

A Review of Childhood Immunizations

Grand Rounds September 24, 2025

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Objectives

- 1) List routine childhood immunizations in Ontario
- 2) Describe measles as a disease as well as the options for early immunization and “boosters”
- 3) Describe vaccine hesitancy and provide resources for parents and providers



Disclosure



I have no conflicts of interest



I will be mentioning the trade names of certain vaccines for educational purposes

Timeline of routine childhood immunization

2 months

4 months

6 months

12
months

15
months

18
months

4-6 years

Grade 7

14 years

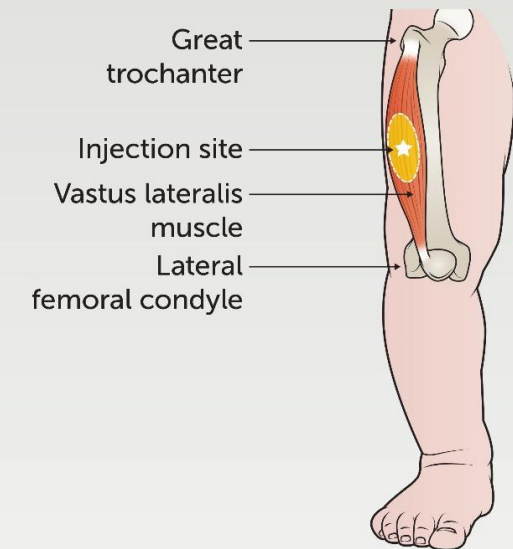


Anterolateral thigh



Deltoid

*SC injection is medial thigh and at 45 degree angle in infants



Publicly Funded Immunization Schedules for Ontario – June 2022

Publicly funded vaccines may be provided only to eligible individuals and must be free of charge

Routine Schedule: Children Starting Immunization in Infancy													
Vaccine \ Age	2 Months	4 Months	6 Months	1 Year ^Φ	15 Months	18 Months	4 Years	Grade 7	14 Years	24 Years	≥34 Years ^Υ	65 Years	
DTaP-IPV-Hib Diphtheria, Tetanus, Pertussis, Polio, <i>Haemophilus influenzae</i> type b	◆	◆	◆			◆							
Pneu-C-13 Pneumococcal Conjugate 13	◆	◆		◆									
Rot-1 Rotavirus	▲	▲											
Men-C-C Meningococcal Conjugate C				◆									
MMR Measles, Mumps, Rubella				■									
Var Varicella					■								
MMRV Measles, Mumps, Rubella, Varicella							■						
Tdap-IPV Tetanus, diphtheria, pertussis, Polio							◆						
HB Hepatitis B								●					
Men-C-ACYW Meningococcal Conjugate ACYW-135								●					
HPV-9 Human Papillomavirus								●					
Tdap Tetanus, diphtheria, pertussis									◆	◆			
Td (booster) Tetanus, diphtheria											◆ Every 10 years		
HZ Herpes Zoster												I	
Pneu-P-23 Pneumococcal Polysaccharide 23												■ / ◆	
Tdap Tetanus, diphtheria, pertussis								◆ One dose in every pregnancy, ideally between 27-32 weeks of gestation					
Inf Influenza			Every year in the fall *										
◆ - A single vaccine dose given by intramuscular injection ■ - A single vaccine dose given by subcutaneous injection ▲ - A single vaccine dose given by mouth ● - Provided through school-based immunization programs. Men-C-ACYW is a single dose; HB is a 2 dose series (see Table 6); HPV-9 is a 2 dose series (see Table 10). Each vaccine dose is given by intramuscular injection Φ - Given no earlier than the 1 st birthday, and prior to 16 months of age							Υ - Once a dose of Tdap is given in adulthood (24 years of age), adults should receive Td boosters every 10 years thereafter I - HZ is a 2 dose series (see Table 12) given by intramuscular injection * - Children 6 months to 8 years of age who have not previously received a dose of influenza vaccine require 2 doses given ≥4 weeks apart. Children who have previously received ≥1 dose of influenza vaccine should receive 1 dose per season thereafter Note: A different schedule and/or additional doses may be needed for high risk individuals (see Table 3) or if doses of a vaccine series are missed (see appropriate Tables 4-24)						

Vaccine Schedule Quick Reference

[illegible]

DTaP-IPV-HiB

- Diphtheria, tetanus, acellular pertussis, inactivated polio, Haemophilus influenza type b
- Given at 2, 4, 6, and 18 months
- IM injection
- Trade name: Pentacel or Pediacel or INFANRIX® -IPV/Hib
- Non live

Pneumococcal C 15 (previously 13)

- Pneumococcal Conjugate 15 (Vaxneuvance) or 13 (Prevnar 13)
- Given at 2, 4, and 12 months
- Bacteria: *Streptococcus pneumoniae*
- IM injection
- Non live

Rot -1 OR 5

- Rotavirus – monovalent (ROTARIX) or pentavalent (RotaTeq) available
- Given at 2 and 4 months
- Oral vaccine
- Live vaccine

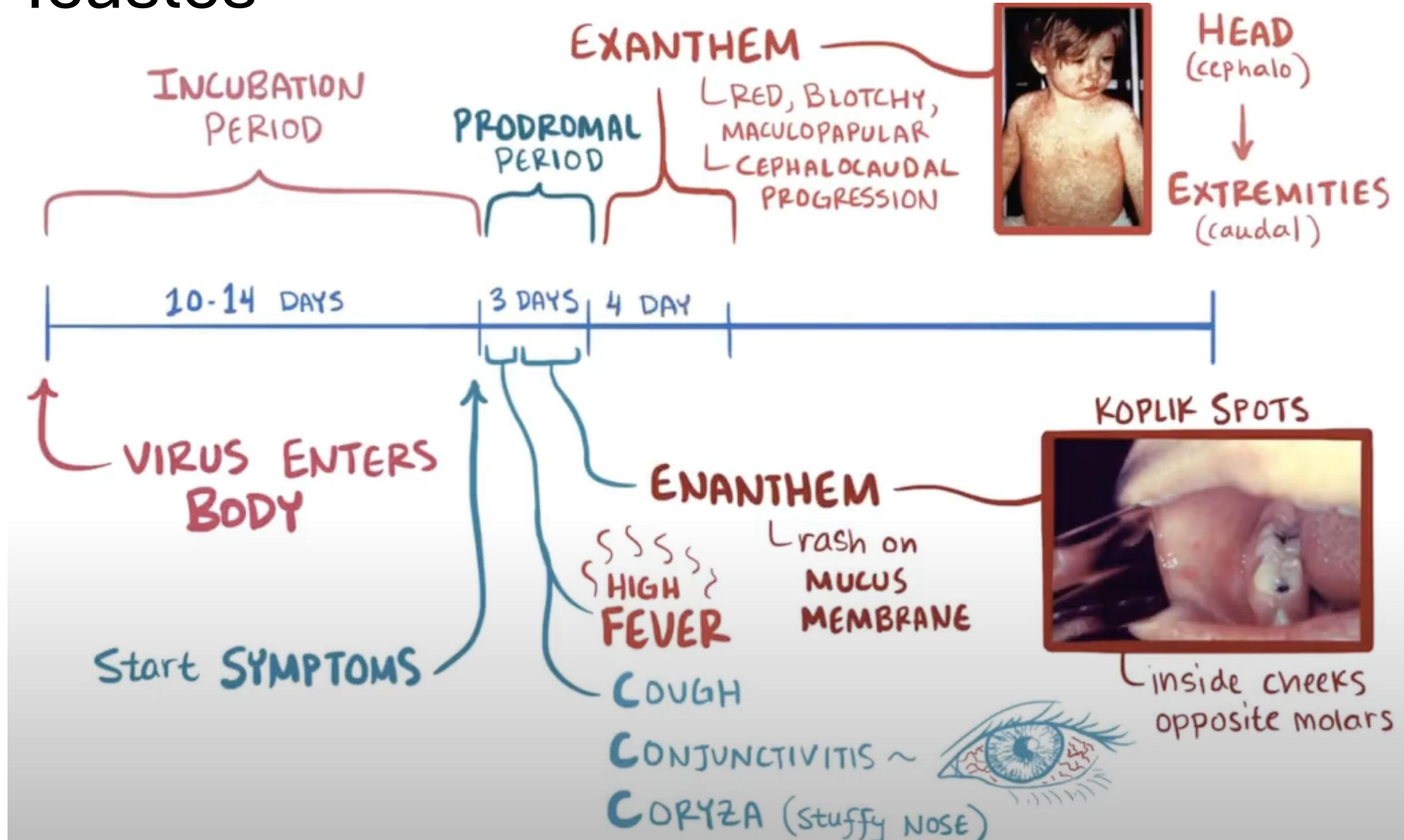
Men C-C

- Meningococcal conjugate vaccine
- Given at 12 months
- Bacteria: Neisseria meningitidis
- Trade name: NeisVac-C[®] Vaccine or Menjugate
- IM Injection
- Non live

MMR

- Measles, Mumps and Rubella
- Given at 12 months
- IM/SC injection
- Live vaccine
- Trade name: MMR II or Priorix

Measles



Measles cases in Canada

- So far in 2025 there are **4,972 measles cases** (4,619 confirmed, 353 probable) reported in Canada.
- From 1998 to 2024, there were an average of 91 measles cases reported in Canada annually
- When testing for measles, two tests for viral detection by PCR are required:
 - 1) urine specimen
 - 2) throat or nasopharyngeal specimen

Early Immunization and “Boosters”

Age Group	Ontario’s publicly funded routine immunization schedule	Measles outbreak immunization schedule and recommendations*
Infants (6 to 11 months)	Not applicable	One dose of MMR
Children (12 months and over)	Two doses of measles-containing vaccine: <ul style="list-style-type: none"> One dose of MMR at 1 year of age One dose of MMRV between 4 and 6 years of age (prior to school entry) 	Two doses of measles-containing vaccine: <ul style="list-style-type: none"> One dose of MMR at 1 year of age Children 1 to 4 years of age are encouraged to receive a second dose measles-containing vaccine as soon as possible**
Adults (18 years and older)	Adults of any age who have had only one dose of MMR may receive a second dose if they are: <ul style="list-style-type: none"> Health care workers Post-secondary students OR based on a health care provider’s clinical judgement 	A second dose of MMR is recommended for all adults born in or after 1970 (for those who have not previously received 2 doses of MMR)

***Two additional doses required after age of 1 year**

***If unknown immunization status, offering a measles vaccine is preferred to ordering serology to determine immune status. There is no harm in receiving an additional dose.**

Var

- Varicella
- Given at 15 months
- SC injection
- Live vaccine
- Trade name : VARILRIX or VARIVAX III

MMRV

- Measles, Mumps, Rubella & Varicella
- Given at 4 years
- SC/IM injection
- Live vaccine
- Trade name : Priorix-Tetra or Proquad

Tdap IPV

- Tetanus toxoid, acellular pertussis, inactivated polio vaccine
- Given at 4-6 years
- Trade name: ADACEL[®] -POLIO
- IM injection
- Non live

Grade 7

- Hepatitis B (Recombivax HB or Engerix-B)
 - 3 dose series at 0, 1, 6 month intervals
- Human Papilloma Virus (HPV – Gardasil)
 - 1 or 2 dose series (2nd dose would be 6 months after)
- Meningococcal conjugate ACYW 135 (Menactra)

14 years

- Tetanus, diphtheria, pertussis (Tdap)
- Trade name: Adacel or Boostrix

Vaccine hesitancy

- Defined as “a refusal of vaccination or a delay in an immunization schedule due to concerns about immunization”
- With regards to childhood immunizations, it is often a discussion with parents who care about their children’s health
- Try to listen to their reasons why they are vaccine hesitant
- Provide them with reputable resources that educate about vaccines and if possible, try to address their main concerns with evidence-based medicine
- Book a follow up visit to discuss their understanding and address any further concerns

Resources for parents and providers

- Caring for Kids – Canadian Pediatric Society
 - <https://caringforkids.cps.ca/handouts/immunization>
- Communicating effectively about immunization: Canadian Immunization Guide
 - <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-1-key-immunization-information/page-5-communicating-effectively-immunization.html#p1c4a1>
- Immunize Canada
 - <https://www.immunize.ca/parents>
- Simcoe Muskoka District Health unit
 - <https://www.simcoemuskokahealth.org/Topics/Immunization/Report-and-request>

References

- Publicly Funded Immunization Schedules for Ontario
 - <https://www.ontario.ca/files/2024-01/moh-publicly-funded-immunization-schedule-en-2024-01-23.pdf>
- Caring for Kids – Canadian Pediatric Society
 - <https://caringforkids.cps.ca/handouts/immunization>
- Communicating effectively about immunization: Canadian Immunization Guide
 - <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-1-key-immunization-information/page-5-communicating-effectively-immunization.html#p1c4a1>
- Immunize Canada
 - <https://www.immunize.ca/parents>
- Simcoe Muskoka District Health unit
 - <https://www.simcoemuskokahealth.org/Topics/Immunization/Report-and-request>