**Elephant Practice Questions:**

Which of the following is true in African (*Loxodonta* spp.) and Asian elephants (*Elephas maximus*) infected with *Salmonella* spp., *Clostridium perfringens,* and *Clostridium difficile*?

1. Elephants have a natural high prevalence of *Salmonella* spp.
2. Elephants have a natural high prevalence of *Clostridium perfringens*
3. PCR has better sensitivity than bacterial culture for screening
4. Culture-positive elephants are often hyporexic and debilitated
5. *Salmonella* spp. has been associated with intestinal flukes

Answer: E

Briefly explain to an elephant keeper colleague how stereoradiographs are taken compared to plain radiography and what implications this has for training an elephant for this behavior

Answer:

* Radiographs are taken normally, but with a shift in the position of the radiographic film or machine between exposures, while keeping the target in the same position
* The elephant cannot move between exposures

Which parameter is most likely to be an indication of an abnormal Asian elephant (*Elephas maximus*) calf at birth?

1. Rasping on lung auscultation
2. Heart murmur
3. Teeth already erupted
4. Failure to nurse within 1 hour
5. Urine retention for 12 hours

Answer: D

Which of the following hematologic marker appears to be associated with a poorer prognosis after infection with elephant endotheliotropic herpesvirus?

1. Decreasing monocyte: heterophil ratio
2. Increase in platelets
3. Increase in viral load
4. Decreasing total solids
5. Increasing antibodies

Answer: A

Burke, Sophie M., et al. "Detection of aerosolized bacteria in expired air samples from Asian elephants (Elephas maximus)." *Journal of Zoo and Wildlife Medicine* 48.2 (2017): 431-439.

**Abstract**: Elephant-mediated transmission of tuberculosis is assumed to be similar to human models, which state close and prolonged contact with an infected individual is required for transmission. Although considered a risk factor for infection, several case studies have reported that close contact with an elephant is not always necessary for transmission, and the role of aerosolized bacteria remains unclear. To investigate aerosol-mediated transmission of pathogenic bacteria from elephants, a method for the detection of aerosols using an adapted sampling system was developed. **A commensal bacterium was isolated from the upper respiratory tract of elephants (*Elephas maximus*) and was used as a proxy organism to detect aerosolized droplets in the sampling system.** **It was found that elephants are capable of producing aerosolized bacterial particles of a size small enough to remain airborne for prolonged periods and penetrate the lower regions of the human respiratory tract.**

Question:

Which of the following is true regarding diagnosis of *Mycobacterium tuberculosis* infection in elephants?

1. Intradermal skin testing is recommended for herd screening.
2. A positive result on an indirect test alone (i.e. serology) is sufficient for diagnosis.
3. qPCR is considered the gold standard test.
4. Culture is the only test that confirms active infection.
5. Mycobacteriosis is most commonly diagnosed in African elephants (*Loxodonta africana*)

Answer: D

Sripiboon, Supaphen, et al. "Successful treatment of a clinical elephant endotheliotropic herpesvirus infection: The dynamics of viral load, genotype analysis, and treatment with acyclovir." *Journal of Zoo and Wildlife Medicine* 48.4 (2017): 1254-1259.

**Abstract**: This article describes the treatment of clinical elephant endotheliotropic herpesvirus (EEHV) infection in a male Asian elephant (*Elephas maximus*; approximately 3 yr old), the dynamics of viral load during the active infection, and genetic analysis of the virus. Treatment included injectable acyclovir (12 mg/kg iv, bid), antibiotic, vitamin, and fluids. **Quantitative polymerase chain reaction was used to measure the viral levels in blood, which decreased continuously after initiation of intravenous acyclovir.** Low levels of virus were detected in the blood for 2 wk, and the virus was undetectable after 1 mo. No complication was observed during the treatment period. **This case report suggests that acyclovir, given parenterally, could potentially enhance survival of clinical EEHV-infected individuals.**

Question:

Which of the following is true regarding elephant endotheliotropic herpesvirus (EEHV)?

1. Elephant endotheliotropic herpesvirus is a gammaherpesvirus.
2. Unlike encephalomyocarditis virus infection, cardiac vasculature is rarely affected.
3. African elephant (*Loxodonta africana*) calves are most susceptible.
4. Intracytoplasmic basophilic inclusions are commonly observed on histology.
5. Most lethal cases in Asian elephants (*Elephas maximus*) are due to EEHV1a.

Answer: E

**Reproductive parameter and birth statistics for a herd of Asian elephants (*Elephas maximus*) in North America over a 20-year period**Kiso WK, Wiedner E, Isaza R, Lindsay W, Aria J, Jacobson G, Jacobson K, Schmitt D.

J Zoo Wildl Med. 2017;48(4):987-996.

Which of the following is suspected to contribute to poor reproductive success of Asian elephants under managed care?

A. Young maternal age at first birth

B. Excessive weight gain during gestation

C. Long pauses during parturition

D. Retained placenta

E. Short inter-calf interval

Answer: B

**ACUTE HEMORRHAGIC DISEASE DUE TO ELEPHANT ENDOTHELIOTROPIC HERPESVIRUS 3A INFECTION IN FIVE AFRICAN ELEPHANTS (*LOXODONTA AFRICANA*) AT ONE NORTH AMERICAN ZOOLOGICAL INSTITUTION**

Fayette MA, Brenner EE, Garner MM, Bowman MR, Latimer E, Proudfoot JS.

Journal of Zoo and Wildlife Medicine 2021;52(1):357–365

An African elephant in your herd has transient low viremia with EEHV3 on routine trunk washes. List three treatments you would like to have available to you immediately should clinical signs arise.

Answer:

1. Famcyclovir
2. Fluids (rectal - tap, IV - isotonic, colloids)
3. Cross-matched fresh frozen plasma, negative for EEHV on PCR

Which of the following is true regarding oral flunixin meglumine pharmacokinetics in African elephants (*Loxodonta africana*) and Asian elephants (*Elephas maximus*)?

1. Diarrhea was a common side effect in one pharmacokinetic study.
2. African elephants consistently had longer time to maximal concentration than Asian elephants.
3. African elephants had a greater area under the curve than Asian elephants.
4. Pharmacokinetic studies in African elephants recommend twice daily dosing.
5. Oral bioavailability was poor in both African and Asian elephants.

Stereotypic behavior is reported to be more common in association with which of the following in captive elephants?

1. Animals housed in large groups
2. Social groups without juvenile animals
3. Adults born at their current facility
4. Training sessions with multiple keepers
5. More time housed outdoors