Preventing Surgical Infection

American Academy of Orthopaedic Surgeons

AAOS American Association of Orthopaedic Surgeons
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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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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Environmental Control

- Operating Room Environment
  - Hand hygiene
    - Provide personnel with efficacious hand-hygiene products that have low irritancy potential
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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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Environmental Control

- Operating Room Environment
  - Hand hygiene
    - Newer alcohol and CHG based hand lotions appear to provide more effective antisepsis 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 antisepsis 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 $\text{H}_2\text{O}_2$ 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
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Environmental Control

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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
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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
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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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
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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Wound Environment

- **Timing of hair removal**
  - Shaving immediately before = 3.1% SSI rates
  - Shaving ≤ 24 hrs before = 7.1% SSI rates
  - Shaving > 24 hrs before = 20% SSI rates
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Wound Environment

- Timing of hair removal
  - Don’t use safety razor
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Wound Environment

- **Skin Preparation**
  - Preoperative skin prep of the surgical field including alcohol, iodophors and chlorhexidene gluconate
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Wound Environment

- Incise Drapes
  - Modifications to these procedures include skin preparation and incise drape application
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Wound Environment

- 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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Wound Environment

- 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.
Preventing Surgical Infection
Wound Environment

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