



CYSTICERCOSIS

1. Agent:

Cysticercosis: Disease caused by *Cysticercus cellulosae*, the tissue or larval stage of *Taenia solium*.

Taeniasis: Intestinal infection with the adult stages of either of the tapeworms, *Taenia solium*, the pork tapeworm, or *Taenia saginata*, the beef tapeworm.

2. Identification:

a. Symptoms:

Cysticercosis: Larvae in muscle tissue may cause muscular pain, weakness, fever, and eosinophilia; involvement in brain may produce symptoms of hydrocephalus, meningoencephalitis or epilepsy. Many cases are asymptomatic or manifest minor disease.

Taeniasis: Mild gastrointestinal complaints.

b. Differential Diagnosis:

Cysticercosis: Tuberculosis (tuberculoma), brain tumor, and other neurologic or psychiatric disorders.

Taeniasis: Other causes of gastroenteritis.

c. Diagnosis:

Cysticercosis: Confirmed by biopsy or CT scan. Serologic and cerebrospinal fluid tests are highly specific and sensitive (Western blot).

Taeniasis: Immunoblot serologic test or ova and parasite exam for proglottid (tapeworm segments) or eggs. The "scotch tape pinworm paddle" (SWUBE™) impression of perianal area has also been used to detect eggs.

3. Incubation:

Cysticercosis: Highly variable, from a few weeks to months or years.

Taeniasis: 8-14 weeks for the adult tapeworm to mature after consumption of a larva.

4. Reservoir:

Cysticercosis: Individuals infected with the adult tapeworm shed eggs that are consumed by self or others. Humans are the definitive host for the adult worm.

Taeniasis: Swine (*T. solium*) or cattle (*T. saginata*).

5. Source:

Cysticercosis: Feces containing eggs or proglottid of *T. solium*; eggs of *T. solium* are directly infectious for human.

Taeniasis: Raw or undercooked pork or beef containing larvae of either species.

6. Transmission:

Cysticercosis: Fecal-oral transmission of eggs via contaminated food, possibly water. Direct person-to-person transmission may occur as well as autoinfection from feces to hand to mouth. Although not proven, retrograde passage of eggs from the jejunum into the stomach may occur.

Taeniasis: Via consumption of larvae in raw or undercooked pork or beef.

7. Communicability: Persons with *T. solium* tapeworm infections are infectious to others. Persons with cysticercosis (larval form) may also be infected with the adult worm and would then be infectious to others. **An individual with cysticercosis without adult tapeworm infection is not infectious to others.**

8. Specific Treatment:

Cysticercosis: Dependent on clinical status and radiographic classification.



Anticonvulsants, steroids, analgesics are employed. Praziquantel (Biltricide[®]), an antihelminthic, and surgery are of value in some circumstances.

Taeniasis: Niclosamide (Niclocide[®]) or praziquantel. Purging is not recommended.

9. **Immunity:** Short lived.

REPORTING PROCEDURES

1. **Reportable:** Report within seven calendar days, *California Code of Regulations*, Title 17, Section 2500.
2. **Report Form:**

CYSTICERCOSIS/TAENIASIS CASE REPORT (CDPH 8581)

CYSTICERCOSIS (TAENIASIS) CONTACT WORK SHEET (acd-cysticercosis worksheet)
3. **Epidemiologic Data:**
 - a. Residence or travel in endemic areas.
 - b. Symptoms or other cases among household members.
 - c. Consumption of raw or undercooked meat, especially outside of the USA, or illegally imported meat.

CONTROL OF CASE, CONTACTS, & CARRIERS

Investigate within 3 days.

CASE:

Case must be evaluated for adult tapeworm infection. If the diagnosing physician has not evaluated the case's stool for infection, a finger prick blood specimen should be obtained. Collection vials and immunoblot strips can be obtained from the Public Health Lab (Serology Unit) and the lancet can be obtained from the district health center. If case refuses a finger prick specimen then stool specimen for O&P (X3) should be obtained.

Food handlers with the pork tapeworm should be removed from work until one week after treatment.

CONTACTS:

Household and sexual contacts should be evaluated for infection with adult tapeworm, as they may be the source of infection. A finger prick blood specimen should be obtained. Collection vials and immunoblot strips can be obtained from the Public Health Lab (Serology Unit) and the lancet can be obtained from the district health center. If case refuses finger prick specimen then stool specimen for O&P (X3) should be obtained.

Food handlers positive for the pork tapeworm should be managed as above.

PREVENTION-EDUCATION

1. Explain transmission of disease.
2. Emphasize personal hygiene and sanitary disposal of human excrement.
3. Advise thorough cooking of pork and beef products.

DIAGNOSTIC PROCEDURES

CASE:

1. Cysticercosis:

- a. Biopsy.
- b. Computed tomographic (CT) or magnetic resonance imaging (MRI) scan.
- c. Serologic testing (enzyme-linked immunoelectrotransfer blot assay [EITB, Western blot]). Contact Public Health Laboratory for instructions.

2. Taeniasis:

a. Immunoblot serological test:

Container: Collection vials and immunoblot strips (contact Public Health Lab for supplies)

Laboratory Form: CDC PATIENT HISTORY FORM FOR *T. SOLIUM* (CYSTICERCOSIS/TAENIASIS) SPECIMEN SUBMISSION

Examination Requested: Serology



Submission Instructions: See [Instructions for Finger Prick Specimen Collection Protocol](#).

b. **Microscopic examination of feces:**

Container: Feces-Parasite.

Laboratory Form: PARASITOLGY (H-383).

Examination Requested: Taenia eggs.

Submission Instructions: Follow instructions in container.

c. **Worm or Segment Identification:**

Container: Tuberculosis tube (50 ml centrifuge tube).

Laboratory Form: PARASITOLGY (H-383).

Examination Requested: Worm identification.

Submission Instructions: Place worm or worm segment in water or saline solution; seal lid securely and refrigerate until transport.

RESOURCES

For more information, go to ACDC website for Reportable Enteric Parasite Infections presentations at <http://publichealth.lacounty.gov/acd/Publications.htm>.