Improving Surgical Wound Classification in the Operating Room

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What is NSQIP

- Reports risk adjusted surgical outcomes
- Provides benchmark for hospitals to compare surgical outcomes data
- Provides us an opportunity to assess and evaluate how well we are providing surgical care
- Identify area for improvement in care practices and systems
Importance of Wound Class

- SB 1058 - A required part of the risk adjustment score for selected Colon, Orthopedic and Cardiac procedures with s/p deep & organ space surgical site infections.

- Accurate documentation

- NSQIP uses to risk adjusted outcomes

- Evaluate surgical infection risk
Wound Class & Risks

- **Class 1-Clean wound** - 1% to 5% of developing SSI or deep tissue infection.

- **Class 2-Clean/Contaminated** has 4%-10% risk

- **Class 3-Contaminated** - has > 10% risk of getting infection even w/ prophylactic abx.

- **Class 4-Dirty-** increase to 27% risk

Test your Wound Classification Knowledge

- Let’s take a quiz-see
- (Test questions taken from *The American College of Surgeons and modified by San Jose Kaiser Permanente*)
A patient underwent a laparoscopic appendectomy. The preoperative CT scan reported the appendix contained a fecalith. There was no mention of infection, rupture, or inflammation in the operative report. What wound classification should be reported?

1. Clean
2. Clean/Contaminated
3. Contaminated
4. Dirty/Infected
KPSF Multispecialty Training

- Abstract cases in multiple specialties of incorrect wound class IDs
- Develop a dozen or more Q&A’s per specialty
- Give individualized training to each specialty in a didactic forum
  - Surgeons and RNs together
  - Blind electronic quizzes with instant results
- Advantage: specific case nuances can be presented and discussed
Answers:

3- **B-wound class 2**- there was no documentation of rupture, inflammation, or purulence, a wound class 2 would be assigned. Appy’s are always a wound 2 as a baseline.

*If the surgeon notes that its acute inflammation, it would change to a wound class 3; if pus, purulence, or perforation noted or peritonitis, this wound would change to a class 4*
Voice of the Customer

Staff’s Perspective

I am not sure of the correct wound class

I’ve never been trained

Why does it even matter?

We rarely do the debriefing-too much to do

We never talk about the wound class-never have
Old Process

Patient in OR room

Circulating RN reviews Consent & determines what wound class prior to start of case

Potential Improvement:
• Correct wound classification

Potential Improvement Areas:
• Standardize communication between surgeons and RN’s-Debriefing
• Correct Wound Classification-Education

Wound class gets revised based on:
➢ Instruments requested during procedure.
➢ *Rarely* conversation between surgeon and circulating RN about wound classification.
➢ Based on RN’s observations of what’s going on at the field.
What are we trying to Improve?
Baseline Performance

Surgical Wound Classification
Kaiser San Jose Medical Center
2009

Goal 90%
Average 69%
Baseline Data

Misclassified Wound Class
May 2009 - June 2009

<table>
<thead>
<tr>
<th>Department</th>
<th>Misclassified %</th>
<th>Cumulative %</th>
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</thead>
<tbody>
<tr>
<td>General Surgery</td>
<td>35</td>
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<tr>
<td>Orthopedics</td>
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<tr>
<td>HNS</td>
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<td>100</td>
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</table>
General Surgery Wound Classification
Modesto

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Misclassified %</th>
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<tbody>
<tr>
<td>Acute Lap. Chole</td>
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<tr>
<td>Acute Appendectomy</td>
<td>30</td>
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<tr>
<td>Hernias</td>
<td>25</td>
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<tr>
<td>Colon</td>
<td>15</td>
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</table>
Appys “should at least be” 3 or 4

KP Northern California 2010
n = 2,599 Appendectomy Cases

96% of lap appys should be wound class 3 or 4

Documented Lap Appy Wound Class 3/4 (Non-NSQIP)
Appys “should at least be” 3 or 4

KP Northern California 2010
n = 2,599 Appendectomy Cases

96% of appys should be wound class 3 or 4

KP Modesto
KP SF
KP (Non-NSQIP)

Appendectomy Expected  ▲ Non-NSQIP MCs Observed  □ SFO  ▲ MOD
Most Common Misused Class

2- Clean/Contaminated

- Specifically used when ENTERING ORGANS
- ENTERING & INVOLVING TRACTS only

**IS NOT:**
- A default wound class when there’s uncertainty
- A gray area between class 1 and class 3 wound
Appendectomy

No inflammation  Grossly inflamed, acute, no pus

Wound Class 2  Wound Class 3
Goal/ Aim

To achieve 90% or higher in correct wound classification by (You pick your target date)
WOUND CLASSIFICATION
GENERAL AND VASCULAR SURGERY
Small Tests of Change-2010

PERCENTAGE CORRECT

Wound class added to Debriefing
Education to Gen/Vas Surgeons
OR/ASU Managers discussed with Staff
Wound Class Posters/decision trees up in OR and ASU rooms
Education to all OR Nurses
Spread to all Surgical Services
Education to Gen/Vas surgeons
Newsletter

PDSA Action Plan
Annotated Run Chart
KPSF Wound Class Progress

NSQIP General & Vascular Surgeries

<table>
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<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tbody>
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- NSQIP Start
- 1st NSQIP Report
- 1st WC Training Gen + Vasc only
- 2nd WC Training All Surgery Staff

Percentage of wounds mis-classified of all wounds classified
Improving Surgical Wound Classification

What Changes Lead to Improvement?

Act
Plan
Study
Do

→ Staff Education/Awareness
→ Standardize the process
→ Sustain changes

Change Concepts

We Can Do It!

Act

Study

Plan

Do

Survey staff regarding communication issues
Weekly audits-monitor wound class discussions, as part of debriefing
Create a biweekly educational newsletter with a case study, rationale, and current data
Decision tree and Posters placed in the L/D C/S rooms
Laminated wound class decision tree and posters placed in all the Operating rooms.
Share surgical wound classification results with Perioperative Nursing Management
Share surgical wound classification results with the General and Vascular Surgeons
Standardize & provide education to all Circulating nurses-wound class quiz
Standardize how wound class is discussed in the debriefing
Standardize and provide education to the General and Vascular Surgeons, then spread to all surgeons-wound class quiz
How will we reach our goal?

To achieve 90% or higher in correct wound classification by July 30, 2010

Drivers

Communication

Education

<table>
<thead>
<tr>
<th>Previous Process</th>
<th>New Process</th>
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<tbody>
<tr>
<td>Wound class is assigned based on:</td>
<td>• Validation of wound class during debriefing.</td>
</tr>
<tr>
<td>➢ conversations during surgery.</td>
<td></td>
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<tr>
<td>➢ Requested equipment</td>
<td></td>
</tr>
<tr>
<td>➢ Dx. On consent or HC surgery case/log info.</td>
<td></td>
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<tr>
<td>➢ No communication Between RN &amp; surgeons</td>
<td></td>
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<table>
<thead>
<tr>
<th>Previous State</th>
<th>Goal</th>
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<tbody>
<tr>
<td>➢ Practice based on past experience &amp; knowledge.</td>
<td>• To utilize standardized wound class definition.</td>
</tr>
<tr>
<td>➢ Inconsistent knowledge of wound class definition</td>
<td>• To have continuous support and feedback to surgeons and OR staff</td>
</tr>
</tbody>
</table>
Tools Created

- Wound Class Poster
- Wound Class Decision Tree
- Wound Class added to Debriefing
- Wound Class Newsletter
- Wound Class Quiz and Educational ppt
- Wound Class/Debriefing Audit Tool
- Individualized specialty training packages
Wound Classification

1- Clean:
Uninfected wound, no inflammation, closed, and if necessary, w/ closed drainage. Non-penetrating (blunt) trauma.

2- Clean/Contaminated:
Respiratory, alimentary, genital, or urinary tract ENTERING ORGANS w/o Major break in technique

3- Contaminated:
Open, acute wounds, breaks in technique or gross spillage, necrotic w/o drainage.
Key words: ACUTE WOUND & INFLAMMATION, NONPURULENT

4- Dirty/Infected:
Old traumatic wound w/ retained devitalized tissue, and existing infection wounds. Wet gangrene.
Key words: PERFORATED, ABSCESS, RUPTURE, INFECTED, PURULENT, SUPPURATIVE
KPSF Wound Class Simplified

HIGHEST WOUND CLASS ASSIGNED TO ALL PROCEDURES USING SAME INCISION

Clean Surgical Incision Site
1-11% wound infection risk

<table>
<thead>
<tr>
<th>Non-Tract*</th>
<th>Tract**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Potential or Pre-Infection
10-17% wound infection risk

Acute Inflammation, dry (ischemic) gangrene, breaks in technique, spillage, true foreign bodies
3

Visually Active Infection
>27% wound infection risk

Incision into pus, purulence, abscess, wet (infected) gangrene, old dead tissue
4

* Ortho, cardiac, vascular, plastics, hernia, breast, abdominal outside of tracts
** Reproductive, urinary, renal, ear, nose, throat, pulmonary, colorectal, hepatobiliary
1 & 2 includes chronic inflammation at these sites, e.g., arthritic joint (1), colitis/Crohns (2)
WOUND CLASSIFICATION DECISION TREE
CVA NSQIP

**Things that does not change wound classification:**
- Chronic inflammation
- Closed Drains
- Cyst drainage
- Colostomy

**Document the highest wound class if there are multiple operating sites involved w/ multiple wound classes.**

**Yes**
- Major breaks in sterile field?
- Acute, Non-purulent inflammation?
- Open wound?
- GI spillage?

**No**
- Major breaks in sterile field?
- Acute, Non-purulent inflammation?
- Open wound?
- GI spillage?

**Yes**
- Pus/purulence?
  - Abscess?
  - Peritonitis?
  - Perforated Viscera?
  - Retained devitalized tissue? (active infection)

**No**
- Pus/purulence?
  - Abscess?
  - Peritonitis?
  - Perforated Viscera?
  - Retained devitalized tissue? (active infection)

**Yes**
- Document Class 4 Dirty/Infected

**No**
- Document Class 3 Contaminated

**Yes**
- Document Class 1- Clean

**No**
- Document Class 4 Dirty/Infected

**Yes**
- Document Class 3 Contaminated

CVA NSQIP - Aline Van, SCNR
Circulator Following final count: “Is the team ready to debrief?”

**Surgeon**
- Verify Procedure, Diagnosis
- **Wound Class**
- Specimen (s) review (Path Sheet & Labels including history)
- Identify equipment issues

**Circulator**
- With the Surgeon review (Path Sheet & Labels including history)
- With the Scrub indicate final count correct (sharp, sponge & instrument)

**Scrub**
- With the RN Circulator indicate final count correct (sharp, sponge & instrument)

**Anesthesia**
- VTE prophylaxis

**HRST SAFETY DEBRIEFING**

Return to Room Time
Anesthesia/RN

HRST Approved 2-8-10
Team Communication

We Can Do It! Improving Surgical Wound Classification
May 4, 2010

Team Members: Efren Rosas, MD, Hernant Keny, MD, Juddie Spafford, Diane Nelson, Michelle McClendon, Diane Steman, Nita Row, Lana Johnson, Peter Schooley, Janda Carlson, Lesley Jarvis, Elaine Barrett, and Christina Solis

Our goal is to improve correct surgical wound classification from 69% to 90% in the Main OR and ASU by July 30, 2010.

Below are our results for the last several weeks. As you can tell from the graph below, we met our goal of getting at least 90% correct in mid-March. *What can we do differently to meet this goal every day?*

- Discuss Wound Class as part of the Debriefing—will be auditing this weekly
- Utilize the Wound Class Posters in every OR

**Test your knowledge!**

A patient had a previous repair of a flexor tendon one week before presentation. During an altercation, the wound was "crushed" open and became covered in dirt and debris. The patient presented to the emergency department for evaluation and was taken to surgery the same day for washout and repair. There was no description of any necrotic or purulent tissue. The wound was left open after the surgery. What wound classification should be reported?

**Answer:** Assign a wound classification of 4 - Dirty/Infected because the wound was opened up before going to the OR, was exposed to a potentially substantial amount of microbes (e.g., dirt and debris), and part of the procedure was a washout.
Track Results

- Leverage on electronic surgical reports
- Audit team communication
  - Was the Debriefing discussed?
  - Was wound class discussed as part of the debriefing?
Key Learning Points

- Collect baseline data & identify areas of improvement (start small).
- Recruit RN and Surgeon Champion
- Educate OR nurses and surgeons on CDC wound class definitions.
- Incorporate wound class validation as part of team debriefing process.
- Monitor data for improvement and evaluate PDSA cycles.
- Develop sustainability plan
Questions & Feedback
REFERENCES


Improving Surgical Wound Classification

Goal Statement - What Are We Trying to Accomplish?:
Improve correct Surgical Wound Classification in the OR and ASU from 69% to 90% by July 30th 2010

Team Members:
- Janda Carlson - Registered Nurse
- Lana Johnson - Registered Nurses
- Peter Schooley - Registered Nurse First Assistant
- Lesley Jarvis - Assistant Nurse Manager

Co-Leads:
- Hemant Keny, MD - Surgeon
- Diane Nelson - Operating Room Manager
- Nita Rowe - Assistant Manager of the OR
- Michelle McClendon - ASU Manager
- Diane Steman - ASU Assistant Manager

Improvement Advisor: Christina Solis, RN

Mentor: Amy Liu and Sommer Kerhli

Sponsor: Efren Rosas, MD and Judie Spafford, RN

PI Oversight Group: PI Executive Council

Business Case: Surgical wound classification directly affects the analyses and interpretation of all postoperative surgical outcomes for standard infection control reports to the State and CMS, as well, as to programs, such as, the American College of Surgeon’s National Surgical Quality Improvement Program. Wound class is an important predictor for the risk of post-operative Surgical Site Infections.
Project Selection:
How Does the Project Fit in Our Organizational Goal?

**Goal:**
- The Quality Leader
  - Evidence Based Care
  - Do No Harm
  - Appropriate Care Setting

**Drivers:**
- Evidence Based Care

**Focus Area:**
- Highly Reliable Surgical Teams-Surgical Briefings And Debriefings

**Project Goal:**
- Increase correct surgical wound classification to 90%

**IA/Mentor:**
- Christina Solis
# How Will We Know a Change Is an Improvement?

## Family of Measures

### Key Measures for the Project

<table>
<thead>
<tr>
<th>Measure</th>
<th>Operational Definition</th>
<th>Type (outcome, process, balancing)</th>
<th>Data Collection Plan (How will you collect data &amp; how frequently)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of correct wound classification for General and Vascular cases in the Main OR and ASU</td>
<td>Number correct divided by the total of general and vascular cases. Definitions set by the ACS and CDC.</td>
<td>outcome</td>
<td>Data is collected every 8 days per NSQIP guidelines from the Surgical Event Log. Documentation of wound class is compared to the surgical operative note, as well as the CDC and ACS definitions.</td>
</tr>
<tr>
<td>% of General and Vascular surgery cases that perform a debriefing at the end of the case and include wound class as part of the tool.</td>
<td>Number of cases that completed the debriefing tool with wound class included divided by the total of number cases audited</td>
<td>process</td>
<td>The debriefing audit will be done by the Anesthesia team. The audit tools will be distributed at the beginning of the week and collected on the last work day of the week.</td>
</tr>
<tr>
<td>Staff satisfaction</td>
<td>Total score on a survey regarding team communication with regards to implemented wound class discussion.</td>
<td>balancing</td>
<td>A team communication survey will be created by the PI workgroup team and distributed in July 2010 to all the General and Vascular surgeons and the perioperative Circulating nurses.</td>
</tr>
</tbody>
</table>
Examples - Clean 1

- Clean wounds do not involve normally colonized areas
- Hernia, lap or open
- Breast Biopsy; mastectomy
- Vascular bypass
- Exploratory laparoscopy
- Lap gastric band
- Amputation (where incision is made is clean)
- Thyroidectomy
- Total hip or knee replacement
Entering any body tract, Respiratory, GI GU, Oropharyngeal
- Cystoscopy, TURP
- Colectomy
- Gastric bypass
- Wedge resection ovary/ovarian cyst drainage

Lap or open cholecystectomy
- Chronic cholecystitis
- Incidental appendectomy, no acute inflammation
- Whipple
- Nephrectomy
- Lung lobectomy
Acute inflammation noted in appy’s, acute cholecystitis (this is a frequently miss classified as a 2)

- Foreign matter on field, regardless of re-draping
- Dry gangrene
- Bile spillage

- Emergency thoracotomy for cardiac massage
- Non-sterile items utilized
- Glove tear or hole, that has lead to wound contamination
Dirty/Infected

- Old traumatic wounds with devitalized tissue
- Ruptured or perforated bowel
- I and D of rectal abscess
- Ruptured appendix

- Supportive wound (pus/purulent)
- Wet gangrene