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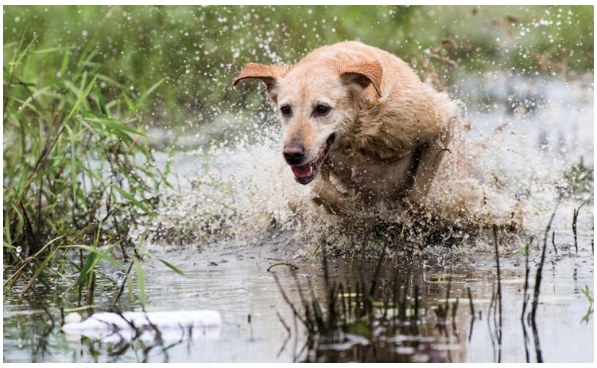
Seward County Kennel Club

A CLUB FOR PERSONS INTERESTED IN DOGS AND THE SPORT OF DOGS.

Information for the newsletter, including brags, needs to be submitted by the first week of the month to be included in the next newsletter. Please email submissions to the editor.

LYMPHOMA AND BLADDER CANCER IN DOGS TIED TO ENVIRONMENTAL RISKS



Environmental pollutants and toxic chemicals have long been known to put people at risk for cancers such as lymphoma and bladder cancer. Researchers at the University of Wisconsin-Madison propose that dogs, too, may be at heightened risk for these cancers when exposed to harmful pollutants and chemicals.

Urothelial cell carcinoma, also called transitional cell carcinoma, is the most common type of bladder cancer in people and dogs. In people with bladder cancer, about half of cases are due to smoking and about 20 percent are due to workplace exposures, but the cause of the remaining 30 percent is not well understood. In the roughly 20,000 dogs per year that develop bladder cancer, the disease is often fatal. As dogs and some people develop a similar form of aggressive bladder cancer, Lauren A. Trepanier, DVM, PhD, DACVIM, DACVCP, the Melita Grunow Family Professor in Companion Animal Health at the University of Wisconsin-Madison, is hopeful that dogs may help identify risks for the cancer in both species.

In their studies, the researchers at Wisconsin have found that dogs and their owners share household exposures to certain chemicals that have been linked to bladder cancer in people. While healthy dogs had two to six times higher urine concentrations of the carcinogenic chemicals acrolein and arsenic than their healthy owners, high levels in the dog were linked to relatively high levels of the same chemicals in their owners.

"Dogs are smaller and closer to the ground, and they tend to roll in the grass and groom themselves, which could explain the higher levels in dogs," says Dr. Trepanier. "The link between higher urine chemical levels in dogs and their owners suggests a shared source of

NEXT MEETING September 15, 2022
Seward Civic Center 616 Bradford St, Seward, NE 68434
No Special Program - General Meeting 7:30pm

MEETING MINUTES

Seward County Kennel Club
August 18, 2022
Seward Civic Center

Meeting called to order at 7:50pm by President Tabitha.

Members in attendance: Diane Nitz, Tanya Williams, Mary Bristol, Cindy Hill, and Tabitha Dvorak.

President's Report - Nothing to report

Secretary's Report
July minutes read. Correction in spelling of name for Ann Schlueter. Minutes approved by acclaimation.

Treasure's Report
Report read and approved by acclaimation. 2nd quarter financial report was available for review.

Performance - Nothing to report

Show - AKC changed requirements for medical personal needed to be at the show. Now only needs to be someone CRP certified.

-Discussion on offering a Scent Work Trial

-Kiwianis have decided not to continue doing concessions at the show. Discussion on who to replace with: 4-H, FFA, local clubs, school groups, Blue River Resue.

-FastCAT check has still not be received.

Old Business
Seward County Fair Overall Dog Showman was Katilynn Butzke. Reserved was Kaleigh Penas. The club received a Thank you card from Kaleigh.

Karen Lacy may have an outstanding membership app that needs to be processed.

New Business - None

Meeting adjourned at 8:35pm.

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these chemicals."

A current researcher of environmental cancer risk in dogs, Dr. Trepanier first studied genetic and environmental risk factors associated with adverse drug reactions. "The same pathways that break down reactive drugs break down reactive chemical carcinogens," she says. "My research now focuses on whether certain chemicals are associated with bladder cancer and lymphoma in dogs and whether people who share households with dogs that are diagnosed with these cancers also have a higher exposure to these same chemicals. This may allow us to 'flag' a household with higher household chemical exposures to air and water pollutants that contribute to cancer. The ultimate goal is to prevent certain exposures in dogs at high risk for these cancers and perhaps identify chemical exposures in their owners that could also be prevented."

Darin Collins, DVM, CEO of the AKC Canine Health Foundation, which provides funding support for this research, says, "The work being done by Dr. Trepanier and her group is tremendously exciting. We are beginning to develop a picture of ways that owners can make choices for their dogs that may help to prevent some cancers. The One Health nature of this research is raising awareness of environmental cancer risks and potentially may impact lifestyle changes."

Dr. Trepanier also researched the association of tap-water contaminants with bladder cancer and of air pollution with lymphoma in dogs, particularly in Boxers, a breed predisposed to the highly aggressive T-cell lymphoma. This study was published in March 2022 in Veterinary and Comparative Oncology.

Matching the dogs' home addresses to their counties of residence, the team used county-level data from the Environmental Protection Agency, the National Air Toxics Assessment, and the Environmental Working Group to assess proximity to environmental pollutants. They found that dogs with bladder cancer, compared to unaffected dogs, lived in counties with higher tap-water total trihalomethanes (TTHMs) and air pollution as measured by ozone, and Boxers with lymphoma lived in counties with higher ozone as well as higher human health risks from volatile organic compounds (VOCs), such as 1,3-butadiene and formaldehyde.

The information is helping them to understand dogs' exposures to these potential cancer-causing contaminants and their relationships to bladder cancer and lymphoma incidence. The red-flag concerns about these contaminants relate to their potential carcinogenic effects, as described here:

- TTHMs are a group of by-products generated by chlorine

and other disinfectants in drinking water. These byproducts are believed to increase the risk of bladder cancer in people by damaging DNA.

- Long-term exposure to ground-level ozone has been linked to respiratory and cardiovascular conditions including lung cancer in people. A colorless, unstable, toxic gas with a pungent odor best known for causing urban smog, ozone is formed when photochemical reactions occur between VOCs and nitrogen oxides (NOx). VOCs come from chemical and gasoline plants, oil-based paints, and autobody and print shops, and NOx are released into the air by power plants, industrial furnaces and boilers, and motor vehicles.
- 1,3-butadiene is a colorless gas with a gasoline odor that is used to make synthetic rubber products such as tires, resins and plastics. Exposure from polluted air and water near chemical, plastic or rubber facilities, auto exhaust, and tobacco smoke have been linked to leukemia in people.
- Prolonged exposure to formaldehyde, a colorless, strong-smelling industrial chemical used for making plywood and particle board, has been found to cause various cancers in people. Exposure comes from inhaling formaldehyde in the air or released from pressed-wood products, tobacco smoke, and auto tailgate emissions.

"These data support our hypothesis that tap-water contaminants and airborne environmental pollutants may contribute to the risk of bladder carcinoma and lymphoma in dogs," says Dr. Trepanier. "If we find that this reflects a direct cause-and-effect relationship, then it is possible that tap-water carbon filtration units and more effective air pollution controls could decease the overall incidence of these cancers in dogs and potentially in people."

Lymphoma Risks in Boxers

The fact that Boxers along with about a dozen other breeds are more susceptible to lymphoma suggests that the cancer risk is inherited — at least in part — though major inherited factors have not yet been identified. This suggests an interaction between genes and the environment.

Dr. Trepanier, a Boxer owner herself, wanted to investigate the relationship between genetic and environmental risk for lymphoma in the breed. This led to her first AKC Canine Health Foundation grant in 2017. Regarding environmental risks, Dr. Trepanier explains, "Canine lymphoma resembles non-Hodgkin lymphoma (NHL) in people and has been associated with chemicals found in tobacco smoke, certain household products, pesticides, herbicides, fungicides, and vehicle exhaust. NHL risk is also increased by defective GST (glutathione-S-transferase) enzymes, which are supposed to break down toxic chemicals in the body.

"In our study in dogs, we looked at whether defective GST genes along with exposure to certain household and yard chemicals were associated with lymphoma in Boxers," she says. "Our hypothesis was that lymphoma risk in Boxers would be increased by low-activity GST gene variants along with higher exposures to environmental chemicals and that we would see a breed-related increase in DNA damage over time.

"While we did not see more defective GST gene variants or higher accumulated DNA damage in Boxers compared to other breeds, we did find that Boxers with lymphoma were almost six times as likely to live within 10 miles of an active nuclear plant and two times more likely to live within 2 miles of a chemical supplier or active crematorium than were unaffected Boxers."

An article published in February 2020 in the Journal of Veterinary Internal Medicine highlighted the findings. "This study did not tell us if exposure to nuclear power plants or crematoriums causes lymphoma in dogs, but we do know that there's an association even in breeds like Boxers that have a high risk for this cancer," she says. "Those same exposures are consistent with risk factors for lymphoma in people and suggest an interaction between breed and environmental chemicals.

"It could be that there are a lot of small gene defects that add up or a gene defect in breaking down environmental chemicals, which don't show up unless a dog is exposed to these chemicals. We are continuing to try and understand these interactions."

The ongoing research of environmental chemical exposure in Boxers with lymphoma involves a new case-control study that measures specific chemicals in the urine of Boxers with the cancer to unaffected Boxers, as well as in household tap water and household air. "We are measuring urine metabolites of VOCs such as benzene," Dr. Trepanier says. "Benzene is found in air pollution, diesel exhaust and cigarette smoke and is known to cause lymphoma and other cancers. We hope to learn more about its effect in dogs."

Better Understanding of Bladder Cancer

Much like the lymphoma research, Dr. Trepanier's ongoing research of bladder cancer in dogs is looking directly at urinary chemical concentrations as well as household chemical exposures in bladder cancer cases compared to unaffected controls. The researchers are measuring metabolites of acrolein and arsenic, both found in air pollution, in dog urine as well as in household dust, tap water and air. They also are measuring these chemicals in the urine of owners of dogs with bladder cancer and comparing it to the urine of owners of unaffected dogs.

"We hypothesize that a dog with bladder cancer might be a 'flag' for a home with higher concentrations of certain chemicals, which could also be exposing people sharing the

same household," explains Dr. Trepanier.

Reflecting on what motivates her research, Dr. Trepanier says, "We want to better understand the environmental risks for dogs that already are known to have a high breed predisposition for bladder cancer or lymphoma. We are trying to identify those environmental risks because they can be modified even if the dog's breed inherited risk cannot be changed."

Dr. Trepanier is gearing up to begin another study of chemical risk factors for lymphoma in Golden Retrievers. "We expect to have more information on environmental cancer risks in Boxers and Golden Retrievers in the next couple of years, including whether particular chemical exposures were at a level high enough to have caused DNA damage in canine lymphoid cells," she says.

The results of these studies should provide owners with specific, evidence-based advice on ways to help protect their dogs, even those at higher breed risk, from these cancers. A toolkit to identify environmental chemical risks that often go unidentified in the home could save the lives of people and dogs.

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BREED SNAPSHOT: NORWEGIAN LUNDEHUND

From Norway's rocky island of Vaeroy, the uniquely constructed Norwegian Lundehund is the only dog breed created for the job of puffin hunting. With puffins now a protected species, today's Lundehund is a friendly, athletic companion.

At a glance, Lundehunds seem a typical northern breed: A spitz type with triangular ears, curving tail, and a dense double coat. But a closer look reveals several unique traits. They have feet with at least six fully functioning toes and extra paw pads, an 'elastic neck' that can crane back so the head touches the spine, ears that fold shut, and flexible shoulders that allow forelegs to extend to the side, perpendicular to the body. This last anomaly produces the breed's distinctive 'rotary' gait.

History

For centuries Lundehunds were bred on Vaeroy, a remote and rocky island off the Norwegian coast. Puffins nest in crevices in the island's cliff walls. Islanders depended on pickled puffin meat to sustain them through long Arctic winters, and the strong, flexible Lundehund was the only way to reach them. These compact puffin dogs would climb the sheer rock walls, worm their way into tiny passages, and snatch the birds. Then they'd skid down the cliffs, with the squawking, flapping prize in their mouth.

akc.org

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