





CANINE DISTEMPER

Hard pad disease

By

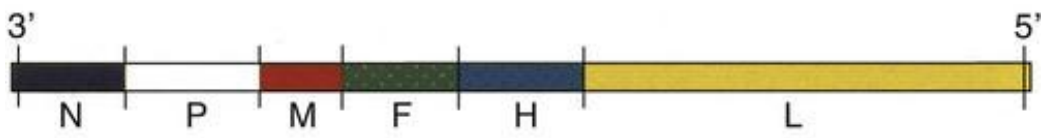
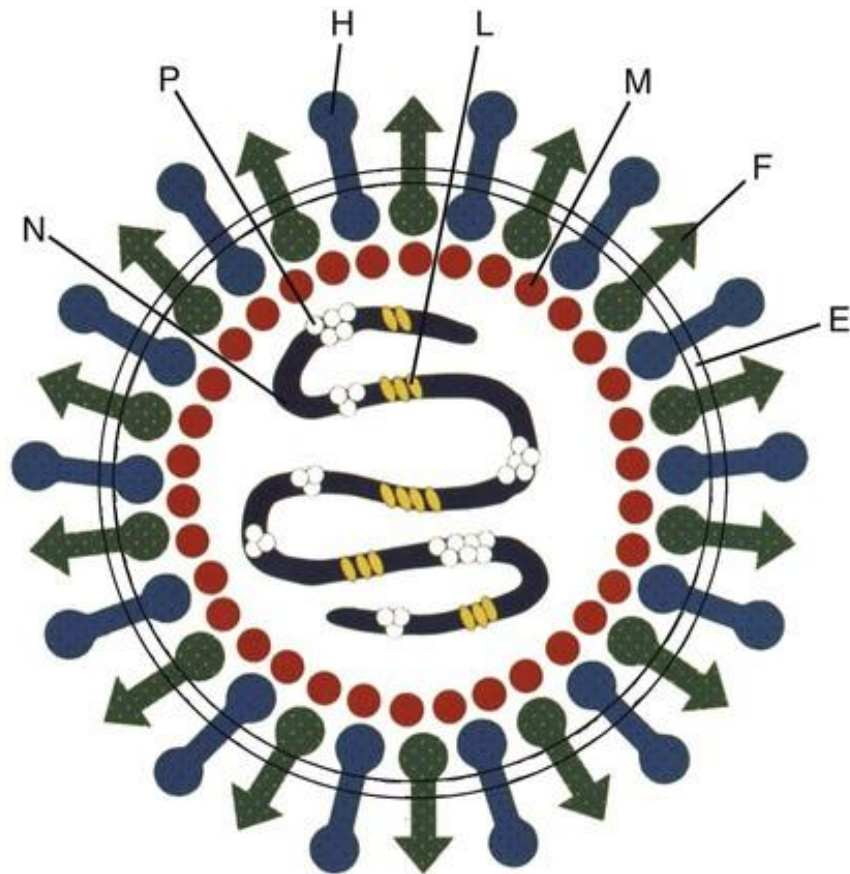
Dr/ Marawan Elfky

Definition

- Highly contagious poly-systemic viral disease of dogs.
- Ch. By diphasic fever, leukopenia, skin hyperkeratosis, GIT & respiratory tract and neurological complication.
- 25-75% of susceptible dogs become sub - clinically infected (long lasting immunity).

Etiology

- CDV genus Morbillivirus” PPR and cattle plague” family Paramyxo.
- Large ssRNA virus (one serotype).
- Sensitive to UV radiation, heat, detergents and lipid solvents.
- Survive for several days at temp. below zero and at -65 °c for at least 7 years.



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Predisposing factors

- Immunosuppression, poor feeding, debility, Vit A deficiency, parasitism and air draughts.

Epidemiology

1. **Distribution:** Worldwide and recorded in Egypt.
2. **Host rang:** (“Wide range Carnivora” dogs, foxes, raccoon, ferret, wolves, mink and skunk).
 - 3-6.m age are more susceptible (weaning & loss of maternal immunity) .
 - Cats and pigs may be infected (bronchopneumonia).
 - Reported in non-human primates with high mortality rates (potential zoonotic risk of CDV in humans).

3. Seasonal incidence: No.

4. Transmission:

a. Source: Body tissues and secretions “respiratory (abundant) and conjunctival exudate, saliva, feces and urine for up to 2-3 m. post infection”.

b. Mode:

- **Primary, inhalation.**
- Contact with contaminated objects.
- Mechanically by flies and insects
- Transplacental or in utero infection of puppies

5. Economic impact:

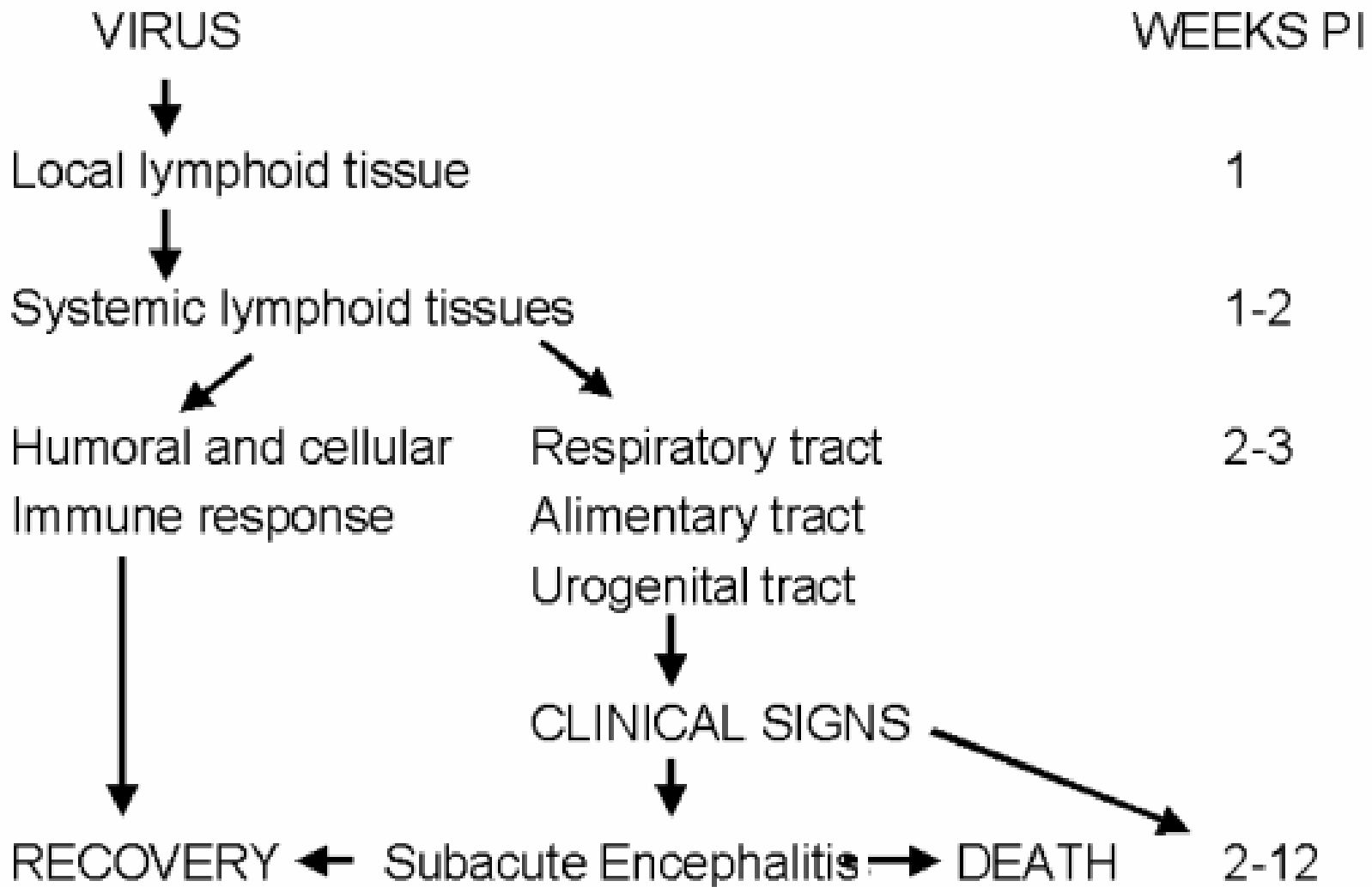
- ❖ Loss of dog's function and deaths of valuable dogs.

Pathogenesis

- After infection by inhalation, the virus multiplies in tissue macrophages.
- Spreading within 1 d via the lymphatics to the tonsils and respiratory lymph nodes, resulting in severe immunosuppression.
- Within 2-4 d., other lymphoid tissues become infected.
- By day 6, the gastrointestinal mucosa, hepatic Kupffer cells and spleen are infected

- Further spread occurs by cell-associated viraemia to other epithelial cells and the CNS.
- Viral virulence, host age and immunity play important role in the outcome of infection:
 - A. Strong immunity**, the virus fails to infect epith. tissues and viremia ceases with elimination of the virus within 14.d and complete recovery occurs.
 - B. Weak immunity**, rapid dissemination of the virus occurs to epithelium of most organs as respiratory, GIT, eye and CNS.

PATHOGENESIS OF CANINE DISTEMPER



Clinical signs

- I.P from 2-9 d.
- Course (10 d.- several months)
- Morbidity and mortality rates variable.



Diphasic

1. Acute systemic form

- Occurs 2–3 weeks post-infection.
- **fever**, depression, anorexia, mucopurulent oculo-nasal disch., coughing, dyspnoea, vomiting and diarrhoea (may be bloody).
- The virus is found in every secretion and excretion of the body.

2. Chronic nervous disease

- Concurrent or follow systemic disease within 2–3 weeks.
- Abnormal behavior, convulsions or seizures, blindness, paresis or paralysis, incoordination and circling.
- **"Chewing gum fits"** type convulsive seizures cha. by chewing movements of the jaw with salivation occurs in dogs developing polioencephalomalacia

- Most animals die 2–4 w. after infection.
- Hyperkeratosis of nose and foot pads with pustular dermatitis of lower abdomen (dandruff throughout the coat) is common in dogs suffering from neurological disease.
- **Chorea myoclonus:** force involuntary neuromuscular twitching (jerking) of the muscles as in the legs or facial muscles, (specific).
- It occurs due to local irritation of lower motor neurons of spinal cord or cranial nerve.

- Can be present while dogs is walk or commonly while sleeping with involuntary defecation and urination.
- It can be present in absence of other neurological signs.

3. Neonatal infection form

- Occurs with or without neurological signs.
- Infection of puppies before eruption of permanent dentition: severe damage of their enamel.
- Dental enamel become irregular in appearance or there is enamel hypoplasia.

4. Transplacental infection form

- Bitch may show inapparent infection, abortion, or the birth of weak puppies
- Young puppies infected transplacentally may develop CNS signs during first 4-6 w.
- Permanent immunodeficiencies occurs in survival puppies.

5. Ocular form

- The virus in the optic nerve and retina.
- Optic neuritis: Ch. by blindness with dilated unresponsive pupils.
- Dege. & necrosis of retina produce gray to pink irregular densities on the eye, with atrophy and complete retinal detachment.

- Circumscribed hyper-reflective areas termed "gold medallion" lesions which are considered characteristic of previous CDV infection.



(a)



(b)



(c)

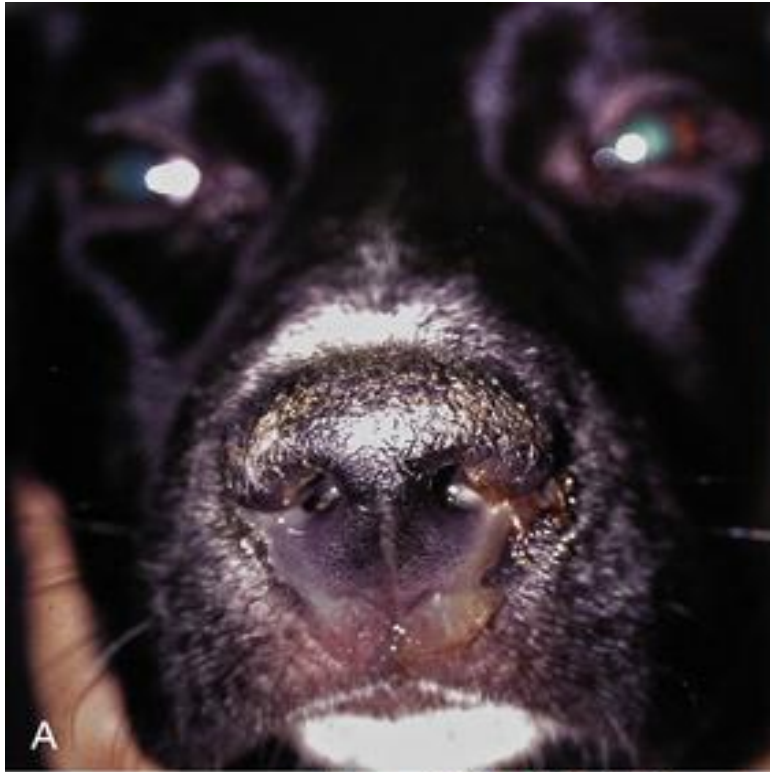


(d)

Figure 1: (a) Serous ocular discharge, (b) Blepharitis along with cloudiness of eye, (c) Scanty nasal discharge (d) Hyper keratinization of Pads in dog suffering from nervous form of canine distemper.

A**B****C****D**





Complications

- Secondary viral, bacterial and or parasitic infections of the skin, digestive and respiratory tract “Immunosuppression”.

P/M lesion

- Thymic atrophy in young puppies.
- Catarrhal enteritis.
- Conjunctivitis, rhinitis and inflammation of tracheobronchial tree and pneumonia .
- Hyperkeratosis of nose and foot pads.
- Meningeal conge. & ventricular dilatation.
- Neuronal and myelin degeneration (demyelination).
- Acidophilic I.C & I.N I.B in respiratory, digestive and urinary epithelium and neurons.

Diagnosis

1- Field diagnosis; depends on case history, clinical signs and P/M lesions.

2. Lab. Diagnosis;

A. Sample (on ice or formaline):

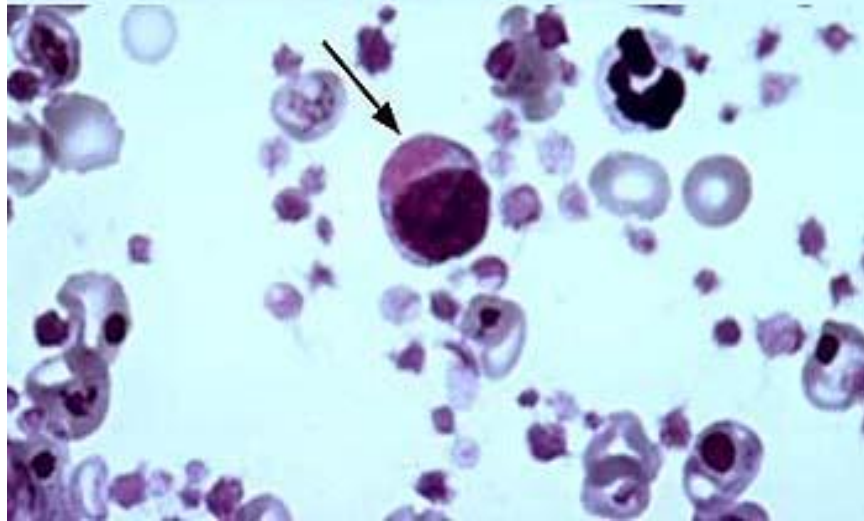
- Transtracheal or pharyngeal washing.
- Smears or scrapings from conjunctiva & hard Pad.
- Urine, CSF, tonsils, skin, uveal tissues.
- CNS, spleen, lymph nodes, stomach, lung, duodenum, bladder, respiratory and genital epithelium.
- Blood & serum.

B. Laboratory procedures:

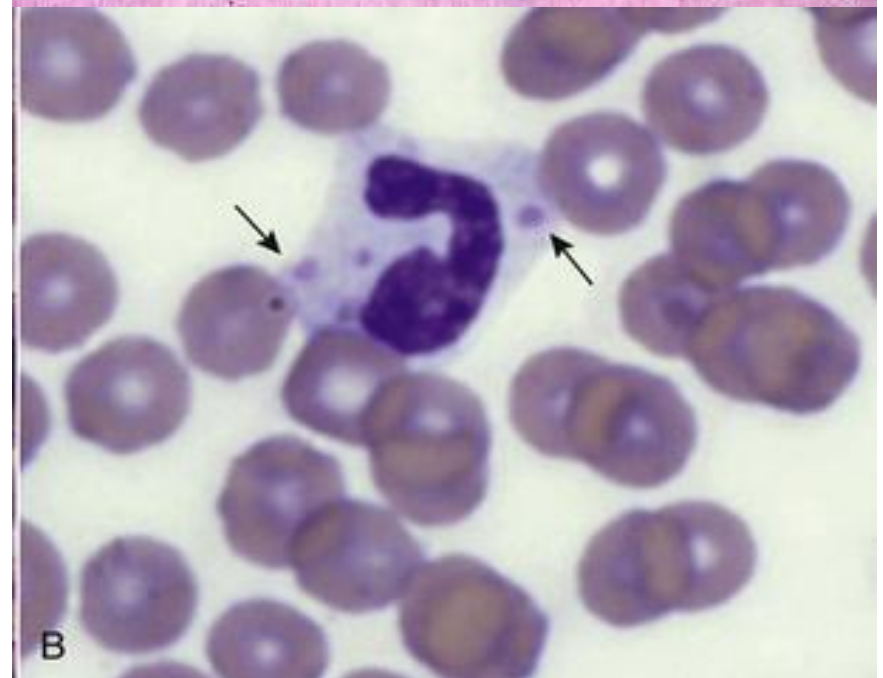
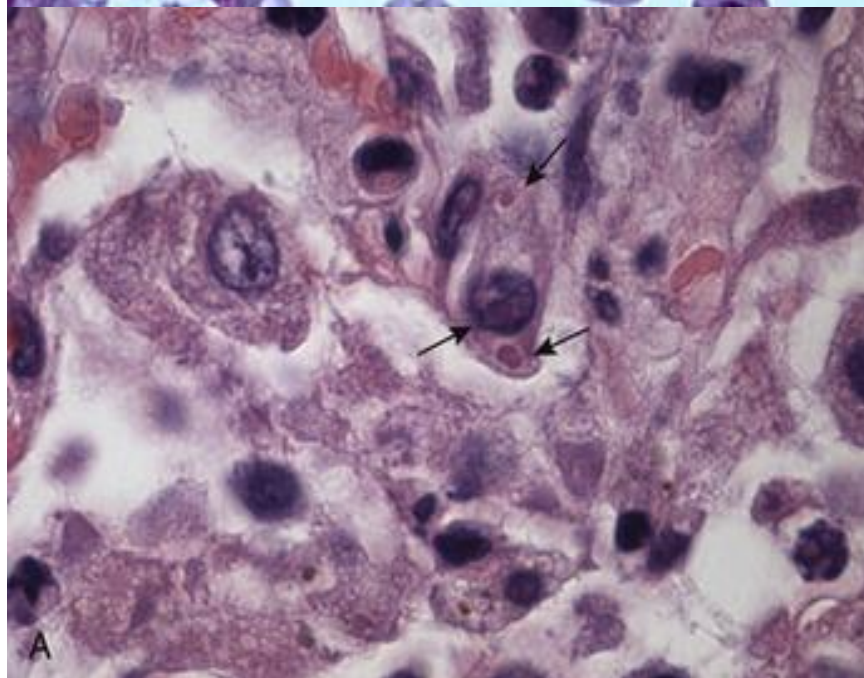
- **Virus isolation** on cell culture (CPE after 2-5 d)
“Giant cell formation”.
- **Molecular assays:** Using (RT) PCR assay, nested PCR and real-time PCR, (highly sensitive and specific).
- **Serological assays:** (IFAT), ELISA and SNT.
- **Serum biochemical analysis:** Decrease in albumin and increased in alpha and gamma globulin in adult.
Marked hypoglobulinemia in puppies.

- **Hematology:** lymphopenia, thrombocytopenia, regenerative anemia,
- **Histopathology:** Acidophilic I.C & I.N I.B in the affected cells.
- **CSF analysis:** Increased in protein and cell count especially lymphocytes and anti-CDV antibody (IgG or IgM).
- **Animal inoculation:** I/C injection in mice, ferrets and hamster producing CNS signs.
- **Radiology:** secondary bronchopneumonia.

Intracytoplasmic inclusion body
in lymphocyte



Distemper - IN inclusion



Differential diagnosis

- All causes of encephalitis or neurological diseases as rabies, infectious canine hepatitis, trauma and brain abscess or tumors.
- Also, Leptospirosis, lead poisoning, toxoplasmosis, bacterial gastroenteritis, ehrlichiosis, coccidiosis.

Treatment

➤ Hygienic treatment:

- a. Infected animal kept in clean warm and free of drafts.
- b. Oculonasal discharges should be removed.
- c. Food and water should be discontinued if vomiting and diarrhea is present.
- d. Cleaning and disinfection of dog kennel.
- e. Dead animal should be hygienically disposed.

➤ **Medicated treatment: (No specific treatment).**

- a. Broad spectrum antibiotic as ampicillin, and synulox.
- b. Ringer's solution given I/V or S/C.
- c. Vit.B to replace those lost and to stimulate appetite.
- d. I/V ascorbic acid, immune sera (10-30 ml),
- e. Antiemetic, antipyretic, antifilmatory, and antidiarrheal drugs.

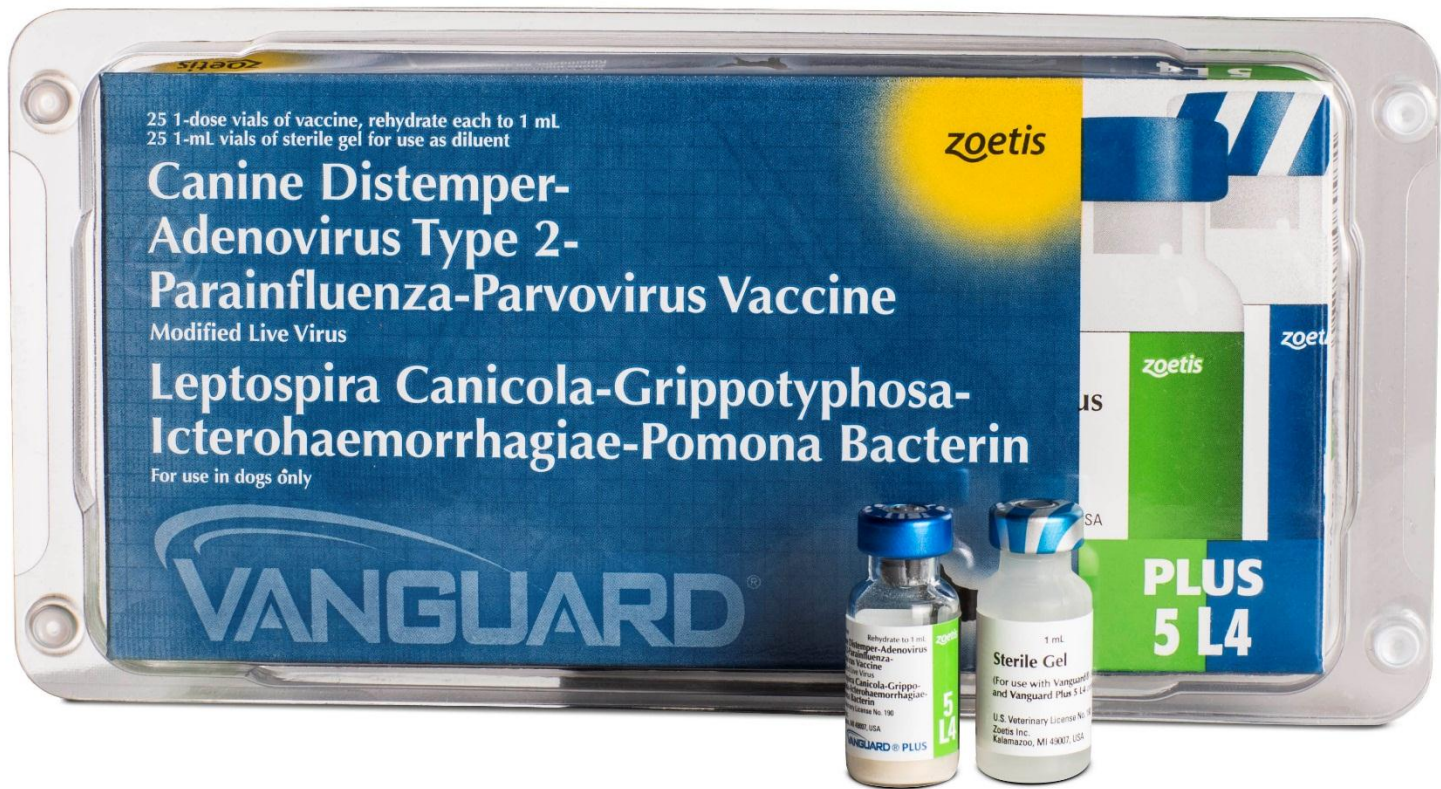
- f. Analgesic and anticonvulsants after onset of systemic disease and prior to development of neurologic seizures.
- g. Glucocorticoid (cortisol) may have variable success in controlling blindness and pupillary dilation.
- h. Prognosis of the disease is generally bad.

Control

- **Segregation of infected dogs** and treat them symptomatically and destruction all source of infection.

Vaccination

- Living attenuated or inactivated vaccines singly or in combination with other canine vaccines.
- Two doses with 3-4 weeks intervals, giving immunity **6 m -1 years**.
- Puppies from non-vaccinated bitch are vaccinated for first time at 1-4 w. age and at 6-16 w. age from vaccinated dam.



25 1-dose vials of vaccine, rehydrate each to 1 mL
25 1-mL vials of sterile gel for use as diluent

zoetis

Canine Distemper- Adenovirus Type 2- Parainfluenza-Parvovirus Vaccine

Modified Live Virus

Leptospira Canicola-Grippotyphosa- Icterohaemorrhagiae-Pomona Bacterin

For use in dogs only

VANGUARD

PLUS
5 L4





live attenuated **canine distemper** virus, live attenuated canine **adenovirus 2** and live attenuated **parainfluenzavirus**, live attenuated canine **parvovirus1&2**, inactivated **Leptospira canicola** and inactivated **Leptospira icterohaemorrhagiae**.



Thank You

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Publications [Titles(4) :: Papers(4) :: Abstracts(4)]

Courses Files(9)

Inlinks: (1)

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News

[2017-06-18]

Member of Animal infectious diseases and prevention department (AIDP), University of Miyazaki, Japan (<http://www.agr.miyazaki-u.ac.jp/~vet/AIDP/members-students.html>)[more](#)

Research Interests

Veterinary infectious diseases

