

Let's talk about intramuscular injections: An interactive roundtable

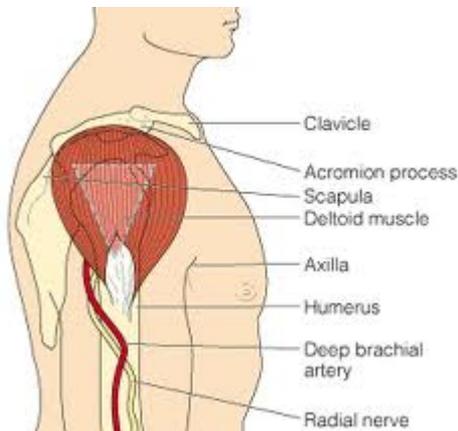
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The Case for Examining IM Injections



Location of Gluteus Medius

Injection Point
(between the knuckle of the
index & middle finger)

Greater Trochanter



What is an IM?

- Skin punctured with needle & medication administered deep into large muscle of the body for prophylactic or curative purposes (World Health Organization, 1999)
- Relatively quick uptake by body & reasonably prolonged action
- Relatively common nursing intervention in clinical practice & fundamental to nursing care
- Estimated 12 billion administered annually throughout world
- 5% or less for immunization

Depot Neuroleptic Injections

- Originally used to deepen anaesthetic before surgery “beatific quietude”
- Antipsychotics – tranquilize sans impairing consciousness or paradox excitement
- Depots developed in 60s to facilitate *compliance* (adherence), reduce relapse & improve functioning
- Long acting – bind alcohol radical of drug to long-chain fatty acid forms “ester”
- Dissolves in oil vehicle

DEPOT IM

- Depot antipsychotics administered by deep IM injection at intervals of 1- 4 weeks

Generally not more than 2-3 ml of oily injection should be administered at any one site

Correct injection technique (including the use of Z-track technique) & rotation of injection sites essential (British National Formulary, 2006, p.184).

- Substances cause formation of a depot within muscle, released over time – release must be at least a week to be defined as depot

Why look at IM?

- Safe medication administration expected competency
- Basic nursing skill, must be treated with due diligence
- IM injection - everyday activity for nurses in clinical practice particularly in P&MHN
 - ? General decrease in IMs in acute care; high number of depot in psych
- Lack of research-based guidelines except Wynaden et al, 2006 BPG - 300 abstracts, 150 articles, 93 nurses practice, use of techniques with 96 consumers
 - Identified VG as best site

Many Issues

Site

- History – dorsogluteal; contemporary evidence of using ventrogluteal, deltoid, vastus lateralis
- Site selection single most consistent factor associated with complications & injury (Cocoman & Murray, 2002)

Needles– size, length, safety needles, BMI

Volume – concentration, viscosity

Side effects – irritability

Issues

- Technique – mapping, air bubble, Z-Track
 - Bunching increases risk of injection into subcutaneous (stretch)
- Sometimes subcutaneous not IM
 - Traditional needle length & fat thickness
- Positioning – prone promotes relaxation, staff safety
- BMI – obesity, fat pads, needle choice
- Liability

Damage to sciatic nerve by injection to DG area

Supreme Court of Nova Scotia

Plaintiff as result of disabling pain in his buttock & left leg, is unable to work at any gainful employment & his condition is permanent

(cannot sit comfortably, needs to lie down frequently)

Non-pecuniary damages, loss of income, future loss of income, cost of drugs, past drug costs, future drug costs - \$611,821.00

One More Issue – Four Themes

The morality of treating patients with depot neuroleptics – Svedberg, Hallstrom & Lutzen

Themes:

- **Benevolent justification** – pt welfare at stake
- **Inability to advocate** the pts' best interest
- **Accommodative interactions** - able to respond to expressed needs
- **Acceptable advocacy** MDs responsive to RN suggestions

Walsh & Brophy, 2010

- Recent literature advocates preferential use of ventrogluteal (VG) over dorsogluteal (DG) site
- Potential sciatic nerve damage with DG – limited evidence, based on anatomical rationale vs actual research
- Complications include: skin & tissue trauma, muscle fibrosis & contracture, nerve palsies & paralysis, infectious processes – abscesses or gangrene

Dorsogluteal (DG)

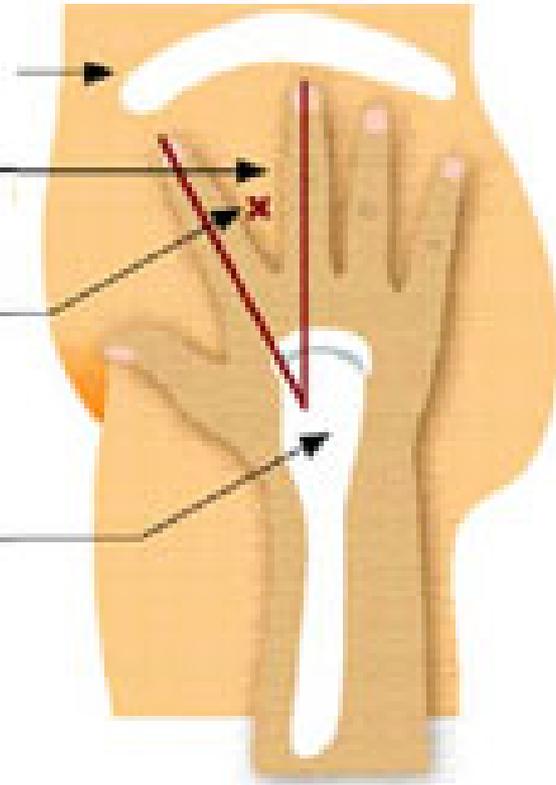
- Historically main site for IM injections, traditionally favoured site for administration of depots
- Commonly referred to as “upper outer quadrant”
Perry & Potter (not listed as a site, just 2 sentences)
- Because of the sciatic nerve location, the dorsogluteal muscle is not recommended as an injection site. If the needle hits the sciatic nerve, the pt may experience partial or permanent paralysis (p.599)

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Ventrogluteal

Ventrogluteal - VG

- Introduced early 1950s, b/c frequent dorso site complications, especially sciatic nerve injury
- VG favoured in many countries – boney land marks easy to palpate, site simple to locate; greater thickness of gluteal muscle, thinner layer of sc fat; relatively free of large penetrating nerves & blood vessels
- Many suggest VG safest site for IMs – research favouring VG hasn't filtered down to practice
- Safer site, evidence-informed

Ventrogluteal (VG)

- Located away from major nerves & muscles
- Large well defined muscle, surrounded with S/C fat
- Prudent to use VG and VL as sites of choice for routine IM in adults
- VG – faster uptake of medication & better access to muscle
- Prone position

Nurses most frequent users of VG are:

20-24 years, degree prepared, have btw 1-4 yrs experience (Walsh & Brophy, 2010)

VG con't

- Research > very few people use ventrogluteal & vastus lateralis sites.
- Nurses reluctant changing to ventrogluteal – difficulty marking site; nursing text 1960's dorsogluteal preferred.
- Evidence favours ventrogluteal vs dorsal, nurses slow to embrace.
- 81% of RNs more comfortable & confident administering in dorsogluteal site. (Crawley, 2008)

Vastus Lateralis

- One of largest muscle groups – well developed at birth
- Little to no evidence, advice re VL not specific

Advantages:

- Ease of access, no major blood vessels or significant nerve structures
- Bulk of muscle tissue in non-atrophied pts in thigh region further reduces risk of injury

Inadvertent damage to femoral nerve or artery due to inaccurate land marking



Deltoid

Deltoid

- Used for small volume non-irritating medication
- Easy access, no exposure below waistline
- Literature – pain frequently reported complication
- Small area, small muscle mass, close proximity of radial nerve, brachial artery and bony processes > more substantial injury can occur
- Small muscle size > number and volume limited at this site – max 2 ml
- Better site for small volumes, rapid onset injections, greatest blood flow

Deltoid



Deltoid Site

It is easily accessible but not well developed in many adults. This site has the potential for injury because the axillary nerve lies beneath the deltoid. The radial, brachial and ulnar nerves and the brachial artery lie within the upper arm and under the triceps and along the humerus. Therefore nurses should use this site only for small medication volumes (0.5 to 1 ml) and for routine immunizations in toddlers, older children and adults

(Nicoll and Hesby, 2002)

CADTH Intramuscular Administration of Antipsychotics: Clinical Effectiveness and Safety

Canadian Agency for Drugs and Technology in Health

1. What is the comparative effectiveness of intramuscular antipsychotic medications administered in the deltoid versus dorso-gluteal muscles?
2. What is the clinical evidence regarding the complications or risk of intramuscular antipsychotic medications administered in the deltoid versus dorso-gluteal muscles?



Are We on the Same Page?

- who self-medicate, obese clients Compared textbooks for instructions for IMs
- Deltoid: preferred for vaccinations in adults, potential injury to radial, median, ulnar and axillary nerves, not well developed in many patients, use when other sites are inaccessible & small volume (0.5-2ml), discrepancies to determine injection site exist (triangle vs 2 finger below acromion process)
- DG: 4 of 5 did not recommend site - risk to sciatic nerve
- VG: favored for large volumes of medications, viscous or potentially irritating meds; lack of major blood vessels and nerves.
- Vastus Lateralis: recommended for infants or those who self-medicate, obese persons



INVEGA (paliperidone)

Risperidone Consta and Paliperidone (invega sustenna)

RISPERDAL® CONSTA® (risperidone) Long-Acting Injection - combination of extended-release microspheres for injection & diluent for parenteral use – 2 needles – deltoid & gluteal

- First supplied with non-safety needle, longer needle than best practice
- INVEGA (paliperidone) is an atypical antipsychotic medication that is derived from the active metabolite of risperidone

Paliperidone Palmitate

- Study several years ago – find alternate site for depot injections
- Company pre-selected deltoid, no rationale for choice i.e. Not evidence-informed, no evidence of nursing involvement

Monograph:

- Initiate with 150 mg injected in to deltoid, followed in 8 days with 100 mg in deltoid - then can go to gluteal
- Cannot split the dose and use 2 injections

Reaching Steady State

- Administration of first and second doses in gluteal vs deltoid tends to delay time to achieve steady state –
 - How much of a delay to steady state b/c deltoid vs gluteal – up to 3 months questionable
 - were pts getting an IM or subcue?
- Concern re: study (some nurses participating in study continued to use gluteal not deltoid)

Big Pharma Dictating Practice Concerns

- Site selected not evidence-informed
- Larger volume than recommended for deltoid – in general and splitting dose unacceptable
- Needle length as with Risperidone
- Absence of direction to use Z-track – implies not necessary
- ? Aspiration of syringe plunger

Perry & Potter Clinical Nursing Skills & Techniques – Next Edition

Drug company rep: pleased to inform you that we received a favourable response from Elsevier the publishers of Perry, Potter *Clinical Nursing Skills & Techniques*.

Although the deltoid is easily accessible, the muscle is not well developed in many adults. There is potential for injury because the axillary, radial, brachial, and ulnar nerves and the brachial artery lie within the upper arm under the triceps and along the humerus. Use this site for small medication volumes (2ml or less) (Nicholl & Hesby, 2002). Carefully assess the muscle to be used, consult medication reference, and carefully locate the injection site prior to administration of medication in the deltoid (Cocoman & Murray, 2008).

What Do You Think? Let's Talk!



What To Do?

- Develop & implement strategies to increase use of and comfort with VG site
- Hampered by absence of well developed practice guidelines for the administration of IM injections
- Questionable formal instruction re: land marking of injection sites or techniques (Cocoman & Murray, 2008)
- Request CADTH review (another province)
- Request RNAO develop Best Practice Guideline
 - (letter and signatures)

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