



FREE STUDY COMPANION

Antibiotic Guide for the **BCPS Exam**

Empiric regimens for 13 infection areas and organism-directed therapy for 30 pathogens, with usual adult doses, durations and renal-dosing flags, checked against current guidelines (2026).

 Pneumonia

 UTI

 SSTI

 Meningitis

 Endocarditis

 Intra-abdominal

 C. difficile

 STIs

 Fungal

 Organisms

INSIDE THE RXBLUEPRINT QUESTION BANK

Case-based BCPS prep that thinks like the exam

This guide gives you the regimens. The question bank teaches you when to use them, case by case, the way the BCPS exam asks.

3,000+

case-based BCPS questions

18

organ systems & disease areas

85+

disease-state study guides

150

question mock exam, weighted like the real one

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Every question starts from a realistic patient case with labs and history, then asks for a decision.

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See accuracy by organ system and the nine BCPS content domains, weakest first.

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A quick, clean review of each major condition on the BCPS exam, one click from every module quiz.

**Written & reviewed by board-certified pharmacists**

Authored and peer-reviewed by board-certified clinical pharmacists; updated as guidelines change.

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BEFORE YOU START

How to use this guide

Pages 4–11 run by infection: who is likely sick, what to start, what to switch to, and for how long. From page 12, the guide runs by organism, for when the culture comes back. Cover the regimen column, say your choice out loud, then check it.

How to read this guide

-  Intravenous
-  Intramuscular
-  Dose-adjust for renal function
-  Gram-positive cocci
-  Gram-negative rods
-  Anaerobes
-  Atypical (no cell wall)
-  Oral
-  Usual duration
-  Choose one option
-  Gram-positive rods
-  Gram-negative diplococci
-  Yeast
-  Mould
-  Spirochete

Doses are usual adult doses for normal renal and hepatic function unless stated. Weight-based doses use actual body weight unless noted.

Six rules of empiric therapy

- 1 Culture first, but don't delay.** Draw blood and site cultures before the first dose when it won't hold up therapy. In septic shock, give antibiotics within 1 hour.
- 2 Match the bug list to the site and the host.** Recent IV antibiotics, hospital stay, prior resistant isolates and immune status drive breadth.
- 3 Know your local antibiogram.** Avoid an empiric agent when local resistance is high (for example macrolides for pneumococcus, or fluoroquinolones and TMP-SMX for *E. coli*).
- 4 Reassess at 48–72 h.** De-escalate to the narrowest active agent once cultures return; stop if infection is ruled out.
- 5 Switch IV to PO** when the patient is improving, can absorb, and a highly bioavailable active agent exists.
- 6 Shorter is usually better.** Most uncomplicated infections need 5–7 days once source control is achieved.

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13 infection areas · 30 organisms

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Community-acquired pneumonia (CAP)

IDSA/ATS 2019 · ATS 2025 UPDATE

SETTING	FIRST-LINE	ALTERNATIVES	DURATION
Outpatient, healthy No comorbidities or MRSA/ <i>Pseudomonas</i> risk	Amoxicillin 1 g TID OR Doxycycline 100 mg BID	Azithromycin 500 mg day 1, then 250 mg daily (or clarithromycin 500 mg BID) only if local pneumococcal macrolide resistance <25%	🕒 3–5 days ≥3 days; stop once clinically stable (ATS 2025)
Outpatient with comorbidities Chronic heart, lung, liver or kidney disease; diabetes; alcohol use disorder; cancer; asplenia	Amoxicillin-clavulanate 875/125 mg BID (or 2 g/125 mg BID) OR cefpodoxime 200 mg BID or cefuroxime 500 mg BID + azithromycin or doxycycline 100 mg BID	Respiratory fluoroquinolone monotherapy: levofloxacin 750 mg daily or moxifloxacin 400 mg daily	🕒 3–5 days Same stability criteria
Inpatient, non-severe Ward	Ceftriaxone 1–2 g q24h or ampicillin-sulbactam 1.5–3 g q6h or ceftaroline 600 mg q12h + azithromycin 500 mg daily	Levofloxacin 750 mg daily or moxifloxacin 400 mg daily β-lactam + doxycycline 100 mg BID if macrolide and FQ both unsuitable	🕒 ≥5 days Afebrile ≥48 h and ≤1 sign of instability
Inpatient, severe / ICU	β-lactam (as above) + azithromycin 500 mg daily OR β-lactam + levofloxacin 750 mg / moxifloxacin 400 mg	Add MRSA cover: vancomycin 15–20 mg/kg q8–12h, AUC-guided or linezolid 600 mg q12h Add <i>Pseudomonas</i> cover: swap the β-lactam for pip-tazo 4.5 g q6h , cefepime 2 g q8h or meropenem 1 g q8h	🕒 5–7 days 7 days if MRSA or <i>Pseudomonas</i> confirmed

🕒 **When to broaden:** add MRSA or *Pseudomonas* cover only for a prior respiratory isolate of that organism, or a hospitalisation with IV antibiotics in the past 90 days plus locally validated risk. Send cultures (and an MRSA nasal PCR) and stop the extra cover at 48 h if negative; a negative nasal PCR has a high negative predictive value for MRSA pneumonia. **No routine anaerobic cover** for suspected aspiration unless there's an empyema or lung abscess. **Steroids:** systemic corticosteroids (e.g. hydrocortisone 200 mg/day) are suggested for severe CAP and recommended against in non-severe CAP (ATS 2025). Test for influenza when it's circulating and treat with **oseltamivir** 75 mg BID ×5 days .

Hospital-acquired & ventilator-associated pneumonia (HAP/VAP)

IDSA/ATS 2016

SETTING	ANTI-PSEUDOMONAL BACKBONE (CHOOSE ONE)	ADD-ONS WHEN INDICATED	DURATION
HAP, low mortality risk No MRSA risk factors; not ventilated; no septic shock	Piperacillin-tazobactam 4.5 g q6h OR Cefepime 2 g q8h OR Levofloxacin 750 mg daily OR Meropenem 1 g q8h / imipenem 500 mg q6h	None: single anti-pseudomonal agent with MSSA activity	🕒 7 days Use procalcitonin plus clinical response to support stopping
HAP high risk, or VAP IV antibiotics in past 90 days, septic shock, ventilated, ARDS, ≥5 days in hospital, or unit MRSA >10–20%	One β-lactam backbone from the left-hand list (pip- tazo, cefepime, ceftazidime 2 g q8h , meropenem, imipenem, or aztreonam 2 g q8h)	MRSA: vancomycin AUC 400–600 or linezolid 600 mg q12h 2nd anti-pseudomonal agent (different class) if high risk: amikacin 15–20 mg/kg q24h , tobramycin 5–7 mg/kg q24h , or ciprofloxacin 400 mg q8h / levofloxacin 750 mg	

🕒 **Never two β-lactams together.** Drop the second Gram-negative agent once susceptibilities return; aminoglycosides are never used alone for pneumonia (poor lung penetration). **Daptomycin** is inactivated by surfactant, so it's never used for pneumonia. Prolonged or continuous β-lactam infusions are reasonable in critically ill patients.

Acute uncomplicated cystitis

IDSA 2010 · IDSA 2024 AMR GUIDANCE

SETTING	FIRST-LINE	ALTERNATIVES	DURATION
Non-pregnant adult Afebrile; no flank pain or systemic signs	🟢 Nitrofurantoin (monohydrate/macrocrystals) 100 mg BID 🟡 avoid if CrCl <30 OR 🟢 TMP-SMX 160/800 mg (1 DS) BID 🟡 if local resistance <20% OR 🟢 Fosfomycin 3 g sachet once OR 🟢 Pivmecillinam where available 🟡	🟢 Oral β-lactam: cephalexin 500 mg BID 🟡, cefpodoxime 100 mg BID 🟡, amox-clav 500/125 mg BID 🟡 🟢 Ciprofloxacin 250 mg BID 🟡: reserve for when others can't be used	🕒 Nitrofurantoin 5 d TMP-SMX 3 d · fosfomycin 1 dose · β-lactam 5–7 d · cipro 3 d
Pregnancy Also treat asymptomatic bacteriuria	🟢 Cephalexin 500 mg BID–QID 🟡 or amox-clav 500/125 mg BID 🟡 or fosfomycin 3 g once	🟢 Nitrofurantoin 100 mg BID: avoid in the 1st trimester (if alternatives exist) and at term 🟢 TMP-SMX: avoid in the 1st trimester and near term	🕒 5–7 days Culture to confirm cure

Pyelonephritis & complicated UTI (cUTI)

IDSA 2025 CUTI GUIDELINE

SETTING	FIRST-LINE	ALTERNATIVES	DURATION
Outpatient pyelonephritis Can take PO; no sepsis	🟢 Ciprofloxacin 500 mg BID (or 1 g ER daily) 🟡 OR 🟢 Levofloxacin 750 mg daily 🟡	🟢 TMP-SMX 1 DS BID 🟡 or an oral β-lactam (e.g. cefpodoxime 200 mg BID 🟡), preceded by one dose of 🟢 ceftriaxone 1 g or a once-daily aminoglycoside when used empirically or if local FQ resistance >10%	🕒 FQ 5–7 days Other active agents 7 days
Inpatient cUTI, no sepsis Fever, flank pain, obstruction, catheter, stent or nephrostomy	🟢 Ceftriaxone 1–2 g q24h OR 🟢 Cefepime 1–2 g q8–12h 🟡 OR 🟢 Piperacillin-tazobactam 4.5 g q6–8h 🟡	🟢 Ciprofloxacin 400 mg IV q12h 🟡 / levofloxacin 750 mg 🟡 🟢 Gentamicin 5–7 mg/kg q24h 🟡 (watch nephro-/ototoxicity) ESBL risk: 🟢 ertapenem 1 g q24h 🟡	🕒 7 days Once improving on active therapy (5–7 d for FQ); GNR bacteremia from a urinary source also 7 d
cUTI with sepsis or septic shock Or prior MDR isolate	🟢 Meropenem 1 g q8h 🟡 (ESBL risk or prior ESBL) OR 🟢 Cefepime 2 g q8h / pip-tazo 4.5 g q6h 🟡 if low ESBL risk	Prior CRE or DTR-<i>Pseudomonas</i>: newer β-lactam/β-lactamase inhibitor guided by the prior isolate (see page 13) Add 🟢 vancomycin 🟡 only for Gram-positive cocci in urine/blood or high enterococcal/MRSA risk	

🕒 **IDSA 2025 cUTI essentials:** pick empiric therapy mainly on whether the patient is septic, avoid any agent a prior urinary isolate was resistant to, and use an antibiogram only if it is local, recent and relevant. Narrow to the culture result, then **switch to an effective oral agent** once improving. Diabetes, BPH or immunosuppression alone do **not** make a UTI complicated. **Catheter-associated UTI:** remove or replace a catheter in place >2 weeks before collecting the culture. **Nitrofurantoin and fosfomycin don't reach kidney tissue:** never use them for pyelonephritis, cUTI or bacteremia. **Moxifloxacin** has poor urinary concentrations.

Asymptomatic bacteriuria (ASB)

IDSA 2019

SCREEN & TREAT	DO NOT SCREEN OR TREAT
Pregnancy (screen early; treat 4–7 days) Before urologic procedures that breach the mucosa (1–2 doses just before)	Older adults, people with diabetes, spinal cord injury, indwelling catheters, kidney transplant beyond the first month, and non-urologic surgery. Cloudy or smelly urine, or confusion without systemic signs, is not an indication. Treating ASB drives resistance and <i>C. difficile</i> without improving outcomes.

Cellulitis, abscess & necrotizing infection

IDSA SSTI 2014

INFECTION	FIRST-LINE	ALTERNATIVES	DURATION
Non-purulent cellulitis, mild Streptococci most likely; no systemic signs	Cephalexin 500 mg QID OR Dicloxacillin 500 mg QID or penicillin VK 500 mg QID	Clindamycin 300–450 mg TID (β-lactam allergy) Add MRSA cover (TMP-SMX or doxycycline) only with penetrating trauma, IV drug use or known MRSA	🕒 5 days Extend if not improved
Non-purulent cellulitis, moderate Systemic signs (fever, tachycardia, leukocytosis)	Cefazolin 1–2 g q8h OR Penicillin G 2–4 million units q4–6h or ceftriaxone 1 g q24h	Clindamycin 600 mg q8h Severe or MRSA risk: vancomycin AUC-guided	🕒 5–7 days Step down to PO when improving
Purulent (abscess, furuncle) <i>S. aureus</i> , often MRSA	Incision & drainage is the key intervention Moderate (systemic signs) or large: TMP-SMX 1–2 DS BID or doxycycline 100 mg BID	Severe: vancomycin , daptomycin 4–6 mg/kg q24h , linezolid 600 mg q12h, or ceftaroline 600 mg q12h Clindamycin 300–450 mg TID if susceptible	🕒 5–10 days After drainage
Necrotizing fasciitis Pain out of proportion, crepitus, rapid spread	Emergency surgical debridement , plus Vancomycin (or linezolid) + pip-tazo 4.5 g q6h + clindamycin 900 mg q8h (toxin suppression)	Swap pip-tazo for meropenem 1 g q8h or ceftriaxone 2 g q24h + metronidazole 500 mg q8h Group A strep confirmed: penicillin G 4 million units q4h + clindamycin	🕒 Until no more debridement needed And afebrile 48–72 h
Animal or human bite	Amox-clav 875/125 mg BID Ampicillin-sulbactam 3 g q6h if severe	Doxycycline 100 mg BID or TMP-SMX or a FQ, + metronidazole or clindamycin for anaerobes	🕒 3–5 days pre-emptive 5–14 days if infected

Diabetic foot infection

IWGDF/IDSA 2023

SEVERITY	FIRST-LINE	ALTERNATIVES / ADD-ONS	DURATION
Mild Skin and superficial tissue only; cellulitis ≤2 cm	Cephalexin 500 mg QID or amox-clav 875/125 mg BID or dicloxacillin	Clindamycin (allergy). Add TMP-SMX or doxycycline if MRSA risk	🕒 1–2 weeks
Moderate / severe Cellulitis >2 cm, deep tissue, or systemic signs	Ampicillin-sulbactam 3 g q6h or ertapenem 1 g q24h or ceftriaxone 2 g q24h + metronidazole 500 mg q8h	<i>Pseudomonas</i> risk (prior isolate, foot soaking, warm climate): pip-tazo 4.5 g q6h MRSA risk: + vancomycin or linezolid	🕒 2–3 weeks Soft tissue; extend if slow
With osteomyelitis	Bone biopsy for culture when possible; tailor to the bone isolate. Highly bioavailable oral agents are acceptable once stable.		🕒 6 weeks 3 weeks after resection with residual infected bone; 2–5 days if all infected bone removed

⚠️ **Don't treat clinically uninfected ulcers** with antibiotics. Probe-to-bone positive or ESR >70 mm/h suggests osteomyelitis. Wound care, offloading and vascular assessment matter as much as the drug. **Clindamycin** carries the highest *C. difficile* risk of the SSTI options.

Acute bacterial meningitis

IDSA 2004 · IDSA HEALTHCARE-ASSOCIATED 2017

AGE / RISK	LIKELY ORGANISMS	EMPIRIC REGIMEN (MENINGEAL DOSES)	DEXAMETHASONE
<1 month	Group B strep, <i>E. coli</i> , <i>Listeria</i>	☹️ Ampicillin + cefotaxime (or ceftazidime/cefepime where cefotaxime is unavailable) OR ampicillin + gentamicin ☹️	Not routinely
1–23 months	<i>S. pneumoniae</i> , <i>N. meningitidis</i> , GBS, <i>H. influenzae</i> , <i>E. coli</i>	☹️ Vancomycin ☹️ + ceftriaxone or cefotaxime ☹️	Yes (Hib; consider for pneumococcus)
2–50 years	<i>N. meningitidis</i> , <i>S. pneumoniae</i>	☹️ Vancomycin 15–20 mg/kg q8–12h (trough 15–20 or AUC-guided) ☹️ + ceftriaxone 2 g q12h	Yes: 0.15 mg/kg IV q6h ×2–4 days, 10–20 min before or with the first antibiotic dose
>50 years or immunocompromised Alcohol use disorder, transplant, steroids	<i>S. pneumoniae</i> , <i>N. meningitidis</i> , <i>Listeria</i> , aerobic GNR	☹️ Vancomycin ☹️ + ceftriaxone 2 g q12h + ampicillin 2 g q4h ☹️ (for <i>Listeria</i>)	
Post-neurosurgery, CSF shunt/drain, penetrating head trauma	Staphylococci (incl. MRSA, CoNS), <i>Pseudomonas</i> and other GNR	☹️ Vancomycin ☹️ + cefepime 2 g q8h ☹️ or ceftazidime 2 g q8h ☹️ or meropenem 2 g q8h ☹️	No

ⓘ **Duration by organism:** *N. meningitidis* and *H. influenzae* 7 days; *S. pneumoniae* 10–14 days; group B strep 14–21 days; aerobic GNR 21 days; *Listeria* ≥21 days. **Stop dexamethasone** if the organism isn't *S. pneumoniae* (adults). Don't delay antibiotics for a CT or LP; draw blood cultures first. **Severe β-lactam allergy:** vancomycin plus moxifloxacin (or aztreonam for GNR); TMP-SMX replaces ampicillin for *Listeria*. **Close contacts of meningococcal disease:** ciprofloxacin 500 mg PO once, rifampin 600 mg PO q12h ×2 days, or ceftriaxone 250 mg IM once.

Infective endocarditis (adults)

AHA 2015 · ESC 2023

SCENARIO	REGIMEN	ALTERNATIVE	DURATION (NATIVE VALVE)
Empiric, native valve	☹️ Vancomycin AUC-guided ☹️ + ceftriaxone 2 g q24h	IV drug use or healthcare exposure: vancomycin + cefepime 2 g q8h ☹️	Tailor once blood cultures identify the organism
Empiric, prosthetic valve	☹️ Vancomycin ☹️ + gentamicin 1 mg/kg q8h ☹️ + cefepime ☹️	Add ☹️ rifampin 300 mg q8h once staphylococci are confirmed and the bacteremia has cleared	
Viridans strep / <i>S. gallolyticus</i> , penicillin-susceptible	☹️ Penicillin G 12–18 million units/day ☹️ or ceftriaxone 2 g q24h	☹️ Vancomycin (β-lactam allergy). 2-week option: β-lactam + gentamicin 3 mg/kg q24h ☹️ in uncomplicated NVE	⌚ 4 weeks PVE 6 weeks
MSSA	☹️ Nafcillin or oxacillin 2 g q4h or cefazolin 2 g q8h ☹️	PVE: + rifampin 300 mg q8h (≥6 wk) + gentamicin (first 2 wk)	⌚ 6 weeks Uncomplicated right-sided: 2 weeks may suffice
MRSA	☹️ Vancomycin AUC 400–600 ☹️ or daptomycin ≥8 mg/kg q24h ☹️	PVE: vancomycin + rifampin + gentamicin (first 2 wk)	⌚ 6 weeks
<i>E. faecalis</i> , ampicillin-susceptible	☹️ Ampicillin 2 g q4h ☹️ + ceftriaxone 2 g q12h (preferred if CrCl <50 or high-level aminoglycoside resistance)	Ampicillin + gentamicin 1 mg/kg q8h ☹️ (synergy dosing) VRE: daptomycin 10–12 mg/kg ☹️ or linezolid	⌚ 6 weeks Amp + gent: 4–6 weeks
HACEK organisms	☹️ Ceftriaxone 2 g q24h	☹️ ☹️ Ciprofloxacin ☹️	⌚ 4 weeks PVE 6 weeks

ⓘ Count duration from the **first negative blood culture**. Get an echo and repeat blood cultures every 24–48 h until clear. Stable left-sided endocarditis can step down to **oral therapy** after ≥10 days IV (ESC 2023). Get an early surgical opinion for heart failure, abscess, large vegetations or persistent bacteremia.

Complicated intra-abdominal infection (cIAI)

SIS/IDSA 2010 · SIS 2017 · IDSA 2024 AMR

SETTING	FIRST-LINE	ALTERNATIVES	DURATION
Community-acquired, mild-moderate Perforated appendicitis, abscess	Ceftriaxone 2 g q24h + metronidazole 500 mg q8–12h OR Ertapenem 1 g q24h	Ciprofloxacin 400 mg IV q12h or levofloxacin 750 mg , + metronidazole (only if local <i>E. coli</i> FQ susceptibility ≥90%) Cefuroxime 1.5 g q8h + metronidazole	4 days After adequate source control (STOP-IT); longer if source not controlled
High severity or healthcare-associated APACHE II >15, immunosuppressed, recent antibiotics	Piperacillin-tazobactam 4.5 g q6h OR Cefepime 2 g q8h + metronidazole 500 mg q8h OR Meropenem 1 g q8h / imipenem 500 mg q6h	ESBL risk: meropenem . Consider adding vancomycin (MRSA or <i>E. faecium</i>) and an echinocandin (yeast on Gram stain, upper-GI perforation, recurrent perforation) in healthcare-associated infection	
Spontaneous bacterial peritonitis Ascitic PMN ≥250 cells/mm ³	Ceftriaxone 2 g q24h or cefotaxime 2 g q8h + albumin 1.5 g/kg day 1, then 1 g/kg day 3	Nosocomial or recent β-lactam: pip-tazo or meropenem Prophylaxis after an episode: ciprofloxacin 500 mg daily or TMP-SMX DS daily	5–7 days

Avoid for community cIAI: ampicillin-sulbactam (high *E. coli* resistance), and cefotetan, clindamycin or moxifloxacin alone (rising *Bacteroides fragilis* resistance). Ertapenem covers **no** *Pseudomonas*, *Acinetobacter* or *Enterococcus*. Routine enterococcal and antifungal cover isn't needed for community-acquired infection.

Clostridioides difficile infection (adults)

IDSA/SHEA 2017 · 2021 FOCUSED UPDATE

EPISODE	PREFERRED	ALTERNATIVES	DURATION
Initial episode Non-severe or severe (WBC ≥15,000/mm ³ or SCr >1.5 mg/dL)	Fidaxomicin 200 mg BID	Vancomycin 125 mg QID Non-severe only, if neither is available: metronidazole 500 mg TID	10 days Metronidazole 10–14 days
First recurrence	Fidaxomicin 200 mg BID ×10 days, or extended pulse: 200 mg BID ×5 days, then 200 mg every other day on days 7–25	Vancomycin taper and pulse: 125 mg QID ×10–14 d, then BID ×7 d, daily ×7 d, then every 2–3 days for 2–8 weeks Vancomycin 125 mg QID ×10 days if metronidazole was used first	Per regimen
Second or later recurrence	Fidaxomicin (standard or extended pulse) or vancomycin taper and pulse	Vancomycin 125 mg QID ×10 d, then rifaximin 400 mg TID ×20 d Fecal microbiota transplantation (or an approved microbiota product) after ≥2 recurrences	Per regimen
Fulminant Hypotension or shock, ileus, megacolon	Vancomycin 500 mg QID (PO or NG) + metronidazole 500 mg q8h	If ileus: add rectal vancomycin 500 mg in 100 mL NS q6h as a retention enema. Get an early surgical consult (colectomy or diverting loop ileostomy)	10–14 days Guided by response

Test only patients with ≥3 unformed stools in 24 h who aren't on laxatives. **Stop the inciting antibiotic** and reassess acid suppression. Oral vancomycin and fidaxomicin act in the gut lumen with minimal absorption, so no renal adjustment is needed; IV vancomycin does **not** reach the colon. Don't test for cure.

Osteomyelitis (adult, native bone)

IDSA VERTEBRAL OSTEOMYELITIS 2015

SCENARIO	FIRST-LINE	ALTERNATIVES	DURATION
Empiric After blood cultures and bone biopsy, if clinically stable	Vancomycin AUC-guided + ceftriaxone 2 g q24h	<i>Pseudomonas</i> risk: vancomycin + cefepime 2 g q8h Daptomycin 6–8 mg/kg q24h in place of vancomycin	6 weeks From start of effective therapy or last debridement
MSSA	Cefazolin 2 g q8h or nafticillin/oxacillin 2 g q4–6h	Oral step-down by susceptibility: levofloxacin + rifampin , TMP-SMX , linezolid , cephalexin (high dose)	
MRSA	Vancomycin AUC 400–600 or daptomycin 6–8 mg/kg	Linezolid 600 mg q12h (watch for cytopenias after 2 weeks); TMP-SMX ± rifampin	

Hold empiric antibiotics in stable patients until a biopsy is obtained, to maximise culture yield. High-bioavailability **oral regimens are non-inferior** to IV for bone and joint infection once the organism is known (OVIVA). **Rifampin** is never used alone and is mainly used for retained hardware.

Sepsis or septic shock, unknown source

SURVIVING SEPSIS CAMPAIGN 2021

COMPONENT	REGIMEN	ADD WHEN	DURATION
Gram-negative cover (incl. <i>Pseudomonas</i>)	Piperacillin-tazobactam 4.5 g q6h or cefepime 2 g q8h or meropenem 1 g q8h	Meropenem for prior ESBL or recent broad-spectrum exposure; add a second Gram-negative agent (e.g. amikacin) only for high MDR risk	Shortest effective course Reassess daily; PCT can support stopping
MRSA cover	Vancomycin load 20–35 mg/kg, then AUC-guided	Linezolid or daptomycin (non-pulmonary) if vancomycin unsuitable; omit MRSA cover if risk is low	
Special situations	Candida risk (TPN, femoral line, abdominal surgery, colonisation at several sites): add an echinocandin . Toxic shock : add clindamycin . Tick exposure : add doxycycline . Neutropenia : see below.		

Give antibiotics **within 1 hour** for septic shock or probable sepsis. Give the first dose in full whatever the renal function, then adjust. **Extended β -lactam infusions** are suggested for maintenance. Find and control the source quickly.

Febrile neutropenia

IDSA 2010 · ASCO/IDSA 2018

RISK	FIRST-LINE	ALTERNATIVES / ADD-ONS	DURATION
Low risk, outpatient MASCC ≥ 21 ; expected neutropenia ≤ 7 days; stable	Ciprofloxacin 750 mg BID + amox-clav 875/125 mg BID	Levofloxacin 750 mg daily or moxifloxacin 400 mg alone. Not if already on FQ prophylaxis β -lactam allergy: ciprofloxacin + clindamycin	Until afebrile ≥ 48 h and ANC > 500 Or, if afebrile and stable, consider stopping after 72 h with no source identified
High risk, inpatient MASCC < 21 , unstable, or expected neutropenia > 7 days	Cefepime 2 g q8h or pip-tazo 4.5 g q6h or meropenem 1 g q8h (monotherapy)	Add vancomycin only for instability, pneumonia, a suspected catheter or skin infection, MRSA colonisation, or severe mucositis. Stop at 48 h if no Gram-positive is found Persistent fever 4–7 days: add an empiric echinocandin , voriconazole or L-AmB	

Fever means a single temperature ≥ 38.3 °C, or ≥ 38.0 °C sustained over 1 h. **Neutropenia** means an ANC < 500 cells/mm³, or expected to fall below 500 within 48 h. Give the first dose **within 1 hour** of triage. Anaphylaxis to β -lactams: **aztreonam** + **vancomycin**.

Gonorrhea, chlamydia & syphilis (adults)

CDC STI TREATMENT GUIDELINES 2021

INFECTION	RECOMMENDED	ALTERNATIVES	DURATION
Gonorrhea, uncomplicated Cervix, urethra, rectum, pharynx	Ceftriaxone 500 mg IM once (1 g if ≥150 kg) + doxycycline 100 mg BID ×7 d if chlamydia isn't excluded	Gentamicin 240 mg IM + azithromycin 2 g once Cefixime 800 mg once No reliable alternative for pharyngeal infection	Single dose Test of cure 7–14 days for pharyngeal infection
Chlamydia	Doxycycline 100 mg BID	Azithromycin 1 g once (preferred in pregnancy) or levofloxacin 500 mg daily ×7 d ⚠️	7 days Retest at 3 months
Syphilis: primary, secondary, early latent (<1 yr)	Benzathine penicillin G 2.4 million units IM once	Non-pregnant with penicillin allergy: doxycycline 100 mg BID ×14 d	Single dose
Syphilis: late latent or unknown duration; tertiary (non-neuro)	Benzathine penicillin G 2.4 million units IM weekly ×3 doses	Non-pregnant with penicillin allergy: doxycycline 100 mg BID ×28 d	3 weeks Restart if a dose is >9 days late (>7 in pregnancy)
Neurosyphilis, ocular or otic syphilis	Aqueous penicillin G 3–4 million units q4h (18–24 million units/day) ⚠️	Procaine penicillin G 2.4 million units IM daily + probenecid 500 mg QID	10–14 days

⚠️ **Pregnancy and syphilis:** penicillin is the only acceptable treatment, so desensitise if the patient is allergic. Expect a possible **Jarisch-Herxheimer reaction** (fever and myalgia within 24 h). Treat partners (expedited partner therapy where permitted). **Doxy-PEP** (doxycycline 200 mg within 72 h of condomless sex) is a CDC 2024 option for MSM and transgender women with a recent bacterial STI.

Pharyngitis, acute otitis media & sinusitis

IDSA GAS 2012 · AAP AOM 2013 · IDSA ABRs 2012

INFECTION	FIRST-LINE	ALTERNATIVES (ALLERGY)	DURATION
Group A strep pharyngitis Confirm with rapid antigen test or culture	Penicillin VK 500 mg BID–TID (adult) or amoxicillin 50 mg/kg once daily (max 1 g) OR Benzathine penicillin G 1.2 million units once	Non-anaphylactic allergy: cephalexin 500 mg BID ⚠️ Anaphylaxis: azithromycin 500 mg day 1, then 250 mg ×4 d, or clindamycin 300 mg TID	10 days Azithromycin 5 days
Acute otitis media (children) Observation is an option in mild cases ≥6 months	Amoxicillin 80–90 mg/kg/day divided BID Amoxicillin in past 30 days, conjunctivitis, or treatment failure: amox-clav 90/6.4 mg/kg/day divided BID	Non-type-I allergy: cefdinir 14 mg/kg/day, cefuroxime 30 mg/kg/day, cefpodoxime 10 mg/kg/day Ceftriaxone 50 mg/kg ×1–3 days	<2 yr: 10 d 2–5 yr: 7 d · ≥6 yr: 5–7 d
Acute bacterial sinusitis (adults) ≥10 days, severe ≥3 days, or "double worsening"	Amox-clav 875/125 mg BID or 500/125 mg TID ⚠️ Resistance risk: amox-clav 2 g/125 mg BID	Doxycycline 100 mg BID or 200 mg daily Levofloxacin 500–750 mg daily ⚠️ or moxifloxacin 400 mg	5–7 days Children 10–14 days

⚠️ Avoid **macrolides** and **TMP-SMX** for sinusitis and otitis because of high pneumococcal resistance. Most sore throats and sinusitis are viral, so use the clinical criteria (Centor/McIsaac; ≥10 days, severe or double worsening) before prescribing.

Candidemia & invasive candidiasis

IDSA CANDIDA 2016

SCENARIO	FIRST-LINE	ALTERNATIVES	DURATION
Candidemia, non-neutropenic	☑ Echinocandin: caspofungin 70 mg load, then 50 mg daily; micafungin 100 mg daily; anidulafungin 200 mg load, then 100 mg daily Once-weekly rezafungin 400 mg, then 200 mg, is also an option	☑ Fluconazole 800 mg (12 mg/kg) load, then 400 mg (6 mg/kg) daily ☑, if not critically ill and fluconazole resistance is unlikely ☑ Liposomal amphotericin B 3–5 mg/kg daily	🕒 14 days After the first negative blood culture and symptom resolution
Step-down	Switch to ☑ fluconazole 400 mg daily ☑ after 5–7 days if the isolate is susceptible, the patient is stable and repeat cultures are negative. <i>C. glabrata</i>: fluconazole 800 mg or voriconazole only if susceptible. <i>C. krusei</i> and <i>C. auris</i>: stay on an echinocandin.		

⚠ **Remove central lines** when possible, get a **dilated eye exam** to rule out endophthalmitis, and repeat blood cultures daily until clear. **Echinocandins** penetrate the eye, CNS and urine poorly. Use fluconazole or amphotericin for *Candida* UTI, and fluconazole or L-AmB plus flucytosine for CNS infection.

Invasive aspergillosis

IDSA ASPERGILLUS 2016

SCENARIO	FIRST-LINE	ALTERNATIVES	DURATION
Invasive pulmonary aspergillosis	☑ Voriconazole 6 mg/kg IV q12h ×2 doses, then 4 mg/kg q12h (PO 200–300 mg q12h). Target trough 1–5.5 mg/L	☑ Isavuconazole 200 mg (372 mg isavuconazonium) q8h ×6 doses, then daily ☑ Posaconazole 300 mg BID day 1, then daily ☑ Liposomal amphotericin B 3–5 mg/kg daily	🕒 ≥6–12 weeks Until lesions resolve and immunosuppression reverses

⚠ **Voriconazole** has many CYP interactions (3A4/2C19/2C9) and can cause visual disturbance, hepatotoxicity, QT prolongation, photosensitivity and periostitis (fluoride). The IV vehicle (SBECD) may accumulate when CrCl <50, so prefer PO when possible. Isavuconazole **shortens** the QT interval. Echinocandins aren't used as primary monotherapy.

Cryptococcal meningitis (HIV-associated)

IDSA 2010 · HHS OI · WHO 2022

PHASE	FIRST-LINE	ALTERNATIVES	DURATION
Induction	☑ Liposomal amphotericin B 3–4 mg/kg daily + ☑ flucytosine 25 mg/kg QID ☑	WHO: single L-AmB 10 mg/kg dose + 14 d of flucytosine ☑ + fluconazole 1200 mg daily ☑ Fluconazole 800–1200 mg + flucytosine if no amphotericin is available	🕒 ≥2 weeks Then a negative CSF culture
Consolidation	☑ Fluconazole 800 mg daily ☑ (400 mg in older IDSA guidance)	—	🕒 8 weeks
Maintenance	☑ Fluconazole 200 mg daily ☑	—	🕒 ≥1 year Stop when CD4 ≥100 and viral load suppressed for ≥3 months on ART

⚠ Manage raised intracranial pressure with **serial lumbar punctures**. Steroids, acetazolamide and mannitol aren't recommended. Delay ART **4–6 weeks** after starting antifungals to lower the risk of IRIS. Monitor **flucytosine** levels and blood counts (marrow suppression), and amphotericin for potassium, magnesium and SCr (give saline pre-hydration).

PART 2

Organism-directed therapy

Narrow to these once identification and susceptibilities return. Adult doses for serious infection with normal renal function. CNS doses are higher where noted.

ORGANISM	FIRST-LINE (ADULT DOSE)	ALTERNATIVES / NOTES
 <i>Staphylococcus aureus</i>, MSSA Clusters; coagulase-positive	 Cefazolin 2 g q8h  or nafticillin/oxacillin 2 g q4h  Cephalexin 500 mg QID  or dicloxacillin 500 mg QID (mild SSTI or step-down)	β-lactams beat vancomycin for MSSA bacteremia, so switch once susceptible. Mild SSTI: TMP-SMX , doxycycline , clindamycin . Get an ID consult and echo for any <i>S. aureus</i> bacteremia
 <i>S. aureus</i>, MRSA	 Vancomycin 15–20 mg/kg q8–12h; load 20–35 mg/kg if critically ill; AUC/MIC 400–600 	Bacteremia: daptomycin 6–10 mg/kg q24h  (not for lungs; check CK). Pneumonia:  linezolid 600 mg q12h. Ceftaroline 600 mg q8–12h  . PO for SSTI: TMP-SMX  , doxycycline
 Coagulase-negative staph <i>S. epidermidis</i>	 Vancomycin AUC-guided  (mostly methicillin-resistant)	Often a blood culture contaminant (1 of 2 sets). Real pathogen with prosthetic material and lines. Use cefazolin if oxacillin-susceptible
 <i>Streptococcus pneumoniae</i> Lancet-shaped diplococci	Penicillin-susceptible:  amoxicillin 1 g TID or  penicillin G 2–4 million units q4h  Empiric or invasive:  ceftriaxone 1–2 g q24h (2 g q12h for meningitis, plus vancomycin until susceptibilities return)	 Levofloxacin 750 mg  / moxifloxacin 400 mg. Macrolide resistance is >25% in many regions. For meningitis, base therapy on the CSF breakpoints
 <i>Streptococcus pyogenes</i> (group A) & other β-hemolytic strep	 Penicillin G 2–4 million units q4–6h  /  penicillin VK 500 mg QID or amoxicillin	Cefazolin / cephalexin . Add clindamycin 900 mg q8h for necrotizing infection or toxic shock. Universally penicillin-susceptible
 <i>Enterococcus faecalis</i> (VSE) Usually ampicillin-susceptible	 Ampicillin 2 g q4–6h  /  amoxicillin 500 mg–1 g TID  Endocarditis: ampicillin + ceftriaxone 2 g q12h	 Vancomycin  (allergy). Cystitis: nitrofurantoin , fosfomycin , amoxicillin . Intrinsically resistant to cephalosporins
 <i>Enterococcus faecium</i>, VRE	 Daptomycin 8–12 mg/kg q24h  or  linezolid 600 mg q12h	Cystitis: nitrofurantoin  , fosfomycin . Watch linezolid for myelosuppression, serotonin syndrome (SSRIs, MAOIs) and neuropathy
 <i>Listeria monocytogenes</i> Gram-positive rod	 Ampicillin 2 g q4h  ± gentamicin 	 TMP-SMX 10–20 mg/kg/day of TMP, divided q6–12h  (penicillin allergy). All cephalosporins are inactive
 <i>Clostridioides difficile</i> Spore-forming anaerobic GPR	 Fidaxomicin 200 mg BID ×10 d	 Vancomycin 125 mg QID ×10 d. See page 8 for recurrent and fulminant disease
 Atypicals <i>Legionella</i> , <i>Mycoplasma</i> , <i>Chlamydia</i>	  Azithromycin 500 mg daily	  Levofloxacin 750 mg  (preferred for severe <i>Legionella</i>), doxycycline 100 mg BID. β-lactams are inactive (no cell wall)
 <i>Treponema pallidum</i> Syphilis	 Benzathine penicillin G 2.4 million units IM (stage-based)	 Doxycycline 100 mg BID (non-pregnant). Neurosyphilis: IV aqueous penicillin G

ORGANISM	FIRST-LINE (ADULT DOSE)	ALTERNATIVES / NOTES
 <i>E. coli</i>, <i>Klebsiella</i>, <i>Proteus</i> Non-ESBL	 Ceftriaxone 1–2 g q24h PO step-down by susceptibility: TMP-SMX  , ciprofloxacin/levofloxacin  , oral β -lactam	Cefazolin  for susceptible UTI isolates; ampicillin if susceptible. 7 days total is enough for uncomplicated GNR bacteremia once source is controlled
 ESBL-producing Enterobacterales	 Meropenem 1 g q8h  / imipenem 500 mg q6h  (critically ill or hypoalbuminemia)  Ertapenem 1 g q24h  (stable)	Cystitis: nitrofurantoin  , TMP-SMX  , cipro/levo  , or one dose of an aminoglycoside. Pip-tazo isn't recommended even when it tests susceptible (MERINO). PO step-down to TMP-SMX or a FQ if susceptible
 AmpC-risk Enterobacterales <i>Enterobacter cloacae</i> , <i>K. aerogenes</i> , <i>C. freundii</i>	 Cefepime 2 g q8h  (if cefepime MIC $\leq$ 2)	Carbapenem if cefepime MIC $\geq$ 4 (possible co-ESBL). Avoid ceftriaxone for invasive infection (inducible AmpC derepression). TMP-SMX or FQ for step-down
 <i>Pseudomonas aeruginosa</i>	 Pip-tazo 4.5 g q6h, cefepime 2 g q8h, ceftazidime 2 g q8h, meropenem 1 g q8h, or aztreonam 2 g q8h  (extended infusion)  Ciprofloxacin 750 mg BID  / levofloxacin 750 mg 	DTR-<i>P. aeruginosa</i> : ceftolozane-tazobactam 1.5–3 g q8h, ceftazidime-avibactam 2.5 g q8h, imipenem-relebactam 1.25 g q6h, cefiderocol 2 g q8h  . Ertapenem, ceftriaxone and moxifloxacin have no activity
 <i>Acinetobacter baumannii</i> Carbapenem-resistant (CRAB)	 Sulbactam-durlobactam 1 g/1 g q6h + imipenem or meropenem  (preferred, IDSA 2024)	High-dose ampicillin-sulbactam (9 g/day of sulbactam)  + a second agent: polymyxin B , minocycline , tigecycline , or cefiderocol . Non-CRAB: amp-sulbactam or a carbapenem
 Carbapenem-resistant Enterobacterales (CRE)	KPC :  meropenem-vaborbactam 4 g q8h, ceftazidime-avibactam 2.5 g q8h, or imipenem-relebactam 1.25 g q6h  NDM/MBL : ceftazidime-avibactam + aztreonam 2 g q8h, or cefiderocol 2 g q8h  OXA-48 : ceftazidime-avibactam 	Know the carbapenemase class (send carbapenemase testing). Cystitis only: one dose of an aminoglycoside , or nitrofurantoin, TMP-SMX or FQ if susceptible. Aztreonam-avibactam is an MBL option where available. Get an ID consult
 <i>Stenotrophomonas maltophilia</i>	  TMP-SMX 8–12 mg/kg/day of TMP  + a second agent at first	Second agent: minocycline , levofloxacin  , or cefiderocol  . Intrinsically resistant to carbapenems
 <i>Haemophilus influenzae</i> <i>Moraxella catarrhalis</i>	 Ceftriaxone 1–2 g q24h (2 g q12h for meningitis)  Amox-clav 875/125 mg BID  (often β -lactamase-positive)	Ampicillin/amoxicillin if β -lactamase-negative. Doxycycline , levofloxacin  , azithromycin
 <i>Neisseria meningitidis</i>	 Ceftriaxone 2 g q12h $\times$ 7 days	Penicillin G 4 million units q4h  if susceptible. Allergy: meropenem or moxifloxacin . Droplet precautions; give contacts prophylaxis (page 7)
 <i>Neisseria gonorrhoeae</i>	 Ceftriaxone 500 mg IM once (1 g if $\geq$ 150 kg)	Gentamicin 240 mg IM + azithromycin 2 g PO; cefixime 800 mg PO (not pharyngeal)
 Anaerobes <i>Bacteroides fragilis</i> (below the diaphragm); oral flora (above)	  Metronidazole 500 mg q8–12h Any β -lactam/ β -lactamase inhibitor or carbapenem  (no need to add metronidazole)	Above the diaphragm (aspiration abscess, dental): amp-sulbactam  , amox-clav , clindamycin . Avoid clindamycin for <i>B. fragilis</i> (resistance)
 <i>Candida albicans</i>, <i>parapsilosis</i>, <i>tropicalis</i>	 Echinocandin (e.g. micafungin 100 mg daily) when critically ill   Fluconazole 800 mg load, then 400 mg daily  when stable	<i>C. parapsilosis</i> : fluconazole preferred (higher echinocandin MICs). L-AmB 3–5 mg/kg
 <i>C. glabrata</i>, <i>C. krusei</i>, <i>C. auris</i>	 Echinocandin : micafungin 100 mg daily or caspofungin 70 mg, then 50 mg	<i>C. krusei</i> is intrinsically fluconazole-resistant; <i>C. auris</i> is often multidrug-resistant and needs contact precautions. Use L-AmB if echinocandin-resistant
 <i>Aspergillus</i> spp. Mould	  Voriconazole 6 mg/kg q12h $\times$ 2, then 4 mg/kg q12h (TDM)	Isavuconazole , posaconazole , or L-AmB 3–5 mg/kg. Mucorales: L-AmB 5–10 mg/kg (voriconazole is inactive)
 <i>Cryptococcus neoformans</i>	 L-AmB 3–4 mg/kg +  flucytosine 25 mg/kg QID  $\rightarrow$ fluconazole	See page 11 for the phases. Echinocandins have no activity against <i>Cryptococcus</i>

Renal adjustment at a glance

Adjust for CrCl

- Most penicillins and cephalosporins (cefazolin, cefepime, ceftazidime, ceftaroline, ampicillin, amp-sulbactam, pip-tazo)
- Carbapenems (meropenem, imipenem, ertapenem) and the newer β -lactam/ β -lactamase inhibitors, cefiderocol, aztreonam
- Vancomycin and aminoglycosides: dose by levels or AUC
- Daptomycin (q48h when CrCl <30)
- Ciprofloxacin and levofloxacin; TMP-SMX
- Nitrofurantoin: avoid if CrCl <30
- Fluconazole, flucytosine; acyclovir, oseltamivir

No renal adjustment

- **Ceftriaxone, nafcillin/oxacillin, clindamycin, doxycycline, minocycline, linezolid, metronidazole, azithromycin, moxifloxacin, rifampin, tigecycline**
- Echinocandins, isavuconazole, posaconazole, oral voriconazole, L-AmB (nephrotoxic, but no dose change)
- Oral vancomycin and fidaxomicin for *C. difficile*

Classic spectrum gaps

- **Cephalosporins:** no *Enterococcus* or *Listeria* activity
- **Ceftriaxone:** no *Pseudomonas*; **ceftazidime:** weak Gram-positive cover
- **Ertapenem:** no *Pseudomonas*, *Acinetobacter* or *Enterococcus*
- **Aztreonam:** Gram-negative only; safe in penicillin allergy (except ceftazidime allergy, which shares a side chain)
- **Daptomycin:** not for pneumonia (inactivated by surfactant)
- **Tigecycline:** not for bacteremia (low serum levels); no *Pseudomonas* or *Proteus* activity
- **Nitrofurantoin and fosfomycin:** bladder only, not for pyelonephritis
- **Moxifloxacin:** poor urinary levels; no *Pseudomonas*
- **Metronidazole:** anaerobes only (plus *C. difficile*, protozoa)
- **Echinocandins:** poor eye, CNS and urine penetration; no *Cryptococcus*
- **Fluconazole:** no mould activity; *C. krusei* resistant
- **Voriconazole:** no *Mucorales* activity
- **Aminoglycosides:** poor lung and abscess penetration; not used alone except for cystitis

Short-course durations worth memorising

CAP: 3–5 d outpatient · ≥ 5 d inpatient	HAP/VAP: 7 d	Pyelo / cUTI: 5–7 d FQ · 7 d other	Cystitis: 1–5 d by agent
Cellulitis: 5 d	clAI with source control: 4 d	GNR bacteremia: 7 d	<i>C. difficile</i>: 10 d
<i>S. aureus</i> bacteremia: ≥ 14 d (uncomplicated)	Osteomyelitis: 6 wk	Endocarditis: 4–6 wk	Candidemia: 14 d after clearance



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