Left Ventricular Assist Devices:

An Innovative Approach to Decrease Infections Using a Silver Contact Dressing*

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Introduction

Heart failure is a condition where the heart cannot pump enough blood throughout the body. Most cases involve the left side where the heart cannot pump enough oxygen-rich blood to the rest of the body. With right sided failure, the heart cannot effectively pump blood to the lungs where the blood picks up oxygen.

Why do we need a LVAD?
(Left Ventricular Assist Device)

- Heart disease is the leading cause of death in the western world.
- 5 million people in the United States have congestive heart failure (CHF).
- 250,000 are in the most advanced stages of CHF
- 500,000 new cases each year
- 50,000 deaths each year
- Only effective treatment for end stage CHF is a heart transplant.
- In 2008:
  - 7318 people were waiting for a heart transplant
  - 2210 received a heart transplant
  - 623 people died waiting
  - 1200-1500 VADs implanted

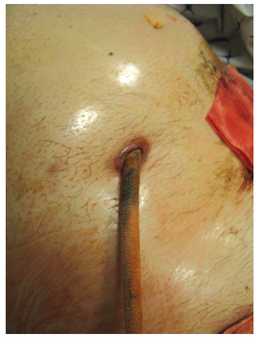
Indications for LVAD:

- Bridge to transplant
  - most common
  - allow rehab from severe CHF while waiting donor
- Bridge to recovery
  - unload heart and allow “reverse remodeling”
  - can be short or long term
- Destination therapy
  - permanent device instead of a transplant
  - currently only in transplant-ineligible patients

Purpose

Left ventricular assist devices (LVAD) are currently the state of the art treatment for patients with end stage cardiac failure. They are mechanical pumps implanted into a patient’s chest to assist their ventricle and increase cardiac output. LVADs are powered by external power sources that connect to the pump via a percutaneous lead (driveline). The driveline exits the body from the upper right quadrant, creating a chronic wound which renders it prone to infection. The WOC Nurse, in collaboration with the LVAD coordinator and cardiovascular team set the innovative “best practice” by **improving patient outcomes with the utilization of a metallic silver nylon wound contact dressing*.**

Clinical Problem



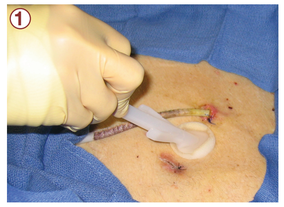
Infectious complications are a leading cause of mortality in this patient population. The driveline exit site is often the entry port of infection which can lead to blood stream and pump pocket infections. In 2007, 39 patients were implanted with LVAD therapy with an **infection rate of 13%** in the acute care setting. Our goal was to develop clinical strategies to decrease the LVAD infection rate in this setting.

Method

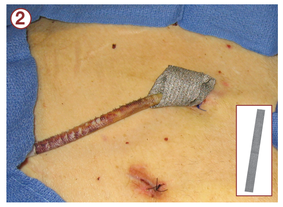
Past management of care included:

- Using sterile technique chlorhexidine gluconate 2% was used to cleanse the site
- A nonadherent occlusive dressing was applied.
- An attachment device was applied to the skin to anchor the driveline.
- Dressings were changed daily.

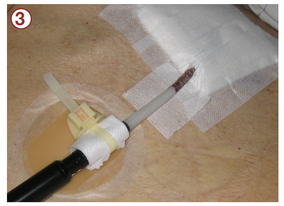
A collaborative plan of care was developed with the coordinator of the VAD team and the Wound Ostomy Continence Nurse to reshape the plan of care which comprised the following:



Using sterile technique, the area is cleansed with chlorhexidine gluconate 2%.

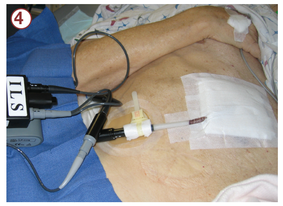


A metallic silver nylon wound contact dressing* is moistened with sterile water and wrapped around the driveline at the exit site.



A sterile gauze dressing is placed over the site beginning post-op day one.

An attachment device is applied to the skin to anchor the driveline.



The gauze dressing is changed daily, but the metallic silver nylon wound contact dressing* is changed every three days.

This continues until the skin at the driveline exit site is healed and there is no further drainage. Once drainage has subsided and the site is healed, a sterile gauze dressing is used and changed weekly and PRN.

Outcomes

In 2008, 36 patients have been implanted with LVAD therapy and from January-March 2009, 7 patients have been implanted. By using a metallic silver nylon wound contact dressing* during the early post operative course, we have decreased our **infection rate to 0%** in the acute care setting. This innovative plan of care has allowed the team to implement a simple cost-effective method to decrease infectious complications and improve patient outcomes.

Conclusion

Based on the results of our “best practice” change, a treatment regime involving the use of metallic silver nylon wound contact dressing* on drivelines has demonstrated **significant reduction of driveline related bloodstream and pocket infections.** By decreasing the frequency of complete dressing changes, there is less chance of driveline contamination and increased biofilm risk. It remains important for the WOC Nurse, VAD coordinator and medical staff to develop a partnership to identify cutting edge opportunities to improve patient outcomes and continue a center of excellence.

References

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Uniting people and information to help save lives. Available at: http://optn.org. Last Accessed February 21, 2009

***Silverlon™, Argentum Medical, LLC., Willowbrook, Illinois 60527**

This “best practice” change was unsupported

Poster design: Kevin Selekof