CITY OF MILWAUKEE
HEALTH DEPARTMENT

City of Milwaukee Health Department

Public Health Laboratory

TEST REFERENCE MANUAL

Zeidler Municipal Building • 841 N. Broadway, Room 205 • Milwaukee, WI 53202
Phone: (414) 286-3526 • Fax: (414) 286-5098
www.milwaukee.gov/healthlab

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Test Reference Manual

Acanthamoeba Culture

Methodology:	Culture
Test Code:	CXACA
CPT Code:	87081
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2-7 days
Specimen Required:	Ocular swab, Tissue (corneal biopsy material, brain, lung), corneal scrapings, contact lens (or solution or swab of case), eye wash, CSF.
Collection:	Tissue, cornea scrapings, contact lens: Transfer specimen into sterile container containing 5 mL of Nelson's saline. Nelson's saline available upon request. Fluid (contact lens solution, eye wash, CSF): 1 mL in sterile screw cap container
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature. Do not refrigerate or freeze.
Transport:	Room temperature
Unacceptable Conditions:	Frozen, refrigerated, formalin-fixed specimens. Dry material. Quantity not sufficient. Slides are not acceptable. Swabs are suboptimal and may result in a false negative result.
Reference Range:	Isolated or Not isolated
Limitations:	N/A
Additional Information:	Microscopic examination of the culture plate for the presence of cysts/trophozoites confirms positive specimen.

Aeromonas Culture

Methodology:	Culture
Test Code:	CXAER
CPT Code:	87046
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must not be collected until > 48 hours after treatment has ceased.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C.
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, transfer specimen to an enteric transport media before transporting to the laboratory.
Unacceptable Conditions:	Unpreserved specimens not received on ice packs or > 24 hours old. Received in transport media not recommended for bacterial isolation or expired. Specimen collected while on antibiotic therapy
Reference Range:	Isolated or Not isolated
Limitations:	N/A
Additional Information:	While some aeromonads are agents of gastroenteritis, there is no consensus at this time that all isolates should be considered significant. *Aeromonas hydrophila* is associated with diarrheal illness and, less commonly, necrotizing skin and soft tissue infections, especially among immunocompromised patients.

Bacterial Identification, Referred Isolate of Non-public Health Significance

Methodology:	Biochemical, 16S sequencing
Test Code:	RFCUL
CPT Code:	87153; 87076 (anaerobic); 87077 (aerobic)
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	7-10 days
Specimen Required:	Pure culture isolate
Collection:	Pure culture isolate on agar slant or plate (not recommended).
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature
Transport:	Room temperature
Unacceptable Conditions:	Isolate mixed or non-viable, frozen specimen
Reference Range:	Species or Genus level Identification
Limitations:	N/A
Additional Information:	Includes identification of organisms of non-public health significance

Bacterial Identification, Referred Isolate of Public Health Significance

Methodology:	Biochemical, serological typing
Test Code:	RFBAC, RFCUL
CPT Code:	87077
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2- 4 days
Specimen Required:	Pure culture isolate
Collection:	Pure culture isolate on agar slant or plate
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature
Transport:	Room temperature
Unacceptable Conditions:	Culture not viable or mixed, frozen specimen
Reference Range:	N/A
Limitations:	N/A
Additional Information:	Includes identification of *Aeromonas, Campylobacter, E. coli* 0157:H7, *Edwardsiella, Plesiomonas, Salmonella, Shigella, Vibrio, Yersinia, Listeria* and other organisms of public health significance. Serotyping performed on all referred isolates of *E. coli, Salmonella*, and *Shigella.*

Bordetella pertussis/parapertussis PCR

Methodology:	Qualitative Real-Time Polymerase Chain Reaction
Test Code:	RTBP
CPT Code:	87798 x 3
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Nasopharyngeal swab, BAL, respiratory aspirate, or sputum
Collection:	NP: Dacron swab in sterile tube BAL, aspirate or sputum: 2 mL in leak-proof plastic tubes
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C, if shipped within 72 hours of collection; otherwise swabs and aspirates must be frozen at -20°C.
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Calcium-alginate and cotton swabs, specimens in charcoal-based media
Reference Range:	Not detected
Limitations:	N/A
Additional Information:	This test detects and differentiates between *B. pertussis*, *B. parapertussis* and *B. holmesii* (an uncommon respiratory pathogen of humans). Test results must be correlated with culture results and/or patient history to confirm as a case of *B. pertussis* or *B. parapertussis* infection. A negative result does not rule out infection with *B. pertussis* or *B. parapertussis.*

Campylobacter Culture

Methodology:	Culture
Test Code:	CXCAM
CPT Code:	87046
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days
Specimen Required:	Stool, rectal swab
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Collection:	Transfer diarrheal stool, formed stool or rectal swab in Modified Cary-Blair transport medium and fill to indicate line per package insert.
Storage and Stability:	Refrigerated: 2-8˚C.
Transport:	Refrigerate at 2-8˚C. within 24 hours
Unacceptable Conditions:	Insufficient amount of sample; specimen > 24 hours old and not in appropriate transport media., non-sterile or leaking container, multiple specimens (more than one in 24 hours), dry swab
Reference Range:	Isolated or Not isolated
Limitations:	N/A
Additional Information:	Identification of *Campylobacter jejuni* should be reported to the local or state public health agency.

Chlamydia Culture

Methodology:	Cell Culture, Immunofluorescence
Test Code:	CTRAC
CPT Code:	87110, 87140
Requisition Required:	Microbiology
Performed:	Tuesday and Friday
Turnaround Time:	3-5 days
Specimen Required:	Cervical, urethral, rectal, throat, ocular
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Collection:	Place swabs in *Chlamydia* transport media; refrigerate immediately, Viral Transport Media (VTM) acceptable as well (M4, M4RT, M6)
Storage and Stability:	Refrigerated: 2-8˚C. for 3 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Dry swabs or swabs with calcium alginate or wood shafts, specimens that are insufficient, leaking, not refrigerated or not labeled
Reference Range:	Isolated or Not isolated
Limitations:	Amplified DNA testing is recommended for detection of *Chlamydia trachomatis* from endocervical and urethral specimens. This assay is unable to differentiate *Chlamydia trachomatis* from other *Chlamydia* species.
Additional Information:	Culture is recommended for *Chlamydia* detection in suspected sexual abuse. Conjunctival eye swabs are included under non-genital culture

Chlamydia trachomatis and Neisseria gonorrhoeae by NAAT

Methodology:	Target Amplification Nucleic Acid Probe
Test Code:	CTAMP, GCAMP
CPT Code:	87491, 87591
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1- 2 days
Specimen Required:	Urine; endocervical, vaginal, male urethral, throat, rectal swabs
Collection:	Collect first-catch urine sample or swab and transfer to appropriate APTIMA Combo 2 Assay transport tubes. Swabs and transport tubes are available upon request.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Urine (unpreserved): Room temperature for 24 hours Urine in transport tube: Store at 2-30˚C for 30 days Swabs in transport tube: Store at 2-30˚C for 60 days or frozen for 12 months
Transport:	Refrigerate at 2-8˚C or room temperature
Unacceptable Conditions:	Any urine specimen transport tube with volumes above or below allowable levels, and any swab specimen transport tube with no swab, two swabs, or a swab not provided by the manufacturer.
Reference Range:	Detected or Not detected
Limitations:	Excess mucus should be removed to ensure the collection of columnar epithelial cells lining the endocervix. If excess mucus is not removed, sampling of these cells is not ensured. The assay is not intended for the evaluation of suspected sexual abuse or for other medico-legal indications. This assay is not validated on age groups <14.
Additional Information:	The patient should not have urinated for at least 1 hour prior to sample collection. Culture is recommended for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* detection in suspected cases of sexual abuse. Assay results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

Clinical Culture, Miscellaneous Culture

Methodology:	Culture
Test Code:	CXMIS
CPT Code:	
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days
Specimen Required:	Amies transport media, CSF
Collection:	Preserve each stool collection in 10% formalin within one hour of collection.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the transport media and on the test requisition.
Storage and Stability:	Room temperature,
Transport:	Room temperature, transport as soon as possible to the lab, or preferably within 6 hours (maximum up to 24 hours)
Unacceptable Conditions:	Improper labeling; specimen received in grossly leaking transport container; specimen received in expired transport media; specimen received after prolonged delay (usually more than 48 hours), Refrigerated or Frozen specimens
Reference Range:	No bacteria isolated or bacteria seen to genus or species level
Limitations:	N/A
Additional Information:	

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Cryptosporidium/Giardia Antigen Detection

Methodology:	DFA Stain, Fluorescent Microscopy
Test Code:	FACRY
CPT Code:	87272, 87269
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Stool
Collection:	Preserved stool: Place in 10% formalin, sodium acetate-acetic acid-formalin (SAF) or ECOFIX within 1 hour of collection. O&P collection kit available upon request. Patients should not have been given barium, bismuth, laxatives, anti-diarrheal agents or antibiotic treatment at least 1 week prior to collection.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Preserved stool: Room temperature Unpreserved stool: Refrigerate at 2-8˚C and must be received by the laboratory within 1 hour of collection.
Transport:	Preserved stool: Room temperature Unpreserved stool: Refrigerate at 2-8˚C. Must be received by the laboratory within 1 hour of collection.
Unacceptable Conditions:	Stool preserved in PVA, MF/MIF or any other preservative other than those listed above are not suitable for use. Rectal swabs and unpreserved stool received >1 hour after collection cannot be tested.
Reference Range:	Detected or Not detected
Limitations:	This test is for the detection of *Cryptosporidium* oocysts and *Giardia* cysts only. A negative test does not rule out the possibility of other parasitic infections. If other parasitic organisms are suspected, routine ova and parasite examination(s) are suggested. Multiple specimens, collected every other day for up to 10 days, may need to be tested before ruling out *Cryptosporidium* or *Giardia* species infection.
Additional Information:	The presence of *Cryptosporidium* oocysts and *Giardia* cysts in a stool specimen does not preclude the possibility of either other parasites being present in the stool or the presence of another condition that may be causing gastrointestinal illness.

Cyclospora Detection

Methodology:	Modified Acid-Fast Stain and Microscopy
Test Code:	EXMAF
CPT Code:	87015, 87207
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Stool
Collection:	Unpreserved stool: Collect and place in a clean and leak proof collection vial. Preserved Stool: Collect in vial containing 10% Formalin within 1 hour of collection.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Unpreserved: Refrigerate at 2-8˚C. Must be transported and received by the lab within 24 hours of collection. Preserved: Room temperature
Transport	Unpreserved stool: Refrigerate at 2-8˚C. (within 24 hours of collection) Preserved stool: Room temperature
Unacceptable Conditions:	Dry specimens, leaking containers, specimens contaminated with oil, barium or urine, multiple specimens (more than one in 24 hours), unpreserved specimens received >1 hour after collection, rectal swabs Frozen: Unacceptable
Reference Range:	Detected or Not detected
Limitations:	N/A
Additional Information:	Identification of *Cyclospora* is considered significant and should be reported to the local or state public health agency. If other parasitic organisms are suspected, a routine ova and parasite stool examination should be considered. Also see *Cryptosporidium/Giardia* Antigen Detection and Microsporidium Detection.

Cystoisospora Detection (formerly known as Isospora)

Methodology:	Modified Acid Fast Stain, Light Microscopy
Test Code:	EXMAF
CPT Code:	87015, 87207
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 3 days
Specimen Required:	Stool
Collection:	Preserve each stool collection in 10% formalin or SAF within one hour of collection.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Preserved stool: Room temperature; Unpreserved stool: Refrigerated; Frozen: Unacceptable
Transport:	Fresh stool specimen: Refrigerated (within 1 hour) Stool preserved in 10% formalin or SAF: Room temperature
Unacceptable Conditions:	Dry specimens, leaking containers, specimens contaminated with oil, barium or urine, multiple specimens (more than one in 24 hours), unpreserved specimens received >1 hour after collection, rectal swabs
Reference Range:	Detected or Not detected
Limitations:	N/A
Additional Information:	A negative test does not rule out the possibility of other parasitic infections. If other parasitic organisms are suspected, routine ova and parasite examination(s) are required. For detection of *Cryptosporidium* and *Giardia*, see *Cryptosporidium/Giardia* Antigen Detection. For detection of *Microsporidium,* see *Microsporidium* Detection

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E. coli O157:H7 Culture

Methodology:	Culture, serological typing
Test Code:	CX157
CPT Code:	87046
Requisition Required:	Microbiology
Performed:	Monday-Friday Outbreak investigations may include testing outside these routine test dates.
Turnaround Time:	3-7 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must not be collected until > 48 hours after treatment has ceased.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, transfer specimen to an enteric transport media before transporting to the laboratory.
Unacceptable Conditions:	Unpreserved specimens not received on ice packs or > 24 hours old. Received in transport media not recommended for bacterial isolation or expired transport media. Specimen collected while on antibiotic therapy
Reference Range:	No *E. coli* O157:H7 detected
Limitations:	N/A
Additional Information:	*E. coli* O157:H7 is considered significant and should be reported to the local or state public health agency.

Enteric Pathogens, Stool Culture

Methodology:	Culture, Shiga-toxin EIA, serological typing
Test Code:	CXENT, SHIGA
CPT Code:	87045, 87046 x 4
Requisition Required:	Microbiology
Performed:	Monday-Friday Outbreak investigations may include testing outside these routine test dates.
Turnaround Time:	3-7 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must not be collected until > 48 hours after treatment has ceased.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C.
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, transfer specimen to an enteric transport media before transporting to the laboratory.
Unacceptable Conditions:	Unpreserved specimens not received on ice packs or > 24 hours old. Received in transport media not recommended for bacterial isolation or expired transport media. Specimen collected while on antibiotic therapy
Reference Range:	No *Salmonella, Shigella, Yersinia enterocolytica*, *Vibrio*spp, *Campylobacter* or *E. coli* O157:H7 isolated. Shiga Toxin not detected
Limitations:	N/A
Additional Information:	Stool culture for isolation of *Salmonella, Shigella, Campylobacter, Yersinia, Enterotoxigenic E. coli, E. coli* O157:H7 is performed by MHDL in outbreak situations through MHD-DCPD (Disease control and prevention division) department only. Identification of *Salmonella* species*, Shigella* species*, E. coli O157:H7,* Shiga toxin producing *E. coli* (STEC)*; Campylobacter* species*, Vibrio* species*, Yersinia enterocolitica, Aeromonas* species are considered significant and should be reported to the local or state public health agency. Significance of other enteric organisms should be determined based on clinical information.

Fungal Culture (Dermatophyte), Hair, Skin or Nails

Methodology:	Culture and Microscopy
Test Code:	CXDER
CPT Code:	87101
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 6 weeks
Specimen Required:	Hair, skin scrapings, nail
Collection:	Hair: Epilate 10-12 hairs. Specify the source of the specimen and include any pertinent clinical information. Skin and nails: Cleanse the area with 70% alcohol prior to specimen collection. Nail scrapings should be from a subsurface portion of the infected nail. Skin should be taken from the active border of the lesion.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature
Transport:	Skin scrapings, nail and hair clippings should be transported dry at room temperature in a sterile Petri dish.
Unacceptable Conditions:	Specimens received frozen, in formalin, or in culture medium will be rejected. Swabs are discouraged unless the only specimen available; submit swabs in 5 mL sterile saline.
Reference Range:	Isolated or Not isolated
Limitations:	Delay in transport of specimen could compromise isolation of organism.
Additional Information:	MHDL does not perform drug susceptibility testing on fungal isolates.

Fungal Culture (Non-Dermatophyte), Other than Hair, Skin or Nails

Methodology:	Culture and Microscopy
Test Code:	CXFUN
CPT Code:	87102
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 6 weeks
Specimen Required:	2 mL sputum or other fluids (1 mL), tissue biopsy. Blood or CSF not acceptable.
Collection:	2 mL sputum or 1 mL other fluids in sterile container. Add small amount of sterile preservative-free saline to biopsy and soft tissue specimens.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature for 72 hours.
Transport:	Refrigerated at 2-8˚C.
Unacceptable Conditions:	Specimens received frozen, in formalin, or in culture medium will be rejected. Swabs are discouraged unless the only specimen available; submit swabs in 5 mL sterile saline.
Reference Range:	Not isolated
Limitations:	Delay in transport of specimen could compromise isolation of organism.
Additional Information:	MHDL does not perform drug susceptibility testing on fungal isolates. Referral to an alternate lab for susceptibility testing may be considered subject to test availability.

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Fungal Identification, Mold, Referred Isolate

Methodology:	Morphological procedure for identification; DNA probes or D2 region of the LSU rDNA gene sequencing
Test Code:	RFFUN
CPT Code:	87107, 87153
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 4 weeks (slow growers may take longer to identify)
Specimen Required:	Pure culture on slant
Collection:	Viable mold in pure culture on agar slant.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature
Transport:	Room temperature
Unacceptable Conditions:	Non-viable organisms, mixed cultures, isolates from environmental sources, organisms submitted on an agar plate.
Reference Range:	Culture negative for fungus
Limitations:	N/A
Additional Information:	N/A

Fungal Identification, Yeast, Referred Isolate

Methodology:	Morphological and biochemical procedure for identification; or sequencing
Test Code:	RFYST
CPT Code:	87106, 87153
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 4 weeks (slow growers may take longer to identify)
Specimen Required:	Pure culture on slant
Collection:	Viable yeast organism in pure culture on agar slant.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature
Transport:	Room temperature
Unacceptable Conditions:	Non-viable organisms, mixed cultures, isolates from environmental sources, organisms submitted on an agar plate.
Reference Range:	N/A
Limitations:	N/A
Additional Information:	N/A

Herpes Simplex Virus (HSV) Type 1 and 2 PCR

Methodology:	Qualitative Real-Time Polymerase Chain Reaction
Test Code:	RTHSV
CPT Code:	87529 x 2
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-5 days
Specimen Required:	Vesicle swab (oral or genital lesions)
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Collection:	Vesicle swab: Collect and place in Viral Transport Media collection tubes (M4, M4RT, M6),
Storage and Stability:	Refrigerated: 2-8˚C. for 48 hours; ≤ -20˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Swabs with calcium alginate or cotton tips, wood shaft, specimens that are insufficient and not refrigerated or not labeled
Reference Range:	Detected or Not detected
Limitations:	N/A
Additional Information:	This assay detects and differentiates HSV-1 and HSV-2

Human Immunodeficiency Virus (HIV), Ag/Ab Screen

Methodology:	Chemiluminescent microparticle immunoassay (CMIA)
Test Code:	HIVC
CPT Code:	87389
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Serum, plasma
Collection:	5-10ml of blood in EDTA, sodium citrate, lithium heparin for plasma and serum separator tubes for serum.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Specimens may be stored on or off the clot or red blood cells for up to 7 days refrigerated at 2-8°C or at room temperature for up to 72 hours. If testing will be delayed more than 14 days, remove serum or plasma from the clot, separator, or red blood cells and store frozen at -20°C for 3-5 years.
Transport:	Refrigerate at 2-8°C
Unacceptable Conditions:	Excessively hemolyzed, grossly contaminated with bacteria, or otherwise extremely turbid
Reference Range:	Non-Reactive
Limitations:	This test is intended for screening only, and requires appropriate confirmatory testing. A non-reactive result does not rule out a new HIV infection.
Additional Information:	For HIV infection confirmation testing – Specimen reflexes to HIV 1/2 Geenius Assay to differentiate HIV-1 and HIV-2

Geenius™ HIV 1/2 Supplemental Assay

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Methodology:	Immunochromatographic assay for the confirmation and differentiation of HIV 1 or HIV 2 antibodies
Test Code:	GHIV
CPT Code:	87389
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Serum, plasma
Collection:	5-10 ml of blood in EDTA, sodium citrate, lithium heparin for plasma and serum separator tubes for serum.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Specimens may be stored on or off the clot or red blood cells for up to 7 days refrigerated at 2-8°C or at room temperature for up to 72 hours. If testing will be delayed more than 14 days, remove serum or plasma from the clot, separator, or red blood cells and store frozen at -20°C for 3-5 years.
Transport:	Serum, and plasma specimens can be shipped at ambient conditions (18-30°C) for up to 2 days or samples can be shipped refrigerated with cold packs or wet ice.
Unacceptable Conditions:	Excessively hemolyzed, grossly contaminated with bacteria, or otherwise extremely turbid
Reference Range:	Negative
Limitations:	This test is intended for screening only, and requires appropriate confirmatory testing. A non-reactive result does not rule out a new HIV infection.
Additional Information:	HIV 1/2 Geenius Assay differentiates HIV-1 and HIV-2. Specimen with indeterminate results will be sent to WSLH for HIV-1 PCR.

Influenza Type A and B PCR

Methodology:	Qualitative Real-Time Reverse Transcription Polymerase Chain Reaction
Test Code:	RTFLU
CPT Code:	87502, 87503
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Throat or NP swabs, or combined throat and NP swabs
Collection:	Collect swab(s) and place in Viral Transport Media collection tubes (M4, M4RT, M6),
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C. for 72 hours; ≤ -70˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Dry swabs, swabs with calcium alginate or cotton tips, wood shaft, and not refrigerated or not labeled
Reference Range:	Not detected
Limitations:	N/A
Additional Information:	This assay detects and differentiates H3, 2009 H1N1, H5 influenza as well as influenza B (Yamagata and Victoria).

Lead, Blood: Capillary or Venous

Methodology:	Graphite Furnace AA Spectrometry
Test Code:	BLEAD
CPT Code:	83655

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Requisition Required:	H-444
Performed:	Monday-Friday
Turnaround Time:	Within 3 working days
Specimen Required:	Whole blood
Collection:	Capillary: Minimum volume of 0.1 mL in microcontainer containing EDTA or heparin. Glass capillary tubes are not acceptable. Label with patient name and date of birth. Venous: Minimum volume of 2 ml in vacutainer or 0.1 mL for pediatric specimen, containing EDTA or heparin.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated
Transport:	No special transport required if < 24 hrs. Refrigerated if after 24 hrs.
Unacceptable Conditions:	Hemolyzed blood, serum and plasma samples are unacceptable as well as unlabeled samples or sample volumes less than 0.10 mL
Reference Range:	By report
Limitations:	N/A
Required Information:	Guardian information required for blood lead testing for children.
Additional Information:	Acceptable range: 0-4 µg/dL for children and 0-10 µg/dL for adults. See Centers for Disease Control (CDC) guidelines for the interpretation of lead and EP blood levels.

Measles Virus (Rubeola) PCR

Methodology:	Qualitative Real-Time Reverse Transcription Polymerase Chain Reaction
Test Code:	RTMEA
CPT Code:	87798
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Throat swabs
Collection:	Specimens should be collected within the first 3 days of illness, but no later than 10 days after onset of rash. Swabs: Place into one vial of Viral Transport Media (M4, M4RT, M6),
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C. for 72 hours; ≤ -20˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C. Frozen samples should be shipped on dry ice.
Unacceptable Conditions:	Swabs with calcium alginate, cotton tips, or wood shafts. Specimens that are insufficient, leaking, not refrigerated or not labeled.
Reference Range:	Detected or Not detected
Limitations:	N/A
Additional Information:	N/A

Microsporidia Detection

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Methodology:	Modified Trichrome Stain, Light Microscopy
Test Code:	EXMSP
CPT Code:	87015, 87207
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2-3 days
Specimen Required:	Stool
Collection:	Preserve each stool collection in 10% formalin within one hour of collection.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Preserved stool: Room temperature
Transport:	Preserved stool in 10% formalin: Ambient
Unacceptable Conditions:	Dry specimens, leaking containers, specimens contaminated with oil, barium or urine, multiple specimens (more than one in 24 hours), unpreserved specimens received >1 hour after collection, rectal swabs. Frozen: Unacceptable
Reference Range:	No Microsporidia spores seen
Limitations:	N/A
Additional Information:	A negative test indicates no visible parasites consistent with *Microsporidia* and does not rule out the possibility of other parasitic infections.

Mumps Virus PCR

Methodology:	Qualitative Real-Time Reverse Transcription Polymerase Chain Reaction
Test Code:	RTMUM
CPT Code:	87798
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Buccal swab
Collection:	Buccal swab: Collect and place in Viral Transport Media collection tubes (M4, M4RT, M6),
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C. for 72 hours; ≤ -20˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C. Frozen samples should be shipped on dry ice.
Unacceptable Conditions:	Swabs with calcium alginate, cotton tips, or wood shafts. Specimens that are insufficient, leaking, not refrigerated or not labeled.
Reference Range:	Not detected
Limitations:	Mumps virus may not be detectable in urine samples for up to 4 days following onset of symptoms.
Additional Information:	Buccal/oral swabs should be collected 3-5 days from the time symptoms are evident.

Mycobacterium tuberculosis Complex and Rifampicin resistance detection PCR

Methodology:	Qualitative Real-Time Polymerase Chain Reaction
Test Code:	TBRIF
CPT Code:	87556
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	24 hours
Specimen Required:	Sputum and processed sediment
Collection:	Collect in sterile, leak-proof container with lid secured tightly and place in sealed biohazard bag for transport.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated at 2-8˚C.
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Saliva
Reference Range:	Not detected
Limitations:	N/A
Additional Information:	This assay detects TB complex and rifampicin resistance but does not differentiate DNA from members of *M. tuberculosis* Complex (*M. tuberculosis, M. bovis, M. bovis* BCG*, M. africanum, M. microti,* and *M. canetti*).

Mycoplasma genitalium NAAT

Methodology:	Target Amplification Nucleic Acid Probe
Test Code:	MGAMP
CPT Code:	87563
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1- 2 days
Specimen Required:	Urine; vaginal , urethral, rectal
Collection:	Collect first-catch urine sample or swab and transfer to appropriate APTIMA Combo 2 Assay transport tubes. Swabs and transport tubes are available upon request.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Urine (unpreserved): Room temperature for 24 hours Urine in transport tube: Store at 2-30˚C. for 30 days Swabs in transport tube: Store at 2-30˚C. for 60 days or frozen for 12 months
Transport:	Refrigerate at 2-8˚C. or room temperature
Unacceptable Conditions:	Any urine specimen transport tube with volumes above or below allowable levels, and any swab specimen transport tube with no swab, two swabs, or a swab not provided by manufacturer.
Reference Range:	Detected or Not detected
Limitations:	Assay is not intended for the evaluation of suspected sexual abuse or for other medico-legal indications.
Additional Information:	Patient should not have urinated for at least 1 hour prior to sample collection. Assay results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

Mycoplasma hominis Culture

Methodology:	Culture
Test Code:	CXMH

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

CPT Code:	87109
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2-7 days
Specimen Required:	Urine, urethral or cervical swab, semen, abscess discharge, amniotic fluid, blood, endometrial washings or biopsy, fallopian tube, genital swabs, placental tissue, urine and prostatic secretions
Collection:	Place specimen into M4 or appropriate media for Mycoplasma transport.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: Immediately 2-8°C and transported on dry ice within 24-48 hours. Frozen: 1 month at -20°C.
Transport:	All specimens should be cultured immediately or refrigerated at 4°C and transported to the laboratory on ice within 4-6 hours of collection. If a delay of more than 6 hours is expected, the specimens should be frozen at -20°C and transported on dry ice within 24-36 hours.
Unacceptable Conditions:	M4-RT, swabs in culturettes, and dry swabs
Reference Range:	*Mycoplasma hominis* isolated or Not isolated
Limitations:	N/A
Additional Information:	Specimens are cultured using agar-broth technique. Confirmation is by microscopy.

Neisseria gonorrhoeae culture w/AST

Methodology:	Biochemicals (API NH), MALDI-TOF, Etest
Test Code:	MCXGC (MALDI) or CXGC (Biochemical)
CPT Code:	87081, 87076 (MALDI) 87077, (Biochemicals), 87181
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 4-7 days
Specimen Required:	Urethral, Endocervical, Rectal, or Throat swab
Collection:	Submit specimen in eSwab transport and collection kit, InTray GC, chocolate agar slant or Thayer-Martin Improved plate inside CO2 transport bag.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage or Stability:	eSwab: Room temperature, refrigerate if longer than 2 hours Chocolate agar slant or MTM plates: Incubate in CO_2 incubator when available at 37˚C overnight InTray: Incubate in regular incubator when available at 37°C overnight
Transport:	Ambient eSwabs: Within 24 hours, refrigerate if more than 2 hours delay
Unacceptable Conditions:	Refrigerated specimen other than eSwab; isolate on plated agar medium that has been transported/submitted WITHOUT CO2 Jar/Bag (unless the subculture is ≥ one day old)
Reference Range:	Culture negative for *Neisseria gonorrhoeae*, Isolate identified as: *Neisseria* (indicate species)
Limitations:	N/A
Additional Information:	Sentinel surveillance to monitor antimicrobial resistance in *N. gonorrhoeae* in the United States is sponsored by the Centers for Disease Control and Prevention (CDC) in collaboration with local and state health departments. MHDL also participates in this program and performs antimicrobial susceptibility testing for Ciprofloxacin, Cefixime, and Ceftriaxone. Identification of *Neisseria gonorrhoeae* is considered significant and should be reported to the local or state public health agency.

Neisseria gonorrhoeae Identification, Referred Isolate

Methodology:	Biochemicals (API NH), 16S sequencing
Test Code:	RFGC
CPT Code:	87077, 87184, 87153
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 4 days
Specimen Required:	Pure isolate of oxidase-positive, Gram-negative diplococci
Collection:	Submit pure isolate on chocolate agar slant or plate, or Thayer-Martin Improved plate, inside CO2 transport bag.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage or Stability:	No longer than 2 days from most recent subculture of the isolate
Transport:	Ambient
Unacceptable Conditions:	Refrigerated specimen; isolate on plated agar medium that has been transported/submitted WITHOUT CO2 Jar/Bag (unless the subculture is ≥ one day old)
Reference Range:	Culture negative for *Neisseria gonorrhoeae*, Isolate identified as: Neisseria (indicate species)
Limitations:	N/A
Additional Information:	Sentinel surveillance to monitor antimicrobial resistance in *N. gonorrhoeae* in the United States is sponsored by the Centers for Disease Control and Prevention (CDC) in collaboration with local and state health departments. MHDL also participates in this program and performs antimicrobial susceptibility testing for Azithromycin, Cefixime, and Ceftriaxone. Identification of *Neisseria gonorrhoeae* is considered significant and should be reported to the local or state public health agency.

Norovirus PCR

Methodology:	Qualitative Real-Time Reverse Transcription Polymerase Chain Reaction
Test Code:	RTNOR

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

CPT Code:	87798 x 2
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Stool or vomitus
Collection:	Collect at least 1 mL stool or vomitus in a sterile, stool transport vial without preservatives
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C for no longer than 48 hours. If longer storage is required, freeze the specimen at -70°C
Transport:	Refrigerate at 2-8˚C for no longer than 48 hours
Unacceptable Conditions:	Stool samples preserved in formalin or PVA; quantity not sufficient, broken or leaking tube.
Reference Range:	Detected or Not detected
Limitations:	N/A
Additional Information:	The assay detects and differentiates Norovirus Genogroups I and II. Norovirus sequencing (CaliciNet) is performed only for epidemiological investigation and public health surveillance purposes.

Ova & Parasite Examination, Intestinal

Methodology:	Concentration, Light Microscopy, Trichrome Stain and *Cryptosporidium/Giardia* DFA Stain
Test Code:	EXSTO
CPT Code:	87177, 87209, 87272, 87269
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	Within 2 days
Specimen Required:	Stool
Collection:	Preserve each stool collection in 10% formalin and modified PVA within one hour of collection. Recommended collection: Three separate stool specimens at least 24 hours apart. An individual requisition must be submitted for each specimen. Collection kit available upon request.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage or Stability:	Preserved stool: Ambient: 9 months;
Transport:	Fresh stool specimen: Ambient (within 1 hour) Stool preserved in 10% formalin and modified PVA: Ambient
Unacceptable Conditions:	Dry specimens, leaking containers, specimens contaminated with oil, barium or urine, multiple specimens (more than one in 24 hours), unpreserved specimens received >1 hour after collection, rectal swabs. Refrigerated or frozen.
Reference Range:	No ova or parasites seen
Limitations:	The ova and parasite exam does not include a test to specifically detect *Cyclospora, Isospora* or *Microsporidium.* For *Cyclospora* and *Isospora*, refer to Cyclospora or Isospora Detection. For *Microsporidium*, refer to Microsporidium Detection.
Additional Information:	Travel history, compromised immune status, clinical symptoms, previous parasitic infection, contact with either infected individuals or contaminated food/ water source or linked to a possible or known outbreak. Identification of *Cryptosporidium* spp. is considered significant and should be reported to the local or state public health agency.

Plesiomonas Culture

Methodology:	Culture
Test Code:	CXPLE
CPT Code:	87046
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must not be collected until > 48 hours after treatment has ceased.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C.
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, transfer specimen to an enteric transport media before transporting to the laboratory.
Unacceptable Conditions:	Unpreserved specimens not received on ice packs or > 24 hours old. Received in transport media not recommended for bacterial isolation or expired transport media. Specimen collected while on antibiotic therapy
Reference Range:	Isolated or Not isolated
Limitations:	N/A
Additional Information:	*P. shigelloides* has been implicated as a cause of gastroenteritis, which has been associated with drinking untreated water, eating raw seafood or travel to tropical countries.

Respiratory Pathogen Panel

Methodology:	Multiplex nucleic acid amplification
Test Code:	RTRPP
CPT Code:	87633
Requisition Required:	Microbiology

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Performed:	Weekly
Turnaround Time:	6 days
Specimen Required:	NP and/or throat swabs, NP/OP combo, lung tissue and nasal swab
Collection:	Place swabs in Viral Transport Media (VTM: M4, M4RT, M6).
Labelling	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C. for 72 hours; ≤ -20˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Swabs with calcium alginate, cotton tips, or wood shafts, specimens that are insufficient, leaking, not refrigerated or not labeled.
Reference Range:	Not detected
Limitations:	N/A
Additional Information:	Detects Influenza A and B; Parainfluenza virus 1, 2, 3, 4a and 4b; Adenovirus; Bocavirus; RSV subtypes A and B; Human rhinovirus/enterovirus; Human metapneumovirus; Coronavirus HKU1, NL63, OC43 and 229E; *Mycoplasma pneumoniae* and *Chlamydia pneumoniae*.

Salmonella Culture

Methodology:	Culture, serological typing (conventional and/or molecular)
Test Code:	CXSAL
CPT Code:	87045
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must be collected after 48 hours
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, place specimen in enteric transport media.
Unacceptable Conditions:	Unpreserved specimens not refrigerated, > 24 hours from time of collection, inappropriate or expired transport media, or collected while on antibiotic therapy
Reference Range:	*Salmonella spp* isolated or Not isolated
Limitations:	N/A
Additional Information:	Identification of *Salmonella* spp. is considered significant and should be reported to the local or state public health department immediately. The isolate will be serotyped using conventional Kauffman White Scheme.

SARS CoV-2 & Influenza A, B combo NAAT

Methodology:	Nucleic acid amplification test (PCR)
Test Code:	RTFSC; XPFSC
CPT Code:	87636
Requisition Required:	Microbiology
Performed:	Monday-Friday

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Turnaround Time:	48 hours
Specimen Required:	NP; nasal swabs (primary sources), Throat (accepted source)
Collection:	VTM, UTM, Saline
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Shipping:	Specimens must be packaged, shipped, and transported according to the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulation. Follow shipping regulations for UN 3373 Biological Substance, Category B when sending potential SARS CoV-2 specimens.
Storage and Stability:	Refrigerated: 2-8˚C. for 72 hours, If longer storage is required freeze at -70°C
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Swabs with calcium alginate, cotton tips, or wood shafts, specimens that are insufficient, leaking, not refrigerated or not labeled.
Reference Range:	Detected or not detected
Limitations:	The laboratory will not test specimen types other than listed above
Required Information:	When possible, include symptom status or test indication (e.g. symptomatic, asymptomatic)
Additional Information:	Detects SARS Coronavirus-2, Influenza A, and Influenza B

SARS-CoV-2, IgG

Methodology:	Chemiluminescent microparticle immunoassay (CMIA)
Test Code:	COVC
CPT Code:	86328
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Serum, plasma
Collection:	5-10ml of blood in EDTA for plasma and serum separator tubes for serum.
Labelling	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Specimens may be stored on or off the clot or red blood cells for up to 7 days refrigerated at 2-8°C or at room temperature for up to 48 hours. If testing will be delayed more than 7 days, remove serum or plasma from the clot, separator, or red blood cells and store frozen at -20°C.
Transport:	Refrigerate at 2-8°C
Unacceptable Conditions:	Excessively hemolyzed, grossly contaminated with bacteria, or otherwise extremely turbid
Reference Range:	Detected or Not detected
Limitations:	Negative results do not rule out SARS-CoV-2 infection. Follow-up testing should be considered. Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to inform infection status Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E
Additional Information:	N/A

Select Agents of Public Health Significance: Screening and Confirmation

Methodology:	Culture, serological, real-time PCR, Time-resolved Fluorescence

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Test Code:	RTENV, CXENV, various
CPT Code:	N/A
Requisition Required:	Microbiology
Performed:	Monday-Friday, with notification Saturday and Sunday
Turnaround Time:	Preliminary screening report: 1-2 days; Confirmation: 3- 7 days
Specimen Required:	Call the laboratory (414-286-3526)
Collection:	Call the laboratory (414-286-3526)
Storage and Stability:	Room temperature
Labeling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Shipping and Transport :	Call the laboratory (414-286-3526)
Unacceptable Conditions:	N/A
Reference Range:	N/A
Limitations:	N/A
Additional Information:	Select agents may include: *Francisella* spp., *Bacillus anthracis, Brucella* spp., *Yersinia* spp., and *Burkholderia* spp. Please contact the laboratory for identification of these or other high-risk organisms not on this list.

Shiga Toxin EIA

Methodology:	Enzyme Immuno-assay
Test Code:	SHIGA
CPT Code:	87045, 87046 x 4
Requisition Required:	Microbiology
Performed:	Monday-Friday Outbreak investigations may include testing outside these routine test dates.
Turnaround Time:	1-2 days
Specimen Required:	Stool, GN broth, Culture
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Shipping:	Must follow IATA or DOT guidelines.
Storage and Stability:	Refrigerated: 2-8˚C.
Transport:	Refrigerate at 2-8˚C and transported to the laboratory within 24 hours of collection.
Unacceptable Conditions:	N/A
Reference Range:	Shiga Toxin Detected or Not detected
Limitations:	Limit of detection for SLT-I and SLT-II are approximately 7 and 15pg/well respectively.
Additional Information:	Detection of Shiga toxin is performed by MHDL in outbreak situations through MHD-DCPD (Disease control and prevention division) department only. Identification of Shiga toxin producing *E. coli* (STEC) is considered significant and should be reported to the local or state public health agency.

Shigella Culture

Methodology:	Culture, serological typing
Test Code:	CXSHI
CPT Code:	87045
Requisition Required:	Microbiology

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Performed:	Monday-Friday
Turnaround Time:	2-5 days
Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must be collected after 48 hours
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, place specimen in enteric transport media.
Unacceptable Conditions:	Unpreserved specimens not refrigerated, > 24 hours from time of collection, inappropriate or expired transport media, or collected while on antibiotic therapy
Reference Range:	*Shigella* spp Isolated or Not isolated
Limitations:	N/A
Additional Information:	Identification of *Shigella* spp. is considered significant and should be reported to the local or state public health agency.

Syphilis, TP-PA

Methodology:	Passive Particle Agglutination
Test Code:	TPPA
CPT Code:	86780
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2-3 days
Specimen Required:	1-3 ml serum
Collection:	3-7 ml whole blood in serum separator tube
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8°C up to 7 days
Transport:	Refrigerate at 2-8°C within 48 hours of collection
Unacceptable Conditions:	CSF or other body fluids
Reference Range:	Nonreactive
Limitations:	The TP-PA test may be reactive in persons from areas where yaws or pinta was, or is, endemic. Samples from patients with HIV, Leprosy, Toxoplasmosis, H. pylori, or drug addiction may react, on occasion, with either the sensitized or the unsensitized particles, causing false-positive or inconclusive results. A reactive TP-PA test will remain reactive following treponemal infection; they should not be used to evaluate response to therapy.
Additional Information:	Test results should always be interpreted in conjunction with additional treponemal and/or non-treponemal serologic test results (as appropriate), the patient's clinical symptoms, medical history, and other clinical and/or laboratory findings to produce a diagnosis of syphilis by disease stage.

Syphilis Screen, EIA

Methodology:	Chemiluminescent microparticle immunoassay (CMIA)
Test Code:	SEIA
CPT Code:	86592
Requisition Required:	Microbiology

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Serum, plasma
Collection:	5-10 ml of whole blood in tube with separator (serum) or dipotassium EDTA (plasma)
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Shipping:	Must follow IATA or DOT guidelines.
Storage and Stability:	Refrigerated: 2-8°C up to 7 days
Transport:	Refrigerate at 2-8°C
Unacceptable Conditions:	Excessively hemolyzed, grossly contaminated with bacteria, or otherwise extremely turbid
Reference Range:	Reactive or Nonreactive
Limitations:	This test is intended for screening only, and requires appropriate confirmatory testing. A non-reactive result does not rule out a new syphilis infection.
Additional Information:	For a weakly reactive or reactive result, a reflex test for confirmation and titer will be added.

Syphilis, RPR, reflex non-treponemal test

Methodology:	Qualitative and quantitative nontreponemal macroscopic flocculation test
Test Code:	SRPR
CPT Code:	86592
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-3 days
Specimen Required:	Serum, plasma
Collection:	Serum: 7 ml of blood collected in tube with separator must be allowed to clot for 10 minutes prior to centrifugation Plasma: 5 - 10ml of blood collected in dipotassium EDTA containing tube. Minimum of 500µl of plasma is required for analysis
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Room temperature <72 hours Refrigerated: 2-8°C up to 5 days
Transport:	Refrigerate at 2-8°C
Unacceptable Conditions:	Excessively hemolyzed, grossly contaminated with bacteria, or otherwise extremely turbid
Reference Range:	Reactive or Nonreactive
Limitations:	This test is intended for screening only, and requires appropriate confirmatory testing. A non-reactive result does not rule out a new syphilis infection. Pinta, yaws, bejel and other treponemal diseases produce positive reactions in this test.
Additional Information:	For a weakly reactive or reactive result, a reflex test for confirmation and titer will be added.

Trichomonas vaginalis NAAT

Methodology:	Target Amplification Nucleic Acid Probe
Test Code:	TVAMP
CPT Code:	87661
Requisition Required:	Microbiology

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Performed:	Monday-Friday
Turnaround Time:	1- 2 days
Specimen Required:	Urine; vaginal swab
Collection:	Collect first-catch urine sample or swab and transfer to appropriate APTIMA Combo 2 Assay transport tubes. Swabs and transport tubes are available upon request.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Urine (unpreserved): Room temperature for 24 hours Urine in transport tube: Store at 2-30˚C. for 30 days Swabs in transport tube: Store at 2-30˚C. for 60 days or frozen for 12 months
Transport:	Refrigerate at 2-8˚C or room temperature
Unacceptable Conditions:	Any urine specimen transport tube with volumes above or below allowable levels, and any swab specimen transport tube with no swab, two swabs, or a swab not provided by manufacturer.
Reference Range:	Detected or Not detected
Limitations:	Assay is not intended for the evaluation of suspected sexual abuse or for other medico-legal indications.
Additional Information:	Patient should not have urinated for at least 1 hour prior to sample collection. Assay results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

Ureaplasma urealyticum Culture

Methodology:	Culture
Test Code:	CXUU
CPT Code:	87109
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2-7 days
Specimen Required:	Urethral or cervical swab preferred, urine, semen.
Collection:	Place specimen into M4 or appropriate media for Mycoplasma transport
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: Immediately at 2-8°C and transported on dry ice within 48 hours. Frozen: 1 month at -20°C.
Transport:	All specimens should be cultured immediately or refrigerated at 4°C and transported to the laboratory on ice within 4-6 hours of collection. If a delay of more than 6 hours is expected, the specimens should be frozen at -70°C and transported on dry ice within 24-36 hours.
Unacceptable Conditions:	M4-RT, swabs in culturettes, and dry swabs
Reference Range:	Isolated or Not isolated
Limitations:	N/A
Additional Information:	Specimens are cultured using agar-broth technique. Confirmation is by microscopy.

Varicella-Zoster Virus (VZV) PCR

Methodology:	Qualitative Real-Time Polymerase Chain Reaction
Test Code:	RTVZV
CPT Code:	87798

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	1-2 days
Specimen Required:	Vesicle swab
Collection:	Vesicle swab: Collect and place in Viral Transport Media (VTM: M4, M4RT, M6).
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C. for 48 hours; ≤ -20˚C for up to 7 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Swabs with calcium alginate, cotton tips, or wood shafts, specimens that are insufficient, leaking, not refrigerated or not labeled
Reference Range:	Not detected
Limitations:	N/A
Additional Information:	This assay may be useful in distinguishing VZV infection from the vesicles or rashes associated with herpes simplex virus (HSV), measles, rubella, pox viruses and other causes. HSV, measles, and rubella RT-PCRs are also available.

Virus Isolation and Identification

Methodology:	Cell Culture
Test Code:	VIRUS
CPT Code:	87252, 87253
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	2- 14 days
Specimen Required:	Collect appropriate specimen, e.g. NP and/or throat swabs, stools or rectal swabs, genital swab, CSF, whole blood
Collection:	Urine: Collect 10-15 mL in a sterile container (minimum volume: 10 mL) Swabs, Biopsy/tissue specimens: Collect and place in Viral Transport Media (VTM: M4, M4RT, M6) Bronchial washes, BALs, or CSF: 1 ml in VTM Liquid stool (1 ml) or marble size solid stool collect and place in VTM Whole blood: 2 ml in tube containing EDTA or heparin
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C for 7 days
Transport:	Refrigerate at 2-8˚C.
Unacceptable Conditions:	Dry swabs, wooden swabs, calcium alginate swabs, and swabs in gel transports; Rectal swabs or stool preserved in formalin, SAF, or PVA; Specimens in bacterial transport media; non-sterile or leaking containers
Reference Range:	Not isolated
Limitations:	Several viruses, such as Norovirus are not culturable. These viruses are best detected by nucleic acid amplification tests (NAATs).
Additional Information:	Multiple cell lines are used to isolate and identify viruses

Yersinia enterocolitica Culture

Methodology:	Culture
Test Code:	CXYER
CPT Code:	87046
Requisition Required:	Microbiology
Performed:	Monday-Friday
Turnaround Time:	3-7 days

The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

Specimen Required:	Stool
Collection:	Collect stool in appropriate leak-proof container or place in enteric transport medium such as Cary-Blair, Amies, or Stuart's. Collection kit is available upon request. Stools must be collected before antibiotic treatment is initiated for greatest chance of isolation of pathogens. If antibiotic treatment has been initiated stool must not be collected until > 48 hours after treatment has ceased.
Labelling:	Minimum of two primary patient identifiers (e.g., patient first and last name, date of birth, unique patient identifier from time of collection, such as medical record number) on the specimen container and on the test requisition.
Storage and Stability:	Refrigerated: 2-8˚C
Transport:	Refrigerate at 2-8˚C. If unpreserved stool is not transported to the laboratory within 24 hours of collection, transfer specimen to an enteric transport media before transporting to the laboratory.
Unacceptable Conditions:	Unpreserved specimens not received on ice packs or > 24 hours old. Received in transport media not recommended for bacterial isolation or expired transport media. Specimen collected while on antibiotic therapy
Reference Range:	*Y. enterocolitica* Isolated or Not isolated
Limitations:	N/A
Additional Information:	Identification of *Y. enterocolitica* should be reported to the local or state public health department immediately.