Trouble Shooting Tips

I. *Aspiration Difficulties*

A. *Possible Causes*

* *Failure to flush according to catheter irrigation procedure.*
* *Blood clot, Fibrin Sheath, or particulate matter obstructing valve when catheter is aspirated.*
* *Kinked catheter outside or inside the body.*

B. *Possible Solutions*

* *Visually check catheter for any exterior kinks or constricting sutures.*

**Attempt to flush vigorously with 10cc normal saline.*

* *Change patients position*
* *Attempt to aspirate with a 20cc syringe (creates a greater vacuum)*

II. Blood Back in Catheter

A. *Possible Causes*

* *Blood clot or particulate matter may be holding the valve open.*
* *Migration or placement of the catheter in the internal jugular vein.*
* *Placement of the catheter in the right atrium or ventricle.*
* *Catheter valve tip cut off during catheter placement.*

B. *Possible Solutions*

* *Attempt to aspirate clot out of the lumen.*
* *Flush vigorously with 10 cc normal saline. (If no resistance is felt).*
* *Obtain order for chest X-ray or dye study to determine catheter position.*
* *If malpositioned, coiled or kinked, catheters should be repositioned with the tip in the Superior Vena Cava.*
* *If unable to reposition treat catheter as an open ended catheter, using clamp and heparin flushes.*

III. Catheter Occlusion

A. *Possible Causes*

* *Blood clot completely obstruction lumen.*
* *Drug precipitate completely obstructing lumen.*
* *May be kinked, coiled or pinched between the clavicle and the first rib.*
* *Catheter valve may not be within vein.*
* *Sutures can tighten and restrict.*

B. *Possible Solutions*

* *Attempt to aspirate blood clot.*
* *Reposition patient.*
* *Obtain physician order for chest x-ray or dye study to determine position of the catheter.*
* *If the catheter tip is not in the Superior Vena Cava, the catheter should be repositioned*

IV. Catheter Damage

A. Possible Causes

* Repeated clamping.
* Contact with a sharp object.
* Rupture from attempt to irrigate an occluded catheter with a small syringe (1 or 3cc syringe).
* Small syringes can generate very high pressures with very little force.

B. Possible Solutions

* Clamp catheter between damaged area and patient with a smooth-edged clamp.
* Always use a 10cc syringe or larger when irrigating the catheter.
* At least 2 inches of intact catheter is needed to be able to repair the body of the catheter.

V. *Air in Line*

A. *Possible Causes*

* *Hole in catheter.*
* *Loose connections (Injection cap, IV tubing).*
* *Holding the catheter connector end above the level of the heart while the valve is open.*
* *Oversleeve has not been put on the catheter connector.*

B. *Possible Solutions*

* *Check catheter for leakage by flushing well with normal saline.*
* *Check for loose connections and proper attachment of the connector and oversleeve.*
* *Aspirate air from catheter.*

Management of I.V. Therapy

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IV SITE SELECTION

Anatomy and physiology

A. Skin Layers

1. Epidermis
2. Dermis

B. Vein Versus Arteries

1. Tunica Intima
2. Tunica Media
3. Tunica Adventitia

C. Structure of peripheral veins

1. Digital
2. Metacarpal
3. Cephalic
4. Basilic
5. Accessory
6. Anticubital

D. Suggestions for starting difficult IV's

1. Elderly
2. Gravity
3. Tapping
4. Warm compresses

E. *Special Precautions*

1. *Elderly*
2. *Obese*
3. *Drug abusers*
4. *Children*

F. *Indications for electronic infusion devices*

1. *Accurate delivery of medication*
2. *Deliver very large or small volumes of fluid at very fast or slow rates accurately*
3. *Patients who cannot tolerate fluid overload*

Patient approach

1. *Always explain the procedure to the patient and encourage relaxation and cooperation*
2. *Good handwashing and proper handling of equipment are necessary for good infectious disease control*
3. *Good venipuncture technique*
   a. *make the vein as prominent as possible*
   b. *position the vein during venipuncture to prevent movement*
   c. *apply tourniquet loosely with small fragile veins*
   d. *explain to the patient what type of device is in the vein*
   e. *to discontinue an IV always apply pressure at the site using a sterile bandage or gauze for three minutes.*
      - *avoid alcohol: alcohol stings and promotes bleeding*

COMPLICATIONS OF IV THERAPY

Unfortunately, there are complications associated with IV therapy. However, if the nurse is aware of these potential hazards the hazardous effects may be lessened if not prevented. Identified below are six major complications of IV therapy, their causes, symptoms, and the action to be taken.

LOCAL INFILTRATION

Definition: *Infusion of an infused substance into surrounding tissues due to dislodgement of IV cannula, weakened vein wall, or vein wall perforation.*

Signs & Symptoms:
* *swollen IV site (may also be swollen below site)*
* *discomfort/pain at insertion site*
* *IV solution continues to drip when tourniquet place above running IV (must be tight enough shut off venous flow)*
* *no blood return*
* *IV rate slows or stops*
* *coolness over area of swelling*

Nursing Action:
* *discontinue IV line*
* *restart line above infiltration*
* *apply warm compresses to site*

Prevention:
* *secure site*
* *be sure tape does not constrict circulation*

PHLEBITIS

Definition: *Inflammation of the vein caused by bacterial (improper insertion technique, poor hand washing, poor site preparation, poor dressing care), mechanical (insecurely taped site, IV located in unstable area, migration of cannula in and out of site), and chemical (irritation by medication or solutions).*

Signs & Symptoms:
* *redness, soreness, drainage at insertion site*
* *redness follows course of vein*
* *fever*
* *patient complains of burning sensations*

Nursing Action:
* *discontinue IV line*
* *restart in another site*
* *apply warm compresses*
* *notify physician (culture of drainage may be ordered)*

Prevention:
* *utilization of aseptic technique*
* *routine site observation*
* *routine dressing changes*
* *avoid joints and decrease cannula manipulation*
* *use large vein for irritating medications or solutions*

CIRCULATORY OVERLOAD

Definition: *Extreme administration of IV fluids particularly seen in elderly and infants caused by infusing too much fluid, infusing fluid too rapidly, or inaccurate monitoring of IV infusions.*

Signs & Symptoms:
* *increased blood pressure*
* *increased venous pressure (CVP)*
* *venous distention (jugular venous distention)*
* *increased respirations*
* *shortness of breath*
* *crackles*
* *discrepancies between intake and output*

Nursing Action:
* *decrease infusion to keep-vein-open rate*
* *raise head of bed or place in sitting position*
* *monitor vital signs*
* *notify physician*
* *administer oxygen if ordered*

Prevention:
* *monitor intake and output*
* *be alert to patient with cardiovascular history*
* *time tape all IV bags*
* *utilize infusion pump when needed*
* *frequently monitor infusion rates*

SYSTEMIC INFECTION

Definition: *Foreign proteins present in either the infusion solution or administration set which has the potential to cause fever.*

Signs & Symptoms:
* *abrupt temperature elevation*
* *tachycardia*
* *chills*
* *patient complaints of malaise*
* *hypotension*

Nursing Action:
* *notify physician*
* *change infusion site, solution, and administration set*
* *monitor vital signs*
* *save solution and administration set for culture*

Prevention:
* *utilization of aseptic technique*
* *maintain clean and dry insertion site*
* *check equipment expiration dates*
* *discontinue any solution after 24 hours*
* *change tubing per institutional policy*

SPEED SHOCK

Definition: *Reaction to infusion fluids containing drugs due to rapid administration or improper administration of bolus infusion.*

Signs & Symptoms:
* *flushed face*
* *headache*
* *chest tightness*
* *irregular pulse*
* *shock*
* *cardiac arrest*

Nursing Action:
* *discontinue drug infusion*
* *notify physician*
* *begin infusion of D5W at KVO*

Prevention:
* *be alert to transfusion recommendations made by medication manufacturers, pharmacy, or drug manuals*
* *monitor flow rates*

AIR EMBOLISM

Definition: *Entrance of air into systemic circulation caused by dry IV lines, large air bubbles in tubing, and loose connections.*

Signs and Symptoms:
* *hypotension*
* *loss of consciousness*
* *cyanosis*

* *weak rapid pulse*
* *rise in CVP*

Nursing Action:
* *position patient on left side with head down*
* *notify physician*
* *administer oxygen if ordered*

Prevention:
* *prime all tubing*
* *tape or Luer-Lok all connections*
* *change all containers prior to becoming empty*

Management of IV Therapy
Bibliography

IV Therapy Clinical Skill Builders, 1990.

Nenturich. Intravenous Therapy, 1990.

Nursing Life, Jan/Feb 1986.

Perry, A., Potter, P.: Clinical Nursing Skills and Techniques. The C.V. Mosby Company, 1990.

Preventing a peripheral IV infection. Nursing, June 1992.

Selecting the best IV site for your patient. Nursing, June 1991.

Starting IV's. Nursing, September 1992.