5 March 2014

HEALTH PROFESSIONAL ADVICE: Pertussis (update March 2014)

SITUATION UPDATE

- The Pertussis epidemic which began in May 2011 has continued without any sign of abating. In 2013 there were 791 cases of pertussis notified, including 98 notifications in <12 month olds.

- Tdap Immunisation for pregnant women is recommended and funded for every pregnancy from 28-38 weeks gestation.

- Azithromycin is the first line treatment and prophylaxis for all ages and is fully funded, this is a much more convenient dosage regime and treatment duration.

- Pertussis is especially serious in infants under 12 months old. For every 100 infants <12 months old with whooping cough, around 70 will be hospitalised. The current public health strategy aims to protect this vulnerable cohort.

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**Pertussis Management Guide**

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Immunisation
The Pertussis vaccine saves infants lives.

Pregnancy Immunisation is funded for every pregnancy from 28-38 weeks gestation - with the ideal time to give the vaccine between 28-38 weeks.
Vaccination protects both mother and baby in the most vulnerable first 6 weeks of life.

Vaccination needs to be on time to protect infants best.

Delay in receipt of any of the first three pertussis immunisations increases the odds of hospitalisation with pertussis in the first year of life by 4-6 times.

- DTap-IPV-HepB at:
  - 6 weeks
  - 3 months
  - 5 months
  - DTap at 4 years

Immunity wanes (whether from vaccine or infection) over 4-6 years, so boosters are required.

Pertussis Case

Notify & Isolate until 5 days of antibiotics/3 weeks of cough (whichever sooner)

Are any Household contacts:

- Healthcare worker;
- Immunocompromised;
- Working with < 1 year old;
- Incompletely immunised;
- < 1 year old;
- Pregnant?

Yes

- Treat case and give Chemoprophylaxis for entire household (prespective of immune status)

- Opportunistic vaccination of household if required (N8 funded for children, pregnant women only)

No

- Treatment and Prophylaxis:
  - Treatment reduces infectivity, early treatment may modify disease severity
  - 1st line: Azithromycin 5 days
    - is fully funded for all age groups
    - for the treatment or prophylaxis of pertussis
      - Dose: Days 1: 10mg/kg/day in a single daily dose (max 500mg/day)
      - Days 2-5: 5mg/kg/day in a single daily dose (max 250mg/day)
  - 2nd line: Erythromycin ethyl succinate (EESE-Mycin) is also fully funded for treatment in children aged 12 months and older and in adults but must be given as a 14 day course

- Adults 400mg four times a day for 14 days
- Children 12 months or older 10mg/kg/day four times a day for 14 days (max 400mg qid)

Roxithromycin (RULID) is NOT recommended for treatment/chemoprophylaxis of pertussis due to poor serum and tissue concentrations achieved.
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CURRENT INFORMATION (links provided to updated sections)

- [Current Process for Health Professionals](#)
- Investigation recommendations updated
- After-Hours laboratory requests
- Azithromycin for all ages now fully funded
- Roxithromycin (rulide) use
- Management in Primary Care & Hospitals
- Immunisation recommendations
- Resources available from ARPHS

CURRENT PROCESS FOR HEALTH PROFESSIONALS

Auckland Regional Public Health Service (ARPHS) is focussing on protecting those at greatest risk of adverse outcomes from pertussis, and promotion of pertussis immunisation. Due to the widespread nature of pertussis in the community, outbreak control is not an achievable objective currently. We are advising the sector (primary care and hospitals) in case management and high priority contact management.

- ARPHS continues to receive notifications (see ‘Managing Suspected Pertussis Cases’ section).
- General Practice and hospital-based health professionals are responsible for providing the case and high priority contacts with appropriate information, advice, and treatment or prophylaxis (see link below)
- Individual cases and their contacts are continuing to be managed through primary care. This has been the case since the disease became epidemic and the public health priority shifted from outbreak control to the protection of those most vulnerable (under 12 month olds, pregnant, immune compromised)
- ARPHS can provide direct advice on high priority contacts by telephone
- Written information for cases, contacts, early childhood education centres, schools, and healthcare institutions is available from ARPHS: [http://www.arphs.govt.nz/health-information/communicable-disease/pertussis-whooping-cough](http://www.arphs.govt.nz/health-information/communicable-disease/pertussis-whooping-cough)

MANAGING SUSPECTED PERTUSSIS CASES

**Notify** – **Investigate** – **Treat** – **Isolate** - **Advise**- **Immunise**

**Notify** on suspicion

- If your patient has a clinically compatible illness and the diagnosis is most likely pertussis, notify ARPHS. Do not wait for investigations to be completed.
- **Inform the patient or caregiver that ARPHS has been notified** and may be in contact

- To notify ARPHS, call **09 623 4600** (24-hour phone line) or fax **09 630 7431** with the information listed below: Fax template provided in **Appendix 1**
Investigate only where necessary
- Investigation is NOT required for all suspected cases.
- ARPHS does NOT recommend testing for the following people:
  o Patients that meet the case definition of a cough for more than two weeks and one or more of the following: whoop, post-tussive vomiting, or apnoea
  o Cases that have been coughing for under 2 weeks, with an illness compatible with early whooping cough, and known contact with a case that met the case definition or with a confirmed case of pertussis (i.e. PCR, culture, or serology positive)
  o Symptomatic household contacts of a confirmed case of whooping cough or a case that meets the case definition
- Diagnostic testing should be considered ONLY if the result will alter the management of cases with high priority contacts (infants under 12 months, pregnant women, immune compromised, chronic disease), or if employment issues arise, or if requested by ARPHS
- Any tests believed urgent should be discussed with the appropriate pathologist

Timing of Infectivity, Investigation, and Treatment

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</tbody>
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Adapted from CDC: [www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html](http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html)
Shading indicates relative sensitivity

After-Hours Laboratory Requests from Virology and Immunology
- PCR and serology specimens collected at community laboratories are all tested at LabPlus
- Specimens will be processed on the next working day

Other important considerations (see diagram above)
- There are several laboratory tests available for the diagnosis of pertussis (see Resources)
The timing of a test impacts on its sensitivity

A negative laboratory result does not necessarily rule out pertussis – consider exposure, clinical compatibility, the diagnostic test performed and its timing. There is no point in requesting PCR testing if the patient has been symptomatic for more than 3 weeks.

### Treat Suspected Cases

- Early treatment may modify disease severity. Treatment reduces infectivity if started during the catarrhal phase or within three weeks of the onset of paroxysmal cough. Beyond this time it should only be considered for pregnant women in their third trimester (pg 146, Immunisation Handbook)

- **Azithromycin** is the recommended first-line treatment and a five day course is fully funded for all age groups if endorsed for the treatment or prophylaxis of pertussis (from 1 December 2012). The recommended dose varies by age and is:
  - **Infants and children:**
    - Day 1: 10mg/kg/day in a single daily dose (max 500mg day 1);
    - Days 2-5: 5mg/kg/day in a single daily dose (max 250mg per day)
  - **Adults:** Day 1: 500mg as a single dose; Days 2-5: 250mg once daily

- **Erythromycin ethyl succinate** (EES/E-Mycin) is also fully funded for treatment in children aged 12 months and older and in adults but must be given as a **14 day course**:
  - **Adults:** 400 mg four times a day for 14 days
  - **Children 12 months or older:** 10 mg/kg/dose four times a day for 14 days (max 400mg qid)

**NOTE**: Macrolide use in pregnancy and the neonatal period has been associated with an increased risk of hypertrophic pyloric stenosis. Advise patients to contact their doctor if vomiting or irritability with feeding occurs.

- **Roxithromycin (RULIDE)** is **NOT recommended** for treatment/chemoprophylaxis of pertussis due to poor serum and tissue concentrations achieved.

- Alternative antibiotic regimens can be found in pg 147 of the 2011 Immunisation Handbook.

### Isolate Cases

- Cases should be advised by their GP or hospital doctor to stay away from babies, young children, pregnant women and immuno-compromised people. They should not attend early childhood education centres, school, work, and social gatherings until either:
  - **five days** of appropriate antibiotics have been completed, **or**
  - **three weeks** have passed since the start of the paroxysmal cough (if not taking antibiotics)

- Children diagnosed with pertussis are required by the Medical Officers of Health to be excluded from Early Childhood Centres/Schools as described above in accordance with the Health (Infectious and Notifiable Diseases) Regulations 1966 and/or the Education (Early Childhood Centres) Regulations 1998.

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1. Pg 146 Immunisation Handbook 2011: Macrolides taken by pregnant or breastfeeding mothers have been reported with an increased risk of infantile pyloric stenosis. The risk is presumed to be lower for azithromycin than for erythromycin; however there have been reports in the literature of pyloric stenosis in infants of women treated in pregnancy with azithromycin. Inform patients to contact their doctor if vomiting or irritability with feeding occurs.
Advise
- Provide information sheets for patients and contacts with suspected or confirmed pertussis (see Resources)

Immunise
- Review the immunisation status of all household members and update as necessary
- Pregnant women should be offered TDap “Boostrix” vaccine in every pregnancy. The vaccine is funded when given in the third trimester. See Resources for more information
- Offer immunisation to adolescent (>16 years) and adult household members who have not received an immunisation booster in the last 10 years – this is not funded.
- Children who have had pertussis infection should still have all of their childhood pertussis immunisations as per the National Schedule

MANAGING CONTACTS OF PERTUSSIS IN PRIMARY CARE & HOSPITALS
- ARPHS is not undertaking contact tracing for pertussis notifications
- Primary care is being asked to manage chemoprophylaxis for household contacts of a pertussis case and provide information to cases to distribute to their other important contacts
- Hospitals are being asked to manage hospital inpatient contacts of a case and provide information to other contacts (from ARPHS website) so they can discuss with their GP whether prophylaxis is indicated. GPs may have additional information regarding other high priority contacts in the family.
- The aim of contact management is two-fold:
  1. To identify symptomatic contacts for treatment
  2. To provide chemoprophylaxis with an aim of reducing the odds of infection in high priority groups (infants under 12 months, pregnant women in their 3rd trimester, immune compromised, those with chronic disease, and their contacts)

Arrange Chemoprophylaxis
- Advise or arrange chemoprophylaxis for the following household contacts of a case of pertussis:
  - all members of a household that includes:
    - an infant under 12 months old or
    - a pregnant woman in the third trimester or
    - household contacts under five years of age who are unimmunised or have had less than three pertussis immunisations, or
    - individuals at risk of severe illness or complications (e.g. chronic respiratory conditions, congenital heart disease or immunodeficiency)
  - contacts who themselves have daily contact with infants under 12 months, pregnant women or individuals at risk of severe illness or complications (e.g. chronic respiratory conditions, congenital heart disease or immunodeficiency) e.g. through childcare or work.
- Prophylactic antibiotic regimens are the same as for treatment of pertussis
- Prophylaxis is not 100% effective. Advise contacts to:
  - be vigilant for symptoms and to see a GP if they develop catarrhal symptoms or cough.
  - stay away from babies, children under 12 months, pregnant women, and immunocompromised people, until:
    - five days of a course of appropriate antibiotics have been completed, or
    - three weeks have passed since last contact with the case if not taking antibiotics

Provide Information for the Case to Pass on to Their Contacts
Advise cases/parents to let their contacts know that they have pertussis including informing:

- Early childhood centres, daycares, schools, workplaces
- Contacts who are aged under 12 months, partially or unimmunised children under five years, pregnant, or immune compromised
- Contacts who are in daily contact with pregnant women, infants under 12 months

Provide cases with Information Sheets to give to their contacts (see Resources)

**IMMUNISATION**

Immunisation remains the mainstay for controlling the current outbreak. To reduce the burden of pertussis in New Zealand, and to prevent or minimise future outbreaks, consistent immunisation coverage rates of 92-94%[^2] are required at each Ministry of Health reported milestone age (i.e. six months, five years, and 12 years). The most vulnerable cohort, infants under 12 months, is currently the least protected with immunisation rates of 82% across the Auckland region at six months of age (64% in Maori, 76% in Pacific)[^3]

Every opportunity to immunise should be taken, including active precall, recall, review of immunisation status at all paediatric consultations, and opportunistic immunisation

**KEY IMMUNISATION MESSAGES FOR PATIENTS**

- **On time** immunisation is essential at 6 weeks, 3 months, 5 months
  
  Delay in receipt of any of the first three pertussis immunisations increases the odds of hospitalisation with pertussis in the first year of life by 4-5 times. **Note**: Due to waning immunity in adulthood, maternal antibodies are generally inadequate to provide protection to newborns.

- **Boosters** are essential at 4 years and 11 years
  
  Immunity following immunisation or pertussis infection wanes after 4-6 years. Boosters help maintain personal immunity through the school years, and also provide indirect protection of infants in the community who are too young to be immunised.

  
  Immunisation is funded for pregnant women from 20 weeks gestation – with the ideal time to give the vaccine between 28-38 weeks.

  This booster is given to reduce the risk of the mother infecting her baby, and to provide passive protection in the first weeks of life. Consult the vaccination datasheet when considering use in pregnancy or lactation.[^4] Note that Section 25 of the Medicines Act allows off-label use of medicines (including vaccines) providing that doctors have informed consent from the patient and exercise a duty of care.[^5] An information sheet on Pertussis Immunisation in Pregnancy is available for patients on the ARPHS website (see Resources).

- **Adult immunisation** (Immunisation Handbook 2011 Page 142)

  Around 80% of infants with pertussis catch it from a parent, caregiver, or sibling. Immunisation of other family members helps provide indirect protection of those who are most vulnerable. Adult immunisation booster is not funded[^6], but is recommended by the Ministry of Health for:

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[^4]: Boostrix datasheet states: Adequate human data on use during pregnancy and adequate animal reproduction studies are not available. Therefore, BOOSTRIX should be used during pregnancy only when clearly needed, and the possible advantages outweigh the possible risks for the foetus. When protection against tetanus is sought, consideration should be given to tetanus or combined diphtheria-tetanus vaccines. As with all inactivated vaccines, one does not expect harm to the foetus. See [http://www.medsafe.govt.nz/profs/datasheet/b/Boostrix-IPVinj.pdf](http://www.medsafe.govt.nz/profs/datasheet/b/Boostrix-IPVinj.pdf)
[^6]: Some employers may provide this to staff free.
PERTUSSIS INFECTION

- Pertussis is a highly infectious bacterial infection spread by coughing and sneezing.
- There are two phases of the illness:
  - **Catarrhal Phase**: Most infectious period lasting seven to 10 days. Symptoms include runny nose, fever, malaise and coughing.
  - **Paroxysmal Phase**: Severe prolonged coughing episodes (paroxysms) that typically end in a whoop (inspiratory gasp), apnoea, or vomiting.
- Pertussis occurs at any age as immunity wanes four to six years after immunisation or infection.
- Clinical presentation varies with age and immunisation status:
  - Immunised children and adults typically experience a milder illness and may not whoop.
  - Infants < six months frequently have an atypical presentation with a short catarrhal phase, gagging, gasping, or apnoea as prominent features, absence of whoop, and a prolonged paroxysmal phase.
- **Complications**: Include pneumonia, neurologic complications including seizures and encephalopathy due to hypoxia, pressure complication resulting from severe coughing include rib fractures, petechial haemorrhage, pneumothorax, hernia, rectal prolapse.
- **Serious complications are most common in infants under 12 months**: 65-75% hospitalised, 10% pneumonia, 20-25% apnoea, seizures ~1%, death 1-2%.
- **Incubation period**: Ranges from five to 21 days.
- **Infectious period**: From symptom onset (catarrhal phase, most infectious period) until three weeks after the onset of paroxysmal or severe coughing.

RESOURCES

For Health Professionals:
http://www.arphs.govt.nz/health-information/communicable-disease/pertussis-whooping-cough

- **Pertussis: Clinical Pathway** (PDF, 75 KB)
- **Pertussis Fax Notification Template** (Word, 213 KB)
- **GP fax: FREE pertussis vaccination for pregnant women** (105.62 KB)
- **Quick answers to frequent Tdap questions** (PDF, 198.59 KB)

For patients and their contacts:
http://www.arphs.govt.nz/health-information/communicable-disease/pertussis-whooping-cough

- Pertussis Fact Sheet in English and Te Reo
- Information for Cases
- Information for Contacts
- Pertussis Immunisation in Pregnancy

For additional information on immunisation, please call the Immunisation Advisory Centre on 0800 IMMUNE (0800 466 863) or visit their website www.immune.org.nz
Appendix 1: PERTUSSIS NOTIFICATION TEMPLATE: Please complete and fax to (09) 630 7431 or Tel: 6234600. Thank you.

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<tr>
<th>Reporting GP:</th>
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<td>NHI:</td>
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<td>Current Address of Case:</td>
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<tr>
<td>Date of Birth:</td>
<td>Male or Female (Circle one):</td>
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<table>
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<th>Coryzal/catarrhal prodrome (URTI symptoms and nonspecific cough)</th>
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<table>
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<td>If yes, Date of Onset:</td>
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| Inspiratory whoop                                               | Y / N |

| Post-tussive vomiting or apnoea                                  | Y / N |

| In GP’s view is this a clinically compatible illness?             | Y / N |

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| Hospitalised                                                     | Y / N |

| Infection Control notified                                       | Y / N |

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| Antibiotics Prescribed: Azithromycin for 5 days Or Erythromycin for 14 days Other | Y / N Date prescribed: |
|                                                                             | Y / N Date prescribed: |
|                                                                             | Y / N Name of antibiotic: |

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<th>Household Contacts: Anyone symptomatic</th>
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<td>Anyone Pregnant 3rd trimester</td>
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<td>Anyone immuno-compromised</td>
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Please visit our website at [www.arphs.govt.nz](http://www.arphs.govt.nz) for further pertussis information and resources.