

TABLE I: Adult Surgical Pre-incisional Antimicrobial Recommendations

All antimicrobials administered within 1 hour prior to incision unless otherwise indicated with only 1 dose recommended for clean/clean contaminated (unless duration of surgery exceeds dosing interval). **Total duration of antibiotics NTE 24 hours post-op.**

Site	Recommended Antimicrobials	Severe/Delayed Penicillin Allergy [†]
ENDOCARDITIS PROPHYLAXIS (See Firstline Link)		
Firstline Link for endocarditis prophylaxis		
CARDIOVASCULAR SURGERY		
<ul style="list-style-type: none"> Cardiac procedures (including transplant) AICD/pacemakers Heart Transplant 	Cefazolin 2Gm IV + Vancomycin 15mg/kg IV* Cefazolin 2Gm IV Vancomycin 1g IV and Ceftriaxone 1g IV	PCN Allergy: Vancomycin 15mg/kg IV*
GENERAL SURGERY		
Esophageal/gastroduodenal (including procedures for obesity)	Cefazolin 2 Gm IV	PCN Allergy: Clindamycin 900 mg IV PLUS Gentamicin 5 mg/kg IV
Gastrointestinal <ul style="list-style-type: none"> Lap/open chole, high risk (low risk, no antibiotics) Biliary tract - high risk; ERCP w/obstruction Appendectomy Intra-abdominal trauma; penetrating wound Liver transplantation, resection or biopsy Whipple procedures Colorectal surgery/Small Bowel Surgery 	Cefoxitin 2 Gm IV* If history of multi-drug resistance within the last 3 months (ie, ESBL or Ceftriaxone-resistant Enterobacteriales): consider Ertapenem 1 Gm IV For elective colon surgeries: mechanical bowel prep + neomycin 1000mg PO and metronidazole 500mg PO x 3 doses on the day prior to surgery Whipple: Piperacillin-tazobactam 3.375 Gm IV	PCN Allergy: Levofloxacin 500mg IV PLUS Metronidazole 500mg IV Use above regimen in lieu of piperacillin/tazobactam for Whipple if ANY PCN allergy
Mastectomy/ hernia repair (ing or diaph) /splenectomy	Cefazolin 2 Gm IV	PCN Allergy: Clindamycin 900 mg IV
GENITOURINARY		
<ul style="list-style-type: none"> Radical, retropubic prostatectomy Bladder procedures; nephrectomy Renal transplantation 	Cefazolin 2 Gm IV	PCN Allergy: Ciprofloxacin 400 mg IV
<ul style="list-style-type: none"> Radical cystoprostatectomy Anterior exenteration Rectocele repair Transrectal prostate biopsy TURP (high risk or bacteriuria) 	Cefazolin 2 Gm IV	PCN Allergy: Vancomycin 15mg/kg IV*
	Cefoxitin 2 Gm IV*	PCN Allergy: Ciprofloxacin 400 mg IV
	If <u>oral</u> ciprofloxacin not previously administered: Ciprofloxacin 400 mg IV	
GYNECOLOGY		
Vaginal, radical or complex hysterectomy, complex laparotomy incl ovarian, pelvic exenteration, c-sections.	Cefazolin 2 Gm IV , add Metronidazole 500mg IV if vaginal entry/total hysterectomy, bowel involvement	PCN Allergy: Clindamycin 900 mg IV PLUS Gentamicin 5 mg/kg IV
GENDER AFFIRMING SURGERY		
Hysterectomy/oophorectomy and vaginectomy Metoidioplasty, phalloplasty, scrotoplasty Orchiectomy and penectomy Feminizing genitoplasty	Cefazolin 2g IV Metronidazole 500mg IV if bowel is involved (May give Metronidazole 500 PO prior to vaginectomy if concerned about BV)	PCN allergy: Vancomycin 15mg/kg IV* PLUS Gentamicin 5mg/kg IV
HEAD AND NECK		
<ul style="list-style-type: none"> Oral/pharyngeal mucosal procedures Oral/Maxillofacial: Bone grafting 	Cefazolin 2 Gm IV PLUS Metronidazole 500 mg IV	PCN Allergy: Vancomycin 15mg/kg IV* PLUS Metronidazole 500 mg IV
Tonsillectomy, rhinoplasty, or other procedures NOT involving oral/pharyngeal mucosa	No data to support prophylaxis; left to surgeon's clinical judgment	
NEUROSURGERY		
Craniotomy	Cefazolin 2 Gm IV	PCN Allergy: Vancomycin 15mg/kg IV*
Shunt placement	Cefazolin 2 Gm IV + Vancomycin 15 mg/kg IV*	PCN Allergy: Vancomycin 15mg/kg IV* PLUS Gentamicin 5 mg/kg IV
All spinal procedures incl laminectomy	Cefazolin 2 Gm IV + Vancomycin 15 mg/kg IV*	PCN Allergy: Vancomycin 15mg/kg IV*
ORTHOPEDIC SURGERY		
<ul style="list-style-type: none"> Arthroplasty of joints ORIF 	Cefazolin 2 Gm IV (add Vancomycin 15 mg/kg IV* if high-risk for MRSA, DM, BMI>30, immunosuppressed)	PCN Allergy: Vancomycin 15mg/kg IV*
Upper and Lower limb amputation	Cefoxitin 2 Gm IV*	PCN Allergy: Clindamycin 900mg IV PLUS Gentamicin 5 mg/kg IV
<ul style="list-style-type: none"> Arthroscopic surgery 	Cefazolin 2 Gm IV (add Vancomycin 15 mg/kg IV* if high risk for MRSA, DM, BMI >30, immunosuppressed)	PCN Allergy: Vancomycin 15mg/kg IV*
All revisions and debridement procedures	Prophylactic antibiotics to be discussed with surgeon	
PLASTIC SURGERY		
<ul style="list-style-type: none"> Free flap procedures Procedures involving implants/prosthetic devices 	Cefazolin 2 Gm IV	PCN Allergy: Clindamycin 900 mg IV
THORACIC SURGERY		
<ul style="list-style-type: none"> Lung procedures Video-assisted thoracic surgery Lung Transplant 	Cefazolin 2 Gm IV PLUS Vancomycin 1g IV and Ceftriaxone 1g IV	PCN Allergy: Vancomycin 15 mg/kg IV* PLUS Aztreonam 1g IV (in lieu of ceftriaxone)
Esophagectomy	Cefoxitin 2 Gm IV*	PCN Allergy: Clindamycin 900 mg IV PLUS Gentamicin 5 mg/kg IV
VASCULAR SURGERY		
All procedures	Cefazolin 2 Gm IV	PCN Allergy: Vancomycin 15mg/kg IV*

[†]Severe delayed onset reactions include: SJS/TEN, DRESS, AGEP, hemolytic anemia, thrombocytopenia, serum sickness, and vasculitis. Patients who have experienced anaphylaxis to penicillin can safely receive dissimilar R1-sidechain cephalosporins (including cefazolin, cefoxitin, and ceftriaxone) without prior testing or additional precaution.

*For patients with TRUE vancomycin allergy (versus infusion related syndrome): administer clindamycin.

#In the event of a **cefoxitin** shortage, **cefazolin 2 Gm IV** plus **metronidazole 500 mg-IV** will be therapeutically substituted according to the therapeutic interchange policy.

TABLE II: Antimicrobial Agents - Additional Information. Please call pharmacy for patients with impaired renal function

Antimicrobial	Infusion time	Intra-operative re-dosing interval in pts with normal renal function* ^Δ	ADULT Dose adjust for wt ≥120 kg	PEDIATRIC Dose Recommendations (Not to exceed standard adult doses)
Ampicillin (± sulbactam)	30 minutes	Q2H	No change	50 mg/kg/dose of the ampicillin component
Cefazolin	IV push	Q4H	Dose change to 3 grams/dose	30 mg/kg/dose
Cefoxitin	IV push	Q2H	Dose change to 3 grams/dose	40 mg/kg/dose
Ceftriaxone	30 minutes	N/A	Dose change to 2 grams/dose	N/A
Ciprofloxacin	60 minutes	Q8H	No change	10 mg/kg/dose
Clindamycin	30 minutes	Q6H	No change	Endocarditis prophylaxis: 20 mg/kg/dose Other procedures: 10 mg/kg/dose
Ertapenem	30 minutes	Q12H	No change	Per approval of Peds Infectious Disease
Gentamicin	30 minutes	Adults only: consider in cases >18h	No change	2.5 mg/kg/dose
Metronidazole	60 minutes	Q12H	No change	15 mg/kg/dose
Piperacillin-tazobactam	30 minutes	Q2H	Dose change to 4.5 grams/dose	N/A
Vancomycin	60-90 minutes	Q12H	Dose change to 1.5 grams/dose	15 mg/kg/dose

*In patients on systemic antibiotics for other indications, surgical prophylaxis should still be administered pre-incision, unless systemic antibiotics are given in the prior 60 minutes (120 minutes if vancomycin) and have an otherwise appropriate spectrum of activity for prevention of surgical site infections

^ΔRegardless of previous dose timing, consider immediate antibiotic re-dosing for > 1.5 L of blood loss (> 25ml/kg or > 30% blood volume loss for patients < 40kg) within a short time frame and in those with severe burns; do not re-dose vancomycin or gentamicin. Restart re-dosing clock if done

TABLE III: Pediatric Surgical Pre-incisional Antimicrobial Recommendations

All antimicrobials administered within 1 hour prior to incision unless otherwise indicated with only 1 dose recommended for clean/clean contaminated (unless duration of surgery exceeds dosing interval). **Total duration of antibiotics NTE 24 hours post-op.** Special exceptions noted in foot notes section

Site	Recommended Antimicrobials	Severe/Delayed Penicillin Allergy [†]
HEAD AND NECK		
Adenoidectomy, Tonsillectomy		No Prophylaxis
ENT, airway- diagnostic direct laryngoscopy/bronchoscopy with no instrumentation (such as biopsy or dilation)		No Prophylaxis
ENT, airway- with instrumentation	Cefazolin; OR Ampicillin/Sulbactam	Clindamycin
ENT, ear		No Prophylaxis ^a
ENT, sinus surgery	Cefazolin	Clindamycin
Cochlear device implantation	Cefazolin	Clindamycin
ENT, clean soft tissue (lymph nodes, thyroid)	Cefazolin	Clindamycin
Cranial nerve (eg, vagus nerve) stimulator placement		No Prophylaxis ^b
Intraoral/Maxillofacial (rhinoplasty, septoplasty, cleft palate, midface reconstruction with/without bone graft, choanal atresia, pharyngoplasty, parotid/submandibular gland)	Cefazolin; OR Ampicillin/Sulbactam	Clindamycin
THORACIC- AIRWAY AND CARDIAC		
Non-cardiac procedures, open, including pleura, lung & mediastinal procedures	Cefazolin	Clindamycin
Thoracoscopic procedures, including pleura, lung & mediastinal procedures	Cefazolin	Clindamycin
Cardiac procedures, closed chest	Cefazolin ^c	Vancomycin ^c
Cardiac procedures, open chest	Cefazolin ^d	Vancomycin ^d
GASTROINTESTINAL		
Esophagus + gastric + small bowel (including ileum) Procedures without entry into GI tract (i.e., Nissen fundoplication)	Cefazolin	Clindamycin
Esophagus + gastric + small bowel (including ileum) Procedures with entry into the GI tract	Cefazolin	Clindamycin + gentamicin
Portoenterostomy (eg, Kasai procedure)	Cefazolin	Clindamycin + gentamicin
Biliary tract, open and laparoscopic procedures	Cefazolin	Clindamycin + gentamicin
Appendectomy, uncomplicated appendicitis	Ceftriaxone + metronidazole	Ciprofloxacin + metronidazole
Appendectomy, complicated appendicitis	Ceftriaxone + metronidazole	Ciprofloxacin + metronidazole
Colorectal	Cefoxitin; OR Ceftriaxone + metronidazole ^e	Ciprofloxacin + metronidazole ^e
GENERAL SURGERY		
Umbilical, ventral & inguinal hernias (high ligation only)		No Prophylaxis ^a
Hernia repairs with mesh	Cefazolin	Clindamycin
Excision of chest wall tumor, including ribs	Cefazolin	Clindamycin
Pectus excavatum or carinatum repair (open or thoracoscopic)	Cefazolin	Clindamycin
Excision of abdominal wall tumor, subfascial (eg, desmoid)		No Prophylaxis
Spleen, Pancreatic (including anastomosis of pancreatic cyst to GI tract)	Cefazolin	Clindamycin
NEUROSURGERY		
Cranial procedures, including shunt and nerve stimulator	Cefazolin ^f	Vancomycin ^f
Spine procedures, including laminectomy	Cefazolin	Vancomycin
Spinal Fusion (idiopathic scoliosis)	Cefazolin	Clindamycin
Spinal Fusion (neuromuscular)	Cefazolin + gentamicin (Add vancomycin single dose preoperatively if history of MRSA colonization or infection)	Clindamycin + Gentamicin (Replace clindamycin with vancomycin single dose preoperatively if history of MRSA colonization or infection)
Percutaneous tenotomy		No Prophylaxis
All others	Cefazolin	Clindamycin
PLASTIC SURGERY		
Plastics-flap-grafts (flaps, microvascular anastomosis, nerve grafts)	Cefazolin	Clindamycin
Plastics-cranial (craniostomosis)	Cefazolin	Clindamycin
Plastics-breast (reconstruction, flaps, implants)	Cefazolin	Clindamycin
Hand surgery	Cefazolin	Clindamycin
GENITOURINARY		
Urology, instrumentation (cystourethroscopy, ureteral stent, lithotripsy)	Cefazolin	Clindamycin
Urology, clean- without entry into GI or GU tract (circumcision, orchiopexy, varicocele excision, ligation of spermatic veins)		No Prophylaxis
Penile (urethroplasty, urethromeatoplasty, hypospadias repair)	Cefazolin	Clindamycin
Vaginoplasty, Hysterectomy	Cefazolin	Clindamycin
KIDNEY-URETER-BLADDER SURGERY		
KUB surgery (nephrectomy, cystectomy, pyelectomy, ureterectomy, vesicostomy, cystotomy, nephrolithotomy, anastomoses within KUB system)	Cefazolin	Clindamycin
KUB-small bowel (enterocystoplasty, including intestinal anastomosis)	Cefazolin	Clindamycin
KUB-Colorectal (appendico-vesicostomy, rectourethral fistula closure)	Cefoxitin	Ciprofloxacin + metronidazole

[†] Severe delayed onset reactions include: SJS/TEN, DRESS, AGEP, hemolytic anemia, thrombocytopenia, serum sickness, and vasculitis. Patients who have experienced anaphylaxis to penicillin can safely receive dissimilar R1-sidechain cephalosporins (including cefazolin, cefoxitin, and ceftriaxone) without prior tested or additional precaution.

^a If ear infection at the time of surgery, may provide prophylaxis (cefazolin; allergy alternative-clindamycin)

^b Periop antibiotics (cefazolin; allergy alternative, clindamycin) may be appropriate for high-risk patients (high risk patients: immunocompromised patients, significant dermatologic condition present)

^c Discontinue peri-op antibiotics after 24 hours regardless of chest tubes and central lines

^d Stop cefazolin at 72 hours; resume x 24 hours with mediastinal exploration and at the time of closure; Consider antifungal coverage for high-risk patients (>= 2 risk factors: chest open > 4 days, on broad spectrum antibiotics for documented infection or concern for infection, on steroids, immunocompromised (e.g. DiGeorge). Options fluconazole or micafungin

^e Ampicillin + gentamicin + metronidazole is appropriate in neonates

^f Duration exceptions: 1. RNS implants: cefazolin x 72 hours, 2. Electrode implantation cases: cefazolin x 72 hours, followed by cefuroxime x 72 hours after second procedure