INTRODUCTION

- Accurate, rapid tracking and documentation of wound size is an important component of wound care.
- Size has traditionally been determined using a wound ruler to measure wound length and width. However, this approach frequently overestimates wound area and is difficult to consistently measure when wound shape changes.
- Wound area measurements provide a more accurate description of changes in wound size over time.
- This study validated a wound area measurement software that tracks wound area, length, and width.

METHODS

MolecuLight™ Wound Imaging Device

- **Wound measurement:** Automatic detection of wound boundaries, option for manual boundary delineating, measurement of wound area (cm²), length and width (cm), or vertical and horizontal (cm).
- **Bacterial fluorescence imaging:** when excited by 405 nm violet light, tissues fluoresce green while bacteria fluoresce red (porphyrin-producers) or cyan (pyoverdine-producing Pseudomonas aeruginosa), enabling real-time detection of bacteria (loads ≥ 10² CFU/g).

RESULTS

**Measurement Accuracy ≥ 5% (2 stickers)**

Benchtop measurement testing of five wounds of known dimensions was performed by 10 trained users.

**Measurement Accuracy ≥ 15% (1 sticker)**

As expected, average measurement error for wound area, length, and width increased to 6-15% when only a single sticker was used.

**Intra-User Variation (Measurement Repeatability)**

To assess repeatability, a single trained user measured the same wound of known area 20 times. Measurements were made using 2 MolecuLight Wound Measurement Stickers.

**CONCLUSIONS**

- These results demonstrate the accuracy and consistency of the dimensions produced by this wound measurement software.
- **Accuracy:** The use of 2 MolecuLight Wound Stickers produced an average wound area measurement error of ≤ 5%, when the image is taken with MolecuLight Wound Stickers in the plane of the wound. When a single sticker was used, error increased to 6-10%.
- Use of two stickers enables the measurement algorithm to better correct for plane inaccuracies, which may be created via suboptimal user placement of the stickers or suboptimal user placement of the imaging device.
- Clinically, area measurements (cm²) calculated from wound borders were in tight accord with wound ruler predictions, except in the case of wounds with irregular wound boundaries, where automated area measurements were far superior.

IMPLICATIONS FOR PRACTICE

- This software can now be confidently deployed in clinical practice, improving wound measurement accuracy, tracking of wound size over time, and documentation.

REFERENCES