Public Health England

Pertussis factsheet for healthcare professionals

This factsheet helps health professionals to identify and test cases of pertussis. Pertussis is a notifiable disease and you should continue to report all suspected cases to your local Public Health England (PHE) Centre to ensure contacts are managed promptly.

Background

Pertussis (whooping cough) is an acute respiratory infection caused by the bacteria *Bordetella pertussis*. It usually begins with mild, cold-like symptoms, which develop over one to two weeks into coughing fits that can be severe. The cough can often last for two to three months. In the UK, a pertussis-containing vaccine (Pediacel™) is routinely offered to babies at two, three and four months old and a fourth dose is included with the pre-school booster (Infanrix® – IPV or Repevax®) when they are three-and-a-half years old.

Pertussis activity tends to peak every three to four years. In response to an observed increase in laboratory confirmed cases of pertussis above anticipated peak levels, the Health Protection Agency[1] declared a national outbreak in April 2012. Following further increases in disease and a number of deaths in young infants, the Department of Health launched a new temporary vaccination programme for pregnant women who are being offered vaccine between 28 and 38 weeks gestation. This immunisation is important to protect infants from birth until they can receive their first primary vaccines.

Who is affected by pertussis?

Pertussis can affect people of all ages. The highest incidence occurs in infants under three months old, who are too young to be directly protected by routine immunisation and for whom the disease is often severe and even life-threatening. Current high numbers of cases are also being confirmed in adolescents and adults who usually suffer a milder disease with a cough that may persist for many weeks. The reasons for this increase are not completely understood but waning immunity following vaccination and/or natural infection is likely to be a factor, although raised awareness and testing have also contributed to the increase in reported cases.

What to look out for

You should suspect pertussis infection and report it to your local PHE centre if someone presents with an acute cough lasting for 14 days or more without an apparent cause plus one or more of the following:

- paroxysms of coughing
- post-tussive vomiting
- inspiratory whoop
- undiagnosed apnoeic attacks in young infants

[1] The Health Protection Agency was abolished and its functions transferred to PHE 1 April 2013.

or

- someone with signs and symptoms consistent with pertussis who has been in contact with a confirmed case in the previous 21 days

or

- someone who is known to be part of any ongoing outbreak investigation in a specific group of people. For example, children attending the same school or nursery where pertussis is known to be been circulating

Managing suspected pertussis

Children with clinically suspected or laboratory confirmed pertussis should be excluded from schools or nurseries until they have completed the recommended course of antibiotic therapy (table 1). Those who are not treated with antibiotics should be excluded for 21 days from onset of symptoms. Administer antibiotics as soon as possible after onset of illness in order to eradicate the organism and limit ongoing transmission.

Table 1. Recommended antibiotic treatment and post exposure prophylaxis by age group

Age group	Clarithromycin	Azithromycin	Erythromycin	Co-trimoxazole*[2]
Neonates (Under 1 month)	Preferred in neonates 7.5mg/kg twice a day for 7 days	10mg/kg once a day for 3 days	Not recommended due to association with hypertrophic pyloric stenosis	Not licensed for infants below 6 weeks
Infants (1 month–12 months)	Under 8kgs 7.5mg/kg twice a day for 7 days 8–11kg 62.5mg twice a day for 7 days	1–12 months 10mg/kg once a day for 3 days	1–12 months 125mg every 6 hours for 7 days	6 weeks–6 months 120mg twice a day for 7 days 6 months–1 year 240mg twice a day for 7 days
Children	12–19kg 125 mg twice a day for 7 days 20–29kg 187.5mg twice a day for 7 days 30–40kg 250mg twice a day for 7 days	Over 1 year 10mg/kg (max 500mg) once a day for 3 days	1–2 years 125mg every 6 hours for 7 days 2–8 years 250mg every 6 hours for 7 days Over 8 years 500mg every 6 hours for 7 days	1–5 years 240mg twice a day for 7 days 6–12 years 480mg twice a day for 7 days 12–18 years 960mg twice a day for 7 days
Adults	500mg twice a day for 7 days	500mg once a day for 3 days	500 mg every 6 hours for 7 days	960mg twice a day for 7 days
Pregnant women[3]	Not recommended	Not recommended	Preferred antibiotic. Not known to be harmful	Contraindicated in pregnancy

* Please note that the doses for treatment and prophylaxis are the same for all ages.

[2] Consider if macrolides contra-indicated or not tolerated.

[3] For pregnant contacts, a risk assessment would need to be done to look at the risk and benefits of antibiotic therapy /prophylaxis. The aim of treating/prophylaxis of women in pregnancy is to prevent transmission to the newborn infant. Where possible, pregnant women should begin treatment three days before delivery.

Laboratory tests for pertussis

Culture

Take cultures by nasopharyngeal swabs/pernasal swabs/nasopharyngeal aspirates. Do not take throat swabs or anterior nasal swabs.

Sample the posterior nasopharynx using a nasopharyngeal swab/pernasal swab (typically flexible ultrafine twisted wire shaft with nylon/Rayon swab). The Copan-style swab is also acceptable for a nasopharyngeal aspirate. The pernasal swab (PNS) needs to be gently pushed along the floor of the nasal cavity towards the posterior wall of the nasopharynx as this is where the *Bordetella pertussis* bacteria are most likely to be found. After sampling, place the PNS for culture in transport media and transfer it without delay to the local hospital laboratory for processing.

The sensitivity of nasopharyngeal culture is affected by patient age (it decreases as people get older), vaccination status and length of illness. The sensitivity also decreases with time after onset and is highly dependent on specimen quality. Timing the specimen collection is important: sensitivity decreases substantially (55% to under 10%) from week one to week four. This means it is vital to have accurate details about the onset of symptoms on the patient request form.

Oral fluid testing (for detecting the anti-pertussis toxin IgG)

PHE introduced oral fluid testing across England and Wales from January 2013. This test is offered to seek laboratory confirmation of clinically suspected cases in people aged between 5 and 16 years (that is, under 17) who have had cough for more than two weeks and have NOT received a pertussis vaccine in the past year. Local PHE centres send these kits in response to any such cases reported to them. They will also post the kit directly to patient's home or to a health professional if preferred. Taking the oral fluid sample is straightforward and clearly explained in the instructions included with each kit.

It takes time to receive the results, so before they become available you should clinically manage patients appropriately.

Serology testing (for detecting the anti-pertussis toxin IgG)

Serological testing is used to seek laboratory confirmation of cases where the date of onset of cough has been at least two weeks before specimen collection. It detects antibodies to pertussis toxin and a level (PT IgG) above 70 international units per millilitre (IU/ml) is considered evidence of recent infection (in the absence of vaccination within the past year). This method is predominantly used to confirm cases in older individuals (over 17 years old).

Polymerase chain reaction (PCR)

The Bordetella Reference Laboratory at the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU) currently offers B. pertussis PCR for acutely ill infants (aged 12 months or under) admitted to a paediatric intensive care unit or paediatric ward with respiratory illness compatible with pertussis. Take pernasal samples for PCR as for culture above, but send them "dry" if possible (that is, not in transport media). PNS for PCR sent in transport media will still be tested.

Table 2. Appropriate laboratory tests for cases of pertussis

Age	Clinical symptoms Up to 2 weeks cough	Testing offered by	Clinical symptoms Over 2 weeks cough	Testing offered by
Up to 1 year Hospitalised	NPA/NPS/PNS for PCR or NPA/NPS/PNS for culture	PHE-RVPBRU Local laboratory*	NPA/NPS/PNS for PCR or NPA/NPS/PNS for culture	PHE-RVPBRU Local laboratory*
Up to 1 year Community Over 1 year–6 years	NPA/NPS/PNS for culture	Local laboratory*	Serum for serology	PHE-RVPBRU
Over 6 years–8 years[3]	NPS/PNS for culture	Local laboratory*	Serum for serology	PHE-RVPBRU
8–16 years[3]	NPS/PNS for culture	Local laboratory*	Oral fluid samples	PHE-RVPBRU
Adults (over 17 years)	NPS/PNS for culture	Local laboratory*	Serum for serology	PHE-RVPBRU

NPA – nasopharyngeal aspirate; NPS – nasopharyngeal swab; PNS – pernasal swab; PCR – polymerase chain reaction; RVPBRU – Respiratory and Vaccine Preventable Bacteria Reference Unit.

*Note: before sampling confirm that the local laboratory has facilities for culture.

If you are uncertain about the testing facilities and where to send samples contact your local microbiologist for information as this may vary in different regions. Note: PHE-RVPBRU does not perform primary isolation.

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