



NEWS



Understanding Comparative Oncology



Dogs share our environment and develop many of the same illnesses as people, and their shorter lifespans make them good candidates for studies of shared disease. The Golden Retriever Lifetime Study was conceived to identify cancer risks in Golden Retrievers, but the Study also could have implications for understanding cancer in other breeds of dogs, in other animal species, and in humans.

To begin, we need to define some terms heard a lot when people talk about comparing animal and human diseases. First, people often confuse translational medicine with comparative medicine. Translational medicine refers to taking basic research results from the laboratory and moving it into the clinic or community. Comparative medicine focuses on the similarities and differences in disease biology between species.

Comparative oncology is the study of naturally occurring cancers in animals to help understand cancer in people and vice versa. Veterinary oncologists frequently point out that discoveries can benefit multiple species, including humans.

Using naturally occurring dog cancers as models for human cancers has gained momentum in the last 20 years. There is a growing recognition that mice fall short as models of human cancer. According to the National Academy of Science, a disappointing 11% of anti-cancer drugs that worked in mice ultimately were efficacious in people, a huge loss in terms of time and money. We also know that rodent physiology differs in some important ways from larger mammals such as dogs and people. There are also ethical concerns when laboratory animals are given a disease rather than learning from an animal that has developed the disease naturally.

Most comparative oncology efforts have focused on dogs because they spontaneously develop many of the same types of cancers as people, including melanoma, breast cancer and lymphoma.

A classic example of a cancer that is almost identical in people (particularly children) and dogs is osteosarcoma, a bone cancer. Amputation of the affected limb was long considered the standard of care to control disease spread. However, Dr. Steve Withrow and colleagues at Colorado State University worked with paediatric oncologists to develop limb-sparing surgery, which was first used in canine cancer patients and then in children to avoid amputation without compromising survival. Pioneering this procedure in dogs and implementing it in children is one of the many exciting examples of the potential to innovate to benefit multiple species.

Veterinary and human cancer researchers are observing dogs to learn about all aspects of cancer research including:

- Cancer risk factors
- How cancerous cells grow and spread
- Genetic changes occurring in cancer cells
- New targets for treatment
- New surgical techniques
- New diagnostic tests
- New drug therapies

Although dogs share many types of cancer with people, often cancers are unique and inter-species correlations can't be made. While it's tempting to make an apples to apples comparison between dogs and people when it comes to all cancer, it is important to avoid generalisations. However, researchers recognise we can still learn a lot by studying canine cancer in its many forms.

The importance of the Golden Retriever Lifetime Study in better understanding these unresolved questions cannot be overstated. The Study gives researchers in-depth environmental, genetic and lifestyle information that can help us identify cancer risk factors. The findings also might identify where dogs and people differ, or what they have in common, when it comes to cancer risk.

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