

Legionnaires' Disease Associated with a Senior Living Community

August-September

Hennepin County

On August 28, 2017, the Minnesota Department of Health (MDH) received a report from a local hospital concerning a Legionnaires' disease (LD) case (Case 1) with onset of symptoms approximately August 22. Case 1 was a resident of a senior living community in Maple Grove that provides memory care, assisted living, and independent living services. MDH conducted a routine interview with a family member on August 31; the family member did not think that Case 1 had left the senior community property during the 10 days prior to illness.

As is routine for a single case in such a setting, MDH followed up with the director of nursing for the facility on September 1 to gather information about the facility and potential risk factors for *Legionella* infection. The facility was relatively new, with building construction completed in 2015. The facility reported about 20 people living in the memory care unit where Case 1 resided, about 60 in the assisted living unit, and approximately 140 in independent living apartments. The director of nursing stated that Case 1 might have spent some time out of the memory care unit in a yard area. Case 1 did not use any respiratory equipment or have a humidifier. The facility did not have any decorative fountains; it did have a therapy pool area but Case 1 was not known to have been near that side of the complex. MDH recommended the facility be on heightened surveillance for 3 months and to notify MDH of any other possible cases. MDH also provided CDC resources for *Legionella* prevention in health care facilities and water management programs.

On September 19, MDH received a report from another local hospital regarding a LD case (Case 2) residing at the same senior living community as Case 1. Case 2 had onset of symptoms approximately September 12. MDH launched an outbreak investigation in collaboration with the facility, the Hennepin County Human Services and Public Health Department, and the City of Maple Grove.

On September 21, MDH alerted health care providers, clinical laboratories, and the public to the outbreak via a press release.

Cases were defined as persons with diagnosed pneumonia and laboratory evidence of *Legionella* infection, with illness onset since August 1, and who lived, worked, or otherwise spent time in the senior living community within the 10-day period prior to illness onset.

The senior living community's nursing director was to report any additional potential cases to MDH immediately for follow-up. The senior living community retained an environmental consultant to assess, sample, and remediate as necessary potential sources of *Legionella*, and to develop a

comprehensive water management program. On September 21, the consultant collected water samples, including samples from various parts of the building potable water system (including resident sinks/showers), pools, and the cooling tower. The consultant submitted the samples to a Centers for Disease Control and Prevention (CDC) ELITE-certified private laboratory for tests including *Legionella* PCR and culture. MDH recommended that immediately following cooling tower sampling, the cooling tower should be remediated per ASHRAE and the Cooling Technology Institute guidelines.

Protective measures recommended for the senior community were based upon CDC guidance. Recommendations included temporarily not using showers, ice machines, or hand sprayers; using bottled water for drinking and brushing teeth; regularly flushing water outlets in unoccupied rooms/units; discontinuing use of the pool/therapy pool; avoiding use of the irrigation system and sprinklers; and considering the use of shower filters. These precautions were implemented by the senior community pending environmental assessment and water testing results.

Beyond the two cases reported, no additional cases connected to the senior community were identified.

Case 1 and 2 were both males and in their 80s. Both were hospitalized for pneumonia. Case 1 was hospitalized for 5 days and recovered. Case 2 died of acute hypoxic respiratory failure due to *Legionella* pneumonia approximately 9 days after onset of illness.

Both cases were laboratory confirmed by the *Legionella pneumophila* serogroup 1 urinary antigen test. Neither of the cases had any lower respiratory samples available for *Legionella* culture.

Case 2 lived in an assisted living unit located three floors directly above the memory care unit where Case 1 resided, in the same wing of the building. There were several unoccupied units of the facility in the vicinity of the cases' living units. Per the environmental consultant's assessment, the facility was flushing outlets of empty rooms monthly; it was recommended to increase to multiple flushings per week.

On September 7 (after Case 1 was diagnosed) the facility's existing water treatment contractor sampled two sites, the cooling tower and hot water from a kitchen outlet. According to a laboratory report dated September 18, the cooling tower sample was positive for *Legionella pneumophila* serogroup 1 and the kitchen sample was positive for non-*pneumophila* *Legionella* species (both results by culture). These isolates had been discarded by the laboratory and were not available for further characterization.

The water samples collected on September 21 from potable water system locations were all negative by both *Legionella pneumophila* PCR and *Legionella* culture. Water samples from the pool and therapy pool were also negative. Hennepin County environmental health specialists confirmed that the pool and therapy pool were operating within recommended parameters.

The water sample collected on September 21 from the cooling tower was positive by *Legionella pneumophila* PCR and grew *Legionella pneumophila* serogroup 1 upon culture. A post-remediation sample from the cooling tower collected on October 3 was negative by both *Legionella pneumophila* PCR and *Legionella* culture.

This was an outbreak of two cases (one fatal) of Legionnaires' disease caused by *Legionella pneumophila* serogroup 1 among residents of a senior living community. Case illness onsets occurred approximately 3 weeks apart.

Although all premise potable water system samples collected were negative for *Legionella*, environmental assessment and epidemiological information (particularly the location of the case's living units) suggested that the potable water system may have been the source. The presence of unoccupied units near the cases' units may have caused stagnancy within the potable water system and created favorable conditions for *Legionella* amplification. However, the facility's cooling tower was positive for *Legionella pneumophila* serogroup 1 and could not be ruled out as a potential source of exposure.