Atrium Health Inpatient Empiric Antibiotic Recommendations for Adults

‡ The duration of therapy suggested refers to the total length of antimicrobial therapy; antimicrobial de-escalation and/or switch to PO therapy are strongly encouraged when clinically appropriate

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Pneumonia					
Community-acquired (CAP)[1]					
---Non-ICU Admission with no risk factors for *P. aeruginosa*	Ceftriaxone 1 g IV q 24 hrs + Azithromycin 500 mg IV/PO q 24 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	Ceftriaxone 1 g IV q 24 hrs + Doxycycline 100 mg PO q 12 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	*Levofloxacin 750 mg PO/IV q 24 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	-Add vancomycin if prior isolation of MRSA from the respiratory tract -If vancomycin is added, obtain an MRSA nasal screen to determine if vancomycin is needed -Addition of anaerobic coverage for suspected aspiration pneumonia is only recommended if lung abscess or empyema is suspected. See Aspiration Pneumonia below for guidance.	DOT 5 days if afebrile x 72 hrs/clinically stable UNLESS abscess/cavitation/empyema present or nonfermenter (i.e. *Pseudomonas*) or *S. aureus* identified via culture‡
---ICU Admission with no risk factors for *P. aeruginosa*	Ceftriaxone 1 – 2 g IV q 24 hrs + Azithromycin 500 mg IV/PO q 24 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	**First check to see if the patient has ever received a cephalosporin** *Levofloxacin 750 mg PO/IV q 24 hrs + *Aztreonam 2 g IV q 6 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)		-Add vancomycin if prior isolation of MRSA from the respiratory tract -If vancomycin is added, obtain an MRSA nasal screen to determine if vancomycin is needed	DOT 5 days if afebrile x 72 hrs/clinically stable UNLESS abscess/cavitation/empyema present or nonfermenter (i.e. *Pseudomonas*) or *S. aureus* identified via culture‡
--- Non-ICU and ICU Admission with *Pseudomonas* Risk (prior *P. aeruginosa* isolation)	*Cefepime 2 g IV q 8 hrs + Azithromycin 500 mg IV/PO q 24 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	**First check to see if the patient has ever received a cephalosporin** *Levofloxacin 750 mg PO/IV q 24 hrs + *Aztreonam 2 g IV q 6 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)		-Add anti-Pseudomonal coverage if prior isolation of *P. aeruginosa* from the respiratory tract -Recommendations do not apply for patients with structural lung disease (i.e. bronchiectasis) or severe COPD with repeat exacerbations & frequent steroid &/or antibiotic use -Rapid de-escalation of broad-spectrum therapy is recommended as soon as clinically appropriate (i.e. ID/susceptibilities, rapid diagnostics) -Add vancomycin if prior isolation of MRSA from the respiratory tract -If vancomycin is added, obtain an MRSA nasal screen to determine if vancomycin is needed	DOT 5 days if afebrile x 72 hrs/clinically stable UNLESS abscess/cavitation/empyema present or nonfermenter (i.e. *Pseudomonas*) or *S. aureus* identified via culture‡
--ICU admission with MRSA and *P. aeruginosa* risk factors (recent hospitalization and ≥3 days of IV antibiotics in the last 90 days)	*Cefepime 2 g IV q 8 hrs + Azithromycin 500 mg IV/PO q 24 hrs + *Vancomycin[2] Pharmacy to Dose (See Comments)	*Levofloxacin 750 mg PO/IV q 24 hrs + *Aztreonam 2 g IV q 6 hrs + *Vancomycin[2] Pharmacy to Dose (See Comments)		-Risk factors for MRSA and *P. aeruginosa* include prior isolation from the respiratory tract and for severe CAP recent hospitalization and ≥3 days of IV antibiotics in the last 90 days -Obtain an MRSA nasal screen to determine if vancomycin is needed	DOT 5 days if afebrile x 72 hrs/clinically stable UNLESS abscess/cavitation/empyema present or nonfermenter (i.e. *Pseudomonas*) or *S. aureus* identified via culture‡
---Aspiration pneumonia: consider addition of anaerobic coverage only if lung abscess or empyema is suspected	Select regimen as above and add Metronidazole 500 mg IV q 12 hrs -OR- Use alternative regimen replacing β-lactam base with 1 of the following based on *P. aeruginosa* risk: If anti-pseudomonal coverage not required: *Ampicillin-sulbactam 3 gm IV q 6 hrs -OR- If anti-pseudomonal coverage required: *Piperacillin-tazobactam 4.5 gm IV q 8 hrs	Select regimens as above and add Metronidazole 500 mg IV q 12 hrs		- Per IDSA guidelines, small-volume aspiration at the time of intubation should be adequately handled by standard empirical severe CAP treatment (i.e. ceftriaxone or levofloxacin) -Need for additional anaerobic coverage in CAP is usually **overestimated** -Worse outcomes seen with metronidazole or clindamycin monotherapy for aspiration pneumonia	
---*Pneumocystis jirovecii* pneumonia (PCP/PJP)	*Trimethoprim/sulfamethoxazole (TMP/SMX)[4] PO/IV 15-20 mg/kg/day in divided doses	Clindamycin 900 mg IV q 8 hrs **OR** Clindamycin 450 mg PO q 6 hrs **+** Primaquine[5] (base) 30 mg PO q 24 hrs		- Consider PJP in patients with CD4 T-lymphocyte (CD4 cell) counts <200 cells/mm3 -Patients with severe PJP initiated on IV therapy may be transitioned to PO therapy if clinically stable -~15% of patients with documented PJP have coexisting OI (i.e. TB, KS, bacterial pneumonia) -Consider TB Isolation & AFB smear/culture of three sputum specimens over 2 days	21 days‡
	Corticosteroid regimen as follows, should be considered for patients with: **paO_2 < 70 mmHg at room air or Alveolar-arterial O_2 gradient ≥35mmHg:** Prednisone 40mg PO BID x days 1-5, then 40mg q 24 hrs days 6-10, then 20mg q 24 hrs x days 11-21 (IV methylprednisolone can be given as 75% of prednisone dose)				

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Hospital-acquired / Ventilator-associated Pneumonia ** Rapid de-escalation of broad-spectrum therapy is recommended as soon as clinically appropriate (i.e. - ID/susceptibilities, rapid diagnostics) **					
---Hospital-acquired (HA) / Ventilator-associated Pneumonia[7]	*Cefepime 2 g IV q 8 hrs + *Vancomycin[2] Pharmacy to Dose +/- *Tobramycin[8] Pharmacy to Dose	**First check to see if the patient has ever received a cephalosporin** *Aztreonam 2 g IV q 6 hrs[9] + *Tobramycin[8] Pharmacy to Dose + *Vancomycin[2] Pharmacy to Dose		-2019 IDSA Guidelines (ref 4) recommend abandoning use of healthcare-associated pneumonia (HCAP) categorization. -In patients with recent **culture history** of an ESBL-producing GNR consider treatment with meropenem & ID Consult. If recent history of a carbapenem-resistant GNR, an ID Consult is recommended. -Fluoroquinolones not recommended first line as empiric therapy due to GNR resistance -Empiric regimens do not cover *B. cepacia*, *S. maltophilia*, or resistant anaerobes -Obtain an MRSA nasal screen and discontinue vancomycin if negative -Cefepime adequately covers mouth anaerobes -Obtain an MRSA nasal screen and discontinue vancomycin if negative	**DOT** should be limited to 8 days
Bronchitis, Acute Exacerbation Antibiotics **NOT** recommended unless: increased sputum volume, purulence, **AND** dyspnea **OR** two symptoms if increased purulence **OR** mechanical ventilation; *Haemophilus influenzae*, *Streptococcus pneumoniae*, & *Moraxella catarrhalis* are most common					
---COPD	*Amoxicillin/clavulanate 875/125 mg PO q 12 hrs **OR** Doxycycline 100 mg PO q 12 hrs	Azithromycin 500 mg PO q 24 hrs If *Pseudomonas* spp. risk factors:* Levofloxacin 750 mg PO q 24 hrs		*Pseudomonas risk factors for COPD: - Documented *P. aeruginosa* infection/ colonization in the past year - Neutropenia (ANC<500/µL - Chemotherapy within the past 30 days - Acquired Immune Deficiency Syndrome (AIDS) - Transplant recipients - Chronic immunosuppression with IV or PO corticosteroids (equivalent of prednisone 20 mg daily or higher)	5-7 days
Urinary Tract Infections					
Lower Tract (Cystitis)					
--- Acute, uncomplicated cystitis	Ceftriaxone 2 g IV q 24 hrs x 3-7 days **OR** *Cephalexin 500 mg PO q 12 hrs x 3-7 days	*Ciprofloxacin 250 mg PO q 12 hrs x 3 days **OR** Nitrofurantoin monohydrate 100 mg PO q 12 hrs x 5 days **OR** *Aztreonam 2 g IV q 6 hrs x 3-7 days		-Suggest an alternative to nitrofurantoin with CrCl <30 mL/min -For the treatment of complicated cystitis; see pyelonephritis	3-7 days‡; DOT is dependent upon agent selection
Pyelonephritis					
---Community Acquired / Complicated[10] pyelonephritis	Ceftriaxone 2 g IV q 24 hrs x 10 days	*Aztreonam 2 g IV q 6 hrs x 10 days +/- *Tobramycin[8] Pharmacy to Dose		-Consider utilizing previous culture data for assistance with empiric selection -If febrile after ≥72 hrs of **appropriate antibiotic therapy**, investigate for any potential complications -Source control via removal of the infected stone/stent/tube/catheter/foreign body and/or draining of the abscess is key to the resolution of infection; consider consulting Urology for patients with stones/obstruction/renal abscesses/etc. -Ceftriaxone & Aztreonam are pregnancy category B; Levofloxacin is not routinely recommended (category C); OB Consult is advised for pregnancy -Consider meropenem for HA infection with history of ESBL; risk factors include: broad spectrum antimicrobials (i.e. cefepime, piperacillin/tazobactam) for ≥7 days in past 90 days, colonization/infection with ESBL in the last 12 months[11]	5-14 days‡; DOT is dependent upon agent selection
---Healthcare-associated (HA)	*Cefepime 2 g IV q 8 hrs x 10 days +/- *Vancomycin[2] Pharmacy to Dose	**First check to see if the patient has ever received a cephalosporin** *Aztreonam 2 g IV q 6 hrs x 10 days + *Vancomycin[2] Pharmacy to Dose + *Tobramycin[8] Pharmacy to Dose			

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Pelvic Inflammatory Disease (PID)					
---Secondary to *Chlamydia trachomatis* and/or *Neisseria gonorrhoeae* and/or polymicrobial	Ceftriaxone 2 g IV q 24 hrs x 14 days + Doxycycline 100 mg PO/IV q 12 hrs x 14 days + Metronidazole PO/IV 500 mg q 12 hrs x 14 days	**First check to see if the patient has ever received a cephalosporin.** **For patients receiving alternative therapy, a culture and susceptibility should direct treatment as there is a high level of gonococcal resistance to fluoroquinolones, tetracyclines, and azalides** Clindamycin 900 mg IV q 8 hrs x 14 days + *Tobramycin[8] 5 mg/kg/day x 14 days		-PID is **most often** from *Chlamydia trachomatis* +/- *Neisseria gonorrhoeae* & less often polymicrobial -All women with acute PID should be NAAT tested for *Neisseria gonorrhoeae* & *Chlamydia trachomatis* -All PID regimens should also be effective against *N. gonorrhoeae* & *C. trachomatis* because negative endocervical screening for these organisms does **not** rule out an upper-reproductive-tract infection -All persons diagnosed with gonorrhea should be tested for other STDs (chlamydia, syphilis & HIV) -Consider the addition of metronidazole, as limited evidence is currently available for its omission - Sex partners of those with *N. gonorrhoeae* & *C. trachomatis* should also be treated	14 days‡
Chorioamnionitis or Endometritis					
Chorioamnionitis or Endometritis	Ampicillin 2 g IV q 6 hrs + *Gentamicin[8] Pharmacy to Dose + Clindamycin 900 mg IV q 8 hrs	+ *Gentamicin[8] Pharmacy to Dose + Clindamycin 900 mg IV q 8 hrs			
Sepsis See Code Sepsis Powerplans for additional details: (Abdominal Source, C. diff Colitis, CNS Infection, Immunocompromised Hosts, OB GYN Infection, Pneumonia, Skin and Soft Tissue, Unknown or Multiple Suspected Sources, Urinary)					
Community-acquired Infection of an Unknown or Multiple Source					
---Community-acquired	Ceftriaxone 2 g IV q 24 hrs +/- *Vancomycin[2,3] Pharmacy to Dose +/- Metronidazole 500 mg PO/IV q 12 hrs	*Aztreonam 2 g IV q 6 hrs+ *Vancomycin[2,3] Pharmacy to Dose +/- Metronidazole 500 mg PO/IV q 12 hrs		-Add metronidazole if anaerobic coverage is needed i.e.- for suspect intra-abdominal -Add vancomycin if CA-MRSA is of concern i.e.- for suspect severe skin and skin structure, CAP with Code Sepsis or CA-MRSA risk -Add vancomycin if *Enterococcus* is of concern i.e.- Select extra biliary intra-abdominal infections (See Complicated Intra-abdominal infections for additional information)	DOT to be determined upon source recognition
HA/HCA Infection of an Unknown or Multiple Source					
---Patient with HA/HCA[6] risk	*Cefepime 2 g IV q 8 hrs +*Vancomycin[2] Pharmacy to Dose +/- *Tobramycin[8] Pharmacy to Dose +/- Metronidazole PO/IV 500 mg q 12 hrs	*Aztreonam 2 g IV q 6 hrs[9] + *Vancomycin[2] Pharmacy to Dose + *Tobramycin[8] Pharmacy to Dose +/- Metronidazole PO/IV 500 mg q 12 hrs		-Consider meropenem for HA infection with history of ESBL; risk factors include: broad spectrum antimicrobials (i.e. cefepime, piperacillin/tazobactam) for ≥7 days in past 90 days, colonization/infection with ESBL in the last 12 months[11] -*Staphylococcus aureus* should never be considered a blood contaminant; if found in a blood culture, to decrease mortality, an ID consult, source control, targeted anti-staphylococcal antimicrobials & repeat blood cultures are required -For Code Sepsis add an aminoglycoside if patient is at risk for MDRO -Add metronidazole if anaerobic coverage is needed i.e.- for suspect intra-abdominal -Aztreonam does not have activity against ESBLs -Antimicrobial orders entered as STAT	DOT to be determined upon source recognition

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Complicated Intra-abdominal Infections (Includes biliary & extrabiliary infections, abscesses & perforations)					
Community-acquired					
---Community-acquired (Extra biliary, abscesses & perforations)	Ceftriaxone 2 g IV q 24 hrs + Metronidazole 500 mg PO/IV q 12 hrs	*Aztreonam 2 g IV q 6 hrs + *Vancomycin[2] Pharmacy to Dose + Metronidazole 500 mg PO/IV q 12 hrs		-Ampicillin or Vancomycin for *Enterococcus* 1.) When *Enterococci* are recovered OR 2.) Empiric for postoperative infection, biliary infections, those who have previously received cephalosporins or other antimicrobial agents selecting for *Enterococcus* species, immunocompromised patients & those with valvular heart disease or prosthetic intravascular materials	DOT is 4-7 days‡ with adequate source control and resolution of symptoms for 48 hours
---Community-acquired (Cholecystitis & Cholangitis)	Ceftriaxone 2 g IV q 24 hrs +/- Metronidazole 500 mg PO/IV q 12 hrs	*Aztreonam 2 g IV q 6 hrs + *Vancomycin[2] Pharmacy to Dose +/- Metronidazole 500 mg PO/IV q 12 hrs		-All patients undergoing cholecystectomy for acute cholecystitis should have antimicrobial therapy discontinued within 24 hrs unless there is evidence of infection outside the wall of the gallbladder -See above comment regarding *Enterococcus*	DOT is dependent upon source control/surgical intervention
---Spontaneous Bacterial Peritonitis (Community-acquired)	Ceftriaxone 2 g IV q 24 hrs	*Aztreonam 2 g IV q 6 hrs + *Vancomycin[2] Pharmacy to Dose		-SBP should be suspected in all patients with ascites and clinical decompensation -Prophylaxis with weekly 750 mg ciprofloxacin or daily DS Bactrim is recommended after the first episode of SBP	DOT is 5-7 days‡ (unless complicated with bacteremia)
Health Care-associated					
---Health Care-associated (Extra biliary) (Including Severe / High Risk / Immunocompromised)	*Piperacillin/tazobactam 4.5 g IV q 8 hrs +/- *Vancomycin[2] Pharmacy to Dose	*Cefepime 2 g IV q 8 hrs + Metronidazole 500 mg PO/IV q 12 hrs +/- *Vancomycin[2] Pharmacy to Dose	**First check to see if the patient has ever received a cephalosporin** *Aztreonam 2 g IV q 6 hrs + *Tobramycin[8] Pharmacy to Dose + Metronidazole 500 mg PO/IV q 12 hrs + *Vancomycin[2] Pharmacy to Dose	-Use of anti-MRSA or anti-yeast agents are not recommended when the organisms are not present -Vancomycin is recommended for treatment of suspected / proven intra-abdominal MRSA infection -Antifungal therapy is indorsed **if** *Candida* is grown from intra-abdominal cultures; an echinocandin should be used if fluconazole-resistant *Candida* isolated & for the critically ill patients; amphotericin-B is **NOT** recommended as initial therapy -Ampicillin or Vancomycin for *Enterococcus* 1.) When *Enterococci* are recovered OR 2.) Empiric for postoperative infection, biliary infections, those who have previously received cephalosporins or other antimicrobial agents selecting for *Enterococcus* species, immunocompromised patients & those with valvular heart disease or prosthetic intravascular materials	DOT is 4-7 days‡ with adequate source control and resolution of symptoms for 48 hours
---Health Care-associated (Cholecystitis & Cholangitis)	*Piperacillin/tazobactam 4.5 g IV q 8 hrs	*Cefepime 2 g IV q 8 hrs +/- Metronidazole 500 mg PO/IV q 12 hrs	**First check to see if the patient has ever received a cephalosporin** *Aztreonam 2 g IV q 6 hrs + * Tobramycin[8] Pharmacy to Dose +/- Metronidazole 500 mg PO/IV q 12 hrs + *Vancomycin[2] Pharmacy to Dose	-All patients undergoing cholecystectomy for acute cholecystitis should have antimicrobial therapy discontinued within 24 hrs unless there is evidence of infection outside the wall of the gallbladder -See above comment regarding *Enterococcus*	DOT is dependent upon source control/surgical intervention
---Spontaneous Bacterial Peritonitis (Health Care-associated)	*Cefepime 2 g IV q 8 hrs	*Piperacillin/tazobactam 4.5 g IV q 8 hrs	*Aztreonam 2 g IV q 6 hrs + *Vancomycin[2] Pharmacy to Dose	-SBP should be suspected in all patients with ascites and clinical decompensation -Prophylaxis with weekly 750 mg ciprofloxacin or daily DS Bactrim is recommended after the first episode of SBP	DOT is 5-7 days‡ (unless complicated with bacteremia)
Surgical Prophylaxis-Refer to Surgical Prophylaxis Order Sets					

Clinical Setting	Primary Selection		Alternative Selection: Contraindication to Primary	Alternative Selection: Moderate, High, or Severe Allergy*	Comments	‡Recommended Duration of Therapy (DOT)
***Clostridioides difficile* Infection**						
---First Episode of mild, moderate, or severe disease WITHOUT hemodynamic instability/shock or toxic megacolon	Vancomycin 125 mg PO q 6 hrs **OR** Fidaxomicin 200 mg PO q 12 hrs* Consider fidaxomicin first line in high-risk patients*		CONSIDER ID CONSULT		*High risk patients: immunocompromised (hematopoietic stem cell transplant recipient, solid organ transplant recipient, malignancy, patients on immunosuppressive medications), age > 65 years, and those meeting criteria for severe infection -If patient is strictly NPO and cannot tolerate anything by mouth and without enteral access, use metronidazole 500mg IV q8h, but switch to PO vancomycin or fidaxomicin ASAP to optimize outcomes -ID/ASN approval required if duration longer than 10 days needed due to delayed resolution	10 days
---First Recurrence (Second Episode) of mild, moderate, or severe disease previously treated with PO vancomycin	Fidaxomicin 200 mg PO q 12 hrs		Vancomycin TAPER (see below) Vancomycin 125 mg PO q 6 hrs x 14 days Vancomycin 125 mg PO q 12 hrs x 7 days Vancomycin 125 mg PO q 24 hrs x 7 days Vancomycin 125 mg PO q 48 hrs x 14 days			
---First Recurrence (Second Episode) of mild, moderate, or severe disease previously treated with metronidazole	Fidaxomicin 200 mg PO q 12 hrs		Vancomycin 125 mg PO q 6 hrs			
---First Recurrence (Second Episode) of mild, moderate, or severe disease previously treated with fidaxomicin	Fidaxomicin 200 mg PO q 12 hrs **OR** Vancomycin TAPER (see below) Vancomycin 125 mg PO q 6 hrs x 14 days Vancomycin 125 mg PO q 12 hrs x 7 days Vancomycin 125 mg PO q 24 hrs x 7 days Vancomycin 125 mg PO q 48 hrs x 14 days		CONSIDER ID CONSULT			
--- Second Recurrence (Third Episode)	CONSIDER GI or ID CONSULT		CONSIDER GI or ID CONSULT			
---Severe, complicated with hemodynamic instability/shock, ileus or toxic megacolon	Vancomycin 500 mg PO q 6 hrs + Metronidazole 500 mg IV q 8 hrs		CONSIDER ID CONSULT		- If complete ileus is present, consider adding rectal installation of vancomycin 500 mg in 100 ml NS every 6 hours	
Skin and Soft Tissue Infections (SSTI)						
Cellulitis						
---Purulent	Mild	If drainable abscess: no antibiotics are indicated- I&D only If **NO** drainable abscess: see treatment for Moderate	See alternative class listed in the Primary Selection		-I&D of abscess is recommended -Mild: No systemic signs of infection[12] & <5 cm area -Moderate: 1 systemic sign of infection or >5 cm area, but hemodynamically stable -Severe: Failed appropriate antibiotics and I&D, or ≥2 systemic signs of infection plus acute hypotension or organ dysfunction --Not for DFI, decubitus ulcers, animal bites, wound-associated SSTI	DOT 5-10 days‡ or until clinical improvement
	Moderate	Doxycyline 100 mg PO q 12 hrs **OR** *TMP/SMX 1-2 DS PO q 12 hrs				
	Severe	*Vancomycin[2] Pharmacy to Dose If clinically improved, may change to: Doxycyline 100 mg PO q 12 hrs **OR** *TMP/SMX 1-2 DS PO q 12 hrs				
---Non-purulent	Mild	*Cephalexin 500 mg PO q 6 hrs OR Dicloxacillin 500 mg PO q 6 hrs	Clindamycin 300-450 mg PO q 6 hrs		-Mild: No systemic signs of infection[12] -Moderate: 1 systemic sign of infection -Severe: ≥2 systemic signs of infection plus acute hypotension or organ dysfunction --Not for DFI, decubitus ulcers, animal bites, wound-associated SSTI -Consider Cefazolin 1g q 8 hrs for <70 kg	DOT 5-10 days‡ or until clinical improvement
	Moderate	*Cefazolin 2 g IV q 8 hrs	*Vancomycin[2] Pharmacy to Dose			
	Severe	*Cefazolin 2 g IV q 8 hrs	*Vancomycin[2] Pharmacy to Dose			

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Diabetic Foot Infection (DFI) OR Wound Associated SSTI					
---Mild	*Cephalexin 500 mg q 6 hrs **OR** *Amoxicillin/clavulanate 2 g PO BID **+/-** *TMP/SMX 2 DS PO q 12 hrs **OR** Doxycyline 100 mg PO q 12 hrs (See Comments)	*Levofloxacin 750 mg PO q 24 hrs + *TMP/SMX 2 DS PO q 12 hrs OR Doxycyline 100 mg PO q 12 hrs		-**Mild**: Only skin/tissue & erythema ≤2 cm -**Moderate**: Structures deeper than skin/tissues (i.e. abscess, osteomyelitis, septic arthritis) & <2 systemic inflammatory response signs (SIRS) or erythema > 2 cm involving only skin/tissue -**Severe**: See Moderate + ≥2 SIRs criterion[13] -*P. aeruginosa* is an UNCOMMON pathogen in DFI except when there is a high local prevalence of *Pseudomonas* infection, warm weather, or frequent exposure of the foot to water -Add TMP/SMX, Doxycycline, or Vancomycin if the patient has evidence of infection and/or colonization with MRSA or for MRSA risk factors -Add Vancomycin if severe DFI -Consider Metronidazole if treating a DFI	DOT is highly influenced by surgical interventions
---Moderate / Severe	Ceftriaxone 2 g IV q 24 hrs +/- Metronidazole 500 mg PO/IV q 8 hrs **+/-** *Vancomycin[2] Pharmacy to Dose (See Comments)	*Aztreonam 2 g IV q 6 hrs +/- Metronidazole 500 mg PO/IV q 8 hrs + *Vancomycin[2] Pharmacy to Dose			
---Moderate / Severe + *P. aeruginosa* risk	*Cefepime 2 g IV q 8 hrs +/- Metronidazole 500 mg PO/IV q 8 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments)	*Aztreonam 2 g IV q 6 hrs[9] +/- Metronidazole 500 mg PO/IV q 8 hrs +/- *Tobramycin[8] Pharmacy to Dose + *Vancomycin[2] Pharmacy to Dose			
Necrotizing fasciitis					
---Necrotizing fasciitis	*Cefepime 2 g IV q 8 hrs + Clindamycin 900 mg IV q 8 hrs + *Vancomycin[2] Pharmacy to Dose	**First check to see if the patient has ever received a cephalosporin** *Aztreonam 2 g IV q 6 hrs[9] + *Tobramycin[8] Pharmacy to Dose + Clindamycin 900 mg IV q 8 hrs + *Vancomycin[2] Pharmacy to Dose		-Surgical Emergency -Recommend Surgical Consult -Consider ID Consult -Common organisms include <u>*Streptococci*</u>, CA-*S.aureus*, anaerobic species, and Enterobacteriaceae and therefore timely de-escalation of anti-pseudomonal coverage is warranted	DOT: continue until debridement is no longer needed, clinical improvement & afebrile x48-72 hrs‡
Central Nervous System Infections					
Meningitis Antimicrobial orders entered as **STAT**					
---Immunocompetent & age < 50	Ceftriaxone 2 g IV q 12 hrs + *Vancomycin[2] Pharmacy to Dose + Dexamethasone 10 mg IV q 6 hrs x 4 days	CONSIDER ID CONSULT		-CSF findings in bacterial meningitis often display a neutrophil predominance, elevated protein concentration, and low glucose -Start dexamethasone concurrently with the 1st dose of antibiotics; ideally given 15-20 mins prior to antimicrobials, but antimicrobials should **NO**T be delayed as it increases morbidity & mortality -Corticosteroids have not been studied in the immunocompromised host; most data to support use is with *S. pneumoniae*	DOT is pathogen specific: (7 days for *Neisseria meningitidis* & *Haemophilus influenzae*; 14 days for *Streptococcus pneumoniae* & ≥21 days for others
---Post-neurosurgical, penetrating trauma, CSF shunt	*Cefepime 2 g IV q 8 hrs + *Vancomycin[2] Pharmacy to Dose	CONSIDER ID CONSULT			
---Immuno-compromised / age > 50	Ceftriaxone 2 g IV q 12 hrs + Ampicillin 2 g IV q 4 hrs + *Vancomycin[2] Pharmacy to Dose + Dexamethasone 10 mg IV q 6 hrs x 4 days	CONSIDER ID CONSULT			
---Cryptococcal meningitis	Amphotericin B Liposomal (Ambisome®) 5 mg/kg IV q 24 hrs[14] + *Flucytosine 25 mg/kg PO q 6 hrs	Fluconazole 12 mg/kg IV/PO q 24 hrs + *Flucytosine 25 mg/kg PO q 6 hrs		-Only Induction therapy doses are listed -Amphotericin based regimen is preferred -Consider monitoring flucytosine levels if renal insufficient is present; peak level <75 mcg/mL -Induction treatment should be followed with fluconazole therapy for at least 8 weeks	Induction x 14 days
---Suspected HSV-1 or HSV-2 (Herpes Simplex Virus)	*Acyclovir 10 mg/kg IV q 8 hrs	CONSIDER ID CONSULT		-CSF findings in viral meningitis often display lymphocytic pleocytosis, elevated protein concentration, and normal glucose -In patients with altered mental status, motor/sensory deficits, altered personality, speech or movement disorders consider encephalitis (below)	DOT is 7-10 days

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		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Encephalitis					
---Suspected HSV-1 or HSV-2	*Acyclovir 10 mg/kg IV q 8 hrs	CONSIDER ID CONSULT		-CSF PCR for HSV-1 & HSV-2 (sensitivity & specificity, >95% & >99%, respectively) -Acyclovir should be initiated in all patients with suspected encephalitis, pending results/studies	DOT is 14-21 days
--- *Ehrlichia chaffeensis* / *Rickettsia rickettsia* (Rocky Mountain Spotted Fever)	Doxycycline 100 mg PO/IV q 12 hrs	CONSIDER ID CONSULT		-If clinical clues suggestive of *Rickettsia* or *Ehrlichia* infection during the appropriate season, doxycycline should be added to empirical treatment regimens -If clinical slues suggestive of *Borrelia burgdorferi* (Lyme Disease) treat with Ceftriaxone 2 g IV q 24 hrs	DOT-continue for 3 days after defervescence
Candidiasis					
---Candidemia / suspect candidiasis **without** recent azole, hemodynamic instability, or neutropenia	*Fluconazole 12 mg/kg IV loading dose, then 6 mg/kg IV/PO q 24 hrs	Caspofungin 70 mg IV loading dose, then 50 mg IV q 24 hrs		-If susceptibilities are not performed for invasive *Candidiasis*, call Micro for antifungal susceptibilities -For infection due to susceptible/susceptible dose dependent (SDD) *C. glabrata*, increase dose of fluconazole to 12 mg/kg daily -If a fluconazole daily dose of >1,600 mg is needed, considered consulting with ID/ASN -Follow-up blood cultures should be performed every day or every other day to establish when candidemia has been cleared -Transition from an echinocandin to fluconazole is recommended for patients who are clinically stable, have fluconazole susceptible/susceptible dose dependent candida, and negative repeat blood cultures -Caspofungin is preferred for azole resistant *C. glabrata* (nationally ~30% of *C. glabrata* isolates) and *C. krusei* (inherently azole resistant) -Intravenous catheter removal is strongly recommended for candidemia -All nonneutropenic patients with candidemia should have a dilated ophthalmological examination, preferably performed by an ophthalmologist, within the first week -Consider an ID Consult -For candidemia, please refer to the Blood Culture Identification (BCID) Treatment Algorithm for additional recommendations	DOT for candidemia without metastatic complications is 14 days after the documented clearance of *Candida* from the bloodstream; therefore repeat cultures are required (A-III)
---Candidemia / suspect candidiasis **with** recent azole, hemodynamic instability or neutropenia	Caspofungin 70 mg IV loading dose, then 50 mg IV q 24 hrs	Amphotericin B Liposomal (Ambisome®) 5 mg/kg IV q 24 hrs[14]			
---Asymptomatic candiduria	Treatment is **not** recommended unless pregnant, neutropenic or undergoing urologic manipulations			-If indwelling catheter; recommend remove/change -For neutropenic patients, should be managed as invasive candidiasis -For urologic procedures, fluconazole 200 mg daily	Not applicable
---Symptomatic candiduria	*Fluconazole 200 - 400 mg PO q 24 hrs	CONSIDER CONTACTING ASN OR ID CONSULT		-For fluconazole resistant organisms or azole intolerance, consider contacting ASN or ID consult -For pyelonephritis; 400 mg q 24 hrs is recommended	CONSIDER CONTACTING ASN OR ID CONSULT

Clinical Setting	Primary Selection	Alternative Selection		Comments	‡Recommended Duration of Therapy (DOT)
		Contraindication to Primary	Moderate, High, or Severe Allergy*		
Fever and Neutropenia/Immunocompromised Host					
---High risk patients	*Cefepime 2 g IV q 8 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments) +/- Metronidazole 500 mg IV q 12 hrs +/- *Tobramycin[8] Pharmacy to Dose	*Meropenem 500 mg IV q 6 hrs +/- *Vancomycin[2] Pharmacy to Dose (See Comments) +/- *Tobramycin[8] Pharmacy to Dose	*Aztreonam 2 g IV q 6 hrs[9] + *Tobramycin[8] Pharmacy to Dose + *Vancomycin[2] Pharmacy to Dose +/- Metronidazole 500 mg IV q 12 hrs	-Fever: an oral temp >38.3°C (101°F) or temp >38.0°C (100.4°F) continuous for 1 hr -Neutropenia: absolute neutrophil count (ANC) <500 cells/mm^3 or an ANC that is expected to decrease to <500 cells/mm^3 in the next 48 hrs -Indications for vancomycin include: hemodynamic instability, radiographic evidence of pneumonia, colonization with MRSA, blood culture with gram-positive (GP) bacteria, severe mucositis, suspected catheter-related infection or skin and soft tissue infection -If vancomycin was started initially, it may be stopped after 2 days if no evidence of GP infection -Patients that remain hemodynamically unstable should have their regimen broadened to include anaerobic bacteria (metronidazole) -Consider tobramycin for HA infection with history of MDRO; risk factors include: broad spectrum antimicrobials (i.e. cefepime, piperacillin/tazobactam) for ≥7 days in past 90 days, colonization/infection with MDRO in the last 12 months[11] -Modifications to the initial therapy should be considered for those previously colonized/infected with ESBLs, vancomycin-resistant *Enterococcus*, or carbapenem resistant *Enterobacteriaceae* -High-risk patients: anticipated neutropenia >7 days or ANC <100 cells/mm^3 and/or significant medical co-morbid conditions (i.e.- hypotension, pneumonia, new abdominal pain, or neurologic changes) or symptoms suggestive of infection -If septic, refer to CodeSepsis Powerplans	DOT to be determined upon source recognition
---Persistent fever after 4–7 days of a broad-spectrum antibacterial regimen **and** no identified source	**ADD** Voriconazole 6 mg/kg q 12 hrs x 2 doses; then 4 mg/kg IV q 12 hrs **OR** Caspofungin 70 mg IV loading dose, then 50 mg IV q 24 hrs	**ADD** Amphotericin B Liposomal (Ambisome®) 5 mg/kg IV q 24 hrs[14]		-Voriconazole commonly causes visual disturbances having blurry/enhanced vision or color changes and typically lasts ~30 minutes after administration; only <1% require discontinuation	

* Allergy severity is determined by using the Inpatient Adult Management algorithm. Additional allergy education can be found on the ASN website under Clinical Pathways and Guidelines.

‡ The duration of therapy suggested refers to the total length of antimicrobial therapy; antimicrobial de-escalation and/or switch to PO therapy are strongly encouraged when clinically appropriate

1. Pneumonia occurring <48 hrs into hospitalization
2. A target vancomycin trough of 15-20 µg/mL is recommended; please refer to the "Adult Vancomycin Dosing Protocol" for additional information
3. Add for ICU patients with shock or MRSA risk: drug abuse, prior/concurrent influenza, immunocompromised, current positive MRSA PCR screening & broad spectrum antimicrobials within the past 90 days
4. Dosing is based on the trimethoprim component; monitor serum K+& CBC while on high doses of TMP/SMX; there is pseudo-elevation in serum creatinine that is to be expected (average increase of ~18%)
5. Whenever possible, patients should be tested for G6PD deficiency before administration of dapsone or primaquine; an alternative agent should be used if the patient is found to have G6PD deficiency
6. HCA risk: Hospitalization in acute care hospital ≥48 hrs in last 90 days, residence in nursing home/long-term care facility, receipt of IV antibiotics, chemotherapy, hemodialysis, or wound care in past 30 days
7. MDRO risk: intubated ≥ 48 hrs, antimicrobials in last 90 days, late-onset (onset ≥5 days of hospitalization), residence in an area endemic for resistance or nursing home/long-term care facility, hospitalization in acute care hospital ≥48 hrs in last 90 days, immunocompromised, receipt of IV antibiotics, chemotherapy, hemodialysis, or wound care in past 30 days or having a family member with a MDRO pathogen
8. Dosing should be based on TBW unless patient is > 20% of their IBW, in which case dosing should be based on ABW. ABW = (TBW - IBW) (0.4) + IBW; Please refer to the "Adult Aminoglycoside Dosing and Monitoring Guidelines" for additional information
9. Less than 80% of isolates of *P. aeruginosa* are susceptible to aztreonam; therefore, an aminoglycoside must be added to ensure adequate empiric coverage
10. Complicated features include bacteremia, stents (stricture), nephrostomy tubes, stones, obstruction, fistula, abscesses, lesions, bladder cancer, incontinence, reflux, foreign body/instrumentation, pregnancy, male sex, transplantation, catheterization, prostatic hypertrophy, or any structural abnormality)
11. Risk factors for ESBLs: broad spectrum antimicrobials (i.e. cefepime, piperacillin/tazobactam) for ≥7 days in past 90 days, colonization/infection with ESBL in the last 12 months, hospitalization ≥5 days in last 90 days where ESBLs are endemic, residence in a nursing home or long-term care facility with an indwelling urinary or vascular catheters, immunocompromised hosts (Tumbarello, 2011; Tamma 2015)
12. Systemic signs of infection: > 38°C or < 36°C; HR > 90bpm; RR > 24bpm or PaCO2 < 32 mmHg; WBC > 12 K/mm^3 <4 K/mm^3, acute hypotension or new onset altered mental status plus organ dysfunction

13. Systemic inflammatory response signs (SIRS): Temp >38°C or <36°C; HR >90 bpm; RR >20 bpm or PaCO2 <32 mmHg; WBC >12 000 or <4000 cells/mm3 or ≥10% bands
14. Premedication with acetaminophen and diphenhydramine for patients who experience infusion-related reactions can be administered 0.5-1 hour prior to treatment; 500 mL of normal saline pre and post dose may help decrease nephrotoxicity associated with amphotericin use; monitor BUN and serum creatinine, electrolytes (K+ and Mg++), liver function tests, CBC and vitals

Abbreviations Key:

* Indicates the need to adjust dose for renal impairment
ABW = adjusted body weight
AFB = acid fast bacilli
CA-MRSA = community-acquired methicillin resistant *Staphylococcus aureus*
CAP = community acquired pneumonia
COPD = chronic obstructive pulmonary disease
CrCL = creatinine clearance
CSF = cerebral spinal fluid
DFI = diabetic foot infection
DOT = duration of therapy
ESBL = extended-spectrum β-lactamase
g = gram
GNR = gram negative rod
GP = gram positive
HA = hospital-acquired
HCA = healthcare-associated
hrs = hours
HSV = human simplex virus
ICU = intensive care unit
IBW= ideal body weight
ID = infectious diseases
IDSA = Infectious Diseases Society of America
IV = intravenous
kg = kilogram
KS = Kaposi sarcoma
MDRO = multidrug-resistant organism
mg = milligram
min = minute
ml = milliliters
NAAT = nucleic acid amplification testing
OB = obstetrics
ºC = degrees Celsius
ºF = degrees Fahrenheit
OI = opportunistic infection
PCP = *Pneumocystis* pneumonia
PCR = polymerase chain reaction
PID = pelvic inflammatory disease
PCP/PJP = *Pneumocystis jiroveci* pneumonia
PO = oral
q = every
SCr = serum creatinine
SDD = susceptible dose dependent
SIRS = systemic inflammatory response signs
SBP= spontaneous bacterial peritonitis
TB = tuberculosis
TBW = total body weight
TMP/SMX = trimethoprim/sulfamethoxazole
WBC = white blood cell

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