ICU Antimicrobial Reference Tables

Downloadable reference - verify local susceptibility, formulation, dosing and current guideline context

These tables are educational starting frameworks. They do not replace the local ICU antibiogram, source control, microbiology/ID advice, organ-function dosing or patient-specific contraindications.

Drug-by-Pathogen Framework

Pathogen / phenotype	Preferred / active strategies	Ineffective / not recommended
ESBL Enterobacterales	Meropenem for severe infection / shock; Ertapenem for susceptible non-Pseudomonas infection when clinically stable; Cefepime-enmetazobactam (Exblifep): alternative in selected ESBL-E infections; U.S. label is cUTI	Ceftriaxone when ESBL resistant; Do not assume piperacillin-tazobactam is equivalent to a carbapenem for invasive ESBL infection
KPC-producing CRE	Meropenem-vaborbactam; Ceftazidime-avibactam (Avycaz); Imipenem-cilastatin-relebactam (Recarbrio)	Aztreonam alone; Polymyxins when an active safer novel beta-lactam is available; Routine aminoglycoside monotherapy for invasive disease
NDM / other MBL-producing Enterobacterales	Aztreonam-avibactam (Emblaveo) when available; Ceftazidime-avibactam + aztreonam when the fixed combination is unavailable; Cefiderocol when susceptible	Ceftazidime-avibactam alone; Meropenem-vaborbactam for NDM; Imipenem-relebactam for NDM
OXA-48-like CRE	Ceftazidime-avibactam (Avycaz); Other agents only when susceptibility/mechanism support them	Meropenem-vaborbactam as a mechanism-based default; Assuming all carbapenemases respond to the same inhibitor
DTR Pseudomonas aeruginosa	Ceftolozane-tazobactam; Ceftazidime-avibactam; Imipenem-cilastatin-relebactam; Cefiderocol when susceptibility/site support use	Ertapenem; Ceftriaxone; TMP-SMX; Vancomycin; Polymyxin as preferred therapy when an active safer beta-lactam exists
CRAB	Sulbactam-durlobactam (Xacduro) + imipenem-cilastatin or meropenem - IDSA 2026 preferred approach; If Xacduro is temporarily unavailable: high-dose ampicillin-sulbactam + another active agent; Alternative combination components when susceptible: high-dose minocycline, high-dose tigecycline, cefiderocol, polymyxin B	Routine carbapenem monotherapy; Colistin/polymyxin as preferred therapy when Xacduro is active/available; Treating colonization as invasive infection
Stenotrophomonas maltophilia	Cefiderocol monotherapy - IDSA 2026 preferred approach for invasive infection, with limited clinical-outcomes evidence; Aztreonam-avibactam + a second active agent - alternative; Levofloxacin, minocycline, or TMP-SMX as components of combination therapy - alternatives; Consider step-down to susceptible single-agent therapy only after clear, sustained clinical improvement	Meropenem; Imipenem; Routine treatment of respiratory colonization
MSSA	Cefazolin; Antistaphylococcal penicillin where appropriate	Vancomycin as preferred definitive therapy when a beta-lactam is tolerated and isolate is susceptible
MRSA	Vancomycin (AUC-guided for serious infection); Linezolid for MRSA pneumonia; Daptomycin for bacteremia/endovascular infection - NOT pneumonia	Daptomycin for primary alveolar pneumonia; Cefazolin as MRSA therapy
VRE / resistant Enterococcus	Linezolid; High-dose daptomycin in selected bacteremia/endovascular infection when susceptible and specialist-guided	Cephalosporins as Enterococcus therapy; Assuming all E. faecium remains daptomycin susceptible

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Invasive Candidemia	Echinocandin initial therapy for most critically ill adults; Fluconazole step-down when clinically stable and isolate is susceptible; Evaluate source control and catheter removal when the catheter is a likely source and removal is feasible	Treating respiratory Candida colonization; Automatic catheter removal regardless of source/feasibility
Invasive Aspergillosis	Voriconazole; Isavuconazole; Liposomal amphotericin B in selected situations	Fluconazole; Echinocandin monotherapy as routine first-line definitive therapy
Mucormycosis	Liposomal amphotericin B; Isavuconazole; Posaconazole as selected step-down/salvage therapy	Fluconazole; Echinocandin monotherapy
Severe Influenza	Oseltamivir enterally as standard first-line therapy when susceptible; Consider longer duration in prolonged severe disease/immunocompromise	Routine doubling to oseltamivir 150 mg twice daily; Delaying antiviral therapy while waiting for confirmatory testing in a compatible severe syndrome

Comparison Matrix - Novel beta-Lactams / CRE

Agent	Best Mechanism/Role	Useful Against	Key Gaps	ICU Pearl
Ceftazidime-avibactam (Avycaz)	KPC / OXA-48-like CRE; selected DTR Pseudomonas	KPC, OXA-48-like; many DTR Pseudomonas	NDM/other MBL alone	For MBL producers, pair avibactam protection with aztreonam or use a preferred MBL-active alternative.
Meropenem-vaborbactam	KPC-producing CRE	KPC Enterobacterales	NDM/MBL; OXA-48-like not its strength	Excellent KPC option; do not generalize all carbapenemases.
Imipenem-cilastatin-relebactam (Recarbrio)	KPC and selected DTR Pseudomonas	KPC; some DTR Pseudomonas	NDM/MBL; OXA-48-like	Mechanism and susceptibility still matter.
Aztreonam-avibactam (Emblaveo)	NDM/other MBL-producing Enterobacterales	Many MBL + co-produced serine beta-lactamases	Not a universal Acinetobacter drug	FDA label is narrower than the IDSA 2026 AMR role.
Cefiderocol	MBL CRE / selected DTR Pseudomonas	Many NDM/MBL CRE; DTR Pseudomonas	Variable CRAB performance; resistance can emerge	Reserve for resistant phenotypes where its spectrum matters.
Ceftolozane-tazobactam	DTR Pseudomonas	Many difficult Pseudomonas isolates	Carbapenemase-producing CRE not its core role	One of the most important modern antipseudomonal options.
Cefepime-enmetazobactam (Exblifep)	ESBL-E / selected AmpC+ESBL	Many ESBL Enterobacterales	Not a universal CRE drug	U.S. FDA label is cUTI; IDSA guidance discusses broader selected ESBL use.

Comparison Matrix - CRAB Options

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CRAB Strategy	2026 Position	Dose/Exposure Pearl	Major Limitation
Sulbactam-durlobactam (Xacduro) + carbapenem	Preferred IDSA 2026 approach for invasive CRAB	Use label renal adjustment; combine with imipenem-cilastatin or meropenem	Not active against all MBL mechanisms
High-dose ampicillin-sulbactam + another active drug	Bridge/alternative when Xacduro unavailable	Target high sulbactam exposure; specialist dosing	Not preferred when sulbactam-durlobactam is available
Minocycline	Alternative combination component when susceptible	IDSA CRAB strategy: 200 mg q12h	Susceptibility is far from universal
Tigecycline	Alternative when site and susceptibility fit	High-dose: 200 mg load -> 100 mg q12h	Avoid as preferred therapy for bacteremia/UTI
Cefiderocol	Selected alternative	Match MIC/site and optimize infusion	Clinical outcome signal in Acinetobacter has been mixed
Polymyxin B	Toxic alternative component	Use expert unit/weight protocol	Nephro/neurotoxicity; prefer safer active options

Comparison Matrix - Core ICU Antibiotics

Drug	Strength	Important Gap	ICU Pearl
Cefepime	Broad Gram-negative + Pseudomonas	No reliable anaerobic coverage	Watch neurotoxicity with accumulation.
Piperacillin-tazobactam	Pseudomonas + anaerobes + many polymicrobial syndromes	Not preferred for invasive ESBL-E when carbapenem indicated	Do not add metronidazole routinely for redundant anaerobic coverage.
Meropenem	ESBL-E, Pseudomonas, anaerobes	Not MRSA/VRE; carbapenemase resistance	Extended infusion often improves PK/PD target attainment.
Ertapenem	ESBL-E; convenient once daily	No Pseudomonas/Acinetobacter	Useful stable/OPAT option, not an antipseudomonal carbapenem.
Cefazolin	MSSA + streptococci	No MRSA/Pseudomonas	Often preferred definitive MSSA therapy over vancomycin.
Ampicillin	Listeria + susceptible E. faecalis	beta-lactamase-producing Gram-negatives	A narrow drug with high-value ICU indications.
Clindamycin	Gram-positive/anaerobes + toxin suppression	Aerobic Gram-negative bacilli	Adjunct toxin suppression, not universal monotherapy.
Aminoglycosides	Rapid concentration-dependent Gram-negative killing	Nephro/ototoxicity; weak tissue monotherapy role	Use PK/TDM rather than fixed renal intervals.

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Comparison Matrix - Antifungals

Drug/Class	Best ICU Role	Major Gap	PK/Toxicity Pearl
Echinocandin (anidulafungin/micafungin)	Initial candidemia in most critically ill adults	Poor urinary/CNS penetration	Few interactions; no routine renal adjustment.
Fluconazole	Susceptible Candida step-down; cryptococcal regimens	No mold activity; resistance species dependent	Excellent oral bioavailability; renal adjustment required.
Voriconazole	First-line invasive aspergillosis	No Mucorales	TDM + many CYP interactions; IV vehicle issues in renal dysfunction.
Isavuconazole	Aspergillosis or mucormycosis	Species-specific resistance	Shortens QT; major CYP3A interactions; no SBECD issue.
Posaconazole	Mold prophylaxis; selected salvage/step-down	Formulation/exposure variability	TDM often useful; avoid IV formulation in marked renal impairment when feasible due SBECD.
Liposomal amphotericin B	Mucormycosis; broad salvage therapy	Nephrotoxicity/electrolyte loss	Monitor K/Mg/creatinine; not reliable against A. terreus.

Site Matters - Tissue Penetration Matrix

Site	Favored / useful exposure	Limitation / poor fit
Central Nervous System / Meninges	Ceftriaxone (meningitis dosing); Meropenem (meningitis dosing); Ampicillin (Listeria coverage); Acyclovir (HSV encephalitis); Fluconazole (good CSF exposure)	Echinocandins - poor CSF penetration; Daptomycin - not a CNS workhorse; Ertapenem - not a meningitis drug
Lungs / Alveolar Lining Fluid	Linezolid - high ELF exposure; Levofloxacin; Cefepime / ceftazidime; Meropenem; Ceftolozane-tazobactam; Ceftazidime-avibactam (Avycaz)	Daptomycin - inactivated by pulmonary surfactant; Aminoglycosides as monotherapy - poor ELF exposure; Tigecycline is not a preferred bacteremia drug despite tissue penetration
Urinary Tract / Kidney	Ceftriaxone / cefepime when susceptible; TMP-SMX; Aminoglycosides; Ertapenem; Cefepime-enmetazobactam (Exblifep) - FDA cUTI indication; Plazomicin - FDA cUTI indication	Echinocandins - poor urinary concentrations; Tigecycline / eravacycline - not preferred for UTI; Polymyxin B - poor urinary exposure compared with colistin/CMS
Bloodstream / Endovascular	Cefazolin for MSSA; Vancomycin (AUC-guided) for MRSA; Daptomycin for susceptible MRSA/VRE bacteremia; Carbapenem or active novel beta-lactam for susceptible invasive Gram-negative disease	Tigecycline - low serum exposure; Eravacycline - not a bacteremia drug; Oral fosfomycin - not for bacteremia
Intra-abdominal / Deep Tissue	Piperacillin-tazobactam; Meropenem / ertapenem; Ceftriaxone + metronidazole; Eravacycline (cIAI label); Tigecycline in selected susceptible resistant infections	Aminoglycoside monotherapy; Vancomycin alone for polymicrobial intra-abdominal sepsis; Agents without anaerobic coverage when anaerobes are part of the syndrome

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Bone / Joint / Prosthetic Material	Cefazolin for MSSA; Vancomycin for MRSA; Daptomycin or linezolid in selected resistant Gram-positive infection; Rifampin may be used only as part of selected staphylococcal prosthetic-material regimens	Rifampin monotherapy - rapid resistance; Short-course therapy without source control in established hardware infection
Eye / Vitreous	Systemic fluoroquinolones have useful ocular penetration in selected syndromes; Endophthalmitis usually requires intravitreal therapy directed by ophthalmology	Relying on systemic antibiotics alone for acute postoperative endophthalmitis
Mold / Invasive Fungal Disease	Voriconazole - invasive aspergillosis; Isavuconazole - aspergillosis / mucormycosis; Liposomal amphotericin B - mucormycosis and broad mold salvage; Posaconazole - prophylaxis and selected salvage/step-down	Fluconazole for Aspergillus or Mucorales; Echinocandin monotherapy for mucormycosis