



# An Update on Pediatric Immunizations

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In recent years, four new vaccines have been licensed in Canada that are now recommended by the National Advisory Committee on Immunization (Health Canada), and the Canadian Pediatric Society. These vaccines are:

- chickenpox,<sup>1-3</sup>
- group C meningococcus,<sup>4,5</sup>
- pneumococcal vaccines,<sup>6,7</sup> and
- an acellular pertussis vaccine for adolescents.<sup>8,9</sup>

Although these vaccines are licensed and recommended for universal immunization, not all provinces have added them to their funded vaccine programs.<sup>10</sup> Some private health-care insurers, however, do fund these immunizations.

## When are the new vaccines supposed to be given?

The chickenpox vaccine is a live attenuated vaccine that is given after a child's first birthday. Both meningococcal and pneumococcal vaccines are given at two, four, and six months of age in sepa-

### Mrs. Young's query

Mrs. Young, a mother of a 14-month-old and a three-year-old, calls to ask about the chickenpox vaccine. Her sister's child, in another province, received the vaccine last week. It was at the same time as his measles, mumps, and rubella shot. Her sister's child is 12-months-old.



Should Mrs. Young's 14-month-old also be immunized against chickenpox? Alternatively, should she send the 14-month-old to a "chickenpox party" being held by a neighbour down the street?

She recalls when her three-year-old had chickenpox. The child was ill for about four days with fever, sleeplessness, and an itchy rash, and had to take antibiotics for a cellulitis that developed at the site of some of the chickenpox lesions.

"Is chickenpox really a serious enough illness that children should be vaccinated against it?" she asks.

**For discussion, see page 140.**

rate sites, but at the same time as the diphtheria-pertussis-tetanus-polio (DPTP) vaccine. A 12- to

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Table 1

## New pediatric vaccines supposed to be given in Canada

Infection prevented	Chickenpox (varicella)	Streptococcus pneumoniae	Neisseria meningitidis	Adolescent pertussis, diphtheria, tetanus
<b>Product</b>	Varivax II™ Varilrix™ Varicella virus vaccine live, attenuated; lyophilized powder and diluent	Prenar™ Pneumococcal 7-valent conjugate vaccine (Diphtheria CRM protein), liquid suspension	Menjugate™ NeisVac-C™ Meningococcal Group C-CRM protein vaccine powder and diluent	Adacel™ Td toxoids combined with purified pertussis antigens
<b>Infant schedule</b>	1 dose at 12 to 18 months (separate needle/injection site than MMR)	2, 4, 6 months, Booster, 12-15 months	2, 4, 6 months	None
<b>Other schedule</b>	1 dose to 12 years; 2 doses, 4-8 weeks apart at ≥ 13 years	2-6 months old, 3 doses 8 weeks apart plus booster at 12-15 months; 7-11 months, 2 doses 8 weeks apart plus booster at 12-15 months; 12-23 months old, 2 doses 8 weeks apart; > 24-months-old, one dose	2 doses 4 weeks apart if 4-11 months of age; >12 months, 1 dose	Substitute for Td booster (can offer every 10 years in adulthood)
<b>Route and volume/dose</b>	Subcutaneous, 0.5 ml	Intramuscular, 0.5 ml/L	Intramuscular, 0.5 ml/L	Intramuscular, 0.5 ml/L
<b>Efficacy</b>	96-100%	94% against invasive disease caused by 7 vaccine serotypes	92-97% against Group C disease	97-100%
<b>Contraindications</b>	Hypersensitivity neomycin, immunodeficiency, pregnancy	Hypersensitivity to vaccine component thrombocytopenia	Hypersensitivity to vaccine component	Hypersensitivity to vaccine component
MMR: Measles, mumps, rubella Td: Tetanus, diphtheria				

15-month pneumococcal booster is also given. The acellular pertussis-tetanus-diphtheria vaccine is given, instead of the tetanus-diphtheria vaccine, at the time of the adolescent booster (Table 1).



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## Immunizations

### Back to Mrs. Young

Chickenpox is a very common illness caused by primary infection with the varicella zoster virus (VZV). The lifetime risk of VZV is 95%. By the age of 5, 50% of children have had the infection. By the age of 12, 90% have had VZV.

Chickenpox commonly is a febrile illness associated with pruritic rash, anorexia, and malaise lasting about five days. It may be associated with considerable morbidity and mortality in previously healthy children.

Because of the unknown risk of these events in her 14-month-old, you do not recommend Mrs. Young attend the "chickenpox party." Your province does not yet fund universal immunization for chickenpox, and, therefore, Mrs. Young cannot get the vaccine unless she pays for it herself, or through private health insurance.

The vaccine is recommended by national advisory agencies, therefore, you inform Mrs. Young of this, and other new vaccines that are available and recommended in childhood. She wants more information about these vaccines, so you direct her to the Canadian Pediatric Society Web site "Caring for Kids," and the parent immunization guide "Your Best Shot" for detailed information.

### How are these vaccines an improvement?

The currently available varicella vaccine is stable at refrigerator temperatures (2 to 8 degrees C), whereas earlier vaccines had to be kept frozen at -15 degrees C. Once reconstituted, varicella vaccine should be kept refrigerated and used within 90 days.

Both of the new pneumococcal and meningococcal infant vaccines are protein-conjugate vaccines that are immunogenic in infancy. The polysaccharide vaccines against *Streptococcus pneumoniae* and *Neisseria meningitidis* could only be used in children over two years of age. Because the

### Take-home message



- Four new vaccines have been licensed in Canada in recent years. They are recommended by the National Advisory Committee on Immunization, yet not all provinces fund them.
- The new pneumococcal and meningococcal infant vaccines are protein-conjugate vaccines that are immunogenic in infancy.
- Pertussis is an often undiagnosed cause of cough illness after childhood and a resurgence of disease in adolescents has been seen in Canada.

highest attack rates and age-specific mortality rates for invasive disease with these infections are in infants, many cases of meningitis, bacteremia, and sepsis (with their associated morbidity, mortality, and parent anxiety) will now be prevented.

The adolescent booster vaccine (diphtheria-tetanus toxoid combined with pertussis) has not previously been available. Pertussis is an often undiagnosed cause of cough illness after childhood and a resurgence of disease in adolescents has been seen in Canada.<sup>11</sup>

### What are the side-effects?

Short-lived injection-site pain is common for all vaccines, including the new ones. Pain and redness at the injection site are seen in about 25% of children in the first 48 hours after immunization. Fever, less than 39 degrees C, can occur. The frequency of fever and local injection site pain is about the same, or less than, for DPTP-Hib injections. There is no evidence that serious adverse events are associated with these four vaccines. They have been part of the universal immunization schedule in the U.S. for several years. CME



## Net Readings

1. Health Canada:  
[www.hc-sc.gc.ca/english/search/a-z/v.html](http://www.hc-sc.gc.ca/english/search/a-z/v.html)
2. Canadian Paediatric Society:  
[www.cps.ca/english/publications/NACIguidelines.htm](http://www.cps.ca/english/publications/NACIguidelines.htm)
3. Caring For Kids:  
[www.caringforkids.cps.ca/immunization/index.htm](http://www.caringforkids.cps.ca/immunization/index.htm)
4. National Network for Immunization Information:  
[www.immunizationinfo.org](http://www.immunizationinfo.org)

9. National Advisory Committee on Immunization (NACI), An Advisory Committee (ACS), National Advisory Committee on Immunization: Prevention of Pertussis in adolescents and adults. *Can Commun Dis Rep* 2003; 29:1-9.
10. Naus M, Scheifele DW: Canada needs a national immunization program: an open letter to the Honourable Anne McLellan, federal minister of health. *CMAJ* 2003; 168(5):567-8.
11. Skowronski DM, De Serres G, MacDonald D, et al: The changing age and seasonal profile of pertussis in Canada. *J Infect Dis* 2002; 185(10):1448-53.

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1. Infectious Diseases and Immunization Committee Canadian Pediatric Society: Varicella vaccine for children. *Paediatrics Child Health* 2003; 8:384.
2. National Advisory Committee on Immunization (NACI): Statement on the recommended uses of varicella virus vaccine. *CCDR* 1999; 25:1-16.
3. National Advisory Committee on Immunization (NACI): Update to the statement on varicella vaccine. *CCDR* 2002; 28:1-7.
4. Infectious Diseases and Immunization Committee Canadian Paediatric Society (CPS): Meningococcal vaccine for children. *Paediatr Child Health* 2002; 7:425-6.
5. National Advisory Committee on Immunization (NACI): Statement on recommended use of meningococcal vaccines. *Can Commun Dis Rep*, 2001. 27:2-36.
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7. National Advisory Committee on Immunization (NACI), An Advisory Committee Statement (ACS) National Advisory Committee on Immunization (NACI): Recommended use of pneumococcal conjugate vaccine. *Can Commun Dis Rep*, 2002; 28:1-32.
8. Infectious Diseases and Immunization Committee Canadian Paediatric Society (CPS): Acellular pertussis vaccine for adolescents. *Paediatrics Child Health* 2003; 8:378.



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