Improving Surgical Care: Cardiac Surgical Site Infections Reduced to a Rare Occurrence

Barbara Drake RN on behalf of the Multidisciplinary Cardiac Surgery Quality Improvement Team

Aim Statement

Issue: Surgical Site Infections (SSI) are a major contributor of postoperative morbidity. This potentially preventable adverse outcome impacts the patient's experience and increases the overall cost of treating the patient.

Goal: To reduce the Vancouver General Hospital Cardiac Surgery SSI rate from 7% to 2% by January 30, 2014 as measured by the American College of Surgeons National Surgical Quality Improvement Program database (ACS NSQIP).

Methods

The multidisciplinary team designed a strategy to reduce the SSI rate using best practices outlined by ACS NSQIP and Safer Healthcare Now (program of Canadian Patient Safety Institute)

VGH has a number of **established practices** to reduce SSI. These include: nasal decolonization with photodynamic therapy, clippers for hair removal, a hand hygiene campaign, a hyperglycemia protocol, and a smoking cessation program.

The new processes introduced included tightened antibiotic timing and antibiotic re-dosing during the operation (OR), new dressing products and protocol for the sternum and harvest site, and active warming of the patient once off cardiac bypass.

Evaluation Tools

ACS NSQIP systematically samples and reviews 12 to 16 cardiac surgery charts a month. SSIs within 30 days post surgical date are recorded. Patients are followed in hospital and post discharge.

Definition of SSI is based on ACS NSQIP criteria, which aligns with the Centre for Disease Control definition. Criteria includes, purulent drainage, positive wound culture or diagnosis by physician.

Additional fields in the ACS NSQIP database are used to audit pre-operative antibiotic timing and compliance of re-dosing of antibiotics intra-operatively (if applicable). Intra-op and immediate post-op temperature is also captured.

Infection Prevention and Control Program monitors patients who undergo cardiac bypass and/or valve surgery. SSIs observed in the initial 90 day post op period are reported, either as an inpatient or upon readmission.

Project

C

Clean Hands

Chlorhexidine Pre-OR wipe twice; night prior and morning of surgery

Nasal De-**C**olonization (Methylene Blue and Photodynamic Therapy)

Clippers for hair removal

L

Leave Dressing on 72 hours post OR
Compression Wrap to harvest site and Silicone based dressing to sternum

Leave Pink Chlorhexidine Skin Preparation Solution on 6 hours post surgery

E

Engage Patients and Staff on Best practices for prevention of SSIs

A

Appropriate **A**ntibiotic Use: Pre-OR timing/Intra OR timing/Post OR duration

N

Normothermia (36 C to 38 C) (Pre/Intra/Post OP)

Normal blood glucose range <10 mmol/L or <180 g/dl

Nutritious Meals

No Smoking

Team Quote

"*That was the hardest part, getting staff to not touch the dressing*," Howard adds "*As a nurse – and physicians as well – We are all ingrained in thinking, 'If there's a wound, I need to look at it.' But after a couple of weeks, everybody bought in and it's been great ever since*."

Acknowledgements

Cardiac Surgery Quality Improvement Team: Wendy Bowles (NP) Rita Dekleer (ICP) Allie Henderson (RN) Jennifer Kelly (RN) Dr. Rael Klein (MD) Jamie McDowell (RN) Tina Oye (RN) Howard Paje (RN) Jessie Rodrigue (RN) Dr. Peter Skarsgard (MD) Rita Sheena (CPhA) Patrick Toedosio (RN) Emily Trew (RN) Markus Zurberg (RN) Barbara Drake (RN)
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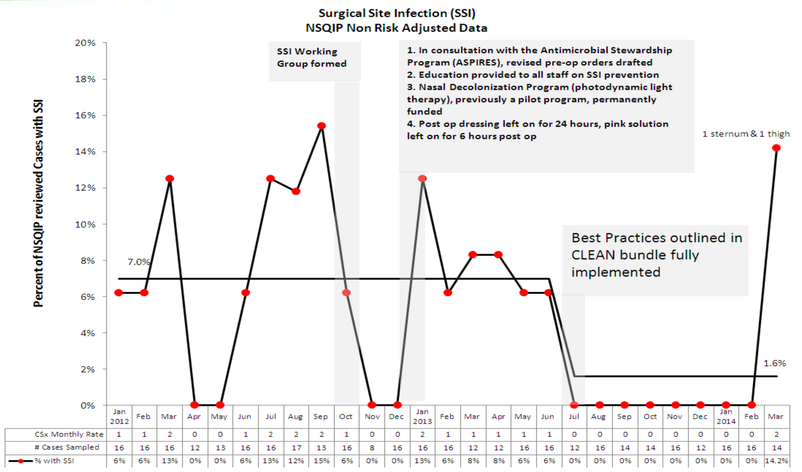
Results



	Jan 2012	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2013	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2014	Feb	Mar
CSx Monthly Rate	1	1	2	0	0	1	2	2	2	1	0	0	2	1	1	1	1	1	0	0	0	0	0	0	0	0	2
# Cases Sampled	16	16	16	12	13	16	16	17	13	16	8	16	16	16	12	12	16	16	12	16	14	14	16	12	16	16	14
% with SSI	6%	6%	13%	0%	0%	6%	13%	12%	15%	6%	0%	0%	13%	6%	8%	8%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	14.2%

Summary of Results

We are on our way of surpassing our goal. Our ACS NSQIP rate for the last 9 months is 1.6 %.

Infection Prevention and Control surveillance and the ACS NSQIP data base, **have only recorded two sternum infections from July 2013 to June 2014.**

Evidence Based Care is cost effective. The new dressings have an estimated added cost of $35, 000 per year. The economic burden of a SSI is estimated to be approximately $30,000 per event. With our inpatient surveillance, an average of one sternum SSI was observed a month. We have avoided at least 11 sternum infections over the last 12 months, resulting in a cost avoidance of $330 000.

Lessons Learned

Front line support is essential. Make the group as inclusive as possible with staff from all disciplines involved in the cardiac surgery patient's surgical journey. Our group includes nurse champions, an infection control practitioner, nurse practitioner, anesthetists, surgeons, pharmacy, nursing leaders and educators from Operating Room (OR), Perioperative Unit and Surgical Units.

Next Steps and Sustainability

Keep the momentum going by sharing data and celebrating successes. Our group continues to meet monthly discussing next steps and future projects. Progress is shared with the staff on unit learning boards. These learning boards are in a high traffic area and are viewed by patients and visitors.

Continue to audit and provide feedback on SSI occurrences with all the surgical staff.

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