

Researchers develop technique to test manatees for heart disease

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Manatee Sonogram: Dr. Trevor Gerlach, a UF aquatic animal health intern, left, watches the results of a cardiac ultrasound (echocardiogram) on a computer monitor while UF cardiology resident Dr. Ivan Sosa performs an echocardiogram on a sub-adult manatee at Lowry Park Zoo. Credit: Lowry Park Zoo

(Phys.org) —Leisurely swims in warm, tropical waters fueled by the gaze of admiring fans and a healthy vegetarian diet. The life of a manatee hardly seems likely to prompt concerns about heart disease. But researchers at the University of Florida say the lumbering, loveable sea cow's ticker deserves a closer look because of the animal's endangered status.

That's why they've developed a technique to test for [cardiac problems](#) in endangered manatees, both in the wild and in captivity. The new technique will enhance knowledge of how the manatee heart functions.

The UF researchers are using the technique to gather data they hope to share with wildlife and zoo veterinarians to ultimately save more manatee lives. Collaborating with scientists from Tampa's Lowry Park Zoo and the [Florida Fish and Wildlife Conservation Commission's marine mammal](#) pathology laboratory in St. Petersburg, they are using echocardiography on the large creatures, making use of a specially designed table built to hold animals weighing up to 2,000 pounds.

"There are a lot of gaps in our knowledge base on basic anatomy and physiology of manatees due to the obvious limitations of working with a 1,000- to 1,500-pound animal that spends its entire life in the water," said Trevor Gerlach, an intern in UF's aquatic animal health program and lead author on a paper that documents the first phase of the researchers' study in the June issue of the Journal of Zoo and [Wildlife Medicine](#). "Due to their current endangered status, it is important that we understand the animal in its entirety so that we can better tailor conservation efforts for the species."

The researchers' long-term goal is to provide practitioners at rehabilitation facilities and those working in the field with data from clinically healthy animals. Such animals could be compared to animals of concern to determine if cardiac disease is present.

To allow for effective testing, the researchers first developed a table built to hold the weight of 2,000-pound animals that were part of a large-scale manatee health assessment conducted by the U.S. Geological Survey in Crystal River. Fourteen healthy, wild and captive Florida manatees underwent echocardiography, administered using the table technique, between fall 2011 and winter 2012. The group included eight

females and six males of various ages.

"We were able to clearly visualize all valves and chambers," Gerlach said, adding that other key indicators of heart function also were successfully obtained. Some abnormalities in the study animals also were documented.

"Our results indicate that echocardiography in the Florida manatee is possible, which has both clinical and research implications in larger epidemiologic studies evaluating diseases of the cardiopulmonary and cardiovascular systems," Gerlach said.

Although extensive research has been conducted on comparative anatomy, physiology and ecology of sea cows, very few studies have evaluated the manatee heart. Basic cardiac morphology and a test called an electrocardiogram have been examined, but the diagnostic value is limited to electrical imbalances in the heart, the researchers said.

"Echocardiography is the gold standard for diagnosing valve diseases and structural abnormalities, and provides other information as well," Gerlach said.

Researchers are finishing up the second phase of the study, which entails collecting more data from echocardiographs to establish normal testing parameters for manatees of various ages.

"Once we establish the parameters, we can begin larger epidemiological studies on the prevalence of heart disease in the wild population, which is one of our long-term goals," Gerlach said.

Bob Bonde, a manatee researcher with the USGS, praised the new technique.

"Out-of-water, real-time assessment of these large aquatic mammals will benefit our evaluation of manatee health-related indices in the wild population," "Knowledge of [manatee](#) reproductive fitness and nutritional condition is paramount to our fully understanding their recovery."

Provided by University of Florida

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