What is trichinellosis?

Trichinellosis, also known as trichinosis, is caused by eating raw or undercooked meat that contains the early, immature form (larvae) of a worm called *Trichinella.* It occurs worldwide, most often in wild animals such as bear, boar, or cougar, but can occur in domestic pigs. It is not common in the United States.

Who gets trichinellosis?

People who eat raw or undercooked meat from animals infected with the *Trichinella* worm are at higher risk for developing trichinellosis. Meats of concern include bear, pork, wild feline (such as cougar), fox, dog, wolf, horse, seal and walrus. Successful control programs in the United States have nearly eliminated the disease in most domestic pigs, but pigs raised outdoors in close contact with rodents and other wildlife have an increased chance of acquiring *Trichinella* infection.

How is trichinellosis spread?

The disease is not spread from person to person. Humans become infected after eating raw or undercooked meat that contains *Trichinella* larvae. Stomach acid removes the hard cover that surrounds the larvae, freeing them to develop into adult worms in the small intestine. The adult worms mate and bear offspring. The new larvae travel via the bloodstream to muscles, where they develop the protective covering and remain in place. This life cycle continues when contaminated meat is eaten by another human or animal.

What are the symptoms of trichinellosis?

Abdominal discomfort, nausea, vomiting and diarrhea, fatigue, and fever are often the first symptoms of trichinellosis. Aching joints, muscle pain, together with swelling of the face and eyes, sweating, chills, headaches, cough, itchy skin, and sometimes constipation occur later. The severity of the disease can be mild or very serious and depends on how much of the parasite is eaten in the contaminated food. Nervous system, heart and breathing problems can occur in cases of severe infection. For mild to moderate infections, most symptoms subside within a few months. Fatigue, weakness, muscle pain and diarrhea can last for months.

How soon after exposure do symptoms appear?

Symptoms usually develop 8-15 days after eating the infected meat, with a range of 5-45 days. Gastrointestinal symptoms (abdominal pain, nausea, vomiting and diarrhea) may occur before the fever, sore muscles and other symptoms, sometimes as soon as 1-2 days after infection.

Does past infection with trichinellosis make a person immune?

A person who has had trichinellosis might have some protection against getting it again.

How is trichinellosis diagnosed?

Trichinellosis is diagnosed by a blood test or by a biopsy of the muscle to identify *Trichinella* larvae.

What is the treatment for trichinellosis?

Several prescription drugs are available to treat trichinellosis. Healthcare providers decide to treat based on the person's symptoms, a history of exposure to raw or undercooked meat, and laboratory test results. Information for healthcare providers is available at http://www.cdc.gov/parasites/trichinellosis/health_professionals/index.html.

How can trichinellosis be prevented?

The most important precaution is to make sure that all fresh meats, especially pork and pork products and meat from wild animals, are properly cooked to safe temperatures. A food thermometer should be used to measure the internal temperature of cooked meat. Do not sample meat until it is cooked. Raw and undercooked meat should be avoided. The United States Department of Agriculture (USDA) recommends the following for the preparation of all meats, including wild game:

- **For Whole Cuts of Meat** (excluding poultry and wild game): Cook to at least 145° F (63° C) as measured with a food thermometer placed in the thickest part of the meat, then allow the meat to rest* for three minutes before carving or consuming.
- **For Ground Meat** (excluding poultry and wild game): Cook to at least 160° F (71° C); ground meats do not require a rest* time.
- **For Wild Game** (whole cuts and ground): Cook to at least 160° F (71° C).
- **For All Poultry** (whole cuts and ground): Cook to at least 165° F (74° C), and for whole poultry allow the meat to rest* for three minutes before carving or consuming.
- **Other precautions**:
  - Wash your hands with warm water and soap after handling raw meat.
  - Curing (salting), drying, smoking, or microwaving meat alone does not consistently kill infective *Trichinella* worms. (Homemade jerky and sausage were the cause of some cases of trichinellosis reported to CDC in recent years.)
  - Freeze pork less than 6 inches thick for 20 days at 5°F (-15°C) to kill any worms.
  - Freezing wild game meats, unlike freezing pork products, may not effectively kill all worms because some worm species that infect wild game animals are freeze-resistant.
  - Clean meat grinders thoroughly after each use.

* According to USDA, "A 'rest time' is the amount of time the product remains at the final temperature, after it has been removed from a grill, oven, or other heat source. During the three minutes after meat is removed from the heat source, its temperature remains constant or continues to rise, which destroys pathogens."

Is trichinellosis common in the United States?

Infection used to be more common and was usually caused by ingestion of undercooked pork. Infection is now relatively rare. The number of cases decreased beginning in the mid-20th century because of legislation prohibiting the feeding of raw-meat garbage to hogs, commercial and home freezing of pork, and the public awareness of the danger of eating raw or undercooked pork

products. Current cases are less commonly associated with pork products and more often associated with eating raw or undercooked wild game meats.

How can I get more information about trichinellosis?

- If you have concerns about trichinellosis, contact your healthcare provider.
- Call your local health department. A directory of local health departments is located at https://www.vdh.virginia.gov/local-health-districts/.
- Visit the Centers for Disease Control and Prevention website at https://www.cdc.gov/parasites/trichinellosis/index.html.

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