Surgical site infection (SSI) antibiotic prophylaxis

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Surgical site infection (SSI) antibiotic prophylaxis: objectives

- To prevent implantation of bacteria in the operated tissues during the intervention
  - Need for antibiotic presence at the incision time
  - No need for antibiotic before or after intervention

- SSI prophylaxis is **NOT** a treatment for infection

Origin of surgical site infections

- The bacteria causing surgical site infections are originated
  - from the patient: 90%
  - from the surgical staff: > 5 %
  - from the environment (air, water): < 5 %

SSI prevention: don’t forget…

- The patient has to be prepared as well as possible:
  - good nutrition
  - infections healed
  - as short pre-operative hospital stay as possible
  - no antibiotic before intervention
  - pre operative shower
  - no shaving on the incision site

Surgical site infection (SSI) antibiotic prophylaxis: indications

1. Clean Surgery

   = No traumatic wounds, no inflammation, no technical or septic errors during surgery, and the gastrointestinal, respiratory, and uro-genital tracts are intact.

→*No prophylaxis is indicated for clean surgery, as infections occur in less than 2% of cases*.

Surgical site infection (SSI) antibiotic prophylaxis: indications

2. Clean contaminated surgery

   = the intervention has had minor technical or septic errors. A minor rupture of the respiratory or uro-genital tract has not resulted in any significant leakage. Absence of any surgical trauma.

   → *prophylaxis is recommended during clean contaminated surgery , since infections occur in up to 10% of cases*.

Surgical site infection (SSI) antibiotic prophylaxis: indications

3. Contaminated surgery

   = Following severe surgical trauma, or related to significant technical and septic errors, or when gastrointestinal tract, bile duct, or urinary tract has ruptured, or there has been an incision in inflamed, non-purulent tissue.

   → Prophylaxis is advised during contaminated surgery, since such infections occur in 20% of patients.

Surgical site infection (SSI) antibiotic prophylaxis: indications

4. Dirty surgery

   = on an infected or long-standing sore or human/animal bite or with the presence of a foreign body, necrotic tissue, pus, a rupture in the intestine, or fracture at the site of the infection.

   →Treatment with antibiotics (not merely prophylaxis) is indicated in the case of dirty surgery

   Prophylaxis is also indicated upon the surgical insertion of a foreign device when the consequences of infection are subject to extremely serious complications.

Timing of antibiotic administration

- Need to obtain effective concentrations in the tissues from incision to closure of the site
- First dose between 1h and 30 min before incision (never > 2 h).
- Most of the time:
  - unique dosis
  - additionnal dosis: if intervention > 3h or huge blood losses
- Stop antibiotics when surgical wound is closed
- Catheters or drains are not an indication to continue antibiotics

Surgical site infection (SSI) antibiotic prophylaxis:

Surgical Service	Routine Pre-op Antibiotic	Penicillin or Cephalosporin Allergy
Burns	Cefazolin	Clindamycin
Cardiac	Cefazolin **Plus** Vancomycin	Vancomycin **OR** Clindamycin **Plus** Gentamicin
Thoracic	Cefuroxime	Vancomycin **OR** Clindamycin
Colorectal	Cefazolin **Plus** Metronidazole Or Ertapenem	Gentamicin **Plus** Clindamycin
Otolaryngology	Cefazolin **Plus or Minus** Metronidazole	Clindamycin **Plus or Minus** Ciprofloxacin
General Surgery/Endocrine	Cefazolin	Clindamycin **Plus or Minus** Gentamicin
GU	Cefazolin	Ciprofloxacin **Plus or Minus** Vancomycin
Hepatobiliary (complicated)	Cefazolin	Tobramycin **Plus** Vancomycin
Neurosurgery	Cefazolin **Plus** Vancomycin (craniotomy or implantation of a device)	Vancomycin

Surgical site infection (SSI) antibiotic prophylaxis

Surgical Service	Routine Pre-op Antibiotic	Penicillin or Cephalosporin Allergy
Oncology	Cefazolin **Plus** Metronidazole (GI and pelvic cases only)	Clindamycin (clean surgeries) Gentamicin **Plus** Clindamycin (GI and pelvic) **OR** Vancomycin (clean surgeries) Ciprofloxacin (GI and pelvic)
Oral/Maxillofacial	Cefazolin	Clindamycin
Orthopedic	Cefazolin **Plus** Vancomycin (Arthroplasties only)	Vancomycin **OR** Clindamycin
Orthopedic-Spine	Cefazolin	Vancomycin **OR** Clindamycin
Obstetrics	Cefazolin	Clindamycin **OR** Vancomycin (if allergic to Clindamycin)
Gynecology	Cefazolin	Clindamycin
Plastics, Reconstructive & Hand Surgery	Cefazolin	Clindamycin **OR** Vancomycin
Vascular	Cefazolin **Plus** Vancomycin (synthetic graft only)	Vancomycin

Preoperative Dosing of Antibiotics

	≤80 kg	81–160 kg
Cefazolin	1 g	2 g
Cefuroxime	1.5 g	3 g
Ciprofloxacin	400 mg	600 mg
Clindamycin	600 mg	900 mg
Gentamicin*	4 mg/kg	4 mg/kg (max 420 mg)
Metronidazole	500 mg	1000 mg
Vancomycin†	20 mg/kg	20 mg/kg (max 2500 mg)