



RESEARCH PROGRESS REPORT SUMMARY

Grant 02322: Analysis of the Health, Behavioral, and Longevity Data Collected in the 9/11 Medical Surveillance Longitudinal Study

Principal Investigator: Cynthia Otto, DVM, PhD
Research Institution: University of Pennsylvania
Grant Amount: \$37,672
Start Date: 2/1/2017 **End Date:** 1/31/2022
Progress Report: Mid-Year 5

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

Following the attacks of September 11, 2001 on the World Trade Center and Pentagon, the AKC Canine Health Foundation awarded funds to the only lifetime longitudinal study tracking the medical and behavioral impacts of a major national disaster on the health and behavior of search & rescue (SAR) dogs. On June 6, 2016, the last study dog was laid to rest and data collection for the 9/11 Medical Surveillance Study was concluded. With 15 years of data, including annual radiographs, bloodwork, and handler surveys (health, performance, and behavior), the opportunity for in-depth analysis and discovery of new best practices and protocols for SAR dogs has never been greater. Data collected from deployed dogs will be compared to data collected from control SAR dogs that underwent similar training and careers, but did not deploy to 9/11. The investigators will explore three key areas of data: behavior, occupational hazards, and longevity related to health and work. Critical information gleaned from this study will have major implications applicable to the development, training, and care of our nation's SAR dogs, other working canines, and even companion dogs. Results will improve our understanding of traits of successful SAR dogs and thus influence dog selection. Importantly, following characterization of trait heritability, this data could be critical to a focused breeding program. The complete analysis of the occupational hazards of SAR dogs will shape preventive practices to allow these dogs to safely and effectively fulfill their mission of saving human lives.

Publications:

Fitzgerald, S. D., Rumbelha, W. K., Braselton, W. E., Downend, A. B., & Otto, C. M. (2008). Pathology and Toxicology Findings for Search-and-Rescue Dogs Deployed to the September 11, 2001, Terrorist



Attack Sites: Initial Five-Year Surveillance. *Journal of Veterinary Diagnostic Investigation*, 20(4), 477–484. <https://doi.org/10.1177/104063870802000410>

Hare, E., Kelsey, K. M., Niedermeyer, G. M., & Otto, C. M. (2020). Long-Term Behavioral Resilience in Search-and-Rescue Dogs Responding to the September 11, 2001 Terrorist Attacks. *Applied Animal Behaviour Science*, 105173. <https://doi.org/10.1016/j.applanim.2020.105173>

Hare, E., Kelsey, K. M., Serpell, J. A., & Otto, C. M. (2018). Behavior Differences Between Search-and-Rescue and Pet Dogs. *Frontiers in Veterinary Science*, 5. <https://doi.org/10.3389/fvets.2018.00118>

Hunt, M., Otto, C. M., Serpell, J. A., & Alvarez, J. (2012). Interactions between Handler Well-Being and Canine Health and Behavior in Search and Rescue Teams. *Anthrozoös*, 25(3), 323–335. <https://doi.org/10.2752/175303712X13403555186253>

Otto, C. M., Downend, A. B., Moore, G. E., Daggy, J. K., Ranivand, D. L., Reetz, J. A., & Fitzgerald, S. D. (2009). Medical surveillance of search dogs deployed to the World Trade Center and Pentagon: 2001–2006. *Journal of Veterinary Behavior*, 4(6), 241. <https://doi.org/10.1016/j.jveb.2009.04.002>

Otto, C. M., Downend, A. B., Serpell, J. A., Ziemer, L. S., & Saunders, H. M. (2004). Medical and behavioral surveillance of dogs deployed to the World Trade Center and the Pentagon from October 2001 to June 2002. *Journal of the American Veterinary Medical Association*, 225(6), 861–867. <https://doi.org/10.2460/javma.2004.225.861>

Otto, C. M., Hare, E., Buchweitz, J. P., Kelsey, K. M., & Fitzgerald, S. D. (2020). Fifteen-year surveillance of pathological findings associated with death or euthanasia in search-and-rescue dogs deployed to the September 11, 2001, terrorist attack sites. *Journal of the American Veterinary Medical Association*, 257(7), 734–743. <https://doi.org/10.2460/javma.257.7.734>

Slensky, K. A., Drobatz, K. J., Downend, A. B., & Otto, C. M. (2004). Deployment morbidity among search-and-rescue dogs used after the September 11, 2001, terrorist attacks. *Journal of the American Veterinary Medical Association*, 225(6), 868–873. <https://doi.org/10.2460/javma.2004.225.868>

We anticipate analysis of the health data set to result in a minimum of one publication for surgical conditions and one publication for medical conditions.

Presentations:

The data was incorporated into presentations:

- February 11, 2021, “Catalyst Speaker Series” Penn State Altoona (virtual 90 min)



- August 14, 2021, “The Life and Times of the Hero Dogs of 9/11” Keynote 2021 AKC Canine Health Foundation National Parent Club Canine Health Conference (virtual 60 min)
- September 7, 2021 AOVET Master’s Course: Surgical Management of Injuries in Canine Sports Medicine (virtual)

Injuries of working dogs, lecture

- September 25, 2021, The Museum of the Dog, 9/11 Search & Detection Dogs: Health and Behavior Explored, New York, NY (60 min)

Report to Grant Sponsor from Investigator:

Data collected over the 15 years of the 9/11 study represents a massive amount of never before available information on the short and long-term impacts of a search & rescue deployment on the health and behavior of the search dog. The data analyzed in this project cover three areas: behavior, occupational hazards, and longevity. With the ever changing and improving methods for data collection, the research team has spent most of the time tracking, organizing, validating, and preparing the 15 years of data to be analyzed. The data for the remaining analysis is in a format in which it can be analyzed and available for cross-referencing several important questions regarding behavior, health and longevity that we have proposed. We found that the behavioral categories of Trainability, Attention Seeking and Energy all decrease with age, independent of deployment status. This is the first longitudinal study of behavior in dogs. Only excitability scores differed by deployment status. Deployed dogs started high and gradually decreased with age, Control dogs started low, increased to a peak, and then decreased with age. No dog was retired in year 1, by year 10 all participating dogs were retired. The reported surgical conditions were most commonly associated with accidents/injuries; whereas medical problems were most commonly associated with degenerative conditions like arthritis. The musculoskeletal system, skin and gastrointestinal system were the most frequently affected whether it was a medical or surgical condition. This information can help guide preventive care for working dogs.