



## COVID-19 Vaccine Injection Technique and Considerations for Health Providers

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### *Editorial*

Appropriate vaccine administration is essential to achieve optimal safety and efficacy in vaccination. It is necessary to administer the vaccine to the correct site and use the appropriate injection technique. Injecting too far to the side of the arm or too low on the arm risks tearing into the axillary or the radial nerve. This can cause burning or shooting pain during the procedure and lead to nerve damage (neuropathy/paralysis). The COVID-19 vaccine should be injected into the deltoid muscle in the upper arm in its central and thickest portion. If the muscle mass in the area of the deltoid is insufficient or for a particular reason the deltoid muscle is unsuitable, the alternative can be the injection into the vastus lateralis muscle in the anterolateral aspect of the thigh. Injection technique, choice of needle length and gauge (diameter), and injection site are important considerations as they can affect the immunogenicity of the vaccine and the risk of local reactions at the injection site.

**Key Words:** COVID-19, Health Providers, Injection, Technique, Vaccine.

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## Introduction

COVID-19 vaccines are widely credited for reducing the spread of the disease and its severity and mortality, although some people still become infected with the virus even after vaccination. Several COVID-19 vaccines are available globally. The World Health Organization (WHO) has an updated list of vaccine candidates under evaluation (1-4). Vaccines must be administered safely and by the correct route. All vaccine providers should receive education and competency-based training on vaccine administration before providing vaccines. Programs should be in place to monitor the quality of immunization services.

Vaccines should be administered to the right person using the correct indication, correct vaccine, correct dose, correct route of administration, correct injection site (if applicable), and correct time (schedule) to optimize their effectiveness and reduce the risk of local reactions or other adverse events. Before vaccine administration, the vaccine identification label must be checked to ensure the selection of the correct vaccine. The expiry date on the vaccine vial and vaccine diluent (if applicable) must be verified to ensure that they have not expired (5-8).

## Route and site of administration

Injecting the vaccine into a muscle:

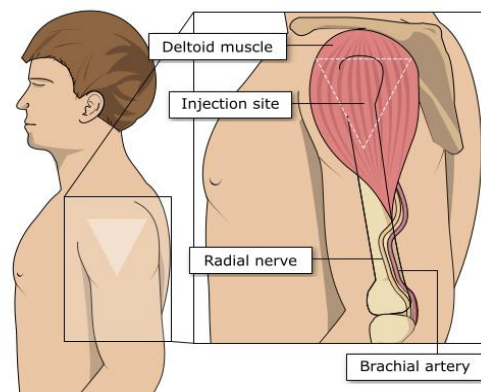
- The needle should be long enough to ensure the vaccine is injected into the muscle. A 25mm needle is used for the administration of the COVID-19 vaccine. A 38mm needle is available for adults who have more fat covering their muscles.
- The COVID-19 vaccine should be injected into the deltoid muscle in the upper arm or if there is insufficient muscle mass in the area of the deltoid or for a particular reason the deltoid muscle is otherwise unsuitable, into the vastus

lateralis muscle in the anterolateral aspect of the thigh.

- Although the deltoid muscle is more commonly used in older children and adults as it is quicker and easier to access, the thigh muscle can be used in these age groups if necessary (9-11).

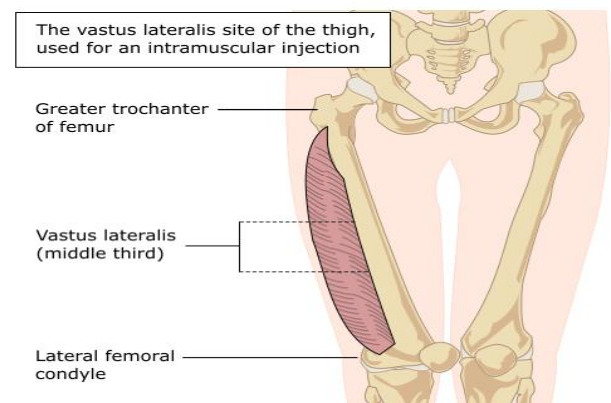
## Vaccination site

The COVID-19 vaccine should be injected into the deltoid muscle in the upper arm (**Figure 1**) in the central and thickest portion (10-12).



**Fig.1:** Deltoid muscle, upper arm (13).

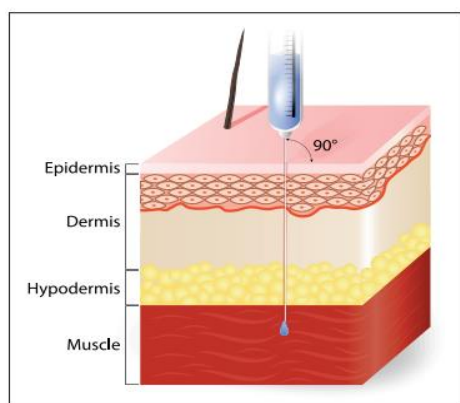
If there is insufficient muscle mass in the area of the deltoid or for another reason the deltoid muscle is otherwise unsuitable, the vaccine is injected into the vastus lateralis muscle in the anterolateral aspect of the thigh (12-14) (**Figure 2**).



**Fig.2:** Vastus lateralis muscle, thigh (13).

**Intramuscular process (Figure 3):**

- Identify the correct site for IM injection,
- Stretch the skin at the site,
- Insert the needle at a 90° angle deep enough to ensure the vaccine is delivered into the muscle,
- Depress the plunger,
- Gently remove the needle, and
- Apply light pressure if bleeding occurs (13, 15, 16).



**Fig.3:** Intramuscular injection technique for COVID-19 vaccination (15).

**IM vaccine administration**

- Have the patient sitting on a chair with their arm relaxed.
- Expose the patient's whole arm and shoulder.
- The skin does not need to be cleaned before vaccination. If it is visibly dirty, then water is sufficient to clean it.
- Identify the correct site for IM injection.
- Stretch the skin at the site.
- Insert the needle at a 90° angle deep enough to ensure the vaccine is delivered into the muscle.
- It is not necessary to pull back on the plunger (aspirate) after the needle is introduced into the muscle.

- Depress the plunger.
- Gently remove the needle.
- Apply light pressure using gauze or cotton wool if bleeding occurs (12, 16-18).

**Before administration**

Vaccinators should ensure that:

- There are no contraindications to the vaccine,
- The vaccine or vaccinator is fully informed about the brand of vaccine(s) to be given and understands the vaccination procedure, and
- The vaccine or vaccinator is aware of possible adverse reactions (ADRs), and how to treat them (11, 13, 14, 19, 20).

**REFERENCES**

1. Rogers K. "COVID-19 vaccine". Encyclopædia Britannica. Archived from the original on 12 June 2022. Retrieved 12 June 2022.
2. Vergano D (5 June 2021). "COVID-19 Vaccines Work Way Better Than We Had Ever Expected. Scientists Are Still Figuring Out Why". BuzzFeed News. Archived from the original on 6 October 2021. Retrieved 24 June 2021.
3. Mallapaty S, Callaway E, Kozlov M, Ledford H, Pickrell J, Van Noorden R. "How COVID vaccines shaped 2021 in eight powerful charts". *Nature*, 2021; 600 (7890): 580–83.
4. World Health Organization. Draft landscape of COVID-19 candidate vaccines. <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines> (Accessed on October 20, 2020).
5. Centers for Disease Control and Prevention. Vaccine Administration. In: Pink Book. Accessed January 2017 at: <https://www.cdc.gov/vaccines/pubs/pinkbook/vac-admin.html>.

6. Australian Government, Department of Health. The Australian Immunisation Handbook. 10th edition. Accessed February 2017 at: <http://www.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home>.
7. Centers for Disease Control and Prevention. Vaccine Recommendations and Guidelines of the ACIP. Accessed April 2017 at: <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html>.
8. Vaccine administration practices: Canadian Immunization Guide. Government of Canada. Available at: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide>.
9. Zuckerman JN. The importance of injecting vaccines into muscle. Different patients need different needle sizes. *BMJ*. 2000 Nov 18;321(7271):1237-8. doi: 10.1136/bmj.321.7271.1237.
10. Ng JY. Inadvertent subcutaneous injection of COVID-19 vaccine. *Postgrad Med J*. 2021 Jun;97(1148):400. doi: 10.1136/postgradmedj-2021-139870. Epub 2021 Feb 15.
11. Centers for Disease Control and Prevention. Administer the Vaccine(s). Available from: <https://www.cdc.gov/vaccines/hcp/admin/administer-vaccines.html>.
12. Merchant H. Inadvertent injection of COVID-19 vaccine into deltoid muscle vasculature may result in vaccine distribution to distance tissues and consequent adverse reactions. *Postgrad Med J*. 2022 Jul;98(1161):e5. doi: 10.1136/postgradmedj-2021-141119. Epub 2021 Sep 29.
13. The PDA Guide to Covid-19 Vaccine Administration. May 2021. Available from: <https://www.the-pda.org/wp-content/uploads/The-PDA-Guide-to-Covid-19-2.pdf>.
14. Alabama Public Health. COVID-19 VACCINE PROVIDER TOOLKIT. December 2020. Available from: [https://www.alabamapublichealth.gov/immunization/assets/covid19\\_vaccineprovidertoolkit.pdf](https://www.alabamapublichealth.gov/immunization/assets/covid19_vaccineprovidertoolkit.pdf).
15. Gordon C. COVID-19 vaccination: intramuscular injection technique. *Br J Nurs*. 2021 Mar 25;30(6):350-53.
16. Centers for Disease Control and Prevention. Administering Vaccine. Available from: <https://www2.cdc.gov/vaccines/ed/covid19/moderna/40140.asp>.
17. The Greenbook chapter 4 is recommended reading to support effective vaccine administration. Available from: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/147915/Green-Book-Chapter-4.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/147915/Green-Book-Chapter-4.pdf).
18. Interim COVID-19 Vaccine Provider Guide. Available from: <https://www.health.state.mn.us/diseases/coronavirus/vaccine/guide.pdf>.
19. Friedensohn L, Zur M, Timofeyev M, Burshtein S, Ben Michael Y, Fink N, Glassberg E. Sub-cutaneous Pfizer/BioNTech COVID-19 vaccine administration results in seroconversion among young adults. *Vaccine*. 2021 Oct 8;39(42):6210-6212. doi: 10.1016/j.vaccine.2021.07.096. Epub 2021 Aug 5. PMID: 34531083.
20. Hills T, Paterson A, Woodward R, Middleton F, Carlton LH, McGregor R, Barfoot S, Ramiah C, Whitcombe AL, Zimbron VM, Mahuika D, Brown J, Palmer-Neels K, Manning B, Jani D, Reeves B, Whitta GT, Morpeth S, Beasley R, Weatherall M, Jordan A, McIntyre P, Moreland NJ, Mirjalili SA. The effect of needle length and skin to deltoid muscle distance in adults receiving an mRNA COVID-19 vaccine. *Vaccine*. 2022 Aug 5;40(33):4827-34.