Additional Reportable Diseases
(includes: Amebic meningitis, Baylisascariasis, Chagas disease, Echinococcosis, Histoplasmosis, Smallpox, Taeniasis or Cysticercosis, Typhus, Vancomycin-resistant *Staphylococcus aureus*)

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To understand the epidemiology of emerging diseases in Washington State residents and to inform public health and health care organizations about conditions that have been diagnosed in residents.
2. To assist in the diagnosis and treatment of cases.
3. If applicable, to identify potentially exposed close contacts, health care workers, and laboratory personnel and to provide counseling.
4. To identify sources of transmission and to prevent further transmission.

B. Legal Reporting Requirements

1. Health care providers and health care facilities: amebic meningitis or smallpox ***immediately*** notifiable to **local health jurisdiction**; baylisascariasis or vancomycin-resistant *Staphylococcus aureus* notifiable to **local health jurisdiction** within in 24 hours; Chagas disease, cysticercosis, echinococcosis, histoplasmosis, taeniasis or typhus notifiable to **local health jurisdiction** within 3 business days.
2. Laboratories: amebic meningitis or smallpox *immediately* notifiable to the **local health jurisdiction**, submission required – specimen associated with positive result, if available, 2 business days; *Baylisascaris* or vancomycin-resistant *Staphylococcus aureus* notifiable to **local health jurisdiction** within in 24 hours, submission required – specimen associated with positive result, if available, 2 business days; *Echinococcus granulosus* or *E. multilocularis*, *Rickettsia typhi*, *Taenia solium*, or *Trypanosoma cruzi* notifiable to **local health jurisdiction** within 2 business days, submission required – specimen associated with positive result 2 business days; *Histoplasma capsulatum* notifiable to **local health jurisdiction** within 2 business days, submission required – isolate within 2 business days, submission on request – serum with positive result within 2 business days
3. Veterinarians: animal cases of some conditions notifiable to Washington State Department of Agriculture https://app.leg.wa.gov/WAC/default.aspx?cite=16-70
4. Local health jurisdictions: amebic meningitis or smallpox **immediately notifiable to the Washington State Department of Health (DOH) Office of Communicable Disease Epidemiology (CDE) at 206-418-5500 or 877-539-4344.**

C. Local Health Jurisdiction Investigation Responsibilities

1. Responsibilities are dependent on the disease under investigation. Report any immediately notifiable condition to CDE.
2. Report any case to CDE through the Washington Disease Reporting System (WDRS) as a Rare Disease, including entering the specific disease in the Clinical and Laboratory tab.

2. THE DISEASES AND THEIR EPIDEMIOLOGY

This guideline covers notifiable conditions that may have exposures within or outside of Washington. According to the 2023 revision of Washington Administrative Code (WAC) 246-101, the conditions are included in the WAC's individual tables for health care providers, health care facilities, laboratories or veterinarians. Conditions that should be reported by local health jurisdictions to the Office of Communicable Disease Epidemiology (CDE) and entered in WDRS as Rare Diseases include:

Amebic meningitis (*Acanthamoeba*, *Balamuthia*, *Naegleria*)*
Baylisascariasis+
Chagas disease*
Cysticercosis*
Echinococcosis
Histoplasmosis*
Smallpox
Taeniasis
Typhus*
Vancomycin-resistant *Staphylococcus aureus* (enter in WDRS under Highly Antibiotic Resistant Organism)

* Condition not generally considered to be endemic to the state recently identified in a Washington resident with exposure in an endemic area

+ Two locally acquired *Baylisascaris* infections have been reported—one in 2017 and one in 2022

Additional conditions investigated by local health jurisdictions can be entered under the Additional Reportable Disease code in WDRS to document workload if desired. The Washington State Annual Communicable Disease Report has a summary of notifiable condition cases.

3. CASE DEFINITIONS

National cases definitions are available for: free-living amebae infections, histoplasmosis, smallpox, and varicella-associated death can be found at: https://ndc.services.cdc.gov/. Additional case definitions may have been developed by the Office of Communicable Disease Epidemiology.

4. DIAGNOSIS AND LABORATORY SERVICES

Appropriate diagnostic testing depends on the suspected agent. Commercial laboratory tests may be unreliable for many of these diseases so confirmation by a reference laboratory may be appropriate. See Section 6 for brief reviews of diagnostic testing for selected conditions. Consult with Office of Communicable Disease Epidemiology (CDE) for assistance with interpreting results, diagnosis and testing (206-418-5500).

Note that Washington State Public Health Laboratories (PHL) require all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

The PHL Microbiology Test Menu lists specific agents by scientific name, (i.e., genus) and includes appropriate shipping temperatures and container: https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu

Biothreat Environmental Chain of Custody form: https://doh.wa.gov/sites/default/files/legacy/Documents/Pubs/302-019-PHLBiothreatEnvironmentalSampleSubmissionChainOfCustody.pdf

5. ROUTINE CASE INVESTIGATION

The case investigation depends on the suspected agent, its mode of transmission, and its communicability. In general, evaluate the diagnosis for a reported case including obtaining copies of prior laboratory reports. To arrange confirmatory testing call Office of Communicable Disease Epidemiology (CDE) (206-418-5500). Determine if others are at risk, either by sharing the case's exposure or by being exposed to a case. See Section 6 for brief descriptions of investigations for selected conditions. Consult with CDE for assistance with performing a public health investigation for other agents. The Reportable Disease reporting form is available at: https://doh.wa.gov/sites/default/files/2022-12/210-067-ReportFormReportableDiseases.pdf

Infection control measures depend on the suspected agent (see Section 6). Health care settings should institute airborne precautions for suspected smallpox. Consult with CDE if needed.

6. MANAGING SPECIFIC DISEASES

Notifiable conditions briefly described below should be reported to Office of Communicable Disease Epidemiology (CDE). Conditions with a national case definition have year of last revision of the case definition: https://ndc.services.cdc.gov/. Testing availability at Department of Health (DOH) or CDC is indicated. Vancomycin-resistant *Staphylococcus aureus* is reported in WDRS as Highly Antibiotic- Resistant Organisms.

A. Amebic Meningitis (*Naegleria fowleri, Balamuthia mandrillaris, Acanthamoeba spp.*)

1. Disease and its epidemiology:

   - Agents and conditions: *Naegleria fowleri* – Primary amebic meningoencephalitis (PAM); *Balamuthia mandrillaris* – Granulomatous encephalitis (GAE) (non-notifiable *Balamuthia* conditions: dermatitis, pneumonitis); *Acanthamoeba spp.* – Granulomatous amebic encephalitis (GAE) (non-notifiable *Acanthamoeba* conditions: dermatitis, pneumonitis, corneal lesions)
   - Illness: meningoencephalitis – acute onset of severe headache, fever, vomiting followed by stiff neck, confusion, seizures, hallucinations that is usually fatal within 3-7 days; granulomatous disease – progressive lesions, rhinitis, pneumonitis
   - Incubation period: 1-14 days

- Differential diagnosis: cryptococcosis, cysticercosis, bacterial meningitis, viral meningitis, intracranial hemorrhage, connective tissue disease, malignancy, rabies, taeniasis, toxoplasmosis, tuberculosis
- Reservoir:
    i. *Naegleria fowleri* and *Acanthamoeba* spp. Found worldwide in warm freshwater (lakes, rivers, and hot springs); contaminated tap water; poorly maintained swimming pools, water parks and splash pads; and soil. In this country mainly but not entirely southern tier states; recent Midwest cases.
    ii. *Balamuthia mandrillaris*: Found worldwide in dust and soil (thought to be primary source of infection) and also found in fresh water. Cases of *Balamuthia* infection in 2017 and 2022 had in-state exposures.
- Transmission
    i. *Naegleria fowleri* and *Acanthamoeba* spp: Exposure via contaminated water entering the nose by swimming, diving, facial submersion, sinus irrigation (e.g., neti pot) with passage via olfactory nerve to the brain and meninges
    ii. *Balamuthia mandrillaris*: Exposure via break in the skin or inhalation of dust containing *Balamuthia,* exposure to fresh water containing *Balamuthia* is possible
- Communicability: none; *Balamuthia* has been transmitted by organ transplant
- Treatment of severe infections with antiparasitic agents; poor success. Provider can consult CDC 24/7 (404-718-4745 or 770-488-7100) about diagnosis and treatment including miltefosine.

2. Case definition (2012) https://ndc.services.cdc.gov/case-definitions/free-living-amebae-infections-2012/
   Confirmed: Presentation of meningoencephalitis or encephalitis with laboratory confirmation (detection of *Naegleria fowleri*, *Balamuthia mandrillaris or Acanthamoeba* antigen, nucleic acid, or organism from a clinical specimen via direct fluorescent antibody, PCR, or microscopy, respectively.)

3. Diagnosis and laboratory services: CDE can arrange testing at CDC. Submit CSF, biopsy, or tissue specimens with microbiology/parasitology form (see Section 4). CDC is developing a genotyping system for *Balamuthia* and their preferred sample is fresh/frozen brain tissue (0.5 to 1.0 g) that has not been preserved with formalin. If CSF (0.5 to 1.0 mL) is available, they can receive that as well.
4. Routine case investigation: identify recent freshwater activities, use of undertreated pools, use of nasal irrigation systems, non-sterile cleaning of contact lenses
5. Controlling further spread: address water source
6. Routine prevention: consider nasal clips during swimming; use sterile water in nasal irrigation systems (neti pots) and for cleaning contact lenses

7. Resources:
   https://www.cdc.gov/naegleria/site.html
   https://www.cdc.gov/parasites/acanthamoeba/
   https://www.cdc.gov/balamuthia/about/
   For providers: https://www.cdc.gov/parasites/hcp/clinical-overview/?CDC_AAref_Val=https://www.cdc.gov/parasites/health_professionals.html

B. Baylisascariasis

1. Disease and its epidemiology:

   - Agent is roundworm *Baylisascaris* primarily *B. procyonis* (raccoons; United States, Europe, and Japan)
   - Illness: varies with dose and where in the body the larvae migrate; invasion of the liver may cause nausea, tiredness, hepatomegaly; spinal cord infection can result in loss of muscle control; neural larvae migrans (cerebral infection) can result in encephalitis; or eye involvement can cause sensitivity to light, inflammation of the eye, and lead to blindness. Consider baylisascariasis in cases of eosinophilic meningitis, particularly among young children and persons with developmental delays.
   - Incubation period: 1 – 4 weeks
   - Differential diagnosis: varies with symptoms; consider other nematode infections (e.g., ascariasis, trichuriasis, hookworm, enterobiasis, strongyloidiasis, filariasis, trichinosis, dirofilariasis, or angiostrongyliasis)
   - Reservoir in Washington is raccoons; racoons in Washington are infected at a high rate, estimated around 70-80%. Eggs develop to maturity in the raccoon's intestine, where adults produce millions of eggs that are passed in the feces. Freshly excreted eggs passed in raccoon feces are not immediately infectious; they take 2-4 weeks in the environment to embryonate and become infectious. The eggs are resistant to most environmental conditions and can survive for years. Dogs can be hosts for *Baylisascaris* and can pass eggs in feces either from infection or through ingestion and passage.
   - Transmission: through ingesting contaminated soil, water, feces, or objects
   - Communicability: none
   - Treatment

   In cases where suspicion of exposure is high, immediate treatment with albendazole (25-50 mg/kg per day by mouth for 10 – 20 days) may be appropriate. Treatment is successful when administered soon after exposure to abort the migration of larvae. Indications for immediate treatment may include known or suspected oral exposure to raccoon feces. Treatment should be initiated as soon as possible after ingestion of infectious material, ideally within three days. If albendazole is not immediately available, mebendazole or ivermectin may be used in the interim.

For clinical baylisascariasis, treatment with albendazole, at the dose given above, with concurrent corticosteroids to help reduce the inflammatory reaction is indicated to attempt to control the disease.

2. Case definition
    a. *Confirmed:* No CDC definition – consult with CDE for suspected case
3. Diagnosis and laboratory services:

    Diagnosis can be difficult; diagnostic findings include eosinophilic pleocytosis, peripheral eosinophilia, abnormalities on MRI, and positive *Baylisascaris* antibody titers on serologic testing of CSF and serum. Neuroimaging and encephalography may assist with identifying neural larva migrans. Ocular examinations may reveal a migrating larva, larval tracks, or lesions consistent with presence of a nematode larva in the eye. CDE can arrange testing at CDC or request case consultation from CDC including review of imaging. Submit serum, CSF, biopsy, or tissue specimens with microbiology/parasitology form (see Section 4). Serological testing for other nematode infections should be considered and may help to diagnose other causes of larva migrans if *Baylisascaris* serology is negative. Testing animal feces for the presence of *Baylisascaris* eggs can be coordinated through a veterinary diagnostic laboratory.
4. Routine case investigation: determine any potential exposure to raccoon feces, particularly in a play area for children or a work area for adults, and identify any others sharing that exposure
5. Controlling further spread: any identified animal feces in the suspected exposure area or raccoon latrines should be removed and burned, buried, or sent to a landfill. Most chemicals do not kill roundworm eggs; however, high heat kills the eggs instantly and boiling water or a blowtorch can be used for clean-up.
6. Routine prevention: avoid contact with raccoon and their feces, particularly raccoon dens or latrines. Recommend prophylactic albendazole for confirmed oral exposure to raccoon feces. Promptly remove any feces identified while using appropriate precautions. Outside surfaces such as decks or patios can be treated with boiling water or a propane torch.

    Discourage raccoons from living in and around the home by preventing access to food, keeping trash containers tightly closed, closing off access to attics and basements, covering sandboxes when not in use, eliminating water sources, removing bird feeders, and clearing brush.
7. Resources: https://www.cdc.gov/parasites/baylisascaris/

C. Chagas disease (American trypanosomiasis)

1. Disease and its epidemiology:

    - Agent is protozoan parasite *Trypanosoma cruzi*
    - The severity and course of infection varies based on age at infection, transmission route, and strain. There are two phases of disease, acute and chronic. Acute phase may be asymptomatic or involve weeks to months of fever, rash, headache, body aches, eyelid swelling, loss of appetite, diarrhea, and vomiting. Hepatomegaly,

splenomegaly, lymphadenopathy, or chagoma (swelling at the site of the bite) may be present. Acute symptoms generally resolve within a few weeks or months, but if a person is not treated with antiparasitic medication, the infection persists and enters the chronic phase. Chronic phase is lifelong in the absence of treatment and is usually asymptomatic (indeterminate form); 20-30% of infected people may develop symptoms (determinate form) years to decades after the acute infection. The two major determinate forms of Chagas disease are:

- Chagas cardiomyopathy – this is the most common clinical manifestation, which results from a chronic inflammatory process that damages the conduction system. Early signs include conduction system abnormalities, segmental left ventricular wall motion abnormalities; later manifestations may include tachycardia, bradycardia, high degree atrioventricular blocks, apical aneurysm, and congestive heart failure. Chagas cardiomyopathy is more common in men.
- Gastrointestinal Chagas disease, which affects the esophagus or colon and presents with dysphagia, weight loss, aspiration, regurgitation, prolonged constipation, or abdominal pain. Gastrointestinal Chagas disease is thought to be caused by *T. cruzi* genotypes that predominate in South America.

Patients diagnosed in the United States will usually be in the chronic phase; either asymptomatic or presenting with chronic disease. Reactivation disease can occur when a chronically infected patient becomes immunosuppressed. Positive serology at blood donation typically reflects prior asymptomatic infection. Illness is more severe in immunocompromised persons or in younger children; <5% die from myocarditis or meningoencephalitis during the acute phase of illness.

- Incubation period: 5-14 days for bug bite; transfusion- and transplant-associated cases may have a longer incubation period, up to 120 days
- Differential diagnosis varies with presentation: acute (leishmaniasis, malaria, meningitis), cardiac (angina/infarct, arrhythmias, dilated cardiomyopathy), intestinal (acute or chronic megacolon, esophageal abnormality, obstruction)
- Reservoirs include humans, dogs, armadillos, opossums, raccoons, some rodents, and other animals.
- Chagas disease is common in parts of Mexico, Central America, and South America, where an estimated 8 million people are infected. Chagas diseases is also rarely transmitted in the United States; reservoirs and vectors occur in some southern and southwestern states. Cases reported in Washington generally report exposures in Central or South America. CDC estimates more than 300,000 persons with *Trypanosima cruzi* infection live in the United States, most infected in parts of Latin America where Chagas disease is found.
- Transmission: mainly through triatomine bug (reduviid or “kissing” bugs) feces contaminating the bug bite (stercorarian transmission), broken skin, or mucous membrane (eye), less commonly by food containing bug feces, congenital infection, blood transfusion, organ transplant, or laboratory exposure. In the United States, maternal-to-infant transmission rate of *T. cruzi* is 1-5%. If left untreated, 20-40% of infected infants will later develop cardiac manifestations.

- Communicability only congenitally or through blood transfusion or organ transplant
- Treatment with antiparasitic medication is recommended for acute infection, congenital infection, reactivated infections, pediatric chronic infections, infections in immunosuppressed persons, and chronic infection in adults up to 50 years old without advanced cardiomyopathy. For adults >50 years with chronic infection, the decision to treat should be individualized. Treatment is with antiparasitic medications (nifurtimox and benznidazole) combined with appropriate medical management of chronic complications. CDC is available for treatment consultations.

2. Case definition (2025)

A. Laboratory Criteria:

Acute Chagas Disease

Confirmatory:

- Visualization of *T. cruzi* by microscopy (e.g. wet mount-microscopic examination, thick and thin smears-Giemsa stain) performed on any tissue or body fluid, OR
- Detection of *T. cruzi* DNA by molecular testing (e.g., NAAT, metagenomic sequencing) performed on any tissue or body fluid

Congenital Chagas Disease

Confirmatory:

- Visualization of *T. cruzi* by microscopy (e.g. wet mount-microscopic examination, thick and thin smears-Giemsa stain) performed on any tissue or body fluid (collected from the fetus or infant within three months of delivery), OR
- Detection of *T. cruzi* DNA by molecular testing (e.g., NAAT, metagenomic sequencing) performed on any tissue or body fluid (collected from the fetus or infant within three months of delivery)

Chronic Chagas Disease

Confirmatory:

- Detection of IgG antibodies specific to *T. cruzi* by at least two diagnostic tests using two different antigen preparations

Presumptive:

- Detection of IgG antibodies specific to *T. cruzi* by a single diagnostic test, OR
- Positive blood, organ, or HCT/P donor screen for *T. cruzi*

B. Epidemiological Linkage Criteria

Acute Chagas Disease

- Suspected triatomine bug exposure (e.g. bite, triatomine found in bed, etc.) within the 3 months prior to specimen collection, OR
- Residence for at least 6 months in a Chagas endemic country*, which concluded within the 3 months prior to specimen collection, OR
- History of donor-derived infection in the recipient of organ or HCT/P

transplant within the 3 months prior to specimen collection, OR
- History of donor-derived infection in the recipient of a blood transfusion within the 3 months prior to specimen collection

**Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela*

Chronic Chagas Disease
- Gestational parent that delivered a fetus or infant with confirmed congenital T. cruzi infection

C. Case Classifications

Acute Chagas Disease

Confirmed: Meets acute Chagas disease confirmatory laboratory evidence AND acute Chagas disease epidemiologic linkage criteria.

Congenital Chagas Disease

Confirmed: A fetus (≥20 weeks or ≥350g) or an infant who meets congenital Chagas disease confirmatory laboratory evidence in the absence of other known routes of transmission.

Chronic Chagas Disease

Confirmed: Meets chronic Chagas disease confirmatory laboratory evidence.

Probable:
- Meets all chronic Chagas disease presumptive laboratory evidence criteria, OR
- Meets one chronic Chagas disease presumptive laboratory evidence criterion AND chronic Chagas disease epidemiologic linkage criterion.

Suspect: Meets only one chronic Chagas disease presumptive laboratory evidence criterion.

3. Diagnosis and laboratory services: The sensitivities and specificities of currently available serologic assays are not high enough for a single assay to be used alone. If no exposure risks but a screening test returns positive, retest commercially. Blood donor screening tests are not appropriate for clinical diagnostic purposes and additional testing is indicated. Acute infections, including congenital infections, can be diagnosed by microscopy or PCR; PCR can also be used to monitor after known accidental or iatrogenic exposure, or to test for reactivation. Chronic infections are diagnosed through serologic testing; the standard approach applies two or more different test types (such as ELISA and IFA). If risk factors and a commercial positive serology test, CDE can arrange confirmatory testing at CDC https://www.cdc.gov/laboratory/specimen-submission/ Submit serum with the appropriate requisition form (see Section 4).
4. Routine case investigation: If only a single modality of serology is positive, obtain the serum specimen for confirmatory testing at CDC (see above). Refer chronic case for

examination and EKG. Identify travel exposures including blood transfusions in endemic areas, bug bites, and exposure to bug habitats with emphasis on possible U.S.-acquired infection. Birth to a parent with possible exposure and congenital transmission is also a risk. Identify and test all blood donors or recipients associated with a case, as well as persons with possible shared exposure (e.g. family members). If the patient has had children since their possible exposure, testing is recommended for offspring regardless of current age.

5. Case investigations for currently pregnant persons: if an individual is currently pregnant at the time of Chagas disease confirmation, or if exposure history is consistent with possible Chagas disease exposure AND confirmatory testing is pending (ie. one modality of serologic testing is positive), infant testing is recommended. Recommended infant testing includes: 1) cord blood collected at birth or whole blood collected <6 weeks after birth should be tested by PCR and examined by microscopy (Giemsa stain for *T. cruzi* trypomastigotes), 2) whole blood collected at 4-6 weeks of age should have repeat microscopic examination of blood smear and PCR, 3) serology at 9-12 months of age. Testing is available at CDC and can be coordinated by CDE. If all testing is negative, congenital Chagas disease is excluded. If any testing is positive, the infant should be further evaluated for treatment; contact CDE.
6. Controlling further spread: No isolation or restrictions apply. Early detection and treatment of new cases, including congenital cases. Defer donating blood if ever diagnosed with Chagas. Educate those sharing case's exposure about Chagas, as well as any children potentially born after infection in birth parent occurred.
7. Routine prevention: in risk area use bed nets, protective clothing, and insect repellents. In the US, blood donations and organ donors are screened for Chagas. Screening of at-risk persons during pregnancy can identify maternal infection and allow early assessment and treatment for congenital *T. cruzi* infection. Targeted screening for Chagas disease using a commercially available serologic assay is recommended for the following individuals: pregnant persons who have lived in a region of endemicity or who have other risk factors for Chagas disease, offspring of a birth parent diagnosed with Chagas disease if born after the birth parent was likely infected, persons reporting shared exposure with a person with confirmed Chagas disease (e.g. family members of confirmed case with shared residence in endemic area), persons who were born in or lived for >6 months in areas of Mexico, Central, or South America with endemic Chagas disease. A guide for healthcare facilities to establish Chagas disease screening is available from Boston Medical Center here: https://sites.bu.edu/chagas/files/2023/04/INSECT-handbook.pdf
8. Resources: Chagas disease – https://www.cdc.gov/parasites/chagas/ and
   https://www.cdc.gov/chagas/hcp/diagnosis-testing/index.html and
   Chagas Biovigilance Network –
   https://www.aabb.org/research/hemovigilance/Pages/chagas.aspx
   Recommendations for Screening and Diagnosis of Chagas Disease in the United States - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9071346/
   Evaluation and Treatment of Chagas Disease in the United States -
   https://jamanetwork.com/journals/jama/fullarticle/209410
   Evaluation and Management of Congenital Chagas Disease in the United States -
   https://academic.oup.com/jpids/article/8/5/461/5477433?login=true

A Guide to Setting up Screening for Chagas Disease in Outpatient Settings - https://sites.bu.edu/chagas/files/2023/04/INSECT-handbook.pdf

D. Echinococcosis

1. Disease and its epidemiology:

- Agent is one of several species of *Echinococcus*, *E. granulosus* (cystic echinococcosis or hydatid disease), *E. multilocularis* (alveolar echinococcosis), *E. vogeli* (polycystic form of neotropical echinococcosis) and *E. oligarthrus* (unicystic form of neotropical echinococcosis). Life cycle is complex with intermediate and definitive hosts of different species. The definitive host for *E. granulosis* is dogs; sheep, cattle, goats, foxes, and pigs amongst others are intermediate hosts. The definitive hosts for *E. multilocularis* are foxes, coyotes, cats, and dogs; small rodents are the intermediate hosts.
- Illness: varies with infecting species and organ involved. Cystic echinococcosis causes slowly enlarging cysts. Liver and lung are most commonly involved, but cysts can occur in the spleen, kidneys, heart, bone, brain or eyes. Pain or discomfort in the upper abdomen or chest, nausea, vomiting, or coughing may occur as a result of the growing cysts. Rupture of a cyst can cause anaphylaxis as well as dissemination. Alveolar echinococcosis causes parasitic tumors in the liver, lungs, brain, and other organs. Pain or discomfort in the upper abdomen, weakness, and weight loss may occur as a result of the growing cysts.
- Incubation period: asymptomatic until cysts are large enough to affect an organ, which generally takes years to decades.
- Differential diagnosis: amoebic or bacterial abscess, fungal infection, malignancy, cirrhosis of the liver, tuberculosis, benign cysts.
- Transmission: accidental ingestion of eggs from *Echinococcus* tapeworms, generally either through hand-to-mouth transfer or direct ingestion of contaminated food or other items. This may include garden produce, berries, or other foraged goods contaminated with feces, contaminated water, or soil. Hand-to-mouth transfer may occur by petting an infected animal or other direct contact; fur may be contaminated. Cysts in the soil are environmentally stable and can survive freezing conditions. Dogs and other canids generally become infected through consumption of infected livestock carcasses (commonly sheep) or wild rodents. Infected animals then shed infectious eggs in their stool. Reservoir is wild and domestic canids, ungulates, and camels for *E. granulosus*, foxes, other canids and rodents for *E. multilocularis*, canids and rodents for *E. vogeli*, and wild felids, rodents and lagomorphs for *E. oligarthrus.*
- Communicability: none
- Treatment: surgery for cystic disease, with 1-6 months of antiparasitic therapy (benzimidazole such as albendazole), cyst puncture, and PAIR (percutaneous aspiration, injection of chemicals and reaspiration) as other options; two years of chemotherapy for alveolar disease but sometimes requiring radical surgery.

2. Case definition

Clinical Criteria:
Typical organ lesions detected by imaging techniques (for example, computerized tomography, sonography, MRI)

Laboratory Criteria:

Confirmatory:

- Histopathology or parasitology compatible with *Echinococcus spp.* (for example, direct visualization of the protoscolex in cyst fluid)
- Detection of *E. granulosis* pathognomonic macroscopic morphology of cyst(s) in surgical specimens
- Detection of *Echinococcus spp.* nucleic acid, such as by PCR or genomic sequencing, in a clinical specimen
- *Echinococcus* spp. specific serum antibodies by high-sensitivity serological test (indirect hemagglutination (IHA), indirect fluorescent antibody (IFA) tests, and enzyme immunoassays (EIA)) AND confirmed by a high specificity serological test (immunoblot)

Presumptive: *Echinococcus* spp. specific serum antibodies by high-sensitivity serological test (indirect hemagglutination (IHA), indirect fluorescent antibody (IFA) tests, and enzyme immunoassays (EIA)) without confirmatory serology performed.

Case Definition:

Confirmed: Confirmatory laboratory evidence and meeting clinical criteria

Probable: Presumptive laboratory evidence and meeting clinical criteria, OR
Confirmatory laboratory evidence without clinical or exposure information available

Suspect: Presumptive laboratory evidence without clinical information available or not meeting clinical criteria

3. Diagnosis and laboratory services: The presence of a cyst-like mass in a person with a history of exposure to dogs in an area where *E. granulosus* is endemic suggests a diagnosis of cystic echinococcosis (CE). Similarly, the presence of typical organ lesions in a person with a history of exposure to host species in an area where *E. multilocularis* is endemic suggests a diagnosis of alveolar echinococcosis (AE); AE is more commonly diagnosed in people of advanced age. Imaging techniques, such as CT scans, ultrasonography, and MRIs, are used to detect cysts, stage the condition of the lesion, and identify the presence of occult lesions. After a cyst, parasitic vesicle, or cyst-like structure has been detected, or a commercial serologic test results positive, additional serologic testing may be used to confirm the diagnosis. The definitive diagnosis is based on pathological-histological analysis of particularly periodic acid Schiff (PAS-) stained specimen of surgically resected tissues. Strain differentiation is not possible using histological analysis and is only available using molecular methods. CDE can arrange testing at CDC or request case consultation from CDC including review of imaging. Submit serum with requisition form (see Section 4). CDC immunoblot testing is to confirm *E. granulosis*; this test has an unknown potential to detect *E. multilocularis* and is unable to speciate. The University of Bern, Institute for Infectious Diseases offers

immunoblot specific for *E. multilocularis* as well as RT-PCR for speciation.

4. Routine case investigation: determine lifetime foreign travel/residence history and any potential exposure to likely host animals, particularly in a play area for children or a work area for adults, and identify any others sharing that exposure
5. Controlling further spread: if any concern for an ongoing exposure to an infected animal, provide prevention information
6. Routine prevention: prevent dog infections – do not allow dogs access to home slaughter or livestock carcasses, consult a veterinarian about preventive treatments; wash hands after handling dogs and before handling food, particularly in areas with endemic disease. Wash garden and wild-foraged produce prior to consumption.
7. Diagnosis of echinococcosis in an animal: if infection is in a carnivorous animal, identify any potential human exposures to the animal, its feces, or feces-contaminated environment. Consider animal owners and household members, veterinary and animal care staff, gardeners, and farm workers. All possibly exposed persons should be provided educational information about prevention measures. Animal owners should be encouraged to follow all recommendations from WSDA and their veterinarian. Consider prophylactic treatment (e.g. albedazole) for persons with known oral exposure to potentially infected feces. Until the infection is confirmed cleared, the animal should be kept as isolated as possible and only be allowed to defecate in a dedicated space that is easily decontaminated.
   If the infection is in a non-carnivorous animal, identify any carnivorous animals that may also share the environment, e.g. working farm dogs. Encourage owners to seek veterinary guidance for any resident carnivorous animals to screen for infection. If there is concern for infected carnivorous animals and screening is not an option, consider steps outlined above (#7). Encourage owners to prevent carnivorous owned animals from roaming and ingesting live or dead rodents or the viscera/organs of any livestock.
8. Resources: https://www.cdc.gov/echinococcosis/site.html

   https://apps.who.int/iris/handle/10665/42427

E. Histoplasmosis

1. Disease and its epidemiology:

- Agent is *Histoplasma capsulatum*, an environmental fungus found in soil that contains large amounts of bird or bat droppings.
- The majority of infections are asymptomatic. Illness may range from self-limited respiratory disease to disseminated infection. Symptoms of acute pulmonary histoplasmosis generally include fever, malaise, headache, cough, chest pain, and myalgias. Disseminated disease can occur in immunocompromised persons.
- Incubation is generally 3-17 days
- Differential diagnosis includes other fungal pneumonias, bacterial pneumonia, *Legionella*, *Mycoplasma* infections, pneumococcal infections, tuberculosis, cancer, viral pneumonia

- Transmission: generally through inhalation of spores from the air, often during activities that disturb the soil. Endemic areas include central and eastern United States, parts of Central and South America, Africa, Asia, and Australia. Cases have been reported in Washington in the absence of a travel history. Animals can also be infected, but animal-human transmission has not been documented.
- Communicability: none except rare organ transplant from infected donor
- Most infections self-resolve; treatment with antifungals is indicated for moderate to severe acute pulmonary, chronic pulmonary, disseminated, and CNS histoplasmosis

2. Case definition: (2017)

   Clinical presentation includes at least two of the following: fever, chest pain, cough, myalgia, shortness of breath, headache, or erythema nodosum/erythema multiforme rash **OR** at least one of the following: abnormal chest imaging; gastrointestinal ulcerations or masses, skin or mucosal lesions; peripheral lymphadenopathy; pancytopenia; enlargement of the liver, spleen, or abdominal lymph nodes; meningitis, encephalitis, or focal brain lesion(s)

   Confirmed: A clinically compatible case with evidence of *H. capsulatum* by any of: culture, histopathology, ≥4-fold rise in complement fixation (CF) antibody titers taken at least 2 weeks apart, detection of H band by immunodiffusion, documented seroconversion by detection of M band by immunodiffusion, or nucleic acid detection.

   Probable: A clinically compatible case with identification of *H. capsulatum* by any of: cytopathology, serum or CSF CF titer 1:32 or greater, detection of M band without a previously negative test, or antigen detection, OR a case that meets confirmatory laboratory criteria, but no clinical information is available, OR a clinically-compatible case that does not meet laboratory criteria but is epi-linked to a confirmed case (e.g. common environmental exposure).

3. Diagnosis and laboratory services: Commercial testing is available; CDE can arrange testing at CDC. Submit serum, CSF or fungal isolate with appropriate virology/serology or microbiology forms (see Section 4).
4. Routine case investigation: ask about travel to endemic area or potential exposure to soil, bird feces or bat feces. If endemic exposure is possible, ask detailed location information.
5. Controlling further spread: Educate those sharing a case's exposure about signs and symptoms of histoplasmosis
6. Routine prevention: Large amounts of bird or bat droppings should be cleaned up by professional companies that specialize in the removal of hazardous waste
7. Resources: https://www.cdc.gov/histoplasmosis/index.html

F. Smallpox

1. Disease and its epidemiology:
   - Agent is variola virus, considered extinct in nature; potential agent of bioterrorism
   - Illness begins as febrile flu-like illness followed by rash progressing through stages of macules, papules, vesicles, pustules, and scabs; rash at same stage of development on

a body area; no naturally-occurring cases worldwide since 1977

- Incubation period: 7-19 days
- Differential diagnosis: chickenpox/shingles, mpox, vaccinia (smallpox vaccine), measles, coxsackievirus , scabies, drug allergy, impetigo, insect bites, mox, rubella, molluscum contagiosum, mononucleosis, scarlet fever, syphilis, erythema toxicum
- Reservoir was humans, now only laboratory specimens exist
- Transmission: respiratory droplets and fomites or through deliberate release of weaponized material; scabs contain virus and are infectious even when dried
- Communicability is high through respiratory secretions while lesions are present
- Treatment is supportive; antivirals may be considered

2. Case definition (2004): https://ndc.services.cdc.gov/

   Suspect: case with fever followed in 1-4 days by generalized acute vesicular or pustular rash

   Probable: case with acute onset of fever ≥101º F (≥38.3º C) followed by a rash characterized by firm, deep seated vesicles or pustules in the same stage of development without other apparent cause OR clinically consistent case with epi link to a confirmed case

   Confirmed: laboratory confirmed case (PCR or virus isolation) OR case with acute onset of fever ≥101º F (≥38.3º C) followed by a rash characterized by firm, deep seated vesicles or pustules in the same stage of development on a body area without other apparent cause with epi link to a laboratory-confirmed case

3. Diagnosis and laboratory services: CDE can arrange testing; submit vesicle, scab, skin, and serum specimens (consult CDE first about specimens and use of protective equipment by health care providers) with virology/serology form (Section 4).
4. Routine case investigation: notify CDE immediately for suspected or confirmed case; evaluate the diagnosis particularly if lesions are deep-seated firm well-circumscribed vesicles or pustules at same stage of development and mpox and vaccinia have been ruled out. Recommend appropriate health care personal protective equipment. Submit with the bioterrorism form (Section 4): 10 ml serum; three lesions (skin top layer, glass slide touched to scraping of lesion base, EM grid or swab touched to base of open lesion); scabs; full thickness skin punch-biopsies.
5. Controlling further spread: strict contact and airborne precautions in health care setting; strict isolation at home; consider quarantine for exposed persons including travel contacts
6. Routine prevention: no routine vaccination
7. Resources: https://www.cdc.gov/smallpox/index.html

G. Taeniasis/Cysticercosis

1. Disease and its epidemiology:
   - Agent is species of *Taenia* parasites including *T. saginata* (beef tapeworm), *T. solium*

(pork tapeworm) and *T. asiatica* (Asian tapeworm) which have complex life cycles involving cysts in muscle tissue and eggs in feces. Taeniasis is caused by ingestion of cysts leading to tapeworm infection. Cysticercosis is caused by ingestion of eggs.

- Illness: Taeniasis most commonly results in no symptoms or mild symptoms. Symptoms due to intestinal tapeworms include abdominal pain, loss of appetite, or weight loss which may be more pronounced for the larger *T. saginata* (to several meters in length). Infection with *T. solium* eggs passed from a person with taeniasis can result in cysticercosis including involvement of various organs (eye, heart, skin, muscles) or neurocysticercoses resulting in seizures, confusion, loss of balance, chronic meningitis, hydrocephalus, or death. Epilepsy is the most common presentation of neurocysticercoses. *T. asiatica* may affect the liver.
- Incubation period: adult tapeworms develop within 2 months of ingestion and can survive for up to 5 years. Cysticercosis develops over a period of months to years after infection when degenerating cysts cause an inflammatory response and resulting swelling.
- Differential diagnosis: varies with symptoms; can include other parasitic intestinal infections, brain abscess, tuberculosis, neurosarcoidosis, malignancy
- Reservoir is cattle for *T. saginata*, pigs and swine for *T. solium*, and pigs and swine for *T. asiatica*; a particular risk for pigs or swine as the source is their opportunity to consume human feces
- Transmission: ingesting contaminated food, soil, water or objects; tapeworm infection results from consuming food (commonly raw or undercooked contaminated beef or pork) containing cysts while neurocysticercosis results from ingesting tapeworm eggs; *T. solium* eggs in human feces of a tapeworm carrier can cause infection in a person (including repeat autoinfection).
- Communicability: A person with taeniasis caused by *T. solium* passes infectious eggs in their stool; ingestion of these eggs can cause cysticercosis.
- Treatment: praziquantel or alternative niclosamide for taeniasis. For cysticercosis, the most urgent therapeutic interventions are aimed at managing the neurological complications, and may require anticonvulsant therapy, corticosteroids, neurosurgical intervention and/or treatment of increased intracranial pressure. Anthelminthic treatment may be indicated, but must be administered with caution, because larval death provokes an inflammatory response that may increase symptoms. Concomitant steroids are usually indicated.

2. Case definition
    a. *Confirmed:* No CDC definition – consult with CDE for suspected case
3. Diagnosis and laboratory services: serologic testing and neuroimaging for cysticercosis are available commercially. If needed, CDE can arrange testing at CDC. Submit serum with virology/serology form (see Section 4). Taeniasis is confirmed through identification of Taenia eggs, proglottids, or scolex in a fecal or pathological specimen. *T. saginata* and *T. asiatica* can be difficult to distinguish.

4. Routine case investigation: Taeniasis: determine unusual meat consumption, particularly wild game from a commercial source or meals during international residence or travel and identify any others sharing that exposure. Cysticercosis: infected person should be tested for taeniasis; family members should also be tested depending on exposure history.
5. Controlling further spread: Prevent fecal-oral transmission of *Taenia* eggs from the feces of an infected patient to avoid cysticercosis. Infected persons should adhere to good hygiene practices and not prepare food for others until infection is cleared. Food handlers should stop work and persons who work with animals should avoid contact with cattle and pigs until infection is cleared (two negative fecal specimens collected on different days following treatment). The patient and household contacts should be screened for cysticercosis if taeniasis is confirmed.
6. Routine prevention: thoroughly cook beef and pork; avoid contact with cattle or pig feces in affected regions, practice good hand hygiene
7. Resources: https://www.cdc.gov/cysticercosis/site.html

H. Typhus

1. Diseases and their epidemiology:
   - Agents are *Rickettsia typhi* or *R. felis* (flea-borne: endemic or murine typhus) and *R. prowazekii* (louse-borne: epidemic typhus). Flea-borne typhus occurs in tropical and subtropical climates, including southern California, Hawaii, and Texas. Reservoirs for flea-borne are rats (reported from tropics and subtropics), reservoirs for louse-borne are humans (Andes region of South America, Burundi, Ethiopia) and rarely flying squirrels in eastern United States.
   - Illness is febrile rash illness for louse-borne with case fatality rate up to 40% if untreated; milder illness for flea-borne. Common symptoms can include fever, myalgias, rash, cough, nausea, and vomiting.
   - Incubation period 7 to 14 days.
   - Differential diagnosis: ehrlichiosis/anaplasmosis, mononucleosis, leptospirosis, spotted fever rickettsiosis, syphilis, tularemia, typhoid
   - Transmission: infected flea or louse feces entering a wound; fleas and lice typically defecate while feeding. Contaminated dust can also be inhaled or contaminate mucous membranes.
   - Communicability for louse-borne is through human body lice.
   - Treatment is with doxycycline for both; for louse-borne also use a pediculicide.
2. Case definition

   Probable: Clinically compatible illness with single IgM or IgG antibody titer

   Confirmed: Clinically compatible illness with confirmatory laboratory including fourfold antibody rise, PCR positive, or positive immunohistochemical stain
3. Diagnosis and laboratory services: CDE can arrange testing at CDC. Submit serum and tissue samples with appropriate virology/serology or microbiology forms (Section 4).

4. Routine case investigation: notify CDE immediately for suspected or confirmed case; obtain appropriate specimens as soon as possible for testing. Assess exposure history; infections acquired in the United States will be reported by CDE to the state where exposure was likely. Suspicion of exposure in Washington should lead to a thorough environmental investigation.
5. Controlling further spread: delouse a lice-infested patient, educate those sharing a case's exposure about signs and symptoms of typhus.
6. Routine prevention: keep rodents away from human habitation. Prevent pets from getting fleas by using a veterinarian-approved flea control product. Prevent flea bites by avoiding stray or wild animals, wearing gloves when handling sick or dead animals, and using EPA-registered insect repellents when spending time outside.
7. Resources: https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/rickettsial-diseases and https://www.cdc.gov/typhus/about/index.html

I. Vancomycin-resistant *Staphylococcus aureus*

1. Disease and its epidemiology:
   - Agent: *S. aureus* with resistance to vancomycin (MIC > 8 ug/mL per Clinical Laboratory Standards Institute (CLSI) M100-Ed32 interpretive criteria). VRSA was first identified in 2002 and as of January 2022, only 16 isolates have been reported in the United States but none in Washington. Vancomycin Resistant *Staphylococcus aureus* (VRSA) is on the continuum of resistance of *S. aureus* from pan sensitive, to methicillin resistant *S. aureus* (MRSA) to vancomycin intermediate *S. aureus* (VISA), to VRSA. VISA is a result of the gradual mutation accumulation of the VISA-associated genes which may occur associated with long term antibiotic therapy, whereas VRSA arises by transfer of van genes, usually from vancomycin-resistant *Enterococcus*.
   - Illness: symptoms depend on location of infection, common sites include skin, lungs, or blood. Patients can also be colonized and have no symptoms.
   - Incubation period: Since patients can be colonized, incubation period is not well-defined
   - Differential diagnosis: none
   - Transmission: *S. aureus* can be transmitted between close contacts in the community, and to patients in health care settings via contaminated health care workers hands, surfaces, or equipment
   - Communicability: *S. aureus* is communicable through close contact with an infected or colonized individual or their body fluids, and from contaminated surfaces or objects. Based on rarity of cases identified globally, range of potential communicability is not fully defined.
   - Treatment: consult with infectious disease specialist for treatment guidance.

2. Case definition (2007)

   Suspect: MIC > 8 ug/mL

   Confirmed: MIC ≥ 16 ug/mL

3. Diagnosis and laboratory services: Submit isolate associated with suspect or confirmed cases for confirmatory antimicrobial susceptibility testing. Ship according to PHL requirements https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu
4. Routine case investigation: Request confirmatory antimicrobial susceptibility testing at PHL. If case is confirmed, ensure contact precautions in health care settings, identify close contacts, including household and health care, for possible screening. Report in WDRS under Highly Antibiotic Resistant Organisms (HARO).
5. Controlling further spread: Ensure case is on Contact Precautions in health care settings. Encourage hand hygiene and cleaning and disinfection of shared equipment.
6. Routine prevention: Hand hygiene, respiratory etiquette, keep wounds clean and covered, do not share personal items.
7. Resources:
   https://www.cdc.gov/staphylococcus-aureus/media/pdfs/VRSA-Investigation-Guide-P.pdf
   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7015472/

7. ROUTINE PREVENTION

Routine prevention measures depend on the suspected agent. See Section 6 for comments about selected conditions. Consult with Communicable Disease Epidemiology for any other conditions (206-418-5500).

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UPDATES

September 2008: The definition of "rare diseases of public health significance" was made consistent with the definition provided in WAC 246-101-010.

January 2011: Section for Specific Diseases including expanded descriptions of certain rare diseases is included. Reporting requirements were revised to reflect the 2011 Notifiable Conditions Rule revision.

January 2014: Section 2 shortened, minor wording changes elsewhere.

December 2014: Viral hemorrhagic fever was removed from this guideline and a full guideline was created.

March 2015: Coccidioides was removed from this guideline and a full guideline for Coccidioidomycosis was created.

August 2015: Carbapenem Resistant Enterobacteriaceae was removed from this guideline and a full guideline was created.

April 2016: Vancomycin-resistant *Staphylococcus aureus* was moved to a separate guideline and amebic meningitis was added.

February 2017: 2016 CSTE case definition was added for amebic meningitis; Histoplasmosis added

March 2018: Update for WDRS. Added leishmaniasis and ricin poisoning. Removed conditions that will have separate guidelines (Burkholderia, ehrlichiosis and anaplasmosis, MERS/SARS, prion disease, tickborne diseases, viral hemorrhagic fever)

March 2019: routine review, update of recent cases

January 2022: added requested reporting for conditions specified in WAC 246-101 updated scheduled for 1/2023 (baylisascariasis, *Candida auris* infection, echinococcosis, taeniasis)

May 19, 2022: Mpox (monkeypox) section was updated to reflect outbreak originating in Europe

June 2, 2022: Mpox moved to a separate document.

December 2022: Condition renamed from Rare Diseases to Additional Reportable Diseases and removed non-notifiable conditions. For 2023 WAC revision combined provider and facility reporting requirement, updated laboratory submission (Section 1B). General updates to notifiable condition sections.

December 2023: Updated laboratory submission process for 2024 WAC Revision.

February 2024: Edited sections 6C (Chagas disease) and 6D (Echinococcosis) with updated recommendations for case follow-up. Added WA-specific case definition for echinococcosis; this case definition was implemented beginning with 2023 cases.

June 2024: CDC links updated

December 2024: New nationally standardized 2025 CSTE case definition added for Chagas disease.