Dear Doctor,

PERTUSSIS: DIAGNOSIS, TREATMENT AND PREVENTION

The following information is provided to assist you in the diagnosis, treatment and prevention of pertussis infection. The aim of disease control efforts is to protect very young or unvaccinated infants who are most at risk of the severe consequences of pertussis infection. Vaccination is the mainstay of pertussis prevention. However, early recognition and treatment of pertussis cases combined with targeted post exposure prophylaxis of at risk contacts is an important adjunct in controlling this important and potentially lethal infection.

CLINICAL FEATURES

Infection with the *Bordetella pertussis* bacterium causes an acute respiratory illness characterised by a catarrhal phase, which is followed by a paroxysmal cough with or without the characteristic ‘whoop’ or post-tussive vomiting. Complete recovery may take months. Older children and adults may not have the classic clinical features of acute whooping cough.

The severe sequelae occur in very young children and include hypoxic encephalopathy, permanent brain damage, secondary pneumonia and death. Infants aged less than six months are less likely to present with the characteristic paroxysmal cough and the symptoms may be indistinguishable from bronchiolitis.

Incubation period: Ranges from 4 to 21 days, usually 7 to 10 days.

Infectious period: Cases are infectious from the onset of catarrhal symptoms. Communicability gradually decreases and is negligible 3 weeks after onset of cough. For public health purposes, a case is considered non-infectious (even if the PCR result is still positive) at whichever time is the earlier of:
- 21 days after the onset of any cough, or
- 14 days after onset of paroxysmal cough (if the onset is known), or
- when they have completed 5 days of a course of an appropriate antibiotic.

LABORATORY TESTING

Nucleic Acid Test (NAT) Testing

Nucleic acid testing (NAT) (also known by the proprietary name of PCR) should be considered the diagnostic method of choice, unless the presentation is delayed until after 4 weeks from any cough onset, or more than 3 weeks after commencement of paroxysmal cough, after which time serological testing may be more useful for diagnosis.

Pertussis serology. *B. pertussis*-specific IgA

The sensitivity and specificity of serology is low. Serology may be useful if a clinically compatible illness has been present for more than two weeks, but is not recommended in children < 2 years old as they are less likely to develop IgA antibodies.

IgA and IgG may be elevated for an unknown period (reported as 1 year but may be as long as 2 years) in an adult or adolescent after vaccination, therefore caution should be taken in interpreting serological results in a recently vaccinated person.

The following table describes recommended tests for pertussis based on the duration of cough illness.

<table>
<thead>
<tr>
<th>Duration of cough</th>
<th>Recommended test(s)</th>
<th>Duration of paroxysmal cough</th>
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</thead>
<tbody>
<tr>
<td>&lt; 4 weeks</td>
<td>PCR &amp; culture (nasopharyngeal aspirate or swab; use Dacron™ or rayon tipped swabs; transport dry)</td>
<td>&lt; 3 weeks</td>
</tr>
<tr>
<td>&gt; 4 weeks</td>
<td>Serology (IgG, IgA)</td>
<td>&gt; 3 weeks</td>
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</tbody>
</table>
CASES

**Antibiotic Treatment** *(see Table below for details)*

Antibiotics given early in the catarrhal stage may ameliorate the disease but may have little effect on symptoms if given later. Importantly, antibiotics reduce the period of communicability and should be initiated as soon as possible. If treatment starts any later than 14 days from onset of any cough, by the time 5 days of treatment are completed, the case is already close to the end of their infectious period (21 days).

**Exclusion**

Cases should be excluded from work, school, pre-school, and child care, and restrict their attendance in other settings, especially where there are infants, until they are no longer infectious. The period of exclusion is for 21 days after the onset of any cough (or 14 days after the onset of paroxysmal cough) or until they have received 5 days of an appropriate antibiotic.

(Child care refers to long day care, family day care or setting where children aged 4 years or less are in care.)

CONTACTS

**Antibiotic Treatment** *(see Table below for details)*

A contact is defined as a person with face to face exposure (within 1 metre) to an infectious case for a single period of at least one hour.

The timeline for providing antibiotic prophylaxis to high-risk contacts should be within 14 days of first contact with an infectious case. For public health purposes the contacts most at risk of developing pertussis infection and recommended as suitable for appropriate antibiotics prophylaxis *(antibiotic eligible contacts)* include:

- All household members when the household contacts include an incompletely vaccinated child < 6 months of age or woman in the last month of pregnancy.
- Where the case attended childcare for more than 1 hour while infectious and their care group contains a child < 6 months of age, then all children in the room who have received less than 3 effective doses of pertussis vaccine as well as staff who have not received a pertussis vaccine booster in the last ten years should receive antibiotics. If two cases occur within 21 days in a room with a child < 6 months of age, all children and staff in the room regardless of vaccination status should receive antibiotics.
- Where there are 2 or more cases within 21 days in the same childcare group and all children are over 6 months of age, then antibiotics should be provided to all children in the room with < 3 doses of vaccine and to staff who have not had a pertussis vaccine booster in the last 10 years.
- In healthcare settings where infants < 6 months or women in their last month of pregnancy are present (including neonatal unit, maternity ward) then the following contacts should receive antibiotics if exposed to the case within 1 metre for > 1 hour:
  - infants < 6 months exposed to the case
  - parents or carers of infants < 6 months of age
  - women in last month of pregnancy

(Please note the Public Health Unit will advise on contact prophylaxis if the case attends a child care facility, health care facility or other institution) *In the absence of evidence concerning the minimum duration of exposure required to lead to infections in neonates, a neonate exposed to an infectious case for less than one hour may warrant being considered a close contact.*

**Exclusion**

*Antibiotic eligible contacts* (unless they are asymptomatic child care centre staff taking antibiotics) should be excluded from childcare, family day care and similar settings until they have taken 5 days of a course of appropriate antibiotics. If recommended antibiotics are not taken, the eligible contacts should be excluded until 14 days from their first exposure to the infectious case. Exclusion of asymptomatic contacts from school or work is generally considered unnecessary.

**VACCINATION**

Vaccination status should be checked immediately (cases, household contacts and childcare contacts) and updated if required. Funded catch up vaccination is available for all children under ten years of age. Pertussis vaccination of those who have had previous pertussis infection is safe; previous pertussis infection is not a contraindication to pertussis vaccination.
Adolescent/adult-formulation (lower dose) dTpa vaccines are recommended for booster vaccination of individuals aged 10 years or more who have previously had a primary course of diphtheria-tetanus-pertussis vaccine. dTpa is provided to adolescents in Queensland as part of the School Immunisation Program.

It is recommended that any adults living in the household of children under six months of age (or regularly caring for these children), receive a dose of dTpa.

### ANTIBIOTICS FOR CASES AND ELIGIBLE CONTACTS  
**CDNA Series of National Guidelines – Pertussis 2015**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Macrolides</th>
<th>Non-macrolide alternative</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Azithromycin</td>
<td>Clarithromycin</td>
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<tr>
<td>&lt;1 month</td>
<td>10mg/kg daily for 5 days</td>
<td>Not recommended (as no safety data)</td>
</tr>
<tr>
<td>1-5 months</td>
<td>10mg/kg daily for 5 days</td>
<td>7.5mg/kg twice a day for 7 days (up to 1g/day)</td>
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<tr>
<td>Infants ≥6 months and children</td>
<td>10mg/kg (up to 500mg) on Day 1, followed by 5mg/kg (up to 250mg) on Days 2-5</td>
<td>7.5mg/kg twice a day for 7 days (up to 1g/day)</td>
</tr>
<tr>
<td>Adults</td>
<td>500mg on Day 1 followed by 250mg daily on Days 2-5</td>
<td>500mg twice a day for 7 days</td>
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<tr>
<td>Pregnancy</td>
<td>Pregnant women with onset of pertussis or exposure within a month of expected delivery should receive antibiotic therapy. It is the responsibility of the treating doctor to select the most appropriate antibiotic. Erythromycin (Category A) has variable absorption and frequent gastrointestinal side-effects. Azithromycin (Category B1) has better absorption. Clarithromycin is a Category B3 antibiotic.</td>
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*Therapeutic Guidelines: Antibiotic notes there is currently no clinical evidence to recommend the use of roxithromycin for the management of pertussis. In vitro evidence indicates it is relatively ineffective.*

*Erythromycin, whilst efficacious for prophylaxis, is not recommended due to poor tolerability. Erythromycin for this reason is not currently listed in the most recent edition Therapeutic Guidelines: Antibiotic*