

CYSTICERCOSIS (Taeniasis)

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 *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. Expulsion of tapeworm segments in stool.

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 (immunoblot) are highly specific and sensitive.

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 pork tapeworm eggs from humans 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 unproven.

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. Symptomatic treatment with anticonvulsants, steroids, and analgesics. Praziquantel (Biltricide®) and albendazole, both 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 (Title 17, Section 2500, *California Code of Regulations*).

2. Report Form: **CYSTICERCOSIS INVESTIGATION FORM (T-378, 10/00).**

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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: A case of cysticercosis must be evaluated for pork tapeworm infection. If the treating 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. Persons with tapeworm may auto-inoculate themselves with tapeworm eggs and develop cysticercosis.

CONTACTS: Household and sexual contacts of either taeniasis or cysticercosis should be evaluated for infection with adult tapeworm, as they may be the source of cysticercosis. Multiple (3) stool specimens for O&P exam should be obtained.

PREVENTION-EDUCATION

1. Explain transmission of both diseases.
2. Emphasize personal hygiene and sanitary disposal of human excrement (to prevent cysticercosis).
3. Advise thorough cooking of pork and beef products (to prevent tapeworm infection).

DIAGNOSTIC PROCEDURES

CASE:

1. Cysticercosis:

- a. Biopsy.
- b. Computed tomographic (CT) or magnetic resonance imaging (MRI) scan.
- c. Serologic and cerebrospinal fluid testing by 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: Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory.

Examination Requested: Taenia eggs.

Submission Requirements: Follow instructions in container.

b. Worm or Segment Identification:

Container: Tuberculosis tube (50 ml centrifuge tube).

Laboratory Form: Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory.

Examination Requested: Worm identification.

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