

# Prevention of Surgical Site Infections

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# Surgical Site Infections

## **Questions:**

1. What are the main causes of surgical site infections?
2. What steps can members of the healthcare team implement to help prevent surgical site infections?
3. How does clean attire and a clean environment decrease the risk of infection?

## **Goal:**

Educate fellow staff about the success of implementing surgical site infection prevention bundles in the Operating Room.

# Learning Objectives

1. After participating in the nursing education in-service, the RN learner and staff will be able to list the causes of a surgical site infections.
2. After participating in the nursing education in-service, the RN learner and staff will be able to explain how adherence to surgical attire policy and a clean environment decreases the risk of infection
3. After participating in the nursing education in-service, the RN learner and staff will be able to convince the surgical team that utilizing a surgical site infection prevention bundle will decrease the risk of infection for our patient population

# What is a Surgical Site Infection (SSI) and what do we know about them?

According to the Centers for Disease Control and Prevention (2019) “A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material.”

Symptoms present within a 30 day post surgical time frame and include:

- Redness and pain around the area where you had surgery
- Drainage of cloudy fluid from your surgical wound
- Fever

SSIs can result in pain and discomfort, loss of income, and decreased quality of life for patients. SSI's can be as small as purulent drainage from the wound to as big as life-threatening conditions and possibly death

SSIs are a leading cause of hospital readmissions

Specific risk factors for SSIs: patient factors (normal flora) and process or procedural factors.

Requires a multidisciplinary approach to incorporate the best practices (SSI Prevention bundle)

# CASE STUDY



# What can we do to prevent surgical site infections?

- ▶ Half of SSI's are preventable with Evidence Based Practice (EBP) implementation.
- ▶ Surgical staff can play a pivotal role in prevention of SSIs
- ▶ A recent study in 2019 showed there is more opportunity to adhere to Evidence Based Practice for SSI prevention and the importance of holding one another accountable to exercise surgical conscience and compliance to the established policies.
- ▶ We will mostly focus on the prevention bundle for SSI but also review established bundles to decrease rates for catheter-associated urinary tract infection (CAUTI), and central line associated bloodstream infection (CLABSI).
- ▶ The SSI bundle consists of interventions in the preoperative, intraoperative and postoperative phase



# SSI PREVENTION BUNDLE TRACER

## Preoperative

- Provide SSI prevention education to patient or caregiver (D,I)
- Reduce HgA1c levels (D,I)
- Provide weight loss, diet modification, and smoking cessation education and referrals (D,I)
- Provide preoperative bathing instructions (D,I,O)
- Perform decolonization of patients who are nasal carriers of *Staphylococcus aureus* (D,I)
- Use clippers for hair removal, if necessary, outside of operative suite (D,I,O)

## Intraoperative

- Help ensure environmental controls for proper OR temperature, humidity, and pressure differential (D,I,O)
- Wear appropriate surgical attire (D,I,O)
- Perform strict surgical hand antisepsis (D,I,O)
- Administer antimicrobial prophylaxis using the right dose of the right medication at the right time (D,I,O)
- Use a dual agent for surgical site skin antisepsis containing alcohol (D,I,O)
- Help ensure sterility of surgical instrumentation (D,I,O)
- Readminister antimicrobial agents according to published standards (D,I,O)
- Optimize tissue oxygenation using supplemental oxygen (D,O)
- Maintain normothermia (D,O)
- Maintain a sterile field (D,O)
- Use safe injection practices and aseptic medication administration (D,O)
- Limit OR traffic to essential personnel (O)
- Preclean surgical instrumentation at point of use (O)
- Perform strict cleaning and disinfection of the perioperative environment (D,I,O)

## Postoperative

- Discontinue antimicrobial agents within 24 hr after procedure (D,I)
- Maintain the patient's postoperative glucose levels (D), normothermia (D), and tissue oxygenation using supplemental oxygen (D,O)
- Perform thorough hand hygiene and use sterile supplies for dressing changes (D,I,O)
- Provide discharge instructions for SSI prevention to patient, caregiver, or discharge destination personnel (D,I)

# Preoperative



Education given to families from surgeon's clinic about proper hygiene before surgery and bathing instructions for night before or day of surgery



If patient is diabetic, consultation to Endocrinology clinic for specific instructions to help control blood sugars during surgery



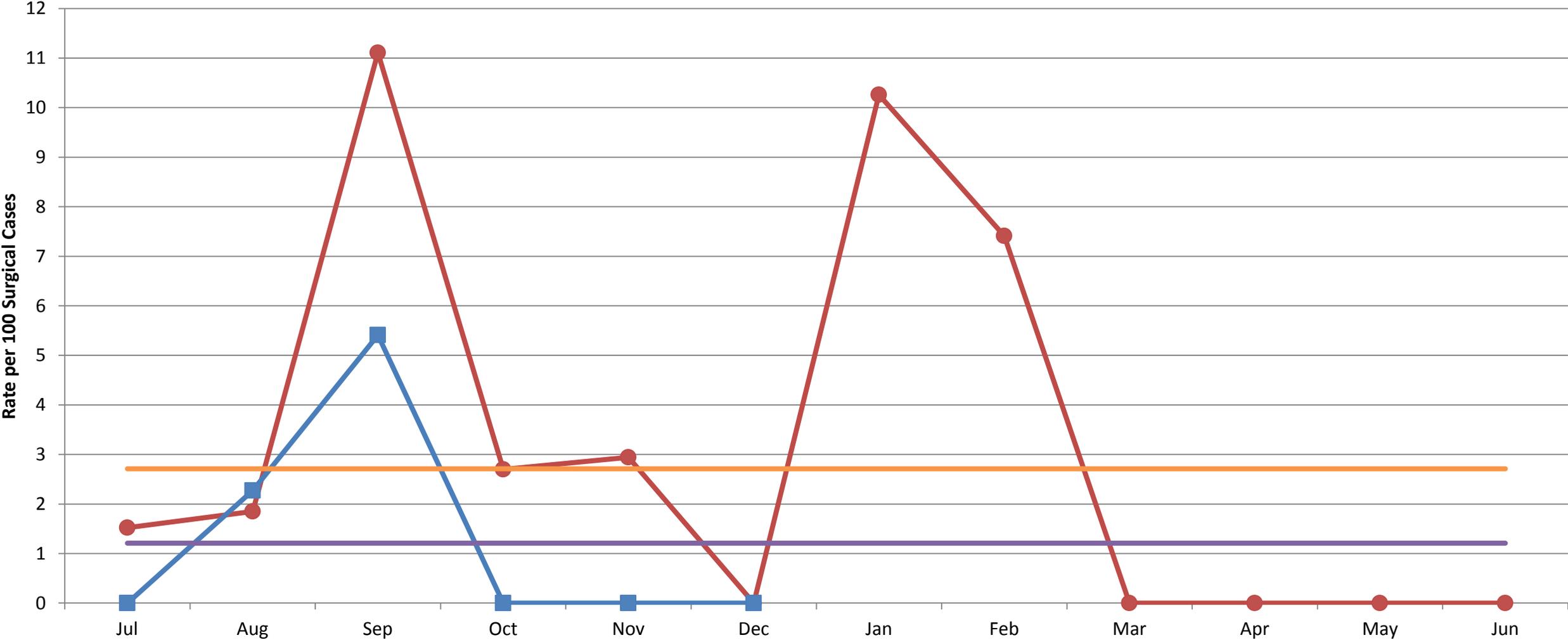
In pediatric populations, hair clipping can be traumatic so this is done in the OR. Hair removal should be appropriate for the location and procedure (e.g., clippers, depilation, no hair removal).



Nasal decontamination is practiced in adult settings at this time

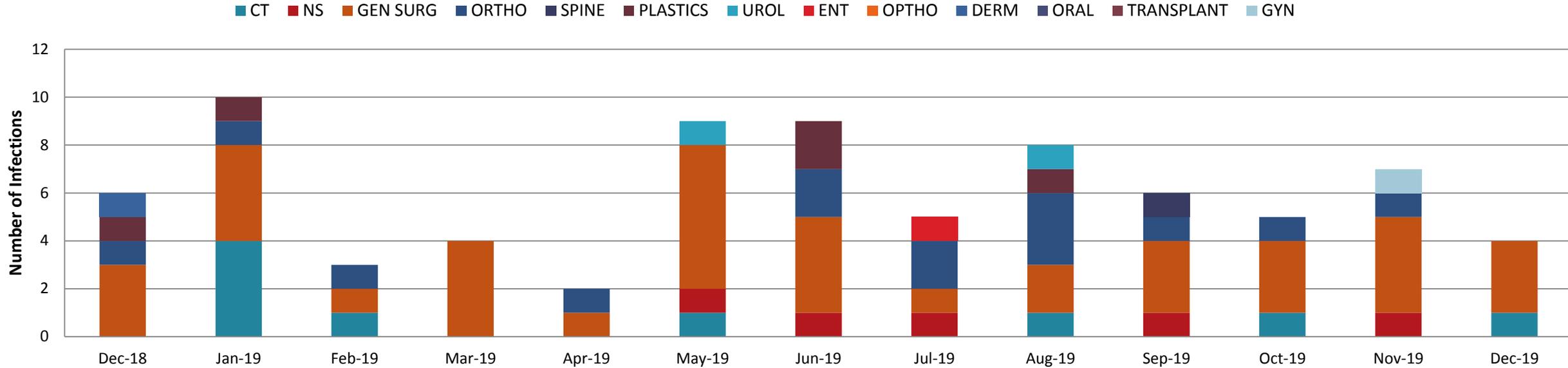
# Rate of Surgical Site Infections (SSI)

FY 19 Rate    FY 20 Rate    FY 20 Average (1.21)    FY 19 Average (2.71)

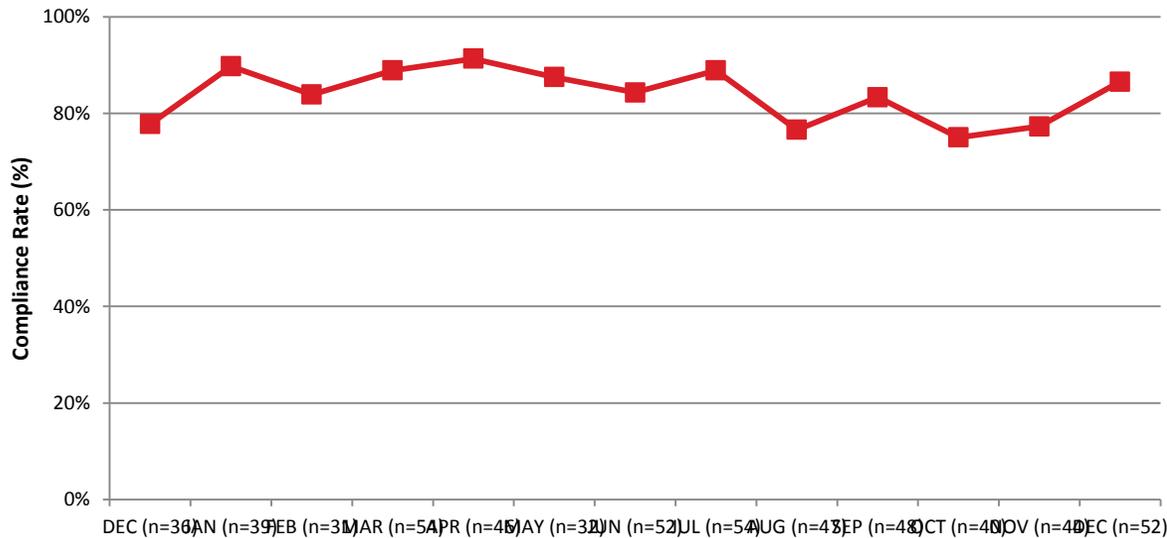


*\*\*Includes VSHN, CARD & FUSN surgeries only*

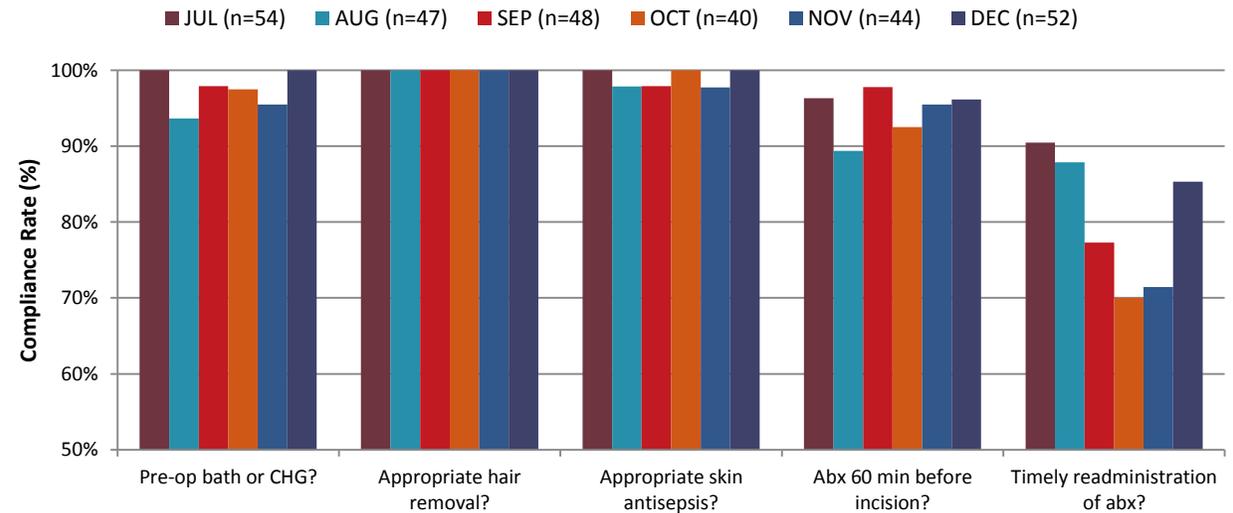
## Surgical Site Infection December 2018 – December 2019



### SSI Prevention Bundle Compliance VPS, Cardiac & Spine Surgeries Combined December 2018 – December 2019



### SSI Prevention Bundle Compliance VPS, Cardiac & Spine Surgeries Combined July 2019 – December 2019



# SSI Bundle intra- operative

Appropriate  
antibiotic  
dosing

Environmental  
Controls

Maintain a  
clean  
Environment

Wear clean  
surgical attire

Surgical skin  
prep and wound  
classification

Hand Hygiene

Minimize traffic

Adequate  
sterilization of  
instruments

# Appropriate antibiotic dosing

- ▶ Using aseptic practices, the correct dose of antibiotics should be initiated within one hour before surgical incision and should be verified during the time out procedure in the room
- ▶ Patients should receive the right dose of prophylactic antibiotics appropriate for their specific procedure
- ▶ Prophylactic antibiotics should be discontinued within 24 hours of surgery completion (within 48 hours for cardiothoracic surgery).

# Humidity Temperature Monitor

TEMPERATURE RANGE 68-75 DEGREES F

TEMPERATURE 20-23.9 CELSIUS

HUMIDITY RANGE 20-60%



## Environmental Controls

- ▶ Each OR has a humidity temperature monitor
- ▶ The current reading in this photo shows :
- ▶ 34.5 % Humidity
- ▶ 21.5° Celsius in temperature or 70.7° Fahrenheit
- ▶ If any of these readings are not within the designated range, please call POM at x 225511.

# Maintain a clean Environment

## AORN Recommendations It takes a team!

### RN and ST:

Damp Dusting horizontal surfaces by night staff before case cart is brought in and items are laid out for the first surgery of the day. Damp dust from top to bottom. During the day, ensures cleaning appropriate before next case begins.

### Anesthesia Tech:

After each case, cleans and disinfects all monitoring devices, sets up for with new pulse ox, EKG, temp probe, ventilation tubing.

Terminal cleaning of anesthesia carts, equipment (IV poles, pumps), machine and monitors/cables.

### Surgical Services Aide:

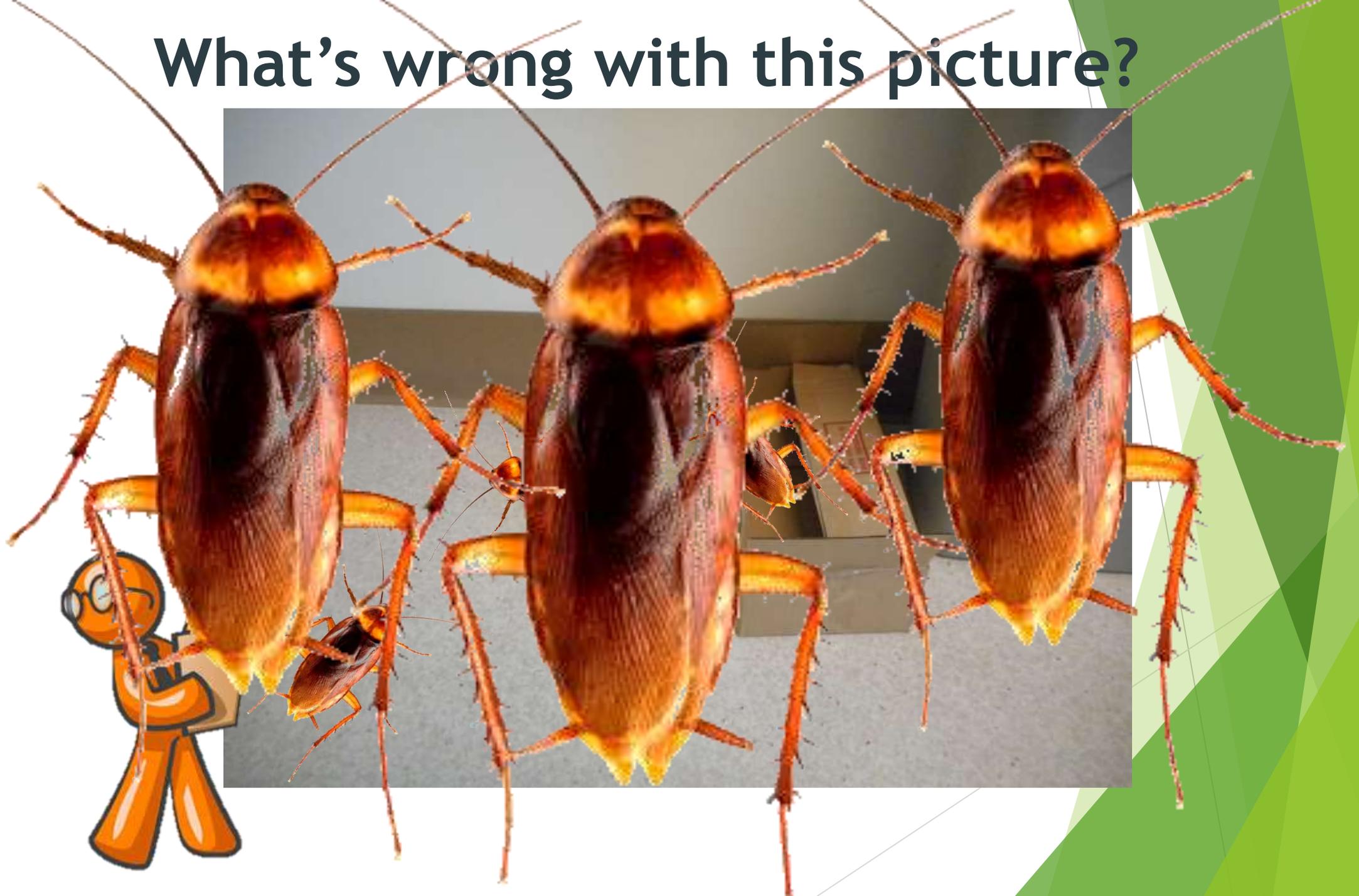
After each case, cleans and disinfects all surfaces, removes all trash and laundry once patient has left the room. Mop floors of operating rooms after each surgical procedure. Spot clean walls when necessary. Discard single use safety strap from OR table.

Enhanced cleaning when patient has been in isolation, wear a gown and gloves in addition to following standard precautions and routine cleaning. Utilize UV disinfectant light following case, especially in airborne cases e.g. Tuberculosis.

Terminal cleaning every 24 hours by single use mop and approved disinfectant on the floor, under bed and equipment. Clean and disinfect all exposed surfaces, plus wheels on carts, all high touch objects, cabinets, phones, computers, light switches etc.

Scheduled cleaning for remaining areas: center core, storage rooms, sinks and vents.

# What's wrong with this picture?





UM... LET'S SAY THE  
KIDNEY FELL ON THE FLOOR.  
DOES THE FIVE-SECOND  
RULE APPLY?

1/2  
The Real Surgeon



**“This wobbling table could cause a fatal surgical error. Run to the cafeteria and grab some sugar packets to even it up, would ya?”**

# Wear Clean Surgical Attire

- ▶ Operating Room(OR) staff are required to wear facility approved and laundered scrubs. Single use jumpsuits are for use when entering the OR for a brief period of time.
- ▶ The top of the scrub should be tucked into the pants or fits closely to the body. Personal clothing must be covered by the scrubs.
- ▶ Wearing scrubs into the hospital are not to be worn in the semi-restricted or restricted areas. This is to minimize cross-contamination from other uncontrolled environments.
- ▶ A long-sleeved jacket that is closed and closely fitted to the body should be worn when performing tasks in the restricted area such as packaging items in the clean assembly area , performing a surgical prep, and when opening supplies to the sterile field.
- ▶ Cover gowns or lab coats are required when going outdoors and should be removed before entering semi-restricted or restricted areas.
- ▶ Surgical attire is changed daily and whenever it becomes visibly soiled. It should not be worn home or taken off campus.

# Oh goody, more on surgical attire

In semi-restricted or restricted areas

- ▶ ALL hair must be covered -including facial hair, ears, scalp skin, and nape of neck
  - ▶ Professional personal cloth hats are permitted as long as they are clean and changed daily.
  - ▶ Should not be removed until end of shift unless soiled.
- ▶ It is recommended that you wear a hospital designated pair of clean close toed shoes in good working condition. If shoe covers are worn, they must be removed before leaving the department.
- ▶ Jewelry: A plain, single band (ring) is acceptable. Earrings must be contained within the bouffant hat when in the restricted areas. No large earrings. Necklaces must be contained inside scrub top. No bracelets (accept medical alert).
- ▶ Identification should be on surgical attire, on top scrub or jacket and is clearly visible at all times.
- ▶ Nails: Tips less than ¼ inch, clean, and healthy. No artificial nails.
- ▶ Personal items must be made of a wipeable material or not placed on OR floor

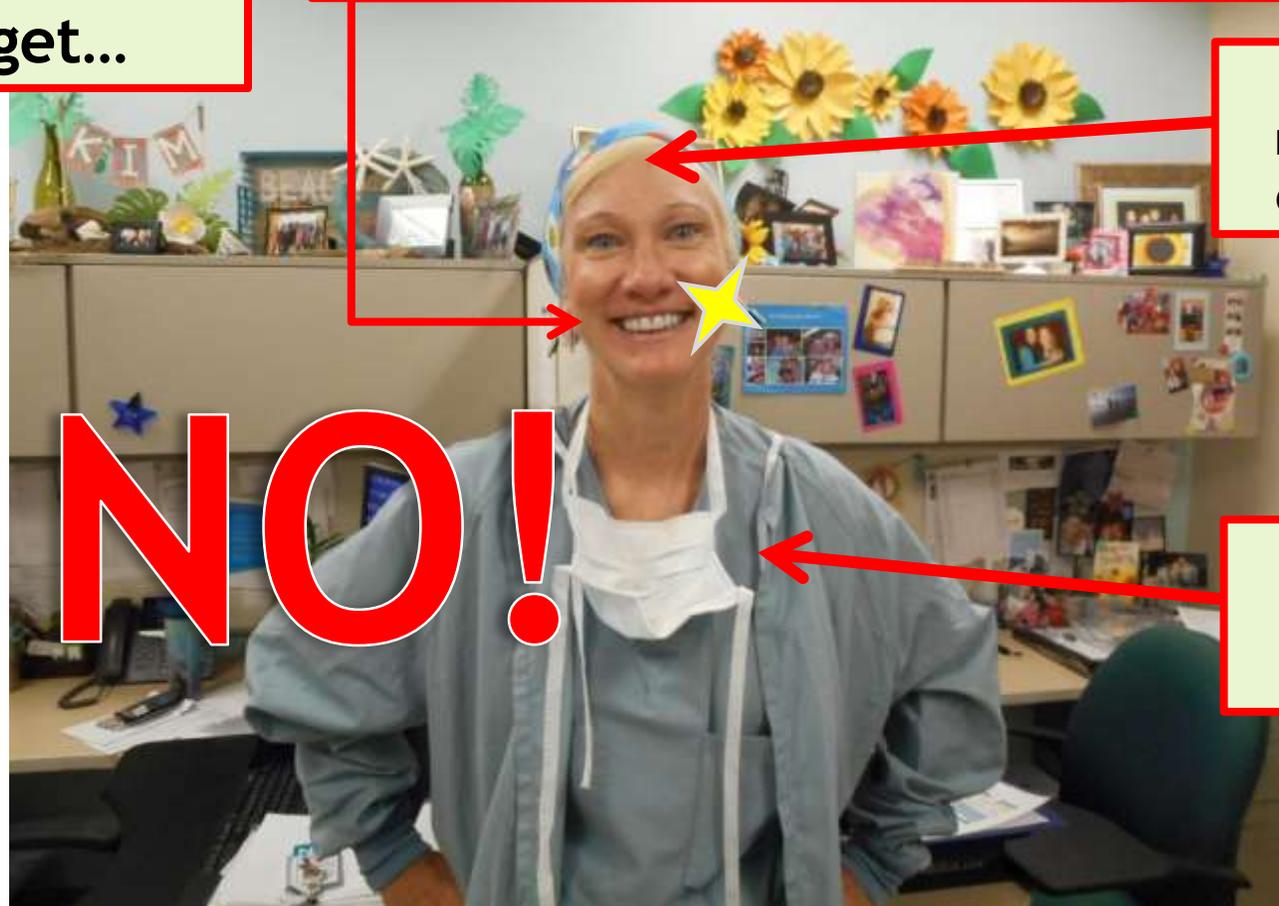
# Am I ready to work in the OR?

But Don't Forget...

A smile is an important part of your surgical attire!

All hair must be covered

No Dangling Masks



**NO!**

## And last, but not least, Mask and Eye Protection

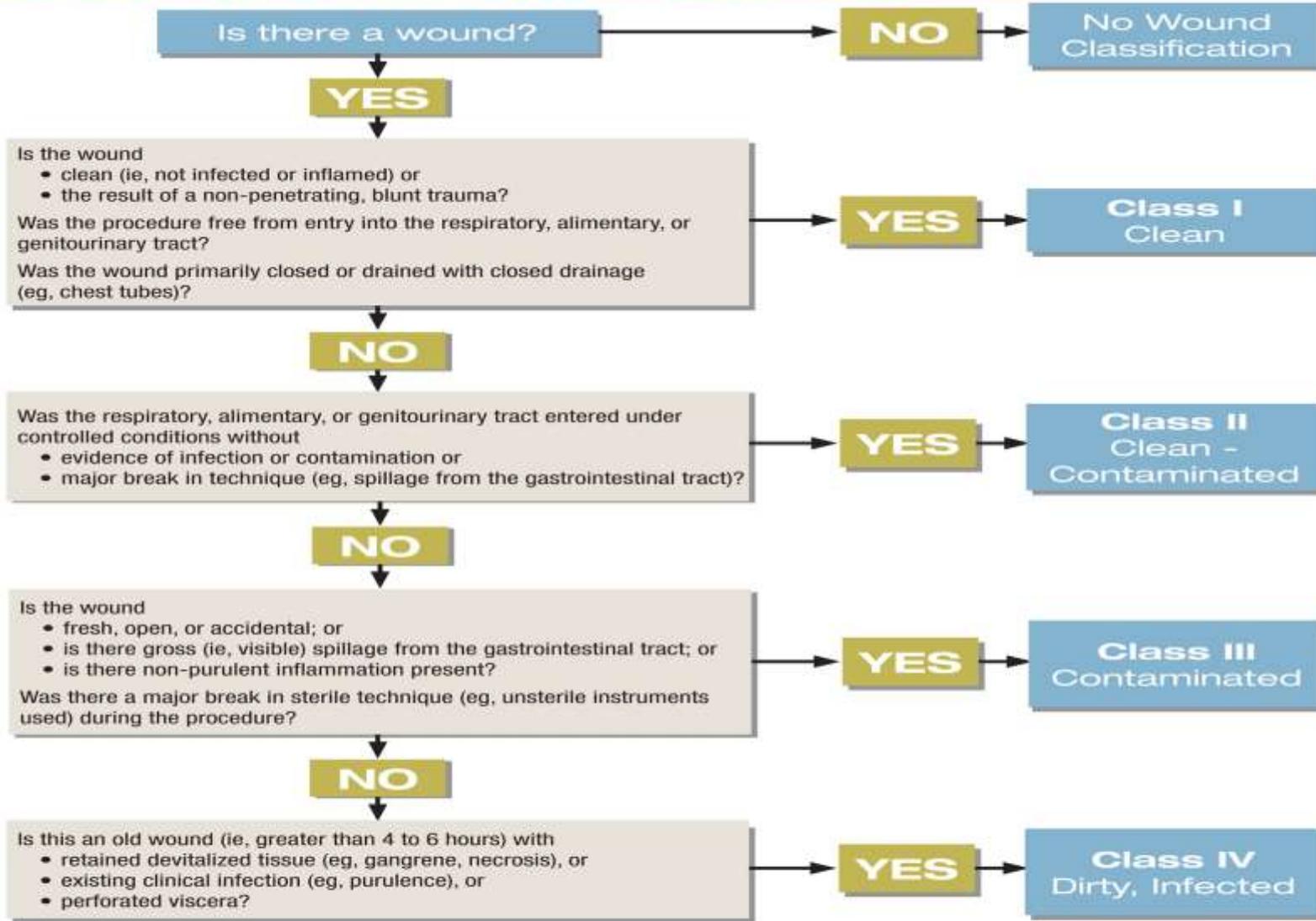


- ▶ In restricted areas, wear a disposable mask when opening sterile items and equipment are present, and when contamination by blood, body fluids or other infectious materials can be reasonably anticipated.
  - ▶ No dangling masks. It should be changed after every case or when wet or soiled.
- ▶ Eye protection to avoid exposure to blood, body fluids or other infectious materials can be reasonably anticipated.
  - ▶ Goggles (disposable or reusable) or a surgical mask with eye shield. Personal prescription glasses must have solid side shields to be considered eye protection.

# Surgical Skin Antisepsis and Wound Classification

- ▶ According to the Centers for Disease Control and Prevention (CDC, 2017) surgical skin preparations should have an alcohol based antiseptic unless contraindicated. AORN recommends dual agent preps containing alcohol.
- ▶ Surgical site preparation solutions include the following:
  - ▶ Betadine scrub & paint (iodophor), CHG, Prevail (iodophor & alcohol), Chloraprep (CHG & alcohol)
- ▶ Dual agents such as Chloraprep and Prevail have ideal antimicrobial properties and prevention of SSI:
  - ▶ Broad spectrum
  - ▶ Rapid bactericidal activity
  - ▶ Persistence or residual properties on the skin
  - ▶ Effective in the presence of blood
  - ▶ Non-irritating or have low allergic and/or toxic responses
  - ▶ No or minimal systemic absorption
  - ▶ Contraindicated for neonates and if used incorrectly can be a fire risk

# Surgical Wound Classification Decision Tree



Importance of Wound Classification

## RESOURCES

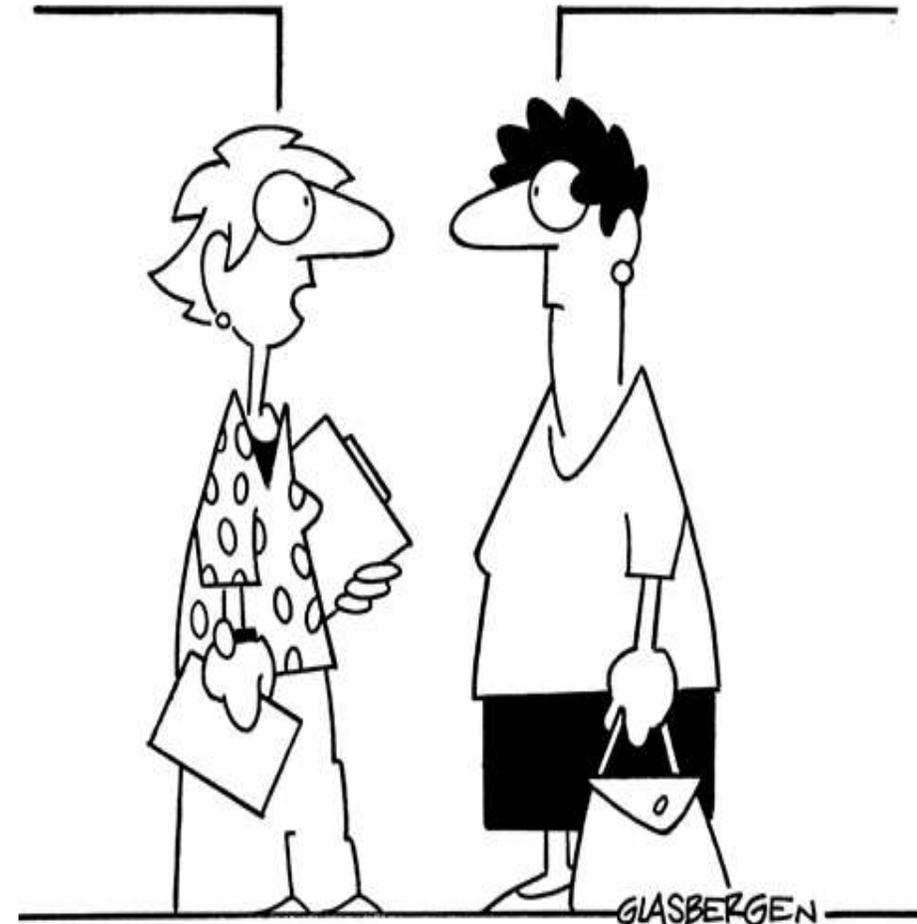
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NOTE: These are the original source documents for development of the CDC surgical wound classification system.

# Hand Hygiene

- ▶ Here is what the [World Health Organization](#) says:
  - ▶ In the health care field, 61% do not clean their hands at the right moment.
- ▶ Sanitize your hands before donning gloves. When you sanitize your hands you decrease the number of organisms you transfer to the outside of the glove.
- ▶ Sanitize your hands after wearing gloves. In a study (Tomas, M.E. et.al., 2015), researchers found that 52.9% of staff who removed gloves caused transmission to skin and clothing.
- ▶ There are 5 moments to perform hand hygiene during intraoperative care
  - ▶ Before touching the patient
  - ▶ Before a procedure (to prevent SSI, CAUTI & CLABSI)
  - ▶ After body fluid exposure
  - ▶ After touching the patient
  - ▶ After touching the environment

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**“Nurses work 12 hours a day: 4 hours caring for patients and 8 hours washing our hands.”**

# Clean Hands Count- doing your part



# Minimize Traffic

## AORN Recommendations

- ▶ **1) Creating laminated door signs for specific cases-** such as spine, VP shunt, or isolation case
- ▶ **2) Installing white boards on the OR door for impromptu messaging** to prevent unnecessary opening of door for communication to staff that is important but can wait until after current case.
- ▶ **3) Teaching universal hand signals** Using American Sign Language, the team taught all staff members specific ways to sign frequent communications such as “do you need help?” or “do you need a break?” which are signed through the OR portal window.
- ▶ **4) Developing an online education-** In to increase knowledge and compliance of traffic control
- ▶ **5) Initiating standardized preop briefing with surgeon and having up to date preference cards** to identify needs prior to case and minimize leaving the room to “run for things”
- ▶ **6) Developing scripted language for asking non-essential people to leave the OR**
  - ▶ “In the interest of patient safety, I’m going to have to ask you to step out of the room at this point in time.”
  - ▶ “I know this is a rare and interesting case, but unfortunately I’m going to have to ask you to leave because we have all the team members we need in the room.”



# Proper Sterilization

- ▶ Sterile Processing Department (SPD) provides adequate sterilization of instruments by following hospital policy and procedure
- ▶ RN and ST check that sterilization indicators have turned and wrapper integrity remains intact
- ▶ ST- keeps instruments free of gross soil at **point of use** by wiping instruments with sterile water
- ▶ ST- opens, disassembles and arranges instruments to permit enzymatic cleaning agent to contact all surfaces of instruments until they reach the SPD department

# Post-operative



Discontinue antibiotics after 24 hrs



Maintain blood sugar (if diabetic), normothermia (36° c or better) and tissue perfusion with supplemental oxygen



Hand hygiene for dressing changes and sterile supplies



Education of preventing Surgical Site Infection upon discharge with patient and families.

If we all do our part, we can play a pivotal role in preventing Surgical Site Infections (SSIs)

Thank you!

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