

Injection by route

Route	Angle	Gauge	Length	Maximum volume
Intradermal	5–15°, bevel up	25–27 G	¼–½ inch	0.1 mL
Subcutaneous	45° with a ⅜-inch needle; 90° with a ½-inch needle	25–27 G	⅜–½ inch	1 mL
Intramuscular	90°	22–25 G. Aqueous takes a higher gauge than oil-based	1–1½ inches (⅝ inch in the deltoid of an adult under 130 lb)	Deltoid 1 mL; vastus lateralis and ventrogluteal up to 3 mL in an adult

✓ **Aspirate IM injections:** pull back 5 seconds; blood means remove, discard and restart. **Never aspirate insulin.** Immunizations are not aspirated, per CDC

✓ **Air lock (IM):** 0.2–0.5 mL of air behind the dose; medication first, then the air

✓ **IV administration is outside a medical assistant's scope of practice**

Site	Route	Landmark
Deltoid	IM	1–2 inches (2 fingerbreadths) below the acromion, above the anterior axillary fold. Not for infants
Vastus lateralis	IM	Middle third of the thigh. Birth through adulthood
Ventrogluteal	IM	Center of the triangle from the greater trochanter, anterior superior iliac spine and iliac crest. Best for Z-track and irritating medications
Abdomen	SUBQ	Costal margins to iliac crests, 2 inches clear of the umbilicus
Outer posterior upper arm	SUBQ	3 inches above the elbow to 3 fingerbreadths below the acromion

Tuberculin (Mantoux) test

Dose	0.1 mL tuberculin PPD	Read at	48–72 hours: earlier or later invalidates it
Site	Intradermal, inner forearm	Measure	Induration only, perpendicular to the bone, in mm. Erythema is not measured
Equipment	1 mL tuberculin syringe, 25–27 G, ¼–½ inch	Positive	5–15 mm, depending on the population
Wheal	6–10 mm, tense and pale; repeat if not achieved	Two-step	Second test 1–3 weeks after the first is read

Live-virus vaccine may be given the same day; otherwise wait 4–6 weeks.