Achieving Zero: Reduction of Deep Sternal Wound Infections Following CABG with Saphenous Vein Donor Site

...from an incidence-based awareness to a culture of prevention

Authors: Cassidy King, RN, CCRN, Terri Hurley, RN, Gulab Meraj, MD, Harry Fleming, RN, Mary Beth Bell, RN, Marcus Lawe, RN, Wendy Robinson, RN, Cynthia Vickery, RN, Ray Wampakon, RN, Heather Whaler, RN, Beth Bausch Wellman; RN, VMUCHC, Athens Regional Medical Center

Introduction

Deep Sternal Wound Infections (DSWI) by 40%, a target under 1.61 infections per 100 patients. This adoption methodology, a multidisciplinary team of cardiothoracic surgeons, nurses from each patient-contact department, environmental services, cardiac rehab, and support personnel was developed. To begin the improvement process, we reviewed the established practices to identify necessary changes that would reduce the rate of infection, based on analysis of the resident avoidance.

Goals and Objectives

Our outcome measure was to determine a reduction of DSWI by 40% from baseline data, within twelve months of starting the initiative. This goal would equate to an annual rate of 1.41 infections or fewer per 100 CABG patients.

The study period chart review of all CABG cases was conducted from January 2011 through December 2012. The dates used for this Quality Improvement Project’s implementation were from March 31st, 2013 through March 31st, 2014.

Methods

• Reviewed all CABG cases with deep sternal wound infection from January 2011 to December 2012.
• Developed flowchart of the current process, from when the patient is identified for surgery through the hospital, to which all team members took notes, added right to the data.
• Conducted interviews and focus groups from admission to discharge in Pre-Admission Testing, Pre-Operative Day Stay, OR, Cardiac Intensive Care Unit, Cardio-Vascular Stepdown Unit, cross team members, team members did not know about each other’s audit findings in order to acquire more objective data.
• Weekly discussions with surgeons, ICU, CICU, OR, and FOS nurses, and the Multidisciplinary Preventive Care committee to assess current findings, equipment in use, changes noted according to the literature, and new education required. We make notes to adjust when process or product changes were addressed.
• All items, processes, and equipment were reviewed on a need-to-change, topic-conducted for weeks or days or three being identified as needing correction in a quick.
• Changes were made, in other process, equipment, or personnel.

The target goal of SSI reduction was always kept as the objective for any changes.

Comprehensive Process Improvement

INITIAL PHASE

• Actual Defense/Percentage testing of equipment
• Patient education of smoking, and CHG skin approval

PRE-OP

• Pre-operative screening for MRSA

POST-OP

• Change in the patient care philosophy from a focus on treatment of SSI to prevention of them

CONCLUSIONS

As a result of implementing changes identified in our quality improvement project, the rate of deep sternal wound infections dropped from a rate of 0.7 infections per 100 patients during the implementation year, from March 2012 through March 2013. This surpassed our target goal of 0.5.

Excess DSWI hospital treatment days

Estimated costs of DSWI treatment

Outcomes

In this year-long quality improvement project the CABG patients at Athens Regional Medical Center in Athens, Georgia, 64 different items, processes, and equipment items were examined for possible impact on patient outcomes.

262 patients were involved in the study.

Within the 29 months of the study, there were 2 deep sternal wound infections, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.

Conclusions

As a result of implementing changes identified in our quality improvement project, the rate of deep sternal wound infections dropped from a rate of 0.7 infections per 100 patients, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.

In this year-long quality improvement project the CABG patients at Athens Regional Medical Center in Athens, Georgia, 64 different items, processes, and equipment items were examined for possible impact on patient outcomes.

262 patients were involved in the study.

Within the 29 months of the study, there were 2 deep sternal wound infections, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.

Conclusions

As a result of implementing changes identified in our quality improvement project, the rate of deep sternal wound infections dropped from a rate of 0.7 infections per 100 patients, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.

In this year-long quality improvement project the CABG patients at Athens Regional Medical Center in Athens, Georgia, 64 different items, processes, and equipment items were examined for possible impact on patient outcomes.

262 patients were involved in the study.

Within the 29 months of the study, there were 2 deep sternal wound infections, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.

In this year-long quality improvement project the CABG patients at Athens Regional Medical Center in Athens, Georgia, 64 different items, processes, and equipment items were examined for possible impact on patient outcomes.

262 patients were involved in the study.

Within the 29 months of the study, there were 2 deep sternal wound infections, and none following these for the remainder of the implementation year, creating an incidence of 0.7 per 100 patients.

11 interventions were implemented rapidly, following structured observation of all processes, procedures, and products used in management of CABG patients. There has not been a CABG-related SSI in over 21 months at Athens Regional Medical Center.
Achieving Zero: Reduction of Deep Sternal Wound Infections Following CABG with Saphenous Vein Donor Site

Athens Regional Medical Center

Authors:
Candis Kles, RN CCRN, Terry Hurry, RN, Cullen Morris, MD., Kerry Fleming, RN,
Mary Beth Bell, RN, Marcia Lowe, RN,
Wendy Robinson, RN, Christy Vickery, RN,
Roy Wampole, RN, Heather Whitaker, RN,
Beth Daupous-Welmeier, RN MSN CCRN

INITIAL PHASE
- Actual Deferral Percentage testing of equipment
- OR particle/dust testing
- Education of staff on clipping, and CHG skin asepsis

PRE-OP
- Pre-operative screening for MRSA
- Standardized process for mupirocin nasal ointment and chlorhexidine mouthwash beginning at pre-op end with surgeon and continuing through discharge post-operatively.
- Involvement of Home Health Care early in the process
- Patient education about 2% CHG bathing wipes pre-op and post-op.
- Disposable ENDS leads
- Surgical site hair removal with clippers in Pre-Operative Short Stay (POSS), after proper patient education conducted

OR
- Disposable pacing wires
- New braided suture and interrupted suture technique by surgeons.
- Silent Soft Silicone 5-layer Bordered Foam Mediastinal Dressing® was placed postoperatively and remained in place throughout hospitalization, changed PRN drainage or changed every 7 days
- Occlusive Chest Tube dressing

POST-OP
- Small heart pillow for splinting
- Involvement of home health, physical therapy and cardiac rehabilitation

PRE-OP
- Pre operative screening for MRSA
- Standardized process for mupirocin nasal ointment and chlorhexidine mouthwash beginning at pre-op end with surgeon and continuing through discharge post-operatively.
- Involvement of Home Health Care early in the process
- Patient education about 2% CHG bathing wipes pre-op and post-op.
- Disposable ENDS leads
- Surgical site hair removal with clippers in Pre-Operative Short Stay (POSS), after proper patient education conducted

OR
- Disposable pacing wires
- New braided suture and interrupted suture technique by surgeons.
- Silent Soft Silicone 5-layer Bordered Foam Mediastinal Dressing® was placed postoperatively and remained in place throughout hospitalization, changed PRN drainage or changed every 7 days
- Occlusive Chest Tube dressing

POST-OP
- Small heart pillow for splinting
- Involvement of home health, physical therapy and cardiac rehabilitation

Comprehensive Process Improvement

Improvement in Cost and Excess Hospital Days with Implementation of Quality Improvement Project

Estimated costs of DSWI treatment

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>$75,000</td>
<td></td>
</tr>
<tr>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>$225,000</td>
<td></td>
</tr>
<tr>
<td>$300,000</td>
<td></td>
</tr>
<tr>
<td>$375,000</td>
<td></td>
</tr>
</tbody>
</table>

Excess DSWI hospital treatment days

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>220</td>
<td>140</td>
</tr>
<tr>
<td>20</td>
<td>120</td>
<td>60</td>
</tr>
<tr>
<td>40</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>60</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>80</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Estimated Cost Savings AFTER Initiation of Quality Improvement Project: $212,315.00

Achieving Zero: Reduction of Deep Sternal Wound Infections Following CABG with Saphenous Vein Donor Site

Athens Regional Medical Center

Authors:
Candis Kles, RN CCRN, Terry Hurry, RN, Cullen Morris, MD., Kerry Fleming, RN,
Mary Beth Bell, RN, Marcia Lowe, RN,
Wendy Robinson, RN, Christy Vickery, RN,
Roy Wampole, RN, Heather Whitaker, RN,
Beth Daupous-Welmeier, RN MSN CCRN

The Mölnlycke Health Care, Mepilex®, and Safetac® names and respective logos are registered trademarks of Mölnlycke Health Care AB. Distributed by Mölnlycke Health Care US, LLC, Norcross, Georgia 30092. © 2014. Mölnlycke Health Care AB. 1.800.843.8497.

5550 Peachtree Parkway, Suite 500, Norcross, GA 30092  |  1-800-843-8497  |  www.molnlyckeUSA.com

The Mölnlycke Health Care, Mepilex®, and Safetac® names and respective logos are registered trademarks of Mölnlycke Health Care AB. Distributed by Mölnlycke Health Care US, LLC, Norcross, Georgia 30092. © 2014. Mölnlycke Health Care AB. 1.800.843.8497.

5550 Peachtree Parkway, Suite 500, Norcross, GA 30092  |  1-800-843-8497  |  www.molnlyckeUSA.com

The Mölnlycke Health Care, Mepilex®, and Safetac® names and respective logos are registered trademarks of Mölnlycke Health Care AB. Distributed by Mölnlycke Health Care US, LLC, Norcross, Georgia 30092. © 2014. Mölnlycke Health Care AB. 1.800.843.8497.