Chapter 11
Intravenous Cannulation

Objectives

- Define the term intravenous cannulation
- Recall the indications and contraindications of intravenous cannulation
- Identify the equipment used to perform intravenous cannulation
- Select preferred solutions for use in management of trauma and medical emergencies

Objectives

- Recall the recommended ratio of IV replacement to blood loss in patients experiencing hypovolemic shock
- Describe the methods used to determine the proper IV flow rate
- List the advantages, disadvantages, and complications associated with the use of peripheral veins
Objectives

- Identify the veins that are commonly used for peripheral intravenous cannulation
- Recall the steps used to perform peripheral intravenous cannulation
- Use problem-solving skills with IV lifelines that are not functioning properly to determine the cause and correct the problem

Objectives

- List complications associated with IV therapy
- Demonstrate the steps for discontinuing an IV lifeline

Introduction

- Intravenous cannulation
  - Placement of a catheter in a vein
  - Administer blood, fluids, medications
  - Obtain blood specimens
Introduction

- Intravenous cannulation
  - Indications
    - Cardiac disease
    - Hypoglycemia
    - Seizures
    - Shock
    - Precautionary measure
  - Contraindications
    - Sclerotic veins
    - Burned extremities
    - Critical patients

Body Substance Isolation Precautions

- When performing IV therapy
- Hepatitis B virus (HBV)
- Human immunodeficiency virus (HIV)

Body Substance Isolation Precautions

- Gloves
- Barrier protections
- Proper disposal
**IV Cannulation—Equipment**

- IV solution
- Administration set
- Extension set
- Needles/catheters
- Tourniquet
- Protective gloves
- Gown and goggles

- Tape
- Antibiotic swabs/ointment
- Gauze dressings
- 10mL-35mL syringes
- Vacutainer holder
- Assorted blood collection tubes
- Padded arm boards

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**Equipment**

- Intravenous solutions
  - 25 – 1000 mL
  - Clear plastic bag
  - Two ports

- Colloids and crystalloids
  - Normal saline and lactated Ringer’s
  - 3 L IV crystalloid/1 L blood lost (3:1)
Equipment

- Administration set
  - Piercing spike
  - Drip chamber
  - Flow clamp
  - Drug administration port
  - Connector end

Equipment

- Microdrip chamber
  - Precise amounts

Equipment

- Macrodrip chamber
  - Large amounts
Equipment

- IV flow rates
  - Medical emergencies
    - "To keep open" (TKO)
    - Precautionary measure
    - Administer medications

- Trauma
  - Patient's response
  - Pulse
  - B/P
  - Capillary refill <6 y/o
  - Cerebral function
  - Severe hypovolemic patient
  - Wide open rate
  - 2-3 L limit
  - 3-4 times normal flow

Equipment

- Volutrol chamber
  - Specific amounts
  - Pediatric infusions
Differences Between Arteries and Veins

Sites for Peripheral Venous Cannulation
- Sites used in routine situations

Sites for Peripheral Venous Cannulation—Other Sites
Procedure for Performing IV Cannulation

- Insert spiked piercing into IV bag
- Drip chamber filled to half way

Procedure for Performing IV Cannulation

- Place tourniquet
- Make slip knot

Procedure for Performing IV Cannulation

- Complete band placement
- Cleanse site
Procedure for Performing IV Cannulation

- Pull skin taut—needle bevel facing up
- Penetrate at juncture

Procedure for Performing IV Cannulation

- Enter vein from either top or side
- Watch for blood flashback

Procedure for Performing IV Cannulation

- Advance needle
- Slide catheter
Procedure for Performing IV Cannulation

- Remove needle
- Draw blood sample
- Release tourniquet
- Connect IV
- Secure in place
- Commercial device
Procedure for Performing IV Cannulation

- Proper disposal of used needle

Procedure for Performing IV Cannulation

- Documentation
  - Date/time
  - Type/amount
  - Device used
  - Site
  - Number of attempts
  - Flow rate
  - Adverse reactions
  - Name of EMT-I

Procedure for Performing IV Cannulation

- Common puncture sites that use an arm board
Procedure for Performing IV Cannulation

- Proper disposal of used needle

Complications

- Pain
- Catheter shear
- Circulatory overload
- Cannulation of an artery
- Hematoma or infiltration
- Local infection
- Air embolism
- Pyrogenic reaction
Drawing Blood

- Equipment

Discontinuing the IV Lifeline

- Equipment
  - Protective gloves
  - Sterile gauze pads
  - Adhesive bandage

- Close control valve

- Carefully untape and remove dressing

Discontinuing the IV Lifeline

- Stabilize tissue with dressing

- Withdraw catheter

- Cover puncture site with dressing and tape
External Jugular Vein Cannulation

Elderly Patients

Summary

- IV cannulation is used for administering blood, fluids, or medications into circulatory system and for obtaining blood samples
- IV placement should never delay patient transport
- Normal saline and lactated Ringer's solution are recommended for prehospital therapy; they are isotonic crystalloid solutions
Summary

- Crystalloid solutions diffuse out of circulatory system quickly; at least 3 L must be administered for every liter of blood lost.

- Two most common administration sets are micro (delivers 60 drops/mL) and macro (delivers 10 to 20 drops/mL).

- Plastic over-the-needle catheters are most commonly used because they can be better anchored and permit freer patient movement.

Summary

- In noncritical patients, use distal veins on dorsal aspect of hand as IV sites.

- During cardiac arrest, preferred sites are veins of antecubital fossa.

- Difficult cannulation can occur in obese persons, during shock and cardiac arrest, in chronic mainline drug users, in elderly patients with "fragile" or "rolling veins," and in small children.

Summary

- When selecting equipment for IV therapy, ensure fluid is clear, not outdated, and bag has no leaks.

- Employ infection control procedures when assembling administration set, cannulating vein, and attaching IV tubing to catheter.

- Discard needles appropriately.
Summary

- Release tourniquet once IV is connected to catheter
- Carefully monitor patient for signs of improvement and for signs of circulatory overload
- Some complications of IV therapy are pain, catheter shear, circulatory overload, cannulation of artery, infiltration/hematoma, local infection, and air embolism

Questions?