

# Preventing Surgical Infection



# Preventing Surgical Infection

- An “outside to in” concept

# Preventing Surgical Infection

- **Environmental Control**
  - ◆ **Operating Room Environment**
  - ◆ **Patient Environment**
  - ◆ **Wound Environment**

# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**
  - ◆ **Keep doors closed and limit traffic in and out of the operating room**
  - ◆ **Eliminate needless activity**
  - ◆ **Eliminate needless personnel**



# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**
  - **Use standard scrub attire, sterile gloves, gowns and drapes to decrease wound contamination and exposure of health care workers (HCWs).**



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# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**
  - ◆ **No visible hair or nose**
  - ◆ **Change mask and scrubs**
  - ◆ **Strict adherence to OR discipline and Universal Precautions**



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# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**

- ◆ **Hand hygiene**

- ◆ **Provide personnel with efficacious hand-hygiene products that have low irritancy potential**



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# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**

- ◆ **Hand hygiene**

- ◆ **The cost of hand-hygiene products should not be the primary factor influencing product selection**



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# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**

- ◆ **Hand hygiene**

- ◆ **Newer alcohol and CHG based hand lotions appear to provide more effective antiseptics than standard scrub**



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## Environmental Control

### ■ Operating Room Environment

#### ◆ Hand hygiene

- ◆ To maximize acceptance of hand-hygiene products, solicit input from employees regarding the feel, fragrance, and skin tolerance of all products under consideration.



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## Environmental Control

### ■ Operating Room Environment

#### ◆ Hand hygiene

- ◆ Provide health care workers with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antiseptics or hand washing



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## Environmental Control

### ■ Operating Room Environment

#### ◆ Hand hygiene

- ◆ Healthcare personnel are more likely to comply with hand hygiene procedures if senior medical staff people or peers are seen to be compliant



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## Environmental Control

- **Operating Room Environment**
  - **Sterilize all surgical instruments according to published guidelines**
  - **Ethylene oxide has been classified as a carcinogen and is being replaced by H<sub>2</sub>O<sub>2</sub> sterilization procedures**



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## Environmental Control

- **Operating Room Environment**
  - ◆ **maintain positive pressure in the conventional operating room and provide greater than 15 operating room volumes exchanges per hour**



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## Environmental Control

- **Operating Room Environment**
  - ◆ **Laminar Flow - Consider performing orthopedic implant operations in operating rooms with ultra clean air and body exhaust suites - CDC**



# Preventing Surgical Infection Environmental Control



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# Preventing Surgical Infection

## Environmental Control

- **Operating Room Environment**
  - ◆ **Laminar Flow - After decades of clean-air operating rooms, no uniform opinion about the efficiency in preventing infections has been achieved**



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## Environmental Control

- **Operating Room Environment**
  - ◆ **Laminar Flow - with an infection rate of around 1% only a very large series of homologous surgical cases will show statistical significance**



# Preventing Surgical Infection

## Environmental Control

### ■ Patient Environment

- ◆ **Laminar Flow and body exhaust suits in combination with other infection control measures appears to improve infection rates**



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## Environmental Control

### ■ Patient Environment

- ◆ Monitor and maintain normal glycemia
- ◆ Maintain normothermia (above 36 degrees).



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## Environmental Control

### ■ Patient Environment

#### ◆ Antimicrobial Prophylaxis

- ◆ Give the initial dose within one hour preceding incision
- ◆ Use the appropriate antimicrobial and dosing



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## Environmental Control

### ■ Patient Environment

#### ◆ Antimicrobial Prophylaxis

- ◆ Repeat the dose during surgery as needed to maintain blood levels - CDC



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## Environmental Control

### ■ Patient Environment

#### ◆ Antimicrobial Prophylaxis

- ◆ Stop prophylactic antimicrobials within 24 hours
- ◆ Discontinue use even with catheters or drains still in place



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## Environmental Control

### ■ Patient Environment

#### ◆ Antimicrobial Prophylaxis

- ◆ Know your hospital antibiogram
- ◆ Know your formulary
- ◆ Know your patient population





# Preventing Surgical Infection

## Environmental Control

- Patient Environment
  - ◆ Antimicrobial Prophylaxis
    - ◆ vancomycin is appropriate for prophylaxis for major surgical procedures involving implantation of prosthetic materials or devices at institutions that have a high rate of infections caused by MRSA or MRSE



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# Preventing Surgical Infection

## Environmental Control

- **Patient Environment**
  - ◆ **Antimicrobial Prophylaxis**
    - ◆ **vancomycin is appropriate for prophylaxis for a patient who has a life-threatening allergy to beta-lactam antibiotics**



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## Environmental Control

- **Patient Environment**
  - ◆ **Antimicrobial Prophylaxis**
    - **Vancomycin should be used to treat known infections, not for routine prophylaxis**



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## Environmental Control

- **Patient Environment**
  - ◆ **Antimicrobial Prophylaxis**
    - ◆ **vancomycin is not appropriate for infection or colonization of indwelling central or peripheral catheters**



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## Environmental Control

### ■ Wound Environment

- ◆ Perform proper skin preparation to decrease Surgical Site Infection (SSI)

- ◆ Hair Removal

- ◆ Skin Preparation

- ◆ Incise Drapes



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# Preventing Surgical Infection Wound Environment

- **Perform proper skin preparation**
  - ◆ **Method of hair removal**
    - ◆ **Razor = 5.6% SSI rates**
    - ◆ **Depilatory = 0.6% SSI rates**
    - ◆ **No hair removal = 0.6% SSI rates**
    - ◆ **Electric shaver alternative**



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# Preventing Surgical Infection Wound Environment

- **Timing of hair removal**
  - ◆ **Shaving immediately before = 3.1% SSI rates**
  - ◆ **Shaving  $\leq$  24 hrs before = 7.1% SSI rates**
  - ◆ **Shaving  $>$ 24 hrs before = 20% SSI rates**



# Preventing Surgical Infection Wound Environment

- **Timing of hair removal**
  - ◆ **Don't use safety razor**



# Preventing Surgical Infection Wound Environment

## ■ Skin Preparation

- ◆ preoperative skin prep of the surgical field including alcohol, iodophors and chlorhexidene gluconate



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# Preventing Surgical Infection Wound Environment

- **Incise Drapes**

- ◆ **Modifications to these procedures include skin preparation and incise drape application**



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## ■ Incise Drapes

- ◆ **Skin Preparation and operation was associated with a six fold increase in infection rate when compared with operations in which the incise drape did not lift**



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## ■ Incise Drapes

- ◆ In another randomized, prospective study use of this system documented decreased cost with use



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# Preventing Surgical Infection Wound Environment

- **Surgical technique**
  - ◆ **Minimize operative time**
  - ◆ **Maintain hemostasis, gentle handling of tissue, eradicate dead space, remove dead tissue and foreign bodies as needed, close over drain when indicated.**



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- **Surgical technique**
  - ◆ **Sterile dressing**
  - ◆ **Post operative surveillance for SSI**

