

After Successfully Lowering Surgical Site Infections, Now What? Development of a Quality Initiative to Improve Wound Healing While Sustaining Low SSI Rates

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Abstract

Pediatric cardiac surgical site infections (SSIs) contribute to negative outcomes including increased length of stay, antibiotics, additional procedures, stress, and even death. We recognized higher SSIs rates compared to other centers. A quality improvement initiative to reduce the number of SSIs in coded and non-coded procedures was initiated. After phase I and II of this initiative, we successfully lowered and sustained low SSI rates, now what? Development of a quality initiative to improve wound healing while sustaining low SSI rates.

Introduction

- Phase I:
 - 2018 Revised SSI bundle and launched use of Prineo® dressings. Not worse, not yet achieving desired results
 - 2019 Formed SSI Steering Committee, implemented SSI prevention guideline and intraop audits. SSI rates trending down
 - 2020 Implemented CT Surgery Wound Care Team to round on cardiac patients to monitor healing and early prevention, and staff education, rates maintained
 - 2021-2023 SSI steering committee evaluated best practices, revised SSI bundle, increased education, developed intraop prevention guideline, started daily CHG bathing. SSI rates continue to decrease
- Phase II:
 - Sustainability
 - 2023-2024 Developed wound team rounding tool to improve communication, updated SSI guideline, standardized procedure for obtaining wound cultures, and started tracking wound healing progression
 - Low SSI rates sustained 4.5 consecutive years
- Phase III:
 - How to continue to sustain low SSI rates and improve wound healing

Methods

- Needs assessment of surgical site wounds exposed
 - Variable wound culture practices
 - Variable dressings used on surgical wounds
 - Need to improve wound healing

Methods

- Established tracking wound healing progression in cardiac surgical patients helped identify
 - Most vulnerable patients
 - Recurrent trends in surgical patients
 - Weaknesses
 - Need for more bedside education and for VAD dressing change skill stations
 - Need to improve wound healing
- Discovered silver impregnated antimicrobial dressings known as Silverlon®
- Advantages of Silverlon®
 - Silver impregnated
 - Does not release silver into the skin or tissues
 - Delivers antimicrobial silver ions when activated by saline or sterile water
 - Silver ions in the dressing will kill wound bacteria held in the dressing and provide antimicrobial barrier to help reduce infection
 - Has shown to kill pseudomonas in one hour and MRSA in 4 hours
 - In vitro studies have shown dressings are effective against several microorganism species
 - No age contraindication – can use on premature infants and those with CHG allergies
 - May be used for up to 7 days
 - Are MRI compatible
 - Works in a moist environment, promotes healing and control of wound bacteria
 - Effective in management of infected wounds
 - Can use on all types of wounds
 - Vascular access sites, PIV sites, ventricular assist device sites, orthopedic pin sites, wound drain sites, surgical wounds including incisions, grafts and donor sites and partial to full thickness dermal ulcers
- Disadvantages of Silverlon®
 - None identified so far

Interventions

- Launched silver impregnated dressings (Silverlon®) as a trial on two catabolic patients with ventricular assist devices (VADs)

Interventions

Day 1 Silverlon® placed over R Neck ECMO Incision



Day 5 of Silverlon® coverage

Day 6 bedside team removed Silverlon® with trach care and covered site with PolyMem® silver. Wound regression after 1 day without Silverlon®



2 days later after replacing Silverlon® dressing

- Exhibiting remarkable wound healing

- Day 1 using Silverlon® over RVAD and LVAD sites and with wound vac over mediastinal incision



- After 2 weeks use

After 2 months use



- Successful results and expanded to all our VAD patients
- No positive wound cultures since implementing
- Improved healing and extended to other surgical wounds
- Other services lines implementing Silverlon® dressings

Results

- Successful implementation of Silverlon® silver impregnated dressings
 - Able to maintain and sustain low SSI rates
 - Improved wound healing
 - No positive wound cultures
 - Decreased frequency of VAD dressing changes
 - No wound complications or interactions
 - Overall cost savings with decreased frequency of dressing changes



Conclusions

- Improved wounds, fewer infections leads to low SSI rates
- Continued use of a dedicated surgical wound team for oversight of surgical wounds is the most reliable key driver to sustain low SSI rates
- Ongoing tracking of wound healing progression, evaluating best practices, education are additional key drivers
- Launching Silverlon® silver impregnated antimicrobial wound dressings has demonstrated improved wound healing without any wound infections
- We utilize a run-chart to track SSI infection rates, wound healing and have established a sustained reduction in pediatric cardiac SSIs and achieved improved wound healing maintaining low SSI rates now 5.5 consecutive years.
- Next steps are to expand Silverlon to PICC lines, CVLS, and RA lines

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Acknowledgment

Special thanks: Clinical Nurse Specialists Andrea Torzone and Alexandra Birely, CVOR team, and the Heart Cetner Nurses and Support Staff