Chapter 64

Administration of Injectable Medications
Injectable Medications

- Injection or intravenous (IV) infusion
  - More invasive than administration by mouth, rectum, or through the skin
- Common methods of injection
  - Intradermal, subcutaneous (SC), intramuscular (IM), and IV
  - Intracardiac, intramedullary, intrathecal, intraosseous, and intraperitoneal
Administration of Medication by Injection

- Reasons
  - Most effective
  - Unavailable for any other form of administration
  - Desired action is achieved quickly.
  - Dosage accuracy is critical.
  - The client cannot retain oral medications.
  - The client is unable or unwilling to swallow oral medications.
  - The digestive system cannot absorb the drug.
Syringes and Needles
Syringes and Needles (cont’d)

• Syringes
  – The safety syringe
  – Needleless systems
  – Systems for various injection methods
    • SC injections
    • IM injections
    • Intradermal injections
Angles of Insertion
Question

Is the following statement true or false?

A nurse must always dispose of all syringes and needles in the hazardous waste container.
**Answer**

False

Always dispose of all syringes and needles in the sharps container to prevent needlestick injuries to nurses and environmental personnel. A needlestick injury can cause serious infections and/or other disabilities.

The hazardous waste container does not protect against needlesticks or injury from broken glass. The sharps container is managed using special procedures.
**Preparations**

- Injectable medications may be
  - Powders that must be reconstituted with a diluent
  - Premixed by the manufacturer
  - Ampule
  - Vial
  - Prefilled syringe

- Discard any unused portion of an ampule’s contents because there is no way to prevent contamination of an open ampule.
Intradermal Injections

- Shallow injections given just beneath the epidermis
  - Often used for diagnostic testing
  - Inner aspect of the forearm; the back may be used
  - Tuberculin syringes

- Instruct the client not to scratch or pinch the site.
Z-Track or Zig-Zag Method
Intravenous Administration

- Fluids are administered via the circulatory system.
  - Central line
  - Peripheral line
- Primary, tandem, piggyback infusions
- Infusion
- Transfusion
- Complications when working with IVs
  - Infiltration, phlebitis, embolism (thrombus), infection (sepsis)
Determining Venous Access Sites

- Choose a vein by considering its size for the purpose, length of time the vein will be accessed, mobility requirements, and comfort for the client.

- Peripheral veins may be partially collapsed in a dehydrated client.

- A longer needle may be needed for an obese client.

- Special techniques may be required for small children and infants because they have smaller veins.

- Access may be difficult in older adults and clients who are very ill.
IV Solutions

- The most commonly used IV solutions include:
  - Normal saline (0.9% NS or 0.9% NaCl)
  - 5% dextrose in normal saline (D5NS)
  - 5% dextrose in sterile water (D5W)
  - 5% dextrose in 0.45% normal saline

- Signs of infiltration
  - Swelling or puffiness, coolness, pain at the insertion site (sometimes), feeling of hardness, possible leaking of fluid
Pumps and Controllers

- Infusion pumps
- Electronic infusion controllers
- Patient-controlled analgesia and portable pumps
- Microdrip setup
- Regulating the infusion rate
  - Calculating the rate of infusion
- Correct programming of controllers and pumps is the “seventh right” in the guidelines for administration of medications.
Long-Term Infusions, Central Lines, and Infusion Ports

- Types of IVs
  - Central lines, central venous access devices (CVAD), or central venous catheters
- The short central venous catheter
- The PICC line
- The midline catheter
- Infusion ports
Total Parenteral Nutrition

- Total parenteral nutrition (TPN), formerly known as hyperalimentation, is also called central parenteral nutrition (CPN).
  - Amino acids, dextrose (10%–70%), and electrolytes
  - Lipids (fats), vitamins, and trace elements such as zinc, copper, manganese, or chromium
- Infusion of TPN requires insertion of an IV line in a large blood vessel, the internal jugular vein in the neck (an IJ line), or the superior vena cava (SVC line).
**Question**

Is the following statement true or false?

Total parenteral nutrition can be administered only by way of a large central venous catheter.
Answer

True

Total parenteral nutrition (TPN) can be administered only by way of a large central venous catheter because it is very concentrated.

A peripheral blood vessel would not have sufficient blood flow to dilute the TPN solution.
Administration of Intravenous Medication

- Ensure that the label of the medication to be infused states that it is safe for IV administration.
- A medication given IV, even though it may be the correct medication and in an IV form, must be also given in the correct dosage.
- Never administer IV medications into tubing that is infusing blood or blood products or TPN solutions.
The Saline Lock
Administration via Piggy Back

Primary IV tubing to IV solution bag

Secondary IV tubing used for piggyback administration

Syringe containing medication

Needleless blunt tip syringe

Needleless hub with safety connector lock

Needleless access port

To client
Volume-Controlled Infusion

- The solution to be used to dilute the medication is supplied in a small bag that is hung on an IV pole and a volume-control device is hung below it.

- After priming the tubing, the ordered amount of diluent is run into the volume-control chamber and then, the prescribed medication is injected into the intake port of the chamber.

- This infusion is often given piggyback.

- The rate of administration must be carefully controlled.
**IV Bolus or Push**

- Medications may be given by IV “push,” also called a bolus.
- The push introduces a concentrated dose of medication directly into the circulatory system.
- This injection is given in a short period of time and is not intermittent.
- In some cases, a “smart pump” is used.
Question

Is the following statement true or false?

A medication should be referred to as an IV push if it is to be given over a period of time.
Answer

False

Do not refer to a medication as an IV push if it is to be given over a period of time.

The procedure may be identified as “an IV to be given over 5 minutes or over 10 minutes,” for example.
Nursing Considerations

- Calculate the dosage correctly, double-check all IV push medications.
- Confirm that the IV catheter is in the vein and the fluid is flowing freely.
- If it appears that the IV is infiltrated, the push should not be given.
- If IV push medication is injected into surrounding tissue rather than the vein, serious problems can occur, including an abscess or tissue sloughing.
- If an IV push is given too fast, it can cause very serious complications, including death.
Venipuncture

- Venipuncture or phlebotomy
  - The process of puncturing a vein for the purpose of obtaining a blood specimen or establishing an IV access site
  - Vacutainer system
  - Butterfly needle
End of Presentation