# Fluorescence imaging guided dressing change frequency during negative pressure wound therapy: a case series

Raizman R. Journal of Wound Care (2019). *

Fluorescence imaging of bacteria guided timing of dressing changes, the extent of wound cleaning, and selection of the appropriate and most cost-effective NPWT (standard vs. instillation).

## Study Design

- The **MolecuLight *i:X*®** Imaging device is used at the point-of-care to visualize in real-time fluorescence from wound tissue and the presence and location of regions containing bacteria.
- Eleven diverse wounds undergoing NPWT were imaged for bacterial (red or cyan) fluorescence at various stages as part of routine wound assessments.

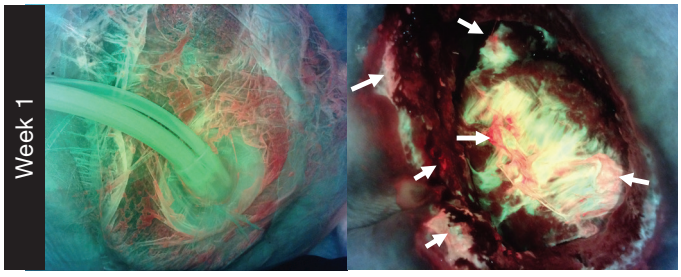
## Study reports the following benefits:

**9/10**
Wound care patients more appropriately triaged with fluorescence information

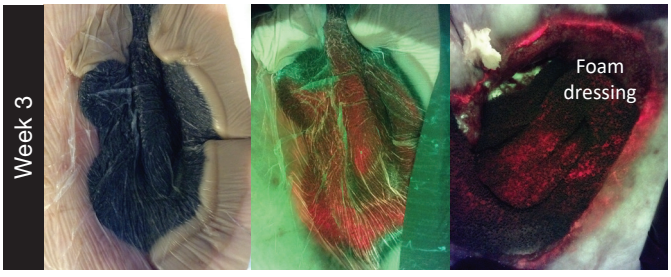
**$1552**
Single patient cost savings (USD) due to fluorescence evidence-based treatment plan changes

## Key Results

- Bacterial fluorescence using the **MolecuLight *i:X*®** was detected under sealed, optically-transparent (routine) adhesive prior to dressing changes, on foam dressings, within the wound bed, and on peri-wound tissues.
- Bacterial visualization in real-time helped to guide: (1) bioburden-based, personalized treatment regimens, (2) clinician selection of NPWT with or without instillation of wound cleansers and (3) the extent and location of wound cleaning during dressing changes. The ability to visualize bacteria prior to removal of dressings led to expedited dressing changes when heavy bioburden was detected and postponement of dressing changes for 24 hours when red fluorescence was not observed, avoiding unnecessary disturbance of the wound bed.
- Study found 9/10 patients were likely to have received more appropriately triaged care with the fluorescence information. **60% of these 9 patients would have been undertreated**; these patients therefore benefited from increased resources in the short term, while **30% of patients were being overtreated** and fluorescence information prompted a decrease in resource use. Based on microbiological confirmation and monitoring of wound progress, allocating clinical resources elsewhere did not compromise wound progress.




Fluorescence image through sealed dressing (left). Wound bed (right); arrows denote red fluorescence.




Standard image (left) and fluorescence images (center & right)
*Microbiology confirmed heavy growth of E.coli, E. faecalis, S. aureus*

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# Treatment Selection

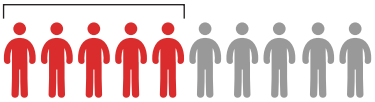
## Altered Treatment Decisions based on Fluorescence Information

**9/10** more appropriately triaged with fluorescence

**6/10** were to be under treated

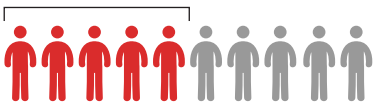
**3/10** were to be over treated

**5/10** led to additional, targeted cleaning during dressing changes



**3/10** prompted initiation of or maintenance on NPWTi with wound cleansers

**5/10** dressing change timing was influenced



**2/10** facilitated patient education

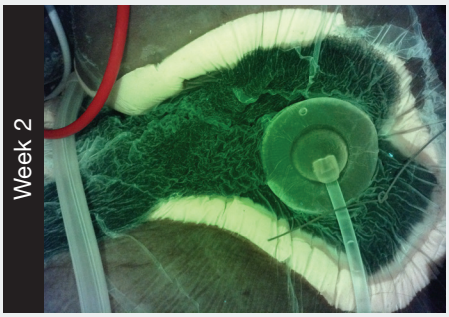
**1/10** prompted use of silver based antimicrobial products + NPWT

## Health Economics

Prior work comparing NPWT dressing changes every three days vs. seven days found no difference in rate of complications, including infections[1]. This suggests that wounds free of heavy bacterial burden can receive less frequent changes, so long as they are carefully and objectively monitored by skilled personnel and monitoring is facilitated by fluorescence imaging information.

Daily therapy cost for NPWTi has been reported as $194 USD[2]. This study calculates that delaying dressing changes by 48 hours, in conjunction with daily fluorescence monitoring, would have decreased the number of dressing changes required over 8 weeks of NPWT from 19 to 11. This treatment plan adjustment would have decreased NPWT care costs by $1552 USD (8 fewer changes x $194) in a single study patient.

**Fluorescence Image**
*(no red fluorescence)*




*Microbiology confirmed negative for bacterial growth*

## Conclusion

Fluorescence imaging guided timing of dressing changes, the extent of wound cleaning, and selection of the appropriate and most cost-effective NPWT (standard vs. instillation). Study results highlight the capability of bacterial fluorescence imaging to provide invaluable real-time information on a wound's bacterial burden, contributing to clinician treatment decisions in cases where bacterial contamination could impede wound healing.

## Study Citation

* Raizman R. Fluorescence imaging guided dressing change frequency during negative pressure wound therapy: a case series. J Wound Care (North American Supplement). 2019. 28(8)

**References:**
1. Kim YH et al. J Wound Care 2015; 24(11):536–542
2. Gupta S et al. Int Wound J 2016; 13(2):159-174.



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