Are techniques used for intramuscular injection based on research evidence?

This article debates the evidence surrounding the nursing procedure of administering intramuscular injections.

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The technique for delivering intramuscular injection remains rooted in custom and practice. This literature review examines the evidence on this commonly performed nursing procedure covering all aspects including site and needle selection.

**BACKGROUND** Intramuscular injections (IMI) are frequently referred to as a ‘basic skill’ but involve a complex series of considerations and decisions relating to:

- **Volume of injectate**;
- **Medication to be given**;
- **Technique**;
- **Site selection**;
- **Equipment**.

Other considerations are patients’ age, physical build and pre-existing conditions such as bleeding disorders, and the environment where the injection is given (Plotkin et al, 2008).

The administration of IMI has been a fundamental nursing skill since the 1960s (Beyea and Nicholl, 1995) and there is evidence that educating student nurses on injection techniques leads to improved and safer practice (Bandolier, 2003). In reality the procedure is usually taught once during pre-registration education and may not be formally revisited. This has resulted in poor practice including the increased incidence of needle-stick injuries.

Healthcare interventions can be undertaken on the basis of customs and habits that practitioners no longer critically question. The term ‘custom and practice’ is a commonly used to describe this phenomenon (Pippard, 2008). While not all custom and practice is ‘bad practice’, some aspects need to be changed in the light of evidence-based research.

Moving practitioners from custom and practice to evidence-based practice was a key driver for the NHS modernisation programme (Department of Health, 2002). However, custom and practice seems to remain entrenched in IMI techniques. Reasons for using the IM route for administration of drugs, and the technique adopted, vary worldwide. In the UK the growing incidence of obesity has highlighted the need to review site selection, needle length and technique to ensure correct administration of medicines by IMI.

Another key element in IMI technique is aspiration of the syringe plunger after needle insertion, for which there is little supporting evidence.

**LITERATURE REVIEW** There have been many articles about IMI techniques in the nursing literature over the last four decades (for example Hunter, 2008; Greenway, 2004; Workman, 1999; Beyea and Nicholl, 1995; Hahn, 1990; Torrance, 1989; Hanson, 1963), which are frequently cited. However, the past decade has seen a shift in both medical and nursing literature on changing practice in administration of drugs via IMI (for example Hunter, 2008; Nisbet, 2006; Wynaden et al, 2005).

The specific changes debated include site, needle size and injection depth. The debates have been driven by new technologies, advances in drug design and changing populations. However, clinical practice does not seem to follow the evidence base underpinning some aspects of IMI.

Few articles appear to re-examine the evidence for IMI; they often repeat opinions and anecdotes with little supporting evidence. A literature review of Medline, Cinahl and Cochrane databases found little evidence on injection theory and no evidence for aspiration of the syringe plunger. Studies have been undertaken on steps such as site selection and needle depth but have not always been rigorous comparative studies; this indicates the need for further research.

Recent studies are predominantly linked to aspects of vaccine administration. There is a perception that vaccines are associated with small volumes and childhood immunisations. However, the volume of vaccine injectate can be up to 4ml and vaccines are administered to all age groups (Plotkin et al, 2008). Evidence of reactogenicity associated with vaccines following superficial administration is well documented (for example Diggle and Deeks, 2000). Limited opportunities for both student and registered nurses to perform injections in practice are associated with deteriorating knowledge and skills (Hemsworth, 2000). Existing poor practice may be compounded by new technologies, for example auto-disable injection devices, that may require new techniques.

**PRACTICE POINTS**

- The technique for IMI needs to be reviewed in the light of existing evidence.
- Evidence supports the use of Z track technique and stretching the skin of the injection site.
- Evidence supports the use of the ventrogluteal site for all ages.
- The dorsogluteal site should not be used for injection as it poses unnecessary and unacceptable risk for patients.
- Needle length and tissue depth are linked to adverse events as obesity has increased. Patients should be weighed and assessed for the required needle length with needles inserted up to the hub to ensure the full length is used.
- Aspiration should be undertaken with dorsogluteal procedures as needle insertion is close to the gluteal artery but is not necessary with other sites.