INTRAVENOUS CATHETERIZATION

PART 2
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Updated December 2006
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2007 Ontario Base Hospital Group
STARTING AN I.V
USE ASEPATIC TECHNIQUE
NO EXCEPTIONS
STARTING AN I.V

BE SAFE WITH SHARPS

NO EXCEPTIONS
Preparing IV Equipment
Equipment to start an IV
- gloves (plus other PPE as needed)
- IV bag
- IV tubing
- tourniquet
- IV catheter
- alcohol swab
- 2 x 2 dressing
- transparent dressing
- strips of tape (3-4) 4-6” long
- sharps container
IV attempts: start at a distal site

then attempt proximal
Veins of the Hand
1. Digital Dorsal veins
2. *Dorsal Metacarpal veins*
3. Dorsal venous network
4. *Cephalic vein*
5. Basilic vein

Veins of the Forearm
1. Cephalic vein
2. *Median Cubital vein*
3. Accessory Cephalic vein
4. Basilic vein
5. Cephalic vein
6. Median antebrachial vein
Selecting I.V. site - tourniquet on

- vein anatomy, size of vein
- valves (stay away from)
- movement
- pulsation
- hardness
- presence of shunts
- sites with infection
- previously used sites (injured, sclerotic)
- reason for I.V (T.K.V.O, fluid therapy, medication)
- again, attempt access in a distal to proximal fashion
Preparation of the vein(s)

- place arm in dependant position (below the heart)
- tourniquet to block venous return
- warm skin
- flexion arm and hand
- gentle palpation / tapping
Tourniquet application and getting veins up
I.V procedure

- patient communication
- site selection
- assemble equipment (gloves)
- tourniquet applied
- cleanse site
- check catheter for integrity
- stabilize vein puncture with bevel up
- observe for flashback in chamber
- advance catheter 2mm further (drop angle)

- pull stylet 1-2mm back
- advance catheter at shallow angle
- release tourniquet
- apply transparent dressing
- place 2x2 under hub
- connect I.V site
- assess patency and regulate drip rate
- secure I.V tubing and site
- label site with size of catheter, time, date, initials, length of catheter
- communicate with partner
Cleaning Site
Catheterization
Attaching I.V Set
Complications of IV Therapy: Local/Systemic

Potential complications

- infiltration, extravasation - local
- infection - local or systemic
- fluid overload - systemic
- catheter/air embolism - systemic
- “speed shock” (cold fluid into core) - systemic
- phlebitis (chemical, mechanical) - local
- vasospasm - local
Possible complications

Infiltration
- accumulation of fluid (I.V. or blood, or medication) in tissue
- S&S: white, puffy, hard, cool, pain,
- treatment: discontinue I.V., restart I.V. away from site, chart the incident, including what was done to treat it (e.g. cold pack)

Extravasation
- I.V fluid is flowing into surrounding tissue instead of vein because vein wall is punctured, broken or catheter is outside of vein
Infection

Infection at insertion site
- cause: contaminated site or equipment
- S&S: swelling and tenderness at site

Systemic infection (Sepsis) due to invasion of bacteria, virus, or fungus into bloodstream
- onset 1-2 days post I.V, fever, chills, shaking, malaise, tachycardia, hypotension
- cause: use of contaminated equipment or solutions, contamination at site of venipuncture
Infection
PHLEBITIS
NOT USUALLY SEEN IN SHORT TERM I.V THERAPY
INFLAMATION OF VEIN WITH/WITHOUT CLOT FORMATION

Mechanical
❖ occurs due to motion and pressure of catheter on the endothelial wall

Causes
❖ catheter too large for vein, movement of catheter within the vein

Chemical
❖ occurs when an irritating solution is introduced with a catheter that is too large for the vein
❖ the relative occlusion of blood flow prevents adequate hemodilution of the solution
Phlebitis
Hematoma
Infiltration
Tissue Sloughing
Fluid Overload

- causes: excess fluid administration, renal failure, cardiac failure
- S&S: headache, hypertension, coughing, dyspnea, pulmonary edema, restlessness, JVD
- treatment: slow I.V to TKVO, oxygen, elevate head
- document and notify receiving hospital
Air Embolism

Air Embolism

- air inadvertently enters the vasculature and heads through the right side of the heart to the pulmonary circuit and blocks a pulmonary vessel
- 10 ml air can seriously harm or kill a patient

Signs & Symptoms

- clear chest (or wheezing), coughing, sudden onset of SOB, chest pain, dizziness
- tests – ABGs, lung scan, pulmonary angiogram

Treatment

- administer O₂, put pt. in sitting position, IVC filter
- Or - place pt. on left side with head down trapping air in right atrium
- report to hospital staff stat and document incident
CATHETER EMBOLISM

Catheter Embolism

- piece of catheter breaks off entering blood stream
- will travel to right side of heart and most likely will become lodged in pulmonary capillary bed causing signs and symptoms of a pulmonary embolism

- tests: CXR
- risk of PE, CVA, MI

DON’T RE-THREAD THE NEEDLE THROUGH THE CATHETER WHEN YOU MISS ON INITIAL ATTEMPT(S)
Factors that affect flow

- catheter against valve
- catheter too large for vein
- vasospasm
- kinked tube
- I.V bag too low - i.e. height of bag
- elevated arm
- thrombosis
- flexion
- tourniquet inadvertently left on
- amount of fluid in bag low
- line taped to tight - circulation restricted
Saline Lock

- allows for venous access without I.V fluid set attached
- used for patients that need extricated
- if only medications needed: good alternative (e.g. seizure patient)
- prevents fluid overload

Limitations
- can be time consuming
- catheter can become occluded
Equipment for saline lock

- 10 cc syringe
- NaHCL 10 cc nebul/vial
- lock device (prn adaptor)
- tourniquet
- IV catheter
- alcohol swab
- 2 x 2 dressing
- transparent dressing
- strips of tape (3-4) 4-6” long
- sharps container
Blood Tubing

- if anticipated that patient will need blood administration, it is recommended that one line be started using blood tubing
- will not be primary I.V line due to time
- needed for preparation
- 2nd I.V. access alternative
Buretrol

- used for Dopamine administration and intravenous therapy for children
- chamber holds 150 ml and is measured in 1 ml increments
- may or may not be used locally

Priming a Buretrol

- ensure all protective caps in place (top valve open)
- close all roller clamps
- fill cylinder with 30 ml of fluid
- use OSCAR method
  - Open clamp
  - Squeeze drip chamber
  - Close
  - And
  - Release
- prime rest of line
- fill cylinder to 100 ml
- piggy back dopamine into another line
Note: Some Base Hospitals allow for a 250 ml bag of NS with microdrip tubing for pediatric patients rather than a Buretrol
Pediatrics Vascular Access

- preferred site is the largest most accessible vein (arm, leg, hand, foot, scalp)
- access is difficult as veins collapse during shock and arrest
- may be necessary to attempt a blind insertion based upon prediction of anatomic location of vein
- 2 person job
- immobilize site with board and cling
- beware of fluid overload
- use Buretrol or 250 cc bag with microdrip tubing
- if volume replacement needed use macro set

Note: Some Base Hospitals allow for a 250 ml bag of NS with microdrip tubing for pediatric patients rather than a Buretrol
When not to start an I.V.

- when transport is a higher priority
- when you “think” the hospital may want one

- AV fistula – avoid same arm!!
  - Arterio-venous shunt in a hemodialysis patient
  - Starting an IV on the same arm will jeopardize hemodialysis treatment

- Mastectomy – avoid same arm
  - Lymph nodes in the arm on the same side may have been removed as part of the cancer treatment – if IV fluid goes interstitial, it won’t reabsorb well
Fistulas and Shunts

- hemodialysis access in arm for patients with chronic renal failure
- limited life span, limited number of sites, preserve each site as long as possible
- fistula identifiable by palpating for a “thrill” over site

once again…

**DO NOT TAKE BLOOD PRESSURE OR PERFORM VENIPUNCTURE ON ARM WITH FISTULA**
BE SHARPS-SMART
Sharps and needlestick injuries

What to do if you have an injury

- NOTIFY SUPERVISOR IMMEDIATELY
- COMPLETE INCIDENT REPORT AND DOCUMENTATION
- COMPLETE ACR DOCUMENTATION (if appropriate)
- SEEK MEDICAL ATTENTION
NEEDLESTICK POLICY

Ask for local policy

BASE HOSPITAL MEDICAL DIRECTIVES

Ask for local Standing Orders / Medical Directives
Well Done!

OBHG Education Sub Committee
Self-directed Education Program