

Vaccine Administration



A Guide to Selecting Needle Gauge and Length

Why is needle selection important?

- > Needle selection should be based on the route of vaccine administration, recipient's factors (e.g. age, muscle mass), and immunizing agent.
- > This is to reach the appropriate tissue site (dermis, subcutaneous tissue or muscle), to optimize the immune response and reduce the risk of injection site reactions.
 - For intramuscular injections, the needle must be long enough to reach muscle but not involve 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. built in sharps injury protection mechanisms) is preferred and, in many jurisdictions, mandated by law to reduce risk of injury.

General considerations

There are several things you should consider when administering a vaccine, including choosing the right needle gauge and length:

1

Determine the vaccine(s) that is required based on:

- > patient's age
- > medical and vaccination 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](#)

3

Determine if the vaccine requires mixing with a diluent or adjuvant.

4

Determine the appropriate:

- > dosage
- > site of injection
- > needle gauge
- > needle length

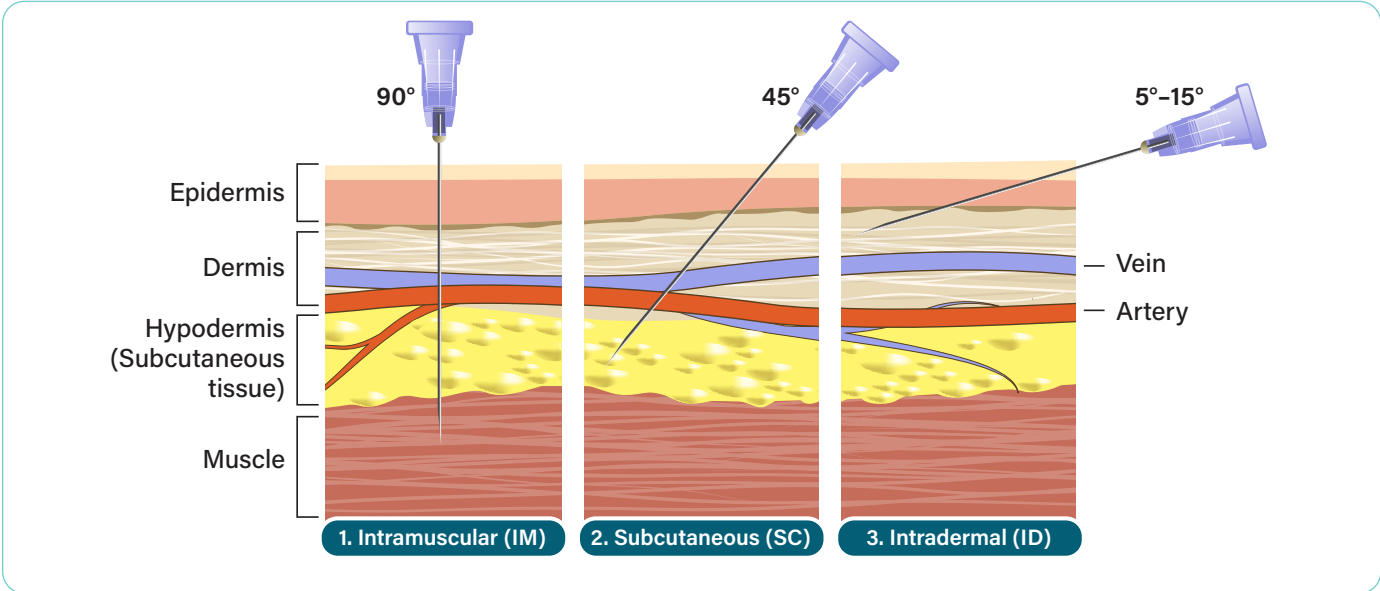
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Administer the vaccine(s).



Additional resource:
[Vaccine administration: a guide to landmarking](#)

Routes of administration



Selection of needle based on the route of administration^{1,2}

Needle gauge	Age of vaccine recipient	Site of injection	Needle length
Route: Intradermal (ID) 5- to 15-degree angle			
26 to 27	All ages	See options for ID administration in footnote ³	1.0 cm
Route: Subcutaneous (SC) 45-degree angle			
25	All ages	Younger than 1 year of age: anterolateral thigh 1 year of age or older: upper triceps area or anterolateral thigh	1.6 cm (5⁄8 inch)
Route: Intramuscular (IM) 90-degree angle ^{4,5}			
22 to 25	Newborns (younger than 28 days of age) and preterm infants	Anterolateral thigh	1.6 cm (5⁄8 inch)
22 to 25	Infants (1 to 12 months of age)	Anterolateral thigh	2.2 cm to 2.5 cm (7⁄8 inch to 1 inch)
22 to 25	Young children (older than 12 months to 3 years of age)	Deltoid muscle	1.6 cm to 2.5 cm (5⁄8 inch to 1 inch)
		Anterolateral thigh ⁶	2.5 cm to 3.2 cm (1 inch to 1 ¼ inch)
22 to 25	Children (older than 3 years to 12 years of age)	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 1 ¼ inch)
22 to 25	Adolescents (older than 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 1 ¼ inch)
22 to 25	Adolescents and adults (older than 12 years of age)	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 260 lbs (118 kg) and females weighing more than 200 lbs (90kg): 3.8 cm (1 ½ inch)

Note: Table adapted from the [Vaccine administration practices: Canadian Immunization Guide](#).

¹ A separate sterile needle and syringe should be used for each injection.

² Aspiration prior to injection of vaccine is not recommended.

³ Options for ID administration include: inner (volar) forearm, area over the deltoid muscle, the suprascapular area on the back or the area over the anterolateral thigh. For each product administered intradermally, refer to the specific product monograph or product guidance documents.

⁴ 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.

⁵ A larger bore (smaller gauge needle, such as 22 gauge) may be required when administering viscous or larger volume products, such as immune globulin.

⁶ 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.



For more information on vaccine administration practices, including infection prevention and control:
[Vaccine administration practices: Canadian Immunization Guide](#)