

Arkansas Mobilizes Public Health and Healthcare Partners to Halt Healthcare-Associated Infection Outbreak

The Arkansas Department of Health leveraged a CDC-funded program to build relationships with healthcare facilities across the state to improve infection control practices, resulting in an effective healthcare-associated infection (HAI) outbreak response.

The deadly Ebola outbreak that originated in West Africa and spread to the United States in 2014 underscores the ongoing threat of emerging infectious diseases. The unparalleled public health response resulted in new opportunities for state health departments to improve their capacity to rapidly address infectious disease outbreaks, including HAIs. Many states rely on CDC's Infection Control Assessment and Response (ICAR) program to bolster their infection prevention and quality improvement activities. The program, funded through the Epidemiology and Laboratory Capacity (ELC) for Infectious Diseases supplement, equips health departments with the knowledge and tools to effectively detect, prevent, control, and respond to known and emerging HAIs, and leverage antibiotic resistance infection control programs across the healthcare and public health continuum.¹

In 2015, the Arkansas Department of Health (ADH) received funding to implement an ICAR program. In the first year of the program, ADH conducted 28 site visits at acute care and critical access hospitals to help facilities determine HAI outbreak response and control priorities. These site visits led to valuable interactions that strengthened the relationships between the health department and healthcare facilities across the state.

These site visits proved to be valuable especially following a successful HAI outbreak investigation and response at an acute care hospital's outpatient clinic, as described below.

- An estimated 51,000 healthcare-associated *P. aeruginosa* infections occur annually in the United States. More than 6,000 of these infections are multidrug-resistant, resulting in roughly 400 deaths per year.²

According to Kelley Garner, the health department's HAI program coordinator and epidemiology supervisor, the partnership established between ADH and the hospital improved situational awareness and strengthened the outbreak investigation and response process. The partnership also set the precedent for future collaborations on HAI outbreak investigations and other HAI-related activities.

Steps Taken:

Six weeks after the ICAR site visit, the hospital notified ADH of a drug-resistant *Pseudomonas aeruginosa* outbreak believed to have originated from contaminated medical scopes used in one of the hospital's outpatient clinics. *Pseudomonas aeruginosa* is a highly drug-resistant bacterial pathogen commonly acquired in hospital settings, or among patients with compromised immune systems. The pathogen typically causes infectious diseases such as pneumonia, sepsis, and urinary tract infections, and can lead to serious complications or death.² Chart abstraction and case finding activities identified ten patients who had acquired similar *Pseudomonas* infections, with two cases advancing to bloodstream infections. To control and prevent the outbreak from spreading further, the hospital and ADH joined efforts and took the following steps:

- Three weeks after they were notified, key staff from ADH visited the clinic to assist with determining the outbreak's origin and establishing a response and control plan.
- To help ADH conduct data analysis, the hospital provided patient demographics and clinical history, robust historical microbiology testing results from the clinic, and an overview of infection control interventions that were put in place.
- The hospital also provided 15 months of microbiology results from specimens submitted by the clinic to calculate the rates of both *Pseudomonas* and drug-resistant *Pseudomonas*. This information was crucial in defining the occurrence of an outbreak.
- Staff from ADH's public health laboratory coordinated submission of isolates from two of the patients who tested positive for drug-resistant *Pseudomonas aeruginosa*. Within two weeks, these isolates were analyzed utilizing pulsed-field gel electrophoresis to determine each sample's genetic fingerprint. Test results revealed that both organisms were indistinguishable and were likely obtained from the same source, leading the ADH team to recognize potential exposures and confirm that an outbreak related to clinic practices was occurring.
- Clinic staff were presented with these preliminary findings to provide insight. They also assisted ADH and the hospital with additional data collection relating to the outbreak.
- Shortly thereafter, ADH used and analyzed the data to confirm the clinic's suspected findings that the outbreak originated from contaminated medical scopes.
- The hospital and clinic staff immediately proceeded to take actions to prevent further spread of the outbreak as described below, bringing the outbreak investigation to a satisfactory close after three weeks.

Results:

The health department's HAI program gleaned several insights and lessons learned on the challenges of infection control in the outpatient setting. Results and successes from the outbreak response include:

- Recommendations for the removal of non-standard cleaning equipment.
- The use of automated reprocessing equipment located near the clinic.
- Additional training on the cleaning, disinfection, and reprocessing of medical scopes.
- No patients identified with drug-resistant *Pseudomonas aeruginosa* since ADH's visit and recommendations.
- A closer working relationship between clinic staff, the hospital's infection prevention staff, and ADH.
- Instilled confidence among clinic staff since the data showed the clinic's recommendations and subsequent actions were successful in preventing transmission.

Lessons Learned:

- This partnership highlights the unique opportunities that arise when funded projects are connected to extend their reach and achieve greater goals. Adds Garner: "The HAI outbreak response represented a critical alignment between multiple funded ELC projects that enabled ADH to conduct a robust, data-driven outbreak investigation in an outpatient setting, which concluded with [the above] recommendations and follow-up activities."

For more information:

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¹ CDC. "Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) Cooperative Agreement." Available at <https://www.cdc.gov/nceid/dpei/epidemiology-laboratory-capacity.html>. Accessed 1-12-2018.

² CDC. "Pseudomonas aeruginosa in Healthcare Settings." Available at <https://www.cdc.gov/hai/organisms/pseudomonas.html>. Accessed 1-12-2018.