PROGRAM Standard Operating Procedure – Laboratory Services	
Title: MIC34300 – Blood Product Culture	Policy Number:
Program Name: Laboratory Services	
Applicable Domain: Lab, DI and Pharmacy Services	
Additional Domain(s):	
Effective Date:	Next Review Date:
Issuing Authority: Director of Health Services	Date Approved:
Accreditation Canada Applicable Standard:	

GUIDING PRINCIPLE:
Occasionally blood, platelets and other transfusion products may become infected at the time of collection from donors, during processing or at the time of infusion into patients. Any organism isolated must be considered significant.

PURPOSE/RATIONALE:
To determine the presence or absence of bacterial organisms in transfusion products such as blood and platelets

SCOPE/APPLICABILITY:
This procedure applies to Medical Laboratory Technologists (MLTs) processing specimens for blood product culture.

SAMPLE INFORMATION:

Type	Transfusion products • Red blood cells • Platelets • Other product remaining after transfusion reaction
Source	Blood product bag/container
Stability	Transport remaining blood product to the laboratory immediately after transfusion reaction is detected
Storage Requirements	Refrigerated
Criteria for rejection	1. Improperly collected, labeled, transported, or handled specimens should be processed. SCM40110-Waiver of Responsibility form needs to be filled out by the responsible nurse

	2. Leaking specimens should be processed, but alert the physician of the possibility of contamination

NOTE: Blood products need to be processed as:

- Body fluid culture received in blood culture vials
  - CXFBC → Source → blood product
- Body fluid received in sterile container
  - CXFLD → Source → blood product

REAGENTS and/or MEDIA:

- Blood agar (BA), Chocolate agar (CHO), Brucella agar (BRU) and Thioglycollate broth (THIO)
- BACTEC Plus Aerobic/F culture bottles and BACTEC Lytic/10 Anaerobic/F culture bottles
- Identification reagents: catalase, oxidase, Staph latex test, Strep latex test, etc.

SUPPLIES:

- Alcohol pads
- Disposable inoculation needles
- Microscope slides
- Sterile red top vacutainer tube
- Anaerobic jar and pouch
- Wooden sticks

EQUIPMENT

- BD BACTEC FX
- Biosafety cabinet
- 35° ambient air and 35° CO_2 incubators
- Vitek 2 and supplies

SPECIAL SAFETY PRECAUTIONS:

Containment Level 2 facilities, equipment, and operational practices for work involving infectious or potential infectious materials or cultures.

- Ensure that appropriate hang hygiene practices be used.
- Lab gown must be worn when performing activities with potential pathogens.
- Gloves must be worn when direct skin contact with infected materials is unavoidable.
- Eye protection must be used when there is a known or potential risk of exposure of splashes.
- All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC).
- The use of needles, syringes and other sharp objects should be strictly limited.

All patient specimens are assumed to be potentially infectious. Routine Practices must be followed. Since viable micro-organisms are used, all cultures must be handled with appropriate precautions. All equipment in contact with cultures should be decontaminated by appropriate methods.

QUALITY CONTROL:

- Refer to Test Manual for reagent quality control procedures

PROCEDURE INSTRUCTIONS:

Step	Action
Processing specimens for blood product culture	
1	Perform all processing of blood products in the biosafety cabinet.
2	20 mL of blood product is needed for the inoculation of blood culture vials. If sufficient volume is received, proceed to step 3. If sufficient volume is not received, aseptically inject 10 to 20 mL of Thioglycollate broth into the blood product bag and mix.
3	On the aerobic and anaerobic blood culture vials place a mark at 10 mL above the level of the broth. Remove the caps from the blood culture vials and clean the septum with alcohol wipes.
4	Inspect the blood product bag and tubing and determine where the material will be taken from. Use an alcohol wipe to clean the area where the needle will be inserted.
5	Using a butterfly needle and a vacutainer barrel, aseptically insert the needle end into the blood product bag. Using the barrel, attach a blood culture bottle and allow to fill to the 10 mL mark. Repeat with the second bottle. Also collect a red top tube.
6	Remove the butterfly needle from the blood product and place a piece of tape over the hole. Place the blood product bag into a large biohazard bag and store in refrigerator until testing is complete.
7	In the biosafety cabinet, using a sterile pipette: • Place 1 to 2 drops of blood product onto BA, CHO and BRU. Add 2 to 5 drops into THIO broth • Streak for isolated growth using a disposable inoculation needle • Prepare smear by placing 1 to 2 drops of fluid on a clean microscope slide and spread out with an inoculation needle to form a thin smear
8	Incubate all media: • Place BA and CHO in the CO_2 incubator • Place BRU in anaerobic jar with anaerobic pouch and indicator as soon as possible after inoculation. Label jar with date of 48 hour read • Label THIO with day 2 date and day 5 date and place in the THIO rack in the O_2 incubator • Place red top tube in the O_2 incubator • Load BACTEC bottles onto the BACTEC instrument **NOTE:** Anaerobes should not be exposed to air for 42 to 48 hours after inoculation
10	Allow smear to dry and perform Gram Stain. Gram stain must be read before culture plates. Refer to MIC20115-Gram Stain Procedure.
11	Interpret blood product smears immediately. During the regular Microbiology lab hours of 08:00 to 20:00, turnaround time for these gram stains is <1 hour.
12	Immediately phone positive blood product gram stain results to ordering location and document in the LIS.

INTERPRETATION OF RESULTS:

Step	Action
1	Process blood culture vials as per MIC34000-Blood Culture.
2	Ensure growth on culture media correlates with gram stain results. If discordant results are found between the gram stain and growth: • Re-examine smear and culture plates • Check for anaerobic growth • Re-incubate media to resolve • May need to inoculate special selective media • Consider re-smearing or re-planting specimen
3	• Observe BA and CHO plates at 24 hours, 48 hours, and 72 hours
4	• Observe BRU and THIO after 48 hours • Re-incubate BRU and THIO for an additional 72 hours • If anaerobic growth is suspected, perform gram stain. If gram stain resembles growth on aerobic plates, further workup is not indicated. If growth does not resemble growth on aerobic plates, perform aerotolerance test. Refer to MIC53700-Aerotolerance Test
5	If growth is observed, perform biochemical testing to report preliminary ID of the isolate. Refer to the Microbiology Bacteriology Manual organism ID charts to guide work-up.
6	Provide genus and species identification as soon as possible. If a preliminary identification cannot be made after 24 hours, release a preliminary culture report using the gram stain morphology.

REPORTING INSTRUCTIONS:

IF	REPORT
No growth after 1 day	**PRELIM:** • Report: "**No Growth after 1 Day. Further report to follow"**
No aerobic growth after 3 days	**INTERIM:** • Report: **"No growth aerobically after 3 days"** • Report: **"@Anaerobic culture to follow"**
No anaerobic growth after 5 days	**FINAL:** • Report: **"No anaerobes isolated after 5 days"**
Any growth	• Report organism(s) identification • List quantitation as **"Isolated"** • Report susceptibility results as per ASTM • All growth is considered a critical result and needs to be phoned to the patient's location • Freeze isolate(s) and log into stored isolates log • Print a copy of the final report and deliver to the transfusion department to be added to the transfusion reaction work up

NOTE:

- Refer to Reportable Diseases – Public Health Act as of September 2009 for reporting to HPU1
- Refer to LQM70620-Laboratory Critical Results List-Microbiology for results that need to be phoned to ordering location
- Refer to MIC36100-Nosocomial Infection Notification Job Aid to determine if organism needs to be copied to Infection Prevention and Control
- Refer to MIC36200-Referral of Category A Specimens to APL for sending category A isolates to APL
- Refer to MIC36300-Referral of Category B Specimens to APL for sending isolates to APL
- Refer to MIC36400-Referral of Category B Specimens to DL for sending isolates to *Dyna*LIFE
- Refer to MIC36500-Referral of Category B Specimens to NML for sending isolates to NML

LIMITATIONS:

1. False-positive results may result from contamination of the blood product at time of performing the culture.
2. False-negative results may be caused by low numbers of organism or by the fastidious nature of the infective organism.

CROSS-REFERENCES:

- 17-02-V1: Specimens Containing Suspected Risk Group 3 Pathogens
- LQM70620-Laboratory Critical Results List-Microbiology
- MIC20115-Gram Stain Procedure
- MIC34000-Blood Culture
- MIC53700-Aerotolerance Test
- MIC36100-Nosocomial Infection Notification Job Aid
- MIC36200-Referral of Category A Specimens to APL
- MIC36300-Referral of Category B Specimens to APL
- MIC36400-Referral of Category B Specimens to *Dyna*LIFE
- MIC36500-Referral of Category B Specimens to *NML*
- SCM40110-Waiver of Responsibility

REFERENCES:

1. Leber, A. (2016). *Clinical microbiology procedures handbook.* (4thed.) Washington, D.C.: ASM Press
2. Jorgensen J.H., Pfaller M.A., Carroll K.C., Funke G., Landry M.L., Richter S.S., Warnock D.W. (2015). *Manual of Clinical Microbiology, 11th edition*. Washington, D.C: ASM Press

APPROVAL:

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Date

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REVISION HISTORY:

REVISION	DATE	Description of Change	REQUESTED BY
1.0	21 Mar 19	Initial Release	L. Steven
2.0	30 Jan 21	Procedure reviewed and added to NTHSSA policy template	L. Steven