Q Fever Risk Management Guideline

Section 1 - Purpose and Scope

(1) The University of Queensland (UQ) is committed to managing the risks of Q Fever in the workplace. This Guideline should be shared with all UQ workers, students, visitors, volunteers and contractors where the risk of Q Fever is present.

(2) Further information about working with biological material and immunisations is provided in the Working with Hazardous Risk Biological Material Procedure and the Vaccinations and Immunisation Guideline.

Section 2 - Q Fever

Type of infection

(3) Q Fever is a zoonotic infection caused by the bacterium Coxiella burnetii, usually via inhalation of contaminated dust and aerosols from infected animals. It is a relatively common but preventable condition which, while rarely fatal, can cause a severe acute illness with complications such as hepatitis and pneumonia. It can also cause damage to heart valves, inflammation of the heart muscle and precipitate chronic fatigue and long-term disability.

Signs and symptoms

(4) Many infected people have no symptoms. People who do become sick often have a severe flu-like illness. Symptoms begin approximately two – three weeks after exposure to the bacteria. However, this period can be as short as four days and as long as six weeks.

(5) Typical symptoms of acute Q Fever include:

a. Fever and chills
b. Severe sweats
c. Severe headache (especially behind the eyes)
d. Muscle pain
e. Weakness and tiredness
f. Weight loss.

Risk

(6) Some people may develop pneumonia (chest infection) and hepatitis (inflammation of the liver) during the course of acute illness. People with pre-existing heart valve abnormalities are at increased risk of endocarditis (infection of heart valves). Although most people make a full recovery and become immune to future Q fever infections.

(7) Q Fever can be diagnosed based on symptoms, clinical examination, and laboratory tests on blood samples. Two or more blood samples on separate occasions are often required to confirm a Q Fever diagnosis.

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Section 3 - Identifying Q Fever risks

(8) People whose work exposes them to high-risk animals, animal products, and animal excreta may develop Q fever.

(9) Other people at risk of Q fever through environmental exposures include:

a. Family members of the high-risk occupational groups described above, through exposures to contaminated clothes, boots or equipment
b. People living on or in close proximity to a high-risk industry (e.g. neighbouring livestock farms, stockyards housing cattle/sheep/goats, meatworks, land being fertilised by untreated animal manure)
c. Visitors to contaminated environments (e.g. farms, abattoirs, animal saleyards)
d. People living near livestock transport routes who may be exposed to contaminated dust from the passing animals
e. People involved in mowing which stirs up dust contaminated by animal excreta, in areas where there are livestock or native animals, commonly kangaroos
f. People who observe or assist animal births.
g. Family members of the high-risk occupational groups described above, through exposures to contaminated clothes, boots or equipment.

Animals infected

(10) Cattle, sheep, and goats are the primary reservoirs for Coxiella burnetii, but a wide range of domestic and wild animals can be infected, including camels, llamas, alpacas, rodents, cats, dogs, horses, rabbits, pigs, buffalo, foxes, some birds, bandicoots, and kangaroos. Ticks are an important vector in the transmission cycle.

(11) The bacteria can be found in the placenta and birth fluids (in very high numbers), urine, faeces, blood or milk of animals who are infected with or carry the bacteria.

(12) The bacteria can survive in the soil and dust for many years and be spread over several kilometres by the wind.

Modes of transmission

(13) ‘Coxiella burnetii’ is a highly infectious bacterium that can survive in harsh environmental conditions. For example, it has survived for seven to nine months on wool at 15 to 20°C, for more than one month on fresh meat in cold storage and for more than 40 months in skim milk at 4 to 6°C.

(14) The bacteria are transmitted to humans via inhalation, ingestion, inoculation or via direct contact with infected aerosols or dust.

(15) Infection with Q Fever most commonly occurs by breathing in droplets or dust containing the bacteria from infected animals such as during:

a. animal birthing, slaughtering or butchering infected animals (especially cattle, sheep or goats); these activities carry a very high risk of infection;
b. handling infected animals, infected animal tissues, fluids or excretions or animal products e.g., veterinary/diagnostic procedures;
c. handling materials that have been infected including wool, hides, straw, manure fertiliser and clothes (e.g., washing clothes worn when birthing, butchering or slaughtering animals);
d. while herding, shearing or transporting animals;
e. while mowing grass contaminated by infected animal excretions; and

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f. when visiting, living or working in/near a high-risk industry.

(16) Infection with Q Fever can also occur through:

a. direct contact with infected animal tissue or fluids on broken skin (e.g. cuts or needlestick injuries when working with infected animals);
b. drinking unpasteurised milk from infected cows, sheep and goats;
c. ticks (rare) transferring the infection to people through tick bites, from breathing in tick excreta or through direct contact (e.g. removal of ticks from domestic animals, aerosol-generating activities such as shearing, or crushing ticks with bare hands);
d. human to human transmission (rare) via blood transfusion from blood collected in the late incubation period of primary infection.

Section 4 - Q Fever risk management at UQ

(17) Workers and students at UQ considered to be at significant risk of infection transmission include those working in and around agriculture, farms, veterinary practices and wildlife research.

Risk assessment

(18) A risk assessment should be undertaken in UQ workplaces where agricultural or feral animals (or their products) are handled or housed or roam near work areas. The following should be considered as part of a risk assessment and management.

Identify the hazard and assess the risk

(19) Consideration needs to be given to the following where:

a. People may inhale aerosols or droplets of urine, faeces, milk, birth fluids, placenta, blood and possibly semen from animal sources;
b. People may be exposed to eye contamination from splashes or aerosols from substances described above;
c. People may inhale dust that contains dried body fluids from animals;
d. People are likely to work with high-risk veterinary specimens, including:
    i. tissue samples known to contain Coxiella burnetii;
    ii. animal birth products, urine, milk and faeces; or
    iii. samples that could contain soil and dust from animal holding areas, where procedures create a droplet or aerosol risk. This is because soil and dust from animal holding areas may be contaminated with birth products, urine, milk and faeces.
e. Contaminated sharps, for example from dehoofing instrument contaminated with soil from the hoof.

(20) In relation to the above points, the frequency of exposure should be considered.

Risk groups

(21) At UQ those considered to be at risk include the following:

a. Veterinarians, veterinary nurses/students/researchers, and others working with veterinary specimens;
b. Those undertaking abattoir placements;
c. Agricultural or environmental science or other workers interacting in areas with wild animals, cattle, sheep or goats on a regular basis or handling non-live animals e.g., taxidermy;

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d. Animal farm staff that handle various species including cattle, sheep and goats;
e. Laboratory workers handling high risk veterinary specimens or working with Q fever organism (Coxiella burnetti);
f. Laboratory/biological resources workers in contact with sheep/goats/cattle/wild animals and/or their products;
g. Sewage treatment operators or workers in areas/ tasks where high concentrations of animal waste/by-products exist; and
h. Grounds workers/gardeners, who mow and slash grass contaminated with animal excreta or those exposed to animal manures in fertilisers and soil conditioners.

Risk Controls

(22) A combination of control measures may be used if a single control is not adequate to minimise the risk. Consider all possible control measures and assess which controls are reasonably practicable. Determining which controls are reasonably practicable includes assessing availability and suitability of control measures, regarding the level of risk. The hierarchy of controls must also be considered with a preference for engineering controls above administrative controls or personal protective equipment (PPE). Cost may be a relevant factor in determining reasonably practicable controls but should not be the primary consideration. The most effective control measure is to eliminate the hazard completely. However, it is unlikely that the hazard, namely the Coxiella burnetii can be permanently eliminated from the animals.

(23) Pre-screening of animals and using only Q Fever negative animals can be considered where possible. If this is not possible and if workers are significantly exposed to the risk of Coxiella burnetii on a regular basis, then the following control measures should be instituted.

Engineering controls

Pre-vaccination screening and vaccination

(24) A safe and effective vaccine (Q-VAX®) is the best way to prevent Q Fever infection.

a. People seeking Q fever vaccination must have both serum antibody testing and a skin test prior to Q fever vaccination;
b. Screening prior to vaccination is undertaken by a medical practitioner on the first visit to exclude persons who are already sensitised to Q Fever antigens and who may therefore experience a severe hypersensitivity reaction if vaccinated. Pre-vaccination screening incorporates taking a detailed history to exclude the likelihood of the person previously having had Q Fever infection or being previously vaccinated with Q Fever vaccine;
c. The pre-vaccination antibody testing and vaccination process involves two appointments with a medical practitioner;
d. The appointments must be exactly seven days apart to allow for the skin test to be read on day seven;
e. Those detected as having had previous exposure to the bacteria, will not require vaccination; and
f. If a Q fever vaccination is required, exposure in high-risk environments should be avoided until 15 days after vaccination to allow immunity to develop. See WorkSafe Queensland - Q Fever.

(25) As the risk of infection with Coxiella burnetii is related to roles, work locations, programs, or courses, a summary of UQ Q fever immunisation and disease screening requirements related to roles, work locations, programs, or courses can be found at:

a. Table 1 - UQ Student Immunisation/Screening Requirements by Program/Course and
b. Table 2 - UQ Occupational Immunisation and Screening Requirements for UQ Workers, Prospective Workers, HDR and Other Research Students.

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(26) Other engineering controls include:

a. implementing dust suppression measures to minimise airborne dust such as water sprinklers or wet cleaning of animal areas rather than sweeping;
b. changing a high-pressure water cleaning method with a low-pressure water system to minimise airborne aerosols;
c. maintaining ventilation and air conditioning systems in animal areas to minimise the dispersal of airborne contaminants;
d. locating high traffic areas, car parks, site entry, offices and dining facilities away from higher risk areas;
e. provide suitable washing facilities for workers.

Elimination controls

(27) Restricting non-essential and non-immune persons from entering Q Fever risk areas

Administrative controls

(28) Providing workers including contractors with information, induction, instruction, and training on Q Fever risk management.

(29) Keeping the workplace clean to minimise the accumulation of dust and dirt as well as washing animal urine, faeces, blood and other body fluids from equipment and surfaces where possible.

(30) Handling and disposing of animal products, waste, placenta and aborted foetuses appropriately, and where possible prevent animals from eating the placenta after giving birth.

(31) Using signage to inform people about Q Fever risk.

(32) Practising good hygiene such as ensuring that hands, and face are washed thoroughly before eating or smoking. Consider enforcing policy that prohibits eating or smoking in areas where there is a risk of exposure.

(33) Appropriate treatment of animal manure: do not remove manure from deep litter sheds or yards for at least one month after birthing season; compost manure or alternatively store manure for three months prior to spreading as fertiliser.

(34) Implementing biosecurity measures to prevent the spread of infection between animals, e.g., tick treatments.

(35) Covering wounds with waterproof dressings when handling or disposing of animal products, waste, placentas, and aborted foetuses.

Personal Protective Equipment (PPE)

(36) The minimum level of respiratory protection is a fit tested half facepiece respirator with a P2 filter. This must be of a suitable size and fit and worn by the worker. The worker is to be instructed in its correct use and fit.

(37) Remove protective and/or contaminated clothing before returning to the home environment. Personal protective equipment and contaminated clothing should be removed at the site and appropriately bagged and washed on site or disposed of, to reduce the risk of exposing non-vaccinated individuals and family members outside of the workplace to Q Fever.

(38) Disposable latex or vinyl gloves, disposable gowns and eye protection should be used when performing clinical procedures on animals or handling animal tissue, blood, body fluids or birthing products.

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Section 5 - Responsibilities

(39) Refer to the Vaccinations and Immunisation Procedure for responsibilities of UQ, Heads of Schools and Organisation Units, Supervisors, Health, Safety and Wellness Division, individuals and contractors (including sub-contractors) in the implementation of this Guideline.

(40) Supervisors who require assistance with implementing this Guideline should contact the Health, Safety and Wellness Division.

Section 6 - 1 - Appendix

Definitions

Term	Definition
Bacterium	A single cell micro-organism some of which can cause disease.
Personal Protective Equipment (PPE)	Equipment worn to minimise exposure to hazards that may cause workplace injuries and illnesses.
Zoonotic	An infectious disease that is transmitted between species from animals to humans

Contacts

(41) UQ Health, Safety and Wellness staff:

a. Occupational Health Nurse Advisor (HSW) - ohna@uq.edu.au or (07) 3365 4883.
b. Biosafety Advisor (HSW) - biosafety@uq.edu.au – (07) 3365 2365.
c. Health, Safety and Wellness Division (HSW Division) - hsw@uq.edu.au or (07) 3365 2365.

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