



The return of the 100-day cough: resurgence of pertussis in the 1990s

Pertussis is an acute respiratory tract infection characterized by severe coughing spasms that may end with an inspiratory whoop. The Chinese name for this illness, "the 100-day cough," attests to its prolonged course. The incidence of pertussis in Canada has decreased by 90% since the introduction of whole-cell pertussis vaccine in 1943. However, pertussis continues to be the most common of all diseases preventable by routine childhood immunization.¹ It remains endemic in this country, with epidemics recurring in 3- to 5-year cycles. In the 1980s the approximate number of reported pertussis cases per year ranged from 1000 to 3000. During the current decade the approximate number of cases reported annually has increased to 2700 to 10 000.^{1,2}

The reason for the increased incidence of pertussis is unclear; a combination of factors are likely involved. Pertussis vaccine coverage is still suboptimal: the national coverage for age-appropriate immunization by the second and seventh birthdays is estimated at 83% and 75% respectively.¹ The whole-cell pertussis vaccine in use until recently may not have provided adequate protection against disease; thus, during outbreaks in highly immunized populations, the effectiveness of 5 doses of whole-cell vaccine against culture-positive and clinical pertussis was estimated at 57% and 59% to 71% respectively.^{3,4} Even when immunity is achieved, through vaccination or natural infection, protection against disease or re-infection is not long-lasting.⁵ In a study of adults living in insti-

tutions, antibody levels fell to pre-infection levels within 5 years after natural disease.⁶ Protection against typical disease declines 3 to 5 years after vaccination and disappears after 12 years.⁵ Waning immunity and the lack of boosting with natural disease results in a growing susceptible older population. Finally, a change in the circulating *Bordetella pertussis* strains over time may be another factor leading to reduced vaccine efficacy and recurrent disease.

Adolescents and adults are currently considered the major reservoir for *B. pertussis*, playing a predominant role in the transmission of pertussis to young children, in whom the disease is most severe.^{5,7,8} Because pertussis is generally milder in older people, the diagnosis tends to be overlooked (Table 1). Persistent cough may be the sole manifestation, and the characteristic whoop occurs in only a few of those infected.^{7,8} Pertussis should be considered in anyone who has a pure or predominant complaint of cough, especially if there is a history of paroxysmal coughing, inspiratory whoop, post-tussive vomiting, cough resulting in sleep disturbance or close contact with others who have similar symptoms.^{5,7,8} Fever and lower respiratory tract signs are usually absent.⁶ Nasopharyngeal cultures should be obtained from all those with suspected pertussis, unless the person is clearly linked to a laboratory-confirmed case during an epidemic. The use of polymerase chain reaction techniques, where available, may enhance the detection of the organism. Pertussis is a nationally notifiable disease, and all laboratory-confirmed and clinically diagnosed cases should be reported to the local public health department.

The new acellular pertussis (aP) vaccines containing purified antigens of *B. pertussis* are efficacious and advantageous in terms of their very low rates of side effects.⁹ As

Table 1: Signs and symptoms of pertussis

Sign or symptom	In adults and adolescents	In children	In infants under 6 mo
Catarrhal symptoms	Variable	Variable	For a few days only or not recognized
Paroxysmal cough	✓	✓	✓
Prolonged cough	✓	✓	✓
Inspiratory whoop	Infrequent	✓	Infrequent
Post-tussive vomiting	✓	✓	✓
Apnea	✗	✗	✓
Cyanosis	✗	✗	✓
Choking	✗	✗	✓
Subconjunctival hemorrhage, petechiae on upper body	✓	✓	✓
Fever	Mild or absent	Mild or absent	Mild or absent
Lower respiratory tract signs*	✗	✗	✗

*Generally absent unless complicated by secondary pneumonia.



Table 2: Recommended vaccination schedule for pertussis¹

Dose no.	Timing
1-3	At 2, 4 and 6 mo of age
4	At 18 mo of age
5	At 4-6 yr of age

of April 1998, all Canadian provinces and territories had incorporated Pentacel (Pasteur Merieux Connaught Canada, Toronto), an aP vaccine combined with vaccines against diphtheria, tetanus, polio and *Haemophilus influenzae* type b, into their childhood immunization programs (Table 2). Vaccine providers should counsel parents on the change to the safer new vaccine. The National Advisory Committee on Immunization has recently published information on acellular pertussis vaccines and recommendations for their use.⁹ The only absolute contraindication to pertussis vaccination is anaphylaxis to a previous dose. A history of hypotonic-hyporesponsive episodes and evolving neurologic conditions are not considered reasons to avoid or defer immunization with aP vaccines.

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