Veterinarian attitudes toward blood-based 'liquid biopsy' testing for cancer detection in dogs

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INTRODUCTION

Cancer is the leading cause of canine death, affecting up to 1 in 3 dogs.[1] Early detection saves lives, but cancer in dogs is usually diagnosed when clinical signs have developed, the disease is advanced, and a cure is unlikely. Noninvasive multi-cancer early detection (MCED) tests are now available for humans and for dogs, leveraging recent advances in cancer genomics and sequencing technology.[2,3] Liquid biopsy testing has the potential to address multiple use cases, including cancer screening in higher-risk populations; aid in diagnosis (when the clinical presentation is suspicious for cancer); and recurrence monitoring after curative-intent treatment.

METHODS

Nationwide quantitative (n=305) and qualitative (n=16) surveys of licensed veterinarians and veterinary oncologists were conducted by Kynetec, focusing on cancer screening, diagnosis, and management in pet dogs, as well as understanding clinician attitudes toward a blood-based 'liquid biopsy' test across multiple use cases.

Quantitative Survey

Online surveys were conducted during May and June 2020 and lasted approximately 35 minutes. To qualify, respondents had to be a practicing veterinarian working in general practice and seeing at least 50% dogs, not be employed in industry, spend at least 25% of their diagnostic tests to an external reference lab, and have worked in veterinary medicine for 2-35 years. A liquid biopsy test concept was presented to participants who then answered questions about a variety of topics including their perception of the need for this type of test and likelihood to use for various clinical use cases.

Qualitative Survey

An interview-style survey was conducted with veterinarians to assess the overall interest in a novel blood test that detects cancer in dogs. An hour-long interview was conducted with each participant by webcam or phone during August 2020, with 11 general practitioners and five board-certified veterinary oncologists. To qualify, participants had to have at least two years experience and presently be practicing full time, with a caseload that was at least 50% canine, and not have worked in industry.

RESULTS

Table 1. Demographics of survey respondents.

	Quantitative Survey	Qualitative Survey
Number of Participants	305 (GP)	16 (11 GP, 5 Onc)
Female % : Male %	64 % : 36 %	63 % : 37 %
Average Years in Practice	20y	21y (GP), 11y (Onc)
Percentage of time spent treating dogs	62%	65%
Average number of dogs seen per month	179	160 (GP), 107 (Onc)
Practice Location (GPs only)		
Urban	12%	0%
Suburban	69%	91%
Rural	19%	9%

Acronyms: GP = General Practitioner; Onc = Oncologist

Veterinarians included in each survey were asked about their approach to cancer screening in dogs using three pre-defined groups (Table 2). In the quantitative survey, participants could select their approach to cancer screening as 'Incidental', 'Routine', or 'Proactive'. For the General Practitioners in the smaller qualitative survey, a pre-screening questionnaire permitted survey involvement only to those who self-identified in the 'Routine' and 'Proactive' groups. There was not a significant association between years of experience or veterinarian age to the approach to cancer screening categories in either survey.

Table 2. Approach to Cancer Screening.

	GPs in Quantitative Survey (n=305)	GPs in Qualitative Survey (n=11)
Incidental: Cancer screening typically occurs incidentally during screening for other diseases or during yearly examinations. I will screen patients for cancer if there is a suspicion of cancer.	23%	N/A*
Routine: I advise to actively look for cancer via thorough physical exams, rectal exams, patient labs/imaging, and needle aspirates of existing masses.	60%	73%
Proactive: I encourage owners who have dogs that might be predisposed to cancer (by age or breed) to schedule physical exams more often and encourage them to pursue additional blood or imaging tests to find cancer early.	17%	27%

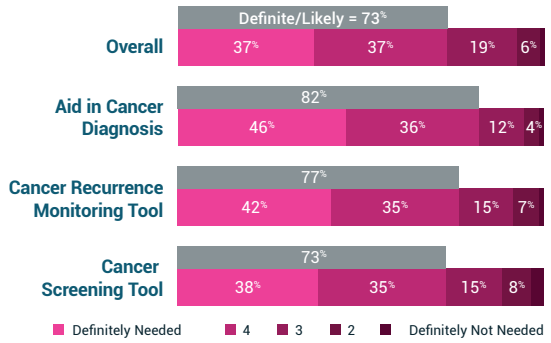
**The qualitative survey design included only veterinarians in the 'Routine' and 'Proactive' group.*

Overall, veterinarians reported that 13.5% of dogs in their practice present with a clinical picture where cancer is one of the top 3 items in the differential diagnoses.

The quantitative survey yielded insights into differences in practice and clients among the veterinarians who self-identified as having a Proactive, Incidental or Routine approach to cancer screening in dogs. Specifically, those who categorized themselves as taking a 'Proactive' approach were more likely to pursue a diagnostic workup to achieve a definitive diagnosis, consider themselves early adopters of new technology, and were also more likely to have clients who are willing to pursue a definitive diagnosis and pursue treatment in-house including surgery and chemotherapy. By contrast, those who categorized themselves as taking an 'Incidental' or 'Routine' approach to cancer screening tended to have clients who were less likely to pursue treatment for cancer; and when treatment was desired, they were more likely to refer patients with cancer out for more specialized management.

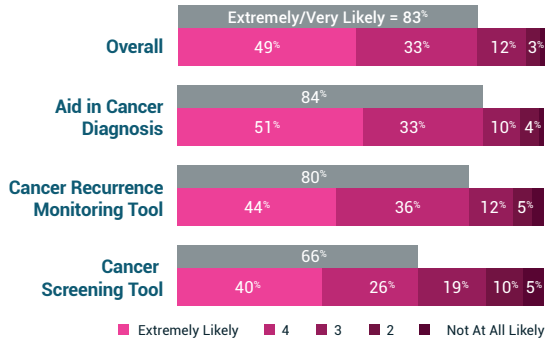
Among all respondents, there was a high perception of overall need for a blood-based test for cancer detection, with 73% of veterinarians identifying a definite/likely need.

Figure 1. Perceived need for a blood-based 'liquid biopsy' test for cancer detection in dogs. (n=305)



Further, 84% of all respondents indicated they were very/extremely likely to use such a test as an aid in cancer diagnosis; 80% very/extremely likely to use as a cancer recurrence monitoring test; and 66% very/extremely likely to use as a cancer screening test.

Figure 2. Likelihood to use a blood-based 'liquid biopsy' test for various clinical use cases. (n=305)



In verbatim survey comments, many general practice veterinarians reported that clients have asked for a blood test to identify cancer in dogs, and veterinary oncologists acknowledged the potential benefits of characterizing the genomic features of cancer through noninvasive means.

"The concept itself is very intriguing to me, it would depend on the type of cancer, but to be able to preemptively identify the presence of a malignancy or the return of a malignancy before you can pick it up with routine diagnostic tests such as blood work, imaging. I think it has potential." [GP]

"Liquid biopsies are certainly exciting and the wave of the future." [Oncologist]

"We field calls all the time from clients wanting to know if there something they can do to be more proactive about screening pets for cancer." [Oncologist]

CONCLUSION

Both general practitioners and oncologists are aware of the high risk of cancer in dogs and clearly see the value of early detection. Novel multi-cancer liquid biopsy tests are likely to be welcomed by a considerable proportion of veterinarians and veterinary oncologists caring for pet dogs.

KEY POINTS

1. A significant majority of veterinarians surveyed identified a strong need for a blood-based 'liquid biopsy' multi-cancer early detection (MCED) test.

2. On average, the veterinarians surveyed estimated that cancer is in the top three differential diagnoses for 13.5% of the canine cases that they see.

3. Veterinarians who self-identify as 'Proactive' in their approach to cancer screening are most likely to pursue a definitive diagnosis of cancer in their patients, and most likely to prescribe a blood-based multi-cancer early detection (MCED) test.

4. Neither years of experience nor age were indicators of veterinarian likelihood to adopt new diagnostic technologies.

5. The majority of veterinarians surveyed (73%) identified a high need for a liquid biopsy test; 84% indicated they were very or extremely likely to use such a test as an aid in cancer diagnosis, with 66% very or extremely likely to use it as a cancer screening test.

References

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