

RECOMMENDED ELEPHANT PRESHIPMENT GUIDELINES

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Routine health monitoring should be performed on all elephants on an annual basis (see “Guidelines for Comprehensive Elephant Health Monitoring Program”). Animals should be trained to permit sampling and examination. Whenever possible, preshipment testing should be performed within 30-90 days of the anticipated shipping date (note: mycobacterial cultures require a minimum of 60 days for final results). The following protocol advises that specific baseline laboratory tests be performed for the purpose of evaluating current health status. Additional tests are recommended to increase baseline information to determine their significance to elephant health. The final decision for specific procedures should be made in partnership between the shipping and receiving institutions. Any abnormal findings should be communicated to the receiving institution in a timely manner. For additional information, refer to the Elephant Husbandry Manual, AZA Standards for Elephant Management and Care, and the AAZV Preventive Medicine Recommendations.

Minimum Database:

1. Signalment - age, sex, origin, studbook#, ISIS#; picture of individual (as viewed from the front and sides) should be included in the permanent record.
2. Anamnesis - summary of information regarding previous health screens, medical problems, diagnostic test results, and treatment. A hard copy and/or electronic form of the complete medical record should be sent to the receiving institution prior to shipment. In addition, the veterinarian should review the behavioral profile of the individual to be shipped.
Specific areas to be included:
 - foot/skin conditions
 - dental/tusk conditions
 - history of colic, diarrhea, GI parasitism (including fecal parasite screens and Salmonella cultures)
 - serologic status, if known (EMC, EEHV, Leptospirosis)
 - vitamin E status, if known
 - TB trunk wash cultures (dates and results)
 - TB serological status (Chembio Elephant TBSTAT-PAK®, dates and results)
 - reproductive history
 - musth history
 - sedation/immobilization data
3. Complete physical exam by a veterinarian familiar with elephant health problems. This should include a review of all systems.
4. Body weight – actual or estimated using body measurements (1).
5. Blood collection
 - Complete blood count (CBC), serum chemistry panel, fibrinogen, serum protein electrophoresis.

- Serologic (ELISA) test for elephant herpesvirus – contact Dr. Laura Richman or Erin Latimer (2). See current Elephant SSP/TAG Research and Tissue Request Protocol for details.
- Bank minimum of 10-20 ml serum (duplicate sample for SSP serum bank) – all banked samples should be labeled with species, studbook #, age, sex, and date collected. Use submission form for serum samples sent to SSP serum bank.

6. Fecal analyses

- Parasite screen - Fecal samples should be collected every 7 days for a total of 3 weeks; direct, flotation, and sedimentation should be performed on every sample to detect intestinal parasitism.
- Enteric pathogen screen - Aerobic culture of feces for enteric pathogens should include special media for the detection of *Salmonella spp.* Since *Salmonella* organisms may be shed intermittently, at least 3-5 fecal cultures should be performed (may be done on consecutive days).
- Contact receiving institution with any abnormal results and treatments.

7. TB cultures and serological testing - refer to the current USDA Guidelines for the Control of Tuberculosis in Elephants 2008 (3). Protocol can be accessed on the USDA website http://www.aphis.usda.gov/animal_welfare/publications_and_reports.shtml.

- Samples for cultures must be collected under the direct supervision of a licensed veterinarian.
- Three trunk wash samples should be collected on separate days, ideally within a 7 day period. Trunk swabs are no longer acceptable.
- All samples should be frozen immediately after collection and shipped frozen.
- Ship by overnight express to NVSL (or other laboratory facility offering comparable procedures). Request mycobacterial culture with speciation (use VS Form 10-4 submission form for NVSL). Serum/plasma sample for serological testing (Elephant TB STAT-PAK®) to be collected during same period as trunk wash cultures.

8. Vaccinations

- Tetanus toxoid * – current vaccination with a commercial equine product is recommended at least every 2-3 years. Follow label instructions for product use (usually 1 ml IM). Recent data indicate that younger elephants may not develop as high titers as older animals (6).
- Rabies vaccine* - current vaccination (within 12 months) with a commercial killed rabies product approved for horses should be considered if the animal resides or will be traveling to an endemic area. Follow label instructions for product use (usually 2 ml IM). Vaccination with Imrab 3[®] has induced detectable titers to rabies virus in African elephants (5). Biannual vaccination is recommended. Data are insufficient at this time to determine adequate protective vaccine doses and titers.
- Leptospirosis vaccine* - recent cases of Leptospirosis in elephants have been documented. Although insufficient information is available at this time, current vaccination (within 12 months) with a commercial killed multivalent vaccine product approved for domestic large animals should be considered if there is evidence of potential for exposure. Follow label instructions for product use.

- West Nile Virus vaccine – insufficient information is available at the time of this writing to recommend vaccination of elephants with the commercial equine WNV vaccine. Some institutions have elected to vaccinate following recommendations for horses. If the receiving institution requests that the elephant is vaccinated, pre- and post-vaccination titers should be measured and submitted to Cornell (contact the SSP Veterinary Advisor for more information).

* Tetanus, rabies, and leptospirosis have been reported to occur in elephants (4, 7, 9, 10).

Additional Preventive Health Recommendations

1. Serological screening for EMC (encephalomyocarditis virus), leptospirosis (multiple serovars), and WNV (West Nile Virus). Although these tests are not species-specific and have not been validated for elephants, they may detect cross-reactive antibodies in exposed animals. The presence of antibodies does not necessarily denote infection/disease. Encephalomyocarditis virus may cause clinical disease and death in elephants (8). Antibodies to leptospirosis have been detected in both Asian and African elephants (9, 10). Insufficient data is available at this time to determine the significance of WNV antibodies in elephants; it is important to include the history of exposure and vaccination to WNV when interpreting results.
2. Serum vitamin E levels – submit heparinized plasma to Michigan State University – Animal Health Diagnostic Laboratory (13).
3. Reproductive tract examination – a complete reproductive examination should be conducted to include transrectal ultrasound, semen collection and analysis, cytology and microbial cultures of the lower urogenital tract (to be screened for bacteria, Chlamydia, protozoa, and Herpesvirus). Herpesvirus has been identified in biopsies of vaginal lymphoid patches in an African elephant (2). A high prevalence of uterine leiomyomas has been observed in captive Asian elephants and could be detected via transrectal ultrasound (11). Since both of these conditions have potentially significant effects on reproduction, a careful evaluation is warranted if the animal is being considered for breeding. All elephants (male and female) over the age of 5 years should have both ultrasound and hormonal assessments performed (testosterone in males; progesterone/LH in females).
5. Urinalysis – fluid and sediment evaluation of clean voided sample; +/- microbial culture.
6. Foot radiographs – baseline radiographs of all feet are strongly recommended (send copies of radiographs to receiving institution); see Gage for description of technique (12).
7. Ancillary diagnostic tests for tuberculosis – see Guidelines for the Control of Tuberculosis in Elephants 2008 for current recommendations (3).
8. Other vaccination regimens will depend on regional requirements and exposure risks (consider vaccination for equine encephalitis viruses, Clostridial diseases). Contact the SSP veterinary advisor for current information.

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