Legionnaires' Disease

When was it discovered?

Legionnaires' disease was first recognised after a number of American Veteran Soldiers (Legionnaires) were taken ill following a reunion in 1976. Retrospective studies of unexplained illness have shown that similar outbreaks have occurred for as long as records have existed.

How dangerous is it?

The disease is caused by the organism Legionella. Of the many species of the organism, Legionella pneumophila seems to be the most harmful to man. It has a wide range of effects ranging from being unnoticed by the infected person through to causing death.

In the UK there are between 200 and 300 recorded cases annually of the disease of which 20-30 are fatal. However many more people are thought to be exposed to the organism and either do not contract the disease or contract it but do not recognise it. Indeed, it has been estimated that up to a quarter of the UK population may have contracted the disease at some time. Investigation has shown that some 40-50% of the cases recorded in the UK originate from abroad.

Who is at risk?

Outbreaks of Legionellosis are rare in the general population but certain individuals are at a significant risk. A typical victim would:

• be a male over 50 (the risk increases significantly over 70)
• be a smoker or ex smoker
• have an underlying illness (chest problems or disease, organ transplant, cancer in the head or neck)

The majority of the University population are not at serious risk. However patients in a hospital are at risk.

What are the symptoms?

Legionnaires' disease is a form of pneumonia. Mild forms of the disease can be mistaken for flu. The initial symptoms may include:

• muscle pain
• fever
• aching joints

Other symptoms that develop may include:

• double or blurred vision
• tremors or shakes
• mental confusion
• dry racking cough
• liver and kidney damage

How is it caught?
In order to catch the disease, the organism has to be inhaled in an aerosol of water, e.g. from a shower, taps or water spraying out of cooling or storage tanks. It cannot be transmitted from person to person.

**How does it affect the body?**

The organism breeds in the lungs and then spreads to all parts of the body via the blood stream causing an infection. The body produces excess white blood cells to fight the infection which in turn produce excess amounts of fluid that go back to the lungs, causing ‘drowning’. Incubation time following exposure to live colonies of the Legionella organism can be from three days up to twenty one days. Tests to confirm its presence may take a further five to ten days.

**How is it treated?**

By giving antibiotics.

**Can it reoccur?**

Once someone has had Legionnaires disease there is very little chance of having it again.

**How does the Legionella organism get into the water supply?**

Legionella is a soil borne organism and can be found in natural water sources. It will enter a building’s water system through the mains. Contamination may also result if soil or groundwater is allowed to enter the water system or by 'seeding' from an adjacent source. Outbreaks can be associated with soil disturbance and have a seasonal pattern (i.e. mild, wet weather).

It is almost always possible to find the organism in a large water system if the investigation is thorough enough. A recent survey showed that

- 50% of hotels
- 66% of commercial
- 66% of domestic
- 75% of hospitals had the Legionella organism in their water systems.

**How is Legionella controlled?**

*The Control of Substances Hazardous to Health Regulations 2002* require a risk assessment to be carried out to prevent (if possible) or minimise the risk of exposure to Legionella. The Health and Safety Executive also issue an Approved Code of Practice *The prevention or control of legionellosis (including legionnaires’ disease)* Approved Code of Practice (L8 2000).

If possible, the risk of Legionella exposure should be prevented, e.g. by not using water based systems or having totally enclosed and maintenance free systems. However this is usually not possible and so exposure has to be controlled to minimise exposure to live organisms.

*Legionella should be controlled by:*

- ensuring that systems are well designed, managed and maintained to minimise the growth and spread of the organism
- preventing people being exposed to the live organism

*To grow and multiply, the Legionella organism needs:*
• a temperature between 20-45° C (37° C degrees is optimum)
• a pH of 6.9
• fresh water
• nutrients to feed on, e.g. iron (rust)
• darkness
• stagnant water

These conditions need to be prevented.

This is done by:

• not having leaking underground pipes
• avoiding storing water
• if water is stored, only storing the minimum necessary and having a rapid turn over of stored water, ideally within 24 hours
• preventing rust forming and not using hemp, leather, string, boss white etc in water systems (these can be a source of nutrient)
• covering tanks
• keeping cold water below 20 o C
• heating hot water to at least 60 o C and circulating it above 50 o C
• having good personal hygiene when working on water systems
• cleaning and disinfecting systems regularly
• minimising dead legs and spurs in the system
• not having standby or duplicate plant
• avoiding the use of hot water calorifiers

The condition of water systems must be regularly inspected, maintained and monitored.

How does the University of Birmingham manage Legionella?

The University Health and Safety Policy The Control of Legionella Bacteria in Water Systems sets out the arrangements for managing Legionella at the University.

The majority of water systems are associated with the University's buildings and infrastructure. The Estates Office is responsible for the management of the arrangements to control legionella in these systems.

However certain budget centres will have equipment which have water systems associated with them. These budget centres are responsible for controlling any legionella risks associated with these systems. Examples include recirculation systems including pumps, machine tool coolant systems, spa baths, dental equipment, showers, humidifiers, etc.