



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: 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 man.

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. Autoinfection from feces to hand to mouth. Retrograde passage of eggs from the jejunum into the stomach. (The latter mode is not proven.)

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 (Biltricide⁷), an antihelminthic, and surgery are of value in some circumstances.



Taeniasis: Niclosamide (Niclocide⁷) 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 INVESTIGATION FORM (T-378).

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, O&P specimens 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. Multiple (3) stool specimens for O&P exam 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. **Microscopic examination of feces:**

Container: Feces-Parasite.

Laboratory Form: PARASITOLGY (H-383).

Examination Requested: Taenia eggs.

Submission Requirements: Follow instructions in container.

- b. **Worm or Segment Identification:**

Container: Tuberculosis tube (50 ml centrifuge tube).

Laboratory Form: PARASITOLGY (H-383).

Examination Requested: Worm identification.

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