

Biological Considerations

Revision Date: August 30, 2018

Concurrent Administration of Vaccines and Biologicals

- Concurrent administration of all vaccines for which a child is eligible increases the probability that a child will be fully immunized at the appropriate age.^{1,2,3}
- Concurrent administration of most vaccines has produced seroconversion rates and rates for adverse reactions similar to those observed when vaccines are administered separately.^{1,2}
- **Inactivated vaccines** can be administered concurrently with or at any time before or after other inactivated or live vaccines.²
 - Different formulations of a vaccine that protect against the same disease (e.g., pneumococcal conjugate and pneumococcal polysaccharide vaccine, or meningococcal conjugate and meningococcal polysaccharide vaccine) cannot be given simultaneously, and a minimum time interval should elapse between the two formulations.¹

See *Biological Products* for specific vaccine information.

- **Live vaccines** given by the parenteral route can be administered concurrently with other live vaccines during the same visit.
 - If not administered concurrently, live parenteral vaccines generally must be separated by at least four weeks¹ (Exception: yellow fever vaccine where there is a minimum 30 day interval recommended).⁴
 - If two live parenteral vaccines are given less than four weeks apart, the immune response to the second vaccine may be diminished by the immune response to the first vaccine. In these cases, the dose of the second vaccine is considered invalid and should be repeated after the recommended interval.¹
 - Live attenuated influenza vaccine (LAIV) may be administered simultaneously with other live parenteral vaccines or at any interval before or after other live parenteral vaccine.³
 - Live oral vaccines may be administered simultaneously with or at any interval before or after any other live vaccine regardless of the route of administration of the other vaccine.¹

See *Biological Products* for specific vaccine information.

- **Tuberculin Skin Test (TST):**
 - Live vaccines may suppress the tuberculin test response, resulting in a false negative reading.
 - The TST may be administered at the same clinic visit as the live vaccine(s), but should be deferred for least four weeks if a live vaccine has been administered recently.⁵

Interchangeability of Vaccines by Different Manufacturers

- In general, the same manufacturer's product should be used for all doses in a vaccine series. However, routine immunization should not be deferred because of the lack of availability of a specific product.¹
- To be considered interchangeable, the vaccines should:
 - be authorized with the same indications and schedules;
 - be licensed for the same population being offered the vaccine;
 - contain comparable type and quantity of antigen; and
 - be similar in terms of safety, reactogenicity, immunogenicity and efficacy.¹

Inactivated polio vaccine and oral polio vaccine doses (OPV) should be considered interchangeable for the purpose of assessing the immunization status of persons new to Canada. OPV is no longer available in Canada, however, it continues to be widely used internationally.¹

Altered Schedules/Doses

- Recommended dosages of a vaccine should not be altered, as they are derived from clinical trials, practical experience, normal periodicity of health-care visits and theoretical considerations.² Administration of amounts smaller than those recommended (e.g., with split doses or using intradermal administration unless specifically recommended) may result in inadequate protection.² If less than the standard-dose volume was given, the vaccine dose should be repeated.^{2,6}
- Exceeding the recommended dose may lead to excessive local or systemic concentrations of antigens or other vaccine constituents.^{2,6}
- Interrupted immunization schedules should not be restarted, regardless of time lapse since the previous dose¹. The interval between vaccine doses can be extended without compromising the immune response, although protection may not be achieved until all the recommended doses have been given.¹ Immunization should be brought up to date as quickly as possible by continuing the age-appropriate schedule (Exception: rabies post-exposure immunization initiated in another country with uncertain vaccines, vaccines given I.D. or unknown schedule, including no clear documentation. See [Biological Products - Rabies Vaccine](#)).
- All vaccines due should be given at the same visit when possible.¹
- Doses given at less than the recommended interval may result in less than optimal antibody response.¹ Case-by-case assessments must be made as to whether or not the dose will need to be repeated.
- Unless specified by the manufacturer, vaccines should never be mixed in the same syringe.¹

References

- ¹ National Advisory Committee on Immunization. (2018). *Canadian Immunization Guide* (Evergreen ed.). Ottawa, ON: Public Health Agency of Canada. www.canada.ca/en/public-health/services/canadian-immunization-guide.html
- ² Advisory Committee on Immunization Practices (ACIP). (2017). General Best Practice Guidelines for Immunization. Retrieved on March 2, 2018 from: <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html>
- ³ Centers for Disease Control and Prevention. (2015). General recommendations on immunization. In *Epidemiology and Prevention of Vaccine-preventable Diseases* - (13th ed.). Retrieved 2018 March 21 from www.cdc.gov/vaccines/pubs/pinkbook/genrec.html
- ⁴ CDC Health Information for International Travel 2018 *Infectious Diseases Related to Travel*. Retrieved 2018 February 21 from <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever>
- ⁵ Canadian Thoracic Society and Public Health Agency of Canada. (2014). *Canadian tuberculosis standards* (7th ed.). Ottawa, ON: Canadian Lung Association. Retrieved 2018 February 21 from, https://cts.lung.ca/sites/default/files/documents/cts/Canadian%20Tuberculosis%20Standards_7th%20edition_Complete.pdf
- ⁶ American Academy of Pediatrics, Committee of Infectious Diseases. (2018). *Red Book: 2018-2021 Report of the Committee on Infectious Diseases* (31st ed.). In D. W. Kimberlin, M. T. Brady, M. A. Jackson & S.S. Long eds. Elk Grove Village, IL: