

Pontiac Fever and Legionnaires' Disease Associated with a Vacation Rental Home Pool Area

January

Cass County

On January 12, 2017, the Minnesota Department of Health (MDH) Infectious Disease Epidemiology, Prevention and Control Division (IDEPC) was notified by a physician at a hospital in St. Paul, Minnesota, of a patient in their Emergency Department with a positive urinary antigen test for *Legionella pneumophila* serogroup 1. This patient had spent the previous weekend (January 6-8) at a vacation rental house with five other adults in Walker, Minnesota. The patient reported that the five other individuals who stayed at the rental house were also ill with respiratory symptoms.

MDH interviewed the patient and confirmed that they had vacationed at a rental home and had spent time in the rental home's indoor pool area, which included a swimming pool, hot tub, and sauna. The MDH Environmental Health Division was notified, and an outbreak investigation was initiated.

The initial case provided MDH with vacationers' names and phone numbers. MDH epidemiologists interviewed all of the group members regarding common activities, potential exposures, and illness history. Cases were defined as follows:

1. Confirmed Legionnaires' disease (LD) cases: persons with diagnosed pneumonia and laboratory evidence of *Legionella* infection, with illness onset 2 to 14 days after going to the rental house.
2. Suspect LD cases: persons with diagnosed pneumonia but no laboratory evidence of *Legionella* infection, with illness onset 2 to 14 days after going to the rental house.
3. Pontiac fever (PF) cases: persons without pneumonia but who reported fever plus at least one of the following symptoms: headache, cough, chest tightness, myalgia, vomiting, or diarrhea, with illness onset ≤ 3 days of going to the rental house.

An MDH sanitarian went to the rental property to meet with the house's caretaker and perform water quality tests for both the pool and spa pool.

MDH interviewed all six of the individuals who stayed at the vacation rental home the weekend of January 6-8. Two individuals, including the initial case, were urine antigen positive for Lp1, had pneumonia, and therefore were confirmed LD cases. Both of the confirmed cases became ill on January 8. One individual met the case definition for suspect LD. This case developed symptoms early in the morning on January 8, and was diagnosed with pneumonia but tested negative by urine antigen. The remaining three individuals met the case definition for PF. Two PF cases developed symptoms on January 8, and one PF case developed symptoms on January 9. All six cases reported fevers, cough, fatigue and chills. Five (83%) cases reported headaches, five (83%) muscle aches, five (83%) tightness in their chest, four (67%) abdominal pain, four (67%) dizziness, and four (67%) confusion. Two individuals were hospitalized as a result of their infection, and both hospitalizations lasted for 2 days. All of the cases developed symptoms within 2 days of their first exposure to the pool area.

Due to a lack of non-ill controls, a case-control study could not be conducted. Common exposures among the cases were the house's indoor pool, spa pool, and sauna. All of the cases reported going into the house's spa pool on January 6 and 7, and one case went in the spa pool on January 8. Two cases reported going in the pool on January 6, and five cases went in the pool on January 7. All of the cases also reported a brief stop at a restaurant on the way to the rental house on January 6; the restaurant did not have any water features.

The rental house contained a pool and spa pool in a shared pool area that was connected to the house via a walkway; neither the pool nor the spa pool were licensed as public pools. MDH sanitarians informed the property owners of the violation and prohibited them from allowing public use of the pool and spa pool. The owners agreed to have the lock on the door to the pool area reversed so that future renters could not access it. A sanitarian met with the property caretaker and ensured that pool access had been restricted and pool closure signs had been posted.

Water quality tests conducted by an MDH sanitarian revealed levels all outside the state regulatory limits. The free chlorine in the pool was 0.0 parts per million (ppm) (regulatory range, 1.0 to 10.0 ppm), pH was 7.0 (regulatory range, 7.2 to 7.8), combined chlorine level at 3.0 ppm (cannot exceed 0.5 ppm), and cyanuric acid levels >100 ppm (cannot exceed 100 ppm). The caretaker did not have access to the pump room, and was therefore unable to determine flow rates and how chlorine was being dispensed.

The spa pool appeared to have no chlorine feeder. Water quality tests on site confirmed free chlorine levels in the hot tub >200 ppm (actual ppm unknown as testing ability does not go beyond 200 ppm), pH of 8.0, and cyanuric acid levels >100 ppm. The property owners appeared to be broadcasting chlorine into the spa pool, which is not an approved method of sanitizer level stabilization.

This was an outbreak of Legionnaires' disease and Pontiac fever associated with a vacation rental home. The timing of the illnesses following exposure to an improperly disinfected and maintained spa pool, a well-known risk factor for *Legionella* infection, strongly suggests that inhalation of aerosols from the spa pool was the most likely source of infection. As a result of the outbreak, the pool and spa pool were no longer available for use by renters since they cannot meet current pool code requirements.