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CEREBROSPINAL FLUIDS

Introduction

Bacterial meningitis is the result of infection of the meninges (lining around the brain).
This section includes central nervous system shunt fluid, fluid from Omaya reservoirs, external ventricular drainage fluid as well as routine CSF. The examination of CSF from patients suspected of having meningitis is always considered to be a STAT procedure.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

a) Direct Examination:
Gram stain: Spun or Unspun; 2 smears if the specimen is grossly bloody.

b) Culture:

Media		Incubation
Blood Agar (BA)	CO_2,	35°C x 48 hours
Chocolate Agar (CHOC)		CO_2, 35°C x 48 hours
Fastidious Anaerobic Broth (THIO)	O_2,	35°C x 7 days
If fungus or Cryptococcus is requested, **add**:		
Inhibitory Mould Agar (IMA)[1]	O_2,	28°C x 4 weeks
Esculin Base Medium (EBM)[1]	O_2,	28°C x 4 weeks
Brain Heart Infusion Agar with 5% Sheep Blood, Gentamicin, Chloramphenicol, Cyclohexamide (BHIM) [1]	O_2,	28°C x 4 weeks

[1]Forward inoculated fungal media to Mycology section for incubation and work-up.

B. Interpretation of Cultures:

Examine aerobic plates after 24 and 48 hours incubation and anaerobic plates after 48 hours. Examine THIO daily for 5 days for any growth. If no growth on the culture plates but evidence of growth in THIO, perform Gram stain and sub-culture onto Chocolate Agar, Brucella Agar & other media as appropriate and process as above.

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up.
Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

C. Susceptibility Testing:

Refer to.

Reporting

a) Gram stain: Report the presence or absence of organisms and WBCs. Do not quantitate.

b) Culture:

Negative Report: "No growth".

Positive Report:

- **Significant isolates:** *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa*, yeasts or other organisms if ≤3 different bacterial types.
  Report all significant isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- **>3 types non-significant isolates**
  Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes.

”Refer to Technical Manual for reporting.

Report results ASAP by telephone to the ward/ordering physician for the following:

- All positive and STAT Gram stains
- All Gram stain results for CAMH and Toronto Grace patients
- Positive cryptococcal antigen test
- All positive culture results (not seen on direct gram stain)
- Notify ICP also for all positive gram and culture. Isolate Notification Table

References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

3. QMP-LS Practice Guidelines – Cerebral Spinal Fluid

4. Abdulmassih, R., Makadia, J., Como, J., Paulson, M., Min, Z., & Bhanot, N. (2016, December). Propionibacterium acnes: Time-to-Positivity in Standard Bacterial Culture From Different Anatomical Sites. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/27829959

5. Shannon, S., Mandrekar, J., Gustafson, D., Rucinski, S., Dailey, A., Segner, R., . . . Patel, R. (2013, February). Anaerobic thioglycolate broth culture for recovery of Propionibacterium acnes from shoulder tissue and fluid specimens. Retrieved July 27, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3553932/

6. Schwotzer, N., Wahl, P., Fracheboud, D., Gautier, E., & Chuard, C. (2014, January). Optimal culture incubation time in orthopedic device-associated infections: A retrospective analysis of prolonged 14-day incubation. Retrieved July 27, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3911454/

OTHER STERILE FLUIDS

Introduction

Pleural (Thoracentesis/ Empyema) Fluids:
Infection of the pleural space may result in severe morbidity and mortality. Therefore rapid and accurate microbiological assessment is required. Any organism found in pleural fluid must be considered significant (although specimen contamination may occur during collection).

Peritoneal and Ascites Fluids:
Peritonitis may be classified as primary (spontaneous), secondary or tertiary. Primary peritonitis usually occurs in someone with pre-existing ascites (e.g. patients with chronic liver disease) in which there has been no entry into the abdominal cavity. Secondary and tertiary peritonitis occur after surgery or trauma to the abdomen. Although enteric Gram negative organisms are the most common isolates associated with these types of infections, polymicrobial infection is common with a mixture of both Gram positives and negatives including anaerobes.

Synovial (Joint) & Pericardial Fluids:
These are normally sterile fluids. Infection of these fluids may be due to a variety of different organisms as a result of direct infection, contamination at the time of surgery/trauma or hematogenous spread.

Amniotic Fluids:
Amniotic fluid is that fluid which surrounds the developing fetus in utero. As with other normally sterile fluids, infection of the amniotic fluid may result in severe morbidity and mortality to the mother and fetus. Any organism isolated must be considered significant (although contamination may occur during collection).

Other Fluids:
Infection of normally sterile body fluids may result in severe morbidity and mortality. Any organism isolated must be considered significant (although specimen contamination may occur during collection). Specimens include tympanocentesis fluid, intraocular fluid, hydrocele fluid, cyst fluid, etc.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

a) Direct Examination:

Gram stain: Spun or Unspun

Fungi-fluor stain: If fungus is requested - with sediment of the spun specimen

b) Culture:

Media	**Incubation**
Blood Agar (BA)	CO_2, 35°C x 2 days
Chocolate Agar (CHOC)	CO_2, 35°C x 2 days
Fastidious Anaerobic Agar (BRUC)	AnO_2, 35°C x 48 hours
Kanamycin/Vancomycin Agar (KV)[2]	AnO_2, 35°C x 48 hours
For sterile fluids other than Peritoneal (Ascites) fluid:	
Fastidious Anaerobic Broth (THIO)	O_2, 35°C x 7 days
For Peritoneal and Ascites fluid:	
Blood Culture bottles (FA and FN)	BacT/Alert 35°C x 5 days
If fungus is requested, **add**:	
Inhibitory Mould Agar (IMA) [1]	O_2, 28°C x 3 weeks
Esculin Base Medium (EBM) [1]	O_2, 28°C x 3 weeks

[1]Forward inoculated fungal media to the Mycology section for incubation and work-up.
[2] Not required for any Eye fluids or Tympanocentesis specimens

B. Interpretation of Cultures:

Examine aerobic plates after 24 and 48 hours incubation and anaerobic plates after 48 hours. Examine THIO daily for 5 days for any growth. If no growth on the culture plates but evidence of growth in THIO, perform Gram stain and sub-culture onto Chocolate Agar, Brucella Agar & other media as appropriate and process as above.

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up. Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

For Peritoneal (Ascites) Fluid in blood culture bottles, follow Blood Culture Manualinstructions.

C. Susceptibility Testing:

Refer to.

Reporting

a) Direct Examination:

Gram stain: Report the presence or absence of organisms and WBCs. Do not quantitate.

Fungi-fluor Stain: Refer to

b) Culture:

Negative Report: "No growth".

Positive Report:

- **Significant isolates** - *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa,* yeasts or other organisms ≤3 different bacterial types
  Report all isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- For bone and joint fluids specimens, report organisms to the species level. If not identified in lab, send to PHOL for species ID.
- **>3 types non-significant isolates**
  Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes."

Telephone results of a positive Gram stain and all positive cultures to the ward / ordering physician.

References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

PERITONEAL DIALYSIS EFFLUENT

Introduction

Dialysis solution is infused into the patient's abdominal cavity through a permanently implanted tube. The solution remains there for several hours, picking up waste from the blood stream. The dialysis solution may become infected while in the patient's abdomen or from external contamination due to the tubing which enters the patient's abdominal cavity. A variety of both Gram negative and positive organisms may infect the dialysis solution.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

NB: No more than one dialysis fluid per patient should be processed every other day. If a bag of cloudy fluid is received after a clean one is processed, culture and sensitivity is always done.

a) Direct Examination:

If specimen is cloudy: Gram stain
If specimen is clear: No Gram stain is needed

b) Culture:

Media	Incubation

If specimen is clear:

Bact/Alert bottles*	Processed as per Blood Culture protocol

Media	**Incubation**
If specimen is cloudy:	
Blood Agar (BA)	CO_2, 35°C x 2 days
Chocolate Agar (CHOC)	CO_2, 35°C x 2 days
MacConkey Agar (MAC)	CO_2, 35°C x 2 days
BacT/Alert bottles	Processed as per Blood Culture protocol

B. Interpretation of Cultures:

Examine aerobic plates for growth after 24 and 48 hours incubation.

For Dialysis fluid in blood culture bottles, follow theBlood Culture Manual.

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up. Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

C. Susceptibility Testing:

Refer to.

Reporting

a) Direct Examination:

Gram stain: Report the presence or absence of organisms and WBCs. Do not quantitate.

b) Culture:

Negative Report: "No growth"

Positive Report:

- **Significant isolates** - *S. aureus,* β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa,* yeasts or other organisms ≤3 different bacterial types
  Report all isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- **>3 types non-significant isolates** – Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes."

Telephone all positive Gram stain and culture results to ward/ordering physician.

When out-patient units are closed, page the Nephrology Fellow/Resident with the Gram stain and/or culture results.

References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

PREDIALYSIS FLUID

Introduction

This is fluid collected prior to dialysis and should normally be sterile.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

a) Direct Examination:

If specimen is cloudy: Gram stain
If specimen is clear: No Gram stain is needed.

b) Culture:

Media	Incubation
If specimen is clear:	
Fastidious Anaerobic Broth (THIO)	O_2, 35°C x 5 days
If specimen is cloudy:	
Blood Agar (BA)	CO_2, 35°C x 2 days
Chocolate Agar (CHOC)	CO_2, 35°C x 2 days
Fastidious Anaerobic Broth (THIO)	O_2, 35°C x 7 days

A. Interpretation of Cultures:

Examine aerobic plates after 24 and 48 hours incubation. Examine THIO daily for 5 days for any growth. If no growth on the culture plates but evidence of growth in THIO, perform Gram stain and sub-culture onto Chocolate Agar, Brucella Agar & other media as appropriate and process as above

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up. Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

C. Susceptibility Testing:

Refer to

Reporting

a) Direct Examination:

Gram stain: Report the presence or absence of organisms. Do not quantitate.

b) Culture:

Negative report: "No growth"

Positive report:

- **Significant isolates** - *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa*, yeasts or other organisms ≤3 different bacterial types
  Report all isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- **>3 types non-significant isolates** – Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes."

Telephone all positive Gram stain and culture results to ward/ordering physician.

When outpatient units are closed, page the Nephrology Fellow/Resident with the Gram stain and/or culture results.

References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

BONE MARROW (ASPIRATES OR BIOPSIES)

Introduction

Infection of bone marrow is uncommon. However, it may be a site of infection with fungus or tuberculosis in patients with disseminated disease.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

a) Direct Examination:

Gram stain: Direct
Fungi-fluor stain: If fungus is requested

b) Culture:

Media	Incubation
Blood Agar (BA)	CO_2, 35°C x 2 days
Chocolate Agar (CHOC)	CO_2, 35°C x 2 days
Fastidious Anaerobic Agar (BRUC)	AnO_2, 35°C x 48 hours
Kanamycin / Vancomycin Agar (KV)	AnO_2, 35°C x 48 hours
Fastidous Anaerobic Broth (THIO)	O_2, 35°C x 7 days
Inhibitory Mould Agar (IMA)[1]	O_2, 28°C x 4 weeks
Esculin Base Medium (EBM)[1]	O_2, 28°C x 4 weeks

Blood Egg Albumin Agar (BEAA)[1]	O_2, 28°C x 4 weeks

[1]Forward inoculated fungal media to the Mycology Section for incubation and work-up. If bone marrow received in BacT/Alert bottle(s), process as a routine blood culture. Do **NOT** inoculate BacT/Alert bottle(s) in the lab. (Refer to theBlood Culture Manual).

A. Processing of Cultures:

Examine aerobic plates after 24 and 48 hours incubation and anaerobic plates after 48 hours. Examine THIO daily for 5 days for any growth. If no growth on the culture plates but evidence of growth in THIO, perform Gram stain and sub-culture onto Chocolate Agar, Brucella Agar & other media as appropriate and process as above.

If bone marrow received in BacT/Alert bottle(s), process as per Blood Culture Manual.

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up. Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

B. Susceptibility Testing:

Refer to

Reporting

a) Direct Examination

Gram stain: Report the presence or absence of organisms.

Fungi-fluor Stain: Refer to

b) Culture:

Negative Report: "No growth"

Positive Report:

- **Significant isolates** - *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa,* yeasts or other organisms ≤3 different bacterial types
  Report all isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- **>3 types non-significant isolates** – Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes."

Call all positive Gram stains and cultures to ward/ordering physician.

References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

BLOOD, PLATELETS, & OTHER TRANSFUSION PRODUCTS

Introduction

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.

Specimen Collection and Transport

See Pre-analytical Procedure - Specimen Collection QPCMI02001

Reagents / Materials / Media

See Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001

Procedure

A. Processing of Specimens:

See Specimen Processing Procedure

a) Direct Examination:

Gram Stain: Direct

b) Culture:

Media	Incubation
Blood Agar (BA)	CO_2, 35°C x 2 days
Chocolate Agar (CHOC)	CO_2, 35°C x 2 days
FAN Aerobic Blood Culture bottle (FO2)	in BacT/Alert 35°C x 5 days
FAN Anaerobic Blood Culture bottle (FN)	in BacT/Alert 35°C x 5 days

A. Processing of Cultures:

Examine aerobic plates after 24 and 48 hours incubation.

If bone marrow received in BacT/Alert bottle(s), process as perBlood Culture Manual.

Any growth of *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa* and yeasts are significant; work up. Other organisms will be worked up only if there are ≤3 different bacterial types. Otherwise (>3 types), simply list the species/morphotypes.

B. Susceptibility Testing:

Refer to

Reporting

a) Direct Examination

Gram stain: Report the presence or absence of organisms.

b) Culture:

Negative Report: No growth

Positive Report:

- **Significant isolates** - *S. aureus*, β-haemolytic streptococci, *Streptococcus anginosus* group, P*seudomonas aeruginosa*, yeasts or other organisms ≤3 different bacterial types
  Report all isolates (do not quantitate) with appropriate susceptibilities.
  If it is detected from the fluid medium only – add ISOLATE Comment \FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely"

- **>3 types non-significant isolates** – Report as TEST COMMENT – "Mixed growth of …….list species/morphotypes."

Telephone results of all positive Gram stains and cultures to ward / ordering physician and Blood Bank
UHN Blood Bank (TG, TW, PMH) call 14-3440
MSH Blood Bank call ext 4502
For other hospitals, please call the respective main information for the telephone number.

I. References

1. P.R. Murray, E.J. Baron, M.A. Pfaller, R.H. Yolken. 2003. Manual of Clinical Microbiology, 8th ed. ASM Press, Washington, D.C.

2. H.D. Izenberg. 2003. Blood Cultures-General Detection and Interpretation, p.3.4.1.1-3.4.1.19 In Clinical Microbiology Procedures Handbook, 2nd ed. Vol.1 ASM Press, Washington, D.C.

3. CCDR Guidelines for Investigation of Suspected Transfusion Transmitted Bacterial Contamination.pdf

For Cryptococcal Antigen procedure see:

"Cryptococcal Antigen"

Record of Edited Revisions

Manual Section Name: Sterile Fluids Culture Manual

Page Number / Item	Date of Revision	Signature of Approval
Annual Review	May 12, 2003	Dr. T. Mazzulli
Annual Review	May 26, 2004	Dr. T. Mazzulli
Specimen Collection moved to Pre-analytical Procedure - Specimen Collection QPCMI02001	April 6, 2005	Dr. T. Mazzulli
Reagents/Materials moved to Analytical Process - Bacteriology Reagents/Materials/Media List QPCMI10001	April 6, 2005	Dr. T. Mazzulli
Specimen processing moved to Specimen Processing Procedure QPCMI06003 – clarification on processing.	April 6, 2005	Dr. T. Mazzulli
Cryptococcal Antigen moved to Technical Manual Cryptococcal Antigen	April 6, 2005	Dr. T. Mazzulli
Page 3 MacConkey reomoved from CSF	April 6, 2005	Dr. T. Mazzulli
Page 3 Modify qualifier for Isolate Comment “from fluid medium only”.	April 6, 2005	Dr. T. Mazzulli
Handling of swabs received for sterile body fluids in Specimen Processing Procedure QPCMI06003	April 6, 2005	Dr. T. Mazzulli
Aerobic plates and THIO incubation – change to up to 4 days	April 6, 2005	Dr. T. Mazzulli
Annual Review	April 6, 2005	Dr. T. Mazzulli
Annual Review	July 23, 2006	Dr. T. Mazzulli
Annual Review	August 13, 2007	Dr. T. Mazzulli
Annual Review	August 15, 2008	Dr. T. Mazzulli
THIO incubation – change to up to 5 days	July 27, 2009	Dr. T. Mazzulli
Annual Review	July 27, 2009	Dr. T. Mazzulli
Annual Review	July 27, 2010	Dr. T. Mazzulli
Annual Review	July 27, 2011	Dr. T. Mazzulli
Added phoning to Blood Bank for all positives platelets and transfusion products	January 18, 2012	Dr. T. Mazzulli
Removed culturing blood product segments	January 18, 2012	Dr. T. Mazzulli
Annual Review	January 18, 2012	Dr. T. Mazzulli
Added mixed growth comments	September 24, 2012	Dr. T. Mazzulli
Change aerobic plate incubation from 4 days to 2 days	September 24, 2012	Dr. T. Mazzulli

Page Number / Item	Date of Revision	Signature of Approval
Annual Review	May 31, 2013	Dr. T. Mazzulli
Peritoneal/Ascites Fluid – change THIO to blood culture bottles	April 16, 2014	Dr. T. Mazzulli
Annual Review	April 16, 2014	Dr. T. Mazzulli
Proper Header and Footer formatting	July 24, 2014	Dr. T. Mazzulli
Update media for CSF (Add BHIM)	March 5, 2015	Dr. T. Mazzulli
Remove TRI and Bridgepoint from calling gram results (not positives) p. 3	April 30, 2015	Dr. T. Mazzulli
Added examine KV on 48hrs p.7 "other sterile fluids"	April 30, 2015	Dr. T. Mazzulli
Remove MAC/BRUC/KV from Pre dialysis fluids p. 13	April 30, 2015	Dr. T. Mazzulli
Annual Review	April 30, 2015	Dr. T. Mazzulli
Updated Procedure section for Direct examination and Culturing of Blood, Platelets, & Other Transfusion Products	May 26, 2015	Dr. T. Mazzulli
Joint fluid section: added in report "For bone and joint fluids specimens, report organisms to the species level. If not identified in lab, send to PHOL."	January 7, 2016	Dr. T. Mazzulli
Annual Review Replaced Calcuflour stain for fungus with Fungi-fluor stain (if fungus is requested) - with sediment of the spun specimen Updated MSH logo in header Formatting changes For (>3 types), simply list the morphotypes, changed to species/morphotypes	April 25, 2017	Dr. T. Mazzulli
Isolate broth comment modified from "From broth culture only, indicative of small numbers or contamination. To "\FLDM "From broth culture only, indicative of small numbers or contamination. Repeat positive results from more than one specimen suggest contamination is unlikely	October 3, 2017	Dr. T. Mazzulli
Annual Review	April 25, 2018	Dr. T. Mazzulli
Minor format change	September 14, 2018	Dr. T. Mazzulli
Annual Review	May 25, 2019	Dr. T. Mazzulli

Page Number / Item	Date of Revision	Signature of Approval
Annual Review Changed Fastidious Anaerobic Broth (THIO) incubation time from 5 days to 7 days for all samples	July 26, 2020	Dr. T. Mazzulli

Full document review included in all updates. Bi-annual review conducted when no revision had been made within 2 years.

Page Number / Item	Date of Revision	Edited by:
Minor formatting change	April 11, 2021	Jessica Bourke
Quantitation wording change	July 8, 2021	Wayne Chiu