

5 Tips to Improve Antibiotic Stewardship in Your Emergency Department

February 18, 2020 by **Robert Redwood, MD, MPH, FACEP; Larissa May, MD, MSPH, MSHS; and Michael Pulia, MD, MS, FACEP**

You may already know the names: vancomycin-resistant *Staphylococcus aureus* (VRSA), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), extended-spectrum beta-lactamase (ESBL) *Escherichia coli*. These are just some of the next-generation “superbugs” that are popping up in emergency departments across the United States. In 2018, 12 of the most concerning multidrug-resistant organisms (MDROs) were ranked by lethality, earning the nickname “the dirty dozen.”¹ More concerning is that some of these bacteria, like the carbapenem-resistant *Klebsiella pneumoniae* that recently resulted in fatal sepsis for a woman in Reno, Nevada, are resistant to all available antibiotics. In other words, they are invincible.²

Or are they? The antibiotic pipeline has largely dried up in recent years, so what can emergency physicians do to combat MDROs?³ Antibiotic stewardship.⁴ As Benjamin Franklin said, “An ounce of prevention is worth a pound of cure.”

When we unnecessarily prescribe antibiotics for viruses, misdiagnose noninfectious conditions (eg, pseudocellulitis), or provide suboptimal antibiotic regimens, we exert selective pressure on our local community’s biome. Selective pressure encourages resistant bacteria to thrive by killing off weaker bacteria.

It is not too late. We are living in a crucial time. The prevalence of superbugs remains low in most communities. By practicing what we call the “5 D’s of antibiotic stewardship”—right diagnosis, right drug, right dose, right duration, right de-escalation—we can reduce the prevalence of MDROs in our hospitals and communities.⁵ Future generations will thank us—or better yet, they won’t even realize they have to.

Meet the 5 D’s

Here are the 5 D’s applied to emergency medicine practice.

- **Right Diagnosis:** Take a diagnostic stand and call a virus a virus. Acute otitis media, bronchitis, sinusitis—all of these entities are far more often viral than bacterial. When the patient is not seriously ill, is not immunocompromised, and clearly had a recent viral prodrome, you can usually avoid antibiotics.

- **Right Drug:** For patients with uncomplicated bacterial infections that require antibiotics, consult your institution’s ED antibiogram to identify the most common causative organism and narrowest spectrum agent that is typically effective (eg, nitrofurantoin for *Escherichia coli*).
- **Right Dose:** Practice weight-based dosing of antibiotics for pediatric patients, and for noncritically ill adults, err on the low side of the suggested dose range.
- **Right Duration:** It is a poorly-kept secret in medicine that the recommended length of most antibiotic regimens was chosen arbitrarily in initial studies and has been subject to inertia ever since. When offered a range of duration of therapy, choose the shortest duration. If you are prescribing any antibiotic for more than seven days, favor a shorter course.⁶⁻⁹
- **Right De-escalation:** Antibiotic de-escalation is a new trend in emergency medicine. Emergency physicians make decisions that generate therapeutic momentum for inpatient antibiotic prescribing. The act of simply writing in the chart, “These broad-spectrum agents should be narrowed to a single-effective agent once culture results have returned,” can save your patients days of unnecessary antibiotics.

For those looking for more specific ways to implement the 5 D’s, we have provided our five tips you can use on your next shift (see Table 1).

TIP	RATIONALE
Avoid “double coverage” for uncomplicated cellulitis.	The addition of methicillin-resistant <i>Staphylococcus aureus</i> coverage for uncomplicated, nonpurulent cellulitis does not reduce treatment failure rates. ^{9,10}
Do not use antibiotics for asymptomatic pyuria or bacteriuria in immunocompetent, nonpregnant patients.	The 2019 Infectious Diseases Society of America clinical practice guidelines indicate that routine prescribing should be avoided, even for older adults with cognitive impairment, in favor of close observation. ¹¹
Utilize severity of illness and evidence-based scoring systems to determine which patients with pneumonia require broad-spectrum antibiotics.	Health care–associated pneumonia is no longer considered a valid paradigm; instead use clinical severity and/or the Drug Resistance in Pneumonia (DRIP) score to determine which pneumonia patients require broad-spectrum antibiotics. ¹²
Consider watch-and-wait (delayed) prescribing for uncomplicated infections.	This strategy has demonstrated dramatic reductions in antibiotic use for respiratory conditions (eg, otitis media). ¹³

(click for larger image) **Table 1: Top 5 Tips to Improve Antibiotic Stewardship in the Emergency Department**

Become a Champion for Your ED

Ready for the next level? What about becoming an ED antibiotic stewardship champion or starting an ED-specific antibiotic stewardship program? Yes, this is in our wheelhouse!

Hospital antibiotic stewardship programs are now required by The Joint Commission and the Centers for Medicare & Medicaid Services (CMS), and emergency medicine needs to

have a seat at the germ-infested table. Practicing at the intersection of the community and the hospital, we are the frontline providers for patients with MDROs. Our role is to try to select the correct initial antibiotic, despite diagnostic uncertainty. This unique and often challenging task requires an informed plan. We, as emergency physicians, should be the ones making the plan, not just following orders from others who don't have experience doing what we actually do.

For an in-depth implementation guide to antibiotic stewardship in the emergency department, check out the **MITIGATE toolkit**. This tool takes the Centers for Disease Control and Prevention's recommended core elements for outpatient antibiotic stewardship (which include a commitment to using antibiotics appropriately, implementing one policy or practice, tracking and reporting, education, and expertise) and adapts them to emergency department and urgent care settings. The toolkit leverages improvement science and behavioral economics to nudge clinicians to do the right thing in avoiding antibiotics for viral infections.

ED champions are critical to any program's success. Interventions are more effective when they take the unique ED environment and workflow into account.

Still on the fence about leading the antibiotic stewardship charge? There are plenty of other ways you can start to engage beyond day-to-day patient care.

First, make sure someone from your emergency department sits on the antibiotic stewardship committee. Think about how local guidelines and clinical pathways can support better antibiotic use. For instance, do you really need a urine sample in the nurse-driven order set for chest pain? How about working with pharmacy and therapeutics to develop an empiric antibiotic prescribing guide based on antibiograms for your emergency department? The same goes for sepsis order sets, which should include evidence-based empiric antibiotic prescribing decision support. We can even facilitate de-escalation by making sure relevant cultures are ordered.

The goal of antibiotic stewardship programs is to improve patient outcomes, but they can also make your life easier. Find out the pain points to optimizing antibiotic use in your emergency department and then design a simple quality improvement project to fix them. There are a number of stewardship targets to explore, and some of these efforts can be made seamless through the use of behavioral nudging—for example, setting a default duration for antibiotics in your electronic health record by indication or making the first-line agents pop up for the default diagnosis. These fixes are better for patient care, they preserve physician autonomy, and they require fewer clicks. Win-win-win.

The fight against superbugs and MDROs is not coming to our emergency department's doorstep; it is already here. As the frontline physicians for any epidemic, we will be the ones wearing the hazmat suits, placing the central line to hang the fourth antibiotic, and watching our patients suffer. ACEP has a team of emergency physicians working to prepare antibiotic stewardship resources for our workforce. In the meantime, we ask, Are you ready to step up and be an antibiotic steward? Is your emergency department ready for an antibiotic stewardship program? And before we just throw broad-spectrum agents into an IV, what the heck is the source of that 102°F fever in the patient in bed four?

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