Handheld, non-contact wound measurement device
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Repeatable and accurate wound measurement forms an important part in the assessment and treatment of chronic wounds and pressure ulcers. Current wound measurement methods span a continuum, from the ruler method which is easy to perform but lacks accuracy to devices using stereophotogrammetry which are accurate and repeatable but are expensive.

A prototype handheld wound measurement system has been developed that measures wounds without contact, processes images in <1 min and is low cost. The device is based upon a simple digital camera such as those found in cell phones. Using computer vision techniques, device software suggests a wound boundary and gives the calculated area. The user can then 1) accept the area (if the wound boundary detection is correct), 2) modify the wound boundary by dragging the outline using a stylus on the touch screen, or 3) reject the wound boundary and re-trace the wound manually using the stylus.

Accurate wound dimensions using photography require knowing the distance between the camera and wound and the ability to correct for a skewed image. The use of four laser pointers and computer vision techniques overcome these technical challenges. To test accuracy, repeatability and skew correction, a model wound with known dimensions was measured at four distances and skew angles between 0º and 35º. Accuracy across distance and skewness ranged from 5%-7.5% with a coefficient of variation (repeatability) of <4%. This performance exceeds values reported for rulers, tracing methods and photography and equals performance of higher cost structured light devices.

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