

The Challenge with Canine Cancer

Cancer is the leading cause of death in dogs. While their lifetime risk is similar to humans (between 1:2 and 1:4), their annual cancer incidence is up to ten times higher because of their shorter lifespans.¹⁻⁵ Like in people, both genetic and environmental factors drive cancer incidence in dogs. Some purebred dogs may carry a higher number of germline (inherited) mutations that predispose them to cancer. Furthermore, because dogs and humans share the same environment, dogs are exposed to the same carcinogens as their owners.^{6,7} Additionally, the burden of cancer in dogs increases with age: up to 50% of dogs >10 years of age will develop cancer during the remainder of their lives.^{3,8,9}

Cancer care is an essential part of pet health care.¹⁰ Unfortunately, most patients are presented for evaluation once clinical signs develop, by which time the cancer is often advanced, microscopic or macroscopic spread has already occurred, and a cure is no longer achievable.¹⁰⁻¹⁴ Thus, cancer in dogs currently carries a significant burden of morbidity and mortality.^{3,15,16}

The conventional path to achieving a cancer diagnosis in dogs varies based on the patient characteristics, tumor type, and tumor location.¹⁷ Traditional diagnostics include tissue biopsy, exploratory surgery, and fine needle aspiration (FNA) cytology. These diagnostic tests are associated with variable levels of risk dependent upon the site of the suspected mass and the characteristics of the procedure; such risks include infection, internal bleeding, fracture after bone biopsy, non-diagnostic results, and in the worst cases, death.¹⁷⁻²⁸ FNA is less invasive and lower risk compared to biopsy; however, inconclusive results or misdiagnoses are common with FNA.^{29,30} Also, not all tumors are easily accessible to sampling by FNA.

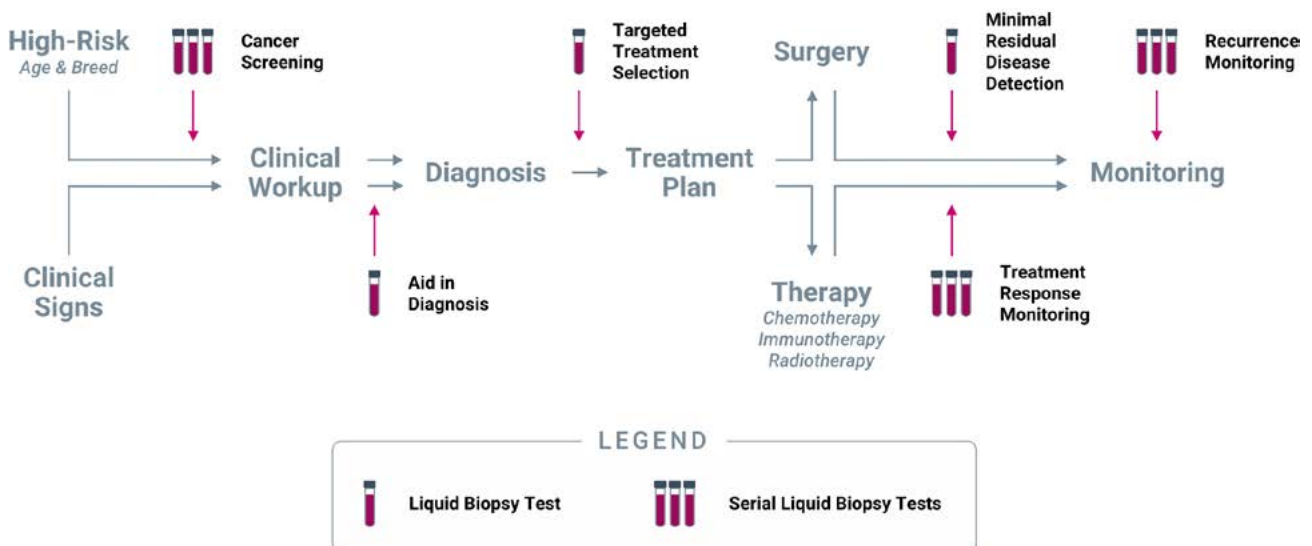
By leveraging advances in genomic technology and oncology, PetDx® has created the first-of-its kind test for the detection, characterization, and management of canine cancer based on a simple blood draw:

Oncok9® – The Liquid Biopsy Test for Dogs™

What is Liquid Biopsy?

Liquid biopsy typically refers to the sampling and analysis of cancer-related analytes from blood. The unique, non-invasive nature of liquid biopsy allows it to be deployed in multiple clinical use cases across the full spectrum of cancer care in dogs, including screening, aid in diagnosis, targeted treatment selection, treatment response monitoring, minimal residual disease detection, and recurrence monitoring.³¹ This method has unique advantages, especially in cancer (or cancer-suspected) cases where obtaining a tissue sample for traditional histological analysis may be particularly risky or difficult.

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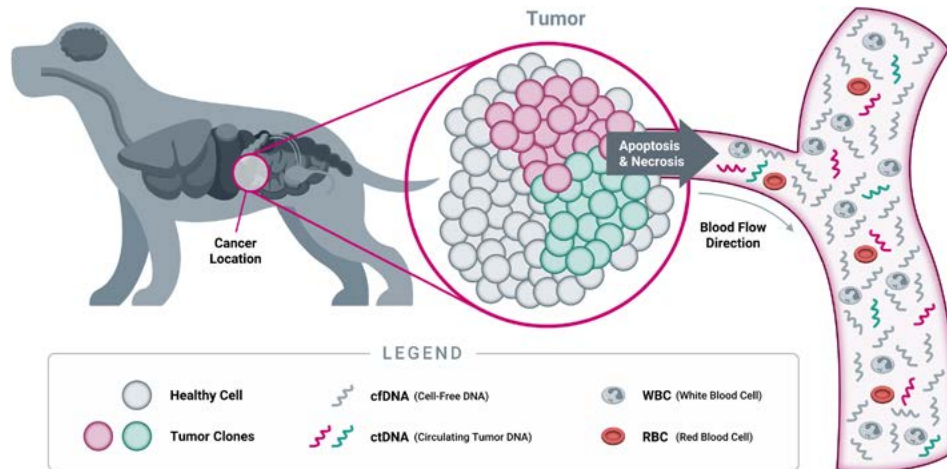


How OncoK9 Works

Cancer is a disease of the genome and develops as the result of the successive accumulation of genomic alterations (DNA mutations) in body cells over time; these are known as somatic (or acquired) mutations. Cancer occurs when one or more of these alterations confer an uncontrolled growth advantage to a population of cells.³²

When cells die, DNA within the nucleus is broken down into small fragments which get released into the bloodstream as 'cell-free' DNA (cfDNA). Both normal

and cancer cells release cfDNA, but the fragments arising from the cancer cells can be distinguished from those originating in normal cells by examining their DNA sequence.³³ The OncoK9 liquid biopsy test interrogates millions of cfDNA fragments in each blood sample, using next-generation sequencing (NGS) technology and bioinformatics algorithms to non-invasively detect alterations in the DNA that indicate the presence of cancer.



When to Use OncoK9

OncoK9® is a multi-cancer early detection (MCED) test for the detection and characterization of cancer-associated genomic alterations in DNA isolated from canine whole blood samples, using next-generation sequencing (NGS) technology. **OncoK9 is intended for use in dogs who are at higher risk of cancer. The risk of cancer in dogs increases with age and is also increased in certain breeds. OncoK9 is recommended as an annual screening test for all dogs starting at 7 years of age,**

and starting at younger ages for dogs belonging to breeds in which cancer tends to develop earlier in life. It is also recommended as an aid-in-diagnosis for dogs in which cancer is suspected based on clinical signs or other clinical findings. As with any laboratory test, OncoK9 results should be interpreted by a veterinarian in the context of each patient's medical history and clinical presentation. The test is available by prescription only.

Interpretation of Results

OncoK9 alerts the veterinarian to genomic alterations associated with the presence of cancer by reporting one of three results:

CANCER SIGNAL NOT DETECTED

A **Cancer Signal Not Detected** result indicates that no cancer-associated genomic alterations were detected in the DNA from the patient's blood sample. This significantly reduces but does not eliminate the

probability that cancer is present. If cancer is clinically suspected, a full diagnostic evaluation should be performed. Consider re-testing if cancer remains high on the differential diagnosis list, as advancing disease generally provides a higher cancer signal.

CANCER SIGNAL DETECTED

A **Cancer Signal Detected** result indicates that cancer-associated genomic alterations were detected in the DNA



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from the patient's blood sample. This significantly increases the probability that cancer is present but does not establish a definitive diagnosis of cancer. A full clinical evaluation must be performed to establish a definitive diagnosis in this patient. **This result should not be used as the sole basis for making important decisions such as treatment or euthanasia.**

NOT REPORTABLE

A **Not Reportable** result indicates that the sample sent to PetDx did not meet internal quality criteria for a reportable result, and submission of a new sample is typically advised. The report will provide instructions about submitting a new sample.

As with any laboratory test result, close consultation between the veterinarian and dog owner is necessary to ensure that test results are interpreted for each patient in the context of their unique clinical presentation.

Summary

By leveraging breakthrough technology from the human oncology arena, PetDx has created OncoK9, a non-invasive liquid biopsy test that has the potential to revolutionize the detection, characterization, and management of cancer in canine patients.

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