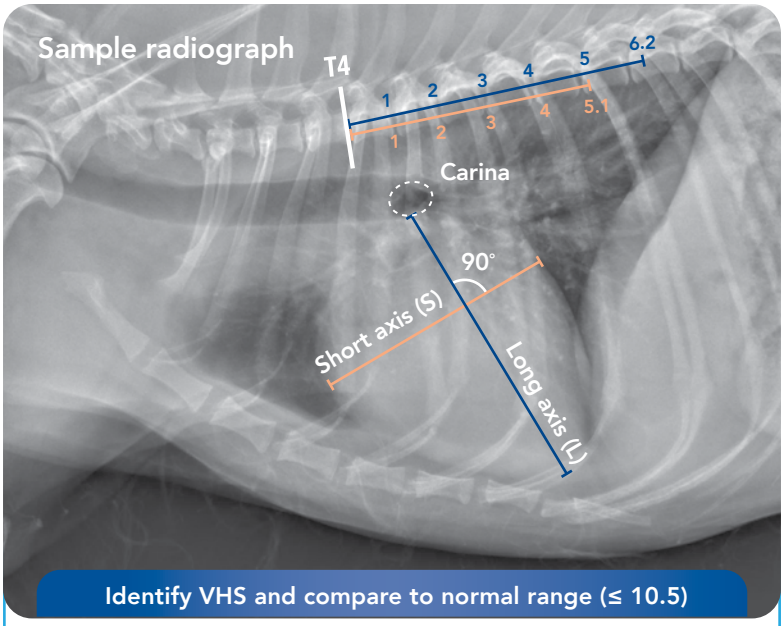
CALCULATE YOUR PATIENT'S VERTEBRAL HEART SCORE (VHS)[1]

VHS is used to assess cardiac enlargement based on measurement of long and short cardiac axis using thoracic vertebrae from T4 as a relative measure.

FOLLOW THESE STEP-BY-STEP INSTRUCTIONS



Identify VHS and compare to normal range (≤ 10.5)

Sample VHS calculations from radiograph above

This example: **Long axis line = 6.2,** Short axis line = 5.1

VHS = L + S
= 6.2 + 5.1
= 11.3
= Above normal range

1 Using a lateral thoracic radiograph, ensure the thoracic vertebrae T4 to T12 are clearly delineated.

2 Using calipers, measure the longest axis of the cardiac silhouette from the most ventral aspect of the carina (bifurcation of the left and right mainstem bronchi) to the apex (designated 'L').

3 Transfer this long axis measurement to the vertebrae, starting at the cranial edge of T4, and count the number of vertebrae that fall within the caliper points.

4 Using calipers, measure the short axis at the widest part of the cardiac silhouette, perpendicular to the long axis measurement (designated 'S').

5 Transfer this short axis measurement to the vertebrae, starting at the cranial edge of T4, and count the number of vertebrae that fall within the caliper points.

6 Sum the 2 measurements.
VHS = L + S

ACVIM Consensus Statement Recommendation

In the absence of an echocardiographic measurement, clear radiographic evidence of cardiomegaly, e.g., general breed VHS ≥ 11.5 or a comparable breed-adjusted VHS, or evidence of accelerating (increasing) interval change in radiographic measurements, can be used to identify Stage B2.[2]

BREED ADJUSTED VHS VALUES

BREED	VHS NORMAL RANGE[1,3–5] (calculated from VHS mean ± SD)
Accepted normal VHS	≤ 10.5
Boxer	10.8–12.4
Bulldog (English and French)	11.0–14.4
Boston Terrier	10.3–13.1
Cavalier King Charles Spaniel	10.1–11.1
Labrador Retriever	10.2–11.4
Pug	9.8–11.6
Pomeranian	9.4–11.4
Whippet	10.5–11.8

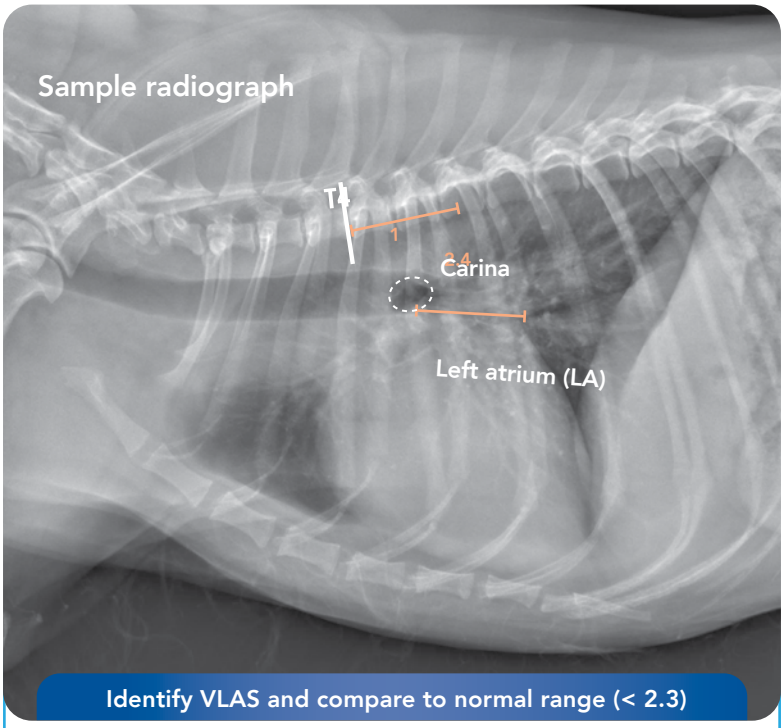
You can use VHS calculations to help identify dogs with advanced preclinical mitral valve disease. For more information, visit **www.epictrial.com.**

NEW

CALCULATE YOUR PATIENT'S VERTEBRAL LEFT ATRIAL SIZE (VLAS)[6]

Assessment of VLAS can be used as a radiographic measurement to assess cardiac size and predict left atrial (LA) enlargement in dogs with myxomatous mitral valve disease (MMVD).

FOLLOW THESE STEP-BY-STEP INSTRUCTIONS



Identify VLAS and compare to normal range (< 2.3)

Sample VLAS calculations from radiograph above

This example: **VLAS = 2.4 vertebrae.**

1 Using a lateral thoracic radiograph, ensure the thoracic vertebrae T4 to T8 are clearly delineated.

2 Using calipers, measure a line from the center of the most ventral aspect of the carina (bifurcation of the left and right mainstem bronchi) to the most caudal aspect of the left atrium where it intersects with the dorsal border of the caudal vena cava.

3 Transfer this measurement to the vertebrae, starting at the cranial edge of T4, and count the number of vertebrae that fall within the caliper points.

4 The VLAS is defined as the length of the line measured from T4 expressed in vertebral-body units to the nearest 0.1 vertebra.

ACVIM Consensus Statement Recommendation

In the absence of echocardiography to confirm left atrial enlargment, the 2019 ACVIM consensus guidelines confirmed VLAS values of ≥ 3 likely identify Stage B2 MMVD.[2]

Scan the QR code for more information about VLAS measurements.

References: 1. Buchanan JW, Bucheler J. Vertebral scale system to measure canine heart size in radiographs. *J Am Vet Med Assoc.* 1995;206(2):194–199. **2.** Keene BW, Atkins CE, Bonagura JD, Fox PR, Häggström J, Fuentes VL, Oyama MA, Rush JE, Stepien R, Uechi M. ACVIM consensus guidelines for the diagnosis and treatment of myxomatous mitral valve disease in dogs. *J Vet Intern Med.* 2019;33(3):1127–1140. **3.** Jepsen-Grant K, Pollard RE, Johnson LR. Vertebral heart scores in eight dog breeds. *Vet Radiol Ultrasound.* 2013;54(1):3–8. **4.** Lamb CR, Wikeley H, Boswood A, Pfeiffer DU. Use of breed-specific ranges for the vertebral heart scale as an aid to the radiographic diagnosis of cardiac disease in dogs. *Vet Rec.* 2001;148(23):707–711. **5.** Bavegems V, Van Caelenberg A, Duchateau L, Sys SU, Van Bree H, De Rick A. Vertebral heart size ranges specific for whippets. *Vet Radiol Ultrasound.* 2005;46(5):400–403. **6.** Malcolm EL, Visser LC, Phillips KL, Johnson LR. Diagnostic value of vertebral left atrial size as determined from thoracic radiographs for assessment of left atrial size in dogs with myxomatous mitral valve disease. *J Am Vet Med Assoc.* 2018;253(8):1038–1045.