

Elephant TB – What Are the Rules? A Primer on the USDA Guidelines

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Background –In 1996, tuberculosis emerged as a disease of concern for captive elephants in the U.S. Due to animal and human health concerns, the veterinary and human medical community was brought together under a mandate from the US Animal Health Association (USAHA) to develop guidelines that would address the diagnosis and treatment of TB in elephants. The first guidelines, which included testing and treatment protocols, as well as travel restrictions for TB positive and TB exposed elephants, were published in 1998 and subsequently revised in 2000 and 2003 as new clinical and scientific information became available. These guidelines are referenced in USDA, APHIS, Animal Care Policy #21, “Control of Tuberculosis in Regulated Elephants.” The guidelines are developed by the National TB Working Group for Zoo and Wildlife Species. The goals of this group are to continue to gather information that will aid in understanding this disease in elephants and other wildlife species in an effort to better serve the animals in our care, protect those who work with them, and provide animal and public health officials with current data to address their concerns.

Why do we have guidelines and who is responsible for implementing them?

The Guidelines for the Control of Tuberculosis in Elephants are recommendations based on available scientific data and clinical experience from elephants and other species that are compiled by a panel of experts including veterinarians that work with elephants, scientists and researchers in the field of mycobacteria, epidemiologists, and human medical professionals. The goal is to objectively review the most current information to provide the best recommendations for diagnosing, treating, and preventing tuberculosis in elephants. These guidelines are available to USDA, APHIS, Animal Care for their use as reference material for their policy manual. What is often misunderstood is the document has been developed by the USAHA mandated working group, not USDA. Other regulatory agencies, including State veterinarians, can make additional requirements that exceed those in the TB guidelines or other federal regulations. Therefore, it is critical to check your state and local requirements prior to transport or other animal-related activities to ensure compliance.

Current Guidelines – What are the current requirements for testing?

Unfortunately, in this ever-changing world, we can't keep current on all the information that is available – that's what the internet is for! The 2003 guidelines are still the current standard for testing and treating elephants and can be found at http://www.aphis.usda.gov/animal_welfare/downloads/elephant/tb2003.pdf. So, what do you need to be compliant? **Three negative trunk wash cultures during a 12 month period**, collected on separate days, preferably during a 7 day period. It is critical that you have a negative test result in order for the test to count; if the culture comes back as inconclusive, it DOES NOT COUNT toward the three negative cultures required. Without three negative culture results annually, your elephant may not be considered

adequately tested and therefore, according to the TB guidelines document, ineligible to travel. According to the guidelines, “elephants should be tested the same month each year so that annual test dates are 12 months apart. All elephant must be tested every calendar year. Note that the date the sample is collected is the “test date”...” The important point is that if you don’t get a negative sample for *M. tb* complex, another sample would be needed to replace this culture; don’t let this slip by since it will often take a month or two to get this information. There are very clear instructions on sample collection and submission for trunk washes in the guidelines which should be carefully reviewed to get the cleanest and most accurate sample.

If an elephant has had- exposure to a TB culture-positive elephant anytime in the last five years, there are different testing requirements. These include increased frequency of trunk wash cultures and-depend on how recently the animal has been exposed. These are the classifications of “groups A, B, and C” that are often referred to when discussing testing and travel requirements for elephants with respect to TB. The group D elephant is a culture positive animal and there are extensive sections on testing and treatment in the guidelines.

What are the new diagnostic tests that we are hearing about (“Rapid Test”, “MAPIA”)?

The officially accepted test at this time is still the trunk wash, with all the pros and cons. Elephants are intermittent, potentially infrequent, shedders of *M. tb* and it is difficult to grow in the lab. In a study of infected badgers in the UK, only 28% of animals were culture positive for *M. tuberculosis* at any given time when followed by multiple cultures even though researchers had determined that all animals were infected. In a Swedish study of TB-infected elephants (confirmed at necropsy) *M. tb* was isolated from only 6 of 177 trunk wash samples. So, what does this suggest when we only test elephant trunk washes three times per year?

Over the years, researchers have investigated blood-based tests to determine if they are useful for diagnosing TB. The enzyme-lined immunoassay (ELISA) has shown promise for elephants for a number of years but has not been readily available. The Rapid Test (Elephant TB STAT-PAK®) and MAPIA™ (multi-antigen print immunoassay) are two tests that detect antibodies for *M. tb* complex organisms in the blood. Initial studies suggest that early infection can result in a positive test in these assays months to years prior to a positive trunk wash culture result due to periodic shedding of bacteria. In 23 known TB infected elephants based on positive cultures, 23 were positive by RT and MAPIA. Additional data is currently being compiled. The Elephant TB STAT-PAK® was licensed in August 2007. The MAPIA is also performed as a confirmatory test for the Elephant TB STAT-PAK® by Chembio Diagnostic Systems, Inc. but is not licensed.

Update on New Guidelines

The U.S. Animal Health Association, which provides input on legislation to Congress, has requested that the TB working group provide the Tuberculosis Committee of this association with a revised draft of guidelines for control of TB in elephants by their meeting in October 2007. The working group is committed to meeting this deadline and providing guidelines that incorporate all current scientific advances and information, as well as addressing the concerns of the elephant and animal health community. Trunk

wash culture will continue to be the current gold standard for diagnosis of tuberculosis although new diagnostic tests are important to investigate as additional tools in advancing our knowledge of this disease. The working group continues to gather data on the Elephant TB STAT-PAK®, MAPIA, and other new tests to help understand conditions of exposure, active and latent infection in elephants, as well as the effects of treatment. These are important differences when considering if treatment is warranted. Concerns regarding the limitations of treatment are also being addressed by the group. Additional data is needed on TB treatment protocols and the adverse effects that have been observed in elephants. These potential complications have been listed in the new guidelines. A list of consultants to contact for advice regarding treatment or other aspects of TB in elephants is also available in the document. The working group welcomes any valid, scientific input and will continue to collaborate with the appropriate organizations and agencies in order to benefit elephant health and continuously improve these recommendations.

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