An introduction to the principles and practice of safe and effective administration of injections
Introduction

Giving an injection safely is considered to be a routine nursing activity. However it requires knowledge of anatomy and physiology, pharmacology, psychology, communication skills and practical expertise.

Today we will emphasise the research-based practices that are known to encourage nurses to incorporate best practice into an everyday procedure.
Intended Learning Outcomes

• Recognise the five reasons why medication may be given by injection (parenteral route)

• Differentiate between the structures involved and uses of the intramuscular (IM) and subcutaneous (SC)

• Outline factors influencing choice of syringes and needles

• Outline sites, basic preparation and administration techniques for the IM and SC routes

• Recognise the importance of universal precautions when giving injections
Considerations

- Equipment
- Route
- Site
- Technique
- Safety
Equipment

Luer Lok®
- For secure connections

Eccentric Luer slip
- Allows one to get closer to the skin

Concentric Luer slip
- For all other applications
What needle should I use for IM injections?

- 21G or 23G
- Green or blue hub
- Length depends on patient and site
Equipment

What needle should I use for SC injections?

- 25g or 26g
- Orange or brown hub
- Length depends on patient and site
Equipment

Particle Contamination

Blunt Filter/ Fill Needles
Filter out subvisible particles of glass, rubber, fibre and other residues. The infusion of these particles has been linked with phlebitis, vascular occlusion and subsequent embolism, formation of granulomas and septicaemia.

They are for use when withdrawing drugs from vials and glass ampoules.
Injections

Reasons for Giving Medication by Injection

- Rapid action required
- Drug altered by intestinal secretions
- Drug not absorbed by alimentary tract
- Patient cannot take oral drug
- Drug unavailable in oral form
Preparation of Patient

- Promote comfort and relaxation
- Explain reason for injection
- Describe the procedure / obtain informed consent
- Check for any allergies/history of anaphylaxis
- Check prescription/drug/patient identify
- Check expiry dates and record lot numbers
- Avoid over-exposure of patient
- Positioning of patient
Injections

Procedure for Injections

• Select site
• Select correct needle length and syringe
• Wash hands and apply gloves
• Prepare injections using aseptic technique
Injections

Procedure for Injections

• Check patient identity
• Skin preparation (local policy)
• Inject slowly and remove needle
• Document procedure
• Review the individual as appropriate
Injections

Preparation of skin prior to Injections

• Little evidence to support the need for disinfection of the skin prior to subcutaneous or intramuscular injection
• If soiled, however, skin should be cleaned by soap and water or can be disinfected by an alcohol swab (if alcohol swab has been used allow the alcohol to evaporate before injecting)
• Refer to local policy
Injections
Intramuscular Route

How many sites can be used to give an I.M. injection?

1) The Deltoid.
2) The Ventrogluteal site.
3) The Dorsogluteal
4) The Vastus Lateralis.
Injections
Sites for IM Injections

- Deltoid
- Ventrogluteal
- Dorsogluteal
- Vastus Lateralis
Traditionally nurses were told to divide the buttocks into four quadrants.

**INJECT INTO THE UPPER OUTER QUADRANT**
Injections

Intramuscular Injection
Variability in subcutaneous tissue thickness

  - dorsogluteal injections in 213 adults
  - 1½ inch (or 38 mm) 21g green needle
  - localisation using CT scans

- Conclusions
  - Only 5% of women
  - Only 15% of men

actually received IM injections, all other injections went into subcutaneous tissue
Injections
Intramuscular Injections

The distance from skin to muscle in this patient (line marked 1) is 42mm

An injection given with a 38mm (11/2”) needle stayed in the fatty SC tissue
Injections

A Recent Adaptation of this Approach

• The ‘Double Cross’
• Divide the buttock with an imaginary cross
• THEN divide the upper outer quadrant by another imaginary cross
• Inject into the upper outer quadrant of the upper outer quadrant
Injections

The ‘Double Cross’
Injections

The ‘Double Cross’
Injections

The ‘Double Cross’
Injections
Intramuscular Injections

• ‘Bunch up’ in elderly, emaciated or infants
• Divide thigh into thirds, inject into bottom of top 1/3
Injections

Intramuscular Injections

Deltoid

- Identify the Greater Tuberosity
- Move 5cms (1-2 inches) below the site
- Rotate arm to confirm site
Injections

Intramuscular Injections

Z tracking Procedure

Pull skin taut then insert needle

Remove needle and release skin
Injections

Intramuscular Injections

**Z tracking Procedure**

- Pull skin taut
- Keeping skin taut with heel of hand insert needle at a 90% angle
- Aspirate plunger over 5-10 seconds noting any blood
- If clear inject 1ml every 10 seconds
- Wait 10 seconds before removing needle (Beyea & Nicoll 1995)
- Keep skin taut until needle removed
- Don’t massage the site
- Check patient and site (30 minutes)
Injections

Intramuscular Injections

Z tracking Procedure

Pull skin taut then Insert needle

Remove needle and release skin
Injections

Recommended medication volumes per muscle site

Ventrogluteal  Up to 4ml in a well developed muscle

Up to 2ml in less developed muscle

Vastus lateralis  Up to 4ml in a well developed muscle

Up to 2ml in less developed muscle

Deltoid  Up to 1ml in a well developed muscle

Up to 0.5ml in less developed muscle
Injections
Subcutaneous Route

- Thighs
- Arms
- Abdomen
- Buttocks
Injections

Speed of Absorption in Injection Sites
Injections

Procedure for Subcutaneous Injections

- Lift skin fold
- Puncture skin at 90 degrees
- Do not aspirate
- Inject slowly and remove needle
- Release lifted skin fold
Injections

Scan: Thin Patient

Injections performed with an 8mm needle,

Without a lifted skin fold (left)

With a lifted skin fold (right)
Injections

No lifted skin fold

Lifted skin fold
Injections

Correctly lifted skin fold

Incorrectly Lifted skin fold
Injections

Potential Complications

- Infection
- Incorrect location of injectate
- Pain
- Anaphylaxis
Injections

Potential Complications

• Long and short term nerve damage
• Intramuscular haemorrhage
• Hitting a blood vessel
• Sterile abscess
• Lipodystrophy
Understand the legal & professional responsibilities when administering an injection.
Legal and Professional

- Training and direct supervision with mentor
- Carry out procedure in accordance with Trust policy
- Develop competence
- Practice your skill regularly
- Do not proceed unless confident
- Documentation
Safety Issues

Who gets injured?
35% are Nursing Staff

Where does the injury occur?
37% in the patients room/ward

Was the sharp contaminated?
78% Yes

36% NSI occur during use
19% NSI occur during an injection (intramuscular/subcutaneous)

EPINet™ data for Needles and Syringes 2003
If I am stuck with an infected needle, what is the risk?

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>HBV</td>
<td>1 in 3</td>
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<tr>
<td>HCV</td>
<td>1 in 30</td>
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<tr>
<td>HIV</td>
<td>1 in 300</td>
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Safety

Cost to practitioner

- Immeasurable stress
- Lifestyle changes
- Possible premature death

Cost to employer

- Covering sickness
- Treatment costs
- Litigation
- Recruitment and retention of staff
Safety

The National Audit Office (NAO 2003)

The report stated needlestick and sharps injuries accounted for 17% of accidents to NHS staff and were the second most common cause of injury, behind moving and handling at 18%.

- At least four UK HCW’s are known to have died following occupationally acquired HIV infection

- Since 1996, the HPA has received reports of nine HCW’s who have been infected with HCV because of occupational exposure

- With 40,000 reported incidents a year and at least as many unreported, needlesticks and sharps injuries are a significant issue.
Safety

Standard Precautions

Skin
Cuts or abrasions in any area of exposed skin should be covered.

Gloves
Well fitting clean gloves must be worn during procedures where there may be contamination of hands by blood/body fluids.

Hand Washing
The use of gloves does not preclude the need for thorough hand washing between procedures.

Aprons
Where there is a possibility of blood spillage.

Eye Protection
Where there is a danger of flying blood splashes.

Sharps Container
Needles are not to be resheathed prior to disposal into approved sharps container.
Safety

SAFE DISPOSAL OF SHARPS

• Immediately after use
• Never resheath or bend needles
• If possible, dispose of needle and syringe as a single unit
• Don’t overfill sharps boxes
• Report any accidents/incidents in accordance with your local hospital policy
Management of Needlestick injury

- Bleed wound under running water
- Wash with soap and water
- Attend Occupational Health dept – assess risk and take appropriate action
- Identify source of contamination eg patient details
- Document and Report incident