



Antibiotic Prophylaxis in Gastrointestinal Surgery

Translated from the original French version published November 2005

This guide is provided for information purposes and is not a substitute for clinical judgment.

TREATMENT GUIDELINES

- Antibiotic prophylaxis must be adapted to specific resistance patterns of each hospital environment.
- Patients with cardiac defects at risk for developing bacterial endocarditis following gastrointestinal surgery should receive appropriate antibiotic prophylaxis. This is not addressed in the present guide: please refer to the card focusing on the treatment of bacterial endocarditis.

Antibiotic prophylaxis

Prophylaxis NOT RECOMMENDED

Low-risk gastroduodenal surgery
Low-risk biliary surgery

Prophylaxis RECOMMENDED

Contaminated surgery

Clean-contaminated surgery (entering the *lumen*)

- Colorectal surgery
- Appendectomy (perforated, necrotic or gangrenous appendix must be treated)
- Oesophageal surgery in presence of obstruction and occasionally in the following situations:
 - oesophageal dilatation and oesophageal varix sclerotherapy
 - oesophageal surgery in general, regardless of the level of risk
- High-risk gastroduodenal surgery in the following situations:
 - reduced gastric acidity (including use of antacids or acid-reducing agents)
 - decreased gastroduodenal motility (obstruction, morbid obesity)
 - cancer, digestive hemorrhage, gastric ulcer
 - certain surgical procedures: gastric or biliopancreatic bypass pancreatoduodenectomy (Whipple's procedure), percutaneous gastrostomy
- Small intestine surgery
- High-risk biliary tract surgery:
 - age over 70 years, diabetes mellitus, obesity
 - acute cholecystitis, cholelithiasis or obstructive jaundice
 - nonfunctioning gallbladder (excluding non-urgent laparoscopic cholecystectomy in low-risk patients)
 - certain procedures: retrograde cholangiopancreatography
 - open biliary tract surgeries, regardless of the level of risk

Second-line prophylaxis

⇒ Indications:

- Documented allergies to β -lactams:
 - patients having shown signs of anaphylaxis, urticaria or rash, within 72 hours of administering a β -lactam antimicrobial or patients having had a serious adverse reaction such as drug fever or toxic epidermal necrolysis.
 - Patients colonized with methicillin-resistant *Staphylococcus aureus* (MRSA) or with methicillin-resistant coagulase-negative staphylococci.
- ⇒ Although Clindamycin has been extensively associated with the development of *Clostridium difficile* colitis, it has a more appropriate activity spectrum against pathogens encountered in several types of gastrointestinal surgery than has Vancomycin, which is preferred for other types of surgery.
- ⇒ Second-line regimens with gentamicin are preferred to regimens with ciprofloxacin, since certain data seems to link the use of quinolones with the emergence of *C. difficile* colitis. This information is to be interpreted in view of each hospital setting.

Timing of preoperative antibiotic administration

- At induction of anesthesia
- Variable (depending on recommended agent)

Dosage of antibiotic prophylaxis

- When antibiotic prophylaxis is recommended, a single dose is sufficient except in situations where antibiotic therapy must be continued (e.g. perforated appendix).
- **Cefoxitin et cefazolin:**
 - A single 2 g IV dose at induction may be used in patients > 80 kg.
 - For cefoxitin, a single 2 g dose provides better coverage against enterobacteriaceae, even in adults < 80 kg.
- Pediatric dose: measured in mg/kg with a maximum equivalent to the adult dose.

Antibiotic administration

Cefazolin, cefoxitin	direct IV over 3-5 minutes OR IV infusion over 15–30 minutes
Clindamycin	IV infusion over 30-60 minutes (maximum of 30 mg/minute in adults)
Gentamicin	IV infusion over 15-30 minutes
Metronidazole	IV infusion over 30 minutes

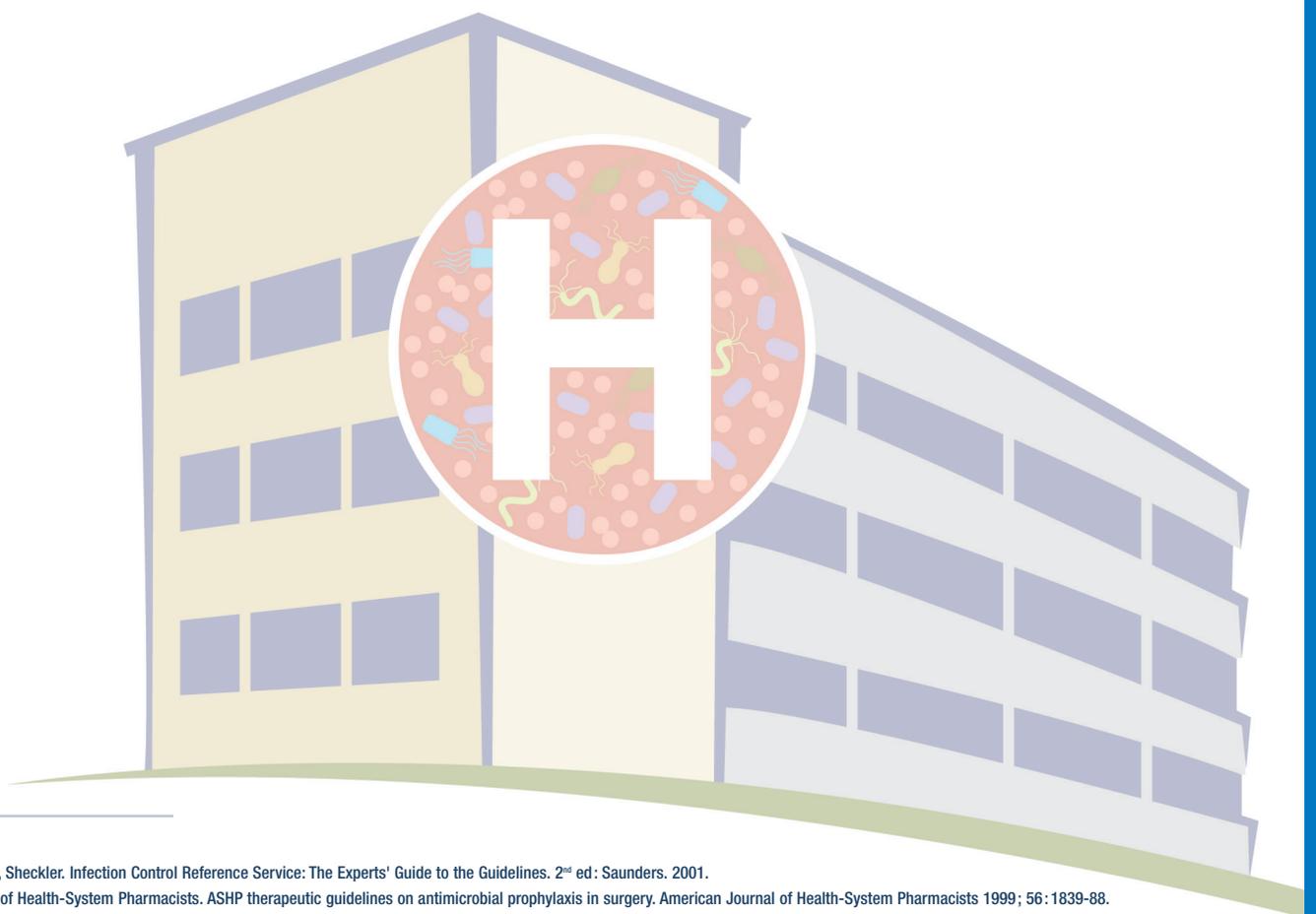
Characteristics of pediatric antibiotic prophylaxis

- Few studies have evaluated the efficacy of antibiotic prophylaxis in children undergoing gastrointestinal surgery.
- Recommendations are based on adult population trials and may be adapted to local experience.

ANTIBIOTIC PROPHYLAXIS*

Type of surgery	Adults				Children [¶]			
Gastrointestinal	First-line therapy ^{†‡}	Cost per dose [§]	Second-line therapy [†]	Cost per dose [§]	First-line therapy ^{†‡}	Cost per dose [§]	Second-line therapy [†]	Cost per dose [§]
Oesophageal in presence of obstruction	Cefazolin (Ancef [®]) 1 g IV	\$1	Clindamycin (Dalacin [®]) 900 mg IV	\$3	Cefazolin (Ancef [®]) 25 mg/kg IV Dose range: 20-30 mg/kg Maximal dose: 1 g	\$1	Clindamycin (Dalacin [®]) 10 mg/kg IV Maximal dose: 900 mg	\$1
High-risk gastroduodenal	Cefazolin (Ancef [®]) 1 g IV	\$1	Clindamycin (Dalacin [®]) 900 mg IV	\$3	Cefazolin (Ancef [®]) 25 mg/kg IV Dose range: 20-30 mg/kg Maximal dose: 1 g	\$1	Clindamycin (Dalacin [®]) 10 mg/kg IV Maximal dose: 900 mg	\$1
			AND Gentamicin (Garamycin [®]) 2 mg/kg IV	\$4 (70 kg)			AND Gentamicin (Garamycin [®]) 2 mg/kg IV	\$1
Small intestine	Cefazolin (Ancef [®]) 1 g IV	\$1	Clindamycin (Dalacin [®]) 900 mg IV	\$3	Cefazolin (Ancef [®]) 25 mg/kg IV Dose range: 20-30 mg/kg Maximal dose: 1 g	\$1	Clindamycin (Dalacin [®]) 10 mg/kg IV Maximal dose: 900 mg	\$1
			AND Gentamicin (Garamycin [®]) 2 mg/kg IV	\$4 (70 kg)			AND Gentamicin (Garamycin [®]) 2 mg/kg IV	\$1
Colorectal	Cefoxitin (Mefoxin [®]) 1-2 g IV	\$7	Clindamycin (Dalacin [®]) 900 mg IV	\$3	Cefoxitin (Mefoxin [®]) 30-40 mg/kg IV Maximal dose: 1-2 g	\$5	Clindamycin (Dalacin [®]) 10 mg/kg IV Maximal dose: 900 mg	\$1
	Metronidazole (Flagyl [®]) 500 mg IV	\$1	AND	\$4 (70 kg)	Metronidazole (Flagyl [®]) 10 mg/kg IV Maximal dose: 500 mg	\$1	AND	\$1
	AND Cefazolin (Ancef [®]) 1 g IV	\$1	Gentamicin (Garamycin [®]) 2 mg/kg IV		Cefazolin (Ancef [®]) 25 mg/kg IV Dose range: 20-30 mg/kg Maximal dose: 1 g	\$1	Gentamicin (Garamycin [®]) 2 mg/kg IV	
Appendectomy	Cefoxitin (Mefoxin [®]) 1-2 g IV	\$7	Metronidazole (Flagyl [®]) 500 mg IV		\$1	Cefoxitin (Mefoxin [®]) 30-40 mg/kg IV Maximal dose: 1-2 g	\$5	
	Metronidazole (Flagyl [®]) 500 mg IV	\$1	Gentamicin (Garamycin [®]) 2 mg/kg IV	\$4 (70 kg)			AND	\$1
	AND Cefazolin (Ancef [®]) 1 g IV	\$1	Clindamycin (Dalacin [®]) 900 mg IV	\$3			Gentamicin (Garamycin [®]) 2 mg/kg IV	
Biliary tract, open or high-risk procedure	Cefazolin (Ancef [®]) 1 g IV	\$1	Gentamicin (Garamycin [®]) 2 mg/kg IV	\$4 (70 kg)	Cefazolin (Ancef [®]) 25 mg/kg IV Dose range: 20-30 mg/kg Maximal dose: 1 g	\$1	Gentamicin (Garamycin [®]) 2 mg/kg IV	\$1
			± Metronidazole (Flagyl [®]) 500 mg IV	\$1			± Metronidazole (Flagyl [®]) 10 mg/kg IV Maximal dose: 500 mg	\$1

* Only one brand name product is listed although several manufacturers may market other brand names.
 † Dose must be administered at induction of anesthesia, except for particular situations requiring clinical judgment.
 ‡ Cefazolin, cefoxitin: repeat preoperative dose during procedure if it lasts over 3 hours or if blood loss exceeds 1500 mL.
 § Approximate cost negotiated for the healthcare facilities of the region of Québec (June 2005). Cost may vary with the region.
 || Approximate cost of the lowest dosage for a 20 kg child.
 ¶ Few studies have evaluated the efficacy of antibiotic prophylaxis in children undergoing gastrointestinal surgery. Recommendations are based on adult population trials and may be adapted to local experience.



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