Strong Memorial Hospital
University of Rochester Medical center
601 Elmwood Ave
Rochester, New York 14642

Document Title: BacT/ALERT System

Author	Effective Date	Supersedes Procedure #

Revised by	Date Revised	Effective Date
Susan Raub	08/02/12	08/06/12

Approval Signature	Approval Date
Dwight J. Hardy, PhD	8/3/2012

Distributed to	# of Copies	Distributed to	# of Copies
Positive Blood Culture station	1		

Strong Memorial Hospital
University of Rochester Medical center
601 Elmwood Ave
Rochester, New York 14642

CHANGE CONTROL FORM

Document Title:

1.Check one:

New procedure ☐	New process ☐	New form ☐	New flow chart ☐
Revised procedure x	Revised process ☐	Revised form ☐	Revised flow chart ☐
New job aid ☐	New labels ☐		
Revised job aid ☐	Revised label ☐		

2. Brief description of changes:
   - No longer reviewing HH Gram stained smears automatically, only on request;
   - Initial subculture of anaerobic non-BacTAlert bottles to include ana. CAP;
   - Clarify that blind subs held for *Brucella*/HACEK held for 3 days;
   - New ED telephone tree for reporting +BC on ED boarding/discharged pts.

3. S. O. P. validation needed? (Circle one) NO

4. Process validation needed? (Circle one) NO

5. Associated procedure and other documents (list those that need to be written or revised): None

6. Table of Content (TOC) update needed? NO

Author: Susan Raub Date: 8/2/12
Reviewed by: Susan Raub Date: 8/2/12
Approved by: Dwight J. Hardy, PhD Date: 8/3/2012

BacT/Alert System

I. BacT/Alert System

A. Principle and description of the system

The BacT/Alert (bioMerieux, Durham, NC) 3D Microbial Detection System is an automated, continuous monitoring system for detecting bacteria and yeast in blood.

The system consists of six incubation modules which incubate, agitate, and continuously monitor culture bottles for microbial growth directed by a Controller Module, and a processor for data processing. Two enriched broth media are currently being used; one intended for the culture of fastidious and nonfastidious aerobic bacteria and yeast (SA), the other for obligate anaerobic bacteria (SN). Both culture bottles contain 40 ml of media and are designed to accommodate a maximum of 10 ml of patient blood. On occasion, broth media with activated charcoal is received; one for fastidious and nonfastidious aerobic bacteria (FA) and one for obligate anaerobic bacteria (FN).

In the BacT/Alert system, patient blood is inoculated into a culture bottle at the patient location prior to transport to the lab. When received by the lab, each inoculated bottle is placed in one of the incubator-agitators where it is monitored every 10 minutes by a dedicated reflectometer. CO_2 generated during microbial growth diffuses across a semipermeable membrane into a sensor where it dissolves in water and produces hydrogen ions. As the concentration of hydrogen ions increases, the pH decreases, and the color of the sensor changes from teal grey to tan, which is detected as a change in reflected light. A growth curve for each culture bottle is computer generated by comparing initial concentrations of CO_2 to concentrations of CO_2 produced over time. When an increased rate of CO_2 production is observed or when the initial readings reflect a very high level of CO_2, the system automatically indicates that a positive culture has been detected. Conventional laboratory methods are then employed to identify the microorganisms and determine their antibiotic susceptibilities.

B. Activities according to shift

1. Day Shift

a. Record temperatures of BacT/Alert modules.

b. Check the back-up space available for the next back-up.

c. Check the Load Report for errors and correct as necessary.

d. Unload positive bottles from BacT/Alert and workup completely.

e. Process any positive bottles that are received from Highland Hospital.

f. Load new bottles.

g. Unload negative bottles and report in LIS computer, discard bottles.

h. Process any non-BacT/Alert bottles that are received and mark any Special Hold Bloods for future subculture.

2. Evening Shift

a. Load new bottles onto BacT/Alert system.

b. Work-up bottles which are flagged as positive prior to 10 pm according to protocol (section II). Also work-up positive bottles received from Highland Hospital.

3. Night shift

a. Load new bottles onto BacT/Alert system.

b. Work-up bottles which are flagged as positive according to protocol (section II) when a second checker is available.

c. If a checker is not available, pull positives, prepare and read Gram stain, and subculture to BAP and CAP. Save smears to be reviewed in the morning.

C. Specific Operation of BacT/Alert System

1. Recording temperatures of BacT/Alert modules

a. Click the Log Temperature Icon on the Observa screen and record the temperature of each of the 6 modules. Note that the thermometers are kept in the "off" position and must be turned "on" for the temperature to display. Return thermometer to "off" position before placing back in cabinet. The temperature range is 35.5 to 36.5°C. Make sure to adjust the thermometer temperature reading in accordance with any correction factors noted next to each thermometer.

1) If temperature is >0.5 degrees more or less than optimal temperature of 36.0°C, the instrument may need calibrating. Monitor temperature for 3 hours. If calibration is necessary, notify Tech V or Supervisor.

2) If >2°C from optimal temperature, discuss with Tech V or Supervisor immediately. Do not calibrate unless instructed to do so.

BacT/Alert System

2. Check the back-up space available on the Observa status screen.

   a. Data is backed up at the same time everyday by the Observa computer. Data is added to a DVD-RW disc. Disc should not be changed each day. The computer determines the amount of space available based on the size of the last back-up.

   b. Once a disc is full, a message will appear in red type on the Observa screen: "Room for 0 back-ups remaining." This is a reminder to change the disc. It does not mean the back-up has failed.

   c. Remove the full disc and place in a case labeled with the start and end dates. Do not label the actual disc.

   d. Insert a formatted disc.

   e. The message will not change on the Observa screen until the next back-up. Place a note on the Observa computer that the disc has been changed.

3. Check the Load Report for errors

   a. The Load Report prints each morning at 7am. It includes all bottles loaded since midnight the day before.

   b. Review Load Report for omissions and/or errors and make corrections. If you do not have time to make corrections, consult with a co-worker or supervisor. If demographic data is missing, correct by using the "Download Information Procedure" that transfers information from the LIS to the Observa computer.

4. LOAD BOTTLES - As soon as possible after arrival of blood cultures in the laboratory.

   a. The bar code label on the bottle will be used with the LIS accession bar code number to identify each bottle loaded. If the barcode on the bottle is not able to be scanned, apply a generic bar code.

   b. Compare the requisition, LIS stickers, and the labels on the bottles to be sure all information is accurate and logged in correctly

   c. Touch "Load bottles" indicator on the controller.

   d. Scan the bar code label on each bottle first (you will hear two beeps) followed by the LIS accession bar code (you will hear three beeps). The order in which you load the bottles is not important, but the order in which you scan bottle bar code and accession number is important. The bottle bar code must be scanned first, and the accession

number second. If the barcode is scanned into the wrong data field, an error message will appear on the Controller screen (#923 Invalid Barcode entry). Touch the X on the error screen and scan the correct barcode.

e. Insert bottle into any cell of an incubation module that is lit.

f. If using a generic bottle bar code, scan the generic bar code first, then wand the LIS accession bar code, toggle bottle type to the appropriate selection, then load into any cell of an incubation module that is lit.

5. UNLOAD POSITIVES

a. Touch the UNLOAD POSITIVES icon ("+") on the controller.

Locate and remove positive bottles that are indicated by a light next to the cell.

Pull positive worksheet from the LIS. If a mate was previously positive, retrieve previously printed worksheet from "Strong Positive Notebook" to document findings. These worksheets are used to document Gram stain results and are kept for 2 years.

b. Gram stain, subculture, and report positive cultures.

All manipulations of blood culture bottles are performed in a biological safety cabinet.

1) As soon as possible, remove bottles that are flagged as "positive" by the system. Vent and subculture all bottles to BAP and CAP, and prepare a smear for Gram stain.

2) Read Gram stained smears and confirm findings of all positive Gram stains with a checker or supervisor. On the evening shift, confirm with another technologist. If not possible on the night shift, leave the slides on the bench for review the following morning.

3) Record type of positive bottle(s), date positive, Gram stain results and review initials on the Positive Worksheet.

4) Report "positive" blood cultures by telephone and enter report into LIS computer along with the review person's initials, the person receiving the report with read back verification. Also add the appropriate subculture media. Print media labels for each positive bottle.

5) Subculture positive bottles to any additional media necessary according to Gram stain results (section II). Gram stains are kept for at least 1 month.

BacT/Alert System

6) False positive bottles are reloaded on the machine as soon as possible (Section I.C.10.). Anaerobic false positive bottles must be subcultured anaerobically as well as aerobically before reloading.

c. Gram stain procedure for FA and FN bottles

1) Gram stains from bottles with activated charcoal are difficult to read. The following procedures may make reading these smears easier.

2) Place one drop on one end of the slide. Allow the drop to rest for 10 seconds to allow the charcoal to settle.

3) Tilt the slide to allow a stream of the sample to separate from the charcoal. Spread the stream using an applicator stick.

4) An alternate procedure is to make a push smear as made for a differential slide in Hematology.

5) Read the slide in the area that has been spread.

6. Highland Hospital POSITIVE CULTURES

a. Bottles flagged as "positive" at Highland Hospital are Gram stained, subcultured, and reported in the LIS and to the patient location by the Highland Hospital Microbiology technologists. LIS reports are given a "preliminary" status.

b. Bottle(s), Gram stained slide(s), and subculture plates are sent to SMH for organism work-up. SMH Microbiology technologists review **the report and media received**, and update the status to "interim". **If requested by HH staff to review a smear, add the smear information into the LIS.**

c. Any discrepant Gram stain results are reported to the Highland Hospital Microbiology Lab. Any changes are entered into the LIS and called to the patient location by the Highland Hospital Microbiology Lab.

d. False positive bottles are Gram stained, subcultured, and the bottles(s) re-loaded at the Highland Hospital. Subculture plates and slides are sent to SMH **for documentation** and work-up. False positive cultures are finalized by the SMH positive blood technologist when the bottles are negative on the Highland Hospital BacT/Alert.

7. Utility of computer generated growth curves

BacT/Alert System

a. Routinely print a copy of the graph on false positive cultures, i.e. those flagged by the system but "no organisms seen" on two successive Gram stains. Attach a copy of the graph to the corresponding worksheet. Also note the WBC count on the graph. High WBC counts may account for a false positive reading due to the utilization of the substrate by the cells. Very suspicious graphs with normal WBC counts should be brought to a supervisor's attention.

b. If you are not absolutely certain the bottle is positive, subculture and reload.

c. Batches of "positive culture bottles", often from the same instrument and recognized within a short time span, may be "false positives". See #10 below.

8. UNLOAD NEGATIVES

a. Select Unload-Report on the Observa computer and wait for printing to finish before unloading any bottles.

b. Touch "-" icon on the controller.

c. Remove all flagged bottles with a negative test result from instruments (cell indicators light up for all cells containing bottles to be unloaded).

d. Open the Negative Bloods List on the LIS. Mark off all bloods that appear on the negative list from the BacT/Alert on that list and batch finalize as "No Growth". Any bottle numbers on the BacT/Alert list that are not on the LIS negative list should be given to the Positive Blood tech to result. Discard bottles; put aside any with colored dots on the top. Colored dots indicate a Special Hold blood that must be subcultured after removal from the machine, see #12 below.

9. Non-Blood BacT/Alert bottles – Inoculated at Patient Location

a. Prepare and Load bottles on BacT/Alert instrument as for blood cultures.

b. For source of joint fluid change length of incubation to 7 days. Scan bottle barcode into Controller. Touch bottle icon (bottle with clock), change default to 7 days, press checkmark. Touch accession icon (bottle with number). Scan accession barcode and load bottle.

c. Fluids and other non-blood bottles will have the suffix "0J", not "0Z". Sources should download appropriately from the LIS computer and should not need other changes.

d. Work-up and Reporting

BacT/Alert System

1) Negative cultures --- unload and sign out at 5 days (except joint fluids, sign out at 7 days). Manually result as "no growth". These bottles will not appear on the LIS Negative Blood List (because they are not bloods).

2) Positive cultures are worked up by appropriate Main Lab station.
The positive bottle(s) are transferred to the Main Lab.
If mate is negative, BacT/Alert person should notify the Main Lab station when complete.

10. Non-Blood BacT/Alert bottles – Inoculated at Set-up

a. Log on to Observa. Select Culture Data Entry, scan accession barcode. Select "Fluid" from Source drop-down menu. Select appropriate description from Site drop-down menu (knee, pleural, etc.). Save entries.

b. For source of joint fluid change length of incubation to 7 days. Scan bottle barcode into Controller. Touch bottle icon (bottle with clock), change default to 7 days, press checkmark. Touch accession icon (bottle with number). Scan accession barcode and load bottle. Note: The barcode will not contain the suffix "0J".

c. Work-up and Reporting, as in 9.d.

11. "False-positive" Blood Cultures

a. A culture is considered a "false-positive" when the BacT/Alert flags a bottle as positive and no organisms are seen on two successive Gram stains.

1) Print a copy of the corresponding graph to confirm "false-positive" status. Discuss with supervisor if graph appears consistent with a positive culture.

2) Note WBC value of patient on the graph or the positive worksheet.

3) After the BAP and CAP subculture (and anaerobic subculture for anaerobic bottles), bottles are reloaded as soon as possible. When reloading, make sure to scan ONLY the bottle bar code. The machine already knows its accession number.

4) If the accession number is scanned, the computer will replace the bottle barcode with the accession number and give an error code on the controller.

5) The computer will change the bottle's status from "positive" back to "negative to date."

6) Any bottle out of the instrument >48 hours can not be re-loaded. Place the bottle in the blood incubator and subculture on day 5. Hold plates for 48 hours.

b. If a bottle is flagged more than once by the BacT/Alert and no organisms are seen on Gram stain, print graph and discuss with supervisor.

c. Batches of "positive culture bottles", often from the same instrument and recognized within a short time span, may be "false positives". Review graphs before proceeding with work-up and discuss with supervisor or senior staff member as soon as possible. If convinced cultures are false-positives, reload ASAP without Gram stain and subculture. This occurs most often after the machine has been non-functional due to instrument malfunction or instrument service for an extended period of time.

12. ANONYMOUS BOTTLES

a. ANONYMOUS BOTTLE "?+" / "?*- " icons are located at the top middle right of the controller screen and will appear blue if a bottle(s) has been loaded on the machine without being scanned. Because the machine does not know the identity of the bottle, it automatically assigns a number beginning with "U" for "unknown" to keep track of the readings.

1) Select UNLOAD ANONYMOUS BOTTLES. The cells with anonymous bottles will light up.

2) Pull bottle(s) one at a time, scan the bottle bar code, then the accession bar code, and reload in the same cell if negative. If anonymous bottles are positive, scan and remove for work-up.

3) The anonymous bottle squares should turn grey and no further action should be necessary.

13. SPECIAL HOLD BOTTLES

a. Special Holds are asked for in such cases as culture-negative endocarditis and for the isolation of *Brucella* or HACEK organisms (*Haemophilus*, *Actinobacillus*, *Cardiobacterium*, *Eikenella*, and *Kingella*).

b. Special Hold Bottles are those bottles that are held on the BacT/Alert for 14 days and subcultured and Gram-stained after the completion of the 14 day incubation period to insure that very fastidious organisms are not present.

c. To initiate a Special Hold, doctors must write *Brucella* or HACEK on the order request or call the laboratory with the verbal request. We will process 3 aerobic bottles for special subculture. It is important to choose 3 representative bottles before

the date/time of any administration of antibiotics. If numerous bottles exist, choose one representative from each of three collection dates. Special Holds, *Brucella* and HACEK holds are noted as a special comment in the computer. As soon as we receive this request, the comment should be entered and the culture should be given an INTERIM status so that it appears on the "Positive Blood Worklist".

d. To change maximum test time in Observa, click "find accession". Enter the accession and click OK. Expand tree pane and click on the aerobic bottle. Change max test time from 5.0 days to 14.0 days, click Save.

e. While changing the test time, note the cell location for each bottle to be held.

f. In order to recognize these bottles as Special Holds, a colored "HOLD" sticker is placed on the top of each aerobic bottle to be held, and a label with the Order # is placed on the Special Hold Subculture List at the Positive Blood Station. Indicate the date of the 14 day subculture after each sticker and the media to be used.

g. Bottles are Gram-stained and subcultured by the BacT/Alert tech after 14 days onto Brucella Blood Agar and Chocolate Agar. Incubate plates for three days. Bottles are held in the Blood Incubator until plate incubation is complete. When culture is to be finalized, choose "No HACEK Organisms Isolated" or "No *Brucella* Isolated" from the keypad.

14. IMPORTANT DETAILS REGARDING THE OBSERVA COMPUTER:

When the computer is not in use, always return to the status screen. Observa will automatically log-off a user after 10 minutes of inactivity. However, being logged-on will not interfere with the interface.

a. DOWNLOADING INFORMATION from LIS to Observa:

1) Log onto Soft.
2) From the Main Menu, click Interface from the top toolbar or the left-hand tree, then Instrument Menu.
3) Highlight SMH BactiAlrt176 and click the 'Create Loadlist' button.
4) Choose 'All Orders' from the 'Way of Classifying Orders' section. Edit date and order number as needed. Remove the 'S' from the 'For Location Only' section. Click OK.
5) Highlight 'Bacterial Blood Culture' and click the 'Add' button. Click OK.
6) Highlight the order number to be downloaded, press the spacebar to mark it. Click the 'Download Selected Order(s)' button from the top toolbar (red arrow with a red checkmark in it). Information for that order will then be downloaded from the Interface to the LIS. Click the top 'X' to exit.

BacT/Alert System

b. Problems with the system

Never turn computer off unless instructed to do so by bioMerieux.

1) Any problem, error message, or unusual event should be brought to the attention of supervisor or Tech V. Do not attempt to solve problems for which you are not certain of the corrective action.

2) Consult BacT/Alert Owner's Manual and Trouble-shooting Guide. For an in-depth explanation of Error Codes, use BacT/Alert Controller manual.

3) If unable to solve problem or provide satisfactory explanation, call bioMerieux. Information such as software versions, customer and system numbers, and instrument serial numbers are found on the front of the problem log.

For computer and other system equipment problems, call:
Instrument Service 1-800-682-2666

Modem # is 585-275-8912 ... use only as instructed by bioMerieux. The modem for the Observa is connected at all times. bioMerieux customer service will explain how to initialize the software for the modem. If modem access is needed for the controller, the modem must be turned on using the small black box on top of the Controller cabinet.

II. Blood cultures in bottles other than BacT/Alert bottles:

A. Handling

1. Bottles, e.g., vacutainer bottles, may accompany a patient transferring from another hospital. Immediately call to the attention of the person responsible for blood cultures. **Enter the type of bottle(s) received as an order entry comment in the LIS.**

2. Print a bottle barcode label and affix it to the Special Hold Culture Subculture List so that the Positive Blood Tech is aware of the culture. Do not load bottles or enter information in the BacT/Alert system. Enter "@No growth to date" in the test field of the LIS and give the order an interim status. Order media.

B. Subculture

NOTE: All manipulations of blood culture bottles are performed in a biological safety cabinet.

1. Perform Gram stain if there is any reason to believe the culture is positive. Subculture onto appropriate media based on Gram stain results. If for any reason the culture is thought to be positive, subculture on appropriate media according to Gram stain results.

2. If culture less than 24 hours old, subculture to a CAP and reincubate bottle, **unless there is some reason to believe that the culture is positive. Anaerobic bottle should be cultured for anaerobes in the chamber (CAP), as well as aerobically.**

3. If culture is more than 24 hours old or there is suspicion that the culture is positive, Gram stain and plate (according to result of Gram stain) whether turbid or not. **Anaerobic bottle should be subcultured for anaerobes in the chamber (CAP), as well as aerobically.** If no growth is detected, incubate bottle for a total of four days, checking daily for increased turbidity, hemolysis, gas production, clumps of bacteria, or other changes. If the culture still appears negative at Day 5, subculture onto another CAP - (add anaerobic CAP if anaerobic bottle).

4. Hold all subculture plates 2 days before discarding them as "No Growth". **(Only *Brucella*/HACEK subcultures need to be held 3 days.)**

III. Work-up of "positive" cultures

A. Occasion for Gram Stain and Subculture

1. Bottles flagged as positive by the BacT/Alert system are treated as "positive" until proven otherwise and Gram stain all suspected positives as soon as possible.

   All manipulations of blood culture bottles are performed in a biological safety cabinet.

2. Aerobic and anaerobic bottles flagged as positive by the BacT/Alert system must be subcultured aerobically whether or not organisms are seen on Gram stain.

3. Anaerobic bottles flagged as positive by the BacT/Alert system which have no organisms seen are also subcultured anaerobically to a CAP.

4. Refer to section III.B.2 and III.B.3 for more detail regarding subculture of anaerobic bottles.

B. Subculture Based on Gram Stain/Bottle Findings

1. No organisms seen on Gram stain.

   a. If flagged by the BacT/Alert make a second Gram stain. If still "NOS", print graph and look up WBC count using the Lab site of the computer. Consult with supervisor if evidence of growth.

   b. Subculture to Blood and Chocolate agar and incubate at 36°C in CO_2 (plus an anaerobic CAP if anaerobic bottle is flagged).

BacT/Alert System

c. Reload into the BacT/Alert by scanning the bottle bar code label only. Enter "No Growth to Date" in the computer and make it an INTERIM so that this accession number will appear on the positive blood worklist.

1) If no growth at 48 hours, consider as negative to date.

2) If growth in 24 or 48 hours, repeat Gram stain of bottle.

a) If organisms are seen, work up as in positive Gram stain procedure.

b) If no organisms are seen, repeat subculture and consult supervisor.

2. Organism seen on Gram stain

a. Confirm Gram stain results with checker if possible. On those nights when a checker is not available, leave the positive blood worksheet and slides next to the set-up microscope for a technologist from the day shift to check.

b. Telephone appropriate person at patient location. When entering interim results into the LIS document review by checker, call and read back information.

c. Subculture aerobic and anaerobic bottles as follows, according to the morphology of organism seen on Gram stain.

1) Gram-positive cocci - note resembling streptococci or enterococci (chains), resembling staphylococci (clusters), or simply Gram-positive cocci (pairs).

Inoculate blood and chocolate plates and streak for isolation. Incubate at 36°C in CO_2.

2) Gram-negative diplococci

Inoculate blood, chocolate and MacConkey plates and streak for isolation. Incubate at 36°C in CO_2 incubator.

3) Gram-negative bacilli

Inoculate blood, chocolate and MacConkey plates and streak for isolation. Incubate plates at 36°C in CO_2 incubator.

If faint-staining, curved or S-shaped rods are seen, consider *Campylobacter*. Inoculate Chocolate and Brucella blood agar, streak for isolation and incubate plates

at 36°C in a ziplock bag inflated with Campy gas. (N.B.: *Campylobacter* may be more easily seen in underdecolorized fields on Gram stain.)

If Gram stain morphology from anaerobe bottle is consistent with *Fusobacterium* (longer, thin, pointed ends) subculture to KV, COL, LLA and incubate plates anaerobically.

4) Gram-positive bacilli

Aerobic bottle:
Inoculate blood and chocolate plates, streak for isolation and incubate in 36°C CO_2 incubator. Include an anaerobic CAP if organisms seen are "*P. acnes*-like".

May be reported as "Gram-positive bacilli consistent with *Propionibacterium* species" if typical Gram stain morphology and recognized as positive at ≥3 days.

Anaerobic bottle:
Inoculate aerobic media above.
Inoculate COL and CAP anaerobically if organisms seen are "*P. acnes*-like". All other Gram-positive bacilli are subcultured anaerobically to COL and LLA.

5) Mixed Gram-positive and Gram-negative organisms

Aerobic and Anaerobic bottle:
Inoculate BAP, CHOC, MAC, CNA. Incubate at 36°C in CO_2.

Anaerobic bottle:
NOTE: if Gram-negative bacilli morphology in anaerobic bottle is highly suspicious of *Fusobacterium sp.*, subculture to COL, KV and LLA and incubate those plates anaerobically.

Inoculate COL and LLA if Gram-positive cocci or Gram-negative bacilli are mixed with Gram-positive bacilli and incubate anaerobically.

6) Yeast and Mycelial growth

a) Inoculate Blood, Chocolate, CAN2 for isolation of yeast. Also inoculate SAB for susceptibility testing. If growth is clearly consistent with filamentous fungus, omit CAN2 and replace with IMA. Incubate fungal plates at 36°C in main lab non-CO_2 incubator; other plates are incubated at 36°C in CO_2.

b) Yeast - Look for obvious budding. Also note whether cells are oval (as in *Candida* species) or round (possible *Cryptococcus* species).

If oval, report as "Yeast".

If round, a Calcofluor stain or India Ink should be performed ASAP.

N.B. If the patient has had a recent isolate of *Cryptococcus* species from blood culture, a Calcofluor stain need not be performed.

Report:
If stain shows evidence of capsule, report:
"Encapsulated yeast consistent with *Cryptococcus* species"
Identification to follow

If stain shows no evidence of capsule, report:
"Yeast". Identification to follow.

c) Mold - When hyphal forms are seen, confirm with a mycologist and supervisor, if possible. Report "hyphal elements", "septate hyphae", or "aseptate hyphae" if clearly recognized.

3. Special Considerations for anaerobic bottles

a. All anaerobic bottles with Gram-positive bacilli or mixed with Gram-positive bacilli seen on Gram stain are plated anaerobically to pre-reduced anaerobic media in addition to aerobic culture media (section III.B.2.).

Gram + bacilli (Prop)	COL, CAP
Large Gram + bacilli	COL, LLA
Gram + bacilli mixed with other morphologies	COL, CNA, LLA

The person covering the BacT/Alert station is responsible for anaerobic subcultures when the anaerobe chamber is not staffed.

IV. Reporting

A. Telephone

When:

1. As soon as organisms are seen on Gram stain and the Gram stain results have been reviewed by a checker (if possible).

2. If no organisms are seen on Gram stain, yet organism(s) has been confirmed by repeat subculture.

BacT/Alert System

3. If there is a major discrepancy between the initial report and a subsequent report.

   N.B. If a mate bottle is positive on a culture previously reported as positive and has Gram stain morphology consistent with that of the other bottle - there is no need to telephone results. Document as a hidden comment in LIS that previous positive was called. However, if bottle is from a different site or different day, despite same Gram stain morphology, report must be telephoned to patient location.

Procedure:

1. ED

   Check patient location in LIS. If admitted, notify as for SMH in-patient. If not admitted, call (refer to Master Reporting Chart for telephone numbers) **for boarding and discharged patients**:

   a. ED **(including OBS2/2-1800)**

      Telephone tree is posted at BacT/Alert bench.

2. SMH and HH In-patients, Nursing Homes

   a. Call the patient location. Ask to speak with a physician or a nurse involved in the patient's care. If neither is available give the report to another member of the nursing staff.

3. MCH Patients

   a. Call MCH and ask for the appropriate patient location. Once transferred to the patient location, ask for Nurse Manager. If the Nurse Manager is not available, ask for the Charge Nurse or (last choice) page the Infection Control Office.

4. Clinics, Private Ambulatory, and Health Centers

   a. Notify the physician.

5. Discharged inpatients

   a. If deceased, neither telephone nor broadcast report is needed. Put interim report in LIS.

   b. Notify the attending physician. To find the name of the attending, query for the patient's most recent registration record in CIS.

BacT/Alert System

NOTE:

If possible, all Gram stain reports should be reviewed by a checker or supervisor before being called. If no supervisor/checker is available, leave worksheet and slide(s) on the Blood Station bench for review the following shift.

Name, including last name, of person notified must be recorded on the worksheet and in the LIS.

B. LIS Reporting

All organisms must be reported using appropriate mnemonics to insure that the information will be listed on all LIS generated lists and reports. When no organisms were seen but growth was present, one must re-Gram the bottle. If the organism is seen on the original or subsequent Gram stain, then the growth may be further identified and reported as a positive. If re-Gram of the bottle does not produce organisms, one must replate and only if growth appears on the replate should it be considered a true positive and reported!

The type of bottle is mentioned only in the initial Gram stain results. Later it is deleted from the growth report by the positive blood technologist.

It is of utmost importance to view the computer report to make sure that it is accurate.

1. Positive culture reporting procedure:

   Under appropriate bottle enter the date
   Choose Gram stain result
   Choose subculture media
   Enter "reader 1 and reader 2" data
   Enter "call" data with read back verify notation
   Go to the Isolate Field and enter the appropriate organism and qualifiers
   Make status "Interim"
   Print labels
   View for accuracy

2. Negative culture

   "No growth to date" is an automatic verified preliminary result for all blood cultures as soon as specimen is logged into the LIS.

3. Procedure for finalizing negative cultures

   If all bottles are negative, these will appear on the SBLD Worklist in SOFT. Mark all orders (using F5) that appear on the BacT/Alert negative list. Add "No Growth" test comment and

choose "F" for final result.

References:

1. Hardy DJ, BB Hulbert, and PC Migneault. Time to detection of positive BacT/Alert blood cultures and lack of need for routine subculture of 5- to 7-day negative cultures. J Clin Microbiol 1992;**30**:2743-2745.

2. Morris AJ, ML Wilson, S Merritt, and LB Reller. Rationale for selective use of anaerobic blood cultures. J Clin Microbiol 1993;**31**:2110-2113.

3. Reller LB, PR Murray, and JD MacLowry. 1982. *Cumitech 1A, Blood Culture II.* Coordinating ed., JA Washington II. American Society for Microbiology, Washington, D.C.

4. Thorpe TC, ML Wilson, JE Turner, JL DiGuisseppi, M Wilert, S Merrrett, and LB Reller. BacT/Alert: an automated colorimetric microbial detection system. J Clin Microbiol 1990;**28**:1608-1612.

5. Washington JA II and DM Ilstrup. Blood cultures: issues and controversies. Rev Infect Dis 1986;**8**:792-802.

Revised:	11/29/89
Revised:	09/01/91
Revised:	02/15/94
Reviewed:	07/08/99
Revised:	06/01/01
Revised:	10/20/02
Reviewed	06/30/03
Revised	01/06/04
Revised	01/05/05
Revised	02/03/05
Revised	10/11//05
Revised	08/08/06
Reviewed	08/06/07
Revised	08/04/08
Revised	08/03/09
Revised	08/05/10
Revised	08/03/11
Revised	08/02/12