

Select Antimicrobial Stewardship Mythbusters

Urinary Tract Infection (UTI)

UTIs are one of the most frequent indications for antimicrobial use, but it is estimated that they are misdiagnosed 39% of the time. It is critical for patient care and antimicrobial stewardship that UTI be distinguished from asymptomatic bacteriuria.

MYTH: The urine is cloudy and smells bad. My patient has a UTI.

- Urine color, clarity, or odor should not be used alone to diagnose UTI or start antibiotics in ANY patient population.

Urine Clarity and UTI Diagnosis			
Sensitivity	Specificity	PPV	NPV
13.3%	96.5%	40%	86.3%

- Foul-smelling urine is an unreliable indicator of infection, and is usually more dependent on patients' hydration status, recent diet, and concentration of urea in the urine. Consider hydration therapy and symptoms prior to UTI workup.

MYTH: My patient has pyuria (presence of WBC in the urine) or bacteriuria. My patient has a UTI.

Pyuria:

- Non-infectious causes of pyuria include acute renal failure, STIs, or the presence of a bladder catheter.
- A UA with WBC count <10 may reflect hydration status and should not be used alone to support a diagnosis of UTI.

Bacteriuria:

- Asymptomatic bacteriuria (ASB) is the presence of bacteria in the urine in the absence of symptoms, and should generally not be treated with antibiotics (exceptions: pregnant women and patients undergoing urologic procedures).
- Unnecessary treatment of ASB is common and increases the risk of adverse events and risk of drug resistant organisms.

UTI is NOT a laboratory-defined diagnosis. Diagnosis should be made based on clinical signs/symptoms of UTI or infection, then confirmed by microscopy/culture.

- Common urinary symptoms → Dysuria, frequency, urgency
- Systemic signs of infection → Fever, elevated WBC count

UA Reflex Criteria: Need TWO or more of the following

Mod-Large LE, positive nitrites, ≥ 10 WBC
(sample not run if moderate or greater epithelial cells present)

Positive laboratory workup for UTI should include UA that reflexes to urine culture and finalizes with growth of a predominant organism.

MYTH: My elderly patient has altered mental status or presented with a fall. My patient has a UTI.

- Altered mental status and falls in the elderly are caused by many factors. Evidence of systemic infection (fever, leukocytosis) or other signs/symptoms of UTI (especially dysuria) should be present to make a UTI diagnosis.
- In the absence of clinical instability or other signs of UTI, elderly patients with acute mental status changes accompanied by bacteriuria and pyuria can reasonably be observed without antibiotics for resolution of confusion for 24-48h while evaluating for other causes of confusion including dehydration.

In most cases, it is safe to say: if there is symptom-free pee, LET IT BE!

Aspiration Pneumonia

Aspiration pneumonia is a bacterial lung infection that results from aspiration of oropharyngeal and gastric contents in sufficient amounts to cause alveolar and systemic inflammation.

- Considered a subset of CAP or HAP depending on environment of pneumonia onset.
- Historically, anaerobic bacteria were thought to be the predominant pathogen in aspiration pneumonia.

MYTH: Coverage of anaerobic pathogens is necessary in treatment of aspiration pneumonia.

Emerging consensus is that aspiration pneumonia is polymicrobial and reflective of oral hygiene and living environment that may modify normal colonizing flora.

- The 2019 ATS and IDSA guidelines for CAP recommend to NOT routinely add anaerobic coverage in patients with aspiration pneumonia, and to treat with standard first-line CAP or HAP agents such as ceftriaxone.
 - Exceptions: anaerobic coverage should be considered in cases of pulmonary abscess or empyema.
- Adding unnecessary anaerobic coverage increases risk for Clostridium difficile infection as well as antimicrobial resistance.

Gram Negative Bacteremia

MYTH: My patient has a bacteremia due to enteric gram negative bacilli. Longer treatment is necessary.

- Gram-negative pathogens are less likely to seed distal anatomical sites and therefore are less likely to lead to recurrence of bacteremia, abscess, or endocarditis.
- Gram negative bacteremia often arises from a urinary source.
 - Most antibiotics reach high bactericidal concentrations in the urine, promoting rapid clearance of the source of infection and bacteremia.
- Multiple trials have shown that a 7 day duration is noninferior to a 14 day duration for uncomplicated gram negative bacteremia.
 - Shortening durations is an important antimicrobial stewardship strategy to decrease unnecessary antibiotic use and curb development of resistance.
- Longer courses should still be utilized for complicated gram negative bacteremias, including if:
 - Source control is not readily achievable.
 - The bacteremia is complicated by endocarditis.
 - The pathogen is noted to have significant resistance risks (i.e. *Pseudomonas aeruginosa*, *Acinetobacter baumannii*).
 - The patient is severely immunosuppressed.

Sensitivity results are from all specimens tested by SPH Laboratory (both inpatient and outpatient).

Restricted Agents: Certain antimicrobial agents are restricted and require approval by the Antimicrobial Stewardship team prior to use based on best-practice criteria. Such agents include Linezolid, Daptomycin, Meropenem, Ertapenem, Ceftaroline, Oritavancin, Fosfomycin, Tigecycline, Fidaxomicin, Voriconazole, Anidulafungin, and fecal microbiota transplant.

AMS Pharmacist Extension: 447-2450

St. Peter's Health

Microbiology and Pharmacy Departments

Antibiotic Sensitivity Profile for Period January-December 2024

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St. Peter's Health Antibiotic Sensitivity Profile 2024	# Isolates	Ampicillin/Sulbactam	Ampicillin	Cefazolin	Cefotaxime	Ceftazidime	Cefepime	Ceftriaxone	Ciprofloxacin	Clindamycin	Daptomycin	Ertapenem	Erythromycin	Gentamicin	Imipenem	Levofloxacin	Linezolid	Meropenem	Minocycline	Nitrofurantoin ²	Oxacillin(nafcillin)	Penicillin	Piperacillin/Tazobactam	Rifampin	Tetracycline	Tobramycin	Trimethoprim/Sulfa	Vancomycin
Staphylococcus aureus <i>MRSA</i> ³	103									72	100		11	100			100		100	100				100	86		98	100
Staphylococcus aureus <i>MSSA</i>	344									81	99		72	100			100		100	100	100			100	93		98	100
Staphylococcus lugdunensis	57									90	100		90	100			100		100	100	96			100	100		100	100
Coagulase negative Staphylococcus	108									65	100		36	95		79	100		100	100	56			100	82		72	100
Streptococcus pneumoniae ⁴	22				90			86		90			65			100	100					80			100		95	100
Streptococcus anginosus	29		100		100			100		70			56				96								52			100
Enterococcus species ¹	86		100						94	100						94	100			100					34			100
Escherichia coli	1744	73	64	95		96	98	96	91			100		93	100	91				98			100			94	97	
Klebsiella aerogenes	33			0		82	100	76	100			93		100	85	100				26			100			97	97	
Enterobacter cloacae complex	58			0		78	98		100					98	95	100				57			100			100	97	
Klebsiella oxytoca	55	60	0	87		98	100	94	100			100		97	100	100				91			100			98	93	
Klebsiella pneumoniae	234	90	0	96		96	98		98			100		99	99	99				52			100			99	95	
Proteus mirabilis	78	95	86	100		100	100	100	88			100		91	19	90							100			92	79	
Pseudomonas aeruginosa	133					95	100		97					98	99	96		100					100			99		

Values are reported as percent susceptible.

Group B strep and group A strep can be considered 100% susceptible to penicillin, ampicillin and cefazolin therefore sensitivities are not routinely done and alternatives should only be considered in penicillin-allergic OB patients or for serious infections.

¹ Includes E. faecalis and other Group D enterococci (including non-faecium and non-faecalis species, some of which (i.e. E. gallinarum and E. casseliflavus) are intrinsically resistant to vancomycin).

Ampicillin is the drug of choice for UTI's caused by Enterococci. Ampicillin is highly concentrated in the urine meaning Enterococci remains susceptible to urinary concentrations of ampicillin 100% of the time even if the MIC is resistant. Sensitivities are performed on all sources except outpatient urine cultures.

² Sensitivities are only tested on urine cultures.

³ All Staph aureus MRSA species are 99% susceptible to daptomycin.

⁴ Sensitivities for S. pneumoniae only tested on 22 isolates but improved/stable trend from 2020-2022.