



# Honey Dressings for Infected Left Ventricular Assist Device Wounds

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## Introduction

Left ventricular assist devices (LVADs) are implanted into patients with severe heart failure. These mechanical circulatory support devices attach to the left ventricle and pump blood to the aorta. Devices are shrinking as technology advances, but still require transcutaneous drivelines to supply power to the pump via external batteries. The driveline exits the patient's left or right upper quadrant as seen below.

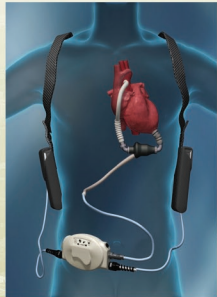


Figure 1: Heartmate II pump configuration  
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## Clinical Problem

Infectious complications are common in LVAD patients, occurring in up to 28% of patients within three months of implantation<sup>2,3</sup>. Infection may be local at the driveline site or systemic, and may occur at any time during the patient support period (up to five or more years). As well as significantly increasing the cost of LVAD therapy, driveline infections may negatively impact the patients' quality of life, particularly those associated with malodorous and/or highly exuding wounds. Dressing regimes differ greatly between centers with no consensus on the best method.

## Why *Leptospermum* species honey?

1. Effective eradication of organisms often responsible for LVAD infections: *B. cepacia*, *S. aureus*, *P. aeruginosa*, *E. coli*, *Candida* spp., *Acinetobacter* spp., Vancomycin-Resistant *Enterococcus*, Methicillin-Resistant *S. aureus*, and multiresistant Gram negative organisms<sup>2-5</sup>.
2. Reduction of wound odor from wounds due to release of hydrogen peroxide by the honey<sup>6</sup>.
3. Reduction of wound exudate due to the osmotic activity of the high sugar content.
4. Inhibition of bacterial growth by the acidic pH<sup>6</sup>
5. No pathogen resistance to the antibacterial effects.
6. No serious adverse effects reported.

## Purpose

A protocol using sterile active *Leptospermum* species (Manuka) honey-impregnated dressings<sup>1</sup> was initiated on two patients who presented with suppurative chronic driveline infections, non-responsive to intravenous antibiotic therapy and standard wound care.

## Patient 1:

Chronic driveline infection growing *P. aeruginosa*. Honey-impregnated alginate was used until heart transplant, 18 days later. Wound cultures did not clear, but there was a significant reduction in exudate and odor.



Figure 2: Pre-honey treatment: copious purulent exudate and severe malodor



Figure 3: Day 18 of honey dressing: trace exudate only

## Patient 2:

Chronic driveline infection growing *Stenotrophomonas maltophilia*. Treatment was commenced using a honey-impregnated hydrocolloid dressing, and discontinued at day 8 for unrelated reasons. There was insufficient treatment time to see any beneficial effects apart from a reduction in odor and amount of exudate.



Figure 4: Pre-honey treatment, erythematous, tender and highly exuding

## Discussion

The patients suffered significant quality of life impairment as a result of frequent hospitalizations and constant weeping of malodorous wound exudate. Honey-alginate dressings were applied around the driveline and covered with gauze. Dressing frequency was daily at first, then every other day once drainage reduced. Reduction of odor and exudate was noted almost immediately in both cases. Clear cultures were not achieved in either wound, although treatment in both cases was aborted by cardiac transplantation and removal of the driveline. In both cases, the abdominal pump pocket was noted to be the primary site of infection. Given that fact, it's unlikely that any topical wound treatment would have cleared the external site infections.

## Conclusion

Active *Leptospermum* species honey-impregnated dressings reduce odor and exudate from infected LVAD driveline exit sites.

## References:

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