



# SHARPPS Newsletter

Surveillance for Healthcare-Associated and Resistant Pathogens Patient Safety (SHARPPS) Program

## SPECIAL EDITION: AN OVERVIEW OF *LEGIONELLA*

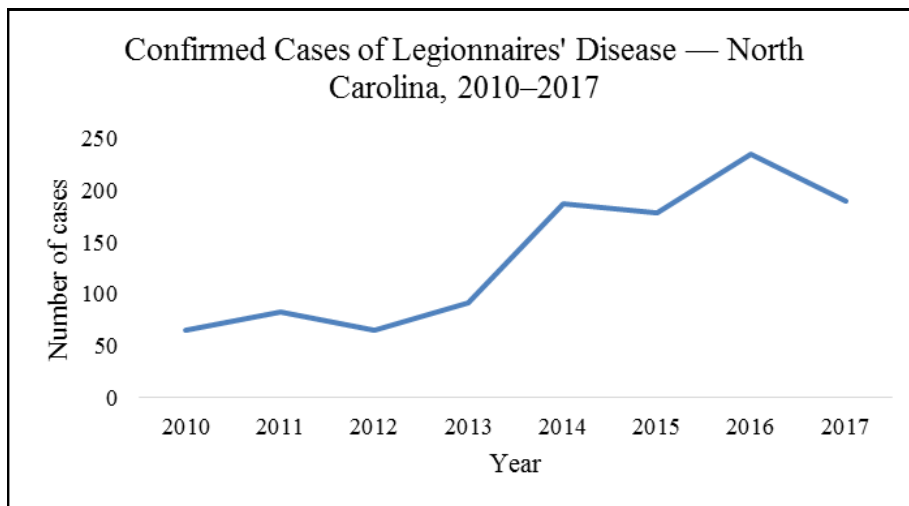
### What is *Legionella*, and Why is it Important for Public Health?

Legionellosis is a disease caused by *Legionella* bacteria. The bacteria can cause a pneumonia called Legionnaires' disease, as well as a less serious infection called Pontiac fever that has symptoms similar to a mild case of the flu. This disease has been nationally notifiable since 1976, after an outbreak at a 1976 American Legion convention in Philadelphia, from which the disease gets its name.

*Legionella* bacteria are found naturally in freshwater. The bacteria can also grow and multiply in human-made water systems such as: plumbing systems, cooling towers (air-conditioning units for large buildings), hot tubs, decorative fountains, water features, and hot water tanks. When the bacteria grow in these systems, it becomes a health concern. Legionnaires' disease and Pontiac fever only occur in people who breathe in contaminated water droplets (i.e. mists, showering, splashing) from affected water systems. The disease is not spread person to person, and you cannot become infected by drinking affected water. Those who are aged 50 years and older, current or former smokers, and those with certain underlying conditions such as chronic lung disease (i.e. chronic obstructive pulmonary disease or emphysema), weak immune systems, cancer, diabetes, kidney failure, or liver failure are at increased risk.

Legionnaires' disease is similar to other types of pneumonia with symptoms including but not limited to cough, shortness of breath, fever, muscle aches, and headaches. Symptoms typically occur within two to ten days after exposure, and rarely up to 14 days after exposure. Diagnosis of Legionnaires' disease is typically via urine testing in people with pneumonia. Treatment is available with antibiotics and in most cases, is successful if treated early, but the disease can cause death in about 15% of cases.

The number of Legionnaires' disease cases reported in the United States has been steadily increasing since 2000, with about 6,000 cases reported in 2015. NC Division of Public Health (NC DPH) has also seen increases in Legionnaires' disease across the state with close to 200 cases reported in 2017 (see Figure). Increases are suspected to be due to a combination of an aging population, aging plumbing infrastructure, and increased awareness and testing.



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## Overview of *Legionella* Investigations

Because of *Legionella*'s association with outbreaks, all cases of Legionnaires' disease are reportable and require investigation. After a case is reported to public health authorities, communicable disease staff from the local health department contact the patient to obtain further demographic, clinical, and exposure information. Standard information is collected from all case patients, which helps determine if further investigation is warranted.

There are three general categories of Legionnaires' disease cases that inform potential next investigation steps: sporadic, travel-associated, and healthcare-associated. Sporadic cases have no epidemiologic link to high-risk outbreak settings such as lodging or healthcare facilities. Because these cases could have been exposed in a variety of settings, generally no further investigation is pursued.

Travel-associated cases occur in individuals who spent at least one night away from home during the incubation period (ten days) prior to illness onset. The Centers for Disease Control and Prevention (CDC) is notified of all travel-associated cases linked to lodging facilities (i.e. hotels and cruise ships). If two cases are associated with a single establishment, a call for cases and further investigation, including environmental assessment and sampling, are recommended to better characterize potential exposure sources.

Healthcare-associated cases are divided into two categories: possible and definite. Possible healthcare-associated cases are those in which the patient was in a healthcare facility (i.e. hospital or long term care facility) for any part of the ten day period prior to illness onset, suggesting the healthcare facility is a possible site of exposure. Definite healthcare-associated cases are those in which the patient was in a healthcare facility for the entire ten days prior to illness onset and did not leave the facility during that period. Both categories of healthcare-associated cases require further investigation as discussed briefly in the next section. Definite cases also require an environmental assessment. For more details regarding investigation steps, please refer to the [NC Communicable Disease Manual](#). If two cases, either definite or possible, are associated with a single healthcare facility, further interventions including environmental sampling, admission restrictions and water restrictions are recommended to better characterize potential exposure sources and mitigate further exposure risk.



### Recent Healthcare-Associated Legionellosis Activity in North Carolina

A single possible or definite healthcare-associated case of Legionnaires' disease is considered a sentinel case. Outbreaks occur when a second case of healthcare-associated Legionnaires' disease is identified in the same facility within a six month period. Last year in North Carolina, there were 12 sentinel cases of Legionnaires' disease and four outbreaks (one beginning prior to 2017) occurring in long-term care and independent living facilities.

On-site assistance and recommendations were provided to all facilities. Standard recommendations included implementing water restrictions (e.g., installation of 0.2 micron filters on all fixtures), conducting surveillance for new cases of Legionnaires' disease, environmental sampling for the presence of *Legionella* bacteria and monitoring water parameters (e.g., temperature and residual chlorine levels), notifying residents, staff, and families, and working with an expert consultant to develop and implement a water management plan.

The outbreaks varied by number of cases involved, environmental sampling results, and duration of water restrictions. The average number of Legionnaires' disease cases per outbreak was 3.5 (range: 2 – 5); one case occurred in a facility employee, and the remainder occurred in residents. Environmental sampling is ongoing. To date, culture results showed that *Legionella* bacteria were detected at 1 of the 4 outbreak facilities (25%). Water restrictions were implemented at all 4 facilities and have been discontinued at 2 (50%) following negative environmental sampling results and the development and implementation of water management plans.

## Recent Legionellosis Activity Cont'd.

Responses to Legionnaires' disease outbreaks are complex and resource-intensive. They require the coordinated efforts of healthcare facility administrators and staff, local health department communicable disease and environmental health personnel, external partners (i.e. CDC and expert consultants) and NC DPH. Communication and education are the foundation for successful responses to these outbreaks and for keeping North Carolinians healthy.

## Water Management Plans to Prevent and Control *Legionella* Bacteria in Healthcare Facilities

In June 2017, the Centers for Medicare and Medicaid Services (CMS) issued a memorandum requiring Medicare and Medicaid-certified healthcare facilities to develop and implement water management plans to reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in building water systems and to increase awareness about water system maintenance.

Water management plans should describe the following:

- Areas where *Legionella* might amplify within the facility's water systems
- Points of use where people might be exposed to *Legionella* through mists or aerosols
- Physical conditions, operations, maintenance, and repairs of water systems
- Potential control measures and corrective actions
- Monitoring activities to determine the effectiveness of the program in preventing proliferation of *Legionella*

Open water systems that may be affected include any systems that produce mists or aerosols (e.g., cooling towers, water fixtures, ice machines, spas, nebulizers and many others).

Developing a water management plan should begin with a systematic baseline survey and assessment of water systems in the facility providing details on the number and type of water systems in the facility, water source at points of entry, condition of components in each system, places where water is processed, hoses and fixtures at point of use, and the complexity of the systems.

Next a qualitative risk assessment should be performed to identify systems where conditions are suitable for *Legionella* to multiply, are open to the environment, and produce mists or aerosols. *Legionella* may multiply in places where water temperature is held between 80°F and 120°F, water is stored and recirculated at low pressures or could stagnate, components are degraded (i.e., rust, sludge, scale, biofilms), or a disturbance has occurred (e.g., construction, renovation). The water management team should establish procedures to monitor water quality indicators, environmental health rule compliance, and inspections and maintenance of cooling towers, water fountains, and ice machines.

The results of the baseline survey and qualitative risk assessment guide the need for additional action including environmental sampling. If samples are collected, analysis should be performed by laboratories that hold an Environmental *Legionella* Isolation Techniques Evaluation (ELITE) certification from the CDC. Facilities can establish critical control points and procedures to monitor water quality indicators (temperature, pH, residual disinfectants, flow rate, and water pressure), environmental health rule compliance, inspections and maintenance of cooling towers, water fountains, and ice machines, and adherence to cleaning and decontamination standards for aerosol-producing medical devices.

For additional information on *Legionella*, please refer to the following resources:

- [CMS Legionella Memorandum](#)
- [CDC Legionella Toolkit](#)
- [Occupational Safety and Health Administration \(OSHA\) Technical Manual on Legionnaires' disease.](#)
- [NC DPH Guidance on Legionellosis](#)

## SHARPPS PROGRAM UPDATES

The SHARPPS Program is pleased to announce new staff members. Katie Steider permanently joined our team as an epidemiologist. Katie has been with us since August 2016, serving as the CDC/CSTE (Council for State and Territorial Epidemiologists) Applied Epidemiology Fellow. Kristin Pridgen recently accepted a permanent position with the SHARPPS program as the HAI Health Educator. Dr. James Lewis permanently joined our team as the SHARPPS Medical Director. Lastly, Savannah Carrico began working with us in a temporary capacity as an epidemiologist in December 2017. Savannah received her Master of Public Health degree in Epidemiology and most recently worked with the Benton County Health Department in Oregon, where she participated in several local outbreaks including tuberculosis and meningitis. We are thrilled to welcome these new team members, and look forward to our continued collaboration with their local, state, and national partners to develop and implement infection prevention and antibiotic stewardship strategies. Feel free to contact any of our [SHARPPS program staff](#) regarding healthcare-associated and antimicrobial-resistant infections and patient safety.

## GET SMART KIDS' ARTWORK COMPETITION

The Be Antibiotics Aware (formerly Get Smart about Antibiotics) Campaign is a national public health campaign aimed at raising awareness on antibiotics and increasing appropriate antibiotic prescribing and use. North Carolina Division of Public Health is a state partner of the national campaign. U.S. Antibiotics Awareness Week, a national observance intended to engage healthcare providers, educational systems, and the general public around antibiotic stewardship in various health settings, was observed November 13-19, 2017.

To celebrate, the NC Be Antibiotics Aware Campaign hosted its second Kids' Artwork Competition. Out of 40 submissions from children across the state addressing appropriate antibiotic use, 5 winners were selected. The winning pieces of artwork were converted into posters and will be used as official NC Get Smart Campaign educational materials. The posters will be distributed to healthcare facilities, local health departments, and school health offices across the state.

Posters can be viewed and ordered on the [NC Be Antibiotics Aware Campaign](#) website; additional information regarding antibiotic stewardship can be found on [CDC's Be Antibiotics Aware](#) website.

### BE ANTIBIOTICS AWARE: SMART USE, BEST CARE



*Artwork submitted by 11th grader, Mallori Mull of Mount Holly, NC, Winner of the 2017 NC Get Smart Artwork Competition*

For more information, visit the NC Get Smart Campaign:

<http://epi.publichealth.nc.gov/cd/antibiotics/campaign.html>



## NC SHARPPS HELPS HOSPITALS AND LONG-TERM CARE FACILITIES PREPARE FOR PHASE 2 OF CMS REFORM OF REQUIREMENTS FOR LONG-TERM CARE FACILITIES

Phase 2 of the revised Medicare and Medicaid requirements for participation for long-term care facilities (LTCFs) ([42 CFR part 483, subpart B](#)) went into effect November 28, 2017. These requirements include the minimum health and safety standards that LTCFs must meet to participate in Medicaid and Medicare. Phase 2 revisions include the requirement for LTCFs to communicate specific information to a receiving provider (e.g. at an acute care hospital) when a resident is transferred or discharged (§483.15(c)(2)). Although the revisions are specific to LTCFs, hospitals should also be aware of the new requirements as they may see changes in communication from LTCFs. These revisions are an opportunity for all healthcare facilities to evaluate their existing interfacility communication methods to assess the information that is included.

The LTCF requirement for interfacility communication includes, but is not limited to, isolation precaution information due to current or previous infection/colonization, most recent relevant labs, medications (including when last received), advance directive information, and comprehensive care plan goals. In order to facilitate this communication between healthcare settings, the NC Division of Public Health Surveillance for Healthcare Associated and Resistant Pathogens Patient Safety (SHARPPS) Program developed and piloted an interfacility transfer form. The form contains the information necessary for LTCFs to be in compliance with the revised Medicare and Medicaid requirements as they relate to communication to a receiving provider at transfer and discharge.

Pilot participants from the acute care hospital, emergency medical services, and LTCFs reviewed the form favorably. Participants reported the form was useful for identifying individuals on isolation precautions and identifying appropriate personal protective equipment (PPE); initiating isolation precautions in the emergency department; preparing PPE in the ambulance; and identifying individual needs and baseline status. Participants also reported that using a standard interfacility transfer form county-wide was beneficial in communicating information clearly and efficiently between different healthcare facilities. This collaborative approach to interfacility communication reflects CDC recommendations for [managing multidrug-resistant organisms in healthcare settings](#) and [combating antibiotic resistance](#). The NC SHARPPS Program encourages any efforts to standardize interfacility communication between healthcare facilities and collaboration to contain and prevent multidrug-resistant organisms.

The interfacility transfer form and instructions are available free of charge from the [NC SHARPPS Program webpage](#). Please email [nchai@dhhs.nc.gov](mailto:nchai@dhhs.nc.gov) with questions or for more information.

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