

Surgical Prophylaxis

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Introduction

- Wound infection is the second most common nosocomial infection
- Direct costs ~ 1 billion dollars/yr

Terminology

- **Prophylaxis:**
 - Administration of an antibiotic prior to contamination of previously sterile tissue or fluids
- **Presumptive therapy:**
 - Administration of an antibiotic when there is a strong possibility of, but unproven established infection
- **Treatment:**
 - Administration of an antibiotic when an established infection has been identified.

Terminology

- **Surgical wound infections:**
 - incisional infections identified by purulent or culture positive drainage isolated from any structure above the fascia
 - Deep infections, purulent drainage from sub-fascial drains, wound dehiscence, or abscess formation
 - Wound dehiscence
 - Breakdown of surgical wound.

Wound Classification

- **Clean (SWI risk < 2%)**
 - usually elective cases e.g. vascular surgery, craniotomy
- **Clean-contaminated (SWI risk < 2-10%)**
 - minimal spillage, urgent cases – cholecystectomy, head and neck surgery
- **Contaminated (SWI risk 10-20%)**
 - gross soiling of operative field e.g. colorectal surgery with spillage
- **Dirty (SWI risk > 30%)**
 - e.g. perforated appendicitis with abscess formation; penetrating wound > 4hrs old, pre-op perforation of GIT
 - ** Antibiotics are used for treatment – NOT prophylaxis**

Principles of surgical prophylaxis

- Timing of antibiotic administration
- Duration of prophylaxis
- Organisms involved
- Which agent?

Principles of Surgical Prophylaxis

- **Timing of antibiotic administration**
 - ideally 30-60 min **BEFORE** the surgical incision is made
- **Duration of prophylaxis**
 - Single dose of antibiotic given just before procedure should provide adequate tissue levels
 - Discontinue within 24hrs
 - If procedure is > 3hrs, repeat intra-op doses may be necessary to maintain adequate levels.
 - Re-administration is indicated at intervals of 1 or 2 times the half-life of the drug.
 - Insertion of prosthetic valve – prophylaxis for 24 hrs (3 dose regimen, depending on antibiotic used)

Organisms involved

- Most surgical infections are acquired from the patients own microbial flora
- *S.aureus* is the major pathogen in wound infection after clean surgery.
- Gram negative bacteria cause wound infections in colon, gyne, genito-urinary procedures
- Potential for resistant organisms varies (depends on hospital epidemiology)

Which agent?

- Cephalosporins are widely favoured
 - Adequate spectrum of activity,
 - Few side-effects,
 - Low incidence of allergic reactions
- First gen agents (e.g Cefazolin) are more active against *S. aureus*, less expensive, have narrow spectrum of activity, moderately long serum half-life (1.8hrs)
- For colorectal surgery cefoxitin if preferred (activity against anaerobes) or Cefazolin plus metronidazole.

Procedures which benefit from surgery

- Hysterectomy: Cefazolin/clindamycin
- C/section(emergency): Cefazolin after cord is clamped
- Simple open fracture: Cefazolin
- ORIF: Ceftriaxone
- Joint replacement: Cefazolin or Vanco (if previous MRSA)

Procedures which benefit from surgery

- Elective colorectal surgery – Mechanical bowel cleansing + Cefoxitin
- Non-elective: Cefoxitin or Cefazolin + Metronidazole
- Appendectomy: Cefoxitin
- Urological procedures: Cefazolin (1g q8 1-3 doses peri-operatively). If urine is sterile – prophylaxis is discouraged
- Transrectal prostate biopsy: Cipro 500mg po 12 hrs prior to surgery, repeat 12hrs after