Ordering Recommendations for Clinical Microbiology Testing

- **Ensure requisition and specimen are labeled with**
  - Patient's full name
  - Health service number (HSN) **or** date of birth
  - Source of specimen
  - Collection date and time

- **All requisitions MUST also**
  - Indicate specific method of collection
  - List patient antibiotic therapy, previous antibiotic treatment failure or if patient is immunocompromised

Test Requested	Specimen	Ordering Recommendations
Bacterial Culture (C&S)		
Abscess Fluid (C&S)	• Drainage	• Cultures of surgical drainage from clean surgical procedures are not indicated if there are no signs of infection. • Do not inoculate blood culture bottles with drainage fluids. • Do not send drainage tube to be cultured.
Blood Cultures (C&S)	• Blood	• Collect blood cultures prior to administration of antibiotics.
Body Fluid, Sterile (C&S) • Other than blood, bone marrow, CSF, effluent or urine	• Sterile fluid ○ Pleural ○ Peritoneal ○ Pericardial ○ Synovial	• Swabs of sterile fluids are inappropriate specimens due to the risk of being contaminated with skin flora. • Gram stain cannot be done if specimen is sent in BACTEC culture bottles only. Please send small volumes of sample in sterile container to ensure Gram stain can be performed.
Cerebrospinal Fluid (C&S)	• Lumbar puncture • Extraventricular drain • Indwelling shunt	• Avoid sending first tube collected for Microbiology testing due to increased risk of specimen contamination. • If ordering additional testing for reference laboratory, ensure adequate volume is submitted.

Test Requested	Specimen	Ordering Recommendations
Eye (C&S)	• Conjunctiva swab	• Routine conjunctival swabs are NOT processed. All specimens received labelled "Eye" are assumed to be conjunctival swabs and will NOT be processed with the exception of swabs from patients less than 90 days old. • Please contact the Microbiologist-on-call at (306)655-1000 if there are special circumstances (i.e. persistent infection or treatment failure, blepharitis or corneal ulcers) prior to submission to the laboratory.

Feces (C&S)	Feces	• If *Vibrio* species requested, patient must have history of travel to an endemic area or ingestion of shellfish.
		• Indicate if food poisoning is suspected.
		• Outbreak number must be clearly written on requisition if outbreak has been declared.
		• Culture for enteric pathogens shall be processed on patients hospitalized **less than three days only**
		  ○ Consider *C. difficile* testing with new onset diarrhea from patients hospitalized greater than three days
		  ○ Consider the "seasonality" of bacterial infection before automatically ordering stool samples for culture and sensitivity
		• One specimen per day is processed to a maximum of two specimens within a seven day period
		• Feces MUST be to **fill line** indicated on transport medium label
		• Specimen MUST be free from any contaminating material (e.g. urine or water)

Neisseria gonorrhoeae (GC) Culture	• Eye
	• Genital
	  ○ Cervix/Endocervix
	  ○ Vaginal
	  ○ Urethral
	• Rectal
	• Throat
		• Vaginal swabs are ONLY processed on hysterectomy patients. This information MUST be clearly indicated on requisition.
		• Consider alternate testing from a voided urine specimen for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* by molecular testing (NAAT).

Urine (C&S)	• Catheter • Surgical (excluding kidney aspirates) • Voided	• Only one specimen collected within 24 hours using the SAME collection required • Bagged urines are often contaminated by skin flora. Confirmation of significant bacteriuria is best accomplished by catheter collection.

Test Requested	Specimen	Ordering Recommendations
Mycoplasma & Ureaplasma	• Genital swab ○ Urethral ○ Endocervix ○ Vaginal	• Alternate testing for genital mycoplasmas in urine samples must be approved in consultation with the Microbiologist-on-call at (306)655-1000.
Ova & Parasites (O&P)		
Giardia/Cryptosporidium Screen	Feces	• Completed Microbiology Requisition plus Parasitology History Sheet required ○ All sections MUST be filled out by requesting physician or practitioner unless otherwise specified ○ No patient history or incomplete patient history provided will result in ONLY a screen for Giardia and Cryptosporidium (one specimen per 14 days) being performed ○ A full stool Ova & Parasites microscopy (two stool specimens one on each alternate day) will only be done routinely on the following patient groups ▪ Travelers to endemic areas (anywhere outside of North America or Western Europe within the last 3 months (travel date must be provided) ▪ Recent immigrants (within the last 6 months) ▪ Immunocompromised ▪ Suspected worm or other pathogenic parasitic infection ▪ Recent anti-parasitic treatment ▪ < 9 years of age • Culture for parasites shall be processed on patients hospitalized **less than three days only** ○ Consider *C. difficile* testing with new onset diarrhea from patients hospitalized greater than three days • Antibiotics, mineral oil, bismuth, kaolin or barium will interfere with parasite detection. Delay specimen collection a minimum of seven days after administration of these substances
Molecular (PCR)		
Acanthamoeba PCR	Contact lens Corneal scraping	• For ocular specimens (corneal scrapings or intact contact lens) only. • Intended to assist in the diagnosis of Acanthamoeba keratitis (AK). Clinical correlation is required. • Performed as a “research use only” test and has not yet been fully validated for diagnostic purposes.

Test Requested	Specimen	Ordering Recommendations
Adenovirus PCR	Bronchial Eye Nasopharyngeal Throat Tracheal	• Validated for respiratory tract and ocular specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. If testing is not available on site, specimen shall be sent out to reference laboratory.
BK/JC PCR	CSF Serum Urine	• Validated for urine, serum, and cerebrospinal specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • The test is recommended only for patients with appropriate risk factors for BK or JC-associated disease and is not indicated for screening of asymptomatic patients.
Bordetella pertussis/parapertussis PCR	Nasopharyngeal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • Intended to aid in the diagnosis of whooping cough. Optimal sensitivity for testing is within the first 3 weeks of onset of symptoms. • Not recommended for screening of asymptomatic patients. Clinical correlation is required. • Not recommended for follow-up of patients previously diagnosed with pertussis (i.e. it should not be used as a test of cure).
Chlamydia pneumoniae PCR	Bronchial Nasopharyngeal Sputum Throat Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • Intended to aid in the diagnosis of pharyngitis, bronchitis, or atypical pneumonia in children and adults caused by *C. pneumoniae*. • Not recommended for screening of asymptomatic patients. Clinical correlation is required. • Not recommended for follow-up of patients previously diagnosed with *C. pneumoniae* infection (i.e. it should not be used as a test of cure).

Test Requested	Specimen	Ordering Recommendations
Chlamydia trachomatis PCR	Bronchial Eye Nasopharyngeal Tracheal	• Validated for respiratory tract and ocular specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • Not recommended for the screening of asymptomatic patients. Clinical correlation is required. • Not recommended for follow-up of patients previously diagnosed with *C. trachomatis* infection (i.e. it should not be used as a test of cure).
Clostridioides difficile PCR	Feces	• Validated for fecal (stool) specimens only. • Test procedure not validated for children less than 2 years of age. • Intended for use only in patients displaying appropriate clinical symptoms and not for screening of asymptomatic patients. • Asymptomatic colonization by *C. difficile* is possible in certain populations (eg. infants). Clinical correlation is required. • Not recommended as a test of cure since nucleic acids may persist for variable times after effective treatment.
Cytomegalovirus (CMV) PCR	Body Fluid Bone Marrow Bronchial CSF Tissue Tracheal Urine Various, other	• Validated for a range of specimen types – consult the MOC for further information. • CMV may be associated with a range of clinical conditions, mainly in immunosuppressed patients, neonates, and pregnant women, and should only be requested if there is a strong suspicion of CMV-related disease based on clinical and other diagnostic findings. • This is a qualitative assay used as a screening test only – quantitation of CMV viral loads cannot be performed with this test (refer to Cytomegalovirus Viral Load PCR for quantitative testing).
Cytomegalovirus (CMV) Viral Load PCR	Plasma	• Validated for plasma only. • Other types of specimens may be tested after consultation with the MOC, but will not give an accurate numerical value for viral load. • Used to quantitate CMV DNA as International Units (IU) per mL of plasma (CMV viral load). • Intended for the assessment and ongoing monitoring of patients – most commonly transplant recipients – who are at risk of developing CMV disease, or are being treated for CMV-related disease.

Test Requested	Specimen	Ordering Recommendations
		• Not intended as a general screen for the presence or absence of CMV (refer to CMV PCR test for this purpose). • May only be ordered on the same patient if at least 5 days have elapsed between collections.
Enterovirus/Parechovirus PCR	Bronchial CSF Feces Mouth Nasopharyngeal Rectal Throat Tracheal	• Validated for respiratory tract, cerebrospinal fluid and fecal specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • These viruses may cause a range of clinical conditions and therefore the test should only be requested if there is a strong suspicion of infection based on clinical and other diagnostic findings. • The test will differentiate Enteroviruses from Parechoviruses, but will not determine the specific sub-type of Enterovirus. Consult the MOC if identification of the specific Enterovirus type is required.
Epstein-Barr Virus (EBV) Viral Load PCR	Plasma	• Validated for plasma only • Other types of specimens may be tested after consultation with the MOC, but will not give an accurate numerical value for viral load. • Used to quantitate EBV DNA as International Units (IU) per mL of plasma (EBV viral load). • Intended for the assessment and ongoing monitoring of patients – most commonly transplant recipients – who are at risk of developing, or are being treated for, EBV-related disease such as post-transplant lymphoproliferative disorder. • Not intended as a general screen for the presence or absence of EBV (refer to Epstein - Barr virus (EBV) PCR test for this purpose). • May only be ordered on the same patient if at least 5 days have elapsed between collections.
Epstein-Barr Virus (EBV) PCR	CSF	• Specimens require clinical correlation, consultation, and clearance by the MOC prior to testing. • Performed as a “research use only” test and has not been fully validated for diagnostic purposes.
Herpes Simplex Virus (HSV) PCR	CSF Dermal Eye Genital	• Validated for cerebrospinal, ocular, and dermal (vesicular lesions) specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • The test requires clinical correlation. In the case of central nervous system disease, the test will only

Test Requested	Specimen	Ordering Recommendations
	Mouth	be performed if there are other diagnostic indicators of HSV infection (eg. abnormal protein, glucose, or white cell counts in the CSF), or for specific at-risk patient groups (immunocompromised, neonates). The test is not intended for the screening of asymptomatic patients. Consult the MOC for special requests. • The test may detect viral shedding in asymptomatic patients when dermal or genital sites are tested since intermittent shedding without noticeable lesions is possible. • The test will detect both HSV Type I and HSV Type 2, and will differentiate between the types.
Influenza A and B PCR	Bronchial Nasopharyngeal Throat Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • The test is not intended for the screening of asymptomatic patients. Clinical correlation is required. • The test will detect both Influenza A and Influenza B and differentiate between them. • The test will detect all sub-types of Influenza A but will not differentiate between them. If Influenza typing is required, please contact the MOC.
Legionella pneumophila PCR	Bronchial Nasopharyngeal Throat Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • The test is not intended for the screening of asymptomatic patients. Clinical correlation is required. • The test detects all species within the *Legionella* genus. Differentiation of *L. pneumophila* from other species is done by reflex testing.
Mycoplasma pneumoniae PCR	Bronchial Nasopharyngeal Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to collection. • To aid in the diagnosis of pharyngitis, bronchitis, or atypical pneumonia in children and adults caused by *M. pneumoniae*. • The test is not intended for the screening of asymptomatic patients because asymptomatic colonization with *M. pneumoniae* has been reported. Clinical correlation is required.

Test Requested	Specimen	Ordering Recommendations
		• The test is not recommended for follow-up of patients previously diagnosed with an *M. pneumoniae* infection (i.e. it should not be used as a test of cure).
Norovirus PCR (Outbreak and Routine)	Feces	• Validated for fecal (stool) specimens only. • Other specimen types will not be processed. • The test is used to detect the presence of Norovirus as an aid to determining the cause of acute diarrhea. Clinical correlation is required. • The requisition MUST be accompanied by an outbreak number or an Infection Control practitioner. • Refer to Infection Prevention and Control (ICP) Policy and Procedures Manual for specific collection guidelines.as assigned by Public Health.
Pneumocystis PCR	Bronchial Sputum Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens will NOT be processed. • Because *Pneumocystis* can be found asymptomatically in both healthy and immunocompromised patients, test results must be correlated with patient symptoms and clinical presentation. • This test is not recommended for follow-up of patients previously diagnosed with *Pneumocystis* infection (i.e. it should not be used as a test of cure).
Respiratory Syncytial Virus (RSV) PCR	Bronchial Nasopharyngeal Throat Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to collection. • The test will specifically detect RSV Type A and RSV Type B and will distinguish between them. • This test is intended to aid in the diagnosis of respiratory tract infections and is not intended for the screening of asymptomatic patients. Clinical correlation is required.
Respiratory Viruses PCR	Bronchial Nasopharyngeal Throat Tracheal	• Validated for respiratory tract specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to collection. • This test is intended to aid in the diagnosis of respiratory tract infections caused by one of up to 16 different commonly-encountered human respiratory viruses. It is not intended for the screening of asymptomatic patients.
Varicella Zoster Virus (VZV) PCR	CSF Dermal	• Validated for cerebrospinal and dermal (vesicular lesions) specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior

Test Requested	Specimen	Ordering Recommendations
		to testing. • The test requires clinical correlation. In the case of central nervous system disease, the test will only be performed if there are other diagnostic indicators of VZV infection (eg. abnormal protein, glucose, or white cell counts in the CSF), or for specific at-risk patient groups (immunocompromised, neonates). The test is not intended for the screening of asymptomatic patients. Consult the MOC for special requests.
West Nile Virus (WNV) PCR	Plasma Serum	• Validated for serum and plasma specimens only. • Other types of specimens which are not listed require consultation and clearance by the MOC prior to testing. • The test is intended for the detection of WNV in blood and will only be performed upon request from the Saskatchewan Transplant Program. • The test is to be used for the screening of solid organ donors and transplant recipients prior to organ transplantation. It will only be performed at the request of the Saskatchewan Transplant Program or after consultation with the MOC. • In order to facilitate testing, please notify the laboratory directly at (306)655-1688 or via the MOC if it is known that a specimen will be forthcoming. • The test may be helpful as an adjunct test in diagnosing possible WNV infection in patients with symptomatic central nervous system disease. However, the likelihood of detecting WNV in symptomatic patients is relatively low – other diagnostic tests (eg. serology) should also be used to assist in accurately diagnosing WNV infection in symptomatic patients.
Mycobacterial (AFB)		
Acid Fast Bacilli (AFB) Smear and/or Culture	All specimens *except* Blood and Bone Marrow	• Collect specimens for diagnosis of tuberculosis or non-tuberculous mycobacterial infection. • Specimen will be referred to Roy Romanow Provincial Lab.
	Blood	• Myco/F Lytic culture media is to be used as an adjunct to aerobic blood culture media for the recovery of mycobacteria, and fungi from blood or sterile body fluids. • Generally restricted to use in immunocompromised patients e.g. solid organ or stem cell transplant recipients, late-stage HIV disease. • No advantage of Myco/F Lytic over standard blood culture bottles for culture of *Candida* species.

Test Requested	Specimen	Ordering Recommendations
	Bone Marrow	• Bone marrow aspirate must be collected into a Myco/F Lytic blood culture bottle AND if enough specimen, a sterile container for smear and additional testing. • If specimen is collected in Myco/F Lytic bottle only, an AFB smear can NOT be performed. • Myco/F Lytic bottles are available from RUH Microbiology laboratory on approval of Microbiologist-on-call.
Interferon Gamma Release Assay (IGRA)	Whole Blood	• Interferon Gamma Release Assay (IGRA) by QuantiFERON® TB Gold is an in vitro diagnostic test to detect cell mediated immune response to peptide antigens that simulate mycobacterial proteins of the *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*, *M. microti*, and *M. canetti*). • Individuals infected with Mycobacterium tuberculosis complex organisms have lymphocytes in their blood that will recognize mycobacterial antigens. Recognition of these antigens will initiate the generation and secretion of interferon-γ.
Mycobacterium tuberculosis PCR (GeneXpert)	Sputum Bronchial Tracheal CSF Tissue*	• Validated for lower respiratory tract specimens only. • Other types of specimens (denoted by *) require consultation with MOC prior to collection. • Test is routinely performed on the first specimen submitted for TB/AFB culture for inpatients and Emergency room patients. • Repeat testing or testing on outpatients may be requested in consultation with the MOC. • Will detect all members of the *Mycobacterium tuberculosis* complex (includes *M. tuberculosis*, *M. bovis*, *M. africanum*, *M. canetti* and *M. microti*) but will not distinguish between the members of the MTB complex. • The test has not been studied in patients undergoing antimicrobial chemotherapy and should not be used to assess therapeutic success or failure.
Viral Serology		
Zika Virus	Serum Urine	• EXACT travel location (City & Country), DEPARTED and RETURN date, SYMPTOMS and ONSET date MUST be clearly indicated on NML requisition or the specimen may be subject for rejection by testing site.

Test Requested	Specimen	Ordering Recommendations
		• Refer to Molecular Detection of Zika Virus by Reverse Transcriptase PCR (RT-PCR) webpage (available on Government of Canada - Guide to Services) to ensure specimen and requisition requirements are met prior to collection. • For additional information, go to the Government of Canada website Zika Virus Prevention and Treatment Recommendations or contact the Microbiologist on-call at (306)655-1000 if consultation is required.