Osiris, Integra, and Smith Nephew; he is on the Scientific Advisory Board for KCI, an ACCELITY company, Aplion Medical Users, Harbor MedTech, Podometrics, and HyperMed. Dr. Lavery has received research support from Osiris, Macro-Cure, Integra, Glasko Smith & Kline, KCI, an ACCELITY company, and Cardinal. Dr. Attinger is a consultant for Acelity, Smith & Nephew, and Integra.

From the Department of Plastic Surgery, Ohio State University Medical Center; Department of Plastic Surgery, University of Texas Southwestern Medical Center; and Department of Plastic Surgery, Georgetown University Hospital.

Received for publication March 17, 2016; accepted June 21, 2016.

Copyright © 2016 by the American Society of Plastic Surgeons

DOI: 10.1097/PRS.0000000000002697

we have selected vexing problems that confront us all from hidradenitis suppurativa to pressure sores to lymphedema to venous ulcers and review and discuss the evidence we currently have to address them. Finally, we conclude the supplement with an eye toward outlining best practices in multidisciplinary care, communication across the globe, and future directions that we are sure will ultimately find their places in the pages of the next wound healing supplement in 5 years hence.

Our hope is that you find this compendium of current concepts and evidence a worthwhile read, convenient yet thorough, comprehensive yet digestible. Most of all, we attempted to make everything clinically practical, so that each and every one of your practices can benefit from the time spent creating it and, most importantly, from reading it.

Jeffrey E. Janis, MD, FACS

Department of Plastic Surgery
University Hospitals
Ohio State University Wexner Medical Center
Suite 2100, Room 2114
915 Olentangy River Road
Columbus, OH 43212
E-mail: jeffrey.janis@osumc.edu

REFERENCES

1. Broughton G II, Janis JE, Attinger CE. A brief history of wound healing. *Plast Reconstr Surg*. 2006;117:6S–11S.
2. Broughton G II, Janis JE, Attinger CE. The basic science of wound healing. *Plast Reconstr Surg*. 2006;117:12S–34S.
3. Broughton G II, Janis JE, Attinger CE. Wound healing: an overview. *Plast Reconstr Surg*. 2006;117:1e–S–32e–S.
4. Janis JE, Kwon RK, Lalonde DH. A practical guide to wound healing. *Plast Reconstr Surg*. 2010;125:230e–244e.
5. Janis JE, Harrison B. Wound healing part I – basic science. *Plast Reconstr Surg*. 2014;133:199e–207e.
6. Janis JE, Harrison B. Wound healing part II – clinical application. *Plast Reconstr Surg*. 2014;133:383e–392e.
7. Worldwide Wound Management, Forecast to 2024: Established and Emerging Products, Technologies and Markets in the Americas, Europe, Asia/Pacific and Rest of World. Report #S251. 2015.
8. Gould L, Abadir P, Brem H, Carter M, Conner-Kerr T, Davidson J, DiPietro L, Falanga V, Fife C, Gardner S, Grice E, Harmon J, Hazzard WR, High KP, Houghton P, Jacobson N, Kirsner RS, Kovacs EJ, Margolis D, McFarland Horne F, Reed MJ, Sullivan DH, Thom S, Tomic-Canic M, Walston J, Whitney J, Williams J, Zieman S, Schmader K. Chronic wound repair and healing in older adults: Current status and future research. *Wound Repair Regen*. E-published ahead of print February 13, 2015.
9. Margolis DJ, Gupta J, Hoffstad O, Papdopoulos M, Glick HA, Thom SR, Mitra N. Lack of effectiveness of hyperbaric oxygen therapy for the treatment of diabetic foot ulcer and the prevention of amputation: A cohort study. *Diabetes Care*. E-published ahead of print February 19, 2013.
10. Malay DS, Margolis DJ, Hoffstad OJ, Bellamy S. The incidence and risks of failure to heal after lower extremity amputation for the treatment of diabetic neuropathic foot ulcer. *J Foot Ankle Surg*. 2006;45:366–374.
11. Janis JE, Attinger CE. The wound healing supplement. *Plast Reconstr Surg*. 2006;117:4S–5S.
12. Attinger CE, Janis JE. Preface to current concepts in wound healing: update 2011. *Plast Reconstr Surg*. 2011;127:7S–9S.