





Canine Parvovirus infection (CPV)

By

Dr/ Marawan Elfky

Definition

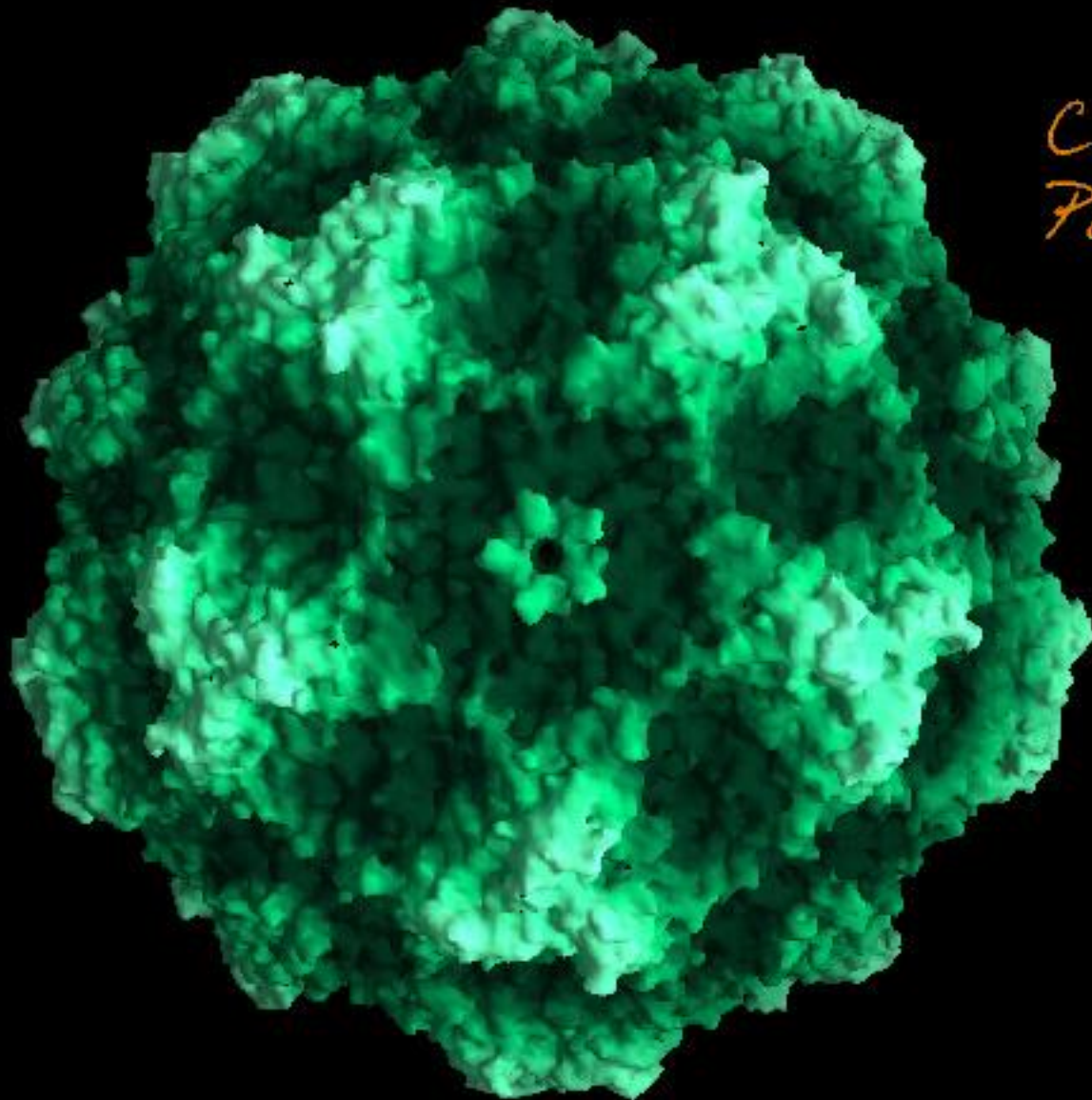
➤ Contagious infectious viral disease of dogs ch.

by two different forms:

- 1. Intestinal form (more common stomach and intestines)**, which is characterized by anorexia, vomiting, diarrhea and weight loss.
- 2. Cardiac form (less common)** attacks the heart muscles of very young puppies, often leading to death.

Etiology

- **CPV-2, family Parvoviridae.**
- **Non-enveloped ssDNA virus.**
- **Resistant** to many common detergents and disinfectants.
- Persist indoors at room temperature for a few weeks; outdoors for many months, **if protected from sunlight and desiccation.**



Canine Parvovirus

*X-ray Structure
determination:*

**J. TSAO, M.S. CHAPMAN,
M. AGBANDJE, W.
KELLER, K. SMITH,
H. WU, M. LUO, T.J.
SMITH, M.G. ROSSMANN,
R.W. COMPANS,
C.R. PARRISH. (1991)
Science, 251 1456-1464
(PDB ENTRY: 2DPV)**

*Radial Depth Cue
Rendering with grasp (A.
NICHOLLS) on Silicon
Graphics:*

J-Y. SGRO

image © 1994 Jean-Yves Sgro

Predisposing factors

- **Stress** (eg, from weaning, overcrowding, malnutrition, etc),
- **Concurrent intestinal parasitism, or enteric pathogen infection** (eg, Clostridium spp, Campylobacter spp, Salmonella spp, Giardia spp, coronavirus) have been associated with more **severe clinical illness.**

Epidemiology

- 1. Distribution:** Worldwide and reported in Egypt.
- 2. Host rang:** (Dogs, foxes, wolves and coyotes).
 - Puppies (**6 weeks to 6 months**) more susceptible.
 - Puppies **less** 6 w (inutero) of age take **cardiac** form while **more** than 6 w take **intestinal** form.
 - **Rottweilers, Doberman, and German Shepherd** dogs have been described to be at **increased risk**.

3. Seasonal incidence : no

4. Transmission:

a. Source: Body secretions of dogs during acute stages of the disease as **saliva & feces.**

b. Mode:

- **Ingestion.**
- Inhalation (rare).
- Inutero infection

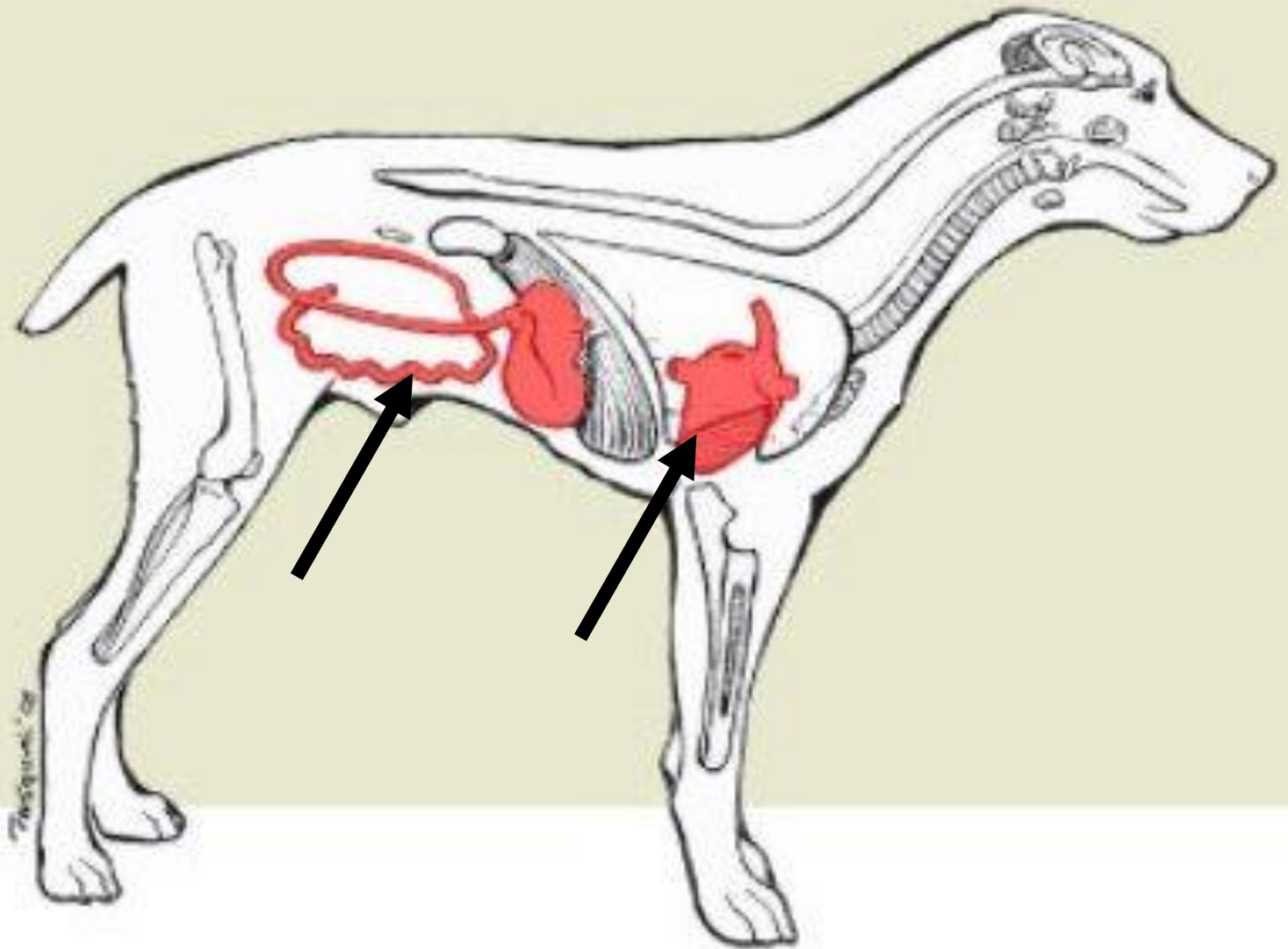
5. Economic impact:

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

Pathogenesis

- Virus is shed in the feces of infected dogs within 4–5 days of exposure (often before clinical signs develop), throughout the period of illness, and for ~10 days after clinical recovery.
- Infection is followed by replication in **lymphoid tissue of the oropharynx then** hematogenous dissemination.
- **Lymphopenia and neutropenia** develop secondary to destruction lymphopoietic tissues.

- **Intestinal form: (more than 6 w of age)** Destruction of the intestinal crypt epithelium results in epithelial necrosis, villous atrophy, impaired absorptive capacity.
- **Cardiac form (less than 6 w of age)** myocardial infection, necrosis, and myocarditis presenting as acute cardiopulmonary failure or delayed, progressive cardiac failure, **(with or without signs of enteritis).**



Clinical signs

- I.P from **3-7 days**.
- Course **2-12 days**
- Morbidity rate **high**
- Mortality rate **high**

Clinical forms

1. Intestinal form (more 6 w):

- ❖ Fever, depression, lethargy and anorexia.
- ❖ Clinical or subclinical infection.
- ❖ Severe enteritis with vomiting and diarrhea which is often blood tinged due to destruction of epithelial cells of intestinal crypts.
- ❖ Dehydration, shock and death within 2 days.

Clinical forms

2. **Cardiac form** (less 6 w):

- ❖ Puppies infected during late gestation or in early neonatal period.
- ❖ **Myocarditis** with signs of cardiac arrhythmia, dyspnea, coughing, pulmonary edema
- ❖ **Deaths** (20-100%) due to myocardial necrosis and myocardial failure.



P/M lesion

- Edema and congestion of abdominal and thoracic **lymph nodes**; thymic atrophy and bone marrow hypoplasia
- A thickened and discolored **intestinal wall**; watery, mucoid, or hemorrhagic intestinal contents.
- Multifocal necrosis of **intestinal crypt** epithelium with sloughing.

P/M lesion

- Pale streaks in the **myocardium**.
- **Pulmonary edema**, alveolitis, and bacterial colonization of the lungs and liver **(complications)**.



Figure 1 Hyperemia of enteric blood vessels



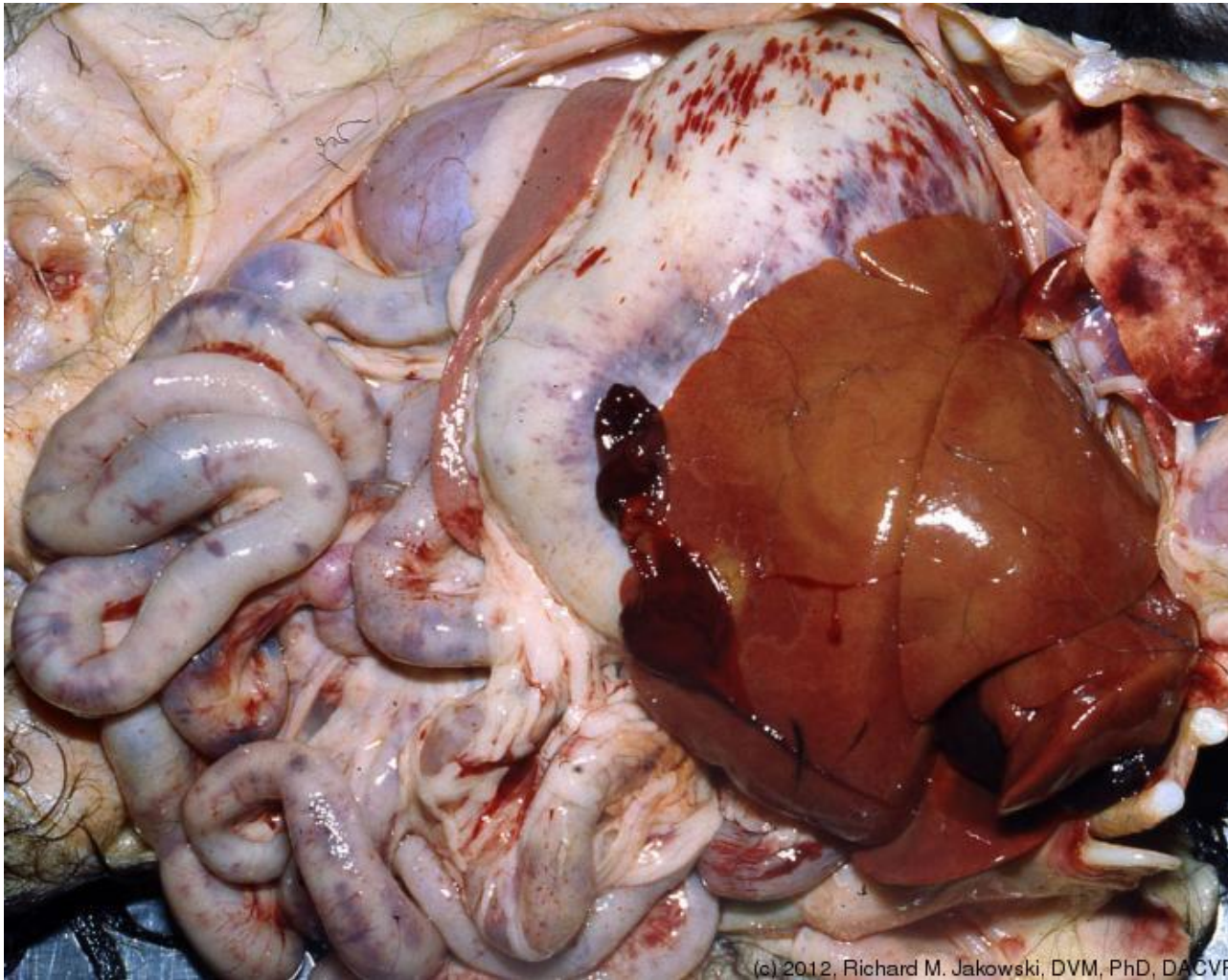
Figure 2 Hemorrhages in intestine



Figure 3 Hemorrhages in liver

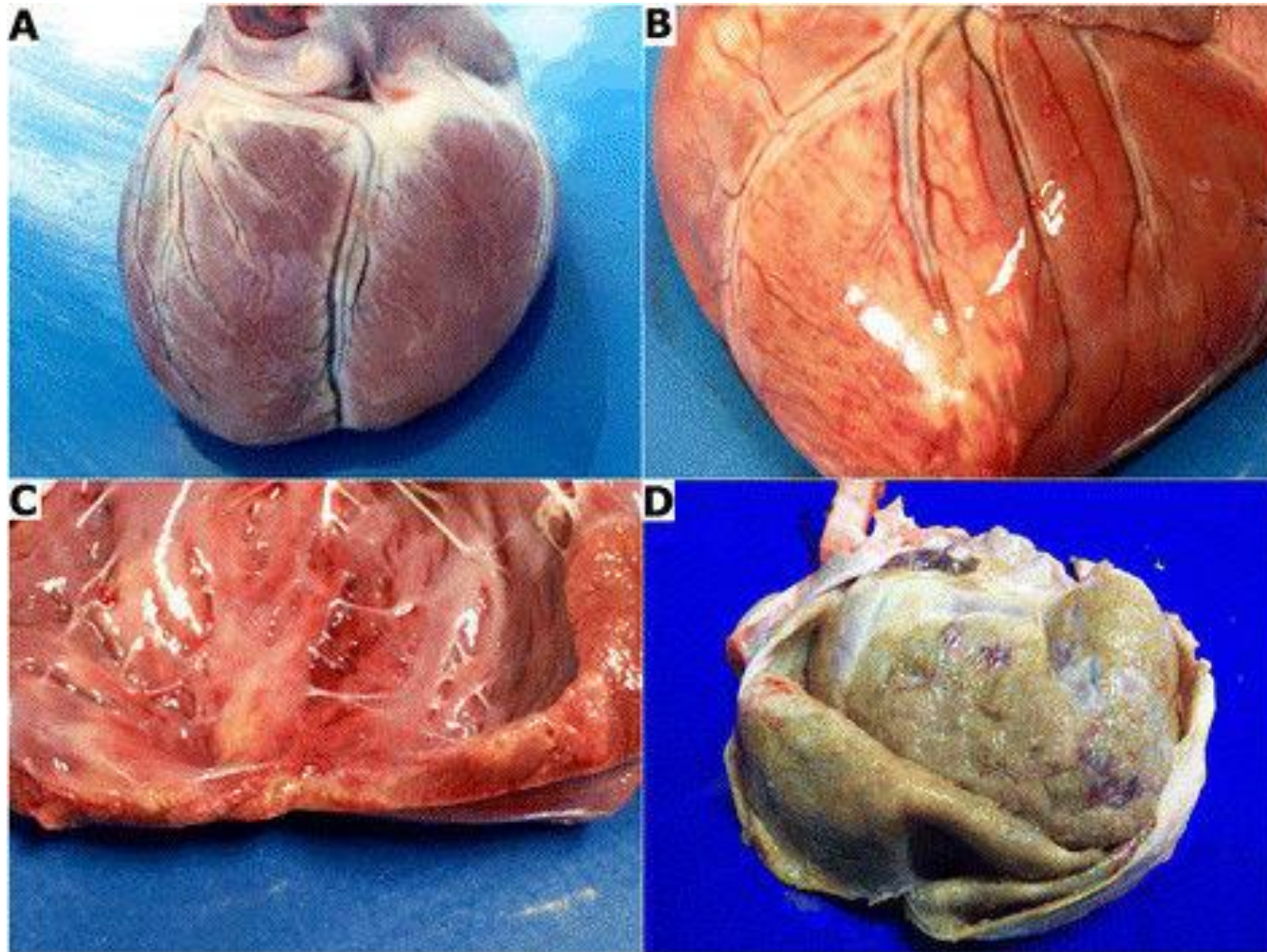


Figure 4 Focal congestion in lungs



(c) 2012, Richard M. Jakowski, DVM, PhD, DACVP

Necropsy of CPV2 infected canine shows signs of **small intestine dilatation and luminal hemorrhage**



A – generalized heart chamber dilation; **B** - infarct in the left ventricular wall; **C** – infarct site: changes in the heart muscle seen on cross-section; **D** – a thickening of pericardial sack with considerable amounts of fibrin covering the heart.

Diagnosis

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

2. Lab. Diagnosis;

A. Sample:

- **Fecal or rectal swabs.**
- **Specimens from internal organs as lung, spleen, thymus or lymph nodes.**
- **Serum and blood.**

B. Laboratory procedures:

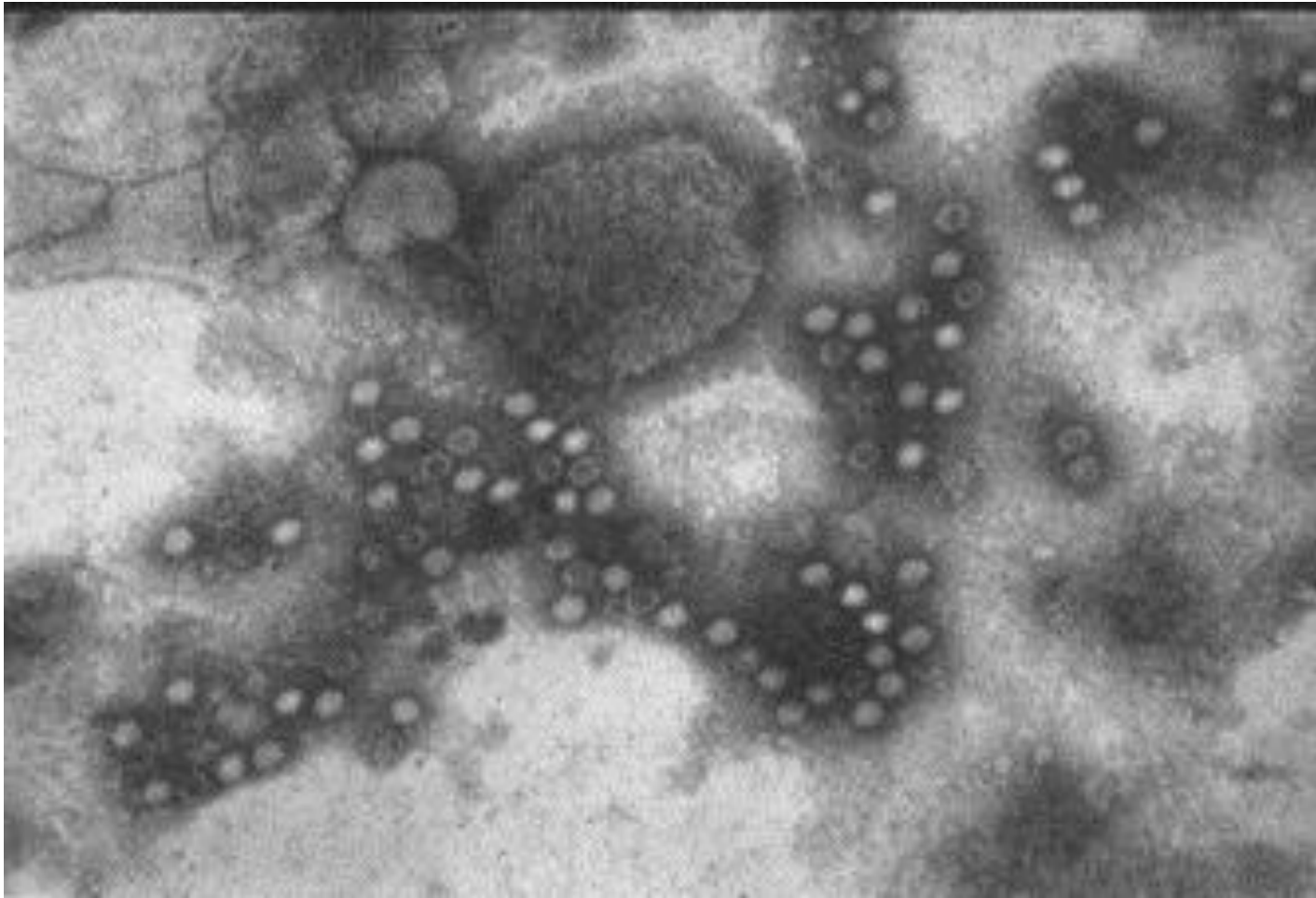
- **Virus isolation** on cell culture
- **Molecular assays:** using nested PCR and real-time PCR, (highly sensitive and specific).
- **Serological assays:** indirect fluorescent antibody test (IFAT), ELISA and SNT (4 fold increase in ab titer 2 weeks apart).
- **ECG:** obvious abnormalities
- **Radiography:** showing cardiomegaly.

B. Laboratory procedures:

➤ Histopathology:

- Destruction of newly formed epithelium resulting in shortening of intestinal villi.
- Interstitial fibrosis of myocardium with presence of I/N IB.

➤ Electron microscope or latex agglutination test on feces.



Parvoviral particles in the feces of infected dog.

Differential diagnosis

- With others causes of diarrhea and myocarditis.

Treatment

- Prognosis is bad in young puppies
- No specific treatment but symptomatic and supportive (**prevent secondary infection**).
- Fluid therapy as ringer's 45 ml/kg, B/W, I/V,
- Glucose 50% in a dose of 0.5 ml/kg.
- Broad spectrum antibiotic as ampicillin or gentamicin.
- Anthelmintic to fight parasites.

Treatment

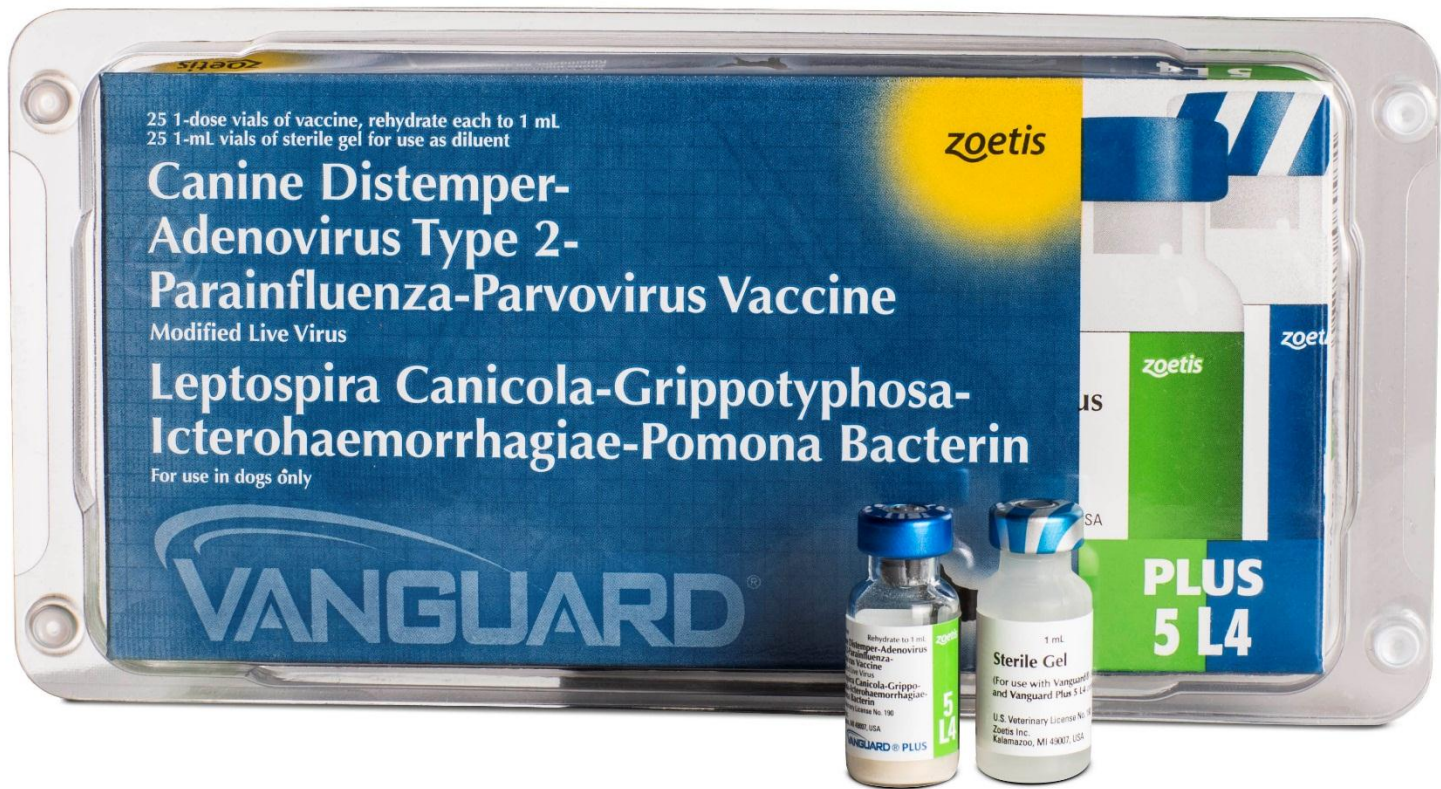
- H2 Blockers to reduce nausea.
- Non-absorbable oral antibiotic as neomycin to reduce ammonia producing bacteria in intestine.
- **N.B:** The survival rate in dogs is about 70 %, but death may result from severe dehydration, a severe secondary bacterial infection, bacterial toxins in the blood, or a severe intestinal hemorrhage.

Control

- **Segregation of infected dogs** and treat them symptomatically and destruction all source of infection.
- **Cleaning & disinfection with hypochlorite at 1:10 or 1:30.**

Vaccination

- Living attenuated vaccines singly or in combination with other canine vaccines.
- Three doses at **(6, 9, 12 w)**, giving immunity **1 years and booster annually.**
- Puppies from non-vaccinated bitch vaccinated for first time at **1-4 w.** age and at **6-16 w.** age if 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**.



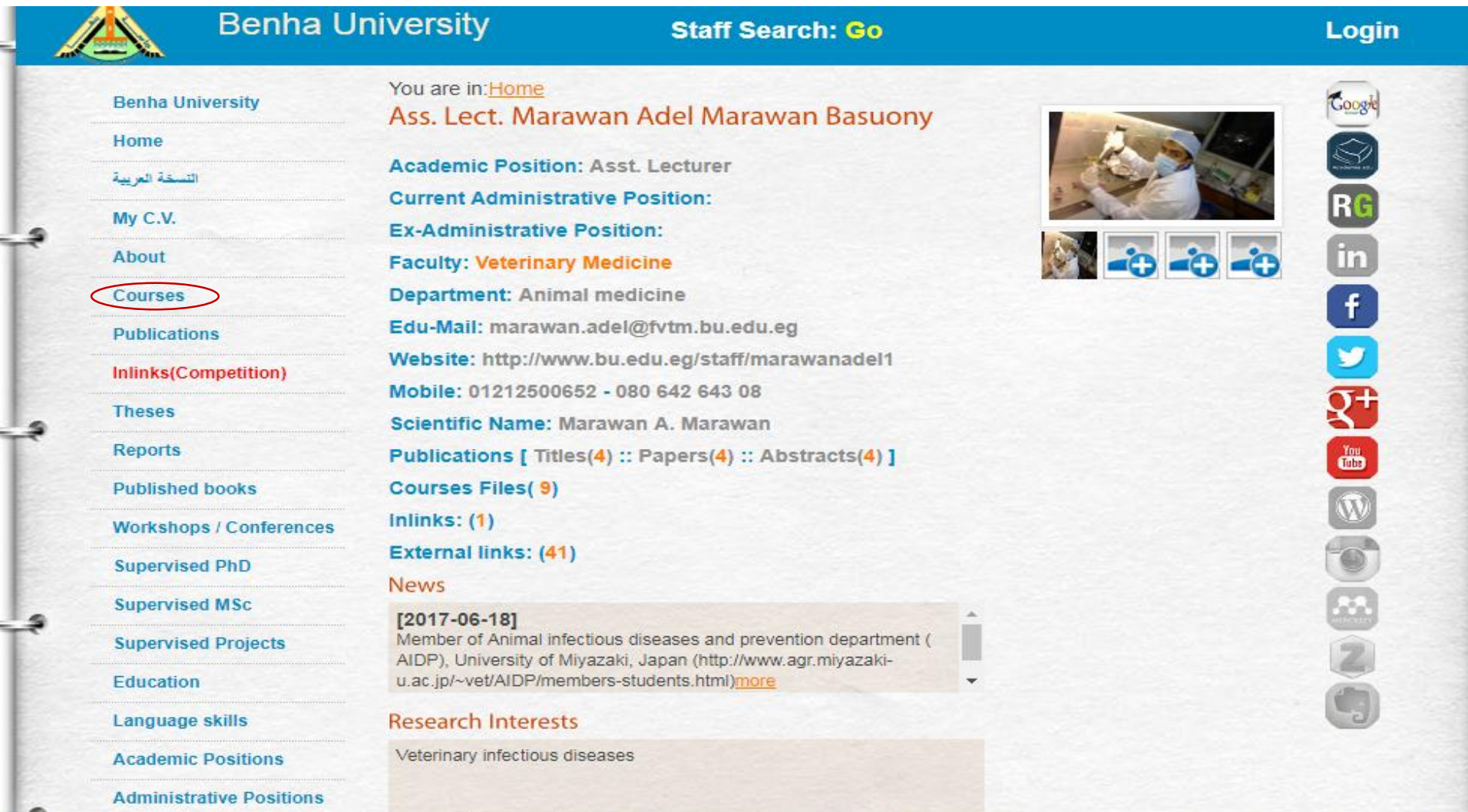
**- DON'T LOSE YOUR DOG TO -
PARVOVIRUS**



Thank You

<http://bu.edu.eg/staff/marawanadel1>

Password **1986**



The screenshot shows a web page for Benha University. The header includes the university logo, the name "Benha University", a "Staff Search: Go" button, and a "Login" link. A left sidebar contains a menu with items like "Home", "التسعة العربية", "My C.V.", "About", "Courses" (circled in red), "Publications", "Inlinks(Competition)", "Theses", "Reports", "Published books", "Workshops / Conferences", "Supervised PhD", "Supervised MSc", "Supervised Projects", "Education", "Language skills", "Academic Positions", and "Administrative Positions". The main content area displays the profile of "Ass. Lect. Marawan Adel Marawan Basuony", listing his academic and administrative positions, faculty (Veterinary Medicine), department (Animal medicine), email, website, mobile number, scientific name, and publication statistics. A news section dated [2017-06-18] mentions his membership in the AIDP department at the University of Miyazaki, Japan. A "Research Interests" section lists "Veterinary infectious diseases". On the right, there is a photo of the staff member, social media icons for Google, RG, LinkedIn, Facebook, Twitter, Google+, YouTube, WordPress, and others.

Benha University Staff Search: **Go** Login

You are in: [Home](#)
Ass. Lect. Marawan Adel Marawan Basuony

Academic Position: Asst. Lecturer
Current Administrative Position:
Ex-Administrative Position:
Faculty: **Veterinary Medicine**
Department: Animal medicine
Edu-Mail: marawan.adel@fvmtm.bu.edu.eg
Website: <http://www.bu.edu.eg/staff/marawanadel1>
Mobile: 01212500652 - 080 642 643 08
Scientific Name: Marawan A. Marawan
Publications [Titles(4) :: Papers(4) :: Abstracts(4)]
Courses Files(9)
Inlinks: (1)
External links: (41)

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

Benha University
Home
التسعة العربية
My C.V.
About
Courses
Publications
Inlinks(Competition)
Theses
Reports
Published books
Workshops / Conferences
Supervised PhD
Supervised MSc
Supervised Projects
Education
Language skills
Academic Positions
Administrative Positions

Google
RG
in
f
Twitter
g+
YouTube
WordPress
University of Miyazaki
Z
Globe