CANINE DISTEMPER (CD)

ANIMAL GROUP AFFECTED	TRANS-MISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Domestic and wild carnivore species, Javelinas, Tayassuidea	Aerosol or contact with oral, respiratory and ocular fluids, exudates and faeces	Depression, mucopurulent oculonasal exudates, CNS signs	Variable, between inapparent infections and high mortality	Modified live and dead virus vaccines, serum therapy (Stagloban)	*In houses* *in zoos* Husbandry protocols, including adequate vaccination, quarantine and housing arrangements

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Susceptible animal groups
Species in all families in the order Carnivora are susceptible to CDV (Canidae, Mustelidae, Procyonidae, Hyaenidae, Ursidae, Viverridae, and Felidae). Besides that even Javelinas and Tayassuidea are susceptible to CDV.

Causative organism
Canine distemper virus (CDV) is a negative-stranded RNA virus, size (100-250 nm) within the family *Paramyxoviridea,* subfamily *Paramyxovirinae,* and genus *Morbillivirus.* CDV is relatively fragile and quickly inactivated in the environment, by ultraviolet light, heat and drying and in common disinfectants.

Zoonotic potential
There has been concern that CDV could be associated with multiple sclerosis in humans, though this theory remains controversial.

Distribution
Animals: world-wide among wild and captive carnivores.
Concern has been raised about the potential transmission of CDV from domestic dogs in or adjacent to wildlife reserves to native wildlife. This may have occurred in the case of free-ranging African wild dogs, lions and was thought possible in the case of giant pandas in China.

Transmission
Transmission of CDV is primarily by aerosol or contact with oral, respiratory, and ocular fluids and exudates containing the virus. It is shed from skin and in faeces and urine. Transplacental transmission has been documented in dogs. Close association between affected and susceptible animals is necessary due to the relative fragility of CDV in the environment. The virus may be shed for up to 90 days after infection.
Suspected animals responsible for CDV transmission to zoo animals are mustelids, canids and felids. If dogs are allowed to enter zoos, they are able to transmit CD in cases where they did not obtain a proper immunoprophylaxis by vaccination.

Incubation period
Incubation period ranges from about 1 week to 1 month.

Clinical symptoms
Clinical presentation depends somewhat on the species; the classic signs are depression and mucopurulent oculonasal exudates. Fever, anorexia, vomiting, and diarrhoea frequently occur. Animals that recover from clinical CD or that have a prolonged illness may be in poor body condition. Central nervous system signs may

be concurrent or follow systemic disease. Neurologic signs depend on the area of brain affected and include abnormal behaviour, convulsions, cerebellar and vestibular signs, paresis or paralysis and inco-ordination.

Post mortem findings

Interstitial pneumonia to bronchopneumonia, catarrhal to haemorrhagic enteritis, and hyperkeratosis of the nose, lips, eyelids, ears, anus, and footpads may be present. Absolute lymphopenia is common. Less commonly observed lesions include damage of enamel, dentin, and tooth roots in animals that contact CDV prior to eruption of permanent teeth.

An important diagnostic feature of CD is the presence of intracytoplasmatic and intranuclear eosinophilic inclusion bodies in epithelia, neurons, and astroglia. Inclusion bodies are also often in gastric mucosa, enterocytes, pancreatic and biliary duct epithelium, and epithelium of the respiratory and urogenital tract.

Diagnosis

Virus neutralisation test (NPLA) is the standard serologic test for antibodies against CDV. PCR also detects CDV in tissues. Immunohistochemistry is very useful for detection of CDV antigen in formalin-fixed, paraffin-embedded tissues.

Material required for laboratory analysis

Sera, tissue (lung, spleen, brain); storage of tissue samples: -80°C; storage of serum samples: -20°C

Relevant diagnostic laboratories

Dr. L. Haas, Institut für Virologie der Tierärztlichen Hochschule Hannover, Bünteweg 17, 30559 Hannover, Germany, Tel. +49-511 9538860, Fax +49-511 8568860

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Treatment

Wild animals that survive CD probably have lifelong immunity to subsequent infection by CDV. Modified live virus (MLV) vaccines, in species that can be safely vaccinated, induce long-life immunity. However, an inactivated vaccine is recommended in general. A serum therapy and the application of antibiotics is although recommended.

To protect pantherides against CD a vaccination scheme involving both inactivated and attenuated live virus vaccine strains might be an option.

Prevention and control in zoos

CD is one of the most important infectious diseases of carnivores in captivity and must be considered in design of husbandry protocols, including vaccination, quarantine, and housing arrangements. Because many threatened and endangered carnivores are susceptible to CDV, it must be considered in management plans and during restoration efforts.

Cave: Common animal vaccines may be virulent for exotic carnivores.

Suggested disinfectant for housing facilities

All virus disinfectants can be used.

Notification

Guarantees required under EU Legislation

Guarantees required by EAZA Zoos

Measures required under the Animal Disease Surveillance Plan

Measures required for introducing animals from non-approved sources

Measures to be taken in case of disease outbreak or positive laboratory findings

Conditions for restoring disease-free status after an outbreak

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