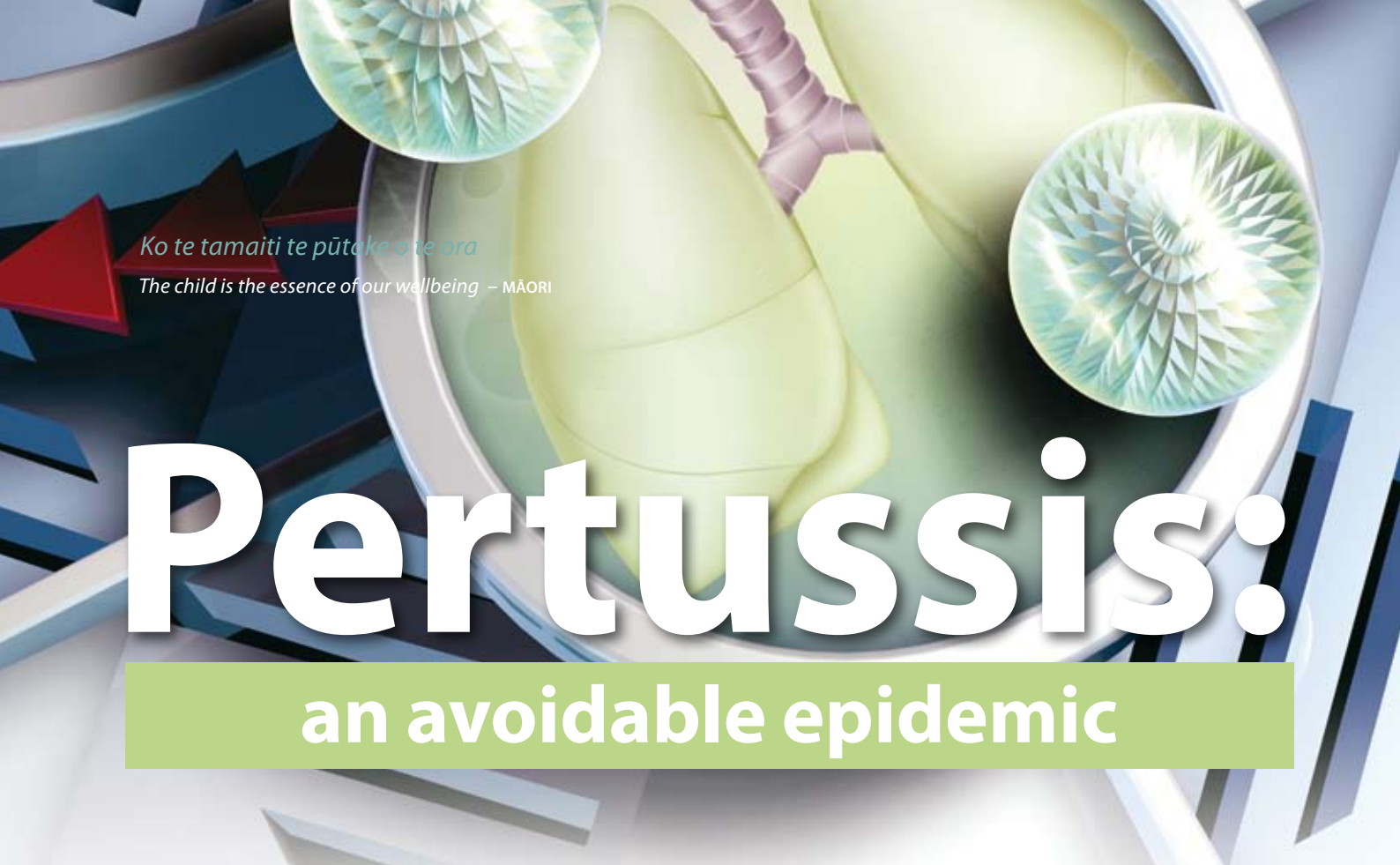

Ko te tamaiti te pūtake o te ora

The child is the essence of our wellbeing – MĀORI

Pertussis:

an avoidable epidemic

There is currently an epidemic of pertussis in New Zealand; almost 3000 new infections have been reported so far in 2012 (to the end of July). Identifying and treating patients with pertussis early is important in limiting the spread of this potentially fatal infection.

What is pertussis?

Pertussis, commonly known as whooping cough, is a highly infectious illness caused by the Gram-negative bacteria *Bordetella pertussis*.[1] Infection can occur in people of any age but is most severe in young children, and can be fatal. Pertussis infection is characterised by bouts of severe coughing with a high-pitch "whoop" sound on inspiration. The excessive and forceful nature of the cough frequently leads to vomiting and occasionally a petechial rash on the face.

The incidence of pertussis is increasing

There are a growing number of new pertussis cases being reported in New Zealand. Between January and 20 July, 2012 there were 2966 pertussis notifications, compared to 425 over the same period in 2011.[2] Pertussis epidemics are cyclic, occurring every few years. The 2012 epidemic, to date, is considerably larger than that seen in 2009, although similar to the 2000 and 2004 epidemics.[2]

The outbreak has highlighted ethnic disparities in the progression of the disease and the care of people with pertussis. The highest number of hospitalisations for pertussis is among Pacific children, with 28% of infections resulting in hospitalisation, followed by Māori children, with 13% hospitalised.[2] By comparison, the hospitalisation rate among New Zealand European children who have pertussis is 3%.[2] Over 60% of all hospitalisations for pertussis have been in infants aged less than one year.[2]

Geographically, the majority of cases have been reported in Canterbury, Capital and Coast and Nelson Marlborough DHBs.[2]

Immunisation offers the best protection, even in an outbreak

The best protection against pertussis is vaccination. It is important to vaccinate on time to offer young infants as much protection as possible, as early as possible. Children aged under one year, and especially infants aged under six weeks, are most at risk of serious infection from pertussis.

The multiple dose pertussis vaccine is between 71 – 85% effective in preventing pertussis.[1] The effectiveness of the vaccine declines considerably over time, with protection lasting between five to ten years.[3] The vaccine can be used preventatively in outbreaks, as initial protection against pertussis develops within 10 – 14 days of immunisation.[4]

However, the pertussis vaccine will be ineffective if infection has already occurred.

The pertussis vaccine is recommended at ages six weeks, three months, five months and four years, followed by a booster dose at age eleven years.[4] In addition, the Ministry of Health recommends that healthcare personnel working with infants, early childhood carers, pregnant women over 20 weeks gestation and household contacts of newborn infants should receive a dose of the vaccine, with the dose repeated every ten years for people who work with infants and healthcare workers, although it is unfunded in the majority of these groups (see "Maternal vaccination now funded").[4]

How to recognise pertussis

Age and immunisation status influence the clinical presentation of patients with pertussis. Infants aged under one year, particularly infants aged under six weeks, may become unwell very quickly, presenting with apnoea and cyanotic spells, rather than cough. In older immunised children and adults, symptoms usually begin after a seven to ten day incubation period, and are initially mild. Signs and symptoms during this period, known as the catarrhal stage, include mild respiratory symptoms, rhinitis, sneezing and dry, unproductive coughing.[1] Individuals are most infectious during this stage.[4]

After one to two weeks, coughing begins to develop into paroxysmal bouts, each with five to ten coughs, during which the "whoop" noise can be heard on inspiration, particularly in younger children, however, infants may not whoop.[1] In older children and adults whooping is often not as pronounced, although the cough may still result in gasping or gagging. Bouts of coughing may be followed by vomiting (post-tussive emesis). Episodes of coughing are frequent, can disrupt sleep and usually continue for between two to eight weeks. Coughing is often worse at night in adults and some children.[5]

Diagnosis can usually be made clinically

A diagnosis of pertussis is likely where the patient has had an acute cough for 14 days or more and has one of: inspiratory whoop, post-cough vomiting, apnoea or paroxysmal bouts of coughing.[6]

If pertussis is suspected in an outbreak situation or in a person epidemiologically linked to a confirmed case, laboratory testing is not required. Testing is also not required for notification of pertussis or to confirm a patient is no longer infectious and can return to early-childcare/school. Testing should be considered if the diagnosis is unclear or where a confirmation is necessary for management of vulnerable contacts, e.g. infants aged under 12 months or women who are pregnant (especially in the last trimester).

Testing for pertussis can be carried out using polymerase chain reaction (PCR), culture or serological testing. PCR is now the preferred method of testing for pertussis and some laboratories no longer offer culture or serological testing. Check with your local laboratory before requesting tests. Compared to

Maternal vaccination now funded in some DHB's

In response to the current epidemic, some DHB's, e.g. Canterbury, South Canterbury and Counties Manukau, now offer a funded dose of the pertussis vaccine to pregnant women over 20 weeks gestation and new mothers. Check with your local DHB as the eligibility for the funded booster dose varies between regions.

Although there is evidence that antibodies to pertussis are transmitted during pregnancy and breastfeeding, this appears to be often insufficient to protect infants under six weeks.[11] This may be because immunity to pertussis decreases over time, rather than the maternal antibodies being ineffective. [11] A single booster dose given to women during pregnancy aims to boost both maternal and infant immunity prior to the infant receiving their six week immunisation.

pertussis culture, results from PCR testing are obtained more quickly, PCR is more sensitive and has the same specificity. Serology is not useful early in the course of the disease and PCR is generally not useful if the patient has had symptoms for more than three weeks. Note that PCR is expensive, costing approximately $130 per test, so unnecessary testing should be avoided.[7]

N.B. Care must to be taken to send the correct dry swab (orange top tube) rather than the blue topped tube with charcoal transport medium used for culture[†]

Best practice tip: In a household with multiple young children, consider testing one family member (with symptoms) to direct the management of other family members, without testing

Notification to the Medical Officer of Health is required for all suspected and confirmed cases of pertussis

Treatment of pertussis

Antibiotic treatment is recommended to reduce transmission of pertussis, however, it is unlikely to alter the clinical course of illness. Young children can deteriorate rapidly and may require hospitalisation. Azithromycin is now funded for pertussis in children aged under one year (see over page).

For infants aged under six months the first-line antibiotic for pertussis is:[8]

- Azithromycin 10 mg/kg, once daily for five days

For infants and children aged six months to one year the first-line antibiotic for pertussis is:[8]

- Azithromycin 10 mg/kg on day one, followed by 5mg/kg/day for days two to five (five days total treatment)

For children aged over one year and adults the first-line antibiotic for pertussis is:[8]

- Erythromycin 10 mg/kg (400 mg for adults), four times daily for 14 days*

Treatment is only effective when initiated within three to four weeks of the onset of cough, as after this time most people are no longer infectious.[6,7] Treatment should be given if the duration of cough is unknown. Women who are pregnant in their last trimester should be prescribed antibiotic treatment regardless of the time of onset of symptoms.[7]

Note that macrolides (e.g. erythromycin, azithromycin) are associated with infantile hypertophic pyloric stenosis in infants aged under three months, however, macrolides remain the most effective option for pertussis infections and the risk from pertussis is considerably higher so treatment is still required in this age-group.[7] Monitoring for complications, e.g. vomiting, becoming forceful, is recommended for four weeks after completion of treatment.[4]

Prophylactic antibiotics are recommended for high risk contacts,** including:[7]

- Children aged less than one year
- People who spend significant time with infants aged less than one year, such as early childhood carers
- Women who are pregnant, particularly in the last month of pregnancy
- Those at risk of severe complications, such as people who are immunocompromised and those with severe asthma

For prophylaxis of asymptomatic contacts use either erythromycin or in children aged under one year, azithromycin (at the same dose and duration as for treatment).

In addition, immunisation should be offered to all adult contacts (unfunded) and any children who have not been immunised.

People with pertussis should be advised to avoid early-childhood care, school or work for five days if given antibiotics. People who are not given antibiotics will remain infectious for three weeks post onset of symptoms, and should be excluded for this period.

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† Blue top swabs can still be used as long as they are placed in a tube without charcoal.

The shorter, orange topped tubes with universal viral medium can also be used.

Check with your local laboratory for the preferred sample method.

* A Cochrane systematic review indicates that an antibiotic course of three to seven days is as effective as 10 – 14 days for the treatment of pertussis, and is associated with fewer adverse effects, however, this is not recommended in current New Zealand guidance.[9]

** Contact is defined as being in close proximity of an infected person for one hour or more, during the person's infectious period.

Azithromycin now funded for pertussis

From 1 June, 2012, azithromycin has been available fully funded for use in infants aged under one year with, or at risk from, pertussis.[10] Azithromycin is as effective as erythromycin, and has a shorter and simpler dosing regimen.

Azithromycin is available as a suspension under the brand name Zithromax. The medicine is supplied as granules for oral liquid 200 mg per 5 mL with a pack size of 15 mL. Prescriptions are subject to endorsement and can be prescribed for a maximum of five days per script to infants aged under one year who:

- Have pertussis and the Medical Officer of Health has been notified or;
- Have been in contact with a notified case of pertussis

Practitioners should be aware that this use of azithromycin is not approved by Medsafe and therefore prescribing should comply with Section 25 of the Medicines Act.*

* Allows the practitioner to "procure the sale or supply of any medicine" for a particular patient in his or her care, even in a situation in which it is contraindicated, provided that the practitioner offers care of an adequate professional and ethical standard.

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