

# SSI Prevention

## A 12 Step Program for OR Observations



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# Overview and objectives

**OVERVIEW:** This session will describe a program undertaken for the purpose of observing inpatient and outpatient surgical cases to learn about surgical infection prevention from OR teams during a series of surgical case observations in 2013.

## OBJECTIVES

1. At the end of the session participants will be able to describe one approach to establishing an OR observation program.
2. At the end of the session, participants will be able to list three "plus measures" for SSI prevention.

**Of course, the overarching goal of this and our work as IPs every day is to prevent this . . . .**



**And to never forget that those are connected to  
these . . .**



# Step 1 – OR Observation Project



# Steps 2 through 12 – OR Observation Project

2. Watch U tube video(s) of surgical procedure
3. Arrive 1 hour prior to scheduled case – notify OR manager or other OR nurse contact and change into scrubs
4. Plan to observe only one case – get to OR room in time to watch room prep and tray opening
5. Ask OR nurse and tech questions from checklist if possible
6. Ask tech/circ nurse/manager to identify a place in the room which is out of the way of team and equipment but permits observation of case
7. Introduce myself to team and purpose of observation
8. Use checklist to guide observations/questions and take notes
9. Update checklist after each observation as needed
10. Debrief with OR Manager – best practices and opportunity areas, any questions re: procedure/instruments/work flow
11. Send thank you note and best practice summary to team and their superiors
12. Send list of potential opportunity areas described to Manager during debrief, via email in “for your eyes only” message to support his/her ongoing efforts.

# My OR Checklist



# SSI Prevention “Plus Measures”



**KP HAI Prevention and Control Plus Measures Toolkit:**

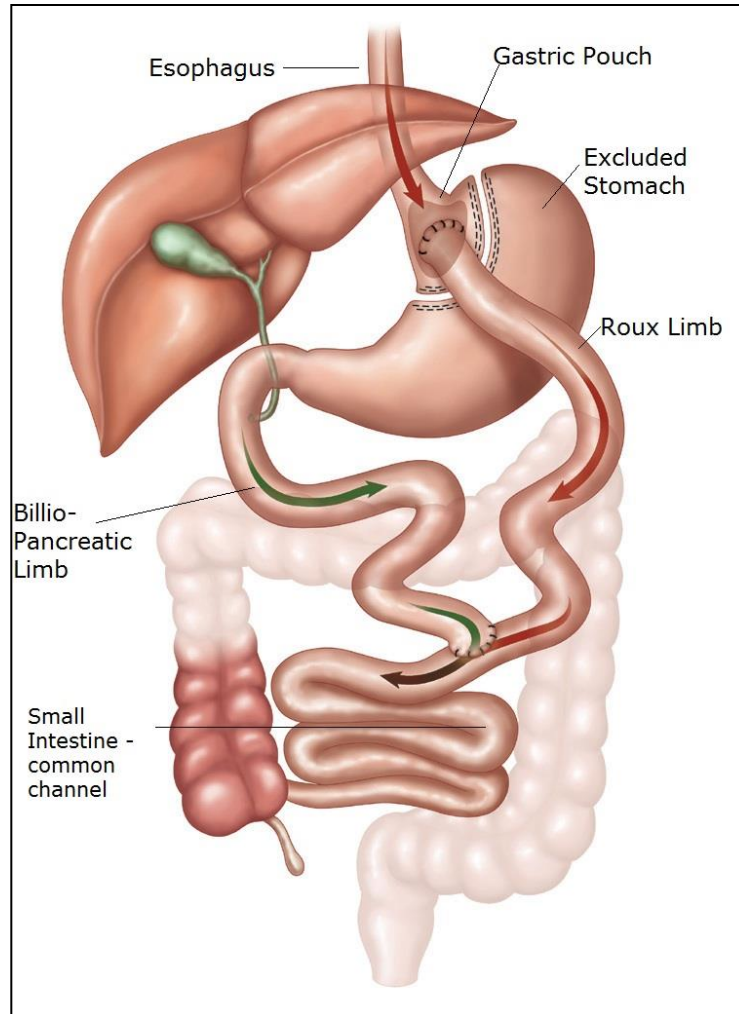
<http://kpnursing.org/quality/infectioncontrol/index.html>



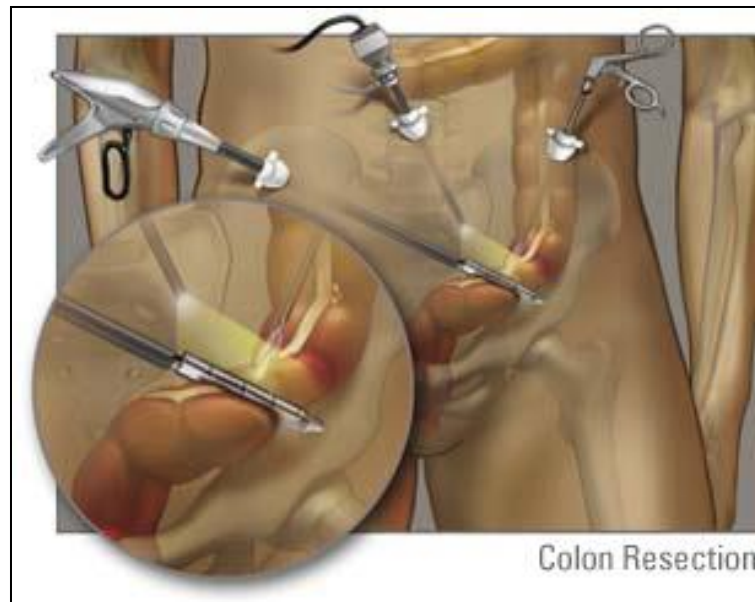
# Observation - The Surgical Cases



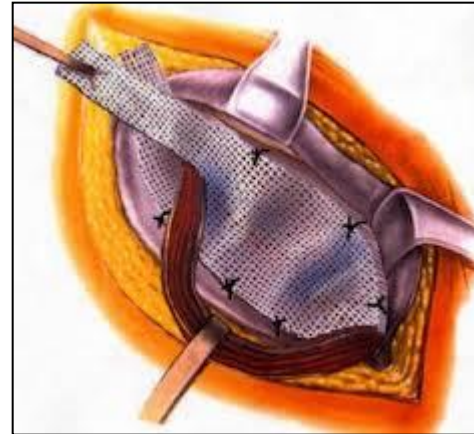
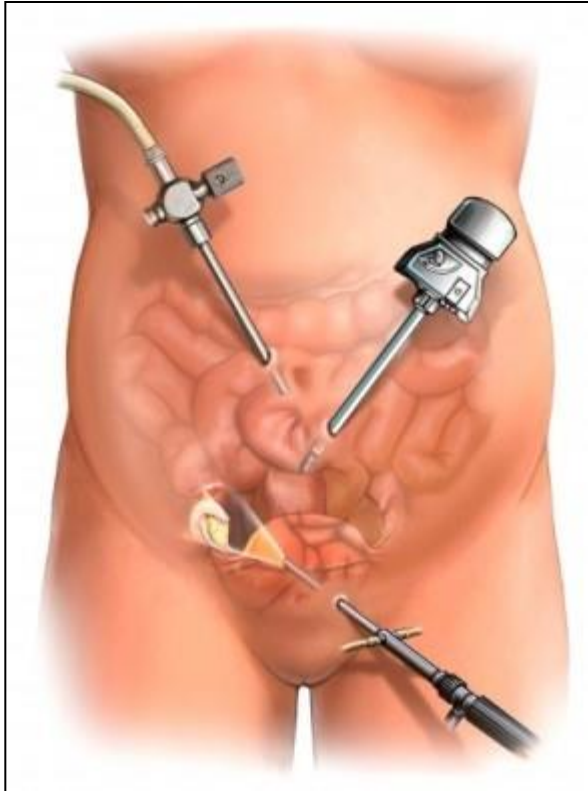
# 1. General Surgery - Laparoscopic Gastric Bypass



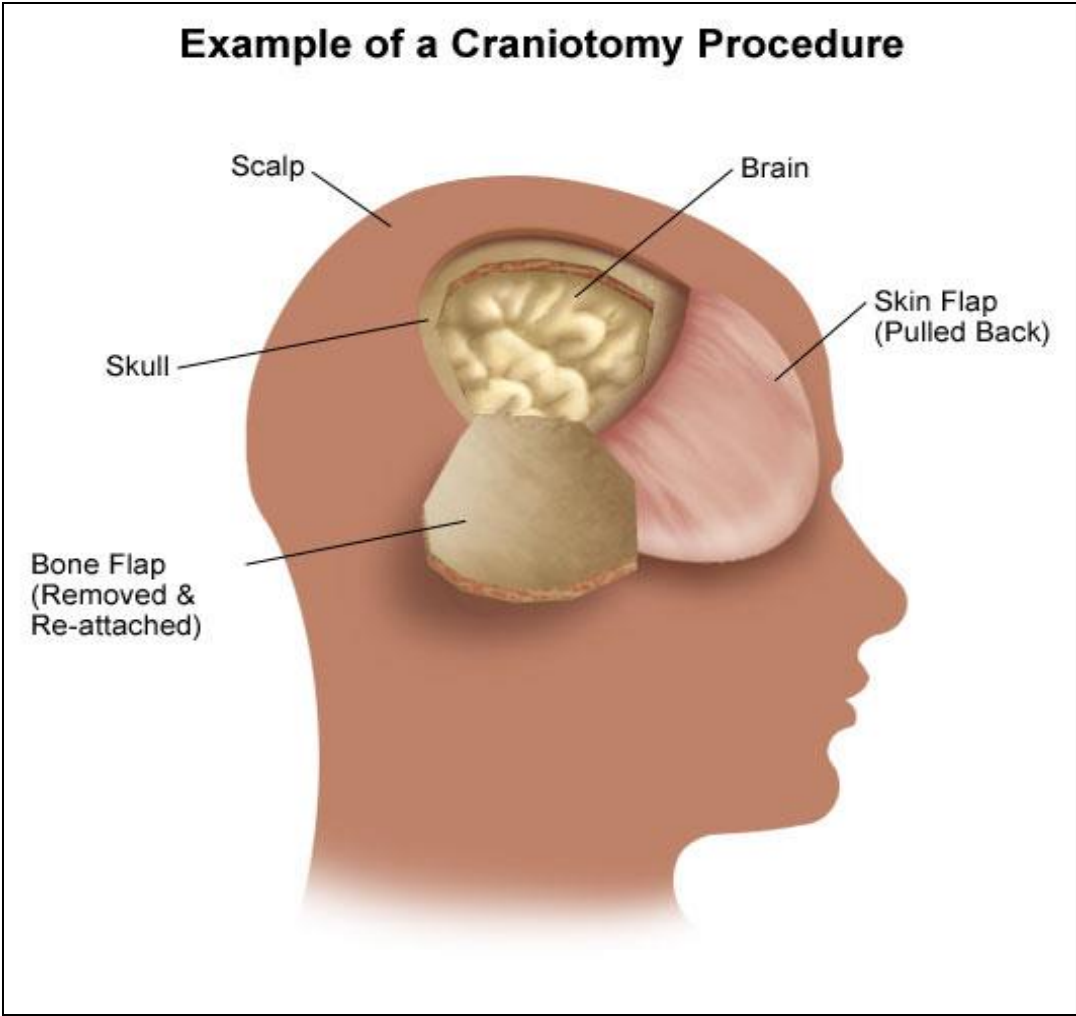
## 2. General Surgery - Laparoscopic Colectomy



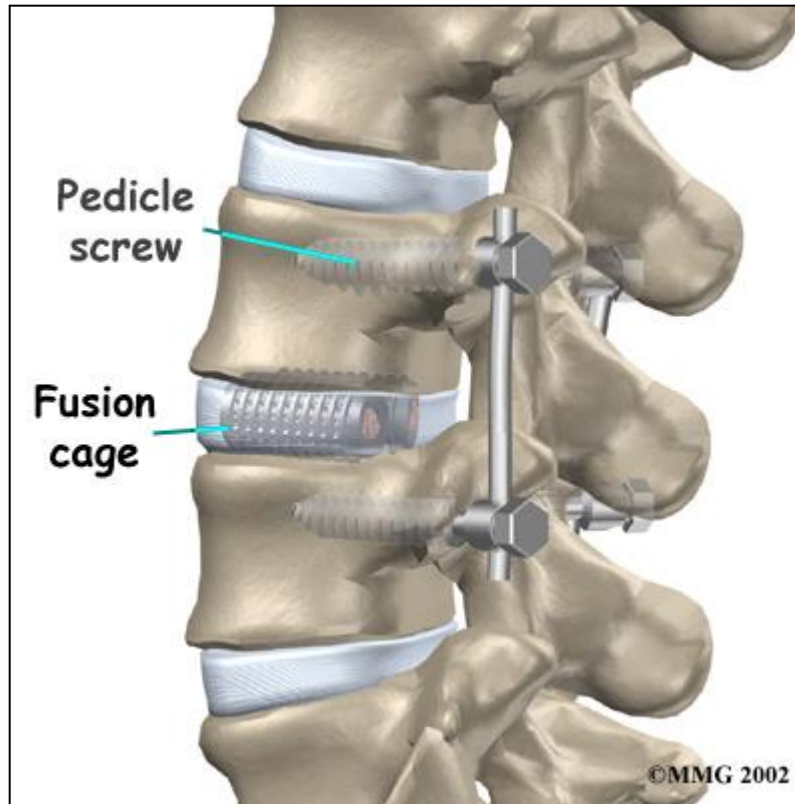
### 3. General Surgery - Lap Hysterectomy, Hernia Repair



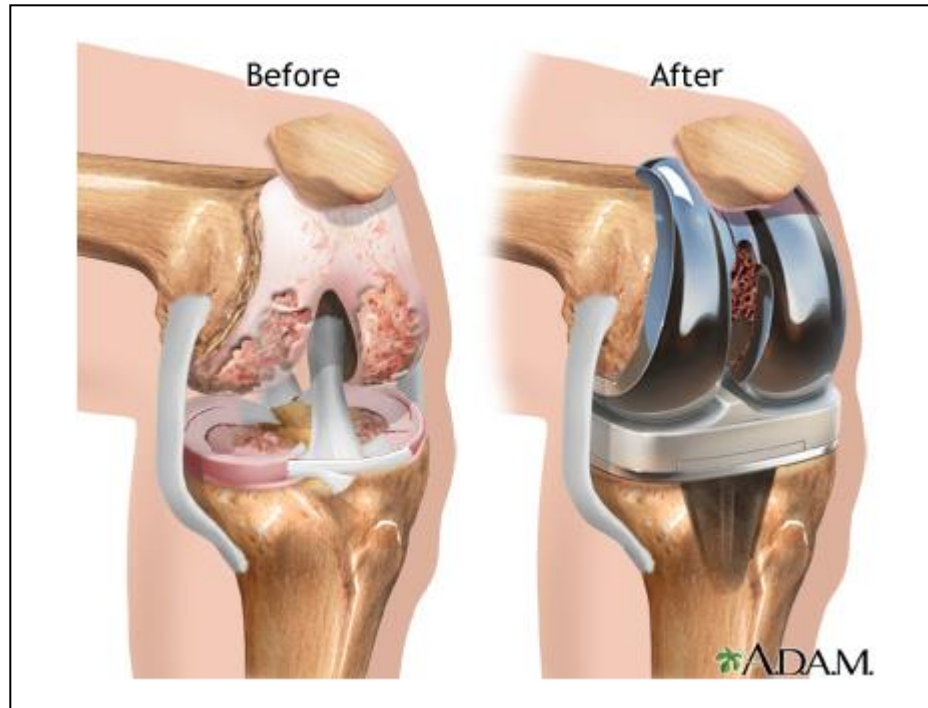
# 4. Neurosurgery - Craniotomy



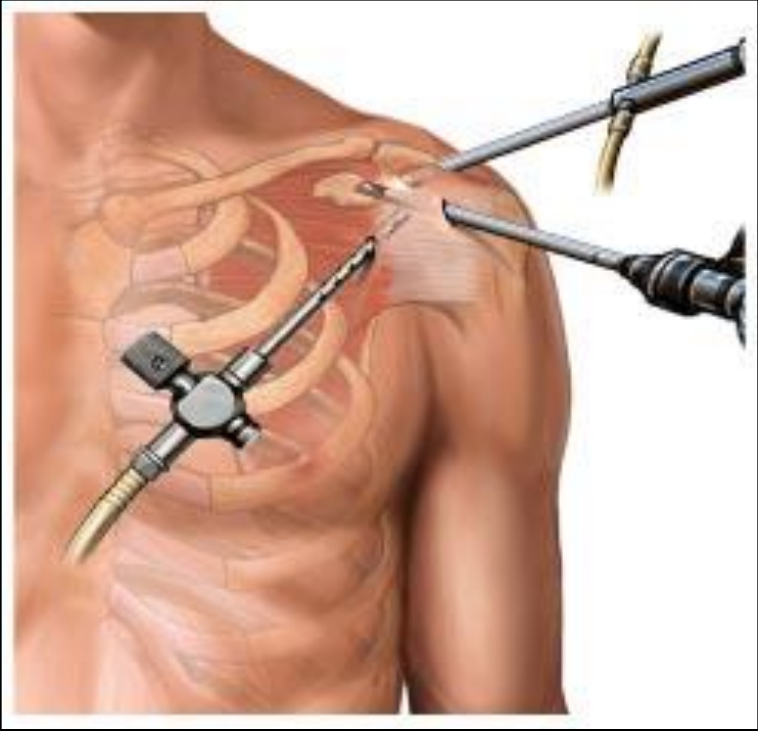
## 5. Neurosurgery/Spine - Laminectomy and Fusion



## 6. Orthopedic - Total Knee Replacement

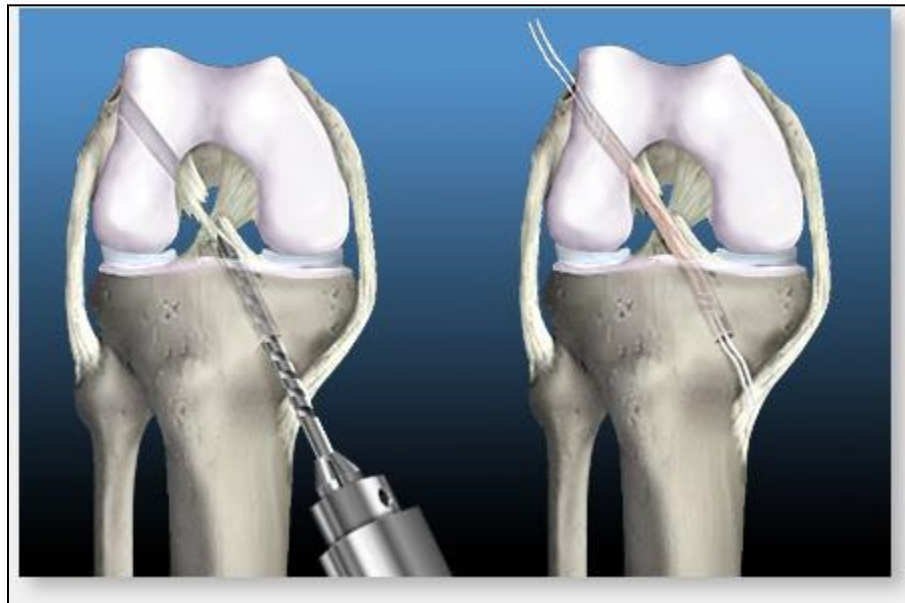


# 7. Orthopedic - Shoulder Arthroscopy

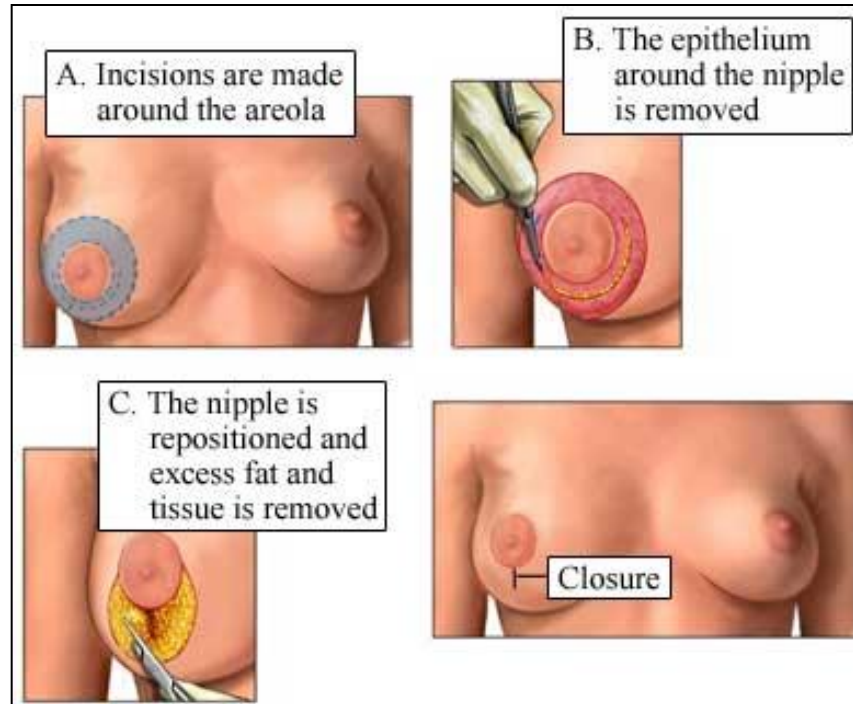




## 8. Orthopedic - ACL Reconstruction



# 9. Plastics - Breast reduction



# 10. Cataract Extraction & Lens Implantation

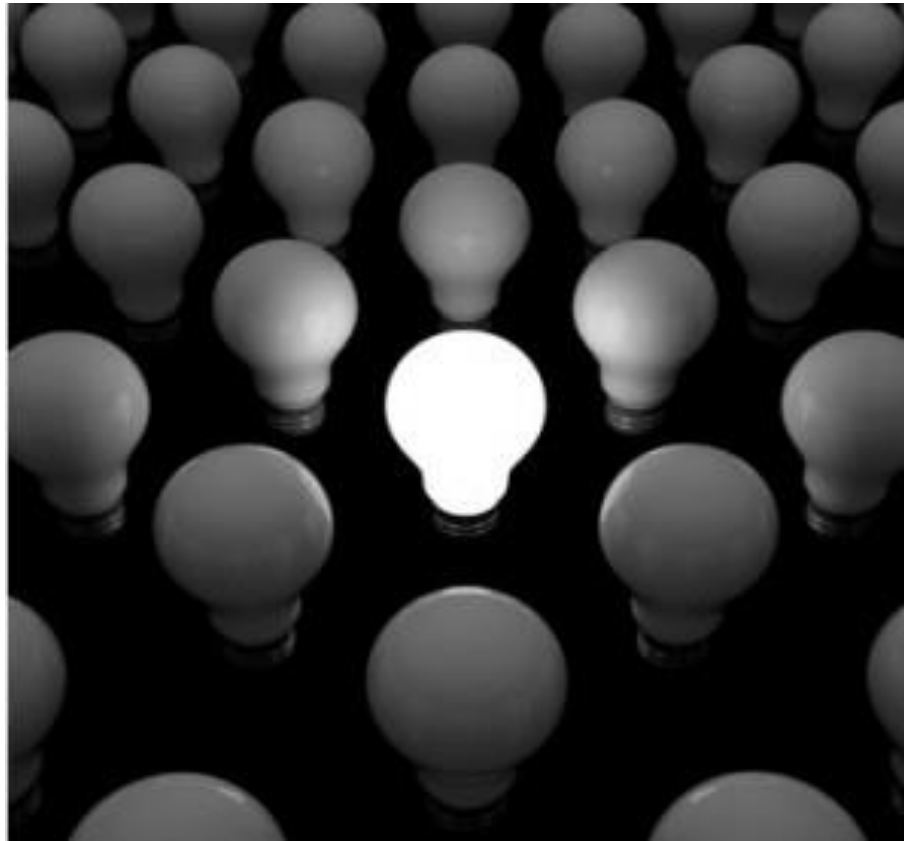


# 11. Cardio-Thoracic - CABG



# Best Practices

## Pre, Intra and Post-op



# Pre-operative Best Practices



- Repeated pre-op CHG bathing
- Dual agent skin prep prior to spinal anesthesia
- Dual agent skin prep prior to surgical incision
- Hair removal before patient enters OR (clipper with vacuum used for emergency cases when hair removal performed in the OR room)
- Horizontal surfaces in OR room wiped down prior to opening trays for first case
- Nasal decolonization for high risk patients with Mupirocin or PVI
- OR Director reads thank you note from a patient during morning huddle
- Perineal cleaning prior to prep before Foley insertion with soap wipe in kit
- Pre op oral CHG mouth rinse for patients receiving general anesthesia to reduce risk of post op pneumonia
- PVI impregnated incise drape
- Standard higher dose Ancef for obese patients e.g. Bariatric and C Section

# Intra-operative Best Practices



- Closed stop cocks with needless caps and port protectors
- Complete head and body hair coverage
- Copious irrigation post procedure prior to closing
- Double gloving by all scrubbed staff/surgeons
- Management of staff breaks and lunches to reduce traffic during cases
- Surgeon changes sterile gloves before closing
- Wound edge protector

# Post-operative Best Practices



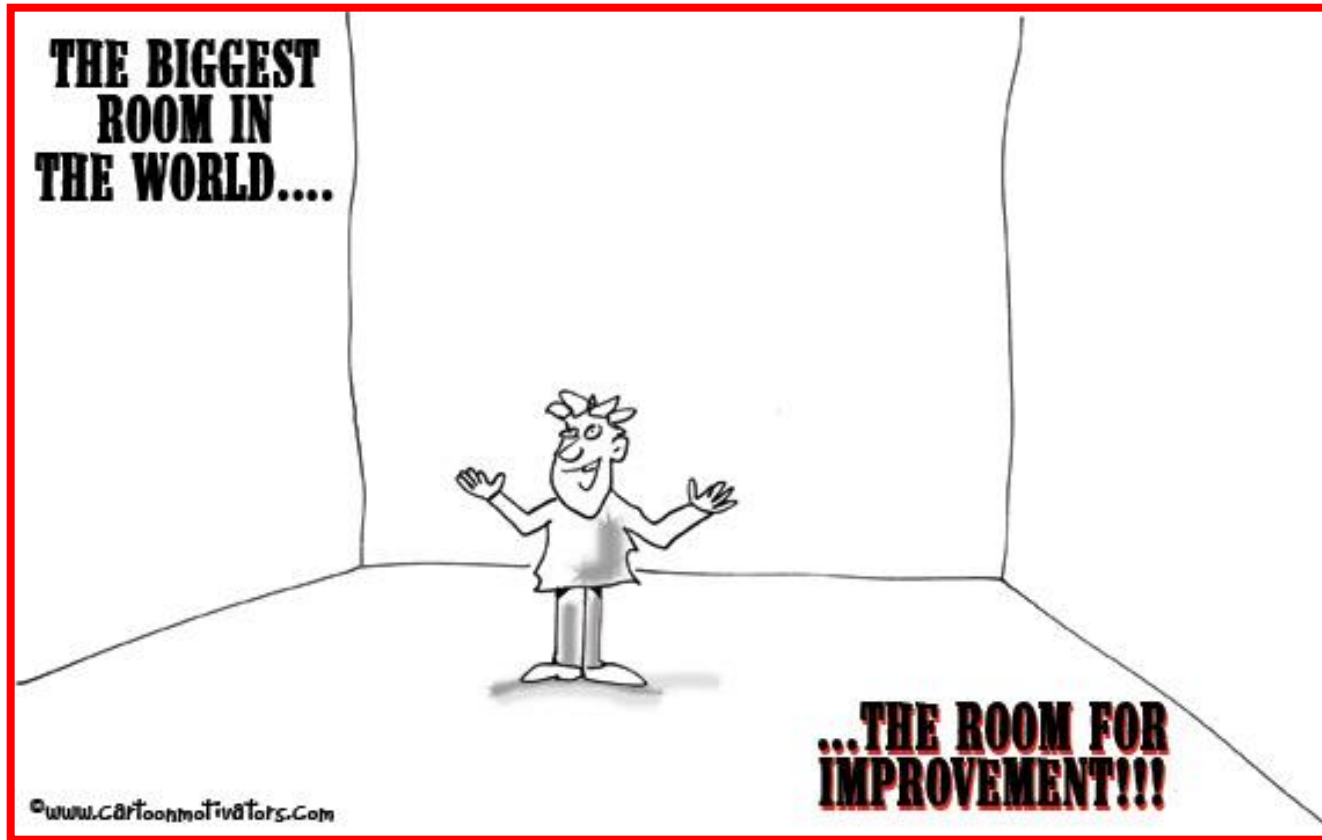
- HAP kit provided to surgical patients receiving general anesthesia including chlorhexidine oral rinse, spirometry, tooth brush
- Pneumatic tourniquet is cleaned/disinfected b/w patients by 3rd party single use device reprocessing vendor
- Post op foley removal reminder, order set
- Post op pneumonia prevention pathway integrated into EMR: CHG oral rinse, mobility, etc.



# Cataract extraction - Best Practices



- Deionized water used for rinsing eye instruments during reprocessing
- Eye trays contain disposable cannulas and disposable lens enfolder
- Hand sanitizer given to patient upon discharge
- Inventory of eye trays sufficient to avoid IUSS
- Lumens/channels:
  - ✓ Replace small re-usable cannulas with disposable when possible
  - ✓ ATP for assessment of cleaning of re-usable instruments with small channel/lumen
  - ✓ Quik Rinse system used to clean lumens of re-usable eye instruments with small channel/lumen (e.g. hand piece)
  - ✓ Medical grade air used for drying instruments with channel/lumen
- Policy of single medication container for single patient



**Improvement Opportunities Identified**

# Pre-operative Improvement Opportunities



- Incorrect use of brushless surgical hand scrub
- Not all staff wearing long sleeves in OR room
- Pubic and head hair clipped in OR
- Scrub tech wearing fleece jacket while clipping patient hair in OR – hair adhered to fleece
- Staff with beard hair, hairy arms uncovered and/or head hair hanging outside mask/head coverings.

# Intra operative Improvement Opportunities

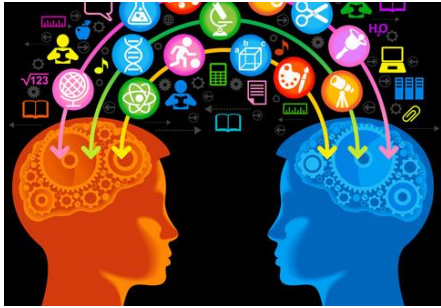


- After intra-operative cystoscopy the surgeon reinserted the same foley
- Anesthesia provider placed forced air warming blanket hose in pants to keep warm during case (potentially blowing pubic hair into sterile OR space)
- Foley bag resting on the floor
- Lots of traffic in and out of room during case - #50 for one case
- Total joint intra capsular cocktail mixed in room (risk contamination) vs. pharmacy under hood (recommended) – e.g. Ropivacaine, morphine, epinephrine, saline.

# Post operative Improvement Opportunities



- Instruments with small lumens/channels – hard to clean
- No accountability for cleaning lead apron, hover mat, anti-fatigue mats, ortho helmets
- Transfer of instruments from point of use to decontamination in a timely manner.

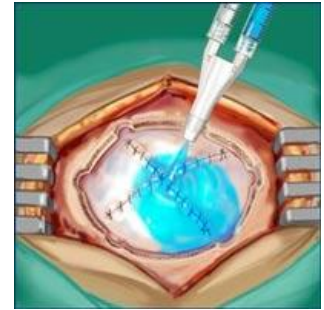
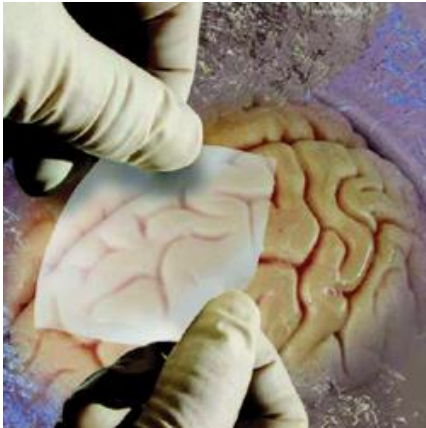


## New information (to me)

- Periop staff and surgeon consensus that focus should be on ensuring **complete hair coverage** instead of **eliminating skull caps** – skull caps sometimes cover hair better than bouffant, and what about chest and arms?
- Instrument sharpness is critical to minimize tissue trauma and case length – Lap hysterectomy was 6 hours long due to morselating the unusually hard fibroids attached to the uterus.
- For abdominal/GYN procedures – cleanse belly button and vagina with 50% diluted peroxide to remove blood/bioburden prior to applying pre-op skin prep (Chloraprep for skin, Betadine for vagina/perineum)
- Stop cocks: there are stop cocks that are closed systems with needless injection caps – these can be covered by port protectors between injections.



# New information (to me)





## **New information (to me)**

- Efforts to minimize blood loss in ortho cases (and transfusion which increases infection risk) include epinephrine in post procedure intra-capsular injection cocktail, Tranexamic acid infusion, ice machine device integrated into post op dressing.
- Post op pain control can improve immune response (reducing infection risk) – better control with local anesthetic agent (natural antibacterial properties)/nerve blocks than opiates.
- V lock suture is designed to eliminate knots and associated biofilm development which can potentially increase the risk of stitch abscess/superficial infection.



# Additional “Plus Measures”



# Red cap

*Version 1*: red cap = visitor

*Version 2*: red cap = patient pre-op checklist pending

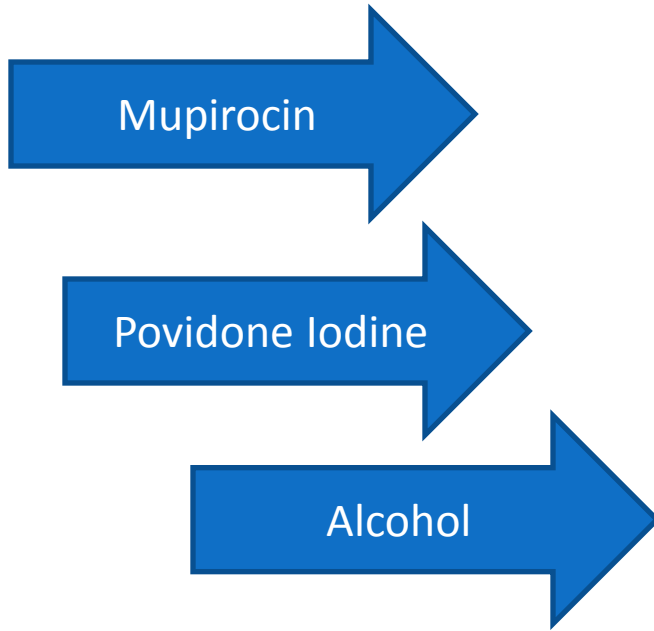


# Use of disposables – hard to clean items



1. Brown DQ. Disposable vs. reusable electrocardiography leads in development of and cross-contamination by resistant bacteria. *Crit Care Nurse*. 2011 Jun;31(3):62-8.

# Nasal Decolonization High Risk Cases



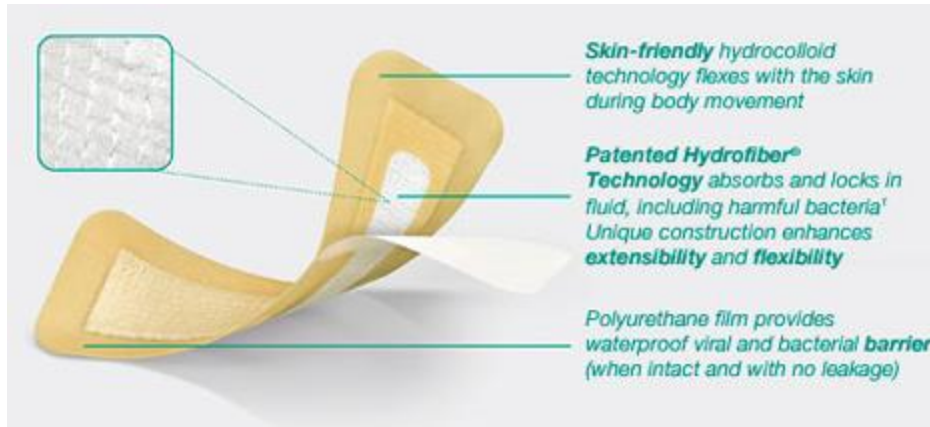
1. Phillips M et al "Preventing Staph aureus SSI: RCT Comparing Nasal Mupirocin and PVI". Abstract 2013 APIC Conference and ID Week.
2. Steed L et al. "Reduction of nasal staphylococcus aureus carriage in healthcare professionals by treatment with a non-antibiotic, alcohol based nasal antiseptic". AJIC 2014.

# UV light as adjunct to manual cleaning



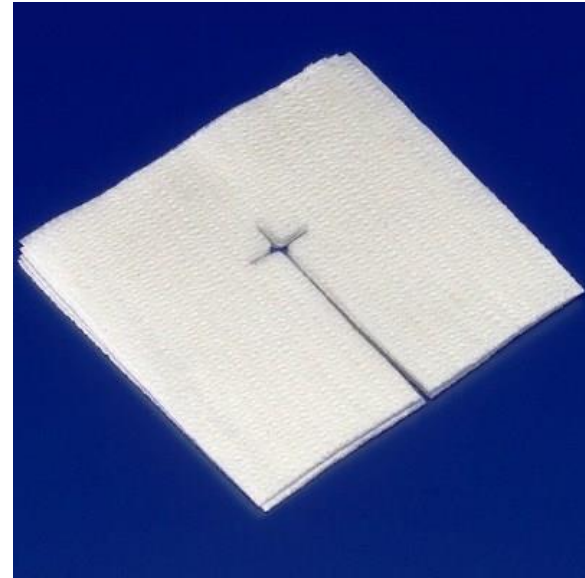
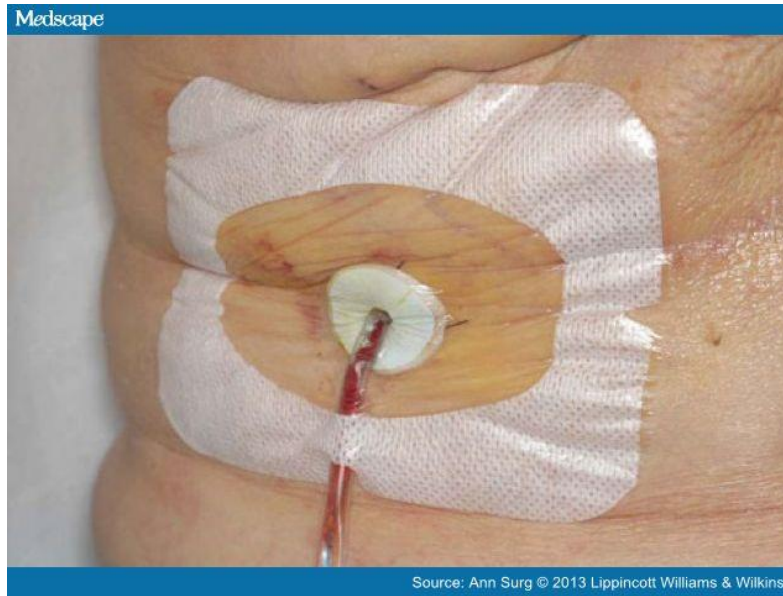
1. Anderson DJ et al. "Decontamination of targeted pathogens from patient rooms using an automated ultraviolet-C-emitting device." *Infect Control Hosp Epidemiol.* 2013 May;34(5):466-71.
2. Doan L et al. "Clinical and cost effectiveness of eight disinfection methods for terminal disinfection of hospital isolation rooms contaminated with *Clostridium difficile* 027". *J Hosp Infect.* 2012 Oct;82(2):114-21.

# Antimicrobial post-op dressing



1. Eberlein T et al. "Comparison of PHMB-containing dressing and silver dressings in patients with critically colonised or locally infected wounds". J Wound Care. 2012 Jan;21(1):12, 14-6, 18-20.
2. Martín-Trapero C, et al. "Surgical site infections. Effectiveness of polyhexamethylene biguanide wound dressings." Enferm Clin. 2013 Mar 22.

# Antimicrobial dressing for pins and drains



1. Blechman K, Reavey P. American Association of Plastic Surgeons Conference April 2012. ABSTRACT: "Use of the Biopatch Drain Dressing to Reduce Infection Rates in Expander/Implant-Based Breast Reconstruction."

# Intra-operative Irrigation



1. Edmiston CE Jr. et al. "Reducing the risk of surgical site infections: does chlorhexidine gluconate provide a risk reduction benefit?" *Am J Infect Control*. 2013 May;41(5 Suppl):S49-55.
2. Barnes S, Spencer M, Graham D. Surgical wound irrigation: A call for evidence-based standardization of practice. *American Journal of Infection Control* 42 (2014) 525-9.



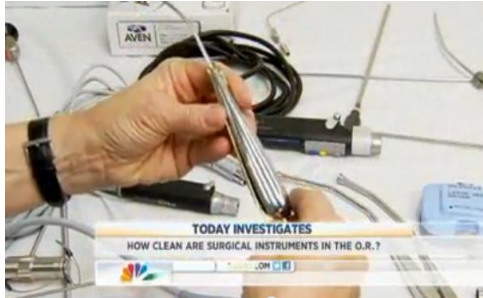
# Skin Closure



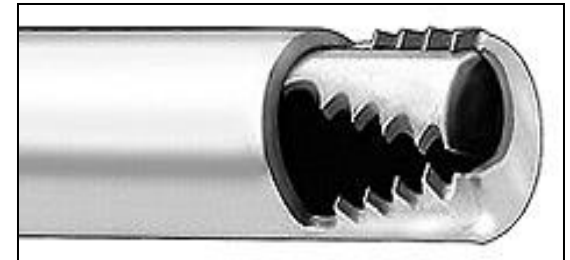
1. Fraeman KH. "Patient outcomes associated with 2-octyl cyanoacrylate topical skin adhesive in coronary artery bypass graft surgery". *Surg Infect (Larchmt)*. 2011 Aug;12(4):307-16.
2. Singer AJ. "Evaluation of a novel wound closure device: a multicenter randomized controlled trial". *Acad Emerg Med*. 2011 Oct;18(10):1060-4.
3. Williams N. "Randomized trial of antimicrobial-coated sutures to prevent surgical site infection after breast cancer surgery". *Surg Infect (Larchmt)*. 2011 Dec;12(6):469-74.

**What I have added to my checklist**

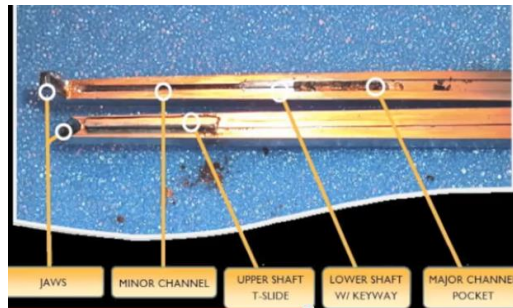
# From the News: Channeled Surgical Instruments Assessment of Cleaning



Suction



Shaver



Kerrison rongeur

1. Eaton, J. "Filthy surgical instruments: The hidden threat in America's operating rooms Danger in dirty instruments". *The Center for Public Integrity I Watch*. February 22, 2012.
2. Dancer SJ, Stewart M, Coulombe C, Gregori A, Viridi M. Surgical site infections linked to contaminated surgical instruments. *J Hosp Infect*. 2012 Aug;81(4):231-8.

# Assessment of Channeled Surgical Instruments With ATP – no vendor preference intended



## STEP 1

### WATER TEST

#### PREPARE

Apply the appropriate connectors, caps and plugs found in the sampling kit.



## STEP 2

### WATER TEST

#### FLUSH

Flush the selected channel or lumen with 40 ml of sterilized water followed by 60 ml of air and collect the rinsate.



## STEP 3

### WATER TEST

#### CLICK/SHAKE

Dip the test into the sample rinsate. Immediately activate the test and shake for 5 seconds.



## STEP 4

### WATER TEST

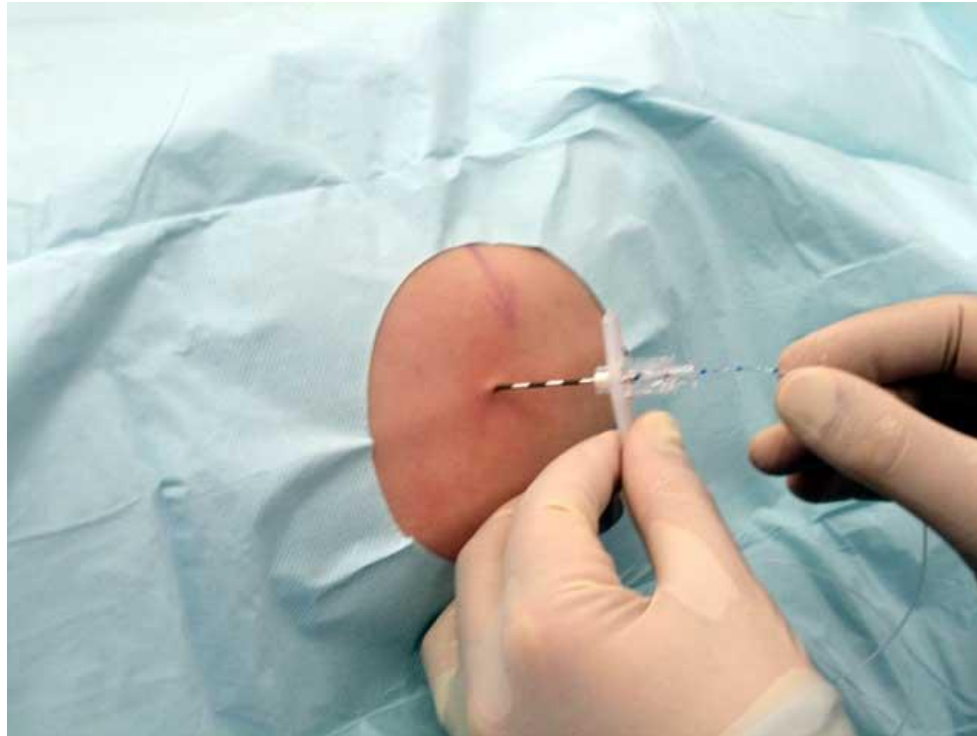
#### MEASURE

Place test in luminometer and measure.



1. Alfa MJ Monitoring and improving the effectiveness of cleaning medical and surgical devices. Am J Infect Control. 2013 May;41(5 Suppl):S56-9.
2. King JS, Pink MM, Jobe CM. Assessment of reprocessed arthroscopic shaver blades. Arthroscopy. 2006 Oct;22(10):1046-52.

# From case observations: Skin prep prior to epidural anesthesia



1. Bedoya A, Gentilesco B. Prosthetic valve endocarditis: a complication of spinal epidural abscess. Case Report Med. 2010;2010:105426.

# From a conference: Pain control and infection risk



1. Sacerdote P, Franchi S, Panerai AE. Non-Analgesic Effects of Opioids: Mechanisms and Potential Clinical Relevance of Opioid-Induced Immunodepression. *Curr Pharm Des.* 2012 Jun 28.
2. De Oliveira GS Jr, Fitzgerald P, Streicher LF, Marcus RJ, McCarthy RJ. Systemic lidocaine to improve postoperative quality of recovery after ambulatory laparoscopic surgery. *Anesth Analg.* 2012 Aug;115(2):262-7.

# From case observations: Cleaning of lead gowns, anti fatigue mats, ortho helmets



1. Grogan BF, Cranston WC, Lopez DM, Furbee C, Murray CK, Hsu JR; Skeletal Trauma Research Consortium. Do protective lead garments harbor harmful bacteria? *Orthopedics*. 2011 Nov 9;34(11):e765-7.

**Today I will live  
in the moment,  
unless the  
moment is  
unpleasant in  
which case I  
will eat a cookie**

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