



## THE NORTHEAST WILDLIFE DISEASE COOPERATIVE

<http://sites.tufts.edu/nwdc>

# Chronic Wasting Disease (CWD)

## Cause

Chronic wasting disease is caused by a prion, which is an abnormal protein that behaves like an infectious agent. CWD is a neurological disease of cervids (deer, elk and moose) categorized as a transmissible spongiform encephalopathy (TSE). Other known TSE's include scrapie in sheep, bovine spongiform encephalopathy (mad cow disease) in cattle, and Creutzfeldt-Jakob disease (CJD) in humans. CWD was first reported in captive mule deer in 1967 in Colorado, but was not recognized as a TSE until 1978.

## Significance

Chronic wasting disease has had a major impact on hunting and cervid farming in affected states. Because of a long shedding period and the resilience of the prion responsible for CWD, it is very difficult to control and eradicate the disease.

## Species Affected

CWD is known to affect free-ranging and captive white-tailed deer, mule deer, Rocky Mountain elk, moose, and red deer, though it is likely that other species of cervid are also susceptible. This disease is not known to infect humans or domestic animals.

## Distribution

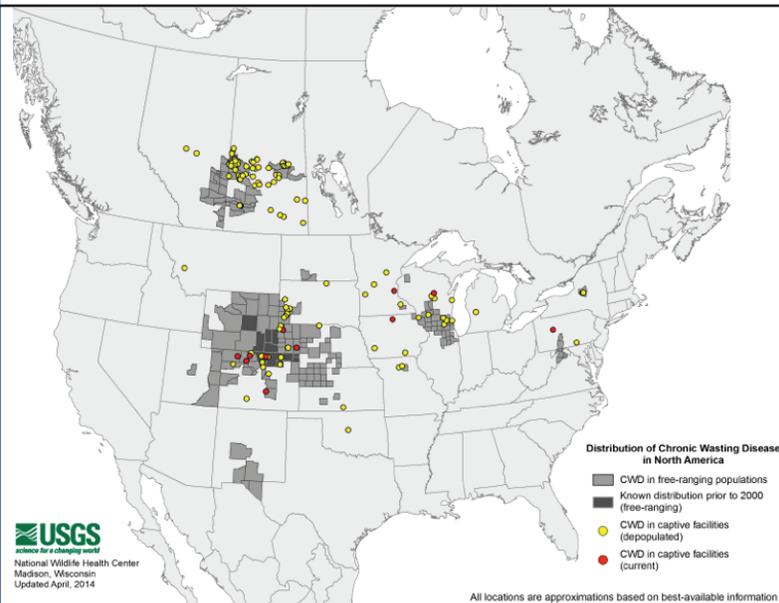
Chronic wasting disease was originally found in a captive mule deer herd in Colorado and was reported in Wyoming soon after. The disease has since become established in free-ranging deer and elk in these states and has spread to several other states and 2 Canadian provinces (see map for the 2013 distribution of the disease in the United States). CWD has also been reported in South Korea following importation from Canada.

## Transmission

CWD is transmitted both directly via contact with infected animals and indirectly through contaminated feces, urine, saliva, and infected carcasses or environments. Though it is still uncertain, current research suggests that the minimum incubation period from time of infection to the presentation of clinical signs is around 16 months. Animals can directly transmit the disease to other animals during this time. Infected animals can also begin shedding prions as early as 11 months prior to showing any symptoms of the disease. The prions that cause CWD are very difficult to kill and can remain infective in soil for many years.

## Clinical Signs

Clinical signs usually appear 24 to 48 months following exposure to prions, though signs may also appear much later after infection. Clinical signs include weight loss, loss of body condition, depression, and excessive



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salivation, drinking, and urination. Neurological signs of CWD include stumbling, trembling, and lack of fear of humans and predators. Most animals will die within several months following the onset of clinical signs.

## Diagnosis

Special laboratory techniques are used to diagnose CWD from postmortem samples of brain, lymph node, or tonsil tissue. Because an animal can be simultaneously infected with several diseases, it is important to distinguish CWD from the many other diseases that have similar clinical signs.

## Treatment

There is currently no treatment or vaccine for CWD.

## Management/Prevention

Management of chronic wasting disease has proven difficult and eradication of this disease is unlikely. Many agencies are working together on a national management plan in hopes of containing CWD and preventing its further spread. Several states including Pennsylvania, New York, Colorado, and Wyoming have established long-term surveillance programs to monitor wild cervid populations. These states, along with many other states including Maine, Iowa, and Texas are also continuously monitoring captive cervid populations for CWD. Most states have adopted regulation that prohibits the importation and exportation of cervid body parts that are more likely to harbor prions, including the spinal column, the brain, and lymph tissues. In endemic regions like Colorado, additional regulation is in place regarding removal of any parts of deer, elk or moose from CWD areas.

Other possible management actions to control the spread of CWD include quarantining and depopulating captive herds that test positive for the disease, prohibiting import of cervids from states with confirmed cases of CWD, and prohibiting feeding of wild cervids. Wild cervids should be kept away from captive cervid populations to reduce the risk of infection.

CWD is not currently believed to cause disease in humans, though hunters are encouraged to take routine precautions when handling their deer or elk.

Hunters should not shoot, handle, or consume any animal that appears sick. In order to prevent exposure to any disease-causing organism, including



Photo by Dr. Mike Miller, Colorado Division of Wildlife

the prion of CWD, hunters should wear gloves while dressing game and should wash hands and instruments thoroughly after field dressing. Hunters should also minimize handling of brain and spinal cord tissues. For more information about precautions hunters should take in relation to CWD go to:

[www.portal.state.pa.us/portal  
server.ptopen=514&objID=587240&mode=2](http://www.portal.state.pa.us/portal/server.ptopen=514&objID=587240&mode=2).

## Suggested Reading

Centers for Disease Control and Prevention (CDC). 2011. Chronic wasting disease (CWD).

[www.cdc.gov/ncidod/dvrd/cwd/](http://www.cdc.gov/ncidod/dvrd/cwd/)

Chronic wasting disease. United States Department of Agriculture, Animal and Plant Health Inspection Service. [www.aphis.usda.gov/animal\\_health/animal\\_diseases/cwd/](http://www.aphis.usda.gov/animal_health/animal_diseases/cwd/)

Chronic wasting disease Response Plan. July 2011. Commonwealth of Pennsylvania.

Gilch, S., N. Chitoor, Y. Taguchi, M. Stuart, J. E. Jewell, and H. M. Schatzl. 2011. Chronic wasting disease. Topics in Current Chemistry. Springer-Verlag Berlin Heidelberg.

National Wildlife Health Center. Chronic wasting disease (CWD). United States Geological Survey. [www.nwhc.usgs.gov/disease\\_information/chronic\\_wasting\\_disease/](http://www.nwhc.usgs.gov/disease_information/chronic_wasting_disease/)

Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic wasting disease in Wild and Captive Cervids. June 2002. United States Department of Agriculture.

Williams, E. S., J. K. Kirkwood, and M. W. Miller. 2001. Transmissible Spongiform Encephalopathies. Pages 292-301 in E. S. Williams and I. K. Barker, editors. Infectious diseases of wild mammals. Iowa State University Press, Ames, Iowa, USA.