

Vaccine schedules

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The Infectious Diseases and Immunization Committee of the Canadian Paediatric Society has intermittently reviewed the recommendations for the routine immunization of children made by the National Advisory Committee on Immunization. The purpose of the present note is to update physicians and other health care providers on the changes related to childhood immunization. Included is a composite schedule for routine immunization of healthy children and adolescents (Table 1).

Recommendations are also included for immunization under special circumstances:

- Children one to six years of age who were not previously immunized in infancy (Table 2).
- For children seven years of age and older who were not previously immunized in infancy (Table 3).

- Vaccines against encapsulated bacteria, for healthy children not previously immunized in the first three to six months of life (Table 4).
- For children who have a clinical condition, which increases their susceptibility to severe disease due to encapsulated bacterial organisms, consult Table 5 for vaccines required according to their presenting age.

Since the committee's last review, published in January/February 1999:

- all provinces have introduced routine immunization programs against hepatitis B;
- an adolescent/adult acellular pertussis (ap) vaccine has been licensed and recommended for use for adolescents; and

TABLE 1
Routine vaccine schedule for healthy children and adolescents*

Age	dTap/IPV	Hib	MMR	HBV [†]	Vaccines dT±ap	VZV [‡]	PCV-7 conjugate [†]	MenC-conjugate [†]
2 months	X	X		X			X (at 2 or 3 months) [§]	X (at 2 or 3 months) [§]
4 months	X	X		X			X (at 4 or 5 months) [§]	X (at 4 or 5 months) [§]
6 months	X	X		X			X (at 6 or 7 months) [§]	X (at 6 or 7 months) [§]
12 months			X			X	X (12-15 months)	
18 months	X	X	and X	or				
4-6 years	X		or X	X 3 doses				
Teenage years				2 months apart	dT±ap at 14-16 years [‡]			
Adult years				at any age [¶]	dT every 10 years			

*No change in schedule for premature infants. Start first dose at chronological age of two months for routine vaccines; [†]Infants of Hepatitis B vaccine (HBV)-negative mothers: HBV should be given at two, four and six months of age, can also be given at any age after infancy. Infants of HBV-positive mothers or suspected maternal infection: HBV should be given at birth with an injection of Hepatitis B immune globulin followed by 2nd and 3rd dose of HBV vaccine at one and six months of age; [‡]These vaccines may not be publicly funded in all provinces for this indication; [§]Option of administering meningococcal C (MenC) conjugate and/or pneumococcal conjugate vaccine (PCV)-7 at three, five, seven months (rather than two, four, six months) if parents wish to avoid three to four shots per visit; [¶]HBV is also available for a two-dose schedule in 11 to 15 year olds. ap Acellular pertussis; d Diphtheria; IPV Inactivated polio vaccine; Hib Haemophilus influenza type b; MMR Measles mumps rubella; T Tetanus toxoid; VZV Varicella zoster vaccine. ± Plus or minus

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TABLE 2
Immunization schedule for children one to six years not previously immunized in infancy (and still nonimmune)

Timing	dTap/IPV	Hib	MMR	HBV	Vaccines dT±ap	VZV†	PCV-7 conjugate†	MenC-conjugate†
1st visit	X	*	X	X		X	X	X
2 months later	X	*	X (or per routine)	X			X (if 12-23 months)	(or anytime after,
2 months later	X	*		X			*	to avoid more
6-12 months later	X	*					*	than 2 shots
Age 4-6 years	X	*		or			*	per visit)
Teenage years				X 3 doses	dT±ap at 14-16 years†			
Adult years					dT every 10 years			

*See Table 4 for details and the correct number of doses; †These vaccines may not be publicly funded in all provinces for this indication. ap Acellular pertussis; d Diphtheria; IPV Inactivated polio vaccine; HBV Hepatitis B vaccine; Hib Haemophilus influenza type b; MenC Meningococcal C; MMR Measles mumps rubella; PCV Pneumococcal conjugate vaccine; T Tetanus toxoid; VZV Varicella zoster vaccine. ± Plus or minus

TABLE 3
Immunization schedule for children seven years of age and older not previously immunized in infancy (and still nonimmune)

Timing	dT±ap	IPV	Hib	MMR	Vaccines HBV	VZV*	PCV-7 conjugate*	MenC-conjugate*
1st visit	X	X	†	X		X	†	X
2 months later	X	X	†	X		X (if ≥ 13 years old)	†	
6-12 months later	X	X	†				†	
Teenage years	dT±ap at 14-16 years*		†		X 3 doses‡		†	
Adult years	dT every 10 years							

*These vaccines may not be publicly funded in all provinces for this indication; †Not indicated in this age group; ‡Hepatitis B vaccine (HBV) is also available for a two-dose schedule in 11- to 15-year-olds. ap Acellular pertussis; d Diphtheria; IPV Inactivated polio vaccine; Hib Haemophilus influenza type b; MenC Meningococcal C; MMR Measles mumps rubella; PCV Pneumococcal conjugate vaccine; T Tetanus toxoid; VZV Varicella zoster vaccine. See Table 4 for more details

TABLE 4
Immunization schedule for vaccines against encapsulated bacteria for healthy children not previously immunized in the first three to six months of life

Timing	Hib vaccine (age at first visit)			PCV-7 conjugate* vaccine (age at first visit)			MenC-conjugate* vaccine (age at first visit)	
	7-11 months	12-17 months	18 months to 5 years	7-11 months	12-23 months	24 months to 5 years	4-11 months	≥12 months
At 1st visit	X	X	X	X	X	X	X	X
2 months later	X			X	X		X	
4 months later				X (past 12 months)				
At 18 months	X							

*These vaccines may not be publicly funded in all provinces for this indication. Hib Haemophilus influenza type b; MenC Meningococcal C; PCV Pneumococcal conjugate vaccine

- the 7-valent conjugated pneumococcal vaccine as well as a conjugated meningococcal type C vaccine have been licensed and recommended for inclusion in the routine infant immunization schedule.

Canada does not have a harmonized routine infant immunization schedule. The schedules detailed in the

present note have attempted to account for the various provincial recommendations. As well, some routine vaccines and vaccines for special circumstances are publicly funded in some jurisdictions but not in others. Readers are encouraged to check with their local health departments concerning provincial variations in both the scheduling and funding of these vaccines.

TABLE 5
Recommendations for vaccines against encapsulated bacteria for children considered to be at high risk for these diseases

Presenting age	Hib	PCV-7 conjugate*	Vaccine PPV-23*	MenC-conjugate*	MenACYW-P*
<3 months	X 4 routine doses	X 4 routine doses [†]	X 1 dose at 2 years	X 3 routine doses [†]	X 1 dose at 2 years
3-11 months	X 3-4 routine doses	X 3 routine doses [†]	X 1 dose at 2 years	X 2 routine doses [†]	X 1 dose at 2 years
12-17 months	X 2 routine doses	X 2 routine doses [†]	X 1 dose at 2 years	X 1 routine dose [†]	X 1 dose at 2 years
18-23 months	X 1 routine dose	X 2 routine doses [†]	X 1 dose at 2 years	X 1 routine dose [†]	X 1 dose at 2 years
2-4 years	X 1 dose	X 2 doses [†]	X 1 dose >2 months later	X 1 routine dose [†]	X 1 dose >2 weeks later
5-9 years	X 1 dose	X 2 doses [†]	X 1 dose >2 months later	X 1 routine dose [†]	X 1 dose >2 weeks later
10-19 years	X 1 dose		X 1 [‡]	X 1 routine dose [†]	X 1 dose >2 weeks later
≥20 years	X 1 dose		X 1 [‡]	X 1 routine dose [†]	X 1 dose >2 weeks later

*These vaccines may not be publicly funded in all provinces for this indication; [†]The conjugate vaccine dose(s) is/are to be sequentially followed by the polysaccharide vaccine dose(s); [‡]In some circumstances a second pneumococcal polysaccharide vaccine (PPV)-23 dose may be given five years after the first. ACYW-P ACYW-polysaccharide; Hib Haemophilus influenza type b; MenACYW-P Meningococcal ACWP-polysaccharide; MenC Meningococcal C; PCV Pneumococcal conjugate vaccine

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The recommendations in this note do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate. This article also appears in Paediatr Child Health 2003.

ERRATA

In the Original Article "Guidance on patient identification and administration of recombinant human activated protein C for the treatment of severe sepsis" published in the November/December issue of *The Canadian Journal of Infectious Diseases* on pages 361 to 372 Figure 2 on page 365 was printed as an incomplete figure. Please see the next page for the complete figure.

In the Original Article "Distribution of serogroups of *Neisseria meningitidis* and antigenic characterization of serogroup Y meningococci in Canada, January 1, 1999 to June 30, 2001" published in the November/December issue of *The Canadian Journal of Infectious Diseases* on pages 391 to 396 a mistake appeared in the Results section on page 392. The mistake relates to the sentence (column 2, paragraph 1, line 10) "This molecular method identified two isolates as serogroup B, two as serogroup Y and one each as serogroups C and W135". The sentence should read "This molecular method identified four isolates as serogroup B, one as serogroup C and two each as serogroups Y and W135".

The authors for the CIDS Position Paper "Contemporary antiviral drug regimens for the prevention and treatment of orolabial and anogenital herpes simplex virus infection in the normal host: Four approved indications and 13 off-label uses" published in the January/February issue of *The Canadian Journal of Infectious Diseases* on pages 17 to 27 should have been printed as: Fred Y Aoki MD, for the CIDS Antimicrobial Agents Committee. The paper originated from the Committee. The Committee members involved were:

- Gerald A Evans, Kingston, Ontario (Chair)
- Susan King, Toronto, Ontario
- Michel Laverdiere, Montreal, Quebec
- Lindsay Nicolle, Winnipeg, Manitoba
- Peter Phillips, Vancouver, British Columbia
- Corinna Quan, Windsor, Ontario
- Coleman Rotsteiin, Hamilton, Ontario

In the PID Note "Vaccines schedules" published in *Can J Infect Dis* 2002;13:358-360, misrepresentations appeared in Tables 3 and 4. Table 3 (page 359), VZV column, second row, should read "X (if ≥13 years old)". Table 4 (page 359), MenC-conjugate vaccine column, for age 4-11 months, should have a dose, "X" for the first visit, and a second dose, "X" for two months later (two doses in total). Please find the revised tables below.

TABLE 3
Immunization schedule for children seven years of age and older not previously immunized in infancy (and still nonimmune)

Timing	dT±ap	IPV	Hib	MMR	Vaccines			PCV-7 conjugate*	MenC-conjugate*
					HBV	VZV*			
1st visit	X	X	†	X		X		†	X
2 months later	X	X	†	X		X (if ≥13 years old)		†	
6-12 months later	X	X	†					†	
Teenage years	dT±ap at 14-16 years*		†		X 3 doses‡			†	
Adult years	dT every 10 years								

*These vaccines may not be publicly funded in all provinces for this indication; †Not indicated in this age group; ‡Hepatitis B vaccine (HBV) is also available for a two-dose schedule in 11- to 15-year-olds. ap Acellular pertussis; d Diphtheria; IPV Inactivated polio vaccine; Hib Haemophilus influenza type b; MenC Meningococcal C; MMR Measles mumps rubella; PCV Pneumococcal conjugate vaccine; T Tetanus toxoid; VZV Varicella zoster vaccine. See Table 4 for more details

TABLE 4
Immunization schedule for vaccines against encapsulated bacteria for healthy children not previously immunized in the first three to six months of life

Timing	Hib vaccine (age at first visit)			PCV-7 conjugate* vaccine (age at first visit)			MenC-conjugate* vaccine (age at first visit)	
	7-11 months	12-17 months	18 months to 5 years	7-11 months	12-23 months	24 months to 5 years	4-11 months	≥12 months
At 1st visit	X	X	X	X	X	X	X	X
2 months later	X			X	X		X	
4 months later				X (past 12 months)				
At 18 months	X							

*These vaccines may not be publicly funded in all provinces for this indication. Hib Haemophilus influenza type b; MenC Meningococcal C; PCV Pneumococcal conjugate vaccine