

Validation of a Laser-Assisted Wound Measurement Device for Measuring Wound Volume

Kathryn E. Davis, Ph.D., Fadi C. Constantine, M.D., Elaine C. MacAslan, B.S., Jessica D. Bills, B.S., Debby L. Noble, B.S., and Lawrence A. Lavery, D.P.M., M.P.H.

Abstract

Background:

Accurate and precise wound measurement is an essential part of the medical record when monitoring a patient with a chronic wound. This study was designed to determine if a new device, a laser-assisted wound measurement (LAWM) device, provides valid measurements for wound area, depth, and volume.

Methods:

We compared four methods to evaluate the area and volume of 12 wounds of differing size and depth that were created on the dorsum of a sacrificed pig. We evaluated the LAWM device, digital photograph assessment with National Institutes of Health ImageJ software, measurements of depth with a ruler, and weight-to-volume assessment with dental paste. We then sought to cross validate this data with further analyses obtained from these measurements using a Play-Doh[®]-based wound as a model for constant area with different depths.

Results:

We demonstrate that the LAWM device measures wound area accurately. Depth (and therefore volume) measurements, however, are artificially low. This inaccuracy is the same for shallow and deep wounds.

Conclusions:

The inaccuracy in the depth and volume measurements with the LAWM device results in an artificially low measurement. However, this may not affect percentage difference measurements. Further studies will need to be performed to determine if this device can accurately determine wound changes in the clinical setting.

J Diabetes Sci Technol 2013;7(4):1161–1166

Author Affiliations: Department of Plastic Surgery, University of Texas, Southwestern Medical Center, Dallas, Texas

Abbreviations: (LAWM) laser-assisted wound measurement, (NIH) National Institutes of Health, (RD) ruler depth

Keywords: ARANZ, medical imaging, wound measurement, wound volume

Corresponding Author: Kathryn Davis, Ph.D., Department of Plastic Surgery, University of Texas, Southwestern Medical Center, 5323 Harry Hines Blvd. F4.310A, Dallas, TX 75390-8560; email address kathryn.davis@utsouthwestern.edu