



Utility of MolecuLight *i:X*[®] For Managing Bacterial Burden in Pediatric Burns



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This is the first study to use the MolecuLight *i:X*[®] device in a pediatric population to visualize and localize clinically significant bacterial burden. It demonstrates the significant utility of using the MolecuLight *i:X* imaging procedure as part of routine assessment of pediatric burn wounds.

Study reports the following:

88%	100%	93%
Wounds where bacterial fluorescence was detected in peripheries (in regions not typically swabbed)	Pediatric patients compliant with the MolecuLight imaging procedure	% of clinicians who reported highest practicality of incorporating MolecuLight <i>i:X</i> into routine diagnostic practice

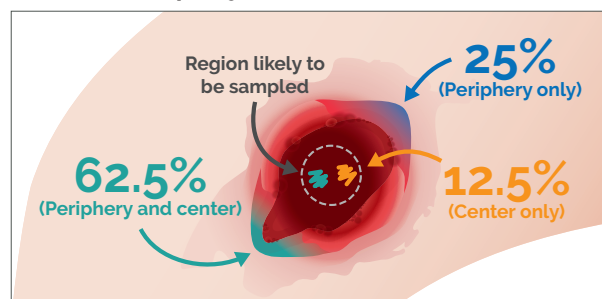
Study Design

- The MolecuLight *i:X* imaging device detects pathogenic bacteria in real-time using safe, non-invasive violet light. Most bacterial species fluoresce red in MolecuLight *i:X* fluorescence images; *Pseudomonas* fluoresces cyan.
- A single-center prospective observational study was conducted to assess the efficacy of the device in identifying moderate-to-heavy bacterial levels (>10⁴ CFU/g) in 15 pediatric burn wounds from patients, ages 1–13 years.
- Wounds were assessed for clinical signs and symptoms. If indicated, a Levine swab sample was collected.
- Fluorescence images were captured for all wounds assessed. Targeted swab sampling was done on regions of the burn wounds positive for red or cyan fluorescence to correlate bacterial fluorescence signals to bacterial presence.
- Clinicians completed a questionnaire assessing the compliance of pediatric patients towards use of the device as well as feasibility of integrating the device into routine diagnostic practice.

Key Results

- The MolecuLight *i:X* device instantly detected the presence and distribution of significant bacterial loads over the burn wound region.
- When observed, bacterial fluorescence was located in the peripheries of 87.5% of the wounds, regions likely to be missed by standard swab microbial assessment. Routine swab technique missed significant bacterial bioburden in 3/6 (50%) observations.

Bacterial Fluorescence was Observed in the Periphery of Most Burn Wounds



Location of bacterial fluorescence (red or cyan) observed in 8 study wounds (expressed as percentages).

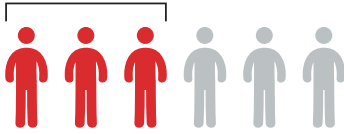


Clinical Signs and Symptoms Were Verified Using Fluorescence Imaging and Microbiology

CSS Indicated Bacteria in Burn Wounds

3/6

wounds were positive for bacterial fluorescence, microbiology and CSS



3/6

wounds were positive for bacterial fluorescence, but CSS misdirected the swab location, resulting in negative microbiology



CSS DID NOT Indicate Bacteria in Burn Wounds

8/10

wounds were negative for bacterial fluorescence, microbiology and CSS



2/10

wounds were positive for bacterial fluorescence and microbiology, despite being CSS negative



Clinicians were blinded to the bacterial fluorescence status when assessing clinical signs and symptoms (CSS) and swabbing for microbiology

- In all wounds lacking clinical signs and symptoms, swabs targeted to fluorescence-positive regions were positive for microbial growth.
- Pediatric patients demonstrated strong compliance towards the *i:X* device. 89% of pediatric patients indicated no trepidation towards the imaging device and 100% were comfortable with the darkness required for imaging.
- 100% of bacterial fluorescence-negative wounds corresponded to negative microbial cultures.

Author's Conclusions

"The study results revealed the device's ability to immediately detect a significant bacterial bioburden, including subsurface burden, and sub-clinical bacterial colonization and/or infection, thus potentially avoiding unnecessary swabs and the delay associated with waiting for the results. This has the potential to financial savings along with improving outcomes...this device can bridge the gaps of the current diagnostic deficits and may shape the future of wound care management."

Impact on Practice

The presence of bacteria in burn wounds delays healing. Use of fluorescence-guided wound assessment enables more accurate sampling of burn wounds to determine bacterial load and species, and guides appropriate, evidence-based deployment of treatment.

Study Citation

* Farhan N, Jeffery S. Utility of MolecuLight *i:X* for managing bacterial burden in pediatric burns. *J Burn Care Research*, irz167, <https://doi.org/10.1093/jbcr/irz167>

