


Report of James McBain, DVM retired, Stephanie Norman, DVM, PhD, Tom Reidarson, DVM, DACZM

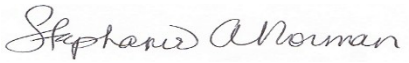
As members of her veterinary care team and at the invitation of Friends of Toki, a non-profit organization co-founded by Pritam Singh and Charles Vinick, we present key findings from the very detailed necropsy of Tokitae (Toki).

The passing of Toki was a sad event that was strongly felt by all of her care staff and her supporters worldwide. Her death was the result of multiple degenerative changes resulting from chronic disease. The primary culprit was likely the pneumonia that plagued her for months combined with heart disease and deteriorating kidney function that became apparent as death became imminent. As is often the case in the elderly one primary problem becomes many as death approaches. Our optimism during Toki's long period of therapy was based on how ill she was when we started and her positive response to treatment during the following months of therapy. The bacterium, *Pseudomonas aeruginosa*, that contributed in large part to Toki's death is ubiquitous. It is a multi-drug resistant bacteria that is a significant challenge for antibiotic therapy. Deposition of amyloid, a harmful protein associated with chronic inflammatory disease, added kidney failure to Toki's insurmountable medical challenges.

There was no evidence of dehydration, which indicates that she was receiving adequate fluids through her fish, Jell-O cubes, and ice cubes. This was further bolstered by the increase in her blubber measurements of more than 2 cm (creating a body condition that compared favorably with other female killer whales of her length), through feeding of high-quality fish and additional water supplementation when needed and antibiotic support. Though she experienced periodic abdominal discomfort, no evidence of gastrointestinal ulceration or cancer was noted, only mild changes consistent with gastritis. Collectively, these findings point to Toki experiencing chronic, age-related health changes that were most likely pushed to an acute stage by a bacterial infection caused by a medically difficult organism well-known to be everywhere in the environment. Despite the best diagnostics, treatments, and monitoring of Toki's health by her care team, the long-running balance of her chronic, but manageable, health status was upended to an acute, terminal end, for which we are all deeply saddened.

Respectfully submitted:

  
James McBain, DVM retired

  
Stephanie Norman, DVM, PhD

  
Thomas Reidarson, DVM, DACZM

(Biographical Statements follow)

**Dr. James McBain, DVM,** Retired Vice President of Corporate Veterinary Services for SeaWorld and Busch Garden Parks is considered a pioneering expert in marine mammal veterinary medicine. His career at Sea World included serving as senior staff veterinarian corporate director of veterinarian medicine and Vice President of Corporate Veterinary Services. He has authored and coauthored more than 83 scientific papers, books and presentations on marine mammals and is recognized worldwide for his experience and expertise. Dr. McBain is seen by his peers as having fundamentally altered the way in which marine mammal medicine is practiced. Dr. McBain has served as a mentor and trained countless veterinarians seeking his specialized knowledge. In 2009 he received the Distinguished Veterinary Alumni Award for Outstanding Service from Washington State University.

**Dr. Stephanie Norman, DVM, PhD,** veterinary epidemiologist and wildlife veterinarian, received her DVM from Texas A&M University; her Master of Science in epidemiology from the University of Washington, Seattle; and her PhD in wildlife epidemiology from the University of California, Davis. She has been involved in the field of animal health, disease, and conservation for more than 20 years. Dr. Norman has extensive clinical and teaching experience and has authored or co-authored more than 40 peer-reviewed scientific papers and reports. In addition, she has served as a wildlife epidemiologist for NOAA, National Marine Fisheries Service.

**Dr. Thomas H. Reidarson, DVM, DACZM.** Former Director of Veterinary Services for SeaWorld of California. After departing in 2010 Reidarson formed a consulting group named Reidarson Group: Marine Animal Specialists where he consults for nine Caribbean, North American, and Asian marine animal institutions. He is board certified in the American College of Zoological Medicine with an emphasis on Aquatic animals, is former president of the International Association of Aquatic Animal Medicine (IAAAM), continues to lecture at a number of US and international veterinary schools and institutions, and authored or co-authored nearly 100 book chapters, papers, and abstracts. He holds a Doctor of Veterinary medicine from the University of California Davis and master's degree in molecular biology and Biochemistry from the University of California Irvine where he is a co-discoverer of a central molecule in tumor biology, Tumor Necrosis Factor.