Royal Free London
NHS Foundation Trust

Bordetella pertussis testing information

Recommended tests for *B. pertussis* testing vary according to the length of time since cough onset, please see table 1 for detail.

Table 1. Recommended tests for pertussis testing according to the length of time since cough onset

Time since onset of cough	Optimal test	Alternative tests	Comments
Less than 14 days	PCR	Culture	PCR = gold standard test Culture lacks sensitivity, particularly after first week of illness
14-21 days	PCR	Culture	PCR = gold standard test Culture lacks sensitivity
		Oral fluid for IgG detection (2-16yr olds)	Oral fluid kit must be ordered from the local Health Protection Team. It is only available for 2-16 yr olds.
Greater than 21 days	Serum for Antibody titres (>16yr old)	Oral fluid for IgG detection (2-16yr olds)	Antibody levels confounded by recent vaccination. Oral fluid kit details above.

Bordetella pertussis PCR

Molecular testing (PCR) is much more sensitive than culture for the detection of acute *B. pertussis* infection.

Turn-around time*:* PCR testing is currently referred to an external reference laboratory with a turn-around time of 5-7 days. Microbiology are developing an in-house service to reduce this TAT.

Specimen type and collection container:

- The optimal sample is a **nasopharyngeal swab** thin-wire dry swab (orange lid).
- If dry thin-wire swab is not available, normal calibre swab taken from nose and throat and sent in Viral Transport Medium (VTM) or Universal Transport Medium (UTM) is acceptable.
- Naso-pharyngeal aspirate (NPA) in universal container is also acceptable.

Swab type	Swab image (example)
Thin wire dry swab (orange lid)*	
Viral transport medium (red lid with liquid)*	
Universal transport medium (red lid with liquid)*	

*Please note images are typical examples of swabs but may vary between manufacturers

***Bordetella pertussis* culture**

Culture for *B. pertussis* is possible in the early catarrhal stage of the infection, but has poor sensitivity compared with PCR. Culture is not recommended in later stages of infection due to unacceptable false negativity.

Turn-around time*:* Culture turn-around time is 8-10 days owing to the slow growth rate of *Bordetella sp* in culture.

If requesting culture, the sample must be sent on a charcoal swab, other swab types will be rejected. Charcoal swabs are not suitable for PCR.

- The gold standard for culture is a Pernasal thin-wire charcoal swab.
- Nose and/or throat swabs may be sent as alternative using standard charcoal swabs but have lower sensitivity.

Bordetella pertussis dies very rapidly outside the body. To maximise the chance of growing on culture the posterior nasopharynx should be sampled because this contains the highest concentration of the *B. pertussis* bacteria. The swab should be transported in Charcoal media and taken to the laboratory immediately.

Swab type	Swab image (example)
Thin wire charcoal swab (orange lid)	

Collecting a Pernasal swab for *Bordetella pertussis* culture

- Wear a mask and eye-protection because the patient it likely to cough.
- Gently push the thin-wire swab along the floor of the nasal cavity until it reaches the nasopharynx.
- Hold the swab against the posterior wall of the nasopharynx for up to 30 seconds, or until the patient coughs.
- After removal, place the swab quickly into the charcoal gel container and send to the laboratory immediately.

Figure 1. Collecting a Pernasal swab for *Bordetella pertussis* culture