

Closing the gap on racial disparities in diagnosis of chronic wound infections: the concerning trend involving skin pigmentation and a role for fluorescence imaging



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Did you know...

Only 5% of images in general medical literature include dark skin tones¹.
 A survey of 226 healthcare professionals found that **64% were not aware of any educational materials regarding skin tone and wound care**⁵.
 Pressure injuries are **more likely to form**², are **less likely to heal**³, and are **more severe**⁴ in black nursing home residents than in white residents.

There is a **gaping lack of knowledge & evidence** on how skin tone impacts pathological manifestations in wound care, which translates into poorer outcomes.

METHODS:

In this **clinical trial post-hoc analysis of 350 chronic wounds** (DFUs, VLU, PU/PI, SSI & others) we aimed to:

- Identify any variability in erythema & infection diagnoses across a range of skin tones.
- Determine if fluorescence (FL) imaging could serve as a more objective marker of pathogenic wound bacteria.

Clinician assessment
 CSS+ if at least 3 of the International Wound Infection Institute (IWII) clinical signs and symptoms of infection⁶ (e.g. swelling, erythema, pain).

Tissue culture and microbial analysis
 Quantitative microbial analysis (CFU/g) and speciation (TOF MS).

Point-of-care fluorescence imaging
 MolecuLight fluorescence imaging was used to detect areas of bacterial burden (red and/or cyan fluorescence) at loads >10⁴ CFU/g⁷.



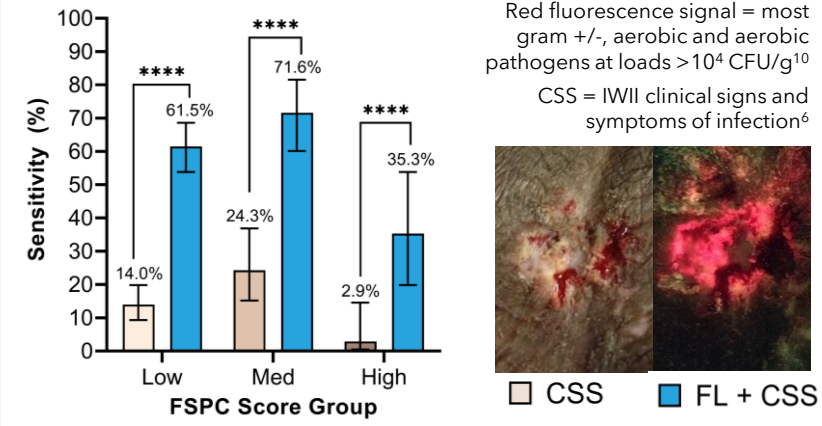
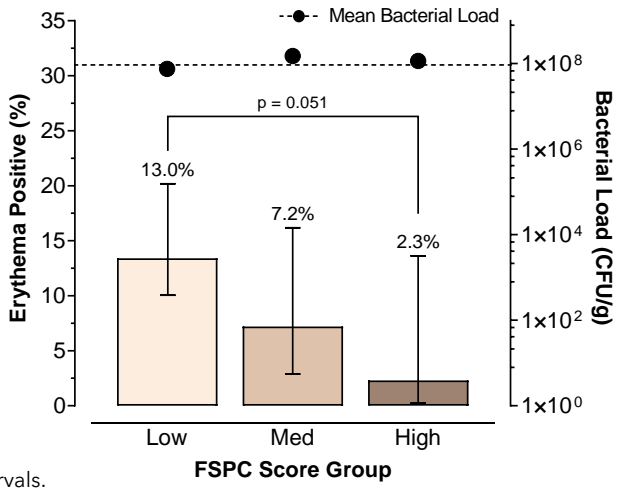
RESULTS:

Clinicians flagged fewer wounds with erythema in patients with highly pigmented skin, despite equal bacterial loads (figure right).

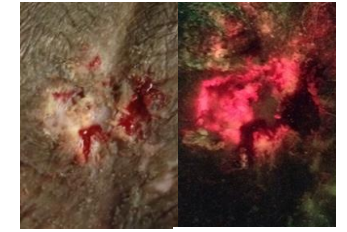
Clinicians may be unaware that erythema presents as a range of hues on dark skin tones⁹ (red, violet, burgundy, deep purple, and even subtle skin darkening).

This could lead to delayed treatment, increased complication risks, and worsened wound outcomes.

Black vertical bars represent 95% confidence intervals. **** denotes statistical significance at p ≤ 0.0001.



Red fluorescence signal = most gram +/-, aerobic and aerobic pathogens at loads >10⁴ CFU/g¹⁰
 CSS = IWII clinical signs and symptoms of infection⁶



Fluorescence imaging allowed clinicians to identify more at-risk or clinically infected wounds across all skin tones, compared to standard clinical assessment (figure above).

This benefit was **most pronounced for patients with the highest skin pigmentation**, corresponding to a 12-fold increase in detection sensitivity (figure above).

CONCLUSIONS:

Bacteria risks infection & prevents healing¹¹.
 Point-of-Care Fluorescence imaging of bacteria may help level the playing field for identifying at-risk wounds and facilities a proactive and equitable approach to wound care.

How can you help **reduce this disparity?**

- Educate yourself** and your colleagues on how to accurately diagnose infection in patients with highly pigmented skin.
- Use equitable and objective diagnostic methods**, such as fluorescence imaging of wound bacteria.
- Exercise a high index of suspicion** when assessing for infection on deeply pigmented skin.