

Trichinosis (Trichinellosis)

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of transmission (e.g., contaminated meat) and to prevent further transmission from such sources.
2. To educate exposed persons about signs and symptoms of disease, thereby facilitating early diagnosis.
3. To educate people about how to reduce their risk of infection.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 3 business days.
2. Health care facilities: notifiable to local health jurisdiction within 3 business days.
3. Laboratories: *Trichinella* species notifiable to local health jurisdiction within 2 business days. Specimen submission is on request only.
4. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Begin follow up investigation within one business day.
2. Report all *confirmed* cases to CDES (see definition below). Complete the standard case report form (at: <http://www.doh.wa.gov/notify/forms/trichinosis.pdf>) and enter the data into the Public Health Information Management System (PHIMS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Trichinosis is caused by intestinal roundworms (nematodes) in the genus *Trichinella*. The species *Trichinella spiralis* occurs worldwide and causes most human infections.

B. Description of Illness

Although most infections are subclinical, illness in humans is highly variable and can range from asymptomatic infection to a fulminating, fatal disease, depending on the number of larvae ingested. In the week after being ingested in infected meat, larvae mature into adult worms in the intestine and may cause abdominal discomfort, nausea, vomiting and/or diarrhea. Weeks later as the larvae from these adult worms migrate into tissues, persons may develop fever, myalgias, weakness, malaise, and periorbital edema. Less frequently, persons develop rash, photophobia, and retinal or subungual hemorrhages. In severe cases, myocarditis, pneumonia, and encephalitis may develop and cause death.

C. Trichinosis in Washington State

DOH receives no or one report of trichinosis per year. The rare cases in recent years have been associated with wild game, either cougar or bear meat, eaten raw or as jerky.

D. Reservoirs

Many different omnivores and carnivores can be infected. Reservoirs include home-raised pigs, horses, dogs, rats, foxes, wolves, bears, seals, polar bears, and wild boars.

E. Modes of Transmission

Trichinosis is acquired by eating raw or insufficiently cooked flesh of animals containing viable encysted larvae. In the United States, trichinosis was associated historically with eating undercooked pork from domesticated sources when pigs were fed raw food scraps or could eat rats, but now wild game meat is the most common source. After ingestion, larvae develop into adult worms in the epithelium of the small intestine. Gravid female worms then produce larvae. The larvae penetrate the intestinal wall, disseminate via the bloodstream throughout the body, and become encapsulated in skeletal muscle.

F. Incubation Period

Systemic symptoms usually appear about 1–2 weeks after ingestion of infected meat but may appear between 5 and 45 days depending on the number of parasites involved. Gastrointestinal symptoms may appear within a few days.

G. Period of Communicability

The infection is not transmitted directly from person to person.

H. Treatment

Albendazole or mebendazole appear to be effective when given early in the course of the illness. Although these medications are active against adult worms in the gut, they have little effect on larvae embedding in tissue. Corticosteroids are used when symptoms are severe.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

A disease caused by ingestion of *Trichinella* larvae. The disease has variable clinical manifestations. Common signs and symptoms among symptomatic persons include eosinophilia, fever, myalgia, and periorbital edema.

B. Laboratory Criteria for Diagnosis

1. Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or
2. Positive serologic test for *Trichinella*.

C. Case Definition (1996)

Confirmed: a clinically compatible case that is laboratory confirmed.

D. Comment

In an outbreak setting, at least one case must be laboratory confirmed. Associated outbreak-associated cases should be reported as confirmed if the patient shared an epidemiologically implicated meal or ate an epidemiologically implicated meat product and has either a positive serologic test for trichinosis or a clinically compatible illness.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

The diagnosis of trichinosis is likely in persons with myositis, fever, periorbital edema, eosinophilia and a history of consuming non-commercial undercooked meat. Laboratory confirmation is commonly made by detection of *Trichinella* specific antibodies in serum drawn at least 3 weeks after infection. The diagnosis can also be confirmed by identification of *Trichinella* larvae in a skeletal muscle biopsy specimen (taken at least two weeks after infection) but a biopsy is not often necessary.

B. Services Available at the Washington State Public Health Laboratories (PHL)

PHL can assist in identifying *Trichinella* species in a muscle biopsy or food specimen, and will forward specimens for serologic testing to the CDC. Contact Communicable Disease Epidemiology Section for approval prior to submitting specimens.

Note that 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.

C. Specimen Collection

Label serum or biopsy specimens with two identifiers (e.g., name and date of birth). Please enclose a completed PHL Microbiology form (available at: <http://www.doh.wa.gov/EHSPHL/PHL/Forms/Microbiology.pdf>)

5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

A. Identify Potential Sources of Infection

Ask about possible exposures 5–45 days before onset, including:

1. Handling or eating raw/undercooked pork or pork products or other meats
2. Handling or eating raw/undercooked wild game meat including wild game jerky
3. Travel outside the United States (determine dates and locations)

B. Identify Potentially Exposed Persons

Identify persons who shared the same exposure as the patient.

C. Environmental Evaluation

If the source of the patient's exposure is a commercial product, contact Communicable Disease Epidemiology Section or the DOH Food Safety Program and begin a traceback investigation.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations: Hospitalized patients should be cared for using standard precautions.

1. No work or child care restrictions are needed.

B. Case Management: No case follow up is needed.

C. Contact Management: None, since the disease is not spread from person to person.

D. Management of Other Exposed Persons

Persons exposed to the same source as the case should be educated about symptoms of trichinosis. Prophylaxis with antiparasitic agents should be recommended to persons who recently ingested contaminated meat.

D. Environmental Measures

1. Potentially infected meat should not be consumed by others.
2. If improper cooking of meat is suspected at a restaurant, inspect the restaurant.

7. MANAGING SPECIAL SITUATIONS

A. Possible Foodborne Outbreaks

Trichinosis is not a frequent cause of foodborne outbreaks. Consult Communicable Disease Epidemiology Section if you suspect a common-source outbreak.

8. ROUTINE PREVENTION

A. Immunization Recommendations: None

B. Prevention Recommendations (found at:

<http://www.cdc.gov/parasites/trichinellosis/prevent.html>)

- Cook meat products until the juices run clear or to an internal temperature of 170° F.
- Freeze pork less than 6 inches thick for 20 days at 5° F or colder to kill any worms.
- Cook wild game meat thoroughly. Freezing wild game meats, unlike freezing pork products, even for long periods of time, may not effectively kill all worms.
- Cook all meat fed to pigs or other wild animals.
- Do not allow hogs to eat uncooked carcasses of other animals, including rats, which may be infected with trichinellosis.
- Clean meat grinders thoroughly if you prepare your own ground meats.
- Curing (salting), drying (to make jerky), smoking, or microwaving meat does not consistently kill infective worms.

ACKNOWLEDGEMENTS

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UPDATES

January 2011:

The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.