

## Encephalomyocarditis Virus (EMV, EMCV) in Elephants [www.elephantcare.org](http://www.elephantcare.org)

### Etiology

- genus Cardiovirus, Family Picornoviridae
- worldwide distribution
- isolated from many mammals, including humans

### Epizootiology

- rodents reservoir host
- pigs primary domestic animal host
- occurs in many captive non-domestic species, especially primates
- African and Asian elephants susceptible
- sporadic occurrences in South Africa, Australia, U.S.
  - first cases in Florida 1974-1977 (5 confirmed ; 7 suspect) / 20 lions died
  - primarily Southeast U.S.
  - elephant cases in at least 8 zoos in 6 states
  - South Africa 1993-1994 – 60 cases in free-ranging bulls
  - fall and winter outbreaks in U.S.

### Transmission and Pathogenesis

- incubation 9-10 days
- oral; fecal and/or urine contamination of food
- no evidence of eleph to eleph transmission
- subclinical infections possible
- replicates in myocardial cells and kills them

### Clinical Signs in Elephants

- sudden death
- anorexia, lethargy
- +/- respiratory signs
- subclinical infection possible
- recovered animals +/- weak hearts / future anesthesia risk

### Diagnosis

- antemortem dx rare due to rapid clinical course
- gross lesions: pale streaks in the myocardium, hydrothorax; hydropericardium ; pulmonary edema; froth in tracheobronchial tree
- histopath: myocardial degeneration and necrosis with lymphocytic infiltrates
- virus particles may be visible on electron microscopy
- definitive diagnosis: virus isolation, PCR, mouse inoculation
- serological test for antibodies available – Texas A&M

### Differential diagnosis

- herpes virus

- hypovitaminosis E
- cardioactive glycoside plant poisoning (oleander)

#### Management

- no specific treatment
- prevention by rodent control is crucial
- vaccine available in South Africa
- commercial pig vaccine in U.S.
- experimental elephant vaccines in U.S. (Dr. Kay Backues, Tulsa Zoo)
- zoos in endemic areas may vaccinate; further studies needed

#### Zoonotic potential

- humans susceptible; sporadic cases (rare)
- laboratory workers; adolescents
- aseptic meningitis; polio-like syndrome