COVID 19 Vaccine Implementation Task Force

Clinic Reference

Title:	**Administration of Intramuscular (IM) Immunizations**
Area:	**Reference for Immunizers**
Effective Date:	June 1, 2021
Revised Date:	July 30, 2021
Approver:	Clinical Team

Assessing Injection Site

The two recommended intramuscular (IM) injection sites for immunizations are the deltoid and vastus lateralis (anterolateral thigh) muscles.

For the majority of adults and children over the age of 1 presenting to the immunization clinics, the deltoid will be the most appropriate site for immunization. The vastus lateralis may be considered as an alternate site for young children or if the deltoid muscle is assessed as not an appropriate site.

For infants less than 12 months of age, intramuscular immunizations are administered in the vastus lateralis as this site provides a larger muscle mass for better absorption.

Do not administer active immunizing agents into the gluteal muscles due to the risk of reduced efficacy from poor absorption if the injection does not reach the muscle. When choosing the appropriate injection site, inspect the skin's surface for bruises, scars, or inflammation and palpate the site for masses, edema, or tenderness. Do not inject vaccine if any of these are found as there may be interference with absorption of the vaccine. If unavoidable, vaccines may be administered through a tattoo or superficial birthmark.

Clinical judgment should be used when selecting appropriate injection site and needle length according to adequacy of muscle mass and age.

Selecting Needle Size

For IM injections, select a needle that is long enough to reach the largest part of the muscle, but not so long to reach the underlying bone. This is to prevent the vaccine from being deposited in subcutaneous tissue which decreases the chance of local adverse effects (i.e., less redness and swelling at injection site) and ensures efficacy.

For most infants, children, and adults, a 1" needle is used for IM immunizations administered in the deltoid or the vastus lateralis muscles. However, needle length may need to be adjusted based on the clinician's assessment of muscle size and subcutaneous tissue present. A 1 ½" needle may be considered for individuals who are assessed as having larger muscle mass and a larger amount of subcutaneous tissue, such as well-developed or muscular individuals or individuals considered obese.

A 5/8” needle may be considered for individuals who are assessed as having less muscle mass and less subcutaneous tissue such as younger children or elderly with under-developed or a smaller amount of muscle mass.

A 22-to-25-gauge needle should be used depending on the viscosity of the vaccine.

Positioning and landmarking for IM injections

Correct positioning of the client and landmarking are critical steps to ensure the vaccine is administered in the correct site. Stabilization measures and comfort restraints of infants and young children are necessary to protect the individual, minimize discomfort, and ensure safety during the immunization procedure.

For young children and infants, instruct the parent/caregiver to hold the child in a manner that the immunization site selected is clearly visible to the immunizer and the child is sufficiently stabilized to prevent as much movement as possible during the immunization. The age and developmental stage of the child are important considerations when assessing the appropriate use of comfort restraints. It is essential that the parent/caregiver is aware that their role in holding the child is to assist the child to remain as still as possible for the immunization, and not to overpower the child. The parent/caregiver should be advised not to utilize comfort restraint measures until the immunizer is ready to administer the vaccine. In circumstances where excessive restraint would be necessary to ensure stability of the site, the immunizer should defer the immunization until a time that the immunization can be accomplished with the use of routine stabilization measures.

Positioning for Deltoid Injection Site:

The following technique should be used to correctly position older children and adults for injection into the deltoid:

- Advise older children and adults to sit in a straight-back chair and position their arm in a manner that exposes the deltoid muscle and relaxes the arm.
- Encourage the child/adult to place their forearms and hands in a relaxed position on their upper thigh.

The following technique should be used to correctly position infants and younger children for injection into the deltoid:

- Instruct younger children to sit sideways on the lap of the parent/caregiver.
- The arm being used for the immunization should be held close to the child’s body by the parent/caregiver, while the other arm is tucked behind the parent’s/caregiver’s back.
- Ask the parent/caregiver to firmly hold the child’s legs and feet between his or her thighs, and control them with their free hand, if necessary.
- The deltoid site should be clearly visible, and the child is firmly stabilized by the parent/caregiver to prevent movement during the immunization.

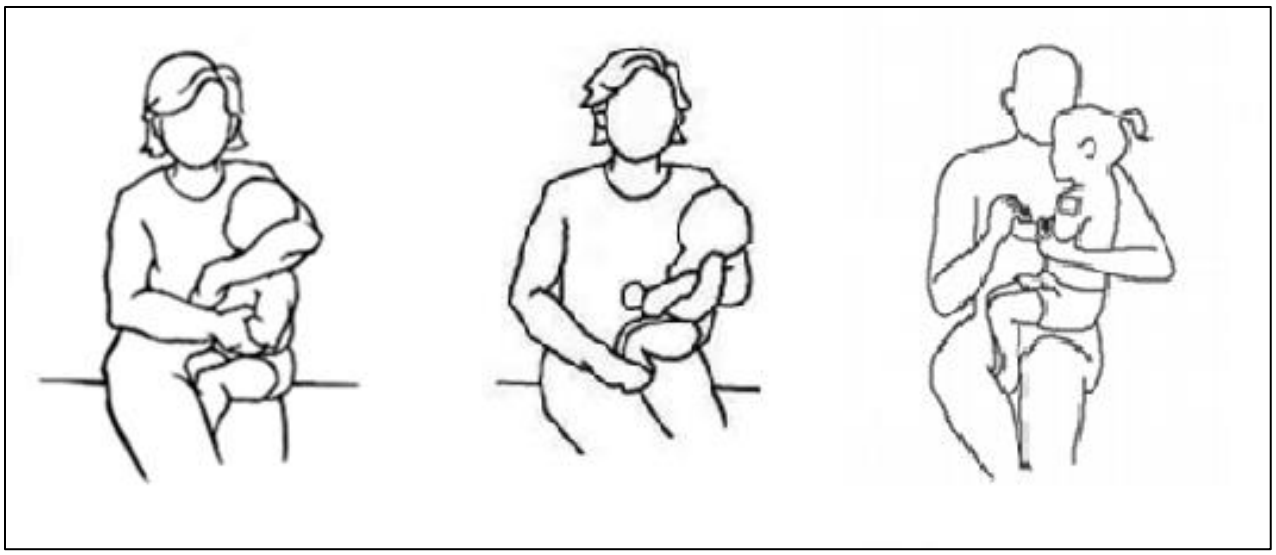

Figure 1 Adapted from BC CDC Immunization Manual

Landmarking for Deltoid Injection Site:

- Expose the shoulder completely.
- Identify the injection site by drawing an imaginary triangle with its base at the lower edge of the acromion process and its peak above the level of the axillary fold. The injection site is in the center of the triangle – the central and thickest portion of the deltoid muscle
- For adults and older children, the target zone for injection is 2.5 to 5 cm (1 to 2 inches) below the acromion process. In younger children, the target zone may be closer to 2.5-3 cm (approx. 1 inch) below the acromion process depending on the size of the muscle. To avoid causing injury, do not inject too high (near the acromion process) or too low.

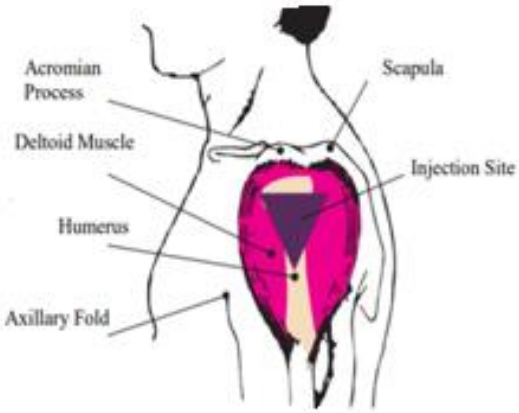

Figure 2 Adapted from CDC

Positioning for Vastus Lateralis (Anterolateral Thigh) Injection Site:

The following technique should be used to correctly position older children and adults for injection into the vastus lateralis:

- Position older children and adults in a seated, supine, or side-lying position that exposes the vastus lateralis site.

The following technique should be used for correctly position infants and young children for injection into the vastus lateralis:

- Instruct the parent/caregiver to hold the infant or young child in a “cuddle” or semi-recumbent position on their lap.
- The child’s head should rest on the parent’s/caregiver’s arm.

- Ensure the child's arm that is positioned closest to the parent/caregiver, is tucked into the caregiver's side, or placed behind the caregiver's back. The child's other arm is controlled with the caregiver's arm and hand placed over it.
- Instruct the parent/caregiver to hold the child's outside leg around the calf or knee. Alternately, the parent/caregiver may place the child's feet between their legs and secure the child's legs with their hand.
- The vastus lateralis site should be clearly visible and the child is firmly stabilized by the parent/caregiver to prevent movement during the immunization.

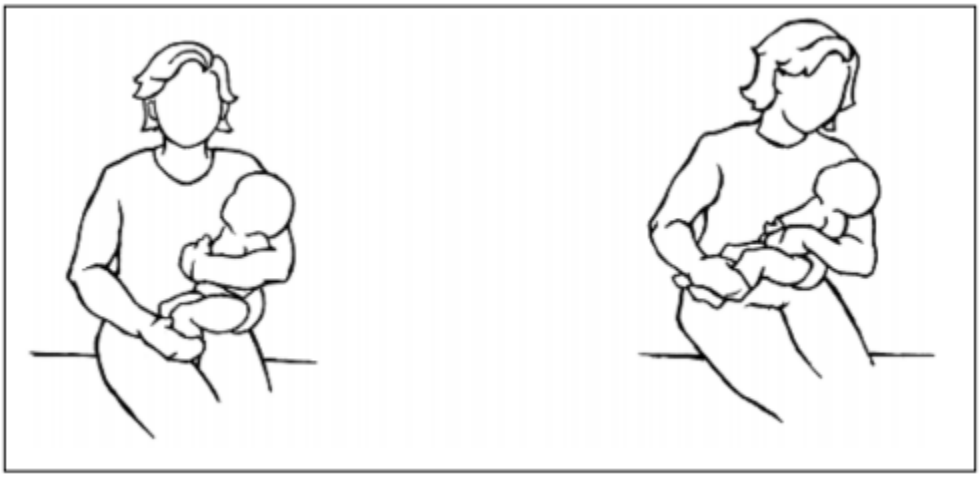

Figure 3 Adapted from BC CDC Immunization Manual

Landmarking for Vastus Lateralis (Anterolateral Thigh) Injection Site:

- Define the site by dividing the space between the trochanter major of the femur and the top of the knee into three parts; draw a horizontal median line along the outer surface of the thigh.

- The injection site is in the middle third, just above the horizontal line.

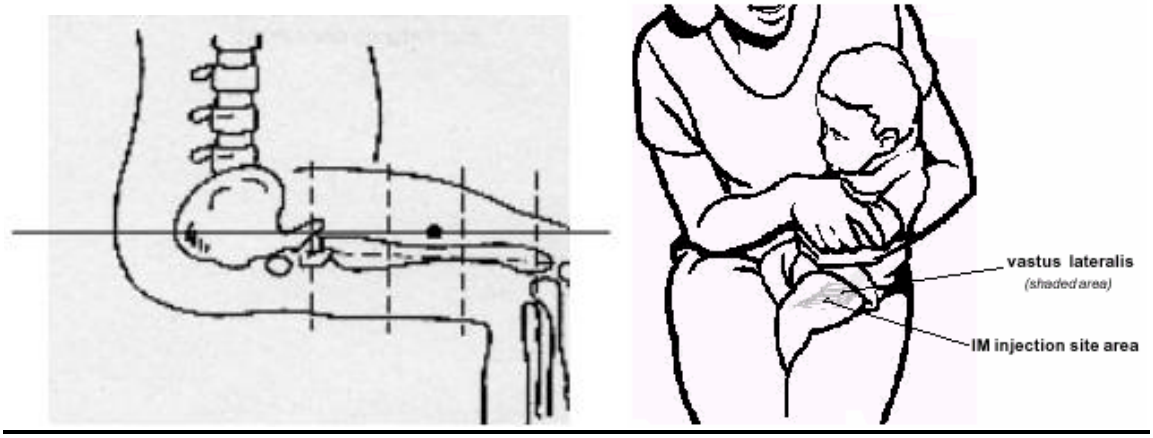

Figure 4 Adapted from BC CDC Immunization Manual

Intramuscular injection technique

- Thoroughly clean hands using soap and water or hand sanitizer.
- Cleanse the injection site with a new alcohol swab by circling from the center of the site outward for 1-2 inches. Allow to dry to avoid a burning sensation on insertion of the needle.
- If client's muscle mass is small, bunch or squeeze the muscle between the non-dominant thumb and fingers before and during the injection to increase muscle mass and minimize the chance of striking bone. This bunching method is commonly used for pediatric, geriatric or emaciated clients with reduced muscle mass when using a 1" needle.
- Alternatively, place your thumb and forefinger on either side of the site of injection and press the area flat. This method is recommended when clinical judgement has deemed a 5/8" needle appropriate for use based on client assessment.
- Insert the needle quickly at a 90° angle into the muscle.

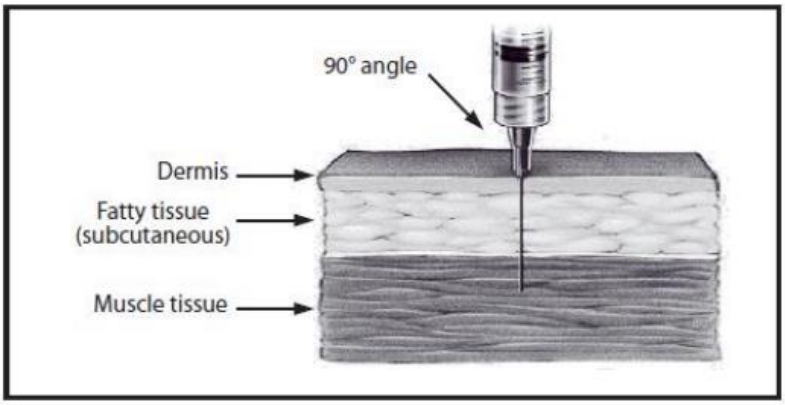

Figure 5 Adapted from CDC

- Do not aspirate (do not pull back on the plunger).
- Inject the vaccine while maintaining stability of the limb and needle.
- Remove the needle in a swift motion.
- Activate the safety mechanism and discard into the sharp's container.
- A cotton ball can be used to apply pressure to the injection site to minimize bruising. Do not massage the injection site as this may damage underlying tissue. Use of adhesive bandages is not routinely recommended.

Multiple intramuscular injections

When more than one vaccine is to be administered, it is preferable to use separate anatomic injection sites (different limbs) but is not necessary. Use of different limbs assists in differentiation of local adverse events following immunization. When administering two or more vaccines in the same limb, separate the injection sites by as much distance as possible. A separation of at least 2.5 cm (1 inch) is preferred so local reactions are unlikely to overlap. In individuals where there is insufficient deltoid muscle mass, the vastus lateralis (anterolateral thigh muscle) may be used.

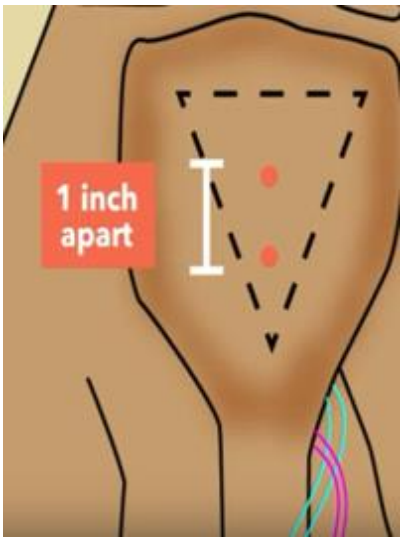

Figure 6 Adapted from WRHA

Generally, the maximum volume that can be administered by intramuscular injection in the deltoid is 1 mL. The maximum volume that can be administered in the vastus lateralis ranges from 1 mL to 5 mL depending on the individual's age. It is important to ensure the maximum volume of vaccine per site is not exceeded. The decision regarding number of injections and maximum volume to be administered in a single injection site, should be based on the age, and assessed muscle mass of the individual.

When administering multiple injections, administer the most painful vaccine, or the vaccine that causes the most stinging, last. Simultaneous injections (two immunizers providing 2 different immunizations at the same time) is not recommended due to a lack of strong evidence of effectiveness and lack of feasibility however, there may be some evidence that simultaneous injections cause less distress for infants less than 1 year of age.

Reducing Immunization Injection Pain and Anxiety

Needle-related fear and phobias can cause significant distress to clients attending an immunization clinic. This stress can trigger feelings of fainting, fatigue, and nausea. Immunizers should consider the following strategies to manage fear and pain:

- **Encourage Comfort and Relaxation**:
    - Ensure the client is positioned comfortably prior to the immunization. Older children and adults should be immunized sitting up to promote a sense of control which can have a positive impact on their experience of pain. The only exception would be if the client prefers to lie supine for the immunization or the client has indicated a history of fainting. Children who are 3 years of age and younger should be sitting upright and be held by a parent/caregiver during the immunization to reduce pain. A combination of patting and rocking can also be used after the immunization.
    - For infants, breastfeeding before, during, and after the immunization should be encouraged as breastfeeding during an immunization has been proven to reduce pain and distress and provides comfort. Alternatives to breastfeeding include bottle feeding with expressed breastmilk or formula, providing a sweet tasting solution such as sucrose or glucose 1-2 minutes before the immunization, or

utilizing other forms of non-nutritive sucking (i.e., use of pacifier or engaging in thumb sucking).

- Encourage slow, deep breathing with immunization. Ask the client to exhale deeply (as if pretending to blow out a candle or blow bubbles) when administering the injection.

- Some individuals may benefit from being vaccinated in a private room and by having a support person attend the vaccination with them. Efforts should be made to accommodate these requests whenever possible.

- If the client reports a history of fainting with needles or is feeling dizzy, ensure they are lying down when receiving the injection and remain lying down for a few minutes post-immunization. Ensure they slowly return to a sitting position, and eventually a standing position, when they are ready.

- **Distraction**:

  - Redirect the client's attention away from the needle with age-appropriate strategies. Talk with them or ask them questions about a subject other than the immunization, encourage them to read, play a video game, watch a video on their phone, listen to music, play with an age-appropriate toy, practice slow deep breathing, or rub their arm.

- **Language**:

  - Immunizers should stay calm and speak in a normal tone of voice.

  - When preparing for the immunization, describe what you plan to do. This demonstrates respect for the client's right to know, confidence in their ability to manage and conveys interest in dealing with their concerns.

  - Describe how it will feel using words such as, "poke", "squeeze", or "pressure". Refrain from using words such as "pain", "hurt", or "sting".

  - Acknowledge the client's concerns and refrain from providing false reassurance. For example, refrain from saying, "it won't hurt". Use honest statements such as "there may be a poke and some pressure that will last a few seconds".

  - Have a positive attitude and use praise for positive coping to help the client feel good about themselves and increase self-esteem. For example, use phrases such as, "I knew you could do it!", "You were so brave!", and "I'm so glad you got the vaccine!"

- **Topical Anesthetics:**

  - Clients may attend an immunization clinic with a numbing cream, patch, spray or other agent that has been applied prior to arriving at the clinic. These agents

numb the surface of the skin so the individual will feel little to no pain with the injection. Whenever a topical anesthetic is applied, it must be removed, and the skin must be wiped clean of any residue before proceeding with the immunization.

References

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