TITLE: ANTIBIOTICS IN ADULT PATIENTS – EMPIRIC USE GUIDELINES, WEILL CORNELL MEDICAL CENTER AND LOWER MANHATTAN HOSPITAL

PURPOSE:

This document is not hospital policy but is meant to serve as general guidelines for the empiric use of antibiotics in the hospital setting at Weill Cornell Medical Center and Lower Manhattan Hospital. These recommendations take into account the site of infection, most common organisms, hospital epidemiology and susceptibilities, expert opinion, and cost. The goals of these guidelines are to optimize antibiotic use and patient outcomes while limiting the emergence of resistant bacteria. These recommendations are not meant to replace clinical judgment. **Antibiotic therapy must still be individualized based on a patient's severity of illness, comorbidities, culture history, antibiotic history, and immune status.** Subsequently, therapy should be modified based on the patients' clinical status and microbiology data obtained. Infectious Diseases should be contacted with any questions or consultations.

APPLICABILITY:

NYP/WC and NYP/LMH prescribers and pharmacists

PROCEDURE:

- Cultures of presumed infected site(s) should always be obtained (preferably prior to initiation of any antibiotic therapy).
- Initial empiric therapy should be chosen based on the most likely pathogens, hospital susceptibility patterns, cost-effective therapy, and impact on development of resistance. Patients' flora may be altered by previous antibiotic courses and recent therapy should be taken into account when choosing initial empiric therapy.
- Greater severity of illness or severely immunocompromised state may warrant broader initial empiric coverage.
- A history of PCN-allergy should be carefully evaluated as it does not always warrant the use of non-beta-lactam antibiotics. In patients with less severe PCN allergies (e.g., mild rash in the absence of both Stevens-Johnson Syndrome and anaphylaxis) the use of cephalosporins or carbapenems may be possible based on risk/benefit. If any doubt exists, consultation with Infectious Diseases is recommended.
- Reassess antibiotic therapy when culture results become available or when worsening of clinical status possibly due to infection occurs. Antibiotic therapy should be modified to target identified pathogen(s) and to narrow the spectrum of activity if possible.
- Discontinue vancomycin if no methicillin-resistant *Staphylococcus aureus* (MRSA) or resistant gram-positive organisms identified.
- A switch to oral therapy should be considered. When using medications with nearly 100% bioavailability (fluconazole, levofloxacin, linezolid, metronidazole, doxycycline, trimethoprim/sulfamethoxazole, azithromycin, and voriconazole), a transition to oral therapy should be considered in patients able to tolerate an oral diet and other oral medications.
    - Other medications: a transition to oral therapy to complete a course of therapy should be considered following clinical improvement, where possible.
- Recommendations for duration of therapy are provided based on clinical syndromes and usual clinical course. Duration may be altered by clinical course.

COMMON TYPES OF INFECTIONS	DEFINITIONS / USUAL ORGANISMS	MODIFYING FACTORS	PRIMARY ANTIBIOTIC THERAPY RECOMMENDED	ALTERNATIVE ANTIBIOTIC THERAPY	TOTAL DURATION OF THERAPY (combined IV+PO)
CENTRAL NERVOUS SYSTEM					
MENINGITIS[1a]	*S. pneumoniae*, *N. meningitidis* *H. influenzae*	Community-acquired (18–50 yrs old, not immuno-compromised)	Ceftriaxone IV + Vancomycin IV	*If severe PCN-allergy*[1b]*:* Vancomycin IV + Aztreonam IV	7-10 days *(7 days: N. meningitidis, H. influenzae; 10 days: S. pneumoniae, others)*
	S. pneumoniae, *N. meningitidis*, *L. monocytogenes*, gram-negative bacilli	Community-acquired (> 50 yrs old, immuno-compromised, pregnant)	Ceftriaxone IV + Vancomycin IV + Ampicillin IV *Mild PCN allergy:* substitute Ampicillin IV with TMP/SMX IV	*If severe PCN-allergy*[1b]*:* Vancomycin IV + Aztreonam IV + TMP-SMX IV	10-14 days *(Documented gram-negative bacilli and L. monocytogenes may need to be extended to 21 days)*
	S. aureus, *S. epidermidis*, *P. acnes,* gram-negative bacilli (e.g., *P. aeruginosa)*	Post-neurosurgery/ CSF shunt, penetrating head trauma	Cefepime IV + Vancomycin IV	*If severe PCN-allergy*[1b]*:* Vancomycin IV + Aztreonam IV [1c]	7–14 days *(Duration for gram-negative bacilli and S. aureus is variable and may need to be extended based on the clinical scenario)*

[1a] An ID consult should be considered for all patients with meningitis.

[1b] In patients with less severe PCN-allergies (e.g., mild rash in the absence of both Stevens-Johnson Syndrome or anaphylaxis), treatment with a third- or fourth-generation cephalosporin or a carbapenem antibiotic may be possible and in some situations may be necessary. ID consult recommended to evaluate risk/benefit.

[1c] Intravenous tobramycin or levofloxacin may be used based on previous culture data. Please note that aminoglycoside penetration into the CSF is generally suboptimal for treatment of gram-negative meningitis/ventriculitis. Intrathecal/intraventricular aminoglycoside administration may be necessary. In addition, quinolone penetration into the CSF is variable and should not be relied upon as monotherapy for gram-negative organisms. ID consult recommended.

If a positive result is obtained from the FilmArray Meningitis/Encephalitis panel, please refer to ANTIMICROBIAL RECOMMENDATIONS BASED ON RAPID IDENTIFICATION OF ORGANISMS FROM CEREBROSPINAL FLUID IN ADULTS

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GASTROINTESTINAL					
UNCOMPLICATED INTRA-ABDOMINAL INFECTIONS (e.g. cholecystitis, cholangitis)[2a, 2b]	Enterobacteriaceae (*E. coli*, *K. pneumoniae), Streptococcus* spp., anaerobes (e.g., *B. fragilis*)	Community-acquired (hospitalized ≤ 3 days) [2b]	Ceftriaxone IV + Metronidazole IV/PO [2d] OR Piperacillin-tazobactam IV	*If severe PCN-allergy[2e]:* Levofloxacin IV/PO + Metronidazole IV/PO ± Gentamicin IV	4–5 days[2h] (may need to be extended with inadequate source control)
COMPLICATED INTRA-ABDOMINAL INFECTIONS (e.g., diverticulitis[2a], recent biliary instrumentation, secondary peritonitis)	As above plus *P. aeruginosa*	Hospital-acquired, Immune-compromised [2c]	Piperacillin-tazobactam IV ± Gentamicin IV[2f]	*If severe PCN-allergy[2e]:* Vancomycin IV + Aztreonam IV + Metronidazole IV/PO ± Gentamicin IV	4–5 days[2h] (may need to be extended for abscesses and those with inadequate source control)
NECROTIZING PANCREATITIS			Antibiotic prophylaxis not recommended without clinical or culture evidence of an established infection[2f]		
NECROTIZING PANCREATITIS WITH ESTABLISHED INFECTION [2b, 2g]	Enterobacteriaceae (*E. coli*, *K. pneumoniae), Streptococcus* spp., *Enterococcus* spp., anaerobes (e.g., *B. fragilis*)		Piperacillin-tazobactam IV ± Gentamicin IV[2f]	*If severe PCN-allergy[2e]:* Vancomycin IV + Aztreonam IV + Metronidazole IV/PO ± Gentamicin IV	10-14 days (may need to be extended with inadequate source control)

[2a] Antibiotics may not be necessary in uncomplicated appendicitis or diverticulitis. Complicated diverticulitis includes patients with an abscess or fistula, those with sepsis or free air in the abdomen, or those that are immunosuppressed.

[2b] Isolation of staphylococci and yeast are uncommon in patients with community-acquired intra-abdominal infection. Use of agents effective against MRSA and yeast is not recommended in the absence of evidence that such organisms are involved in the infection. Therefore, the addition of antifungals for more severe community-acquired and complicated intra-abdominal infections is recommended if *Candida* is grown from intra-abdominal cultures.

[2c] Empiric antimicrobial coverage directed against MRSA should be provided to patients with healthcare–associated intra-abdominal infections who are known to be colonized with the organism or who are at risk of having an infection due to this organism because of prior treatment failure and significant antibiotic exposure.

[2d] History of recent hospitalization/intra-abdominal procedure or significant antibiotic exposure including quinolone prophylaxis may warrant the use of empiric piperacillin/tazobactam IV rather than ceftriaxone IV ± metronidazole IV/PO.

[2e] Severe PCN allergy (e.g., anaphylaxis, shortness of breath, angioedema, Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN)). Other reactions (especially those that occurred >5 years ago) may warrant a trial with a cephalosporin as opposed to using levofloxacin or aztreonam.

[2f] History of significant piperacillin-tazobactam antibiotic exposure and resistant organisms may warrant the use of cefepime IV + metronidazole IV ± gentamicin IV.

[2g] Diagnosis and Management of Complicated Intra-abdominal Infection in Adults and Children: Guidelines by the Surgical Infection Society and the Infectious Diseases Society of America; *Clin Infect Dis* 2010; 50:133-64.

[2h] In patients with adequate source control and complicated intra-abdominal infection, shorter durations (ie 4 days) were shown to have similar outcomes to longer durations (ie 8 days). "Trial of short-course antimicrobial therapy for intraabdominal infection." *N Engl J Med* 2015; 372:1996–2005

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GENITOURINARY					
UTI, UNCOMPLICATED, CYSTITIS	Uncomplicated UTI[3a] infection in a structurally and neurologically normal urinary tract (symptomatic) Most common organism: *E. coli*		Cephalexin PO OR Nitrofurantoin PO (only if CrCL >30 mL/min)	*If severe PCN-allergy[3b]:* Levofloxacin PO OR TMP-SMX PO	3 days(Levofloxacin, TMP-SMX) 5 days (Cephalexin, Nitrofurantoin)
UTI, COMPLICATED, PYELONEPHRITIS	Complicated UTI[3a]: infection in a urinary tract with abnormalities (e.g., suspected or known GU tract obstruction, pregnancy) Pyelonephritis[3a]: clinical syndrome characterized by flank pain or tenderness, or both, and fever, often associated with dysuria, urgency and frequency (upper tract infection) Common organisms: Enterobacteriaceae (usually *E. coli*),		Ceftriaxone IV *The use of piperacillin/tazobactam may be warranted in patients with frequent health care system contact, reside in a chronic care facility, or are immunocompromised*	*If severe PCN-allergy[3b]:* Aztreonam IV + Vancomycin IV	7-10 days For pyelonephritis, 10-14 days for beta-lactams, 5 days for high-dose levofloxacin[3e]
PYELONEPHRITIS IN NON-ADMITTED ED PATIENTS	Pyelonephritis[3a]: clinical syndrome characterized by flank pain or tenderness, or both, and fever, often associated with dysuria, urgency and frequency (upper tract infection)		Ceftriaxone IV x 1 dose, then cefixime PO	Gentamicin IV x 1, then levofloxacin PO[3f]	10-14 days (cefixime) 5 days (high-dose levofloxacin)[3e]
UTI, CATHETER-ASSOCIATED	Catheter-associated UTI (CA-UTI)[3a,3c,3d] : Significant bacteriuria with symptoms of a UTI (fever, flank tenderness, or suprapubic tenderness) Common organisms: *E. coli*, *K. pneumoniae*, *P. aeruginosa*, *P. mirabilis*, *Enterococcus* spp.		Piperacillin-tazobactam IV	*If severe PCN-allergy[3b]:* Aztreonam IV ± Vancomycin IV *The use of vancomycin may be warranted in patients with frequent health care system contact, reside in a chronic care facility, or are immunocompromised or have had prior enterococcal urinary tract infections*	5 days

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[3a] Diagnostic criteria for UTI: pyuria (>10 WBC/mm^3 of urine), significant bacteriuria: ≥ 10^5 bacteria/mL urine (≥ 10^4 for suspected pyelonephritis), symptoms of frequency, urgency, or dysuria. In certain settings, a CFU count < 10^5 may be indicative of a true infection.
Treatment of asymptomatic bacteriuria (defined as: ≥ 10^5 bacteria found in two consecutive voided urine specimens in women *or* a single clean-catch specimen in men; and ≥ 10^2 bacteria found in a single catheterized urine specimen in both men and women) is not recommended, EXCEPT in either pregnant women, or, or in the presence of neutropenia, or about to undergo urinary tract instrumentation or manipulation.

[3b] Severe PCN allergy (e.g., anaphylaxis, shortness of breath, angioedema, Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN)). Other reactions (especially those that occurred >5 years ago) may warrant a trial with a cephalosporin as opposed to using levofloxacin or aztreonam (e.g., 3rd-generation: ceftriaxone IV)

[3c] Removal or changing of the urinary catheter is recommended. With continued need for a catheter, catheter exchange during the treatment course is recommended (i.e., after a few days of treatment). Treatment of asymptomatic bacteriuria with/without pyuria does not appear to be useful in decreasing complications and is not recommended (possible exceptions: neutropenic, solid organ transplant, pregnancy, and patients undergoing urologic surgery).

[3d] The presence, absence, or degree of pyuria should not be used to differentiate CA-ASB (Catheter-Associated Asymptomatic bacteriuria) from CA-UTI (A-II). Pyuria accompanying CA-ASB should not be interpreted as an indication for antimicrobial treatment (A-II). Diagnosis, Prevention and Treatment of CA UTI, CID 2010;50:625-663.

[3e] "High dose levofloxacin" is 750 mg PO/IV Q24h, or the renally adjusted equivalent

[3f] Rate of levofloxacin resistance among E. coli exceeds 10% and as such, in patients with a severe penicillin allergy, an initial dose of gentamicin IV in the ED is strongly encouraged (5 mg/kg x1 if normal renal function, OR 2 mg/kg x1 if some renal insufficiency). If the use of gentamicin is not possible because of significant pre-existing renal insufficiency, initial treatment with levofloxacin may be considered with close follow up of clinical status and culture results.

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RESPIRATORY TRACT					
BRONCHITIS / COPD-EXACERBATION	*S. pneumoniae*, *H. influenzae*, *M. catarrhalis*, *M. pneumoniae*, *C. pneumoniae*		Azithromycin PO/IV OR Doxycycline PO		5 days
COMMUNITY-ACQUIRED PNEUMONIA* ***A pneumonia occurring < 48 hours after hospital admission can be treated as CAP**	*S. pneumoniae*, *H. influenzae*, *M. pneumoniae*, *M. catarrhalis*, *Legionella* spp. Suspected organisms altered by comorbidities (e.g., alcoholism, structural lung disease, post-viral, etc.)	Non-ICU Admission	Ceftriaxone IV + Either: Azithromycin PO[4a,4b] OR Doxycycline PO[4a,4b]	*If severe PCN-allergy[4c]:* Levofloxacin IV/PO[4a,4b]	5 days[4e]
		ICU Admission	Ceftriaxone IV + Azithromycin IV ± Vancomycin IV[4a,4b]	*If severe PCN-allergy[4c]:* Levofloxacin IV ± Vancomycin IV [4a,4b]	5-7 days
		Pseudomonas aeruginosa risk factors[4d]	Piperacillin-tazobactam IV + Azithromycin IV +/- Tobramycin IV[4a]	*If severe PCN-allergy[4c]:* Levofloxacin IV + Tobramycin IV[4a,4b]	5 days
HOSPITAL-ACQUIRED PNEUMONIA* / VENTILATOR-ASSOCIATED / PNEUMONIA (HAP/VAP) ***HAP is defined as a pneumonia occurring ≥ 48 hours after admission** Hospitalized and/or ventilated patients often colonized. Organisms isolated from respiratory cultures should only be treated if accompanied by the clinical signs/symptoms of pneumonia.[4f] Presence of pneumonia defined by a new or progressive infiltrate plus at least two of the following three clinical features: • fever greater than 38°C • leukocytosis or leukopenia • purulent secretions	Common organisms: *S. aureus*, antibiotic-sensitive enteric gram-negative bacilli	**HAP** Clinically stable without risk factors for multidrug-resistance (see below)	Piperacillin-tazobactam IV + Vancomycin IV[4g] *Consider ordering a "MRSA PCR Screening" (nares swab for MRSA).*	*If severe PCN-allergy[4c]:* Levofloxacin IV + Vancomycin IV	7 days[4h]
	Common organisms: As above, plus MDR pathogens including *P. aeruginosa, K. pneumoniae, Acinetobacter* spp., Methicillin-resistant *S. aureus* (MRSA)	**HAP in High Risk Patients** Septic shock Need for ventilation due to HAP **OR** With risk factors for multi-drug resistance: Prior receipt of IV antibiotics in the last 90 days	Piperacillin-tazobactam IV + Vancomycin IV + Tobramycin IV[4g] *Consider ordering a "MRSA PCR Screening" (nares swab for MRSA).*	*If severe PCN-allergy [4c]:* Aztreonam IV + Tobramycin IV + Vancomycin IV	7 days[4h]
	Common organisms: *S. aureus* (including MRSA), *P. aeruginosa, K. pneumoniae, Acinetobacter* spp.	**VAP** Pneumonia occurring ≥ 48 hours after intubation	Piperacillin-tazobactam IV + Vancomycin IV[4g] + Tobramycin IV *Consider ordering a "MRSA PCR Screening" (nares swab for MRSA.*	*If severe PCN-allergy[4c]:* Aztreonam IV + Tobramycin IV + Vancomycin IV	7 days[4h]

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[4a] Consider the addition of vancomycin IV in patients with severe necrotizing and/or cavitating pneumonia or severe post-influenza pneumonia (concern for community-associated MRSA).

[4b] Additional anaerobic coverage in not specifically needed in the majority of CAP cases. If a true aspiration pneumonia is suspected (pleuropulmonary syndrome in patients with a history of loss of consciousness as a result of alcohol/drug overdose or after seizures in patients with concomitant gingival disease or esophageal motility disorders), then consider the need for improved anaerobic coverage: ampicillin-sulbactam IV + (azithromycin IV/PO or doxycycline PO) OR for beta-lactam allergy, levofloxacin IV/PO + clindamycin IV/PO. Documentation in the medical record should indicate the need for this coverage due to true aspiration pneumonia.

[4c] Severe PCN allergy (e.g., anaphylaxis, shortness of breath, angioedema, Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN)). Other reactions (especially those that occurred >5 years ago) may warrant a trial with a cephalosporin as opposed to using levofloxacin or aztreonam (e.g., 3rd-generation: ceftriaxone IV or 4th-generation cefepime IV)

[4d] *Pseudomonas aeruginosa* risk factors: bronchiectasis, structural lung disease with repeated antibiotic or steroid use, residency in a skilled nursing facility

[4e] Treat with 5 days if afebrile 48-72 hours and no more than 1 CAP-associated sign of clinical instability (HR ≤100 bpm, RR ≤24 breaths/min, SBP ≥ 90 mmHg, O_2 sat ≥ 90%, able to take PO). At least 7 days may be required for patients who do not meet these criteria, are immunocompromised, and/or with structural lung disease.

[4f] For patients with suspected VAP, for which quantitative cultures are obtained, the threshold below which discontinuation of antibiotic therapy for VAP may be considered is 10^4 cfu/mL for bronchoalveolar lavage (BAL or mini-BAL).

[4g] Consider ordering a "MRSA PCR Screening" (nares swab for MRSA) in all HAP/VAP patients. A negative nares MRSA PCR has excellent negative predictive value for excluding MRSA pneumonia, warranting early discontinuation of vancomycin in clinically stable patients.

[4h] Efforts should be made to shorten the duration of therapy from the traditional 14 days to periods as short as 7 days

Note: The concept of Healthcare-associated pneumonia "HCAP" has been removed from the guidelines based on recommendations from 2016 Clinical Practice Guidelines by Infectious Diseases Society of America and the American Thoracic Society: Management of Adults with Hospital-acquired and Ventilator-associated Pneumonia. *Clin Infect Dis*. 2016 Sep 1;63(5):e61-e111. The definition was removed from these guidelines because of increasing evidence that many patients defined as having HCAP may not be at high risk for MDR pathogens and that other patient-specific risk factors, such as exposure to antibiotics, are more important risk factors.

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SUSPECTED BACTEREMIA					
BACTEREMIA (INTRAVASCULAR CATHETER-ASSOCIATED[5a] ORUNKNOWN SOURCE[5d]) [5e]	*S. aureus*, *S. epidermidis*, enterococci, gram-negative organisms including *P. aeruginosa*		Vancomycin IV + Piperacillin-tazobactam IV ± Tobramycin IV[5d]	*If severe PCN-allergy[5b]:* Vancomycin IV + Aztreonam IV ± Tobramycin IV	Dependent on source and pathogen [5c]

[5a] Intravascular catheters should be removed whenever possible. Treatment duration usually 7-14 days depending on pathogen and catheter removal.

[5b] Severe PCN allergy (e.g., anaphylaxis, shortness of breath, angioedema, Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN)). Other less severe reactions (especially those that occurred >5 years ago) may warrant a trial with a fourth-generation cephalosporin (cefepime) or carbapenem (meropenem) as opposed to using aztreonam

[5c] Selected pathogens may require a longer duration of therapy based on the following considerations: pathogen, potential secondary sites of seeding, the presence/absence of endocarditis, and the presence of indwelling intravascular catheters or prosthetic devices. *S. aureus* bacteremia warrants a thorough evaluation including echocardiogram and often requires at least 28 days of therapy.

[5d] Therapy must be individualized based on severity of illness, previous antibiotic use and culture histories, and probable source of infection. With a history of multiple antibiotics or resistant organisms, initial therapy with cefepime IV + gentamicin IV or meropenem IV + gentamicin IV may be warranted.

[5e] If positive blood cultures are obtained, please refer to Table 2 in the Antimicrobial Recommendations Based on Rapid Identification of Blood Culture Organisms in Adults guideline to guide antimicrobial therapy

SKIN/SOFT TISSUE					
CELLULITIS	Acute infection of the skin and subcutaneous tissue Common organisms: *S. aureus*, *Streptococcus* spp.	Non-purulent	Cefazolin IV/Cephalexin PO[6a]	*If severe PCN-allergy:* Clindamycin IV/PO [6a]	5-7 days[6j]
	Common organisms: *S. aureus*	Purulent	TMP-SMX IV/PO OR Vancomycin IV	*If sulfa-allergy[6b]:* Doxycycline IV/PO OR Vancomycin IV	5-7 days[6j]
DIABETIC FOOT AND OTHER SUPERFICIAL SKIN ULCERS[6e]	Non-limb threatening and clinically stable without systemic signs of infection Common organisms[6c]: polymicrobial (*S. aureus*, streptococci, gram-negative	Chronic ulcer without signs/symptoms of active infection (e.g., purulence, or erythema, pain, tenderness, warmth, or induration)	Antibiotics usually not necessary[6d]		

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	bacilli, anaerobic gram-positive cocci, and *Bacteroides* spp.)	Signs/symptoms of significant infection (e.g., purulence, or erythema, pain, tenderness, warmth, or induration)	Ampicillin-sulbactam IV[6a]	*If severe PCN-allergy[6b]:* Aztreonam IV + Clindamycin IV/PO[6a]	7–10 days[6f]
	Limb-threatening, clinically unstable, or requiring ICU stay Common organisms[6c]: polymicrobial as above		Piperacillin-tazobactam IV + Vancomycin IV	*If severe PCN-allergy[6b]:* Aztreonam IV + Metronidazole IV/PO + Vancomycin IV[6e]	7–14 days[6f]
NECROTIZING FASCIITIS[6e]	Often polymicrobial (*S. aureus*, streptococci, gram-negative bacilli, anaerobes)		Vancomycin IV + Piperacillin-tazobactam IV + Clindamycin IV[6g]	*If severe PCN-allergy[6b]:* Vancomycin IV + Levofloxacin IV + Clindamycin IV[6g]	10-14 days
WOUND INFECTION	Often polymicrobial (*S. aureus*, streptococci, gram-negative bacilli)	Post-trauma / animal or human bites	Ampicillin-sulbactam IV OR Amoxicillin-clavulanate PO	*If severe PCN-allergy[6b]:* Clindamycin IV/PO + Doxycycline PO	7 days
SURGICAL SITE INFECTION (SSI)	*S. aureus*, Group A streptococci, gram-negative bacilli; if surgery involves GI tract, then also anaerobes, enterococci, other *Streptococcus* spp.	Superficial Incisional[6h]	Cefazolin IV/Cephalexin PO + TMP-SMX IV/PO OR Vancomycin IV	*If severe PCN-allergy:* Clindamycin PO + TMP/SMX PO OR Vancomycin IV	3–5 days[6i]
		Deep Incisional	Vancomycin IV[6e] ± Piperacillin-tazobactam IV *The addition of piperacillin-tazobactam is recommended in patients with recent gastrointestinal and/or genitourinary surgery*	*If severe PCN-allergy[6b]:* Vancomycin IV ± Levofloxacin IV/PO ± Metronidazole IV/PO *The addition of levofloxacin IV/PO and metronidazole IV/PO is recommended in patients with recent gastrointestinal and/or genitourinary surgery*	3–5 days[6i]
		Organ / Space	Vancomycin IV + Piperacillin-tazobactam IV	*If severe PCN-allergy[6b]:* Vancomycin IV + Levofloxacin IV/PO ± Metronidazole IV/PO	7 days

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[6a] Consider the addition of vancomycin IV in patients known colonized with MRSA or MRSA isolated from the wound. Clindamycin may not be appropriate alternative when MRSA is suspected as susceptibilities of MRSA to clindamycin may range from ~40-70%.

[6b] Severe PCN allergy (e.g., anaphylaxis, shortness of breath, angioedema, Steven's Johnson Syndrome (SJS), Toxic Epidermal Necrolysis (TEN)). Other reactions (especially those that occurred >5 years ago) may warrant a trial with a cephalosporin as opposed to using levofloxacin or aztreonam. (e.g., 3rd-generation: ceftriaxone IV, 4th generation: cefepime IV)

[6c] Deep tissue cultures provide the most reliable bacteriologic information in diabetic foot infections. Superficial swabs not recommended.

[6d] Diagnosis and Treatment of Diabetic Foot Infections *Clin Infect Dis* 2012;54:132-173. Ensure appropriate wound care for clinically uninfected ulcers.

[6e] Antimicrobials are mostly in conjunction with surgical management: wound incisional drainage, debridement, and abscess drainage.

[6f] Duration of therapy recommended does not include treatment for osteomyelitis.

[6g] The addition of clindamycin is recommended to decrease toxin production in cases of streptococcal and staphylococcal toxic shock syndromes.

[6h] Most superficial SSI simply involves incisional drainage to evacuate the infected material, antibiotics may not be necessary.

[6i] Longer treatment courses are indicated in the presence of a prosthetic device

[6j] Longer treatment courses may be considered in the absence of clinical improvement

RESPONSIBILITY:
Joint Subcommittee on Anti-Infective Use

POLICY/GUIDELINE DATES:

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