

ANTIBIOTIC PROPHYLAXIS FOR SURGERY GUIDELINE

BACKGROUND

The goal of antibiotic surgical prophylaxis is to ensure adequate serum and tissue levels of the drug at the time of incision, and for the duration of surgery. Antibiotic regimen should include agent(s) that are safe, active against the most likely infecting organisms as well as being cost effective. Optimal dosing, timing of the first dose, and redosing to maintain adequate level during the procedure are more important than administration after the operation. According to the 2017 CDC guideline for the prevention of surgical site infection, administration of post-operative antibiotic doses is not recommended in clean and clean-contaminated procedures.

PROCEDURE

- 1. Documentation of antimicrobial administration must include date, time of administration, name of medication, dose, and route of administration. Do not abbreviate name of medication and do not use unapproved abbreviations.
- 2. Antibiotic prophylaxis for surgery is given *within one hour* prior to surgical incision except for Vancomycin, which is given *within two hours* prior to surgical incision.
- 3. All parenteral antibiotics listed in this guideline may be infused as indicated in Table 1. *Please note, it is strongly recommended that vancomycin be administered over a minimum of 60 minutes and that all pre-operative antibiotics are completely infused before start of procedure.*
- 4. If a tourniquet is to be used in the procedure, the entire dose of antibiotic must be infused prior to tourniquet inflation.
- 5. Intra-operative re-dosing is necessary during procedures that exceed two half-lives of the drug to maintain adequate serum and tissue concentrations.
- 6. In clean and clean contaminated procedures, high-quality evidence suggests that additional prophylactic antibiotic doses are not needed after the surgical incision is closed in the OR even in the presence of a drain. For all other procedures, antibiotic prophylaxis must be discontinued within 24 hours of surgical end time. Use of antibiotics beyond the recommended post-operative duration requires proper documentation of infection or suspected infection.
- 7. Vancomycin use requires documentation of the reason for use in the medical record by the prescribing physician or his (her) designee. Reasons for use include:
 - a. Beta-lactam (penicillin or cephalosporin) allergy
 - b. Known Methicillin resistant *Staphylococcus aureus* (MRSA) colonization or infection or high risk for MRSA (i.e. recent inpatient hospitalization, resides in an extended care facility/group home, receives dialysis)

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ANTIBIOTIC AGENT	PEDIATRIC INTRAVENOUS DOSE (ADULT DOSE)	INFUSION TIME (MINUTES)	TIMINGOF FIRST DOSE	INTRAOPERATIVE REDOSING FOR NORMAL RENAL FUNCTION
Ampicillin/ Sulbactam	50 mg/kg (2 gm) of ampicillin component	30	Begin 60 min or less before incision	Every 2 hrs
Cefazolin	30mg/kg (2gm, 3g for pts≥ 120 kg)	30	Begin 60 min or less before incision	Every 4 hrs
Cefoxitin	40 mg/kg (2 gm)	30	Begin 60 min or less before incision	Every 2 hrs
Cefepime	50 mg/kg (2 gm)	30	Begin 60 min or less before incision	Every 4 hrs
Clindamycin	10 mg/kg (900 mg)	30	Begin 60 min or less before incision	Every 6 hrs
Gentamicin	2.5 mg/kg [based on dosing weight] (5 mg/kg [based on dosing weight] as a single dose)	30	Begin 60 min or less before incision	Every 8 hrs
Metronidazole	15 mg/kg (500 mg)	30	Begin 60 min or less before incision	Every 6 hrs
Vancomycin	15 mg/kg (15 mg/kg)	60	Begin 120 min or less before incision	Every 6 hrs

Table 1. Dosing and Timing of Antibiotic Agents used for Surgical Prophylaxis

Table 2. Recommended Intravenous Antibiotics for Surgical Procedures

PROCEDURE	COMMON PATHOGENS	RECOMMENDED ANTIBIOTIC	POST	
	TATHOUENS		DURATION	
CARDIAC Heart surgery+, PDA (patent ductus arteriosis), ASD/VSD (atrial/ventricular septal defect), Glenn Shunt, valve replair/replacement, Aortic reconstruction,	S. epidermidis, S. aureus	Cefazolin OR Vancomycin^		
prosthetic graft insertion GASTROINTESTINAL Esophageal, gastroduodenal PEG placement/revision/ conversion to other feeding tubes OR high-risk conditions	Enteric gram- negative bacilli, gram positive cocci	For high risk+++: Cefazolin If major reaction to beta- lactams++: Clindamycin <i>plus</i> Gentamicin	No additional antibiotic doses are needed for clean, clean- contaminated procedures, even in presence of a drain	
Biliary, including lap cholecystectomy	Enteric gram- negative bacilli, grampositive cocci, clostridia	Forhighrisk*: Cefazolin If major reaction to beta- lactam++: Clindamycin <i>plus</i> Gentamicin		
Colorectal** Appendectomy or ruptured viscus	Enteric gram negative bacilli, anaerobes, enterococci	Cefoxitin OR Ceftriaxone plus Metronidazole If major reaction to beta- lactams++: Clindamycin plus Gentamicin	For other procedures,	
HEAD and NECK SURGERY Incision through oral or pharyngeal mucosa, lower jaw fraction, removal of esophagus pouch	Anaerobes, entericgram- negative bacilli, <i>S.aureus</i>	Cefazolin OR If major reaction to beta- lactams++: Clindamycin <i>plus</i> Gentamicin	uscontinue within 24 hrs of surgical end time	
NEUROSURGERY## Craniotomy, shunt placement/revision, insertion of pump/reservoir, spinal procedure (laminectomy, fusion or cord decompression)	S. aureus, S. epidermidis	Cefazolin OR Vancomycin ^		
ORTHOPEDIC Spinal procedures or implantation of hardware. Give dose before tourniquet inflation	S.epidermidis, S. aureus	Cefazolin or C efepime and Vancomycin ^		
THORACIC Lung resection, VATS	S. aureus, S. epidermidis, streptococci, entericgram- negativebacilli##	Cefazolin OR Vancomycin [^] or Clindamycin		
VASCULAR (see Cardiac) Extremity amputation for ischemia, vascular access for hemodialysis	<i>S. aureus,</i> <i>S. epidermidis,</i> entericgram- negative bacilli	Cefazolin OR Vancomycin^ OR Clindamycin		

GYNECOLOGIC	Enteric gram- negative bacilli, anaerobes, Gp B strep, enterococci	Cefoxitin OR Ampicillin <i>plus</i> Metronidazole <i>plus</i> Gentamicin If major reaction to beta-lactam++: Clindamycin <i>plus</i> Gentamicin	No additional antibiotic doses are needed for clean, clean- contaminated procedures, even in
GENITOURINARY Bladder augmentation, pyeloplasty	Enteric gram- negative bacilli, anaerobes, enterococci	For high risk only***: Cefazolin OR Cefoxitin OR Ampicillin <i>plus</i> Metronidazole <i>plus</i>	presence of a drain
		Gentamicin Ifmajor reaction to beta-lactam++: Clindamycin plus Gentamicin	For other procedures, discontinue within 24 hrs of surgical end time

^ for known MRSA or high risk for MRSA, or major reaction to beta- lactams

+For open-heart surgery only: use maximum cefazolin 2 gm; redose cefazolin when patient is removed from bypass; alternative to cefazolin monotherapy is cefazolin plus vancomycin for patients at high risk for MRSA. (procedure involves insertion of prosthetic valve or vascular graft).

++Major reactions include anaphylaxis, hives, shortness of breath, wheezing, edema. For minor reactions (nausea, vomiting, diarrhea, mild rash, itching), cephalosporins may still be used.

+++High risk gastroduodenal: morbid obesity, esophageal obstruction, decreased gastric acidity or decreased gastrointestinal motility *High risk biliary: acute cholecystitis, non-functioning gall bladder, obstructive jaundice or common duct stones

**Colorectal procedures: Oral prophylaxis prior to surgery - After appropriate diet and catharsis, 1 gram of neomycin plus 1 gram of erythromycin at 1 pm, 2 pm, and 11 pm or 2 grams of neomycin plus 2 grams of metronidazole at 7 pm and 11pm the day before an 8 am day operation

****High risk genitourinary: urine culture positive or unavailable, preoperative catheter, transrectal prosthetic biopsy, placement of prosthetic material

##Vascular procedures: Clostridia can also be present in lower extremity amputation for ischemia.

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