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# Safety Action Series

## Assessing and Minimizing Risk After Gynecologic Surgery

# Speakers

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# Disclosures

- Linda R Greene, RN, MPS, CIC has no real or perceived conflicts of interest.

- Oluwatosin Goje, MD, MSCR has no real or perceived conflicts of interest.

# Objectives

- Discuss risk factors for infection after gynecologic surgery
- Highlight strategies for controlling alterable risk and managing non-alterable risk
- Provide real world examples of how teams and systems can lower their infection rate

# 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 gynecologic infections
  - They enable organisms to evade antibiotics

# Pathogenesis

- Common pathogens arise from endogenous flora of the skin and or vagina
  - Anaerobes
  - Staphylococcus
  - Streptococcus

# Risk factors

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

- Predictors of gynecologic 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

# Modifiable Risk Factors

Pre-operatively

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

# Modifiable Risk Factors

Intra-operatively

- Surgical sepsis
- Vaginal preparation
- Shaving
- Pre-op antibiotics
- Excellent surgical techniques

# Modifiable Risk Factors

Post operatively

- Early ambulation
- Removal of urinary catheter

# Patient Risk Factors for Gynecologic Infections

| |
|---|
| Perioperative serum glucose 180-200mg/dl |
| Smoking |
| BMI ≥ 30 |
| Nutritional status |
| Depth of subcutaneous tissue ≥ 3cm |
| Co-existing infection at remote body site |
| Vaginal colonization with micro-organism |
| American society of anesthesiologist physical status classification system |
| Immunodeficiency ( Chronic steroid use, chemotherapy) |
| MRSA status |

# Actionable Items to Assess and Prevent Infections Post Surgery

# Preoperative Measures

- Treat remote infections
  - Manage UTI, URI and skin infection before an elective surgery
    - Treat all infections appropriately in elective surgery
- Clipping hair pre-operatively is preferred
  - Avoid shaving
- 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

- Control diabetes*
- Implement glycemic control of <200mg/dl
- Tobacco use
  - Discontinue use at least 30 days prior to surgery

Berrios-Torres et al. JAMA Surg 2017
Olsen MA et al. Infect Control Hosp Epidemiol 2009
King JT et al. Ann Surg 2011

# Skin/Vaginal Preparation

- 2017 CDC guideline recommend preoperative bath or shower
  - Preoperative surgical site preparation
  - Chlorhexidine-alcohol is an appropriate choice unless when contraindicated
  - Chlorhexidine appears to achieve greater skin microflora reduction
  - Has greater residual activity after application than povidone-iodine
    - Alcohol could irritate vaginal mucosa


Clinical Guideline CG74.London UK
Guidelines for perioperative practice Denver (CO) AORN 2018
Wihlborg O et al. Ann Chir Gynaecol 1987
Mangram AJ et al. Infect Control Hosp Epidemiol 1999
Jarral OA. Et al Interact Cardiovasc Thorac Surgery 2011

# Intraoperative Measures

- Surgeons should maintain appropriate aseptic technique
- Minimize operative room traffic
- Minimize risk of wound disruption
- Maintain hemostasis, while preserving blood supply
- Prevent hypothermia
- Gentle tissue handle
  - Avoid inadvertent entries into hollow viscus
  - Remove devitalized tissues
- Use appropriate surgical drains and surgical materials
  - Avoid wound seroma

Boyce JM et al. MMWR Recomm Rep 2002
Crolla RM et al. PLoS One 2012
Mangram AJ et al. 1999
Anderson DJ et al. Infect Control Hosp Epidemiol 2014

# Appropriate Antimicrobials

- Cefazolin should be administered within 1 hour prior to skin incision
  - Additional dose may be needed in
    - Obese -3g >120kg
    - Weight base dose of gentamicin and vancomycin
- Re-dose at 2 times the half-life of the drug measured from initiation of pre-op dose
  - Re-dose cefazolin after 4 hours
- Re-dose when there is excessive blood loss
  - Re-dose cefazolin at 1500ml of blood dose

Pelligrini JE et al.Obstet Gynecol 2017
Anderson DJ et al. Infect Control Hosp Epidemiol 2014
Bratzler DW et al. Am J Health Syst Pharm 2013
Committee Opinion #619. Obstet Gynecol 2015

# Antibiotics for penicillin allergy ?

- Cephalosporin if no immediate hypersensitivity reactions

Bratzler DW et al. Am J Health Syst Pharm 2013
Pichichero ME. et al. Ann Allergy Asthma Immunol 2014

# Antibiotic Regimens in patients with immediate hypersensitivity reactions to penicillin

| Agent | Dose | Half life ( Hours) | Interval to repeat ( hour) |
|---|---|---|---|
| Clindamycin<br><br>OR | 900mg | 2-4 | 6 |
| Metronidazole<br>PLUS | 500mg | 6-8 | NA |
| Gentamicin | 5mg/kg** | 2-3 | NA |
| <br>OR | | | |
| Aztreonam | 2g | 1.3-2.4 | 4 |

**Dose is based on actual body weight, if patients actual body weight is more than 20% above ideal body weight ( IBW), the dosing weight (DW) is determined DW = IBW+ 0.4( actual weight- IBW)

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# Is pre-op screening for BV beneficial ?

- Preoperative screening for bacterial vaginosis maybe considered as a possible means to decrease surgical site infections (SSI)

Soper DE et al . AJOG 1990
Larsson PG et al. Obstet Gynecol 1991
Workowski KA et al. MMWR Recomm Rep 2015

# Antibiotics for MRSA

- Patients with a hx or known methicillin-resistant *staphylococcus aureus* ( MRSA)
  - Single preoperative dose of vancomycin is recommended
  - CDC does not make recommendation on MRSA screening, decolonization or prophylaxis

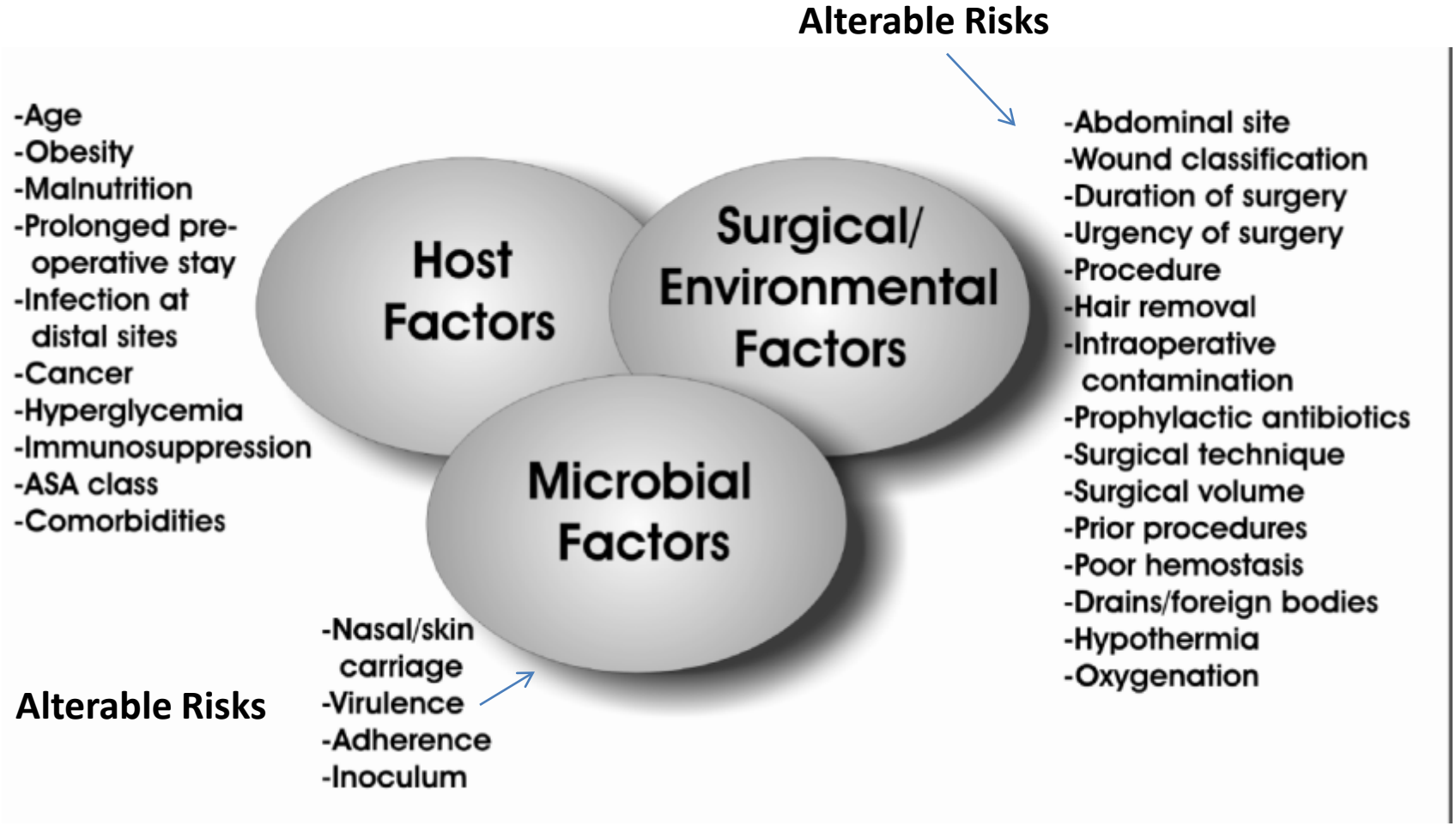
Bratzler DW et al. Am J Health Syst Pharm 2013
Schweizer M.et al. BMJ 2013

# Safety Bundles

- Hospitals should implement safety bundles to decrease SSI

Pellegrini JE et al. Obstet Gynecol 2017
Lavallee JF et al. Implement Sci 2017
Carter EB et al. Obstet Gynecol 2017

# Risk Factors for SSI



# How do we manage these risk?

Basics (Surgical Environment)

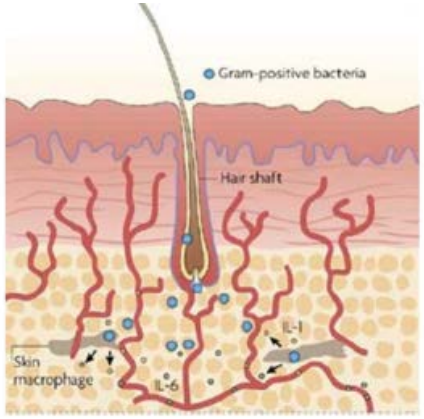
- Normothermia - Warming patients
- Alcohol containing prep
- Maintaining aseptic technique
- Antimicrobial prophylaxis
- Strict aseptic technique

# Rationale

- For most SSIs, the source of pathogens is the endogenous flora of the patient's skin
- Unique challenge in GYN- potential pathogenic microorganisms may come from the skin or ascend from the vagina and endocervix to the operative sites (gram-negative bacilli, enterococci, group B streptococci, and anaerobes)

# Antimicrobial prophylaxis- Important

- Inappropriate choice (procedure specific)
- Improper timing (pre-incision dose)
- Inadequate dose based on body mass index, procedures >3h, or increased blood loss




Any Incision can carry bacteria into The operative site



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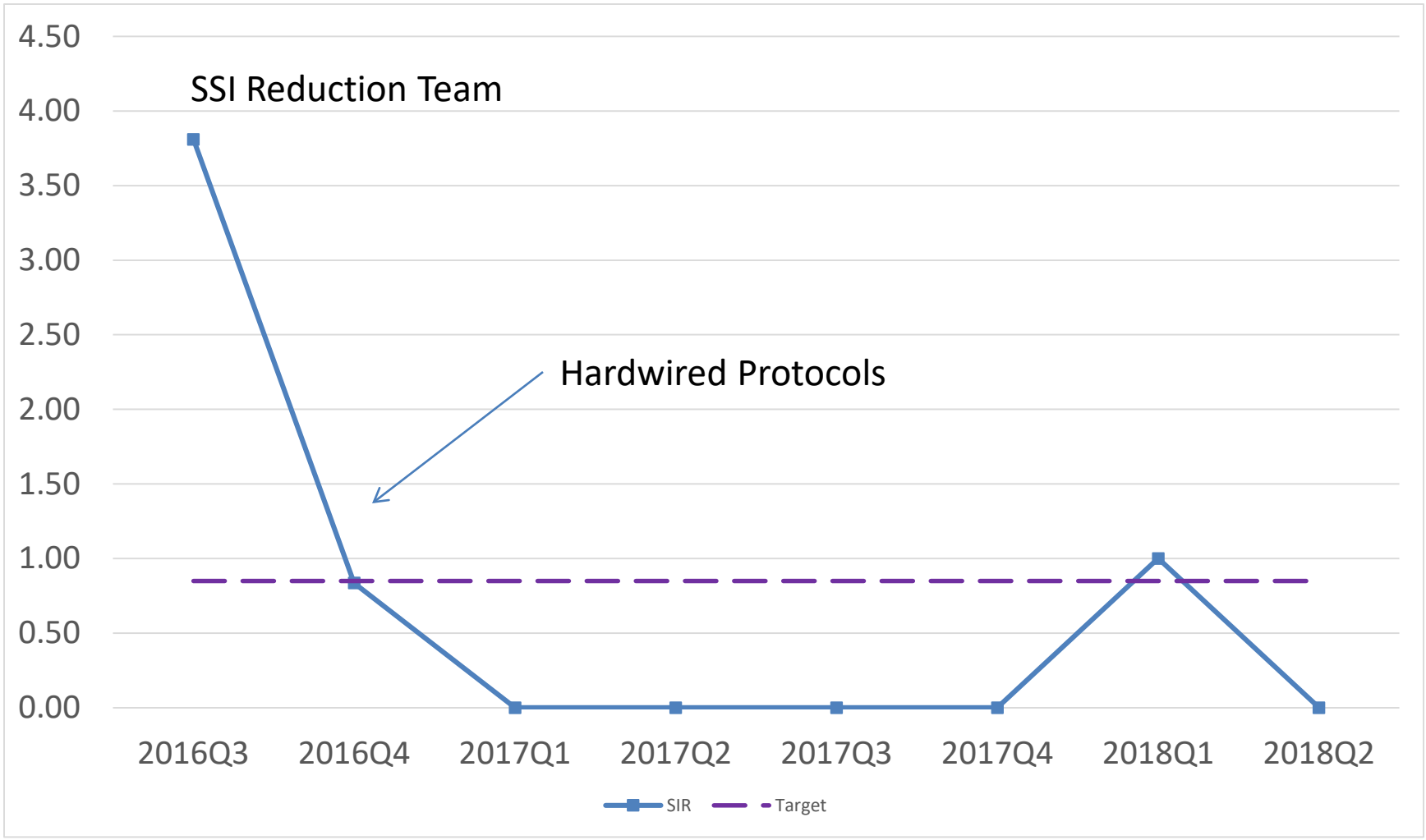
# Antimicrobial Prophylaxis

| Surgery | Recommended Regimen | Alternative Regimen | Details |
|---|---|---|---|
| ***OBSTETRICS & GYNECOLOGY*** | | | |
| Cesarean section<br>Sub-total hysterectomy | Cefazolin | One of the following:<br>1. Clindamycin + Gentamicin<br>2. Vancomycin + Gentamicin | Single dose prior to incision |
| Abdominal/vaginal hysterectomy<br>OR<br>Elective, High-risk laparascopic procedures | One of the following:<br>1. Cefazolin + Metronidazole<br>2. Cefoxitin<br>3. Ampicillin/Sulbactam | One of the following:<br>1. Clindamycin + either: Gentamicin, Ciprofloxacin, or Aztreonam<br>2. Metronidazole + either: Gentamicin or Ciprofloxacin | Single dose |

# Diabetes and Glucose Control

- Implement perioperative glycemic control and use blood glucose target levels< 200mg/dl in diabetic and non-diabetic surgical patients (Category 1 A)
- Implementation is still an issue
- Standard protocols have been implemented by many organizations

# Team Work – Hysterectomy Standardized Infection Ratio



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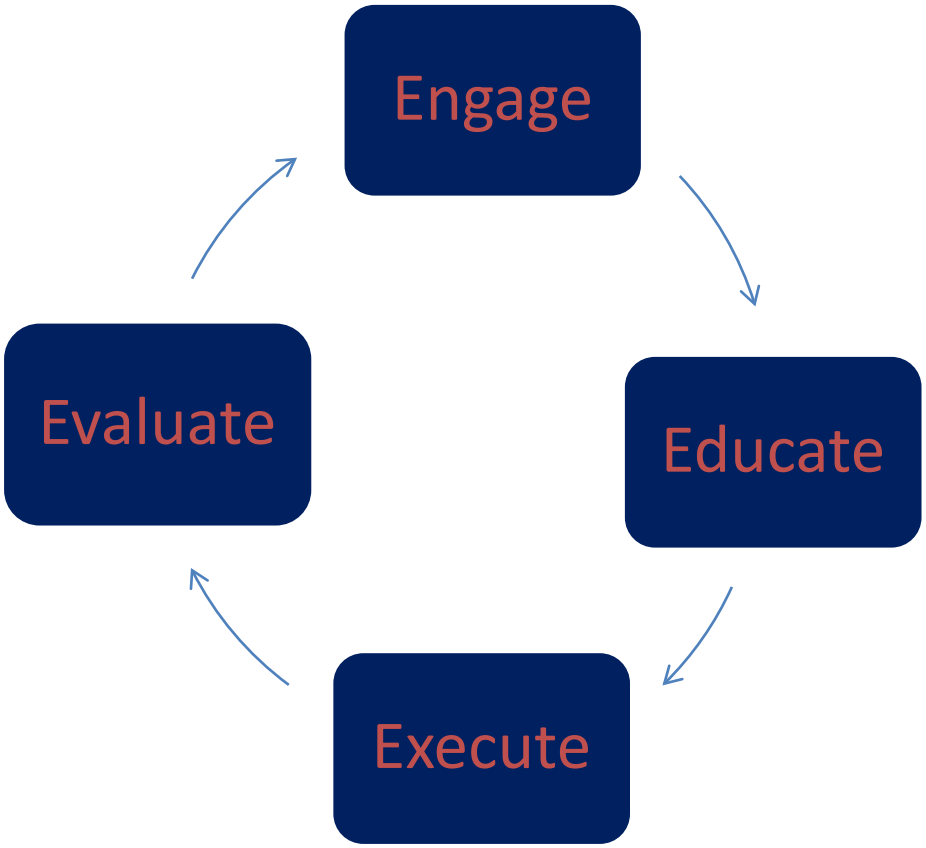
# The Model

Extremely important to recognize that implementing evidence based care involves both technical and adaptive challenges



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# Engagement Strategies

- *Consultation with experts*
  - *We need your help with something*
  - *You're a recognized leader on _____.*
  - *How do you think ___ is going?*
  - *How would you ___, or correct me on ___?*
  - *How can we assist you with ____?*

# Strategies

- **Engagement Strategies:** Made it about the patient, vet interventions with stakeholders Identified physician champions (surgeons are tribal and are most likely to listen to a peer.) Met with surgeons.

- **Education Strategies**: Present the evidence to the group, especially in their own peer review journals. New evidence is important. (technical)

- **Execute:** Standardized, develop standardized protocols, check lists and bundles. (Glucose control protocols, standard warming techniques, etc.)

- **Evaluate:** Shared data on a real time basis. Reviewed cases as well as rates. Transparency of data is important. (technical)

# Processes of Care


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# Q&A Session

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# Next Safety Action Series

## Collaborative Management of Women with Substance Use Disorders During and Beyond Pregnancy

**November 13, 2018**
**12:30 p.m. ET**

**Monika Taylor, MSW**
Director of Behavioral Health Services, Crouse Health

**Nancy K. Taylor, PhD, MSW**
Director, National Center on Substance Abuse and Child Welfare

**Click Here to Register**

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