Prevaccination Q fever screening

Before being vaccinated against Q fever, patients with no previous history of Q fever infection must have antibody and skin tests to identify whether previous (possibly unrecognised) exposure to *Coxiella burnetii*, the causative agent of Q fever, has occurred. Those with prior exposure to *C. burnetii*, as detected by antibody and/or skin testing, may suffer a hypersensitivity reaction to the vaccine.

The two assays measure different arms of the immune system. The skin test detects the presence of acquired cell-mediated immunity (CMI) and is the primary test in the pre-vaccination screen. Detectable antibody may decline at a quicker rate than CMI and may be negative in a subject infected many years previously.

Serology	Skin test	Interpretation
Positive	Any result	Sensitised: do not vaccinate
Equivocal	Positive	Sensitised: do not vaccinate
	Borderline induration or negative	Indeterminate (see below)
Negative	Induration present	Sensitised: do not vaccinate
	Borderline induration or negative	Indeterminate (see below)
	Negative	Non-immune: vaccinate

Test results are deemed indeterminate when the skin test causes an induration (hardened mass) that is just palpable but the serological test detects no antibodies, or when the skin test causes no induration but the serological test detects an equivocal level of antibodies.

An indeterminate result may indicate previous infection with Q fever OR it may merely indicate that the patient has recognised antigens shared between *C. burnetii* and other bacteria. Doctors using the Australian Q fever vaccine have responded to indeterminate test results in one of two ways:

1. Repeat the skin test. Collect serum 2–3 weeks later to look for a rise in titre of *C. burnetii* antibodies in the IFA test, using Phase I and Phase II antigens, and immunoglobulin class analysis. A significant increase (defined as a 4-fold rise in titre of paired sera) in antibodies indicates previous Q fever infection; vaccination is then contraindicated.
2. Vaccinate the patient by **subcutaneous** injection with a 5 µg (0.1 mL) dose, instead of the standard 25µg (0.5 mL) dose of the vaccine. (Note: This 0.1 mL dose is different from the diluted vaccine used in skin tests). If there are no adverse effects (severe local induration or severe systemic effects, perhaps accompanied by fever) 48 hours after the injection, inject a further 0.4 mL (20 µg) dose of the vaccine within the next 8 days (i.e. before the development of cell-mediated immunity to the first dose).

Source: National Health and Medical Research Council (NHMRC), 'Q fever', *The Australian Immunisation Handbook*, 10th ed., part 4, section 4.15 (Canberra, ACT: Department of Health and Ageing, 2014). Available online at: http://immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home~handbook10part4~handbook10-4-15