Vaccine Administration:

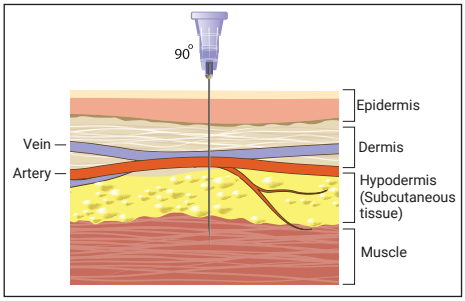
A Guide to Selecting Needle Gauge and Length

1. Determine the vaccine(s) that is required based on:
   - → **patient's age**
   - → **medical and vaccine history**
   - → **provincial or territorial vaccination schedule**
2. Determine **administration route** based on **vaccine product**.

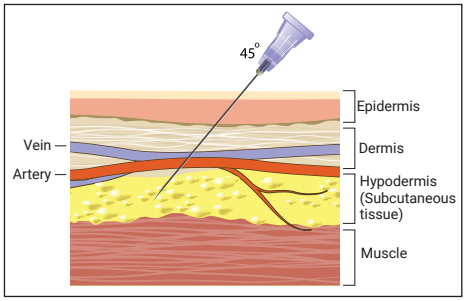
List of vaccines and route of administration
Contents of immunizing agents authorized for use in Canada: Canadian Immunization Guide

Route of administration

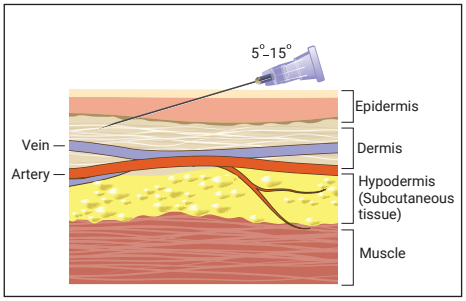
Intramuscular



Subcutaneous



Intradermal



3. Determine the appropriate:
   - → **site of injection**
   - → **needle length**
   - → **gauge**

Why is this important?

- → **Selection of the right needle** should be based on the route, recipient's factors (e.g., age, muscle mass), and vaccine properties. This is to optimize the immune response and reduce the risk of injection site reactions.
- → For intramuscular injections (IM) injections, **the needle should be inserted as far as possible into the muscle** to avoid seeping into subcutaneous tissue but **should not reach underlying nerves, blood vessels, or bone**. When needles are too short to reach muscle, vaccine may be inadvertently injected into more superficial tissue such as dermis and subcutaneous tissue, resulting in increased inflammation, induration or granuloma formation.
- → **The use of safety-engineered needles and syringes** (e.g., protected needle devices) is preferred and, in many jurisdictions, mandated by law to reduce risk of injury.

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Selection of needle based on the route of administration

Route	Needle gauge	Age of vaccine recipient	Site of injection	Needle length[6]
Intradermal (ID) 5° to 15° angle	26 to 27	All ages	See footnote 4	1.0 cm
Route	**Needle gauge**	**Age of vaccine recipient**	**Site of injection**	**Needle length**
Subcutaneous (SC) 45° angle	25	All ages	< 1 year: anterolateral thigh ≥ 1 year: upper triceps area or anterolateral thigh	1.6 cm (5/8 inch)
Route	**Needle gauge**	**Age of vaccine recipient**	**Site of injection**	**Needle length**
Intramuscular (IM)[1,2] 90° angle	22 to 25[3]	Newborns (Younger than 28 days) and preterm infants	Anterolateral thigh	1.6 cm (5/8 inch)
		Infants (1 to 12 months)	Anterolateral thigh	2.2 cm to 2.5 cm (7/8 inch to 1 inch)
		Young children (> 12 months to 3 years)	Deltoid muscle	1.6 cm to 2.5 cm (5/8 inch to 1 inch)
			Anterolateral thigh[5]	2.5 cm to 3.2 cm (1 inch to 1¼ inch)
		Children (> 3 years to 12 years)	Deltoid muscle	1.6 cm to 2.5 cm (5/8 inch to 1 inch)
			Anterolateral thigh	2.5 cm to 3.2 cm (1 inch to 1¼ inch)
		Adolescents (> 12 years to 18 years of age)	Deltoid muscle	See weight-based recommendations for adolescents and adults below
			Anterolateral thigh	2.5 cm to 3.2 cm (1 inch to 1¼ inch)
		Adolescents and adults (> 12 years)	Deltoid muscle	For those weighing less than 130 lbs (less than 60 kg): 1.6 cm to 2.5 cm (5/8 inch to 1 inch)
				Males weighing 130 to 260 lbs (60 to 118 kg) and females weighing 130 to 200 lbs (60 to 90 kg): 2.5 cm (1 inch)
				Males weighing more than 260lbs (118 kg) and females weighing more than 200lbs (90kg): 3.8 cm (1½ inch)

1. A range of needle lengths are provided as clinical judgment should be used when selecting needle length for IM injections. Consideration should be given to vaccine recipient's weight, gender and age. These recommendations are based on the practice of having the skin stretched flat (between thumb and forefinger) at the time of administration.
2. Aspirating before IM vaccination is not recommended.
3. A larger gauge needle (e.g., 22 gauge) may be required when administering viscous or larger volume products such as immune globulin.
4. Options for ID administration include: inner (volar) forearm, area over the deltoid muscle, the suprascapular are on the back or the area over the anterolateral thigh.
5. The deltoid site is often selected for toddlers and young children as temporary muscle pain post-vaccination in the anterolateral thigh muscle may affect ambulation.
6. A separate sterile needle and syringe should be used for each injection.

Table adapted from the
Vaccine administration practices: Canadian Immunization Guide

4 **Administer the vaccine(s).**

For more information on infection prevention and control visit
Infection and prevention control: Canadian Immunization Guide

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