

# EUROPEAN HOSPITAL

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## LEGIONNAIRES' DISEASE

**A hospital outbreak not only causes severe illnesses or death, but also results in ward closures and disruption of care — not to mention potential legal action. What can be done to combat such infections?**



EWGLINET  
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Identified only 31 years ago, Legionnaires' disease is a severe form of pneumonia often caused in humans by *Legionella pneumophila* bacteria. Commonly found in water and soil, the bacteria can be inhaled as aerosol particles and cause severe disease. With no clinical features that distinguish it from other types of pneumonia, misdiagnosis and lack of awareness have led to a significant underestimation of the actual prevalence of Legionnaires' disease.

During the years since its identification, the bacteria caught in hospitals have caused severe illnesses and deaths. During subsequent investigations bacterial sources were identified in hospital water coolers, water from taps, water used to wash nebulisers and, in one severe outbreak, contaminated water that had been used to irrigate burns in an emergency department.

Despite increased awareness of potential sources and hygiene efforts, the threat of Legionnaires' disease remains and reported cases have increased. As recently as this January, a 65-year-old resident of a housing association in Denmark died after contracting the disease. That source was reported to be an insufficiently heated water supply. The association faced legal charges.

Clearly surveillance of this disease is vital. By the late 1980's, it had become clear that international collaboration was needed to exchange information and identify problematic sites across Europe. This led to the formation, in 1986, of the European Surveillance Scheme for Travel Associated Legionnaires' disease (EWGLINET), based in London's Health Protection Agency (HPA) centre for infections. We asked Dr Christian Lueck, one of the EWGLINET collaborators, about the organisation, and the current methods available for hospitals to test for Legionnaires' disease.

'The European Working Group for *Legionella* Infection (EWGLI) consists of specialist scientists with an interest in improving knowledge on the epidemiological and microbiological aspects of Legionnaires' disease,' Dr Lueck explained. 'We achieved this through international surveillance, as well as developing diagnostic, management and treatment methods. One of the sub-groups of EWGLI – EWGLINET – was implemented to capture the low bacterial manifestation rate of 1% effectively. Supported and funded by the European Union, this scheme monitors the formation of clusters (two or more cases associated with the same accommodation site within two years) to raise awareness of problematic sites.'

'Over the last 20 years, there has been a significant increase in the number of reported cases. During 1987, EWGLINET received reports of only three cases, whereas 2007 saw 947 reported cases\*.'

### **What mainly caused such outbreaks?**

'*Legionella* bacteria are common and can be found naturally in environmental water sources. From these sources, the organisms can pass into hot and cold water storage tanks, spa pools or other artificial reservoirs. These water systems often provide conditions favourable to the bacteria, including temperatures between 20 and 45°C, the presence of rust, sediment, sludge or scale,' he pointed out, adding: '*Legionella*

*pneumophila* can also survive and be transmitted via aerosol particles that, once inhaled, cause infection via the respiratory system. Therefore, poorly maintained aerosol-generating devices act as a source of disease.'

'Once a cluster is identified, a report is filed to our London centre to raise awareness of a potential problem. The site in question is then given six weeks to rid their water supply of the bacteria. Health officers then assess the water supply and, if it is still unsafe, the name of the establishment is published on the public EWGLINET website. However, EWGLINET simply raises awareness; the responsibility for shutting down problematic hospitals (or hotels) lies with the health authority of each country.'

### **How is Legionnaires' disease diagnosed?**

'Previously, the diagnosis relied on culturing sputum samples, which can be difficult to obtain as patients often present with a non-productive cough. Invasive sampling procedures are often required, causing discomfort to the patient. Subsequent culturing of the sample is also time-consuming and costly.'

'Now urinary antigen tests, such as the BinaxNOW *Legionella* test (Inverness Medical), are used to diagnose approximately 80% of patients. These detect the presence of the *Legionella pneumophila* serogroup 1 antigen, rather than the live bacteria, from a simple urine sample. The antigens appear one to three days from the onset of symptoms, enabling rapid diagnosis. Therefore, urine samples are generally the favoured testing method. However, sputum samples do provide data on bacterial strains. In cases where a urine test is negative, a sputum sample should still be cultured to check for the presence of other strains,' he advised.'

### **So, what would be the best method of detection?**

'Ideally, using a combination of the high sensitivity achieved from culturing a sputum sample and the rapid, easy-to-use point of care urinary antigen test. So, my gold standard test would be a urinary antigen test that can detect all serogroups.'

### **What advice would you give to hospitals about testing for the disease as well as its source?**

Currently, each country has different guidelines on testing for Legionnaires' disease and how much bacteria is considered dangerous. A proposed scheme is currently under discussion, where water systems are routinely tested



*Legionella pneumophila* bacteria

for the presence and strain of bacteria. This will enable correct testing methods to be used from the onset. One key piece of advice is to remember that immuno-compromised patients are especially vulnerable to infection, as are patients taking corticosteroids, a major risk factor for contracting Legionella.

\* EWGLINET data tables:

[http://www.ewgli.org/data/data\\_tables/month\\_year\\_onset.asp](http://www.ewgli.org/data/data_tables/month_year_onset.asp)