

Cultures/Procedures

AEROBIC CULTURE

Routine culture and routine aerobic culture are synonymous terms. Aerobic culture attempts to identify bacteria which grow in the presence of oxygen and are associated with potential infection at the affected site.

ANAEROBIC CULTURE

Anaerobic culture attempts to identify bacteria which cannot grow in the presence of oxygen and are associated with potential infection at the affected site. Aerobic cultures and Gram stains are also done on all samples submitted for anaerobic culture.

Anaerobic culture can be performed on tissues, fluids and aspirates.

Indications for anaerobic culture are:

- a) Deep abscess of soft tissue.
- b) Exudate in patients with peritonitis or empyema.
- c) Transtracheal aspirate samples.
- d) Soft tissue trauma wounds with a foul odour.
- e) Actinomycosis lesions in tissue with characteristic sulphur granules.

There is no diagnostic value to anaerobic cultures from:

- a) Skin or mucosal surfaces or superficial wounds.
- b) Contaminated but not inflamed tissue.

ANTIMICROBIAL SUSCEPTIBILITY TESTING

CLSI standardized susceptibilities are performed when clinically indicated or when specifically requested by a physician.

BLOOD CULTURE

Blood cultures are indicated for any patient suspected of having bacterial sepsis including patients with:

- a) A sudden increase in temperature, especially if this is associated with rigor, chills, prostration or a change in sensorium and an increase in pulse rate.
- b) A prolonged mild intermittent fever in association with a heart murmur.
- c) Suspected bacterial or fungal sepsis with the exceptions of minor mucocutaneous infections and uncomplicated urinary tract infections.
- d) Multisystem infections such as enteric fever (typhoid), leptospirosis or Brucellosis (Undulant Fever).

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CHLAMYDIA

Chlamydia trachomatis is detected in endocervix and urethra swabs or first catch urine samples using a Nucleic Acid Amplification Test (NAAT). The test is performed at Provincial Laboratory Edmonton. This assay detects viable and non-viable organisms. Conjunctival scrapings for chlamydial inclusions are examined in the Cytology Lab, DTHR-Red Deer. All other samples are submitted to Provincial Lab.

Chlamydia psittaci is the agent of psittacosis and ornithosis. Human psittacosis is a zoonosis contracted by exposure to discharges of various avian species, causing a respiratory or systemic disease. Serology samples are submitted to Provincial Lab.

Chlamydia pneumoniae was initially called Chlamydia TWAR strain. Recent data suggests it to be a common cause of community acquired atypical pneumonia and pharyngitis. Serology samples are submitted to Provincial Lab.

CLOSTRIDIUM DIFFICILE

Clostridium difficile infection (CDI) is a leading cause of health-care associated diarrhea in Canada (usually antibiotic –associated) and has been associated with significant outbreaks in hospitals. Investigation of CDI is indicated for patients who have been on antimicrobial agents within the past 2-3 months, and who have persistent (3 or more unformed or watery stools in a 24 hr. period) or who have evidence of pseudomembranous colitis from colonoscopy, or chronic diarrhea that is unexplained by other investigations. Children less than one year are often colonized and should not be tested.

Laboratory investigation is performed by an immunoassay test that detects both a common antigen in *C. difficile* and the presence of the toxins responsible for the diarrhea. Stool samples that are positive for the antigen but negative for toxin are referred for PCR testing for the presence of the toxin genes.

COLONY COUNT

Bacterial pathogens are quantitated and expressed as the number of organisms per liter. A colony count is performed on urine samples. A quantitative culture may be ordered by special request on fluid samples including bronchial alveolar lavages (BAL). A colony count cannot be performed on swabs, tissue, bone or feces.

EAR CULTURE

Chronic ear infections are often caused by anaerobic bacteria. Aspirated fluid is the recommended specimen for anaerobic culture.

FECES CULTURE

Feces is cultured for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, *Vibrio*, *Plesiomonas*, *Aeromonas* and Shiga toxin producing *Escherichia coli* (including 0157 and non – 0157). Culture for organisms which cause food poisoning is performed if information is provided in patient history.

Collect feces before antibiotic therapy or barium examination. Otherwise wait 10 days after treatment.

Samples collected on inpatients that develop symptoms \geq 4 days after admission are rejected.

FUNGUS

All samples are sent to Provincial Lab.

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GENITAL SWAB

Vaginal swabs from patients > 13 years of age will be screened for bacterial vaginosis (BV) and yeast.

If a physician requests an investigation for *Trichomonas vaginalis*, an antigen detection test will be performed.

Vaginal swabs from patients ≤ 13 years of age receive a routine culture. A routine culture is also provided on genital swabs if there is clinical history provided which includes diagnosis of post-op OBGYN, symptoms of toxic shock syndrome (rash & fever) or endometritis.

Vag-anorectal swabs from pregnant women at 36 weeks gestation are cultured for Group B Streptococcus.

A single swab used to sample both sites is most sensitive.

Cervix, endocervix and urethral swabs are cultured for *Neisseria gonorrhoeae* although NAAT is recommended.

Endocervix and urethral swabs collected in Hologic Aptima Unisex Swab collection tubes are tested for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* by a Nucleic Acid Amplification Assay (NAAT) at Provincial Laboratory Edmonton.

GRAM STAIN

- a) Is not performed on urine, line tips, bone chips or swabs of throat, tonsil, nose or nasopharynx, coccyx, rectal or peri-anal.
- b) Is performed on all other samples submitted for culture.
- c) Is performed on washings, but may be of little clinical value because of high dilution factor.
- d) Is performed STAT on spinal fluids with >50 WBC.
- e) Is performed on sputum. If the specimen is heavily contaminated with oral flora, a culture is not done. Another specimen is requested.

INFLUENZAE A/B – see RSV and Influenzae A/B

MYCOBACTERIA - ACID FAST BACILLI (AFB)

All samples are sent to Provincial Lab – Level III laboratory.

MYCOPLASMA & UREAPLASMA

Routine testing for these organisms is not indicated.

Mycoplasma hominis and *Ureaplasma urealyticum* have been implicated in such disorders as urethritis, prostatitis, upper genitourinary disease such as Pelvic Inflammatory Disease, acute pyelonephritis, postabortal fever, and other non-genital infections. These two organisms do not cause vaginitis or cervicitis. They may form part of the mixed flora in bacterial vaginosis, but they are part of the normal genital mucosal flora in 10% of healthy women as well as men. The most common of the genital mycoplasmas, *Mycoplasma genitalium*, takes 1-2 months to grow in culture, may be a cause of cervicitis and male urethritis, but is not detected by routine culture.

Indications for culture for these organisms should be part of an investigation by an Infectious Disease Specialist, Gynecologist or Obstetrician. The interpretation and management of patients with these organisms requires careful consideration of the presence or absence of other pathogens, immune status of the patient, and other factors. Samples are sent to Provincial Lab.

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OVA + PARASITES

Feces is screened for *Cryptosporidium* and *Giardia* with a fluorescent immunoassay procedure (FIA). Samples with the following histories will be analyzed with a method that detects all parasites:

- a) Travel to or immigration from an endemic area.
- b) Exposure to raw fish or meat.
- c) Confirmed previous parasite infection.
- d) Exposure to contaminated or untreated water.
- e) Close contact to a person with a parasite other than *Cryptosporidium* or *Giardia*.
- f) Refugee/recent immigrant/international adoption.
- g) Employment (Food handler, Daycare Worker, Health Care Worker).
- h) Work Visa.

Samples collected on inpatients that develop symptoms \geq 4 days after admission are rejected.

PARASITE

Examination of fluids and aspirated material from lymph nodes, spleen, bone marrow, spinal fluid, cutaneous ulcers, liver and lung may reveal parasites when conventional methods have failed.

PINWORM

The female pinworm migrates out of the anus to deposit her eggs on the perianal region. Examination should be performed on three consecutive days since the female worm may not migrate every day.

RECTAL OR PERIRECTAL SWAB

Feces is the preferred specimen for gastroenteritis culture. When a stool specimen cannot be obtained, a rectal or anal swab may be submitted. The swab is cultured for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, *Vibrio*, *Plesiomonas*, *Aeromonas* and Shiga toxin producing *Escherichia coli* (including 0157 and non- 0157). Rectal or perirectal swabs are cultured for *Neisseria gonorrhoeae* if requested in history.

Rectal swabs are examined for VRE when a specific request for VRE screen is received.

RESPIRATORY SWAB

Throat and tonsil swabs are examined for Beta hemolytic Streptococci only. *Arcanobacterium*, yeast and pathogenic *Neisseria* species are also reported if history indicates they are suspect.

Nasal swabs are examined for *Staphylococcus aureus*/MRSA carrier status.

Nasal swabs (anterior nares) are examined for MRSA when a specific request for MRSA screen is received.

ROTAVIRUS

Rapid, direct Rotavirus screen testing should be ordered **ONLY** during Rotavirus season (generally November through March) on children < 5 years old and within 3 - 5 days of onset illness. Submit unpreserved stool sample in a sterile container.

Send samples from children 5 years of age or greater and adults to Provincial Laboratory. Include clinical history, and request a virus investigation.

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RSV and Influenzae A/B This test will be available primarily for acute care inpatients, emergency patients, and when ordered by Public Health or Infection Control for outbreak investigations.

SPUTUM, E-TUBE SPUTUMS

A Gram stain is performed. A culture is performed on all E-tube sputums. A culture is not performed on sputum heavily contaminated with oral flora. Daily Gram stains may be ordered on E-tubes in lieu of culture and Gram.

SWABS

Although swabs are adequate samples for culture, fluid or pus from the affected body site is preferred. Please submit the actual fluid or tissue whenever possible.

THROAT INVESTIGATION

Swabs collected for throat investigation are processed for Group A Streptococcus using a molecular method. Culture will be performed in the following instances:

- a) History of treatment failure/non-response to therapy.
- b) History of recurrence of infection.
- c) History of rash.
- d) Visible blood on swab.
- e) Requests for organisms other than Group A Streptococcus.
- f) Indeterminate molecular request.
- g) Penicillin allergy.

TRICHOMONAS

Trichomonas vaginalis rapid antigen test will be performed on request from vaginal swabs. This test is intended for use in patients with symptomatic vaginosis/vaginitis or suspected exposure to T.vaginalis.

URINE CULTURE

Colony counts (CFU/L) are estimated on all urine samples. If there is insufficient urine to inoculate urine to a C&S transport tube (<5 mL), submit a whole sample (on ice) in a labelled sterile container to the Lab within 24 hours of collection.

VIRAL INVESTIGATION

Provincial Lab employs various techniques in viral investigation. These may include culture, electron microscopy, enzyme immunoassay, NAAT testing, direct immunofluorescence and serology.

YEAST

If yeast is the suspected pathogen, order a culture and indicate "yeast" in the patient history.

Esophageal brushes are screened microscopically and cultured for yeast only. Yeast isolates are speciated.

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