

## **PULMONARY FUNCTION TESTING IN HEALTHY AND POSITIVELY BUOYANT OLIVE RIDLEY SEA TURTLES (*Lepidochelys olivacea*)**

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### **ABSTRACT**

A buoyancy disorder is a clinical problem described for an animal that floats high in the water or lists at an angle to the water surface and may be unable to dive. It can be seen in aquatic turtles and marine mammals with respiratory disease, but can also be caused by trauma, pneumocoelom, pneumothorax, pneumomediastinum, gastrointestinal disease, or spinal cord or brain trauma. For treatment of this disorder, it is important to determine the underlying etiology. Baseline diagnostic tests include blood analysis, urinalysis, radiography, cytology, and microbacterial and fungal culture. Other advanced methodologies such as computed tomography (CT), magnetic resonance imaging (MRI), bronchoscopic examination, or pulmonary function tests (PFTs) may be necessary to further characterize the disease process.

This study utilized computed spirometry to compare the pulmonary function of two stranded Olive Ridley sea turtles (*Lepidochelys olivacea*) presenting with a positive buoyancy disorder with two healthy captive Olive Ridley sea turtles held in a large public aquarium. PFT measurements suggest that the metabolic cost of breathing was much greater for animals admitted with positive buoyancy than for the normal sea turtles. Positively buoyant turtles had gasp-type breathing patterns consisting of significantly higher tidal volumes, lower breathing frequencies and higher expiration rates relative to healthy turtles. These findings represent a way to evaluate clinical respiratory function for an individual animal to assist with diagnosis, therapy, and prognosis. This is the first study, to our knowledge, to objectively evaluate sea turtles presenting with positive buoyancy and respiratory disease using pulmonary function tests.

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