VITICUSGROUP™
WVC ANNUAL CONFERENCE
MARCH 2 - 5, 2025 | LAS VEGAS, NV

Volition Veterinary

nu·Q vet Cancer Test

# Early Detection with Canine Cancer Screening

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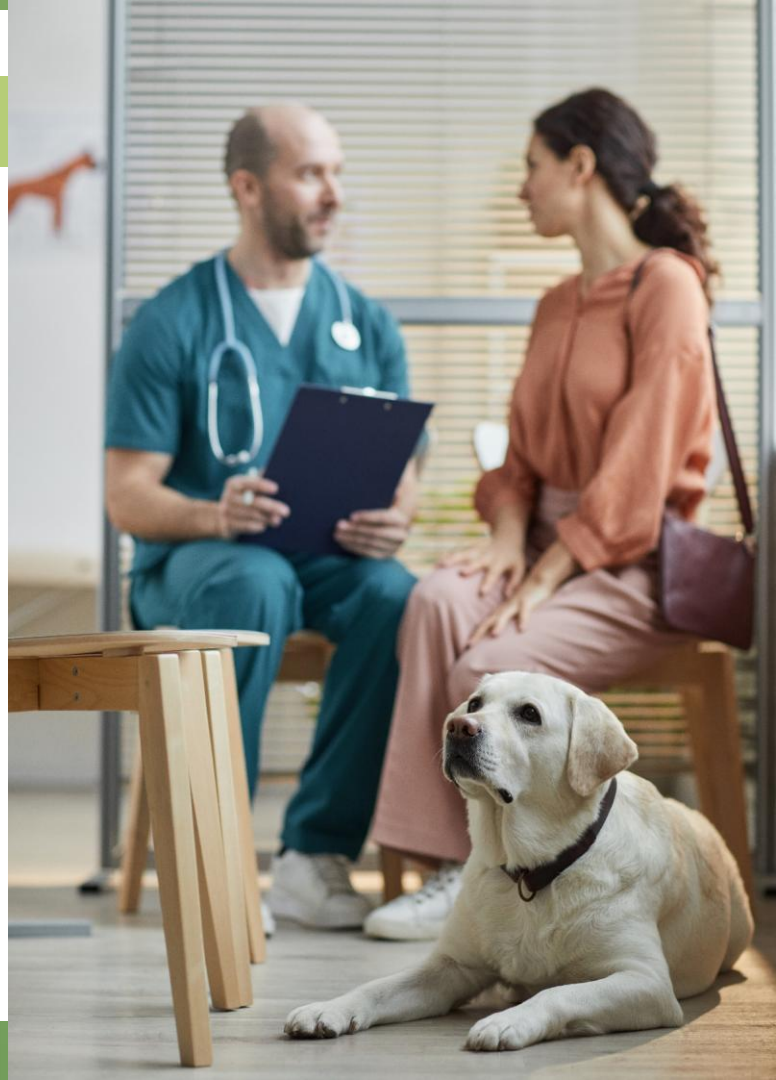
*DAVCIM (Oncology)*

# How Cancer is Detected Today

- Some cancers may develop quickly, showing no signs
- Not all symptoms of cancer are the same
- Pet owners may choose to wait out symptoms
- Dogs are often brought in once symptoms have worsened

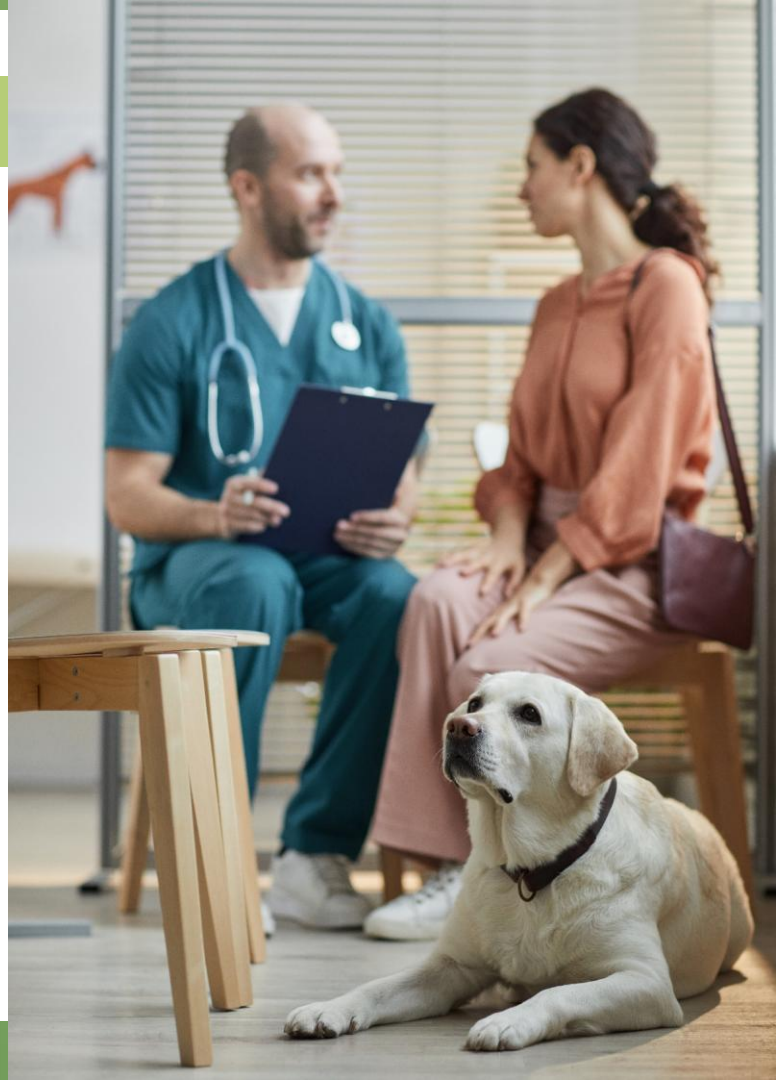


# Canine Cancer Today

- Almost 50% of dogs over 10 will develop cancer[1]
- Approximately 6 million new cancer diagnoses a year
- Hemangiosarcoma and lymphoma make up almost 1/3 of cancer cases diagnosed[2,3]
    - HSA and LSA account for more than 50% of cancers treated by veterinarians
- Cancer in dogs is diagnosed late and through costly and/or potentially invasive procedures such as scans &/or biopsies

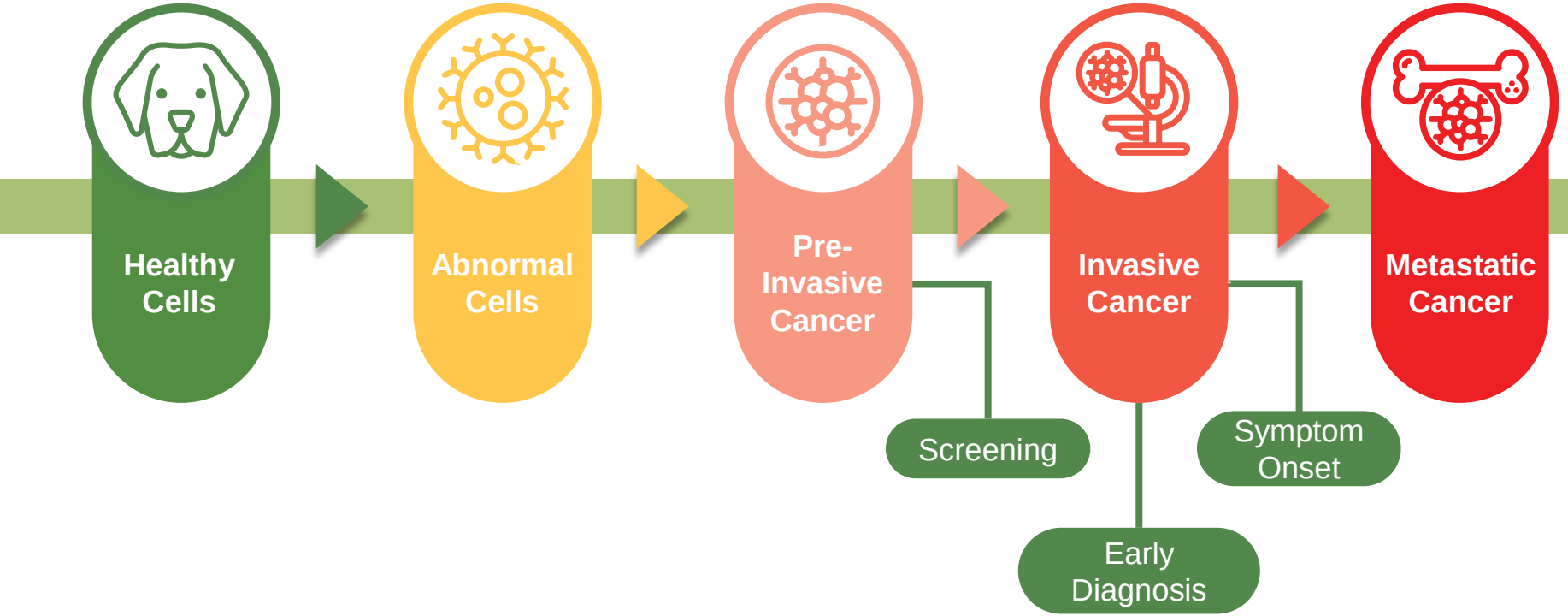
↓ Many dogs asymptomatic

↓ When clinical signs, owners often wait it out




1. AVMA website accessed Jan 2025
2. https://www.csuanimalcancercenter.org/2019/11/14/common-cancers-in-dogs/
3. https://www.akcchf.org/canine-health/your-dogs-health/canine-hemangiosarcoma.html

# The Value of Screening



nu·q vet

# Cancer Test

Integrating an accessible, affordable, easy-to-use blood test into your practice

# Preventive Care & Cancer Screening

- Early detection leads to **early** intervention
  - Allows owners more time to make/prepare for decisions vs on emergency basis
  - Allows them the space to be able to choose from their spectrum of treatment or monitoring options
  - Less emotional toll on owners
  - Less secondary unintentional emotional backlash to vet and team
- Early intervention leads to more **positive** outcomes
- Cancer screening is ideally **easy to do**, **affordable**, & **accurate**

**Nu.Q® Vet Cancer Test** is an accessible, affordable and easy-to-use blood-based test capable of reliably detecting elevated levels of cell-free DNA in canine patients

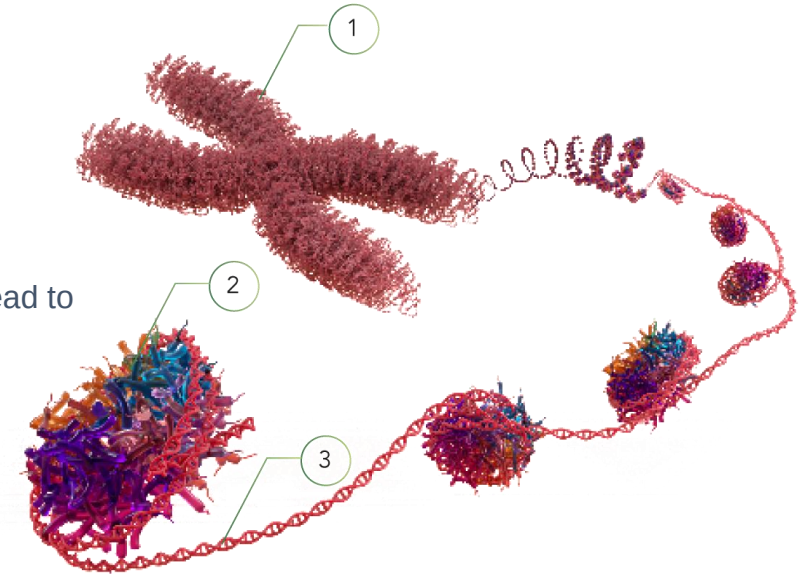
# The Cancer Conversation

- Approaching pet owners on the topic of cancer can be an emotional situation
- Screening process can heighten anxiety in pet parents
- Emotionally and financially prepare pet owners for potential outcomes
- Need to prepare staff and owners for what test is

# How Does the Test Work?

## Nucleosomes are beadlike structures comprised of DNA coiling around the histone protein core

1. Chromosome
2. Nucleosome (DNA wrapped histones)
3. DNA Strand




## How does the Nu.Q® Vet Cancer Test work?

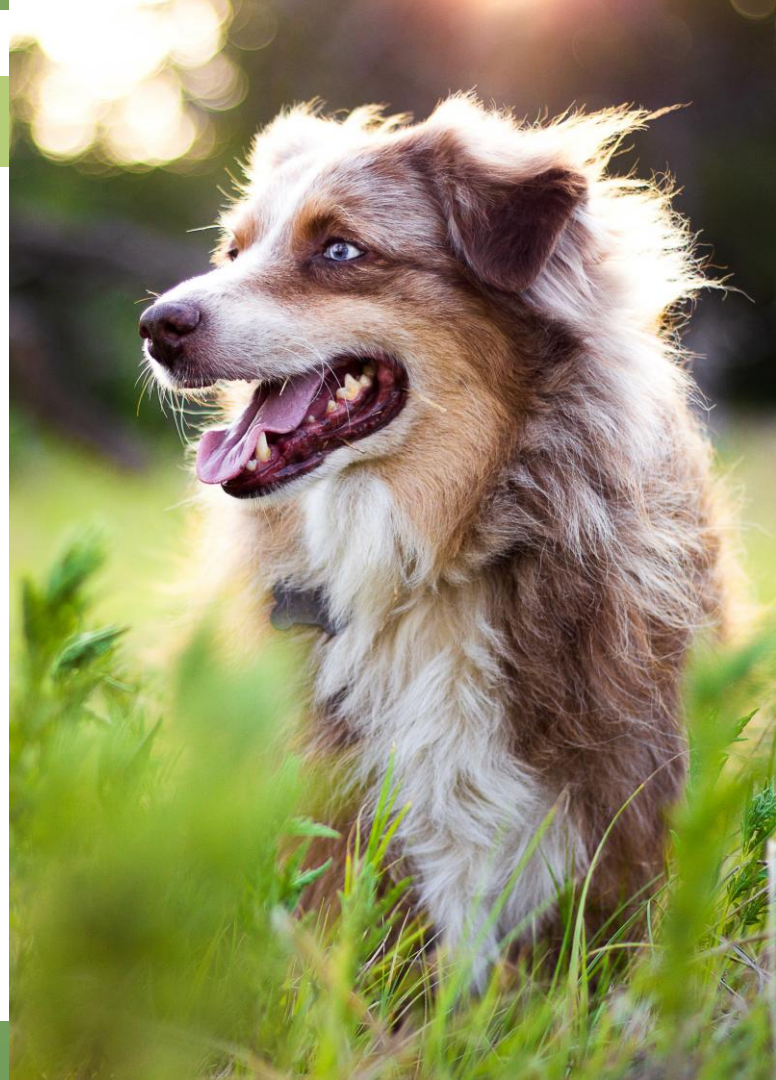
High cellular turnover – due to diseases like cancer – can lead to increased concentration of nucleosomes in bloodstream

They can be captured using antibodies tailored specifically to detect nucleosomes.

The Nu.Q® Vet Cancer Test quantifies these circulating nucleosome levels in the blood.

# Clinical Evidence

- Peer-reviewed and published case series[1] of 662 dogs (134 healthy and 528 with cancer)
- 7 common cancers were evaluated in this study
  - Lymphoma
  - Hemangiosarcoma
  - Osteosarcoma
  - Soft tissue sarcoma
  - Malignant melanoma
  - Mast cell tumors
  - Histiocytic sarcoma



BMC Part of Springer Nature

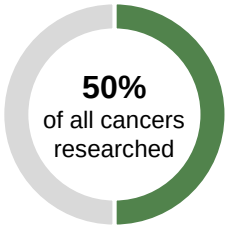
BMC Veterinary Research

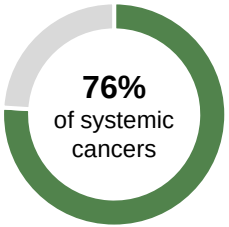
1. H. M. Wilson-Robles et al, BMC Vet Res, 2022, https://doi.org/10.1186/s12917-022-03429-8

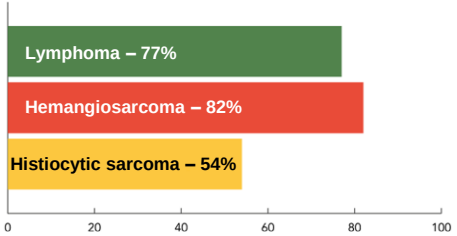
# Clinical Evidence

A peer-reviewed and published case series[1] of 662 dogs.


At **97% specificity, the Nu.Q® Vet Cancer Test** was able to detect approximately

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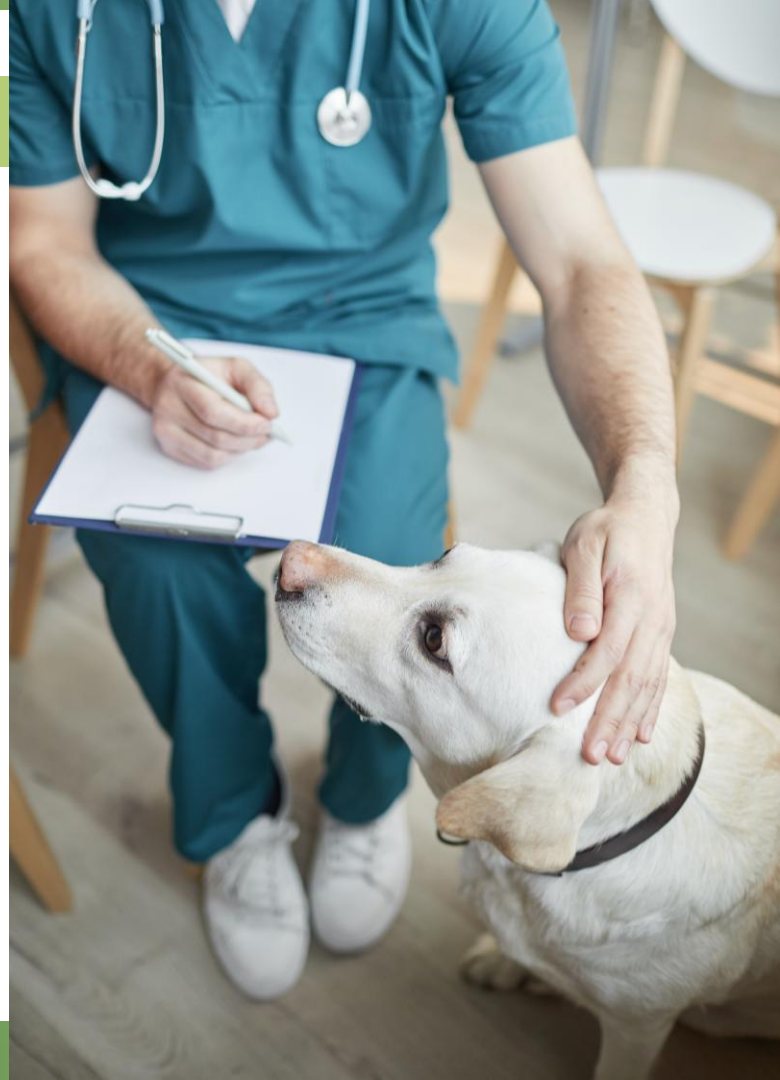
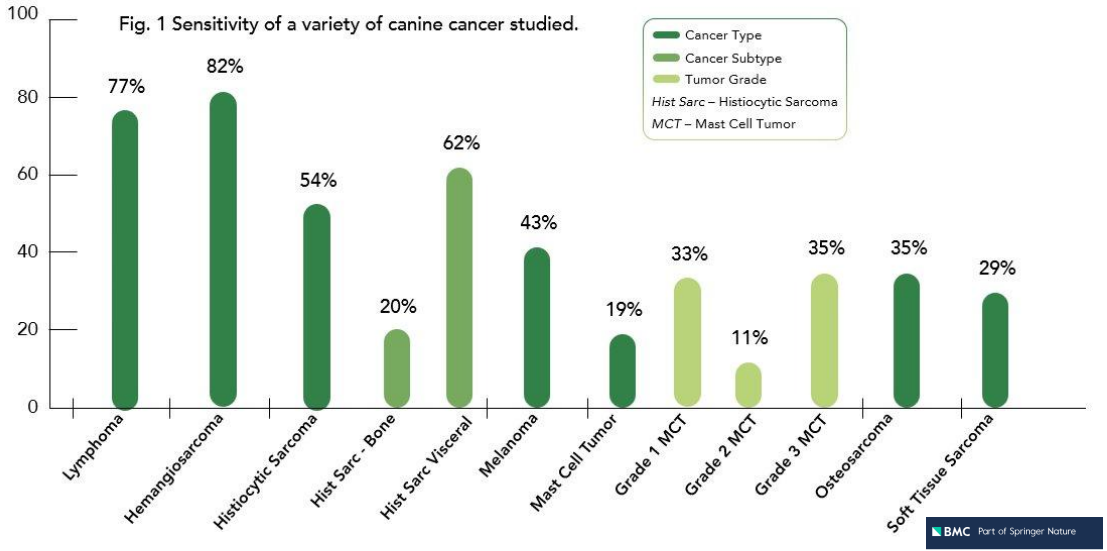


# Sensitivity for a variety of cancers

- Getting additional clinical trial data on various carcinomas and other cancers

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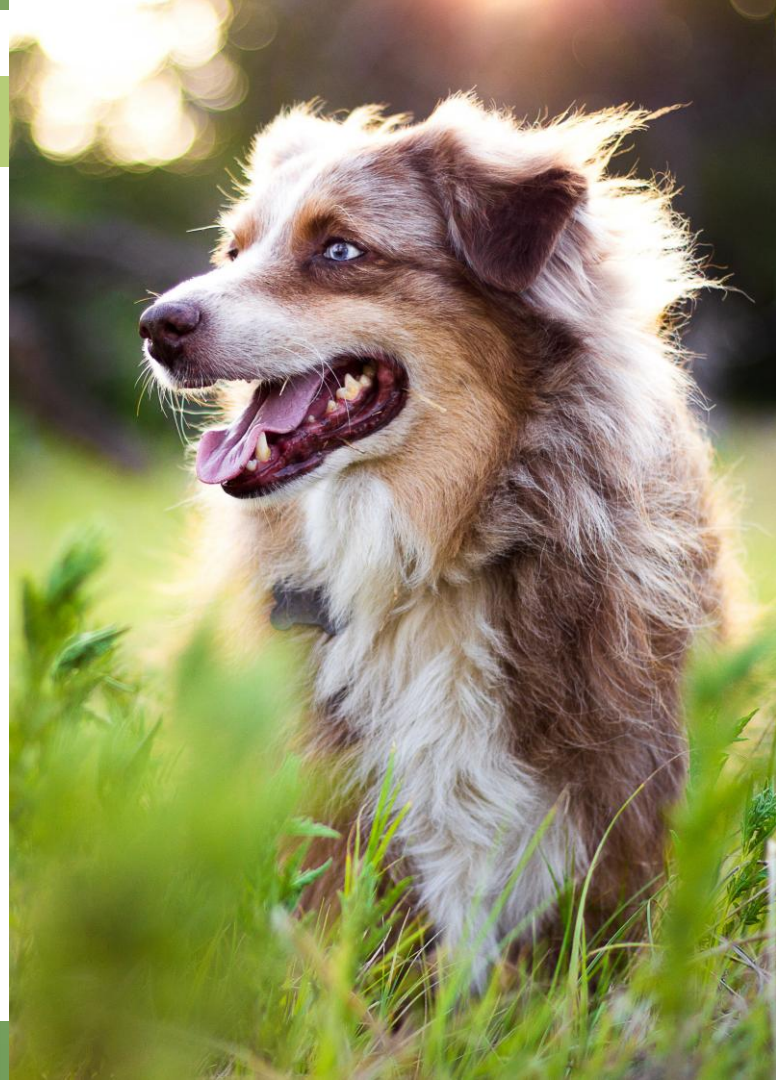
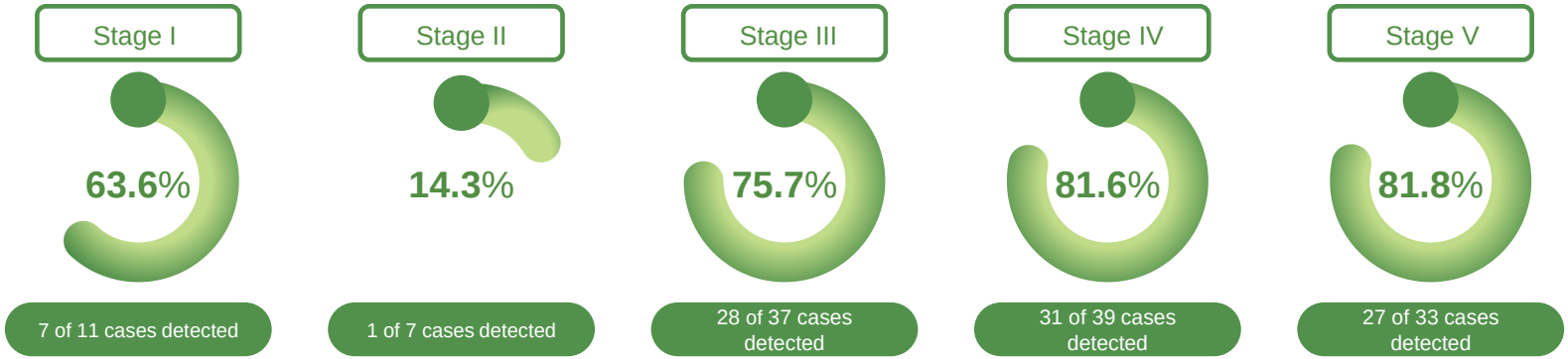


# Lymphoma: Disease Type/Stage[1]




**At 97% specificity, the Nu.Q® Vet Cancer Test was able to detect 77% of lymphoma[1]**

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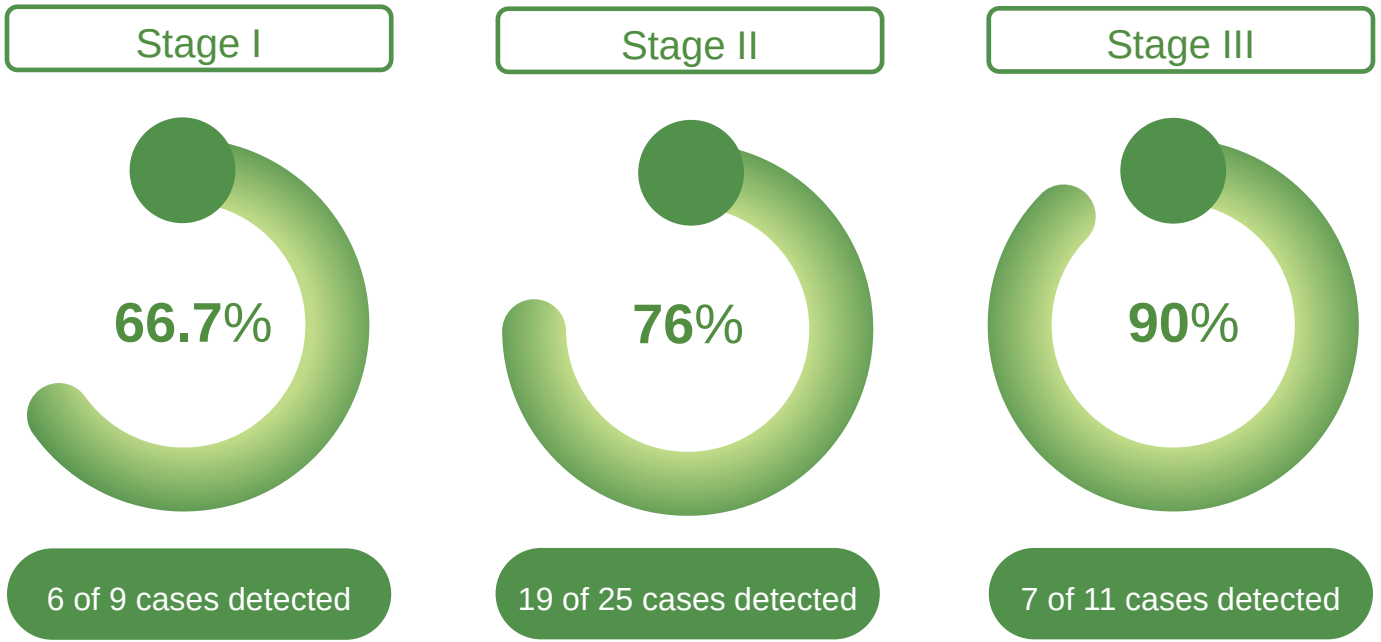
BMC Veterinary Research

1. C. Dolan et al, BMC Vet Res, 2021 https://doi.org/10.1186/s12917-021-02991-x

# Hemangiosarcoma: Disease Type/Stage




**At 97% specificity, the Nu.Q® Vet Cancer Test was able to detect 82% of hemangiosarcoma cases**

1. H. M. Wilson-Robles et al, BMC Vet Res, 2021, https://doi.org/10.1186/s12917-021-02934-6

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BMC Veterinary Research

# When to Screen

- **Leverage your Senior Wellness Profile**
    - **ALL Healthy Dogs 7 and older**
- **Breeds with increased risk of developing cancer**
    - **Age 4 and older**
- **Cancer screening can <u>easily</u> be added to routine check-ups alongside other bloodwork**
- **We strongly recommend that screening be performed 2x per year**

# The Nu.Q® Vet Cancer Test

The Nu.Q® Vet Cancer Test is recommended for **all** dogs over the age of 7, and younger dogs age 4 and older with an increased risk of cancer such as:


Labrador Retriever


French Bulldog


Golden Retriever


German Shepherd


Great Dane


Miniature Schnauzer


Siberian Husky


Bernese Mountain Dog


Beagle


Rottweiler


Boxer


Pembroke Welsh Corgi


Mastiff


Irish Wolfhound


Flat Coated Retriever


Scottish Wolfhound

# How to Submit a Sample (reference lab)

1. 
Draw 2-5mL of blood
from peripheral or jugular vein

2. 
Immediately fill EDTA tube
with blood and gently invert 10 times

3. 
Spin the sample in-house
1600xg for 10 minutes within one hour of sampling
*typically, the blood button setting button

4. 
Remove plasma
place in non-additive tube
*be careful to not disturb buffy coat

5. 
Store sample in fridge and ensure pick up is within 24 hours

Results will be available in 1-3 days

# Point of Care Testing

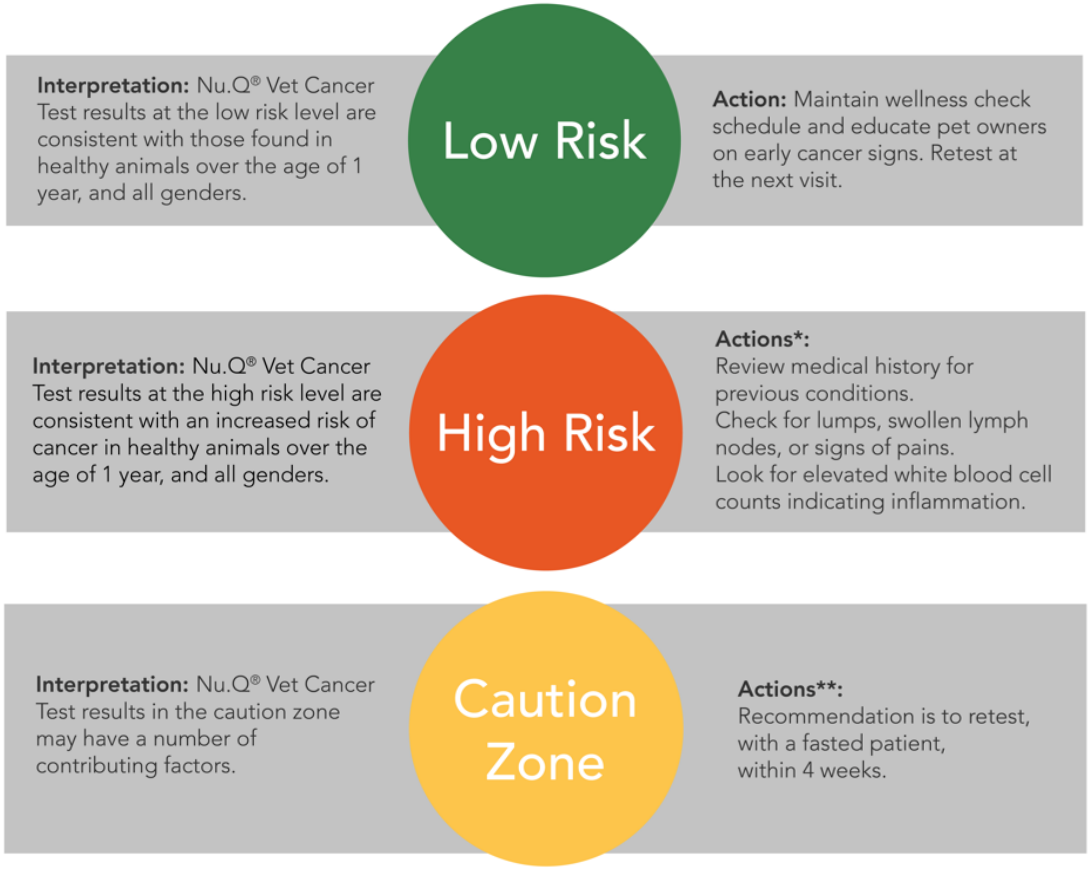
HESKA
AN ANTECH® COMPANY

- Results provided in **6 minutes** with NO need to refrigerate sample or test reagents
- Allows veterinarians to make informed clinical decisions quickly, in-house, while patient is still in clinic


element i+

…Ask your local Antech™ representative!

# Interpreting Results



# Interpreting Results: Green Level

**Low Risk**

## Interpretation:

- Nu.Q® Vet Cancer Test results at the green level are consistent with those found in **healthy** animals over the age of 1 year, and all genders.

## Action:

- Maintain **regular** wellness checks and educate pet owners on early cancer signs
- **Retest** at the next visit.

The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes. Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer. If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

# Reading Emotions: Green Level

**Low Risk**

- Use positive news **(~90% of the time)** as opportunity for continued vigilance – celebrate peace of mind results
- Recommend bi-annual tests to ensure pet stays in the low-risk category
- Monitor for new lumps/bump and for changes in behaviors at home

# Interpreting Results: Orange Level

**High Risk**

## Interpretation:

- Nu.Q® Vet Cancer Test results at the orange level are consistent with an **increased risk of cancer** in healthy animals > 1 year, and all genders

The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes. Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer. If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

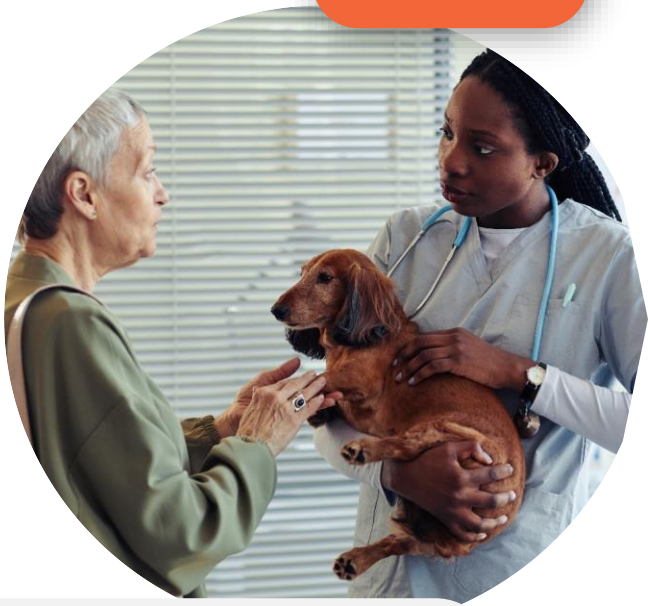
# Interpreting Results: Orange Level

**High Risk**

If medical history review is inconclusive, please call or email our AskNu.Q® Vet Hotline or Inbox to consult with a veterinary professional on your complex case before conducting invasive or costly procedures. You can reach us at AskNu.QVet@volition.com or 979.709.2348.

## Action:

- Take a pause…review medical history for previous inflammatory conditions, surgeries, or familial cancer history
- Physical Examination: Check for swollen lymph nodes, abdominal mass, abnormal discharges, lumps, rectal, or signs of pain
- Bloodwork: Look for elevated white blood cell count indicating inflammation, abnormal liver/kidney markers, or other anomalies hinting at disorders like anemia or infection
- Further Diagnostics: Consider radiographs, ultrasound and other imaging



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# Communicating Results: Orange Level

**High Risk**

- **Moderate to significant elevation of blood nucleosomes**
    - Current client/vet relationship and physical status of pet
    - Give client time to process decisions/alternatives – no need to rush
- **High-risk does not equal a cancer diagnosis, BUT this tells us something is going on internally to be investigated**
    - Confirm sample processed appropriately
    - Consider diagnostic workup
- **Alternative plan - recheck Nu.Q® result in 2 to 4 weeks to monitor trend**

# Interpreting Results: Caution Zone

Caution Zone

## Interpretation:

- Nu.Q® Vet Cancer Test results at yellow level may have a few contributing factors
    - Sample collection and/or handling being the large majority

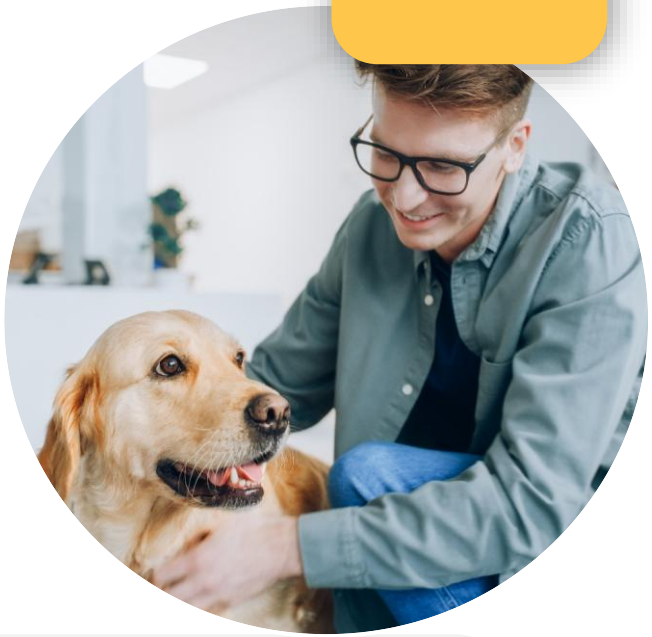
The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes. Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer. If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

# Interpreting Results: Caution Zone

**Caution Zone**

## Suggestion is to retest a fasted sample (min. 4-hour) within 2 to 4 weeks

- **If the Nu.Q® score remains at increased level**
  - Refer to “high risk" actions for patient information to consider before conducting more costly or invasive procedures
- **If the Nu.Q® score returns to low risk level**
  - Educate the pet owner on early cancer signs and schedule a re-test in 6 months.



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# Case Studies


Belle
5-year-old FS Golden Retriever

# Belle

Presenting for annual recheck and doing well at home

- Physical exam
  - No significant findings
  - Grade 1 murmur (new)
- Owner reports doing well at home
- A little more tired than usual, but a puppy was just introduced at home

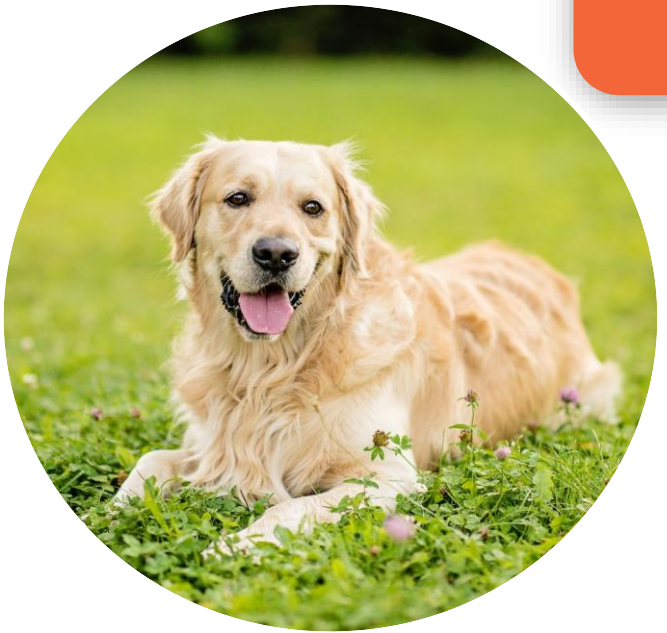
TPR within normal limits

- CBC
  - Slightly thrombocytopenia: 134,000
  - Otherwise, normal
- Chemistry Panel
  - Mild elevation in ALP: 243 mg/dl
- Urinalysis
  - No significant findings

# Belle Results: **Orange Level (187** ng/mL)

**High Risk**

- **Results at the Orange level are consistent with an increased risk of cancer in healthy animals over the age of 1 year, and all genders**
- **The Nu.Q® Vet Cancer Test identifies patients however, confirmatory diagnostics should be used to confirm the suspicion of cancer**
- **Review medical history for previous inflammatory conditions, surgeries, or familial cancer history.**



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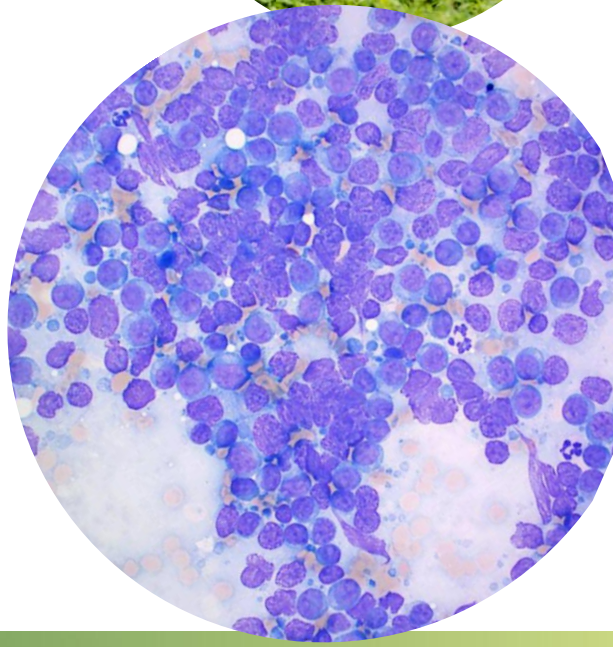
# Belle: What to do next?

- Owner agrees to abdominal ultrasound and thoracic radiographs
- Cranial mediastinal mass on thoracic radiographs
- AUS: splenomegaly with severely mottled appearance (“moth eaten”)
- Cytology both sites

# Belle: What to do next?

- Owner agrees to abdominal ultrasound and thoracic radiographs
- Cranial mediastinal mass on thoracic radiographs
- AUS: splenomegaly with severely mottled appearance (“moth eaten”)
- Cytology both sites
  - **high grade lymphoma**



# Benjamin
## 9-year-old MC Labrador

&

# Boomer
## 6-year-old MC Labrador

# Benjamin

- **9-year-old MC Labrador**
- **Diagnosed with splenic HSA, 4/26/2023**
  - Splenic mass was found after posoitive OncoK9 test
  - Splenectomy
  - Treated with 5 doses doxorubicin
  - Follow up ultrasound at pDVM was concerning for peritoneal metastasis
- **Referred 10/16/2023**

**Physical exam 10/16/2023**

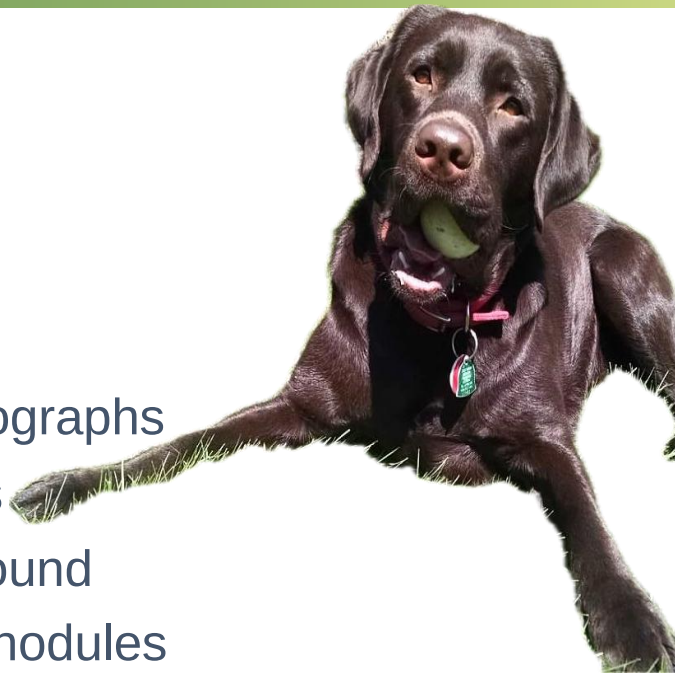
- Pale pink mm
- Rest exam normal

**Plan:**
Full workup and run the Nu.Q® Vet Cancer Test

# Benjamin

## Diagnostics

- CBC
  - Anemic 24%
- Chemistry Panel
  - Normal
- Urinalysis and UPC
  - No significant findings
- Nu.Q® Vet Cancer Test
- 3-view chest radiographs
  - No metastasis
- Abdominal ultrasound
  - No peritoneal nodules
  - No effusion
  - Hyperechoic fat in retroperitoneal space (RPS)
- Aspirate of mass in RPS



# Benjamin Results: Orange Level 255 ng/mL

High Risk

Results at **Orange level** are consistent with increased of cancer in healthy animals over the age of 1 year, and all genders

Confirmatory diagnostics should be used to confirm the suspicion of cancer

Review medical history for previous inflammatory conditions, surgeries, or familial cancer history

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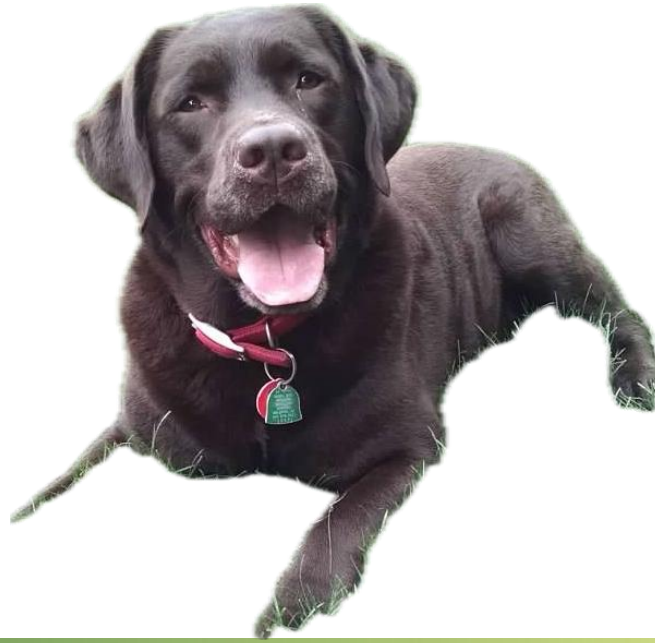
# Benjamin: What to Do Next?

- **Aspirate was non-diagnostic**
- **Based on Nu.Q® and anemia, presumed metastasis**
- **Started oral Palladia**
- **Plan to monitor with Nu.Q®**
- Did well for 2 months, anemia resolved
- Dec. 11, 2023
  - Nu.Q® increased from 255 ng/mL to 311 ng/mL
  - CXR: no metastasis noted
  - AUS: similar RPS mass, no effusion
- Dec. 18 presented for vomiting and lethargy
  - Anemia and moderate thrombocytopenia



# Benjamin CT scan Dec. 30, 2023

- **Diffuse metastatic disease**
  - Too numerous to count nodules in skin, subcutaneous tissues, body wall muscle, mesentery, retroperitoneal space, and skeletal muscle of pelvic limbs and paraspinal muscle
  - Regional subcutaneous, peritoneal and retroperitoneal fluid most likely hemorrhage from bleeding metastatic lesion
- **Euthanized 2 weeks later**
  - Progressive anemia and hypoglobulinemia

# Boomer

- **6-year-old MC Labrador**
- **Presented March 2024 for cancer screening**
  - Had recent lab work
  - No problems on history

**Physical exam**

- Exam normal

**Plan:**
Full screening and run the Nu.Q® Vet Cancer Test

# Boomer

## Diagnostics

- 3-view chest radiographs
  - No metastasis, normal
- Abdominal ultrasound
  - Age related kidney changes
  - Cyst in left kidney
- Nu.Q® Vet Cancer Test submitted

# Boomer Results: Green Level (<15 ng/mL)

**Low Risk**

Consistent with those found in healthy animals over the age of 1 year and all genders

**Continue monitoring bi-annually**

The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes. Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer. If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

# Boomer: Next Recheck November 19, 2024

## Diagnostics

- CBC normal
- Chemistry Panel normal
- Urinalysis USG 1.016
- In house Nu.Q® **<15ng/mL - low suspicion**
- 3-view CXR: Normal, no metastasis
- Abdominal ultrasound
  - Age related kidney changes
  - Cyst in left kidney stable, new one in right
  - Internist recommended IM consult

# Boomer

&

# Introducing Buster

# Otis

12-year-old MN Catahoula mix

# Otis

## History of subcutaneous hemangiosarcoma removed 2 years ago

**Presenting for annual recheck and doing well at home**

- Physical exam
  - Moderate dental tartar
  - Grade 1 murmur (new)
  - Mild arthritic changes to hips and elbows
- As part of wellness exam, run minimum database blood work as well as Nu.Q® Vet Cancer Test

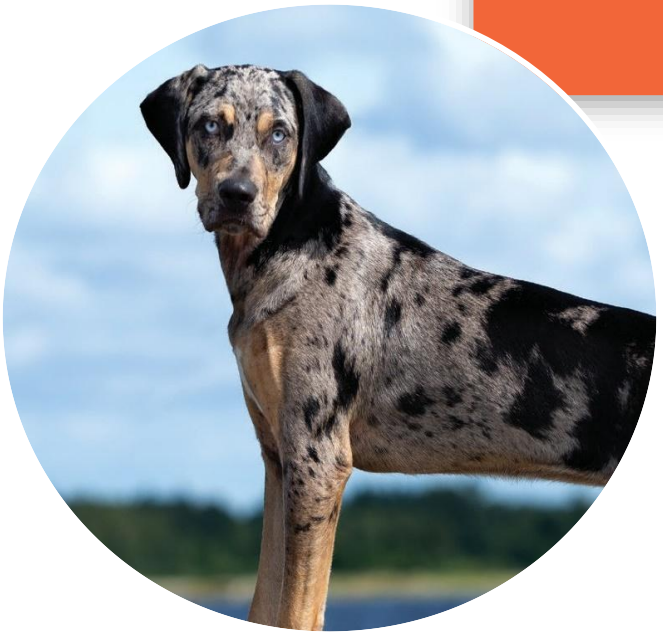
**TPR within normal limits**

- CBC
  - Stress leukogram
  - Slightly low platelets: 192,000
- HW Test and Fecal float
  - Negative
- Chemistry Panel
  - Mildly elevated globulins: 4.6
- Urinalysis
  - No significant findings

# Otis Results: Orange Level

**High Risk**

- **Results at the Orange level are consistent with an increased risk of cancer in healthy animals over the age of 1 year, and all genders**
- **The Nu.Q® Vet Cancer Test identifies patients however, confirmatory diagnostics should be used to confirm the suspicion of cancer**
- **Review medical history for previous inflammatory conditions, surgeries, or familial cancer history**



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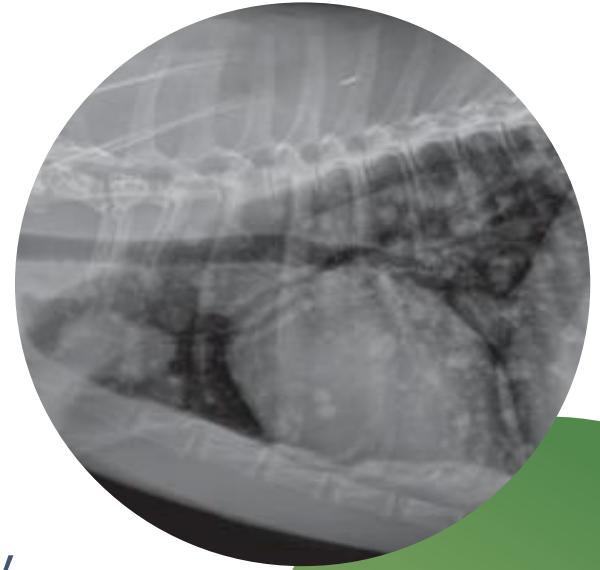
# Otis: What to do next?

- What do you do?
  - Chest radiographs
  - Abdominal ultrasound
  - Refer/advanced imaging like full body CT

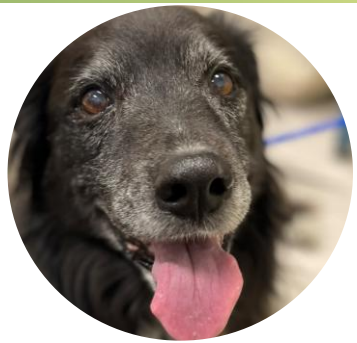


Metastatic lesions on thoracic radiographs

AUS: 6 cm splenic mass


Polly
15-year-old FS Border Collie Cross

# Polly



History of bladder TCC – January 2020

Oral chemotherapy through Sept 2021

**Jan 2022: presents for recurrent urinary signs**

- Physical exam
  - Moderate dental tartar
  - Grade 2/6 heart murmur
- Plan: staging and restart new chemo
  - 3-vew CXR: no metastasis
  - AUS: splenic mass on ultrasound
- Plan to do Nu.Q® Vet Cancer Test

# Polly Results: Green Level

Low Risk

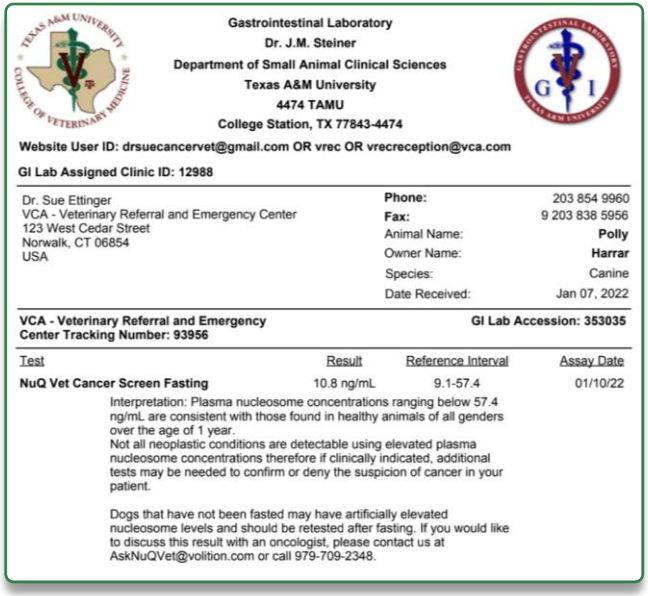
## How to interpret the results

- Results at the Green level are consistent with those found in healthy animal over the age of 1 year, and all genders
- The Nu.Q® Vet Cancer Test identifies patients however, confirmatory diagnostics should be used to confirm the suspicion of cancer

The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes. Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer. If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

# Polly : Results Readout Example

**Low Risk**



Gastrointestinal Laboratory
Dr. J.M. Steiner
Department of Small Animal Clinical Sciences
Texas A&M University
4474 TAMU
College Station, TX 77843-4474

**Website User ID: drsuecancervet@gmail.com OR vrec OR vrecreception@vca.com**

**GI Lab Assigned Clinic ID: 12988**

Dr. Sue Ettinger
VCA - Veterinary Referral and Emergency Center
123 West Cedar Street
Norwalk, CT 06854
USA

| | |
|---|---|
| **Phone:** | 203 854 9960 |
| **Fax:** | 9 203 838 5956 |
| Animal Name: | **Polly** |
| Owner Name: | **Harrar** |
| Species: | Canine |
| Date Received: | Jan 07, 2022 |

**VCA - Veterinary Referral and Emergency Center Tracking Number: 93956**

**GI Lab Accession: 353035**

| Test | Result | Reference Interval | Assay Date |
|---|---|---|---|
| **NuQ Vet Cancer Screen Fasting** | 10.8 ng/mL | 9.1-57.4 | 01/10/22 |

Interpretation: Plasma nucleosome concentrations ranging below 57.4 ng/mL are consistent with those found in healthy animals of all genders over the age of 1 year.
Not all neoplastic conditions are detectable using elevated plasma nucleosome concentrations therefore if clinically indicated, additional tests may be needed to confirm or deny the suspicion of cancer in your patient.

Dogs that have not been fasted may have artificially elevated nucleosome levels and should be retested after fasting. If you would like to discuss this result with an oncologist, please contact us at AskNuQVet@volition.com or call 979-709-2348.

The Nu.Q® Vet Cancer Test identifies patients who may have cancer however, not all neoplastic conditions are detectable using elevated plasma nucleosomes.

Localized tumors are least likely to cause elevated plasma nucleosomes, and this test is not able to differentiate severe/systemic inflammation from cancer.

If there is a suspicion of cancer, we recommend that you perform confirmatory diagnostics to confirm the suspicion of cancer.

# Polly : Histopathology

**Low Risk**

ANTECH
800.872.1001

Pet Cancer Specialt

**VCA Veterinary Referral and Emergency Center #735**
123 W Cedar St, Norwalk, CT, 06854, USA

**Dr. Dr. Sue Ettinger Dacv DVM**

Received **01/20/22** Reported **01/22/22** **NYBC05**

| Pet Name | Owner | Species | Breed | Sex | Age | Ch |
|---|---|---|---|---|---|---|
| Polly | Harrar Peter | Canine | Border Collie | SF | 15Y | 2 |

Spleen. Polly has stable TCC of the bladder. A recent abdominal ultrasound revealed a splenic mass. Other PPH includes a prior diagnosis of rear limb weakness/tenderness.

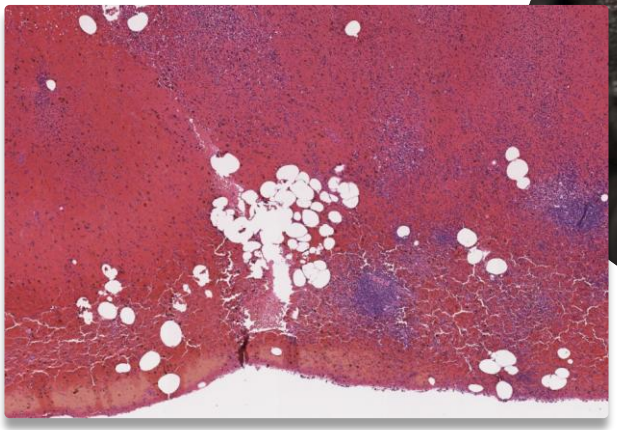
Received: 19.0 cm x 7.0 cm tissue, with a 9.0 cm x 7.0 cm mass.

This Pet Cancer Specialty Biopsy has been reviewed by 3 Pet Cancer Pathology Team Members: Phil Labelle, DVM, DACVP, Cynthia Bacmeister, DVM, PhD, DACVP and Michael Zinn, DVM, DACVP

**MICROSCOPIC DESCRIPTION:**
The mass at the head of the spleen is characterized by erythrocytes enmeshed in fibrin, distending the parenchyma, attenuating the capsule, and pushing up part resident follicles and smooth muscle trabeculae. Interspersed, are well differentiated adipocytes and hematopoietic elements. In the remaining parenchyma, there is lymphoid nodular hyperplasia. There is extramedullary hematopoiesis. There are hemosiderin laden macrophages encircling capsular vessels and trabeculae multifocally.

**MICROSCOPIC FINDINGS:** Splenic hematoma, arising from a myelolipoma

**PET CANCER PATHOLOGY TEAM REVIEW:**
All 3 reviewing members of the Pet Cancer Pathology Team are in agreement that this is a splenic hematoma arising from a myelolipoma



## MICROSCOPIC FINDINGS:
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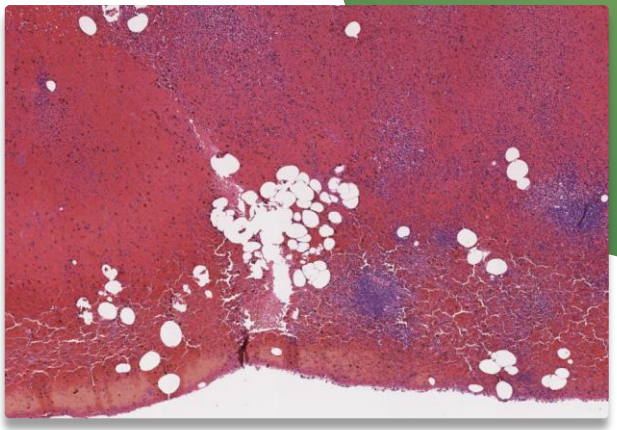

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Volition Veterinary

# Frequently Asked Questions

# Beyond the Basics


- No, it does not but it detects a significant percentage of systemic cancers with high specificity
- Data suggests potential detection capabilities for other cancers such as mast cell tumors, osteosarcoma, oral melanoma, and soft tissue sarcoma

# Beyond the Basics: When to screen


- Ideally, at every wellness visit
- Should be conducted on **ALL** healthy dogs over the age of 7 and **high-risk breeds** as early as age 4
- **At least 2x per year**

# Beyond the Basics

- Only a very small percentage of results would be expected in “**high**” range
- A “**high**” result in a perceived healthy animal is certainly suggestive of cancer, but it requires further clinical investigation on your part

# Beyond the Basics: Clinical conditions

Does the baseline Nu.Q® Vet level offer any prognostic insights?

- No, it doesn’t
- A "**high**" Nu.Q® Vet value doesn't imply advanced disease or predict a shorter survival span

# Beyond the Basics

- For highest pet owner compliance, hospitals who are running large amounts of tests have integrated it into their wellness offerings or preventative panels
- Recommending price be reasonable to pet owner when combined into their wellness panels
- This is a Volume-Repeat-Screening test

# Beyond the Basics: Clinical conditions

How well can Nu.Q® differentiate hemangiosarcoma from hemangioma (or other benign symptoms similar to HSA)?

- Dogs presenting with hemoabdomen are likely to be in shock which also increases nucleosome concentrations
- If there is NO evidence of bleeding, then it can help differentiate benign from malignant incidental splenic masses but not 100%

# Beyond the Basics: When to run


- No, but our current research suggests managed conditions like atopic dermatitis, otitis externa, hypothyroidism, osteoarthritis, or routine non-infectious dental disease, for example, do not influence the Nu.Q® Vet Cancer Test results

# Where to Find:

IDEXX

# Where to Find: Antech™


Heska

# Summary

- Cancer is a **leading** cause of death in dogs
- **Early** detection leads to **early intervention**
- Nu.Q® Vet Cancer Test is an **accessible, affordable and easy-to-use blood-based test** capable of reliably detecting common cancers including lymphoma and hemangiosarcoma
- Introduce it to **your** practice for dogs 7-years-old+ AND for at-risk breeds from 4-years-old

# Questions?

# Thank you for your interest in Volition.

For more information please visit:

https://volition.com/nu-q-vet-cancer-test-veterinarians/

You can reach us via e-mail or via our hotline for a free oncology consult

AskNu.Qvet@volition.com

979-709-2348