Public Health Ontario | Santé publique Ontario

AT A GLANCE

Summary of Immunization Recommendations for Children Previously Immunized with Oral Poliovirus Vaccine

Published: November 2023

Purpose

This document provides a summary of recommendations on the use of inactivated poliovirus vaccine (IPV) in children previously immunized with oral poliovirus vaccine (OPV). It is intended for use by healthcare providers and public health unit staff who review childhood immunization records and provide immunizations to children, particularly newcomer children and refugees. Please refer to the Ministry of Health's Publicly Funded Immunization Schedules for Ontario for routine and catch-up immunization schedules and the Canadian Immunization Guide for immunization recommendations for persons with inadequate immunization records and those new to Canada.

Key Messages

- Outbreaks of circulating vaccine-derived poliovirus (cVDPV) continue globally, particularly in regions with low vaccination coverage and inadequate outbreak control.
- The Canadian Immunization Guide recommends that children previously immunized with bivalent OPV (bOPV), which contains only poliovirus serotypes 1 and 3 but not serotype 2, receive an age-appropriate series of IPV, which contains all three poliovirus types.
- Healthcare providers who provide immunizations to children, particularly newcomer children and refugees arriving from countries using OPV, should review the child's poliovirus immunization history and complete their immunization series with IPV-containing vaccine dose(s) as appropriate for age.
- Healthcare providers should presume that any documented doses of OPV received on or after April 1, 2016, were bOPV and should be considered invalid doses. Healthcare providers should consider children lacking documented immunization history as unvaccinated.

Background

Polio is a highly contagious viral infection that can affect the central nervous system and may lead to paralysis. Symptoms of polio (which occur in about 20-25% of those infected) include fever, fatigue, headache, and nausea and vomiting; paralytic disease occurs in less than 1% of cases.[1] There are three poliovirus serotypes (1, 2, and 3) and immunity to one type does not produce significant immunity to the other types. Since the launch of the Global Polio Eradication Initiative in 1988, cases of wild

poliovirus have declined by more than 99.9%.[2] Wild poliovirus type 2 was declared eradicated in 2015 and wild poliovirus type 3 was declared eradicated in 2019. Wild poliovirus type 1 remains endemic in Afghanistan and Pakistan.[3]

The decline in polio cases worldwide can be largely attributed to the success of global immunization programs with OPV. OPV is a live, attenuated vaccine. Rarely, these attenuated viruses in OPV undergo genetic changes during replication that can cause a vaccine-derived disease that is indistinguishable from wild-type polio, particularly in communities with low vaccination coverage. Because of this low risk of vaccine-derived disease, OPV is no longer used in Canada.[1] IPV, an inactivated vaccine that protects against all three poliovirus types but does not pose a risk of vaccine-derived disease, has been used in Canada as a single or combination product since 1995/96.[1]

Historically, trivalent OPV (tOPV), which also provides protection against poliovirus types 1, 2, and 3, was the predominant vaccine used for polio eradication globally. However, in April 2016, in response to polio cases caused by cVDPV, more than 94% of which were due to type 2 (cVDPV2),[4] the World Health Organization (WHO) coordinated a global withdrawal of tOPV and recommended that countries switch to bOPV containing only types 1 and 3.[5] Despite this switch, outbreaks of cVDPV2 continue globally, particularly in regions with low vaccination coverage and inadequate outbreak control.[3] Monovalent OPVs (mOPV1, mOPV2, mOPV3), which confer immunity to a single serotype, and novel OPV type 2 (nOPV2), which is a more genetically stable vaccine that is less likely to be associated with vaccine-derived disease, are used to control cVDPV outbreaks.[6]

The risk of importation of both wild-type and vaccine-derived poliovirus and onward local transmission remains possible in North America, particularly in communities with low vaccination coverage.7 For example, in 2022, a case of paralytic polio due to cVDPV2 occurred in an unvaccinated adult who had no history of travel, with wastewater testing suggesting local community transmission in New York State.8 Children who have not been vaccinated against all three types of poliovirus (i.e., received bOPV only), including newcomers and refugees to Canada, remain at risk for cVDPV2 infection.[1]

Immunization Recommendations

> Healthcare providers should presume that any children with documented dose(s) of OPV received on or after April 1, 2016, are bOPV. To ensure protection against all three poliovirus types, children who received bOPV should complete their polio vaccine series with an IPV-containing vaccine using an age-appropriate schedule.

- Healthcare providers and public health unit staff providing immunizations to children who are new to Canada should review the child's immunization history.
- The Canadian Immunization Guide recommends that children who have not been vaccinated against all three poliovirus types (i.e., received bOPV only) should receive an IPV-containing vaccine series as appropriate for age (Table 1).
- Immunization records may not explicitly document the type of OPV administered (e.g., tOPV, bOPV, mOPV, nOPV2). In order to ensure protection against all three poliovirus types, healthcare providers should take into account the following considerations:
- If OPV was administered on or after April 1, 2016, healthcare providers should presume that the child received bOPV. Any dose(s) of OPV received on or after April 1, 2016, should be considered

invalid. If OPV was administered prior to April 1, 2016, healthcare providers should presume that the child received tOPV and count the dose(s) as valid.

- Children who have received the recommended number of tOPV or IPV doses according to their age (see Table 1) are considered up-to-date. Documented doses of tOPV or IPV in any combination are considered valid doses if given on/after the minimum age of 6 weeks.
- Children with inadequate immunization records and those lacking documented polio immunizations should be considered unimmunized and started on an age-appropriate immunization schedule with an IPV-containing vaccine.
- If the immunization record does not contain sufficient information to determine the type of vaccine product administered, healthcare providers should use any additional information available such as country of immunization and date(s) of administration, along with their best judgment, to assess the child's immunization record. Routine immunization schedules for IPV and/or OPV by country are available on the WHO website. If uncertainty remains, an age-appropriate immunization schedule using IPV should be offered.
- IPV can be given to incompletely immunized persons and those with inadequate records without concern about prior receipt of polio-containing vaccines; adverse events associated with repeated immunization with IPV have not been demonstrated.

Table 1. Catch-up Immunization Schedule for IPV Vaccine for Children and Adolescents Based on Age of Initiation*[9]

Age at start of catch-up immunization	Total number of IPV doses	Recommended interval between doses
6 weeks-3 years	4 doses†	First 3 doses given at an interval of 8 weeks (minimum of 4 weeks) between doses; 4th dose given 6-12 months after 3rd dose and on/after the fourth birthday†,‡
4-17 years	3 doses	First 2 doses given at an interval of 8 weeks (minimum of 4 weeks) between doses; 3rd dose given 6-12 months after 2nd dose

* This catch-up immunization schedule is specific to IPV vaccine and assumes that the child is up-to-date for other antigens. If the child requires immunization with additional antigens in combination vaccines, refer to the Ontario catch-up immunization schedules.

† A 4th dose is not required if the 3rd dose was given on/after the fourth birthday (and at least 6 months following the 2nd dose).

‡ A dose of IPV-containing vaccine should be administered at 4-6 years of age, regardless of the number polio vaccine doses administered prior to 4 years of age.

References

1. Public Health Agency of Canada. Canadian immunization guide [Internet]. Ottawa, ON: Government of Canada; 2023 [modified 2023 Sep 08; cited 2023 Aug 29]. Available from: https://www.canada.ca/en/public-health/services/canadian-immunization-guide.html.
2. Morales M, Tangermann RH, Wassilak SGF. Progress toward polio eradication — worldwide, 2015–2016. MMWR Morb Mortal Wkly Rep. 2016;65(18):470-3.
3. Global Polio Eradication Initiative. Polio now [Internet]. Geneva: World Health Organization; 2023 [cited 2023 Aug 29]. Available from: https://polioeradication.org/polio-today/polio-now/.
4. Jorba J, Diop OM, Iber J, Sutter RW, Wassilak SG, Burns CC. Update on vaccine-derived polioviruses worldwide, January 2015–May 2016. MMWR Morb Mortal Wkly Rep. 2016;65(30):763-9.
5. Hampton LM, Farrell M, Ramirez-Gonzalez A, Menning L, Shendale S, Lewis I, et al. Cessation of trivalent oral poliovirus vaccine and introduction of inactivated poliovirus vaccine - worldwide, 2016. MMWR Morb Mortal Wkly Rep. 2016;65(35):934-8.
6. Global Polio Eradication Initiative. nOPV2 [Internet]. Geneva: World Health Organization; 2023 [cited 2023 Aug 29]. Available from: https://polioeradication.org/nopv2/.
7. Institut national de santé publique du Québec. Vaccination contre la poliomyélite chez certaines communautés à risqué [Internet]. Québec, QC: Gouvernement du Québec; 2023 [cited 2023 Aug 29]. Available from: https://www.inspq.qc.ca/en/node/33063.
8. Ryerson AB, Lang D, Alazawi MA, Neyra M, Hill DT, St George K, et al. Wastewater testing and detection of poliovirus type 2 genetically linked to virus isolated from a paralytic polio case - New York, March 9-October 11, 2022. MMWR Morb Mortal Wkly Rep. 2022;71(44):1418-24.
9. Ontario. Ministry of Health and Long-Term Care. Publicly funded immunization schedules for Ontario. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2023 Aug 29]. Available from: https://www.health.gov.on.ca/en/pro/programs/immunization/docs/Publicly_Funded_ImmunizationSchedule.pdf.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Summary of recommendations for children previously immunized with oral poliovirus vaccine Toronto, ON: King's Printer for Ontario; 2023.

Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication. The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use. This document may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to PHO. No changes and/or modifications may be made to this document without express written permission from PHO.

Public Health Ontario

Public Health Ontario is an agency of the Government of Ontario dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, front-line health workers and researchers to the best scientific intelligence and knowledge from around the world.

For more information about PHO, visit publichealthontario.ca.

Ontario