

NM West Region Piperacillin-Tazobactam (Zosyn) Usage Criteria

Background: The use of broad spectrum antibiotics in the NM West Region is higher than would be expected for our hospital sizes and patient populations by national standards. Broad spectrum antibiotic usage at CDH, Delnor, and Kishwaukee/Valley West is largely driven by our piperacillin-tazobactam (Zosyn) usage. In an effort to address this potentially inappropriate piperacillin-tazobactam usage, a list of usage criteria has been approved by the NM CDH, Delnor, and Kishwaukee/Valley West Antimicrobial Stewardship Subcommittees and their respective Pharmacy and Therapeutics Committees.

Piperacillin-Tazobactam Usage Criteria

Likely Appropriate Indications	Possibly Appropriate Indications	Likely Inappropriate Indications
Genitourinary		
-Complicated pyelonephritis (sepsis, obstruction, instrumentation, perinephric abscess, kidney transplant)		-Cystitis (uncomplicated or complicated) -Prostatitis -Pyelonephritis (uncomplicated)
Gynecologic		
-Endometritis (acute postpartum) or salpingitis/PID pts who meet sepsis criteria/ICU admission		-Endometritis (acute postpartum) or salpingitis/PID
Intra-abdominal		
-Cholangitis -High risk/severe intra-abdominal infection: complicated cholecystitis, peritonitis, perirectal abscess, diverticulitis with abscess or perforation, or hospital-associated intra-abdominal infection (See Table 2 below)	-Perforated appendicitis or IAI in <u>High risk patients</u> (See table 2 below)	-Uncomplicated Intra-abdominal infection: community-onset cholecystitis, diverticulitis, appendicitis without perf -Spontaneous bacterial peritonitis (SBP)
Respiratory		
-Hospital-acquired pneumonia -CAP with ≥ 3 risk factors for resistance (See Figure 1 below)		-Community-acquired pneumonia with less than 3 risk factors for resistance (see Figure 1 below) -Community-acquired aspiration
Skin/Skin Structure		
-Necrotizing fasciitis -Severe/limb-threatening diabetic foot infection		-Bite wound (human or animal) -Septic arthritis/prosthetic joint infection -Skin infection, uncomplicated (furunculosis, cutaneous abscess, cellulitis, mild diabetic foot infection)
Other		
-Sepsis (initial 48 hr) -Directed therapy based on current culture and susceptibility data -Failure of moderately broad-spectrum antibiotics after 48 hours (ceftriaxone, ampicillin-sulbactam) -Recent history of documented infection with <i>Pseudomonas aeruginosa</i> susceptible to piperacillin-tazobactam -Recommended by ID	-Fever of unknown origin -Necrotizing otitis externa	-Immunosuppression as the only reason cited for use -Infective endocarditis -Neutropenic fever

Table 1: Alternative Antibiotic Recommendations

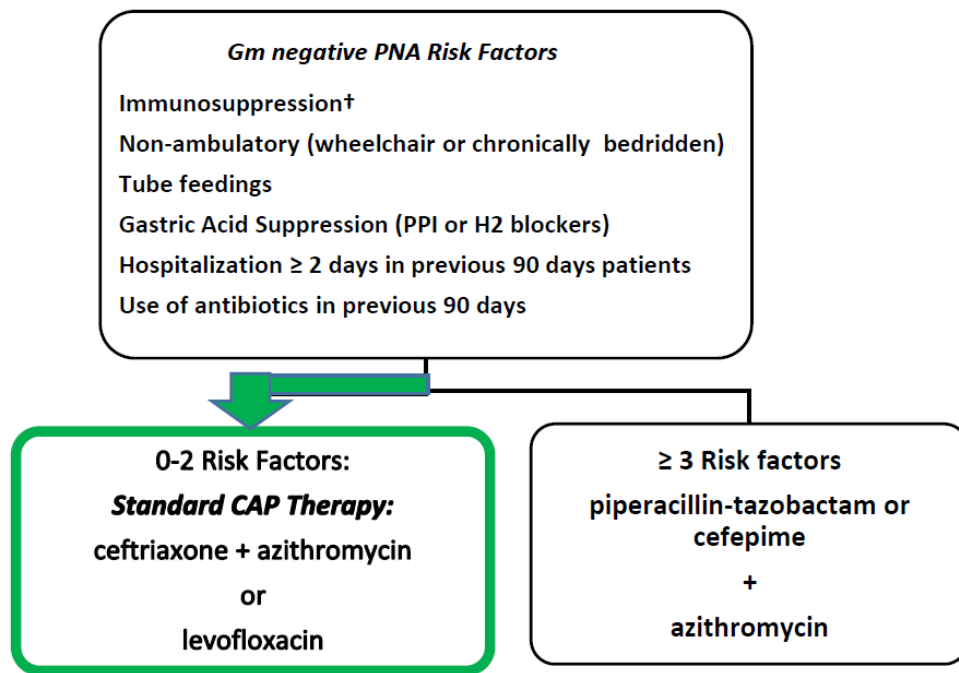
Indication	First-Line Alternative(s)	Second-Line Alternative
Bite wound (animal/human)	PO: Amoxicillin-clavulanate IV: Ampicillin-sulbactam	IV: Ceftriaxone plus metronidazole PO: Doxycycline OR [SMX/TMP plus metronidazole]
Community-Acquired Pneumonia (CAP)/less than 3 risk factors for resistant gram-negatives (see Figure 1)	PO : Cefuroxime plus azithromycin IV : Ceftriaxone plus azithromycin	-Alt for azithromycin: doxycycline -Alt for severe beta-lactam allergy: Levofloxacin alone
Cystitis (uncomplicated and symptomatic)—[For asymptomatic bacteremia, no antibiotics are recommended unless patient is pregnant or undergoing invasive urologic procedure]	PO: Nitrofurantoin OR SMX/TMP IV: Cefazolin	PO: Cephalexin IV: Gentamicin OR Aztreonam
Endometritis (post-partum)	Clindamycin plus gentamicin	Ampicillin-sulbactam
Salpingitis/PID	Ceftriaxone plus metronidazole plus doxycycline	
Immunosuppression	Source-specific or cefepime, if neutropenic fever	Meropenem, if severely beta-lactam allergic
Infective endocarditis (IE)	Refer to IE guidelines (ID Consult)	
<u>Intra-abdominal infection (uncomplicated):</u>		
Appendicitis	Cefazolin plus metronidazole	Aztreonam plus metronidazole
Cholecystitis	Cefazolin	Aztreonam
Diverticulitis	IV: Cefazolin plus metronidazole PO: [Cefuroxime OR SMX/TMP] plus metronidazole	Aztreonam plus metronidazole
Neutropenic fever	Cefepime +/- vancomycin	Meropenem +/- vancomycin
Prostatitis (acute)	PO: SMX/TMP OR doxycycline OR ciprofloxacin (in that order based on susceptibilities) IV: Ceftriaxone	
Pyelonephritis (uncomplicated)	PO: SMX/TMP or ciprofloxacin (based on susceptibilities) IV: Ceftriaxone	
Septic arthritis	Ceftriaxone plus vancomycin	Aztreonam plus vancomycin
Prosthetic Joint Infection	Vancomycin	
<u>Skin/skin structure infection (uncomplicated):</u>		
Non-purulent cellulitis	PO: Cephalexin IV: Cefazolin	Clindamycin
Purulent/Ulcer	PO: SMX/TMP OR doxycycline IV: Cefazolin	Vancomycin
Mild diabetic foot infection (chronic ulcer with cellulitis)	Cefazolin	Clindamycin OR SMX/TMP
Spontaneous Bacterial Peritonitis	Ceftriaxone	Ciprofloxacin

Table 2: Factors Associated with Mortality and Resistance for Intra-Abdominal Infections¹

Factors associated with Mortality
Age > 70 years
Medical Comorbidity (ESRD, ESLD, malignancy, chronic malnutrition)
Immunocompromising condition (poorly controlled DM, high dose corticosteroids, other agents, neutropenia, advanced HIV,
Extensive Peritoneal involvement or diffuse peritonitis
Delay in initial intervention (source control) > 24 hours
Inability to achieve adequate debridement or drainage control

Factors associated with infection with antibiotic resistant bacteria
Healthcare acquired infection
Travel to areas with high rates of resistance (Asia, Middle East or Africa) or antibiotics were received during travel
Known colonization with antibiotic resistance bacteria.

Figure 1: Risk Factors for Gram-Negative Pneumonia²



†Immunosuppression:

- Congenital or acquired immunodeficiency
- Hematologic diseases
- Neutropenia (<1,000 cells/mm³) (excluding cancer chemotherapy pts)
- Treatment with immunosuppressive drugs within past 30 days
- Corticosteroids (>10 mg prednisone per day for more than 2 weeks)

Non-Ambulatory Status: Chronically bedridden or using a wheelchair

References:

1. Solomkin JS, Mazuki JE, Bradley JS et al, Diagnosis and management of complicated intra-abdominal infection in adults and children by the Surgical Infection Society and Infectious Diseases Society of America. *Clin Infect Dis* 2010; 50: 133
2. Shindo Y, Kobayashi D, Ichikawa AM, et al. Risk factors for drug-resistant pathogens in community-acquired and healthcare-associated pneumonia. *Am J Respir Crit Care* 2013; 188(8):985-95.