EXOTIC NEWCASTLE DISEASE

Animal Group(s) Affected	Transmission	Clinical Signs	Severity	Treatment	Prevention and Control	Zoonotic
Birds	Highly contagious Avian Paramyxovirus – 1 (APMV-1). Aerosol and ingestion are the primary routes. Inadvertent comingling asymptomatic with non-exposed birds.	Death; gastro-intestinal and respiratory signs	Severe; typically fatal	Not usually performed. In zoo specimens treatment is supportive care with consideration of vaccination.	Strict biohazard containment. Vaccination program may be considered. Depopulation and disinfection of premises then no new birds for 30 days	Yes, although rare; laboratory workers and vaccination crews are affected most often.

Fact Sheet compiled by: Nancy Carpenter

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Susceptible animal groups: Numerous species of birds (250 species to date) have been affected. Primary concerns are domestic poultry operations (chickens > turkey) and free-ranging double-crested cormorants are particularly susceptible. Penguins are highly susceptible and birds often die acutely; psittacines show varying susceptibility and prolonged shedding of virus. It has not been reported in mammals, except humans when they are exposed to a highly infected environment or during the vaccination process.

Causative organism: RNA virus within avian paramyxovirus-1 group (APMV-1) Genus *Avulavirus,* Family Paramyxoviridae. It should be noted that the mild strains are endemic to the U.S. with the most virulent strains being in other countries.

Zoonotic potential: Yes. Humans can be exposed when vaccinating birds for the disease.

Distribution: Worldwide but endemic in the Middle East, Asia, Africa, Central and South America.

Incubation period: 2-15 days and depends upon the virulence of the strain, the susceptibility of the population and the species affected.

Clinical signs: In humans, clinical signs include self-limiting conjunctivitis and flu-like symptoms. In animals, clinical signs vary by pathotype:
Asymptomatic enteric – generally subclinical
Lentogenic or respiratory – mild or subclinical respiratory signs
Mesogenic – respiratory and occasional neurologic signs with low mortality

Velogenic – most virulent with high mortality rates.

a. neurotropic – respiratory (coughing, gasping) and neurologic signs (muscle tremors, circling, paralysis; green watery diarrhea; decreased egg production (NVND)
b. viscerotropic – hemorrhagic gastrointestinal disease and lesions (VVND)

In domestic laying hen operations, initially a drop in egg production occurs and then numerous deaths within 24-48 hours which will continue for 7-10 days. Birds that survive for 12-14 days may live but may have permanent neurologic damage.

Post mortem, gross, or histologic findings: No specific post mortem lesions are present. However, relevant gross lesions are usually found only in birds infected with velogenic strains include:

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hemorrhage, ulcers, edema and/or necrosis often occur in the cecal tonsils and lymphoid tissues of the intestinal wall (including Peyer's patches); this lesion is particularly suggestive of Newcastle disease. In chickens infected with less virulent strains, the lesions may be limited to congestion and mucoid exudates in the respiratory tract, and opacity and thickening of the air sacs.

Diagnosis: Virus isolation and microscopic lesions identified in tissues. Differential diagnosis list for infectious diseases includes avian cholera (*Pasteurella multocida*), highly pathogenic avian influenza (HPAI), infectious aryngotracheitis (herpesvirus), infectious coryza (*Hemophilus paragallinarium*), diphtheritic avianpoxvirus, psittacosis (chlamydophylosis (*Chlamydophila psittaci*), mycoplasmosis, infectious bronchitis (coronavirus), and, in psittacines only, Pacheco's disease.

Material required for laboratory analysis: Contact laboratory in advance of collections to ensure proper collection storage and shipping methods. Brain and Heart infusion broth (BHI) with high concentrations of antibiotics should be used for transport. Freeze if samples will not be received by the laboratory within 24 hours.
Swabs of trachea, oropharynx, and cloaca can be collected from live birds. Tissue samples from dead birds include trachea, lung, spleen, cloaca, intestines, cecal tonsils, brain. Feces for culture can be collected from either live or dead birds. Serum for ELISA can be used but previous exposure and vaccination may affect results. Reverse Transcriptase PCR is also available. However, results returning before that particular animal might die may be problematic.

Relevant diagnostic laboratories: Testing is performed at numerous state labs.

Treatment: It is not recommended to pursue treatment and typically flock depopulation is performed in domestic poultry operations. However, in a zoo situation the benefit of treatment should outweigh the risk of transmission to other birds.

Prevention and control: Once identified, strict biohazard control methods should be immediately implemented. Slaughter and disposal of all infected and exposed birds is recommended. No new birds in for 30 days. Pests must be controlled to minimize mechanical transfer of the virus.

Suggested disinfectant for housing facilities: cresylics and phenolics

Notification: State and Federal veterinarians should be notified.
Federal: http://www.aphis.usda.gov/animal_health/area_offices/ - use map for regional instructions.
State: http://www.usaha.org/Portals/6/StateAnimalHealthOfficials.pdf

Measures required under the Animal Disease Surveillance Plan: This is a reportable disease and control must be managed with regional veterinary authorities. Once the disease is confirmed, strict biosecurity measures should be taken. Depopulation to prevent spread must be considered.

Measures required for introducing animals to infected animal: Not recommended.

Conditions for restoring disease-free status after an outbreak: Do not repopulate infected areas for at least 30 days from final disinfection.

Experts who may be consulted:
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