

Wound Hygiene Face-off: Scrub vs Soak

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Background

- Cleansing the wound bed/periwound to remove bacterial burden and biofilm is imperative for effective wound hygiene.¹
- Cleansing research has largely focused on different types of cleansers however **little consideration has been paid to the cleansing techniques, such that their effectiveness in removing bacteria remains uncertain.**
- Fluorescence imaging (MolecuLight i:X) now enables detection of the presence and locations of bacterial loads at the point-of-care and can provide immediate information on the efficacy of selected treatment strategies.

This study aimed to compare the efficacy of common cleansing techniques—scrubbing and soaking—using fluorescence (FL) imaging of bacterial burden.

Methods

Procedures

- FL imaging (MolecuLight i:X)** was performed on 59 chronic wounds (mainly VLU, but also PU/PIs, AUs, traumatic wounds, surgical wounds, and others) **before and after scrubbing or soaking the wound and periwound** with a variety of common wound cleansers.

Scrub	30 seconds of vigorous scrubbing with cleanser
Soak	10 minutes soak with selected cleanser.

Image Masking

- A FL-image interpretation expert masked **fluorescence positive (FL+) areas indicating bacterial loads >10⁴ CFU/g**
- Blinded to the type of image (i.e., pre/post hygiene), cleanser, and cleansing technique

Methods

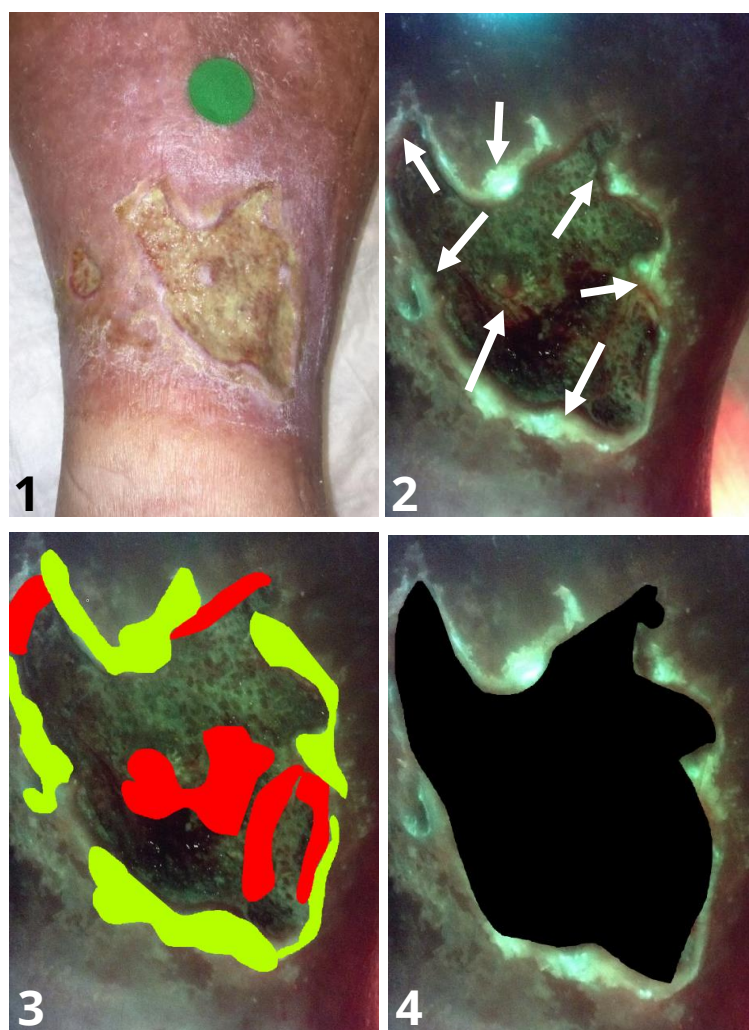


Image Masking (Steps from left to right)

- The standard image.
- FL image showing subtle red/pink and bright cyan areas (arrows), all indicating bacteria at loads of concern clinical (>10⁴ CFU/g^{2,3}).
- The FL positive areas are masked (separately for red and cyan).
- The wound bed is masked.

Masked areas were reviewed by a panel of 3 other experts for any errors, and then quantified using a custom image analysis algorithm.

Image Analysis

- Differences in **FL positive (+) area pre- and post-cleansing were determined for each wound** (i.e., relative % change).
- Compared the average % change in FL+ area between scrub vs soak groups.**
- Statistical significance was assessed using a Mann-Whitney t-test.

Results

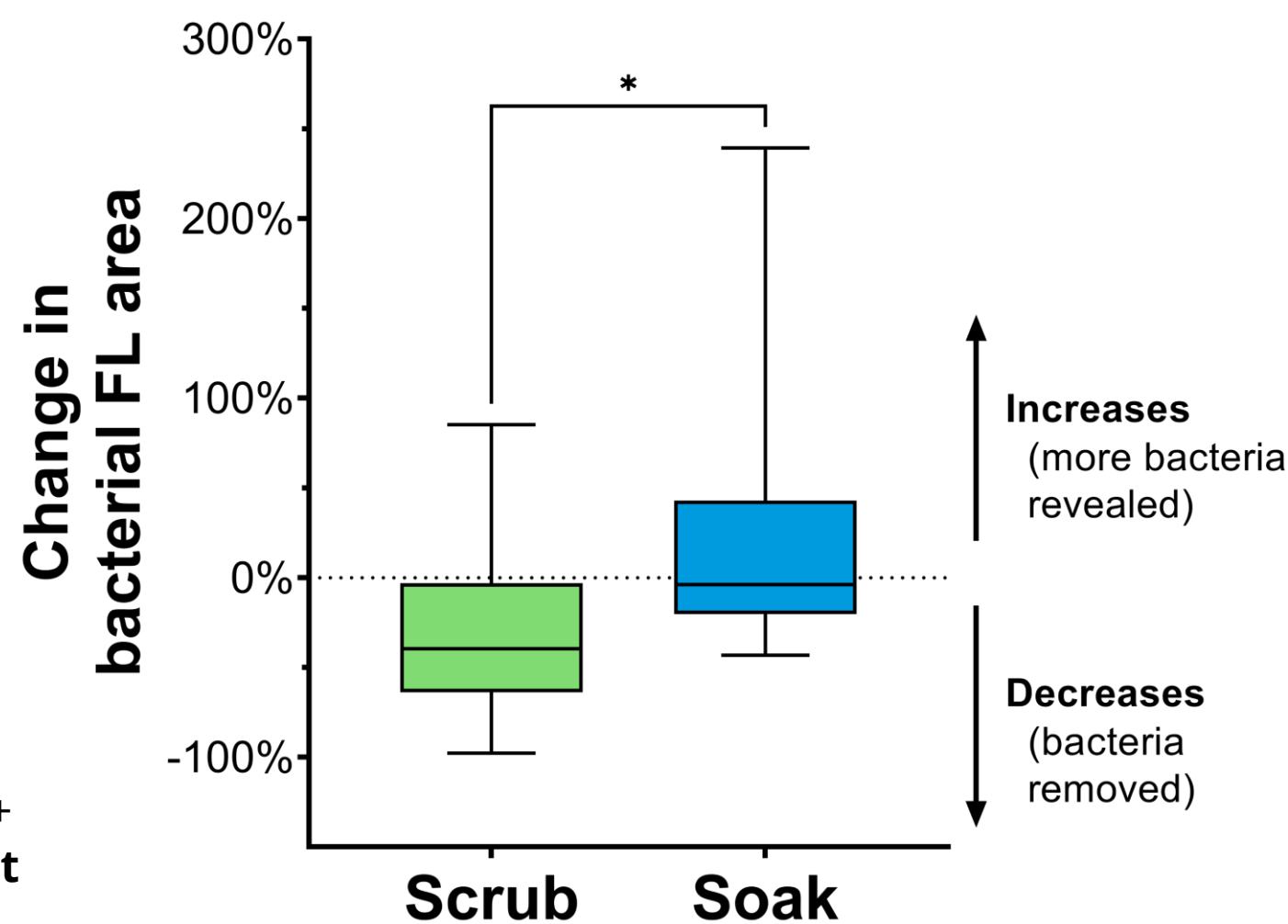
Changes in Fluorescence Area

- The median percentage (%) of the wound bed that was positive for bacterial FL before cleansing was 49.9% for the scrub group and 37.8% for the soak group.
- There was a **statistically significant difference** in the average % change in FL+ area (bacterial FL) **between the scrub and soak groups** (p=0.034):

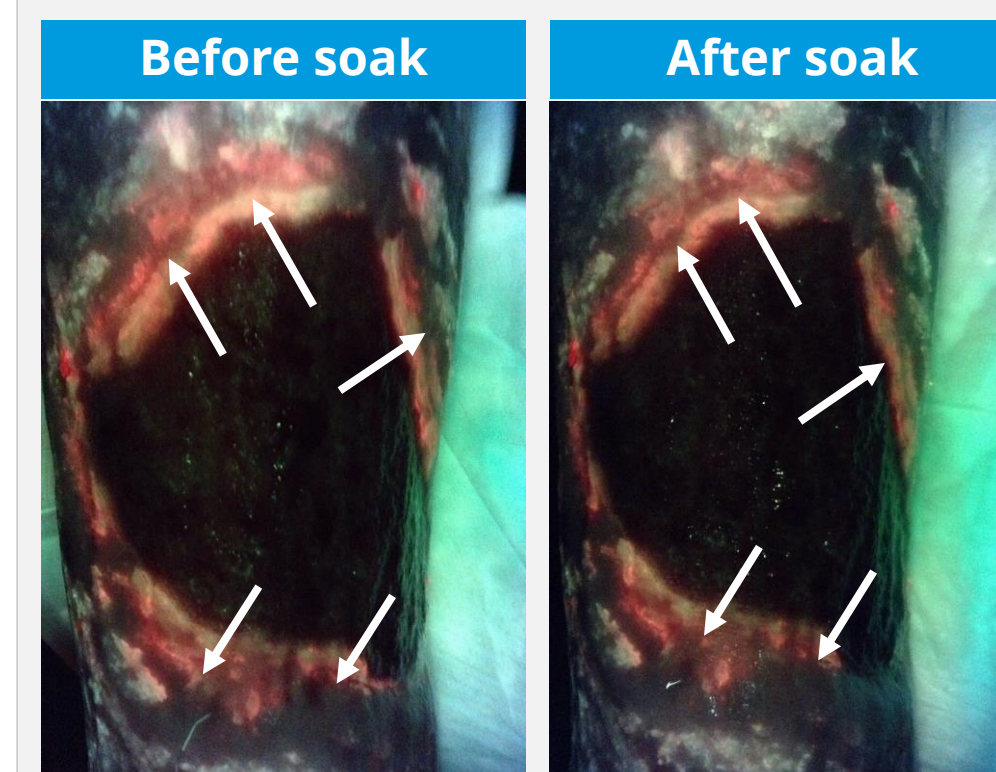
Scrub = 25.7% decrease (-)

Soak = 30.3% increase (+)

Thus, **vigorous scrubbing** targeted to FL+ regions **for at least 30 seconds** was **most effective** in reducing bacterial signals.



Cases

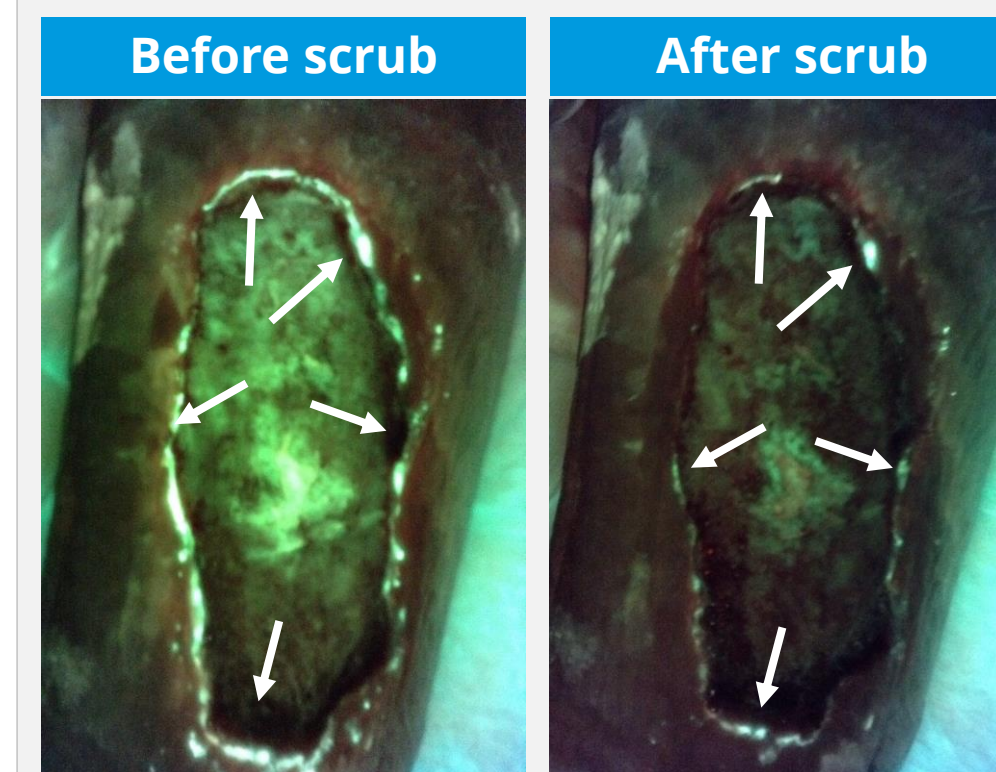


Example 1

- 78-year-old female with a venous leg ulcer (28.24 cm²)
- An 8% decrease in red fluorescence area was observed after 10 min soak.

White arrows in images denote regions of bacterial burden (red).

Most bacteria emit **red** fluorescence⁴ while *Pseudomonas* emits **cyan/glowing white** fluorescence.⁵



Example 2

- 58-year-old male with a venous leg ulcer (30.78 cm²).
- A 39% decrease in cyan fluorescence area was observed after a 30 sec scrub.

White arrows in images denote regions of *Pseudomonas aeruginosa* (appears cyan on image).

Conclusions

- Point-of-care fluorescence imaging indicating regions of high bacterial loads (MolecuLight) revealed that soaking, a commonly used cleansing technique, is less efficacious in ridding a wound of surface bioburden when compared to mechanical cleansing.

Vigorous scrubbing of the wound and periwound with wound cleansers is strongly recommended based on the evidence gained in this study.