

CANINE RESEARCH AT THE DEPARTMENT OF VETERANS AFFAIRS

April 2019

ENABLING VETERANS TO BREATHE AGAIN

For Veterans with spinal cord injuries, being dependent on a ventilator decreases their life expectancy by *decades*. It also interferes with their ability to speak and lead fulfilling lives. Through discoveries made at VA in canine models, researchers from the Louis Stokes Cleveland VAMC have been able to restore breathing and coughing in Veterans with spinal cord injuries. Without canine research, these Veterans would still be dependent on ventilators.



David, a Veteran, spinal cord injury survivor, and recipient of a cough stimulator made possible by canine research.

<http://fescenter.org/bench-to-bedside/>

**Excerpt from a letter sent to the Cleveland VAMC by David's family*

AN UNWAVERING COMMITMENT TO VETERANS

For over 90 years, research has been an integral part of the Department of Veterans Affairs (VA). The Office of Research and Development exists to fulfill our mission to save lives and improve the health of Veterans and the nation through discovery and innovation.

Rarely, our commitment to Veterans requires the use of canines in research. In those cases, we have a clear choice: use our expertise to help Veterans or fail to act and allow Veterans to continue to suffer. Consider David, pictured to the left. Before receiving his cough stimulator, he was hospitalized at least twice a year with pneumonia, the leading cause of death in people with spinal cord injuries.

*"This device has been a life-saver for David. Before David had the implant, he was hospitalized at least twice a year with pneumonia. Each time was life-threatening."**

A SMALL PROGRAM WITH BIG RESULTS

VA conducts just 0.15% of the canine research done in the United States, yet the contribution to our Veterans' and the nations' health is large.

Key historical contributions from VA canine research include the heart pacemaker and kidney, liver, and heart transplantation. The pacemaker restores a normal rhythm in people who have cardiac arrhythmias (abnormal heart beats). These abnormal rhythms can lead to a dangerously slow heartbeat and even sudden cardiac death. Today, millions of people around the world with cardiac arrhythmias live longer and higher quality lives because of pacemakers, and millions more have experienced the gift of life through organ transplants.

Canine research at VA continues to improve the lives of Veterans and the nation. Through discoveries made in canines, we are now able to restore breathing, cough, and quality of life in Veterans like David with spinal cord injuries. This work was showcased on the January cover of the American Journal of Physical Medicine and Rehabilitation.

Another example of how canine research saves lives is the confirmation by VA researchers that PVCs, a common heart rhythm problem, can directly cause heart failure. Ongoing studies will determine why this happens and how best to prevent it. Heart failure is a serious condition that substantially shortens a person's lifespan. Previously, doctors thought that PVCs were harmless. Armed with this information, doctors now know they can save people's lives by treating the PVCs.

TRANSPARENCY AND ACCOUNTABILITY

VA has the most thorough canine research review process in the nation. To move forward, the study must first have been selected for funding by an expert scientific panel at VA or another funding source like the National Institutes of Health or the American Heart Association. Following this, the planned work is reviewed

ENSURING OUR VETERANS' SAFETY

While organs-on-a-chip and computer simulations hold promise for the reduction, refinement, and replacement of canines in research, these approaches have not been validated. The photo below shows a tissue chip, which would not be suitable for testing devices like the stimulators used to produce breathing and cough in Veterans with spinal cord injury. Today, moving directly from findings based on organs-on-a-chip or computer simulations to our Veterans would be equivalent to treating Veterans as lab animals.



locally and nationally by veterinarians, people who have no relationship to the VA, scientists with experience in animal research, and nonscientists. If the plan passes this phase, it must then be approved by the Chief Research and Development Officer, the Undersecretary for Health, and the VA Secretary.

Animal research in VA is closely monitored locally and nationally. When problems arise, they are quickly identified and corrected. The NIH Office of Laboratory Animal Welfare conducted independent site visits of all VA canine programs and found that they are “effectively supporting the humane programs of animal care and use at their institutions and conducting research with dogs and other vertebrate species in compliance with Public Health Service Policy, and all applicable rules and regulations.”

Furthermore, information about VA’s canine research program is readily available to the public, whereas comparatively little information is available about canine research that takes place in the private sector.

DEDICATED TO THE REDUCTION, REFINEMENT, AND REPLACEMENT OF CANINE MODEL

VA conducts canine research only when the research question is scientifically important, when the use of an animal model is necessary, when the animals will be humanely treated, and when the canine model is the only adequate model. For example, the work that confirmed that PVCs cause heart failure had to be conducted in canines because they are the only animals that are known to have a heart electrical system like ours.

VA is committed to leading the way to ensure that science as a whole can continue to reduce, refine, and replace canine models in research. This promise is more than just words: we are taking action. For instance, we have committed to funding studies to validate a newly-identified swine model for some of the heart failure work. If successful, this would reduce the number of canines used in research around the world. Our projected investment in this work (a minimum of \$1,000,000) substantially exceeds our FY2018 canine research spending (\$100,000).

OPEN DIALOGUE AND OUR MISSION

To reduce, refine, and replace the canine models in research while fulfilling our promise to Veterans, we must maintain an open dialogue so that decisions are made with complete information. VA has committed to doing so by commissioning the National Academies of Science, Engineering, and Medicine (NASEM) to assess the care and use of canines in research at VA. Through this process, the public has had several opportunities to observe the work of the NASEM committee and to make comments. We are confident that what we learn through this process will lead to further opportunities to demonstrate our commitment to the judicious use of canines in research.

We will continue to fulfill our sacred mission of improving health and saving the lives of Veterans while also demonstrating our continuing leadership in conducting animal research in an ethical, responsible manner.