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Antimicrobial Stewardship: Molecular Lab Result

Powered by Report ID
DEMO-08Patient
Jane DoeDOB
12/05/1936Collected
8/26/2026, 9:15:00 AMSpecimen Type
Diaper urine swabProvider
Dr. DemoResulted
8/26/2026, 6:05:00 PMReceived
8/26/2026, 1:40:00 PM

Infection Complexity



Organisms Detected

- Escherichia coli
- Enterococcus faecalis
- Proteus mirabilis

Resistance Detected

NON-ACTIONABLE

☐ Sulfonamide☒ Nitrofurantoin **RETAINED**

Antimicrobial Resistance



Allergies

None reported

Interactions

UNCOMPLICATED CYSTITIS

Trimethoprim-sulfamethoxazole

1 contraindicated · 10 major · 7 moderate

Do not co-administer: Antiarrhythmics



COMPLICATED / PYELONEPHRITIS

Ceftriaxone

0 contraindicated · 5 major · 1 moderate

Major: Aminoglycosides, Cytotoxic chemotherapy, Antacids/cations, Azole antifungals +1 more



Infection Control

Standard only - no added precautions: E. coli, E. faecalis, P. mirabilis

#1 RECOMMENDED TREATMENT PLAN

COMPLICATED UTI / PYELONEPHRITIS

Ceftriaxone

Cephalosporin

Broad

Dose: 1-2 g IV/IM QD for 7 days if clinically improving

GUIDELINE / FDA

Est. \$6.98/7d

COVERAGE

- ☒ E. coli
- ☒ E. faecalis
- ☒ P. mirabilis

☒ covers ☒ not covered ☒ variable* — confirm by culture

UNCOMPLICATED CYSTITIS

Trimethoprim-sulfamethoxazole

Sulfonamide

Moderate

Dose: 1 DS (160/800 mg) PO Q12H x 3 days

GUIDELINE

DOSE ADJ: RENAL

CHECK HEPATIC FN

Est. \$0.73/7d

COVERAGE

- ☒ E. coli
- ☒ E. faecalis
- ☒ P. mirabilis

CLINICAL RATIONALE

Uncomplicated cystitis

Trimethoprim-sulfamethoxazole was selected to cover Escherichia coli as a first-line oral agent; it may cover Proteus mirabilis only if susceptibility testing confirms activity. This option does not cover Enterococcus faecalis. In mixed urine an enterococcus frequently represents colonization or asymptomatic bacteriuria, so treat only if clinically significant: urinary symptoms plus a supportive culture and collection context. This is not an instruction to broaden therapy — direct any treatment by culture and susceptibility results. It is appropriate for uncomplicated cystitis. Its high oral bioavailability supports oral therapy. This option applies only if the patient has urinary symptoms and no pyelonephritis, catheter or obstruction; if any of those is present, use the complicated UTI option above.

Complicated UTI / pyelonephritis

Ceftriaxone was selected to cover Escherichia coli and Proteus mirabilis as a first-line intravenous agent. The plan does not cover Enterococcus faecalis. In mixed urine an enterococcus frequently represents colonization or asymptomatic bacteriuria, so treat only if clinically significant: urinary symptoms plus a supportive culture and collection context. This is not an instruction to broaden therapy — direct any treatment by culture and susceptibility results.

WHEN SHOULD THIS BE TREATED? ‡

Do not treat asymptomatic bacteriuria unless before a urologic procedure. This assay cannot distinguish uncomplicated cystitis from a complicated UTI / pyelonephritis — choose from the option(s) above based on the clinical picture (fever, flank/CVA-angle tenderness, obstruction).

DISCLAIMER — For clinical decision support only; not a diagnosis, and the patient was not examined. The reporting laboratory assumes no liability for the actions of physicians, facilities, or other users and is not responsible for injury, death, or damage from use, misuse, or interpretation; drug failure is possible, and independent assessment of indications, contraindications, and side effects is required.

Molecular (PCR) assay — detects nucleic acid and only the panel's validated organisms and resistance genes, not phenotypic susceptibility; off-panel organisms, genes, and variants are not detected. Gene detection does not always predict resistance and gene absence does not establish susceptibility, so a negative result does not preclude infection or resistance. Recommendations reflect typical genotype-phenotype relationships and published guidance, not this patient's measured MICs. Confirm the organism and susceptibility with reflex culture and phenotypic AST, correlate clinically, and do not use this report as the sole basis for diagnosis, treatment, or patient management. (IDSA AMR guidance 2026; CDC AR guidance.)

* Printed doses are standard adult regimens, or the weight-based pediatric/neonatal dose when a pediatric age and weight are provided (a per-kg guideline plus a computed absolute for the supplied weight where pediatric/neonatal dosing data exist). All doses assume normal renal and hepatic function — the report flags where renal or hepatic adjustment may be needed but does not calculate that adjustment; resistance varies, so confirm dosing for the individual patient. ‡ Guidance is limited to the detected panel targets for the reported specimen plus any clinical details supplied, and is not a substitute for full clinical assessment. "First-line" and "alternative" denote this report's ranked recommendation for the detected organism and specimen source, not an endorsement by an outside body; the Drug Selection Basis panel states the evidence class behind that ranking. § Pricing is an estimate based on national-average wholesale benchmarks and may differ from actual acquisition cost. Recommendations are derived from freely available, peer-reviewed literature and U.S. government and professional-society guidance. Interpretive recommendations are generated by decision-support software from Open Laboratory Solutions, LLC, validated for clinical use by this laboratory; not FDA cleared/approved; CLIA regulated.

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ALTERNATIVE TREATMENTS

#	Drug (Generic / Brand)	Class	Coverage	Dose	
#2	Amoxicillin-clavulanic acid / Augmentin	Penicillin Moderate	E. coli E. faecalis P. mirabilis	875/125 mg PO Q8H for 7 days if clinically improving	~\$4.39/7d Ref.
				DOSE ADJ: RENAL	
#3	Ciprofloxacin / Cipro	Fluoroquinolone Broad	E. coli E. faecalis P. mirabilis	500 mg PO Q12H for 5-7 days if clinically improving	~\$2.29/7d Current
				DOSE ADJ: RENAL	
#4	Amoxicillin / Moxatag	Penicillin Moderate	E. coli E. faecalis P. mirabilis	1 g PO Q8H for 7 days if clinically improving	~\$2.11/7d Current
				DOSE ADJ: RENAL	

CLINICAL WARNINGS

SEVERITY	CLASS / AGENTS	KEY RISKS	ACTION
AGS Beers Avoid	trimethoprim-sulfamethoxazole	- Increased risk of hyperkalemia when used concurrently with an ACEI, ARB, or ARNI in presence of decreased CrCl. - Increased risk of worsening of kidney function and hyperkalemia; risk of hyperkalemia especially prominent with concurrent use of an ACEI, ARB, or ARNI. - With warfarin: Increased risk of bleeding - With phenytoin: Increased risk of phenytoin toxicity	USE WITH CAUTION in patients on ACEI, ARB, or ARNI and decreased CrCl. Risk of hyperkalemia especially prominent with concurrent RAS inhibitors. Reduce dosage if CrCl is 15-29 mL/min. Avoid if CrCl <15 mL/min. With warfarin: avoid when possible; if used together, monitor INR closely. With phenytoin: avoid.
AGS Beers	ciprofloxacin	- Increased risk of CNS effects (e.g., seizures, confusion) and tendon rupture. - With warfarin: Increased risk of bleeding - With theophylline: Increased risk of theophylline toxicity	Dosages used to treat common infections typically require reduction when CrCl <30 mL/min. With warfarin: avoid when possible; if used together, monitor INR closely. With theophylline: avoid.

 FDA BOXED WARNINGS

FLUOROQUINOLONE

Serious adverse reactions including tendinitis, tendon rupture, peripheral neuropathy, central nervous system effects and exacerbation of myasthenia gravis. Fluoroquinolones have been associated with disabling and potentially irreversible serious adverse reactions...



Ciprofloxacin

Scan/click: full FDA label

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INTERPRETIVE NOTES

RESISTANCE INTERPRETATION

sul1 confers sulfamethoxazole-component resistance only; trimethoprim-sulfamethoxazole (TMP-SMX) combination resistance requires a separate trimethoprim (dfr/dhfr) determinant, which was not detected on this specimen. TMP-SMX is not removed on this marker alone — confirm activity by culture with susceptibility testing.

nfsA is a loss-of-function nitrofurantoin-resistance determinant: resistance arises when the nitroreductase is INACTIVATED, so detecting the gene does not indicate nitrofurantoin resistance (if anything it suggests the drug can still be activated). Nitrofurantoin is retained; correlate with phenotypic susceptibility.

This report **does not establish** whether the agents below are active against the organisms treated here. For COMPLICATED UTI / PYELONEPHRITIS: ceftriaxone. The ranking reflects the organisms identified and published susceptibility patterns for them, not testing of this patient's isolate. If therapy is given, this is not a reason to broaden it. If an isolate is recovered, susceptibility testing answers this directly.

DRUG-USE CAUTIONS

trimethoprim-sulfamethoxazole: Use only if susceptibility confirmed

ADDITIONAL CONSIDERATIONS

No single agent covers all 3 detected pathogens. #1 recommendation covers 2/3. Combination therapy or targeted culture-guided therapy may be needed.

Enterococcus faecalis was detected on a voided specimen with multiple organism types, which more often reflects periurethral or vaginal flora than infection, so no empiric enterococcal agent was added; current complicated-UTI guidance reserves broader empiric coverage for patients with sepsis, and asymptomatic bacteriuria is not treated in older or long-term-care patients. If culture confirms a predominant Enterococcus faecalis in a symptomatic patient, ampicillin or amoxicillin is the agent of choice (a vancomycin-resistance gene does not predict beta-lactam resistance; confirm by susceptibility testing).

ORAL STEP-DOWN: an oral regimen may cover the organisms this plan treats ONLY if phenotypic susceptibility testing confirms activity: amoxicillin-clavulanic acid (the estimate for Proteus mirabilis reflects an expected species phenotype rather than a measured series of isolates, so it is not used here to support an empiric claim; this panel detects resistance genes and cannot confirm susceptibility — a negative gene result does not establish that amoxicillin-clavulanic acid is active, so obtain a culture before switching). This regimen does not cover Enterococcus faecalis; see the coverage gaps above. Whether Amoxicillin-clavulanic acid is active against Enterococcus faecalis cannot be established from this panel - direct that by culture and susceptibility. In an older or functionally impaired patient a voided specimen with multiple organism types more often reflects contamination or asymptomatic bacteriuria; confirm symptoms before treating.

Diaper-collected urine — high contamination, interpret with caution (diaper specimen). Recognized uropathogen present; treat only with clinical correlation and confirm with a properly collected specimen.

SPECIAL CONSIDERATIONS ‡

Escherichia coli

E. coli is the most common cause of urinary tract infection. Fluoroquinolone resistance is rising in E. coli — confirm susceptibility before use. Base UTI therapy on the ranked, susceptibility-reconciled recommendations above, which distinguish uncomplicated cystitis from complicated or upper-tract (pyelonephritis) disease.

Enterococcus faecalis

Enterococci are intrinsically resistant to cephalosporins (all generations), aminoglycosides (low-level; high-level is acquired), clindamycin, and TMP-SMX (may test susceptible in vitro but is ineffective in vivo). Ampicillin is the drug of choice for susceptible strains.

Intrinsic Resistance: Carbapenem (ertapenem) Cephalosporin Aminoglycoside (low-level) Lincosamide

Trimethoprim-Sulfamethoxazole (in vivo)

Proteus mirabilis

P. mirabilis is intrinsically resistant to nitrofurantoin and tetracyclines. Urease-producing — alkalizes urine causing struvite kidney stones. Unlike other Enterobacterales, generally susceptible to ampicillin. Common cause of complicated UTI and catheter-associated UTI.

Intrinsic Resistance: Nitrofurantoin Tetracycline Polymyxin (colistin)

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