



Optimal Intramuscular Injection Site and Maximum Volume in Adult Population



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Introduction

Intramuscular (IM) injections are a common, yet complex technique used to deliver medication into the muscles of the body. More than 12 billion IM injections are administered annually throughout the world (Jin et al., 2015). Unsafe injection practices can lead to further complications, such as “abscess, hematoma, ecchymosis, pain, and vascular and nerve injury” (Potter et. al., 2020, p.633). The choice of an injection site and needle length varies based on the volume to be administered, size of the patient’s muscle, and the patient’s body mass index (BMI).

With the proper education, utilizing the best injection technique and optimal site limits further patient complications and provides positive outcomes.

Clinical Question

In the adult population, which site is preferred for intramuscular injection and what is the maximum volume of these sites?

Method

The purpose of this project is to aid Orange City Area Health System in developing a protocol that helps nurses in performing proper IM injection technique along with choosing the optimal injection site based on patient characteristics. The Johns Hopkins appraisal tool was utilized to appraise the level and quality of evidence of the literature review. In total, six evidence-based articles were utilized. Articles that focused on intravenous, oral medications, or pediatric population were discarded as they were not relevant to this project.

Databases: CINAHL and PubMed

Keywords: intramuscular injection, maximum volume, medication administration, injection site, needle length, ventrogluteal site, dorsogluteal site

Results

- The deltoid is the preferred site when administering a small dose (< 2 mL) injection
- When administering a larger dose (2-5 mL), the preferred site is the ventrogluteal over the dorsogluteal site
- Historically, the dorsogluteal site was the main site for IM injections. However, the dorsogluteal site is no longer recommended as this site is problematic:
 - Near the sciatic nerve and superior gluteal artery
 - Slow uptake of medication
 - Thick layer of adipose tissue
- Ventrogluteal site is preferred:
 - Easy to locate
 - Greater thickness of muscle
 - Thinner layer of subcutaneous fat
 - Free of major blood vessels and nerves
- With the proper education provided, nurses will be able to perform safer and more effective injection techniques

Nursing Theory

Katharine Kolcaba’s Theory of Comfort guided this research. This theory focuses on providing comfort and how comfort promotes a greater and positive outcome for patients. As nurses perform best practices and techniques, patients will receive the best care. Nurse interventions such as measuring patient BMI for proper needle length, determining the appropriate dosage, and best site to utilize will reduce complications, pain, and anxiety when administering an injection. When comfort is enhanced, a patient's fear is reduced and will make the patient’s experience and outcomes more positive.

Proposed Interventions

- Assessing BMI to select the appropriate site and needle length
- For adults weighing 130lbs - 152 lbs
 - Use 25-mm (1 in) needle length
- For adult women >200 lbs and men >260 lbs
 - Use 38-mm (1½ in) needle length
- BMI that is overweight or obese use a 38-mm needle length
- Proper education for nurses on assessing BMI and proper technique
- Ultrasound is unconventional as it may not be feasible

Conclusion

- Choosing an optimal injection site is based on the volume to be administered along with the patient’s BMI
 - Nursing education is essential
- As a result of proper education technique, adequate medication absorption occurs along with fewer complications leading to a better outcome for patients
- Better outcomes will increase patient satisfaction and increase confidence in nurses

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