BASICS

Paramyxoviruses (PMV) are a group of RNA viruses that cause acute respiratory disease. There are 12 recognized serotypes of avian paramyxoviruses (PMV-1 to PMV-12).

In wildlife, Newcastle Disease Virus (NDV) is most typically seen in CORMORANTS and there is a variant of NDV in pigeons that is usually referred to as Pigeon Paramyxovirus.

CLINICAL SIGNS depend on which strain has infected which species. Birds may die acutely or have prolonged disease. Typical signs may include: weight loss, sneezing, nasal discharge, labored breathing, yellow-green diarrhea, stumbling, and head bobbing.

In PROLONGED CASES, wing and leg paralysis, jerky movements, and dilated pupils also may be seen. Lesions seem to affect the liver, spleen, and respiratory system the most.

TRANSMISSION occurs primarily from direct contact with feces, respiratory secretions or through a contaminated environment. Poultry populations are especially susceptible to NDV infections when in close contact with other birds commonly infected like cormorants, pigeons, and imported psittacine species.

Classic NDV and Pigeon Paramyxovirus can be DIAGNOSED by isolating virus from swabs (oropharyngeal and/or cloacal), serology or PCR testing.

There is no TREATMENT for PMV infections, only supportive care.

ZOOONES
All NDV strains can potentially cause a temporary conjunctivitis in people. However, this is mostly limited to lab workers and vaccination teams that expose themselves to very large quantities of the virus.
There are 12 recognized serotypes of avian paramyxoviruses (PMV-1 to PMV-12), and they are all single stranded RNA viruses. NDV, or Newcastle disease virus (PMV-1), is the most important pathogen of this group for poultry, and is typically the type of PMV that causes issues in wildlife species.

NDV strains are classified into two main groups based on their effects on chickens: virulent NDV (vNDV), which is a reportable disease, and low virulence NDV (loNDV) which is not a major concern and is widely used in available vaccines. Chickens are the most susceptible of domestic poultry, and while most of the research on NDV is conducted in poultry, some strains of NDV do affect wildlife species. The most common species affected are pigeons and cormorants, and the relevant strains of NDV that affect these species routinely circulate in the population.

PMV-2 has been isolated from wild birds, mainly passerines, and caged psittacine species.

**TRANSMISSION** Poultry populations are especially susceptible to vNDV infections when in close contact with other birds commonly infected like cormorants, pigeons, and imported psittacine species, but in reality NDV strains can be found in different species all over the world.

NDV can spread in multiple ways: through exhaled air, respiratory discharges, excrement, and even sometimes through eggs laid by sick birds. Virus is shed during almost every stage of infection, including when an individual is recovering. In addition, the virus can survive for months in the environment and has a wide tolerance range for both pH and temperature; this makes it very easy for wild birds to become infected even without the immediate presence of an infected individual.

For PMV-2, infections in poultry are also thought to originate through contact with wild birds, but the mechanics of transmission between wild or domestic birds are unclear.

**CLINICAL SIGNS** NDV infections can range from being rapidly fatal to absolutely harmless. The severity of the infection depends on what strain it is, and the species, age, and immune status of the potential host.

Newcastle disease presents itself as a respiratory disease, but diarrhea, nervous system signs, and depression are also common clinical signs. Some birds may not appear to be sick and die suddenly. While most of this knowledge comes from research done on poultry populations, many of the same clinical signs are seen in wild birds. Nervous system signs in conjunction with diarrhea are typical in pigeons, and nervous signs are frequently seen in cormorants and exotic bird species.

PMV-2 causes very serious disease in psittacines, but only mildly affects passerines. Clinical signs in psittacines include inflammation of the trachea and intestines, as well as pneumonia.

**TREATMENT** If suspected, vNDV must be reported to appropriate federal and state authorities. Vaccination is an option but does not grant complete immunity, only lessens the severity of infection. Only treatment of symptoms is possible while the infection runs its course. Treatment for other paramyxovirus strain infections is supportive care.

**DIAGNOSIS** NDV can be formally diagnosed by isolating virus or DNA from swabs (oropharyngeal and/or cloacal) and serology coupled with identifying clinical signs. Strain identification is confirmed by PCR. Reference laboratories use sequence analyses to detect genetic differences for comparison of strains from different outbreaks and to identify the source of those infections.

**PRECAUTIONS AND PREVENTION** NDV vaccines are used for chickens, turkeys, and pigeons in other parts of the world, but are prohibited in birds entering the USA as it does not prevent individuals from carrying the disease, and hampers detection of infection during outbreaks.

As many outbreaks of PMV in poultry originate from contact with wild birds, bird-proofing poultry houses and using good biosecurity practices is critical in prevention.

Poultry workers or consumers have not reported being infected. There is no risk of zoonosis for PMV-2 – PMV-12.