central peninsula hospital 250 Hospital Place Soldotna, AK 99669	**POLICY TITLE:** Blood Culture Collection	**DEPARTMENT:** CPGH – Facility Wide **CATEGORY:** Laboratory Services **SECTION:** Microbiology
	POLICY NUMBER: CPGH.705.080	**EFFECTIVE DATE:** MARCH 2025 **Original Date of Policy:** 7/2011
	AUTHORIZED BY: Laboratory, Medical Director	**Revised:** 3/14, 8/15, 9/18, 5/19, 2/24, 6/24, 2/25 **Reviewed:** 10/12, 5/13, 11/16, 12/17, 12/19, 7/20, 7/21, 12/22, 5/23, 6/24, 3/25

APPLIES TO: Collection, transportation and handling of blood culture specimens.

RESPONSIBILITY: Laboratory and medical staff responsible for collecting Blood Cultures.

DEFINITIONS:

AER – Aerobic
ANA- Anaerobic
PED - Pediatric
SPS – Most common anticoagulant used in blood culture bottles. SPS anticoagulant that neutralizes lysozymes, inhibits phagocytosis, inactivates some aminoglycosides, and inhibits pars of the complement cascade; Increases the rate and speed of recovery of both Gram negative and Gram-positive organisms.
QNS – Quantity not sufficient.

PURPOSE: Guidelines for blood culture collection and transport.

PRINCIPLE: When specimens for blood culture are collected, additional procedures must be performed to maximize pathogen detection and minimize the risk of contamination. Protocols for following blood culture specimens should follow product manufacturer's instructions. Specimens should be collected prior to administration of antimicrobial agents whenever possible. Specimens for blood culture must be collected first in the order of draw, before any additional tubes, to prevent carryover of additives.

Blood Volume: The blood volume drawn for culture is the most important variable in detecting blood stream infections. The recommended volume for standard blood cultures is up to 20 mL per culture based on the patient's total blood volume with the volume collected based on the patient's weight. The blood volume collected is significantly related to the pathogen yield with greater pathogen yields obtained from higher blood volumes. Low blood volumes or "short draws" may result in false-negative results due to under-filled bottles.

Blood-to-Broth Ratio: Human blood naturally contains substances that inhibit microbial growth, including complements, lysozymes, phagocytes and antibodies. To reduce the concentration of these inhibitory factors in blood cultures, proper blood-to-broth ratios must be maintained. Failure to maintain these ratios may result in false-negative results from under-filled bottles. Manufacturer-specified minimum volumes for blood culture bottles indicate what volume of blood must be collected in each bottle to maintain the proper blood-to-broth ratio.

MATERIALS: BacT/ALERT bottles:

- BACT/ALERT FA plus (standard aerobic)
- BACT/ALERT FN plus (standard anaerobic)
- BACT/ALERT PF plus (pediatric)

Saf-T Holder or adapter
10 or 20 mL syringe

Butterfly or straight-needle collection device
Chlorahexidine scrub
Providone-Iodine scrub
Gauze pads
Alcohol prep pads
Bandage or medical tape
Biohazard bag
Tourniquet
Gloves and other appropriate PPE as applicable.
Biohazard waste sharps container

STORAGE: Store all bottles (un-inoculated or inoculated) at ambient temperature (15-30^{o}C). Un-inoculated bottles are stable at ambient temperature until the posted expiration date.
Do not pre-incubate, refrigerate or freeze bottles.

SPECIMEN:

Table 1. Specimen Parameters

Type	Whole blood in approved blood culture bottles.
Volume	**Refer to Attachment B for recommended weight-based maximum allowable blood draw volumes per draw or 24-hour period.**

Bottle type	Min. Vol.	Max. Vol.
Aerobic standard (FA Plus)	5 mL[a]	10 mL[c]
Anaerobic standard (FN Plus)	5 mL[b]	10 mL[c]
Pediatric (PF Plus)	N/A	See Attachment B

[a]If there is sufficient blood to fill one bottle only, fill the Aerobic bottle.
[b]Anaerobic bottles < 5mL may be accepted *if* accompanied by a standard Aerobic bottle containing at least 5 mL of blood.
[c]Collectors should attempt to fill up to the manufacturer Fill Line (10 mL) on standard AER/ANA bottles whenever possible.

Rejection Criteria	1. Expired bottles. 2. Damage bottles. 3. Bottles that have been refrigerated or frozen. 4. Bottles containing anticoagulants other than SPS. 5. Mislabeled specimens. 6. Non-validated blood culture bottle types. 7. Aerobic standard bottles containing <5 mL unless an acceptable recollect cannot be obtained or is medically contraindicated. 8. If the aerobic bottle of a set is underfilled <5 mL, reject both aerobic and anaerobic bottles as QNS unless an acceptable recollect cannot be obtained or is medically contraindicated.
Labeling	Required: 1. First & Last name 2. 2nd unique patient identifier (i.e. MRN and/or DOB) 3. Collector's initials 4. Time and date of collection 5. Source (i.e. Peripheral blood, Venous, Arterial, Port, Line, etc.)

	Label Placement: Place labels in the designated label area only. Do not obscure any barcode or volume measurement window on the bottle(s). See Attachment A.
Stability & Transport	For best results, transport inoculated bottles to the laboratory within **2 hours** of collection. Inoculated bottles are stable at ambient temperature up to 24 hours outside the BacT instrument. Do not refrigerate, freeze or pre-incubate bottles during transport.

PROCEDURE:

Table 4. Collection Methods

Central Line Collection (Provider order required)	1. Perform hand hygiene and put on clean gloves and any other necessary PPE. 2. Disinfect the top of each blood culture bottle with a 70% isopropyl alcohol pad. 3. Allow bottle tops to air dry for 1 minute. Do not blow on or fan the area. 4. Multi-lumen catheters: a. Stop and clamp all other infusions EXCEPT vasoactive medications. Do not stop infusions of vasoactive mediations. 5. Vigorously scrub the hub with Chlorahexidine scrub swab for at least 30 seconds. "Scrubbing the hub" each time before accessing a line can decrease the chance of CLABSI causing organisms entering the patient's bloodstream. 6. Allow hub to air dry for at least 30 seconds. Do not blow on or fan the area. 7. Remove Clear-link cap. 8. Collect a waste specimen according to current central line collection protocols. Refer to CPGH.902.140. a. If line contamination is suspected do not discard waste specimen –transfer to prepared blood culture bottles using a transfer device. b. If line contamination is not suspected, discard the waste specimen. 9. Continue collecting blood according to current central line collection protocols. Refer to Tables 1-3. 10. Gently invert bottles after collection to mix. 11. Perform post-collection central line maintenance per CPH protocol. 12. Remove gloves and perform hand hygiene.
Peripheral Collection (Venipuncture or IV Start)	1. Put on clean gloves and any other necessary PPE. 2. Disinfect the top of each blood culture bottle with 70 % isopropyl alcohol. 3. Let bottle tops air dry for 1 minute. Do not blow on or fan the caps. 4. Select a different site for each culture set to be collected. If two separate sites are not available, wait at least one minute between collections; repeat site preparation between collections. 5. Site preparation: Choose one of the following methods. i. **Chlorohexidine Swabstick** (*for use with patients without Chlorohexidine allergies*): 1. Scrub the site with friction using one side of the Chlorahexidine swabstick for 15 seconds with repeated back-and-forth strokes covering a 4 by 4 inch area.

	2. Turn the swab over and repeat scrubbing for at least 30 seconds total, ensuring that the site is completely wet with antiseptic. 3. Allow to air dry for 30 seconds. Do not touch, blow-dry or fan the area. **ii. Povoidone-Iodine Scrub Swabstick** (for use with patients with Chlorohexidine allergies). 1. Cleanse site with 70% alcohol for 30 seconds. 2. Allow site to air dry for 30 seconds. Do not touch, blow-dry or fan the area. 3. Scub the venipuncture site with friction beginning at the center of the site moving gradually outward in concentric circles to cleanse an area at least 4 inches in diameter. 4. Allow to air dry. Do not touch, blow-dry or fan the area. 5. After cleansing the site, avoid palpating the patient's vein. 6. Collect blood: Refer to Table 2 and Table 3. **i. Peripheral venipuncture:** Refer to CPGH.700.085 "Phlebotomy Collections". 1. To transfer blood in to bottles, directly attach the syringe to a female transfer device. 2. Ensure the blood culture bottles remain upright to avoid reflux and ensure the proper amount of blood is pulled into the bottle during transfer. 3. Select the aerobic bottle first and push the syringe down on to the grey stopper top to inoculate the bottle. 4. Allow the vacuum in the bottle to pull in the specimen. Fill the bottle to the appropriate volume (see Table 1 & 2) ensuring not to overfill the bottle. 5. Repeat with anaerobic bottle, if indicated. **ii. Peripheral IV-Start** (qualified medical staff only): Refer to CPGH.902.160 & CPGH.902.150. 1. Do not discard first specimen –transfer to prepared blood culture bottles beginning with the aerobic bottle first followed by an anaerobic bottle, if indicated. Refer to Table 2 & 3. 2. After the collection is complete, remove Povidone-Iodine (if used) from skin with 70% alcohol. 3. Apply bandage or gauze and tape over the site as needed. 4. Gently invert each bottle to mix.

REPORTING RESULTS: N/A

REFERENCE RANGES: N/A

QUALITY CONTROL:

- Inspect each blood culture bottle before use to ensure integrity of bottle and sensor on bottom of bottle is intact.
- Do not use expired bottles.
- Blood Culture contamination rates and blood-volume compliance are monitored monthly by the Microbiology Supervisor, and reported to nursing supervisors, phlebotomy supervisors, and Laboratory Administration. Collection personnel found to have two or more contaminated blood culture collections per calendar month must show documentation of remedial training

in blood culture collection techniques within 30 days for each month they are out of compliance.

CALIBRATION: N/A

MAINTENANCE: N/A

LIMITATIONS:

1. Whenever possible, blood cultures should be collected prior to administration of antibiotics.
2. Do NOT use Chlorohexidine products with care in premature infants or infants <2 months of age. This product may cause irritation or chemical burns.
3. Do not use Chlorascrub on patients with known allergies to chlorhexidine gluconate or isopropyl alcohol. Use Povidone-Iodine on these patients.
4. "Hard-stick" collections: Each phlebotomist has a limit of two attempts to obtain one blood culture set.
    a. If unable to collect a satisfactory sample after two attempts, a different phlebotomist or nursing staff member should attempt the collection, if available.
    b. If unable to collect a suitable specimen after multiple qualified staff have attempted the collection, or if a satisfactory specimen cannot be obtained by routine venipuncture, immediately notify the patient's attending healthcare provider or nurse that an acceptable specimen cannot be obtained and other collection methods should be considered. The attending medical provider will determine if further collection attempts are indicated.
5. All collections involving a line, IV, or arterial collection must be performed by authorized medical staff only.
6. Central line access may only be performed with an order from a medical provider.

REVISION RESPONSIBILITY: Microbiology Supervisor or designee

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Prevantics Chlorascrub Swabstick, PDI, Orangeburg, NY, package insert, www.pdipdi.com

UC Davis Health System; 30/30 Scrub the Hub, HUB Care, 'Blood Draw from Central Venous Line Process' Patient Care Standard XIII-27, policy 10/06.