



# Virulent Newcastle Disease

What you need to know

By Maurice Pitesky DVM

**N**ewcastle Disease (ND) is a highly infectious viral disease that can affect many kinds of birds including domestic poultry and avian wildlife including sparrows, pigeons, doves, crows, owls, cormorants, gulls and pigeons and waterfowl.

Virulent Newcastle Disease (vND) formerly known as Exotic Newcastle Disease (END) is a serious and highly infectious contagious viral disease. An ongoing outbreak of this form of the disease is currently occurring in backyard poultry in Southern California.

There have been outbreaks of vND in Southern California periodically in the Southern California region, including outbreaks in 1971 and 2002.

The 2002 outbreak subsequently spread to Arizona, Nevada, and Texas. These spread from backyard birds to commercial poultry in southern California, and resulted in the depopulation of millions of birds with an economic impact of hundreds of millions of dollars. Because of the popularity of backyard poultry—and how web-based tools have made poultry trading easier—the risk of a broader outbreak needs to be appreciated.









### Why is it called Newcastle Disease?

The Newcastle virus is technically a type of avian paramyxovirus. Viruses are often named after the location where they were first discovered (such as the Ebola River in West Africa). To that point, the Newcastle virus was named for the town in which it was first diagnosed, Newcastle-upon-Tyne, England. Within 10 years of discovery, it had spread to most of the world, most likely due to wide susceptibility in multiple avian species.

### What is the difference between virulent Newcastle Disease and Newcastle Disease?

The disease is extremely variable, ranging from mild to severe, largely due to the different type or strains of the virus. The milder strains are considered common in North America. The disease appears in three general forms:

**1. Lentogenic or mild:** These widespread strains may not produce any clinical signs at all but can be linked to mild respiratory infections. A few eggs



may be soft-shelled, roughened, or deformed. These shell abnormalities can also be seen in birds that have avian influenza and infectious bronchitis. Because no clinical sign is diagnostic of a this specific disease, the only way to determine the causative agent is through laboratory techniques that include virus isolation from tracheal and cloacal swabs.

**2. Mesogenic or moderate:** The mesogenic strains are commonly associated with respiratory signs and occasional neurologic indicators (tremors, twisting of the head and neck, circling, and paralysis) with low mortality. Egg production is decreased significantly and egg quality is poor. Abnormalities are similar to the ones described in the lentogenic section.

**3. Velogenic or very virulent:** The velogenic disease is also called virulent Newcastle Disease. The mortality rate for these velogenic strains can be up to 100%. Clinical signs include ocular and nasal discharge diarrhea, bloody diarrhea, neurological signs, and high mortality. Unfortunately, one of the most common clinical signs is simply death. These clinical signs can also be seen in other diseases including Fowl Cholera, Infectious Bronchitis, Infectious Laryngotracheitis, and Highly Pathogenic Avian Influenza. Therefore, the only way to determine the causative agent is via laboratory techniques including virus isolation.

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In general, younger birds are more susceptible than older birds to the lentogenic and mesogenic strains, but clinical signs can be more severe in younger birds. In addition, while other domestic birds including turkeys, ostriches, geese, and pheasants are susceptible to ND, they are much less sensitive and hence often do not present with the clinical signs described above.

Furthermore, the clinical signs described can vary according to which tissues the virus preferentially infects. Consequently, if the virus preferentially infects the nervous system, the neurological symptoms will be more pronounced.

### How is the disease transmitted?

ENDV is not endemic in North America. Based on the 1971 and 2002 outbreaks, the most likely way END would be introduced to North America was through illegally imported birds from countries where the vND is endemic.

The virus can be spread from excretions from infected birds, aerosols, and feces. This makes the virus associated with contaminated feed, water, footwear, clothing, tools, equipment, and the environment. Exposure to any of these sources of virus can result in transmission via inhalation or ingestion.



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Eggs laid by infected hens may also contain the virus. If hens are affected, egg production is typically severely decreased. If any hatching eggs are laid, the hatchability is also severely reduced.

**Can I get it?**

**Humans who come into close contact with ENDV may develop a mild to moderate conjunctivitis (i.e. an eye infection). Human-to-human spread has not been documented.**

**Control and prevention**

END is considered a "reportable" disease which means that after a diagnosis is made, state and federal authorities need to be notified. In fact, like many avian diseases, there is no cure.

Good biosecurity is essential toward preventing an outbreak. Because the virus can easily spread from contaminated birds to your birds via multiple means, make sure your birds are protected from birds with unknown disease status. In addition, if you purchase

poultry domestically or internationally, poultry should be bought only from suppliers who can certify that the birds have been imported legally or bred in the U.S., and are healthy. In short, use common sense and good biosecurity!

In addition to focusing on biosecurity and management, vaccination should be considered—especially for backyard flocks in close proximity to affected flocks in Southern California. However, vaccine use should not be an invitation for poor management.

The LaSota and B1 vaccines are often available from feed stores. Make sure they are licensed in the U.S. In addition, follow the instructions and/or consult a veterinarian.

**Vaccination tips and warnings**

The best way to deliver a vaccine is via the "eye drop" method. Be aware that the vaccines can produce some mild clinical signs that include a drop in egg production and some mild respiratory signs. Be aware also that vaccinations against vND often need to be given at least twice a year to remain efficacious.

Again, vaccination is not a substitute for good biosecurity, which is the best way to prevent your flock from getting infected from all infectious diseases including vND. To that point, like many vaccines, ND vaccines can be effective in controlling clinical disease. However, the vaccine does not prevent the virus from replicating, shedding and spreading.

In addition, for the vaccine to be effective, multiple does need to be given. Therefore, if you are able to get a chicken that is vaccinated in the hatchery you should not assume your bird is protected for life against all Newcastle Disease viruses.

For these reasons, if you want to consider vaccinating your flock, it is essential to work with a veterinarian who is knowledgeable about poultry disease control and vaccination protocols.

**Don't fall for illegal imports**

Because END is endemic in many other parts of the world including Africa, Asia, and South America, birds should only be purchased legally and should never be imported from a country without proper paperwork and quarantine controls.

For example, live poultry cannot be imported from Mexico to the United States because Mexico is considered endemic for END. A recent END outbreak in 2011 affected commercial birds in two Mexican states, including Baja California Norte which borders Southern California.

If you purchase poultry internationally, poultry should be bought only from suppliers who can certify that the birds have been imported legally, and are healthy. Legally imported pet birds have been quarantined and tested for velogenic strains of APMV-1.

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Because wild birds can carry the virus without becoming ill, outbreaks can occur in domestic poultry after exposure to wildlife. Wild avian birds, especially cormorants, gulls, and pigeons are considered primary sources of disease transmission.

**If you suspect END**

No specific clinical sign is 100% diagnostic of a specific avian disease. However, if you have a high mortality event coupled with a significant decrease in egg production, END should be in the back of your mind.

In such an event, contact your state department of food and agriculture and/or the USDA. They have specially-trained veterinarians who can help diagnose "Foreign Animal Diseases" including END. Because of the severity of the disease and the potential for further virus transmission, don't transfer suspected birds. The specially-trained veterinarians will travel to your flock in order to collect samples which are then brought to

a laboratory for virus isolation.

There is no treatment for END, so if your flock is determined to have the disease, the entire flock will have to be "depopulated." It is important as poultry owners that we recognize this risk and understand why depopulation is an essential control step to protect other peoples' poultry.

**No walls against this disease**

We are very fortunate in that in North America vND is not naturally-found like it is in parts of Latin America, Asia, and Africa.

As noted above, there is a current outbreak of vND in backyard poultry in Southern California. In order to quickly eliminate this current outbreak we need to practice good biosecurity and stop risky practices such as sharing equipment or exposing our birds by using the same clothes with our flock as we do out in the community.

Adopting these simple practices is the best way to protect our flocks and our neighbor's flocks. 🐔

**About the author**

*Maurice Pitesky* is a faculty member at University of California Cooperative Extension (UCCE) with an appointment in poultry health and food safety epidemiology. Pitesky earned his BS in biology from UCLA and his DVM and MPVM from UC Davis. Pitesky is also boarded in preventative veterinary medicine (DACVPM).



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