

## Antimicrobial Resistance: Stopping “Nightmare Bacteria” in their Tracks

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“Antimicrobial resistance poses a fundamental threat to human health, development and security,” stated Dr. Margaret Chan, former director-general of the World Health Organization at a [UN meeting](#) of world leaders in 2016. The issue remains a significant concern in both developed and developing countries in 2018. According to the [Centers for Disease Control and Prevention](#) (CDC), two million Americans develop antibiotic-resistant infections each year, and over 23,000 die from them. Others can suffer long-term and debilitating effects.

Now, there is [a report](#) from the new CDC Antibiotic Resistance Laboratory (AR Lab) Network that over 200 rare and unusual antibiotic-resistant *genes* have been found in antibiotic-resistant bacteria from 27 states. These bacteria include members of a large family known for their ability to cause intestinal upset (carbapenem-resistant Enterobacteriaceae [CRE]) and another that is one of the most common pathogens infecting patients in hospitals (*Pseudomonas aeruginosa*). These “nightmare” bacteria can cause infections that are difficult or impossible to treat, [according to CDC’s Dr. Anne Schuchat](#), Principal Deputy Director of CDC.

The genes were discovered in samples collected in 2017 that included pneumonia, bloodstream infections and urinary tract infections. Through its AR Lab Network, CDC has adopted an aggressive strategy to stop antimicrobial-resistant bacteria in their tracks. Fortunately, the strategy is already yielding results.



*Frequent handwashing and disinfecting frequently touched surfaces are two of the most important infection control strategies in healthcare facilities.*

## *Spreading Like Wildfire*

As CDC notes, antibiotic-resistant pathogens can spread like wildfire: the more they spread, the harder they are to control. Antimicrobial resistance genes in “nightmare” bacteria actually can convey genetic material to regular bacteria upon contact. This transfer of “superbug” status can even take place between bacteria of different species. So far, “nightmare” pathogens are unusual and uncommon, and it is the goal of the AR Lab Network to keep them that way! Through the AR Lab Network, CDC is working with health departments across the US to help keep these bacteria from spreading among people, facilities (such as hospitals and nursing homes), and pathogens themselves.

## *The Containment Strategy*

The [CDC containment strategy](#) for highly resistant antimicrobial pathogens encourages health care facilities and public health authorities to respond at the *first sign* of unusual resistance in a patient.

Following rapid laboratory confirmation of resistance, the recommended response includes assessing the infection prevention and control strategies in the facility, screening exposed contacts (contacts may or may not have symptoms) and coordinating a response with other facilities (e.g., in cases where a patient was cared for at multiple facilities).

These should be followed by ongoing assessments and screenings. The [CDC reports](#) that 11% of screening tests of contacts showing no symptoms found a hard-to-treat pathogen that spreads easily. Detection in those “invisible” cases is critical to containment.

Through its Containment Strategy, the CDC encourages state and local health departments to:

- Ensure health care facilities familiarize themselves with available support from state and local laboratories
- Assess and help improve the quality and consistency of infection prevention and control programs in healthcare facilities throughout the state
- Coordinate with affected healthcare facilities, regional laboratories in the AR Lab Network and CDC for every case of unusual resistance
- Provide timely lab results and recommendations to affected healthcare facilities and providers.

## *A Promising Strategy*

CDC has [published illustrative examples](#) of the success of its containment strategy. In the spring of 2017, for example, the Iowa Department of Public Health contacted CDC with a case of unusual resistance associated with an infection in a nursing home resident. Utilizing the containment strategy, the state health department

### *Laboratory Assistance*

*The CDC's Antibiotic Resistance Laboratory Network includes seven regional and 56 state and local laboratories throughout the US, with 500 additional staff across the country.*

assessed infection prevention and control practices and identified five additional infected residents among the 30 assessed. No additional cases were identified following further infection control assessments and surveys of the affected wing of the nursing home.

This CDC strategy of stopping “nightmare bacteria” in their tracks is a commendable strategy for helping to control the spread of unusual antimicrobial resistance, but it is a strategy mostly directed at the healthcare and public health community. Let’s remember that everyone has a role to play in combating antimicrobial resistance. We can help prevent illnesses that require antibiotics by: (1) adopting a healthy lifestyle to avoid illness; (2) keeping up to date with vaccinations and flu shots; (3) isolating sick individuals; (4) disinfecting frequently touched surfaces; (5) performing hand hygiene frequently and thoroughly and (6) using antibiotics responsibly. When it comes to the fundamental threat of antimicrobial resistance, we’re all stakeholders and we each have a role to play.

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