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## **Message for women and dogs: keeping ovaries is linked to longevity**

WEST LAFAYETTE, Ind. - This year, hundreds of thousands of women and pet dogs will undergo a hysterectomy and have their ovaries removed along with their uterus. Now, two independent research studies looking at longevity may challenge almost four decades of standard operating procedures used in women and in pets.

Research published Tuesday (Dec. 1) shows female dogs that keep their ovaries longer also live longer. The study, exploring the factors that favor successful aging in pet dogs, was conducted by a research team led by David J. Waters, Ph.D., D.V.M.

Waters' work is the first investigation to look for a link between retaining ovaries and reaching exceptional longevity in mammals. Waters is executive director of the [Gerald P. Murphy Cancer Foundation](#), based at the Purdue Research Park of West Lafayette. The Murphy Foundation is home to the Center for Exceptional Longevity Studies, which tracks the oldest living pet dogs in the United States.

The researchers collected and analyzed lifetime medical histories, ages and causes of death for 119 canine "centenarians" - exceptionally long-lived Rottweiler dogs living in the United States and Canada that survived to 13 years, which is 30 percent longer than average Rottweilers. These exceptionally long-lived dogs were compared to a group of 186 Rottweilers that had usual longevity, approximately nine years.

"A female survival advantage in humans is well-documented - women outnumber men by 4:1 among those who reach 100," said Waters, who is associate director of Purdue University's Center on Aging and the Life Course and a professor in the Department of Veterinary Clinical Sciences. "Like women, female dogs in our study had a distinct survival advantage over males. But taking away ovaries during the first four years of life completely erased the female survival advantage. We found that female Rottweilers that kept their ovaries for at least six years were four times more likely to reach exceptional longevity compared to females who had the shortest lifetime ovary exposure.

"Clearly, we have tapped into a unique resource with our Exceptional Longevity Database. We like to think of it as the pet dog equivalent of the New England Centenarian Study. We want to better understand the biology of aging.

Our quest to validate pet dogs as a model for the study of healthy human aging is at the core of this research."

Murphy Foundation scientists think it is time to tackle a new set of research questions relevant to the biology behind aging. At the top of the list are identifying ovary-sensitive processes that may influence the rate of aging and defining the critical window of ovary exposure that optimizes longevity.

The pet dog research published in *Aging Cell* mirrors the findings of the Nurses' Health Study published this summer by Dr. William Parker and colleagues from the John Wayne Cancer Institute in Santa Monica, Calif.

Parker's group studied more than 29,000 women who underwent a hysterectomy for benign uterine disease. The findings showed that the upside of ovary removal - protection against ovarian, uterine and breast cancer - was outweighed by increased mortality from other causes. As a result, longevity was cut short in women who lost their ovaries before the age of 50 compared with those who kept their ovaries for at least 50 years.

"For the last 35 years, most doctors have been routinely advising women undergoing hysterectomy to have their ovaries removed to prevent ovarian cancer," Parker said. "We believe that such an automatic recommendation is no longer warranted."

Waters believes it boils down to systems thinking.

"Nobody would argue that taking the caterpillars out of an environment does not change that environment in unforeseen ways," he said. "You're not simply left with the old environment minus caterpillars. Likewise, we are dealing with an ovarian ecology that urges us to pause and consider the long-term health consequences of taking out ovaries."

Taken together, the emerging message for dogs and women seems to be that when it comes to longevity, it pays to keep your ovaries.

"What we have here is a compelling convergence," Waters said. "The data from women and dogs, together with reported longevity benefits from ovary transplants in mice, are pointing in the same direction - the notion that a network of processes regulating longevity is under ovarian control."

Parker believes the results point to a need for a new conversation between patient and doctor, framed by the patient's specific risk factors and personal concerns. Waters concurs.

"In this era of personalized medicine, it seems only fitting that we should be directing the conversation about elective ovary removal in women and dogs toward a more forward-looking, individualized script," Waters said.