Recommended Empirical Antibiotic Regimens for MICU Patients

Notes: The antibiotic regimens shown are general guidelines and should not replace clinical judgment. Always assess for antibiotic allergies. Antibiotic doses shown are for normal renal function - **adjust for renal insufficiency as appropriate**.

Indication	Recommended empiric therapy	Alternative (use for mild-moderate β-lactam allergy)	Severe β-lactam allergy
Source unknown[€]			
Sepsis syndrome, unclear source and resuscitated (defined as SpO2 >95% with respiratory support up to FiO_2 40% and PEEP 5, off pressors) (*when source known or suspected, select empiric therapy for that source per recommendations below*)	Vancomycin weight-based IV dosing plus Cefepime 2gm IV Q12H[≠] Add metronidazole if possible intra-abdominal source **Discontinue vancomycin if no MRSA identified at 48 hours**	No change	Vancomycin weight-based IV dosing plus Aztreonam 2gm IV Q8H Add metronidazole if possible intra-abdominal source Discontinue vancomycin if no MRSA identified at 48 hours
Septic shock and/or severe respiratory failure (refractory hypotension, PaO_2/FiO_2 ratio of >250) unclear source (*when source known or suspected, select empiric therapy for that source per recommendations below*)	Vancomycin weight-based IV dosing plus Cefepime 2gm IV Q12H[≠] plus Levofloxacin 750mg IV Q24H OR Amikacin 15mg/kg IV Q24H Add metronidazole if possible intra-abdominal source **Discontinue vancomycin and 2nd gram-negative agent if no MRSA or resistant gram-negative organism, identified by 48 hours**	No change	Vancomycin weight-based IV dosing plus Levofloxacin 750mg IV Q24H plus Amikacin 15mg/kg IV Q24H OR Aztreonam 2gm IV Q8H Add metronidazole if possible intra-abdominal source **Discontinue vancomycin and 2nd gram-negative agent if no MRSA or resistant gram-negative organism, respectively, identified by 48 hours**

[€]Add Micafungin 100mg IV daily and consider ID consult if persistent fever and hemodynamic instability despite broad-spectrum antibacterial therapy and one or more of the following:
1. Candida colonization of multiple sites (urine + BAL for example)
2. Total parenteral nutrition (TPN)
3. Solid organ or hematopoietic cell transplantation
4. Prior surgery, especially abdominal
5. Underlying hematologic malignancy
6. Currently undergoing chemotherapy
7. Central venous catheter

[≠]may be associated with increased risk of non-convulsive status in patients over the age of 50 with significant CNS pathology, renal failure. Consult with ICU pharmacist for optimal dosing in these patients.

Pulmonary Infections			
Community-acquired pneumonia (NOTE: if septic shock present, refer to the recommendations for septic shock in the previous box)	Ceftriaxone 1gm IV Q24H plus Azithromycin 500mg PO/IV Q24H Consider addition of Vancomycin and ID consult if risk factors for MRSA pneumonia: necrosis/cavitation, post-influenza pneumonia or other clinical suspicion for S. aureus pneumonia	No change	Levofloxacin 750mg PO/IV Q24H* See recommendations regarding suspected MRSA in first box
Health care-associated / hospital-acquired pneumonia	Vancomycin weight-based IV dosing plus Cefepime 2gm Q8H[≠] May consider addition of 2nd gram-negative agent (levofloxacin or amikacin) Obtain quantitative sputum culture and stop vancomycin if MRSA not identified within 48 hours	No change	Vancomycin weight-based IV dosing + Levofloxacin 750mg IV Q24H* May consider addition of 2nd gram-negative agent (aztreonam or amikacin)
Confirmed MRSA pneumonia (blood or pleural fluid culture +, sputum with >25 PMNs, culture + and no other organisms, BAL 10,000 cfu/mL in the presence of fever, leukocytosis and pulmonary infiltrates)	Vancomycin weight-based IV dosing; Indications for Linezolid 600mg IV every 12 hours ***where there is no clinical improvement with Vancomycin:*** Vancomycin MIC >1, severe necrosis/cavitation. Consult Infectious Disease.	No change	No change
COPD exacerbation (without pneumonia)	Azithromycin 500mg IV x 1, then 250mg IV or PO Q24H OR	No change	No change

*fluoroquinolones have activity against *Mycobacterium tuberculosis*. If TB risk factors, call ID.

[≠]may be associated with increased risk of non-convulsive status in patients over the age of 50 with significant CNS pathology, renal failure. Consult with ICU pharmacist for optimal dosing in these patients.

	Doxycycline 100mg PO BID		
Acute aspiration pneumonia	Ceftriaxone 1gm IV Q24H	No change	Levofloxacin 750mg IV Q24
Lung abscess, aspiration pneumonia presenting from community	Unasyn 3gm IV Q6H	Clindamycin 600mg IV Q8H	No change
Skin and soft tissue infections			
Cellulitis WITHOUT cutaneous abscess, low clinical suspicion for necrotizing fasciitis[¥]	Vancomycin weight-based IV dosing plus Cefepime 2gm IV Q12H[≠]	Vancomycin weight-based IV dosing Plus Cefepime 2gm IV Q12H	Vancomycin weight-based IV dosing plus Levofloxacin 750mg IV Q24H
Cellulitis WITH cutaneous abscess, draining or to be drained	Vancomycin weight-based IV dosing	No change	No change
Necrotizing fasciitis, suspected or confirmed (consult General Surgery and ID)	Vancomycin weight-based IV dosing plus Piperacillin/tazobactam 4.5gm IV Q8H plus Clindamycin 900mg IV Q8H	Vancomycin weight-based IV dosing plus Cefepime 2gm IV Q8H plus Clindamycin 900mg IV Q8H	Vancomycin weight-based IV dosing plus Levofloxacin 750mg IV Q24H plus Clindamycin 900mg IV Q8H
Diabetic foot ulcer infection	Vancomycin weight-based IV dosing plus Piperacillin/tazobactam 4.5gm IV Q8H	Vancomycin weight-based IV dosing plus Cefepime 2gm IV Q8H plus Metronidazole 500mg IV Q8H	Vancomycin weight-based IV dosing plus Levofloxacin 750mg IV Q24H plus Metronidazole 500mg IV Q8H
Odontogenic space infection/parapharyngeal abscess	Unasyn 3gm IV Q6H	Clindamycin 600mg IV Q8H	No change
Urinary tract infections			

[¥]Cellulitis that is not the primary reason for ICU admission or is mild should be treated with Vancomycin alone, no additional gram negative coverage is necessary

Urinary tract infection from community -minimal risk for multi-drug resistant organism	Ceftriaxone 1gm IV Q24H Note: agent of choice for pan-susceptible *E. coli* is cefazolin 1gm IV Q8H	No change Note: agent of choice for pan-susceptible *E. coli* is Cefazolin 1gm IV Q8H	Aztreonam 2g IV every 8 hours
Urinary tract infection from community -moderate to high risk of multi-drug resistant organism or from long-term care facility	Cefepime 2gm IV Q8H	No change	Aztreonam 2g IV every 8 hours
Urinary tract infection, hospital-acquired	Cefepime 2gm IV Q8H	No change	Aztreonam 2g IV every 8 hours
Intra-abdominal infections			
Spontaneous bacterial peritonitis	Ceftriaxone 2gm IV Q24H	No change	Levofloxacin 750mg IV/PO daily
Upper GI bleed prophylaxis (only indicated in patients with cirrhosis)	Ceftriaxone 1gm IV Q24H	No change	Levofloxacin 750mg IV/PO daily
Uncomplicated intra-abdominal infection Examples: Appendicitis without perforation Acute biliary tract infection (cholecystitis, cholangitis)	Ceftriaxone 1gm IV Q24H plus Metronidazole 500mg PO Q8H	No change	Levofloxacin 750mg IV/PO daily Plus Metronidazole 500mg PO Q8H
Central nervous system			
Acute bacterial meningitis	Ceftriaxone 2gm IV Q12H plus Vancomycin weight-based IV dosing plus Ampicillin 2gm IV Q4H (if risk for Listeria)	Ceftriaxone 2gm IV Q12H plus Vancomycin weight-based IV dosing plus TMP-SMX 20mg/kg/day IV divided Q6H (if risk for Listeria)	Aztreonam 2g IV ever 6 hours Plus Vancomycin weight-based IV dosing plus TMP-SMX 20mg/kg/day IV divided Q6H (if risk for Listeria)
Other clinical scenarios			
Febrile neutropenia	Cefepime 2gm IV Q8H Add vancomycin if risk factors for MRSA infection present	No change	Aztreonam 2g IV every 8 hours Add vancomycin if risk factors for MRSA infection present

Necrotizing pancreatitis Consider surgery (Barnett if possible) and consider GI (Attwell if possible) and ID consult (Haas) for co-management. All three attendings would be interested in a multidisciplinary approach to management of these patients	See recommendations for sepsis and septic shock depending on clinical condition.		