Specimen Collection – Special Puncture Collections

I. Collecting and Processing of Specimens
   A. Blood
      1. Special Puncture Collections

         Special Venipunctures

         Special Blood Drawing Techniques for Blood Cultures

         a. Reason for blood culture test – FUO (fever of unknown origin)
            bacteremia
            septicemia
            Usually ordered STAT or timed
            Usually in sets of 2 or 3, drawn either 30-60 min apart, or just before the
            patient’s highest temp
            If antibiotics are started, then specimens are drawn at same time from 2
            different sites (one serves as a control)
            A known skin contaminant must be cultured from 2 sites to be considered a
            pathogen
            Blood can also be drawn into a sterile yellow stopper vacuum tube and
            transferred
            Blood culture bottles contain anticoagulant (SPS) to prevent bacteria being
            trapped in clot

         b. Inoculation procedure
            1. butterfly and hub
            2. special vacuum culture bottle or yellow top tube
            3. double-needle collection hose and culture media bottle or tube
            4. NEVER TOUCH or HOLD bottle while inoculating
            5. Anaerobic bottle filled first
            6. Short sample – false negative

         c. Cleansing procedure
            1. 30 second scrub with surgical soap (or alcohol for 1 min)
            2. application of an iodine compound which is allowed to air dry, then with
               a circular motion, dry 1 minute
            3. alcohol scrub to remove iodine, circular scrub, let dry
               do not retouch with gloved finger
            4. prep blood culture bottles with iodine – follow manufactures
               instructions, remove iodine with alcohol
5. prep gloved finger with iodine for palpating site, false positive result
d. Maintenance of sterility
   1. circular scrub motion
   2. palpation of venipuncture site
   3. never use CVC line
   4. iodine prep gloved finger

Special Blood Drawing Techniques for Alcohol Tests

a. Cleansing procedure – use iodine or green soap
   – NEVER USE ALCOHOL

b. Processing procedure
   NEVER REMOVE STOPPER
   Chain of CUSTODY (COC)
   Patient ID and specimen collection done in presence of witness
   COC done also with drug screens, illegal drugs

Collection Priorities

a. Routine
   Usually drawn early am
   Can be drawn at regularly scheduled “run” during day

b. Timed
   2º pp – after meal or glucose dose (beverage)
   GTT
   3-day special diet
   Fasting, give glucose, 1, 2, 3 hr. usual
   Sometimes urines are also collected at the same times
   If fasting is elevated, GTT is discontinued
   blood cultures
   drug levels
   peak – 1-4 hour after dose (varies, depends on drug, method of
dose, etc.)
   trough – just before next dose
   hormone levels
   cortisol – 8 am then again at 8 pm (diurnal variation)
   aldosterone
   – recumbent position 30 minutes
   – plastic container
renin – activity

– 3 day special diet
– upright or supine
– peripheral vein

c. Special dietary precautions
   Fasting – 12 hr common
   Non-fasting effects –
   glucose (elevated)
   phosphorus (decreased)
   cholesterol (increased)
   triglycerides (increased)
   iron (increased)

d. STAT specimen
   drawn and analyzed immediately
   adhere to proper procedure for obtaining specimen

e. ASAP specimen
   not as urgent as STAT
   priority over routine specimen

f. Priority draw order
   1) STAT
   2) Timed/Fasting
   3) ASAP
   4) Routine

Emergency Situations

a. Stress
   sights and sounds of trauma
   profuse bleeding
   disfigurement
   moaning/groaning
   bedside emergency signal

b. Patient identification
   blood bank or emergency armband
c. Other emergency situations
   choking
   shock
   convulsions
   nausea
   vomiting
   suicide attempt — very emotional

d. Cardiac or respiratory arrest (“Code Blue”)
   phlebotomist’s role – get in, get specimen, and get out
   defibrillation procedures – step back while defibrillating

e. Operating room
   maintain sterility
   follow existing procedure

f. Recovery room
   not considered sterile
   patient condition
   identification procedure

g. Intensive care units
   patient condition – critical
   IVs
   casts/bandages
   central lines
   electrical instruments close to bed

**Other Difficult Blood Drawing Situations**

a. Burns
   limited area for venipuncture
   assessment for capillary puncture
   NEVER STICK BLINDLY

b. Obesity
   avoid excessive vein palpation
   assessment for capillary puncture
   NEVER STICK BLINDLY
c. Casts or dressing, amputee
   proceed as with burn patient
   check with institution policy

d. Tremors
   ask for assistance to prevent damage to vein

e. Unconscious or unresponsive patient
   seek assistance if appropriate
   verbal communication
   touching
   pain reflex

f. Children
   apprehensive
   ask parent to leave (?)
   seek assistance if appropriate
   explain procedure

g. Small, fragile, or superficial veins
   collapse easily
   butterfly technique preferable

h. Geriatric/elderly patients, emaciated patients
   rolling veins
   anchor veins well
   butterfly or syringe since veins are weak and fragile
   loss of sight, hearing, etc. – may need to be very attuned to this
   may have tremors – so may need help

i. Syncope
   1. release tourniquet
   2. withdraw needle
   3. apply pressure
   4. seek assistance – seek help while applying pressure,
      pull cord/push button, yell (?)
   5. instruct patient to place head between knees
j. **IVs, shunts, cannula, fistula, central lines and heparin locks**

**IVs**
- use other arm

**draw distal (below) IV site**
- sample drawn from arm with IV
  1. Ask nurse to turn off IV line
  2. Wait 2 minutes
  3. Apply tourniquet below IV site
  4. Select vein other than the one with IV line
  5. Draw 5 ml and discard
  6. Draw test sample
  7. Nurse restarts IV

**Fistulas and Cannulas**
- Dialysis or kidney transplant patient
  - **Fistula** – surgical passage between an artery and a vein which allows the dialysis unit to dialyze the patient
  - Should never be used for drawing blood
  - **Cannula** (shunt) – used to gain access to a vein; only specially trained personnel should access blood from a cannula

**VAD – Vascular Access Devices**
- **CVC - Central Venous Catheter** – may be inserted into:
  - subclavian vein
  - jugular vein
  - superior vena cava

**PICC** – peripherally inserted central catheter should not be used for blood collection may collapse during aspiration.
- **Implanted port** – special huber needles only
- **Heparin or saline lock** – inserted into a VAD for medication administration and blood collection; saves veins less trauma to patient

Blood specimens – only collected by nurse or specially trained person
  1. nursing vs. phlebotomist
  2. flush line clear of clots (two syringe technique)
  3. withdraw and discard three times the volume of fluid in line
  4. draw sample
  5. maintain sterility
phlebotomists role –
  ensure minimum 10 mL discarded before sample is obtained
  correct volume of specimen
  patient’s identification
  sample distribution
  identification of specimen
  mark source of sample on request form/computer

Special Specimen Handling Procedures
a. Cold agglutinin –
Cold agglutinins attach to RBCs when blood is cooled <37°C, so specimen must
  be kept warm until serum is separated from the cells

b. Chilled specimens – such as ABGs, ammonia, lactic acid, pyruvate, gastrin,
  glucagon, ACTH
  (CLSI/NCCLS recommends not to ice ABGs unless collected with Lactic acid)
  Prevents deterioration of specimen
  Use crushed ice (not cubes) to ensure uniform chilling

c. Protect from light –
  Light causes deterioration of bilirubin, beta-carotene, vitamins A and B₁₂,
  folate, and prophyrins
  Just wrap foil around specimen

Special Dermal Punctures
Bleeding Time – screening test only
a. Duke method - 3rd or 4th finger
  ear lobe – no longer used
  measure time from incision to cessation of bleeding
  difficult to standardize

b. Ivy method – volvar surface of the forearm
  length and depth of incision can be standardized with a commercial
  lancet (simplate device)
  aspirin or salicylate intake may falsely elevate results
General procedure –
1. explain procedure to patient
2. apply blood pressure cuff (40 mm Hg)
3. select site (free of surface veins, visible capillaries, scars, tattoos, and
   hair)
4. cleanse area with 70% isopropyl alcohol
5. make incision do not use pressure or indent skin
6. start stop watch
7. wick (absorb with special filter paper) blood drops every 30 seconds (do not wipe away the blood as this may disturb the platelet plug)
8. stop stopwatch when bleeding ceases (difference between two sites should not be greater than 30 seconds)
9. record time of last blood show on filter paper
10. normal = 1-6 minutes
11. deflate blood pressure cuff and apply butterfly bandage to minimize scarring

Note: bleeding beyond 15 minutes: stop test and report as “greater than 15 minutes”

c. Diagnostic Use
   preoperative screening test
   platelet defects

d. Interfering Factors
   aspirin – 7 to 10 day prior to testing
   antibiotic therapy
   other drugs and alcohol

Neonatal Bilirubin
   Neonate liver is immature, or hemolytic disease of newborn
   Protect from specimen light
   Turn off incubator light
   Wrap specimen in foil
   Avoid hemolysis (interferes)
   If bilirubin >18.0 mg/dL, then it will be transfused

Neonatal screening
   Most states require neonatal screening for PKU and hypothyroidism
   (both cause mental retardation)
   Fill circles on special absorbent filter paper

Blood smears for malaria
   Patients with malaria experience episodes of fever and chills, related to multiplication of parasites.
   Specimens are collected on emergent/timed basis
   EDTA blood or dermal puncture
Prepared as:
- thin smear (prepared as regular blood smear, spread on slide) or
- thick smear (large drop in center of slide, then spread out with wooden stick to size of dime)