INTRAVENOUS INFUSION OBJECTIVES

- By the end of this lesson students should be able to:
- Define intravenous infusion
- Explain the purpose for intravenous therapy
- Explain types of intravenous fluids
- List equipment needed for an intravenous infusion
- Calculate the flow rate for an infusion
- Describe complications that may arise following blood transfusion

PURPOSE OF INTRAVENOUS INFUSION

- To provide patient with fluid when adequate fluid intake cannot be achieved through oral route
- When the patient is unable to swallow, e.g. unconscious patient
- When it is undesirable for the patient to take fluids or food by mouth e.g. post operative patients
- To keep the vein open for administration of drugs or when waiting for blood transfusion
- To maintain and correct electrolyte s of the body when the patient is losing fluids or salts in excess like in persistent diarrhoea and vomiting , in severe burns

TYPES OF INTRAVENOUS INFUSIONS

- Isotonic solutions: they have the same osmotic pressure as that found within the cell.
- Used to expand intravascular compartment and thus increasing circulating volume. e,.g. normal saline(0.9% Nacl) and Ringers lactate.
- They are also known as plasma expanders.

Hypotonic fluids

- Have less osmotic pressure than the cell, when infused it raises serum osmolarity pressure than the cell, causing body fluids to shift out of blood vessels e.g. 5% dextrose in water.
- Hypertonic fluids: Have great osmotic pressure than the cell. When infused it raises serum osmolarity pressure, pulling fluids from cells and interstitial tissues into vascular space, e.g 5% dextrose in normal saline , 5% dextrose in ringers lactate.

EQUIPMENT FOR INTRAVENOUS INFUSION

- Top trolley: Small sterile tray with
- Bowl of swabs, receiver, Galipot with skin disinfectants, a pair of sterile gloves.
- Bottom trolley: Mackintosh and towel padded splint to secure the arm or leg
- A litre of solution to be used , tourniquet, strapping and scissors, sterile giving set, source of light, fluid balance sheet, drip stand, screen

PROCEDURE

- Explain the procedure to the patient
- Screen the bed to ensure privacy
- Assemble all necessary equipment on trolley
- Move the trolley to the bed side of the patient
- Wash hands
- Connect giving set to the infusion bottle and suspend it to a drip stand
- Expel air from giving set and clamp to avoid continuos overflowing of fluid.

- Select site for giving infusion
- Wash hands with soap and water and dry them with clean towel or air dry.
- Put on sterile gloves
- Assistant should apply tourniquet to the limb
- Swab the insertion area with spirited swab
- Insert a canula or a butterfly needle into identified vein and make sure blood comes out

- Release the tourniquet
- Withdraw needle slowly
- Connect the infusion set to a canula/ butterfly needle
- Secure the needle with strapping
- Splint and immobilise the limb if necessary
- Recheck infusion rate

DOCUMENTATION

- Label intravenous infusion bottle and record on fluid balance sheet, include: type of solution, time of commencement, time of completion of each litre, flow rate, medication added if any, name or signature of the one carrying out the procedure
- Record the procedure, interpret and report observations accordingly.

Calculating flow rate

- Drops per minute=total volume to be infused multiplied by drop factor then divide the result by total time in minutes.
- The size of the drop that the administration set creates s known as the drop factor usually found on the packaging of the administration set.

EXAMPLE

- To calculate the drip rate of an i.v that is to infuse 1000ml in 8 hours using the tubing that has drop factor of 10 : $\frac{1000 \times 10}{8hrs \times 60}$
  - $= \frac{10000}{480}$
  - Which gives us 21 drops per minute.

FACTOS AFFECTING THE INFUSION RATE

- Height of the intravenous bottle
- Intravenous infusion is affected by gravity as the height of the infusion bottle increases, gravitation force increases.
- Position of the extremity: As the extremity is elevated infusion will run more slowly, also bending the extremity, wrist or elbow can slow the infusion rate.

- Constriction or kinking of intravenous tubing : This can also affect the flow rate of an infusion
- The position of the needle within the vein : sometimes positional changes can cause the needle bevel to rest against the vein wall interfering with entry of an infusion.

INTRAVENOUS SITE CARE

- Semi permeable dressings are used to cover the intravenous site sometimes gauze dressings are also preferred.

COMPLICATIONS OF INTRAVENOUS THERAPY

- An important nursing responsibility is monitoring the patient for possible intravenous complications which include: infiltration, phlebitis, infection, air embolism and fluid overload.
- Infiltration: occurs when fluid enters subcutaneous tissues. This can occur when needle or catheter slips out of the vein or if intravenous fluid slips into subcutaneous tissue.

phlebitis

- This refers to inflammation of a vein. If a blood clot accompanies the inflammation, it is referred to as thrombophlebitis.
- Factors contributing to phlebitis include; increased length of time the catheter is in the vein, using small veins, infusion irritating substances like potassium chloride or antibiotics.

Complications continued.....

- Infection: Can occur systemically or at the infusion site. The longer an iv line is at one site, the greater the chances of developing infection.
- Signs of infection include: redness, warm site, purulent discharge.
- Systemic site are fever, chills and discomfort.

AIR EMBOLISM

- This refers to air entering the blood system and moving in the blood vessel.

Fluid overload: May occur if the patient receives i.v fluids too rapidly. The elderly especially those with poor cardiac function and the young are prone to fluid overload.

DISCONTINUING INTRAVENOUS INFUSION

- An intravenous infusion is discontinued when ordered fluids have been infused or a complication develop. Before discontinuing an infusion it is important to done disposable gloves since contact with blood is more likely
- Stop the flow ,carefully remove tape, place gauze over the venipuncture as catheter is withdrawn.