An Initiative of the Florida Hospital Association
Hospital Improvement Innovation Network

Surgical Infection Prevention Webinar Series:
Infection Prevention Strategies in the Pre-operative Period
April 26, 2019
Welcome & FHA Mission to Care HIIN Overview
  - Cheryl Love, RN, BSN, BS-HCA, MBA, LHRM, CPHRM, Director of Quality and Patient Safety and Improvement Advisor, FHA

Surgical Infection Prevention in the Pre-operative Setting
  - Linda R. Greene, RN, MPS, CIC, FAPIC, Manager of Infection Prevention, UR Highland Hospital, Rochester, NY

Q&A

Upcoming HIIN Events and Opportunities

Evaluation Survey & Continuing Nursing Education
HIIN Core Topics – Aim is 20% reduction

- Adverse Drug Events (ADE)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Clostridium Difficile Infection (CDI)
- Central line-associated Blood Stream Infections (CLABSI)
- Hospital-onset MRSA Bacteremia
- Injuries from Falls and Immobility
- Pressure Ulcers (PrU)
- Sepsis
- Surgical Site Infections (SSI)
- Venous Thromboembolisms (VTE)
- Ventilator-Associated Events (VAE/IVAC/PVAP)
- Readmissions (12% reduction)
- Worker Safety
SSI Resources, Trainings and Tools

- Mission to Care Website
- HRET HIIN Website
- SSI Change Package
- SSI Top 10 Checklist
- SSI-Colon Prevention Resource Guide
- SOAP UP Resources
- Watch Past Webinars
- HRET HIIN Resource Library
- SSI Podcast Series
- Case Review Templates, Guidelines and more...

**Hospital-Acquired Infections (HAIs)**

**Surgical Site Infection (SSI)**

Surgical site infections are infections that occur in the wound created by an invasive surgical procedure.

The HIIN is focused on reducing SSI from:
- Colon surgery
- Abdominal hysterectomies
- Knee replacement
- Hip replacement

Goal: By September 27, 2018, a 20 percent reduction in SSI

Resources to prevent SSI:
- SSI Change Package
- SSI Checklist
- Watch Past Virtual Trainings
- HIIN Resource Library
- Success Stories
- SOAP UP
Designed to reduce multiple forms of harm with simple, easy-to-accomplish activities that cut across several topics to decrease harm.

Focused on four components:

- **SOAP UP**: Hardwire Hand Hygiene
- **GET UP**: Mobilize Patients
- **WAKE UP**: Prevent Over-sedation
- **SCRIPT UP**: Optimize Inpatient Medications
FHA Mission to Care Update: SSI Colon Rates

Source: HRET Comprehensive Data System, April 24, 2019
FHA Mission to Care Update:
SSI Hysterectomy Rates

Source: HRET Comprehensive Data System, April 24, 2019

<table>
<thead>
<tr>
<th>Date</th>
<th>FL Rate</th>
<th>HRET HIIN Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL</td>
<td>1.36</td>
<td>1.47</td>
</tr>
<tr>
<td>10/16</td>
<td>1.27</td>
<td>1.15</td>
</tr>
<tr>
<td>11/16</td>
<td>1.92</td>
<td>1.36</td>
</tr>
<tr>
<td>12/16</td>
<td>0.60</td>
<td>0.99</td>
</tr>
<tr>
<td>1/17</td>
<td>0.72</td>
<td>1.11</td>
</tr>
<tr>
<td>2/17</td>
<td>0.76</td>
<td>1.13</td>
</tr>
<tr>
<td>3/17</td>
<td>1.18</td>
<td>1.23</td>
</tr>
<tr>
<td>4/17</td>
<td>1.46</td>
<td>1.24</td>
</tr>
<tr>
<td>5/17</td>
<td>1.03</td>
<td>1.24</td>
</tr>
<tr>
<td>6/17</td>
<td>1.11</td>
<td>1.18</td>
</tr>
<tr>
<td>7/17</td>
<td>1.07</td>
<td>1.35</td>
</tr>
<tr>
<td>8/17</td>
<td>0.94</td>
<td>1.08</td>
</tr>
<tr>
<td>9/17</td>
<td>0.99</td>
<td>1.24</td>
</tr>
<tr>
<td>10/17</td>
<td>0.44</td>
<td>1.08</td>
</tr>
<tr>
<td>11/17</td>
<td>0.68</td>
<td>1.15</td>
</tr>
<tr>
<td>12/17</td>
<td>1.20</td>
<td>1.24</td>
</tr>
<tr>
<td>1/18</td>
<td>1.00</td>
<td>1.28</td>
</tr>
<tr>
<td>2/18</td>
<td>1.26</td>
<td>1.20</td>
</tr>
<tr>
<td>3/18</td>
<td>0.57</td>
<td>1.19</td>
</tr>
<tr>
<td>4/18</td>
<td>1.23</td>
<td>1.29</td>
</tr>
<tr>
<td>5/18</td>
<td>1.85</td>
<td>1.36</td>
</tr>
<tr>
<td>6/18</td>
<td>0.67</td>
<td>1.31</td>
</tr>
<tr>
<td>7/18</td>
<td>1.15</td>
<td>1.28</td>
</tr>
<tr>
<td>8/18</td>
<td>1.01</td>
<td>1.11</td>
</tr>
<tr>
<td>9/18</td>
<td>1.40</td>
<td>1.08</td>
</tr>
<tr>
<td>10/18</td>
<td>1.36</td>
<td>1.42</td>
</tr>
<tr>
<td>11/18</td>
<td>1.05</td>
<td>1.05</td>
</tr>
</tbody>
</table>

# FL Reporting: 82 81 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 79 67 65

# HRET HIIN Reporting: 1,026 1,053 1,052 1,057 1,053 1,052 1,051 1,048 1,051 1,048 1,044 1,044 1,043 1,039 1,043 1,036 1,037 1,032 1,028 1,027 1,020 1,020 1,005 985 968 811 717
FHA Mission to Care Update: SSI Knee Rates

Source: HRET Comprehensive Data System, April 24, 2019
FHA Mission to Care Update: SSI Hip Rates

Source: HRET Comprehensive Data System, April 24, 2019

<table>
<thead>
<tr>
<th></th>
<th>FL Rate</th>
<th>HRET HIIN Rate</th>
<th># FL Reporting</th>
<th>#HRET HIIN Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL</td>
<td>1.42</td>
<td>1.25</td>
<td>67</td>
<td>782</td>
</tr>
<tr>
<td>10/16</td>
<td>0.90</td>
<td>0.91</td>
<td>64</td>
<td>799</td>
</tr>
<tr>
<td>11/16</td>
<td>1.17</td>
<td>1.15</td>
<td>65</td>
<td>797</td>
</tr>
<tr>
<td>12/16</td>
<td>0.80</td>
<td>0.94</td>
<td>64</td>
<td>796</td>
</tr>
<tr>
<td>1/17</td>
<td>1.16</td>
<td>1.05</td>
<td>64</td>
<td>833</td>
</tr>
<tr>
<td>2/17</td>
<td>0.42</td>
<td>1.11</td>
<td>64</td>
<td>835</td>
</tr>
<tr>
<td>3/17</td>
<td>1.07</td>
<td>0.97</td>
<td>63</td>
<td>831</td>
</tr>
<tr>
<td>4/17</td>
<td>1.16</td>
<td>1.18</td>
<td>61</td>
<td>834</td>
</tr>
<tr>
<td>5/17</td>
<td>1.36</td>
<td>1.18</td>
<td>61</td>
<td>829</td>
</tr>
<tr>
<td>6/17</td>
<td>0.99</td>
<td>1.05</td>
<td>61</td>
<td>827</td>
</tr>
<tr>
<td>7/17</td>
<td>0.89</td>
<td>1.08</td>
<td>61</td>
<td>819</td>
</tr>
<tr>
<td>8/17</td>
<td>0.96</td>
<td>0.97</td>
<td>61</td>
<td>821</td>
</tr>
<tr>
<td>9/17</td>
<td>1.00</td>
<td>1.23</td>
<td>60</td>
<td>826</td>
</tr>
<tr>
<td>10/17</td>
<td>1.03</td>
<td>0.95</td>
<td>60</td>
<td>827</td>
</tr>
<tr>
<td>11/17</td>
<td>1.14</td>
<td>1.13</td>
<td>60</td>
<td>830</td>
</tr>
<tr>
<td>12/17</td>
<td>0.63</td>
<td>1.18</td>
<td>59</td>
<td>833</td>
</tr>
<tr>
<td>1/18</td>
<td>1.02</td>
<td>1.04</td>
<td>61</td>
<td>826</td>
</tr>
<tr>
<td>2/18</td>
<td>1.33</td>
<td>1.09</td>
<td>61</td>
<td>830</td>
</tr>
<tr>
<td>3/18</td>
<td>1.32</td>
<td>1.15</td>
<td>61</td>
<td>818</td>
</tr>
<tr>
<td>4/18</td>
<td>0.81</td>
<td>1.31</td>
<td>61</td>
<td>821</td>
</tr>
<tr>
<td>5/18</td>
<td>0.41</td>
<td>0.95</td>
<td>61</td>
<td>813</td>
</tr>
<tr>
<td>6/18</td>
<td>0.83</td>
<td>0.97</td>
<td>61</td>
<td>799</td>
</tr>
<tr>
<td>7/18</td>
<td>0.80</td>
<td>1.03</td>
<td>61</td>
<td>800</td>
</tr>
<tr>
<td>8/18</td>
<td>1.21</td>
<td>0.90</td>
<td>61</td>
<td>789</td>
</tr>
<tr>
<td>9/18</td>
<td>0.89</td>
<td>0.93</td>
<td>61</td>
<td>771</td>
</tr>
<tr>
<td>10/18</td>
<td>0.74</td>
<td>0.91</td>
<td>61</td>
<td>746</td>
</tr>
<tr>
<td>11/18</td>
<td>0.30</td>
<td>0.95</td>
<td>61</td>
<td>625</td>
</tr>
<tr>
<td>12/18</td>
<td>0.76</td>
<td>0.65</td>
<td>61</td>
<td>533</td>
</tr>
<tr>
<td>1/19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Register Online</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 23, 2018</td>
<td>NHSN: SSI Surveillance Identification and Analysis</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 20, 2018</td>
<td>SSI-Colon: How to Assess Root Cause and Prevention Strategies</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 18, 2018</td>
<td>NHSN: VAE Surveillance Identification and Analysis</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 22, 2019</td>
<td>VAE: How to Assess Root Cause and Prevention Strategies</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 19, 2019</td>
<td>NHSN: MRSA Bacteremia Surveillance Identification and Analysis</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 26, 2019</td>
<td>MRSA Bacteremia: How to Assess Root Cause and Prevention Strategies</td>
<td>Event archive*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Access Event Archives ([Recordings] | [Slides]) on the Mission to Care HIIN Website
Surgical Infection Prevention
Pre-operative setting

Linda R Greene, RN, MPS, CIC, FAPIC
Linda_greene@urmc.rochester.edu
Objectives

- Describe Risk factors for Surgical Site Infections (SSIs)
- Identify pre-operative strategies to assess and mitigate risk
- Discuss the role of team work and communication across the continuum
Polling Question 1

What is your background?

1. Infection Prevention
2. Nursing
3. Quality
4. Management
5. Other
Risk Factors for SSI

Alterable Risks

Host Factors
- Age
- Obesity
- Malnutrition
- Prolonged pre-operative stay
- Infection at distal sites
- Cancer
- Hyperglycemia
- Immunosuppression
- ASA class
- Comorbidities

Surgical/Environmental Factors
- Abdominal site
- Wound classification
- Duration of surgery
- Urgency of surgery
- Procedure
- Hair removal
- Intraoperative contamination
- Prophylactic antibiotics
- Surgical technique
- Surgical volume
- Prior procedures
- Poor hemostasis
- Drains/foreign bodies
- Hypothermia
- Oxygenation

Microbial Factors
- Nasal/skin carriage
- Virulence
- Adherence
- Inoculum

Alterable Risks
Risk Factors

- Patients should be assessed for risk factors as part of preparation for surgery
  - Modifiable
  - Non modifiable

- Predictors of infections
  - Those that estimate the intrinsic degree of microbial contamination of the surgical site
  - Type and duration of surgery
  - Those that serve as markers for host susceptibility
    - Diabetes, smoking, immunosuppression
Where are the Pathogens?

Pathogen source for most SSIs is endogenous flora of the patient’s skin, mucous membranes or GI tract.

20% of the skin’s pathogens live beneath the epidermal layer in hair follicles and sebaceous glands.

Any incision can carry some of the bacteria directly to the operative site.
Pathogenesis of Infection

- Risk of infection increases with the number and virulence of contaminating bacteria
- Antibiotics in the tissue provide a pharmacologic means of defense to augment natural host immunity
- Bacterial resistance may play a role in some infections
  They enable organisms to evade antibiotics
Issues to Consider

Type of surgery
Clean vs. Clean contaminated
Skin flora vs. bowel
Current Literature
Patient Education
Underlying co-morbidities
History of MDRO’s
# Patient Risk Factors for Infections

<table>
<thead>
<tr>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perioperative serum glucose 180-200mg/dl</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>BMI ≥ 30</td>
</tr>
<tr>
<td>Nutritional status</td>
</tr>
<tr>
<td>Depth of subcutaneous tissue ≥ 3cm</td>
</tr>
<tr>
<td>Co-existing infection at remote body site</td>
</tr>
<tr>
<td>American society of anesthesiologist physical status classification system</td>
</tr>
<tr>
<td>Immunodeficiency (Chronic steroid use, chemotherapy)</td>
</tr>
<tr>
<td>MRSA status</td>
</tr>
</tbody>
</table>
Modifiable Risk Factors

Pre-operatively

- Weight loss
- Nutritional status
- Diabetes
- Tobacco use
- Prolonged steroid use
- Remote infections
Basic Practices

Pre-Testing/Office Setting

1. Education
   ◦ Give patient the patient education tools (SSI Prevention Sheet).
   ◦ Provide education about hand hygiene.
   ◦ Document receipt and understanding of the material.

2. Smoking Cessation (Office setting)
   ◦ Encourage Smoking Cessation for at least 30 days.

3. Screen for Infections
   ◦ Screen for infections during preadmission testing – refer for treatment.
   ◦ Document history of MDRO (multi-drug resistant organism).

4. Nutrition/Pre-Op Diet
   ◦ NPO for solids 8 hours pre-operatively and 2 hours pre-operatively for clear liquids.

5. Pre-Op Skin Prep
   ◦ Require bathing or showering night before and morning of surgery.
Preoperative Measures

- Treat remote infections
  - Manage UTI, URI and skin infection before an elective surgery
    - Treat all infections appropriately in elective surgery
- Encourage weight loss and improve nutrition
  - In planned surgery, recommend weight loss
- Immunodeficiency should be corrected if possible
  - Collaboration with other specialist(s) in patients on prolonged steroids
  - Improve immune status
Evidence Based Guidelines

- Optimal hemoglobin A1C targets levels

- Advise patients to shower or bathe (full body) with soap (antimicrobial or non-antimicrobial) or an antiseptic agent on at least the night before the operative day
Evidence Based Guidelines

Provide instructions for patients prior to surgery describing strategies for reducing SSI risk

Special approaches:
Consider screening patients prior to surgery for MRSA carriage
<table>
<thead>
<tr>
<th><strong>Table I. Pre-operative recommendations for the prevention of surgical site infection, according to various guidelines</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICM</strong></td>
</tr>
<tr>
<td>Nasal screening and decolonisation</td>
</tr>
<tr>
<td>Pre-operative skin preparation</td>
</tr>
<tr>
<td>Immunosuppressive therapy</td>
</tr>
<tr>
<td>Glycemic control (including peri-operative recommendations)</td>
</tr>
</tbody>
</table>

ICM, International Consensus Meeting (strength of consensus); WHO, World Health Organization (quality of evidence); CDC, Center for Disease Control and Prevention (strength of recommendation); NICE, The National Institute for Health and Care Excellence; SHEA, Society for Healthcare Epidemiology of America (quality of evidence); CHG, chlorhexidine; IA/IB, strong recommendations; III, weak recommendations; SSI, surgical site infection.
The goal of the ACS NSQIP risk calculator is to provide accurate, patient-specific risk information to guide both surgical decision-making and informed consent. The risk calculator uses 20 patient predictors (e.g., age, ASA class, BMI, HTN) and the planned procedure (CPT code) to predict the chance that patients will have any of 18 different outcomes within 30-days following surgery.
Using the Calculator

21243 - Arthroplasty, temporomandibular joint, with prosthetic joint replacement

Begin by entering the procedure name or CPT code. One or more procedures will appear below the procedure box. You will need to click on the desired procedure to properly select it. You may also search using two words (or two partial words) by placing a '*' in between, for example: "cholecystectomy + cholangiography"

<table>
<thead>
<tr>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are there other potential appropriate treatment options?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Other Surgical Options</td>
</tr>
<tr>
<td>□ None</td>
</tr>
</tbody>
</table>

Please enter as much of the following information as you can to receive the best risk estimates. A rough estimate will still be generated if you cannot provide all of the information below.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Under 65 years</th>
</tr>
</thead>
</table>

| Sex | Female |

| Functional Status | Independent |

| Emergency Case | No |

| ASA Class | Mild systemic disease |

| Diabetes  | Oral |

| Hypertension requiring medication | Yes |

| Congestive Heart Failure in 30 days prior to surgery | No |

| Dyspnea | No |

| Current Smoker within 1 Year | No |
Calculator

Steroid use for chronic condition
- No

Ascites within 30 days prior to surgery
- No

Systemic Sepsis within 48 hours prior to surgery
- None

Ventilator Dependent
- No

Disseminated Cancer
- No

History of Severe COPD
- No

Dialysis
- No

Acute Renal Failure
- No

BMI Calculation:
- Height: 62 in / 157 cm
- Weight: 170 lb / 77 kg
### Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Your Risk</th>
<th>Average Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious Complication</td>
<td>3.3%</td>
<td>2.9% Above Average</td>
</tr>
<tr>
<td>Any Complication</td>
<td>4.1%</td>
<td>3.6% Above Average</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>0.2%</td>
<td>0.2% Below Average</td>
</tr>
<tr>
<td>Cardiac Complication</td>
<td>0.1%</td>
<td>0.1% Above Average</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>1.9%</td>
<td>1.4% Above Average</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>0.5%</td>
<td>0.5% Above Average</td>
</tr>
<tr>
<td>Venous Thromboembolism</td>
<td>0.3%</td>
<td>0.3% Average</td>
</tr>
</tbody>
</table>

Note: *Your Risk has been rounded to one decimal point.*
## Risk Continued

<table>
<thead>
<tr>
<th>Event</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal Failure</td>
<td>0.1%</td>
<td>0.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Readmission</td>
<td>2.9%</td>
<td>2.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return to OR</td>
<td>1.9%</td>
<td>1.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>0.0%</td>
<td>0.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge to Nursing or Rehab Facility</td>
<td>1.6%</td>
<td>1.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>0.9%</td>
<td>0.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal Failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Readmission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return to OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge to Nursing or Rehab Facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How accurate are our predictors?


Risk calculators accurately predicted the risk of pneumonia, cardiac complications, urinary tract infections, venous thromboembolism, renal failure, unplanned returns to operating room, discharge to nursing facility, and mortality.

Both calculators underestimated serious complications (26% vs 39%), overall complications (32.4% vs 45.3%), surgical site infections (9.3% vs 20%), and length of stay (9.7 days versus 13.1 days). When patients with prolonged hospitalization were excluded, the updated calculator accurately predicted length of stay. The ACS NSQIP risk calculator underestimates the overall risk of complications, surgical infections, and length of stay.
## Table 2. ERAS Society Guideline Elements for Colonic Resections

<table>
<thead>
<tr>
<th>Element</th>
<th>Target Effect and/or Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preadmission</strong></td>
<td></td>
</tr>
<tr>
<td>Cessation of smoking and excessive intake of alcohol</td>
<td>Reduce complications</td>
</tr>
<tr>
<td>Preoperative nutritional screening and, as needed, assessment and nutritional support</td>
<td>Reduce complications</td>
</tr>
<tr>
<td>Medical optimization of chronic disease</td>
<td>Reduce complications</td>
</tr>
<tr>
<td><strong>Preoperative</strong></td>
<td></td>
</tr>
<tr>
<td>Structured preoperative information and engagement of the patient and relatives or caretakers</td>
<td>Reduce anxiety, involve the patient to improve compliance with protocol</td>
</tr>
<tr>
<td>Preoperative carbohydrate treatment</td>
<td>Reduce insulin resistance, improve well-being, possibly faster recovery</td>
</tr>
<tr>
<td>Preoperative prophylaxis against thrombosis</td>
<td>Reduce thromboembolic complications</td>
</tr>
<tr>
<td>Preoperative prophylaxis against infection</td>
<td>Reduce infection rates</td>
</tr>
<tr>
<td>Prophylaxis against nausea and vomiting</td>
<td>Minimize postoperative nausea and vomiting</td>
</tr>
</tbody>
</table>
Figure. Enhanced Recovery After Surgery (ERAS) Flowchart

**Surgery**
- Preadmission nutritional support
- Cessation of smoking
- Control alcohol intake

**Anesthesia**
- Medical optimization

**Nursing**
- Preoperative information

**Preadmission**
- Selective bowel preparation

**Preoperative**
- Preoperative carbohydrates
- No NPO
- PONV prophylaxis

**Intraoperative**
- Minimal invasive surgery
- Minimize drains and tubes
- Regional analgesia
- Opioid-sparing anesthesia
- Balanced fluids
- Temperature control

**Postoperative**
- Early removal of drains and tubes
- Stop intravenous fluids
- Multimodal opioid-sparing pain control
- Early mobilization
- Early oral intake of fluids and solids
- Postdischarge follow-up
<table>
<thead>
<tr>
<th><strong>Discipline</strong></th>
<th><strong>Barriers to implementation</strong></th>
<th><strong>Enablers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>Manpower Time</td>
<td>Setting patient expectations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motivation for patients</td>
</tr>
<tr>
<td>Surgeons</td>
<td>Resistance to change</td>
<td>Ease of implementation of some interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gum chewing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carb loading</td>
</tr>
<tr>
<td>Anesthesiologists</td>
<td>Short pre-op fast – possible cancelled cases</td>
<td>Guideline with easy to follow recommendations</td>
</tr>
<tr>
<td></td>
<td>Possible lack of patient understanding</td>
<td></td>
</tr>
</tbody>
</table>
Taking a deeper dive

- Surgery and anesthesia elicit a stress response that produces marked neurophysiological changes with release of adrenaline, noradrenaline, cortisol, glucagon, and growth hormone.

- Disturbed eating patterns due to fasting or post-operative nausea, omission of insulin or hypoglycemic medication can contribute to glucose dysregulation.

- Preoperative HbA1c levels above 7 have been found to be associated with higher rates of surgical site infection.

- HbA1c is associated with increased length of hospital stay and is a predictor of risk for pulmonary embolism following orthopedic surgery.
What is hemoglobin A1c?

- A1C test measures what percentage of your hemoglobin is coated with sugar (glycated).
- Average blood sugar level over past 2-3 months
- The higher your A1C level, the poorer your blood sugar control and the higher your risk of diabetes complications
The calculation below is provided to illustrate the relationship between A1C and average blood glucose levels. This calculation is not meant to replace an actual lab A1C result, but to help you better understand the relationship between your test results and your A1C. Use this information to become more familiar with the relationship between average blood glucose levels and A1C—never as a basis for changing your disease management.

See how average daily blood sugar may correlate to A1C levels. Enter your average blood sugar reading and click Calculate.

<table>
<thead>
<tr>
<th>Average Blood Sugar (100-300 mg/dL)</th>
<th>A1C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relationship

A1C calculator*

The calculation below is provided to illustrate the relationship between A1C and average blood glucose levels. This calculation is not meant to replace an actual lab A1C result, but to help you better understand the relationship between your test results and your A1C. Use this information to become more familiar with the relationship between average blood glucose levels and A1C—never as a basis for changing your disease management.

See how average daily blood sugar may correlate to A1C levels. Enter your average blood sugar reading and click Calculate.

<table>
<thead>
<tr>
<th>Average Blood Sugar (100-300 mg/dL)</th>
<th>A1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>170</td>
<td>7.55</td>
</tr>
</tbody>
</table>
Polling Question 2

Do you check hemoglobin A 1C pre-op?

1. Only in diabetic patients
2. High risk
3. Specific surgical procedures
4. Specific procedures and diabetics
The Pre-op Shower

Almost all recommendations incorporate the pre-op shower either with or without an antiseptic.

Challenges include:

- Immobility

If using CHG in a shower, it must be left on 2-3 minutes.

Non COMPLIANCE
Surgical Strategies

- For all patients undergoing high risk surgeries (e.g. cardiothoracic (CT), orthopedic, and neurosurgery), unless known to be S. aureus negative, use an intranasal antistaphylocccal antibiotic/antiseptic (e.g. mupirocin or iodophor) and chlorhexidine wash or wipes prior to surgery.

- **Possible Regimens**
  - Intranasal antistaphylocccal antibiotic/antiseptic
    - Mupirocin twice daily to each nare for the 5 days prior to day of surgery
    - 2 applications of nasal Iodophor (at least 5%) to each nare within 2 hours prior to surgery
  - Chlorhexidine
    - Daily chlorhexidine wash or wipes for up to 5 days prior to surgery

- **Supplement Strategy**
  - Consider chlorhexidine bathing or wipes for up to 5 days prior to surgery for all surgical patients, not just those undergoing high risk surgery

https://www.cdc.gov/vitalsigns/staph/index.html
Culturing Challenges

If you are using a universal anti-staph application-why culture?

Main reason to assess MRSA status is to add vancomycin or other agent that covers MRSA to the prophylaxis.
What about allergies?

Pre-operative visits are a good time to assess for allergies.

Many elective cases have cephalosporin's as the first line prophylactic antibiotic.

What do you do with a patient who states a penicillin allergy?

- Question
- Skin test- Severe allergies should be skin tested.
Prophylaxis

**Vancomycin** – bacteriostatic (a biological or chemical agent that stops bacteria from reproducing, while not necessarily killing them otherwise). Can be bactericidal against some strains

**Cefazolin**--Bactericidal antibiotics kill bacteria; slow their growth or reproduction and inhibit cell wall synthesis: the beta-lactam antibiotics
Pre-op assessment

Do all patients come to a central location?

Variability in surgeon offices

For what procedures are classes routinely held?
Preparing the Skin before Surgery

**Skincare** are the most common cause of post-operative surgical wound infections. These wipes will clean your skin before surgery and help prevent infection at the surgical site. The wipes contain an antiseptic called Chlorhexidine Gluconate (CHG). CHG kills bacteria on skin that could cause a wound infection.

**Directions:**
- You will do two skin cleanings at home: one the **evening before** surgery and another the **morning of surgery**.
- Do **not shave** any areas of the body at least 2 days prior to surgery except the face, if desired.
- Avoid contact with eyes, ears, mouth, genital and rectal areas and colostomy if you have one.
- Close packages containing wipes may be warmed by soaking in warm water. **DO NOT** microwave wipes.
- Use wipes on cool and dry skin.
- Gently wipe skin as described below.
- Allow area to air dry **one minute**. **DO NOT rinse**. It is normal for the skin to have a temporary “lacky” or mildly itchy feel for several minutes after the antiseptic solution is applied.
- Dress in **freshly laundered nightwear**. Sleep on **freshly laundered sheets**.
- Throw wipes in garbage. **DO NOT** flush in the toilet.

**Prepping the skin the evening before surgery:**
- Shower or bathe and shampoo your hair as usual the evening before surgery. **Wait one hour** after your shower before using the wipes.
- Use **one cloth** to wipe each area of the body for 20 seconds in the following order (you will use a total of 6 cloths for this process):
  1. Wipe your **neck, chest and abdomen** – *not* the face.
  2. Wipe both **arms**, front and back, starting with the shoulder and ending at the fingertips. Be sure to thoroughly wipe the arm pit areas.
  3. Wipe your **right and left hip** followed by your groin. Be sure to wipe folds in the groin area.
  4. Wipe both **legs**, starting at the thigh and ending at the toes. Be sure to thoroughly wipe behind your knees.
  5. Wipe your **back** starting at the base of your neck to your waist line. Help may be needed to reach.
  6. Wipe your **outer buttocks** – *not* the rectal area.

**NOTE:** If you are scheduled for a c/section or are currently breastfeeding, **DO NOT use the wipes on your breasts**.

- Once you use the wipes do not shower, bathe or apply lotions, moisturizers, or makeup. **Do not rinse your skin.**
Polling Question 3

Do you hold pre-op classes for certain elective cases?

1. Yes
2. No
Other Strategies

Pre-anesthesia phase- CHG wipes prior to surgery

Applied by nursing staff

Augments – bath or shower
Ideal Situation

History - allergies (possible skin testing)
Infections - skin, any antibiotics, history of MRSA or other resistant organisms
Smoking cessation, risk factors
Compliance with pre-op bathing
Expected LOS
Any lines or devices expected
Wound care
Final Thoughts

• Preventing SSIs and complications starts pre-operatively

• Preparing patients and evaluating current status as well as risk is essential to safe care
Questions?
In-Person Meetings:
May 8-9 | DeLand, FL – TeamSTEPPS® Master Trainer Class
May 30-31 | Orlando, FL – Infection Prevention Boot Camp (Registration TBA)
Jun. 5 | Orlando, FL – Preventing Post-Surgical Harm (Registration TBA)

Virtual Events:
FHA HIIN Surgical Infection Prevention (SIP) Webinar Series:
• Apr. 26, 2019 - #1: Pre-operative Strategies for Prevention of SSI (Event archive will be available)
• May 22, 2019 - #2: Intra-operative Strategies for Prevention of SSI
• Jun. 25, 2019 - #3: Post-operative Strategies for Prevention of SSI

FHA Monthly Quality Hot Topics
• May 1, 2019 - Hot Topics Virtual Meeting #7
• Jun. 5, 2019 - Hot Topics Virtual Meeting #8

Check the weekly MTC HIIN Upcoming Events for details and registration
Eligibility for Nursing CEU requires submission of an evaluation survey for each participant requesting continuing education: https://www.surveymonkey.com/r/SIP-04-26-19

- Share this link with all of your participants if viewing today’s webinar as a group *(Survey closes after May 6, 2019)*
- Be sure to include your contact information and Florida nursing license number
- FHA will report 1.0 credit hour to CE Broker and a certificate will be sent via e-mail *(Please allow at least 2 weeks after the survey closes)*
Contact Us

Cheryl D. Love, RN, BSN, BS-HCA, MBA, LHRM, CPHRM
Director, Quality and Patient Safety
Florida Hospital Association
cheryll@fha.org  |  407-841-6230

Linda R. Greene, RN, MPS, CIC, FAPIC
Manager, Infection Prevention
UR Highland Hospital, Rochester, NY
linda_greene@urmc.rochester.edu