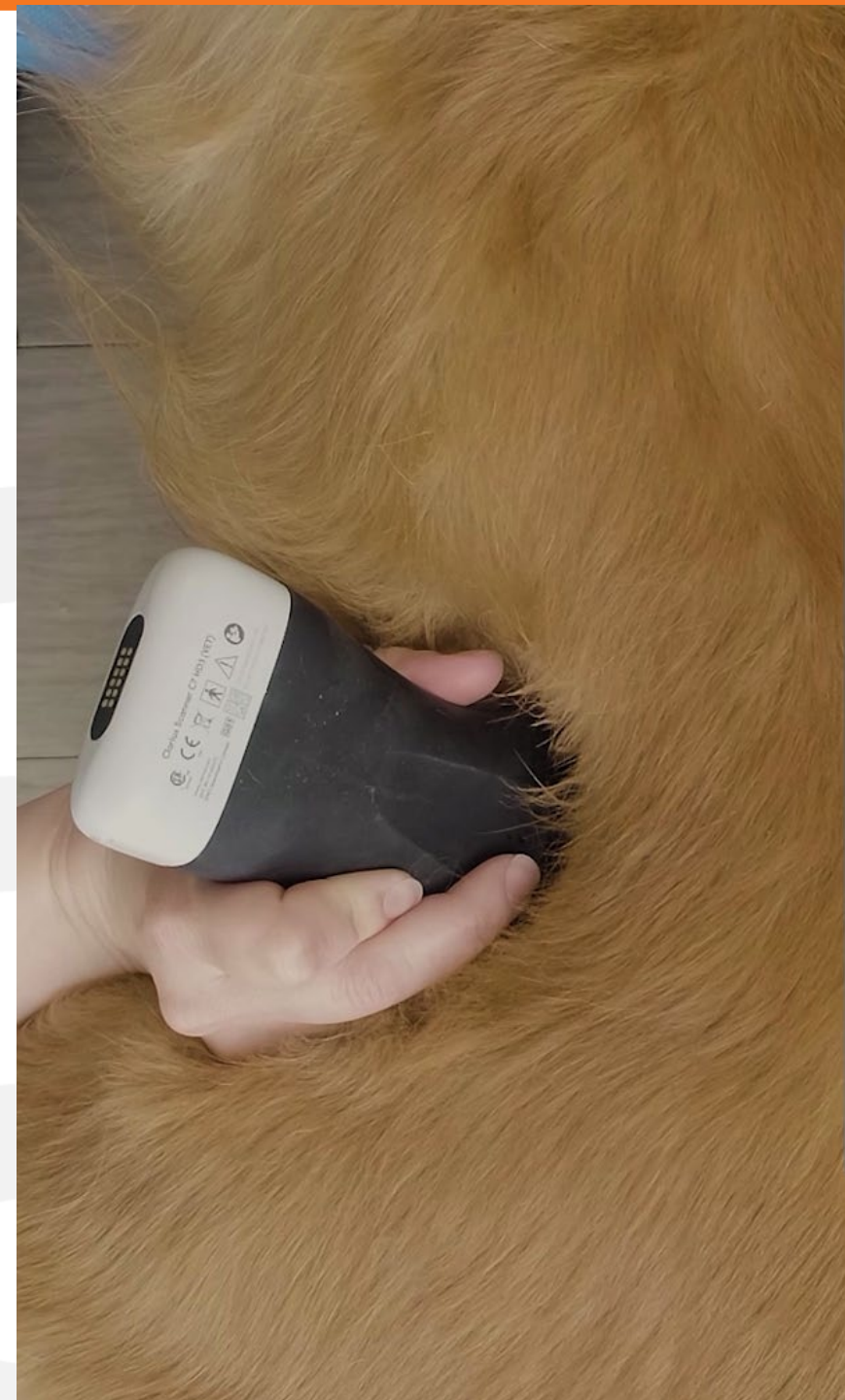


**WEBINAR**

# Practical Small Animal Ultrasound: POCUS Techniques for Imaging Abdominal Lymph Nodes

June 2022



# Your Host



## Dr. Oron Frenkel, MD, MS

*Emergency Physician & POCUS Educator*

*Chairman, Clarius Medical Advisory Board*

# The Sonographic Evaluation of Lymph Nodes

Several parameters can be evaluated using ultrasound; lymph node size, margins, echogenicity, echopattern (echotexture), acoustic transmission, presence and distribution of vascular flow, and vascular flow indices.

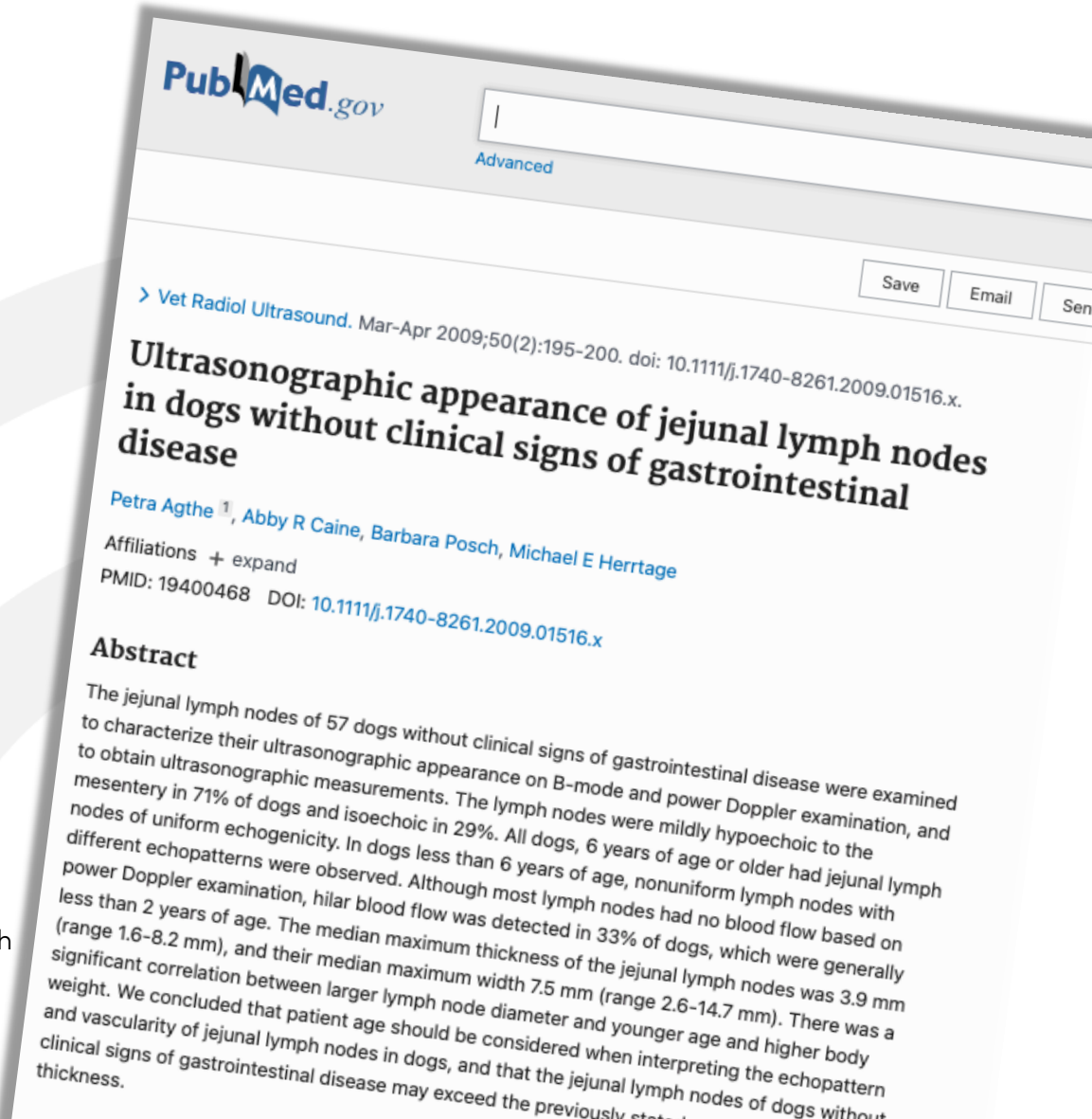
Nyman HT, O'Brien RT. The sonographic evaluation of lymph nodes. Clin Tech Small Anim Pract. 2007 Aug;22(3):128-37. doi: 10.1053/j.ctsap.2007.05.007. PMID: 17844819.



# Ultrasound Appearance of Normal Jejunal Lymph Nodes

“Patient age should be considered when interpreting the echopattern of jejunal lymph nodes in dogs”

Agthe P, Caine AR, Posch B, Herrtage ME. Ultrasonographic appearance of jejunal lymph nodes in dogs without clinical signs of gastrointestinal disease. Vet Radiol Ultrasound. 2009 Mar-Apr;50(2):195-200. doi: 10.1111/j.1740-8261.2009.01516.x. PMID: 19400468.



## Abstract

The jejunal lymph nodes of 57 dogs without clinical signs of gastrointestinal disease were examined to characterize their ultrasonographic appearance on B-mode and power Doppler examination, and to obtain ultrasonographic measurements. The lymph nodes were mildly hypoechoic to the mesentery in 71% of dogs and isoechoic in 29%. All dogs, 6 years of age or older had jejunal lymph nodes of uniform echogenicity. In dogs less than 6 years of age, nonuniform lymph nodes with different echopatterns were observed. Although most lymph nodes had no blood flow based on power Doppler examination, hilar blood flow was detected in 33% of dogs, which were generally less than 2 years of age. The median maximum thickness of the jejunal lymph nodes was 3.9 mm (range 1.6-8.2 mm), and their median maximum width 7.5 mm (range 2.6-14.7 mm). There was a significant correlation between larger lymph node diameter and younger age and higher body weight. We concluded that patient age should be considered when interpreting the echopattern and vascularity of jejunal lymph nodes in dogs, and that the jejunal lymph nodes of dogs without clinical signs of gastrointestinal disease may exceed the previously stated thickness.



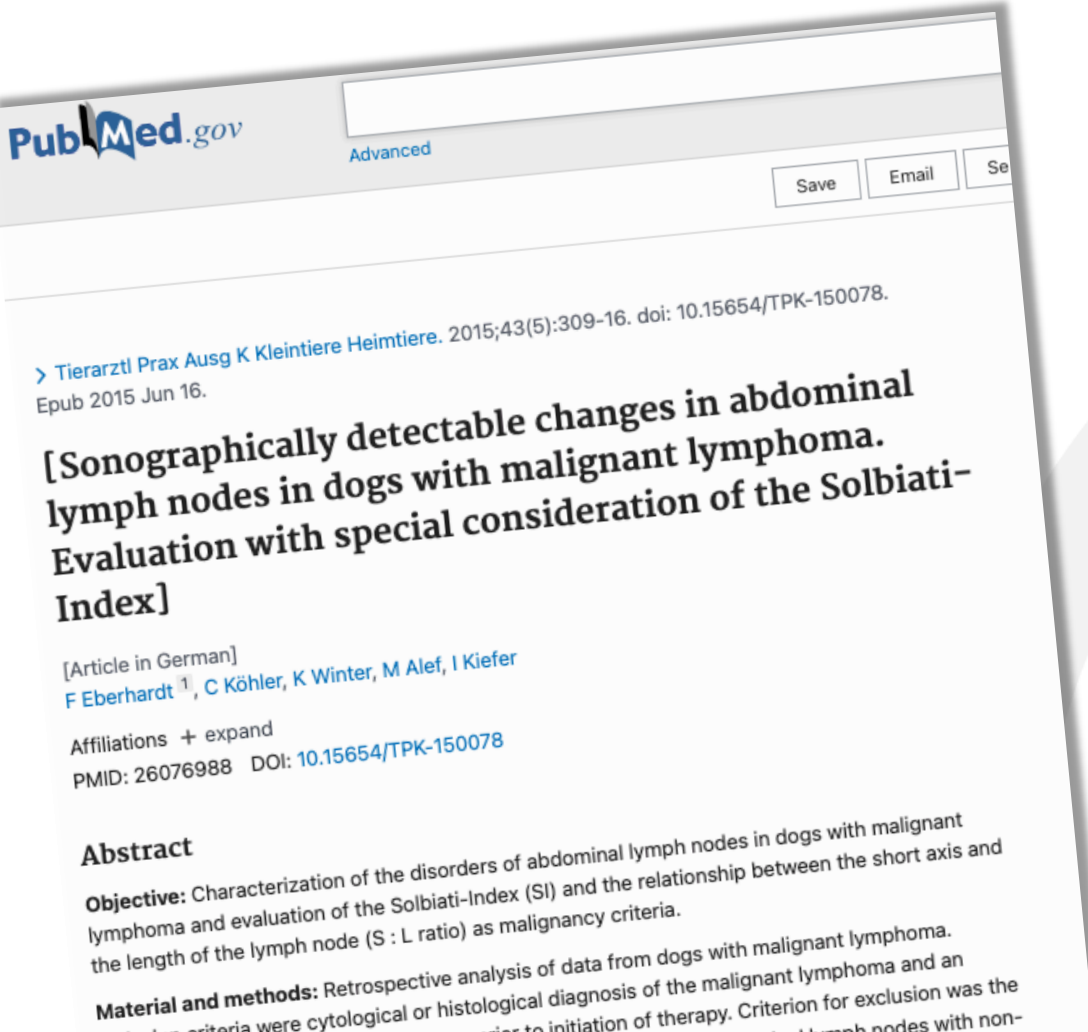
# Ultrasound of Feline Abdominal Lymph Nodes

“Lymph nodes are essential structures to be evaluated in an ultrasonographic examination of the feline abdomen”

Schreurs E, Vermote K, Barberet V, Daminet S, Rudorf H, Saunders JH. Ultrasonographic anatomy of abdominal lymph nodes in the normal cat. *Vet Radiol Ultrasound*. 2008 Jan-Feb;49(1):68-72. doi: 10.1111/j.1740-8261.2007.00320.x. PMID: 18251298.



# Sonographically Detectable Changes with Malignant Lymphoma



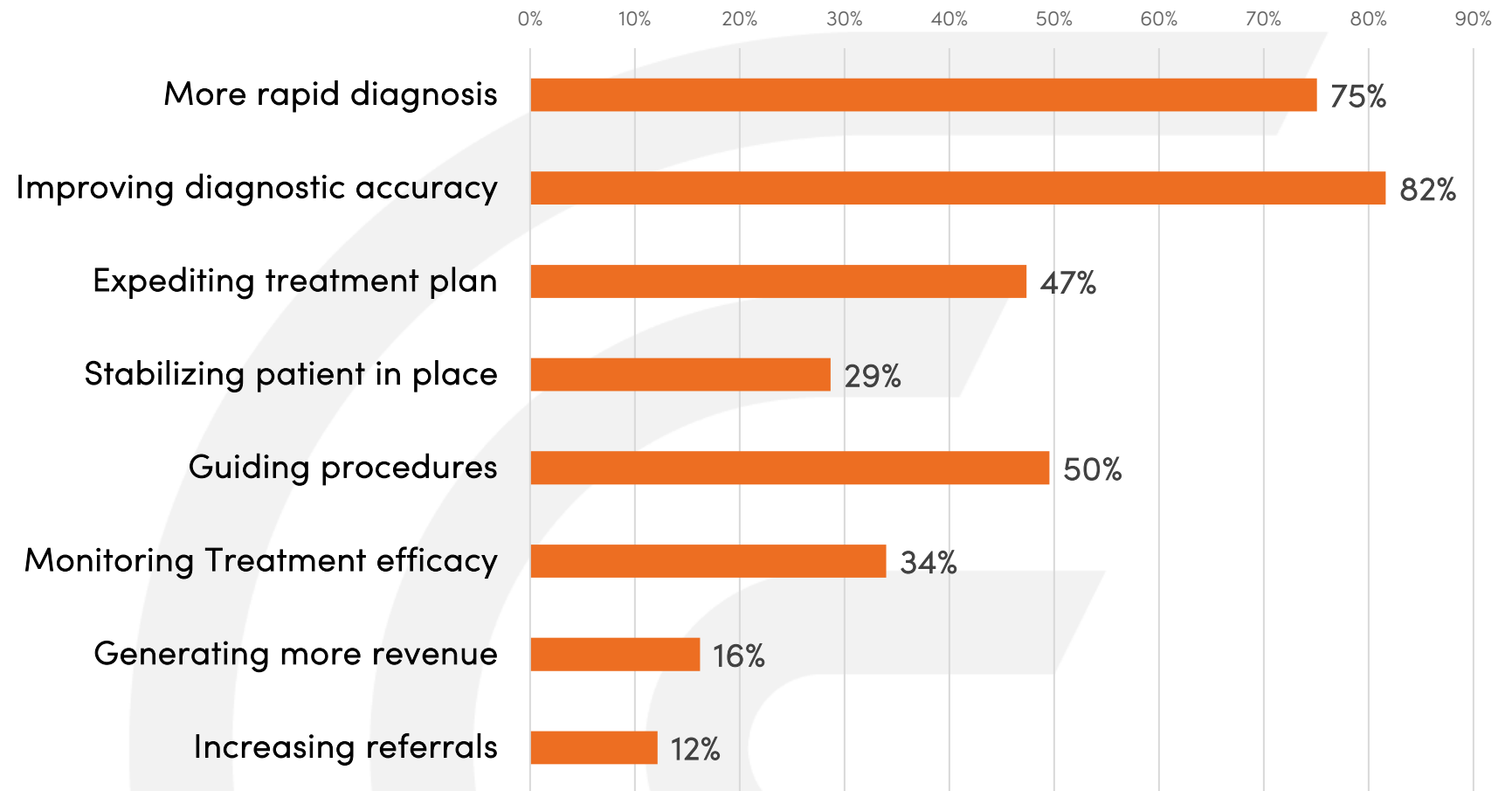
“The significant **increase in the size, rounding and hypoechoic changes** in the lymph nodes in dogs with **malignant lymphoma** are **indicative parameters of malignancy**”

Eberhardt F, Köhler C, Winter K, Alef M, Kiefer I. Sonographische Veränderungen abdominaler Lymphknoten bei Hunden mit einem malignen Lymphom. Auswertung unter besonderer Berücksichtigung des Solbiati-Index [Sonographically detectable changes in abdominal lymph nodes in dogs with malignant lymphoma. Evaluation with special consideration of the Solbiati-Index]. Tierarztl Prax Ausg K Kleintiere Heimtiere. 2015;43(5):309-16. German. doi: 10.15654/TPK-150078. Epub 2015 Jun 16. PMID: 26076988.



# Poll

*What do you see as the key advantages of using ultrasound for veterinary medicine?*



# Your Expert Guest Speaker



**Dr. Camilla Edwards**  
**DVM, CertAVP, MRCVS**

*Peripatetic Veterinary Ultrasonographer |  
Educator | First Opinion Veterinary Ultrasound*

# Abdominal lymph nodes

Dr Camilla Edwards DVM CertAVP MRCVS

First Opinion Veterinary Ultrasound

Conflict of interest declaration: Honoraum



# What will we learn in this webinar?

- Indications
- How to find
  - Medial iliac lymph nodes
  - Jejunal lymph nodes
- Pathology



## **What knowledge are we already assuming?**

We're assuming you have some basic knowledge about ultrasound machine set up and basic anatomy

# Lymph nodes indications for scanning

- As part of the full abdominal ultrasound scan
- Check draining lymph nodes from an area of concern - neoplasia

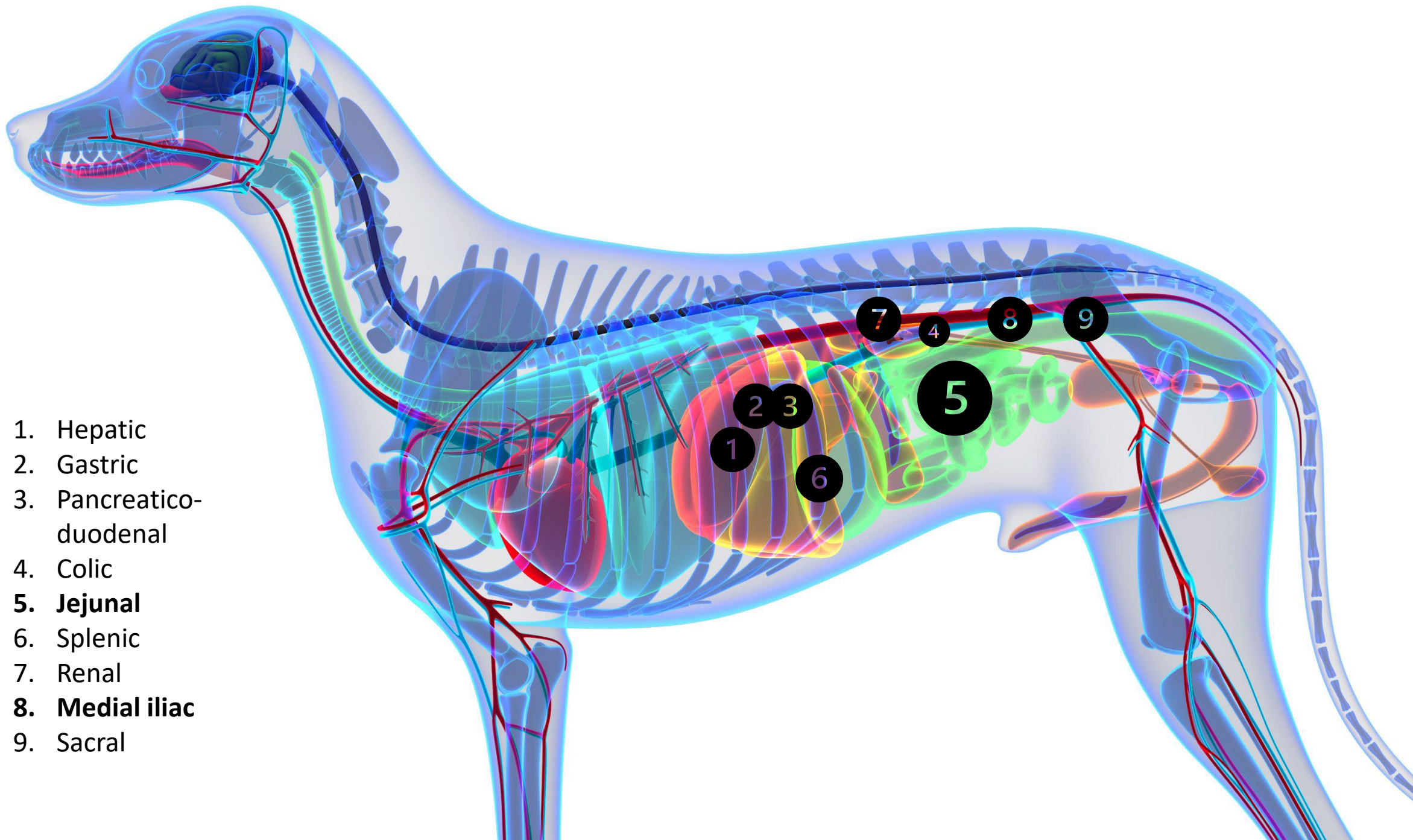
# What am I looking for?

Lymph nodes are hypoechoic/isoechoic, ovoid structures

- Cats
  - Length - varies
  - Width - under 0.5cm in thickness
- Dogs
  - Length - varies
  - Width – under 1 cm in all dogs

# Abdominal Lymph nodes

Lymph center		Nodes	Drainage
Visceral lymph nodes		Splenic, gastric, hepatic, pancreatico-duodenal, renal, colic, jejunal	Viscera
Parietal	Lumbar	Aortic nodes	Diaphragm, ribs, lumbar, vertebrae, peritoneum, liver, more caudal nodes
	Iliosacral	Medial iliac, internal iliac, sacral	Colon, rectum, urogenital, spine, hindlimbs



1. Hepatic
2. Gastric
3. Pancreatico-duodenal
4. Colic
5. **Jejunal**
6. Splenic
7. Renal
8. **Medial iliac**
9. Sacral



# Normal lymph node ultrasound appearance

- Ovoid in shape
- Slightly hypoechoic to surrounding fat
- Homogenous may have hyperechoic centre
- Always measure the width
- Length varies normally
- Up to 4-6cm in length in larger dogs
- <1cm width in dogs
- <0.5cm width in cats
- Lymph nodes are larger and more prominent in young patients



# Abnormal lymph node appearance

## Appearance

- Larger
- Rounder
- Hypoechoic/ heterogenous

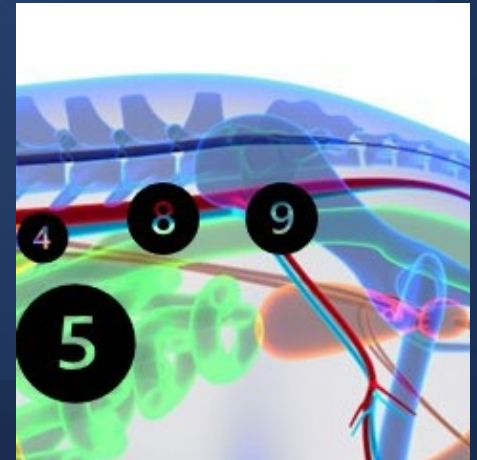
## Pathology

- Reactive
- Primary neoplasia
- Metastatic neoplasia

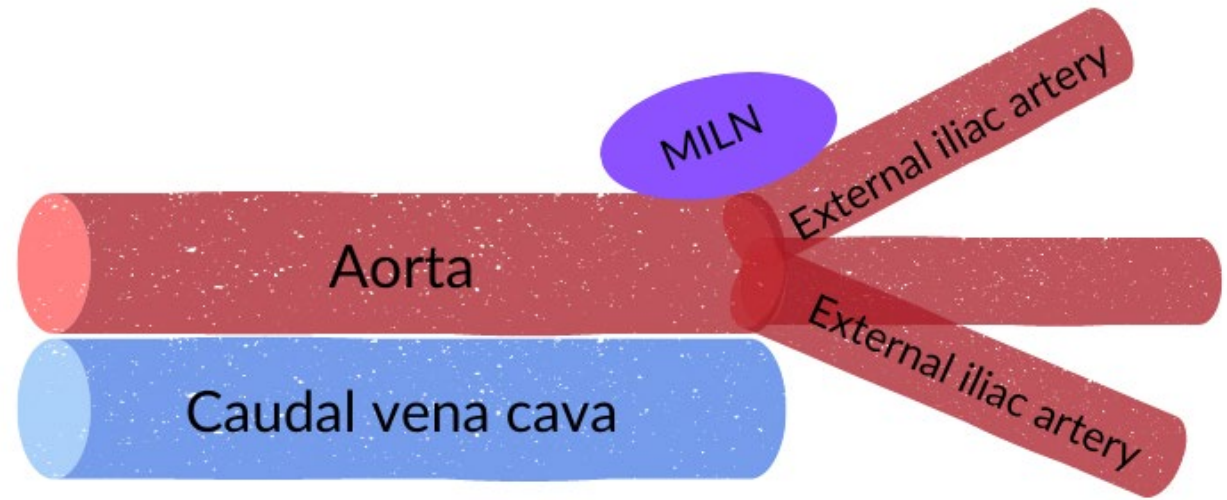
## Diagnosis

- FNA or biopsy for definitive diagnosis

# Medial iliac lymph nodes



# Landmarks for the left medial iliac lymph node







FOVU

5.8 cm

# Aorta and left medial iliac lymph node – right lateral recumbency

Find the medial side of the left kidney – probe cranial – caudal orientation

Pointing dorsally fan until longitudinal anechoic tubes in view aorta nearer on left than CVC

Follow Aorta caudally in longitudinal view until trifurcation reached

Fan in this area.

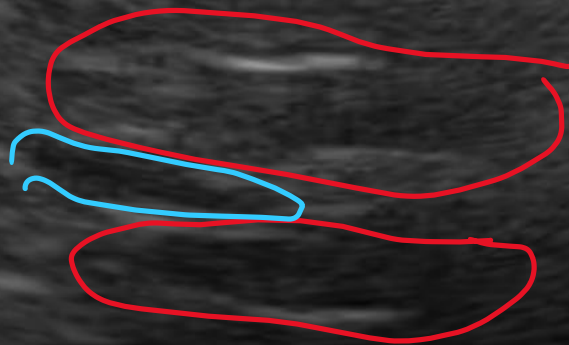
Left medial iliac lymph node is found in this area. To find right repeat on right lateral in left lateral recumbency

# Jejunal lymph nodes



# Jejunal lymph nodes

- Pair of lymph nodes
  - Mesenteric vessels run between them
  - Elongated can be 6cm+!
- 
- Most likely to see on right side
  - Within the mesentery
  - Look out for a vessel in the mesentary
  - Fan probe over vessel



4.1 cm



# Jejunal lymph nodes – left lateral recumbency

Can be seen from the left also, but spleen tends to get in the way

Find caudal end of right kidney

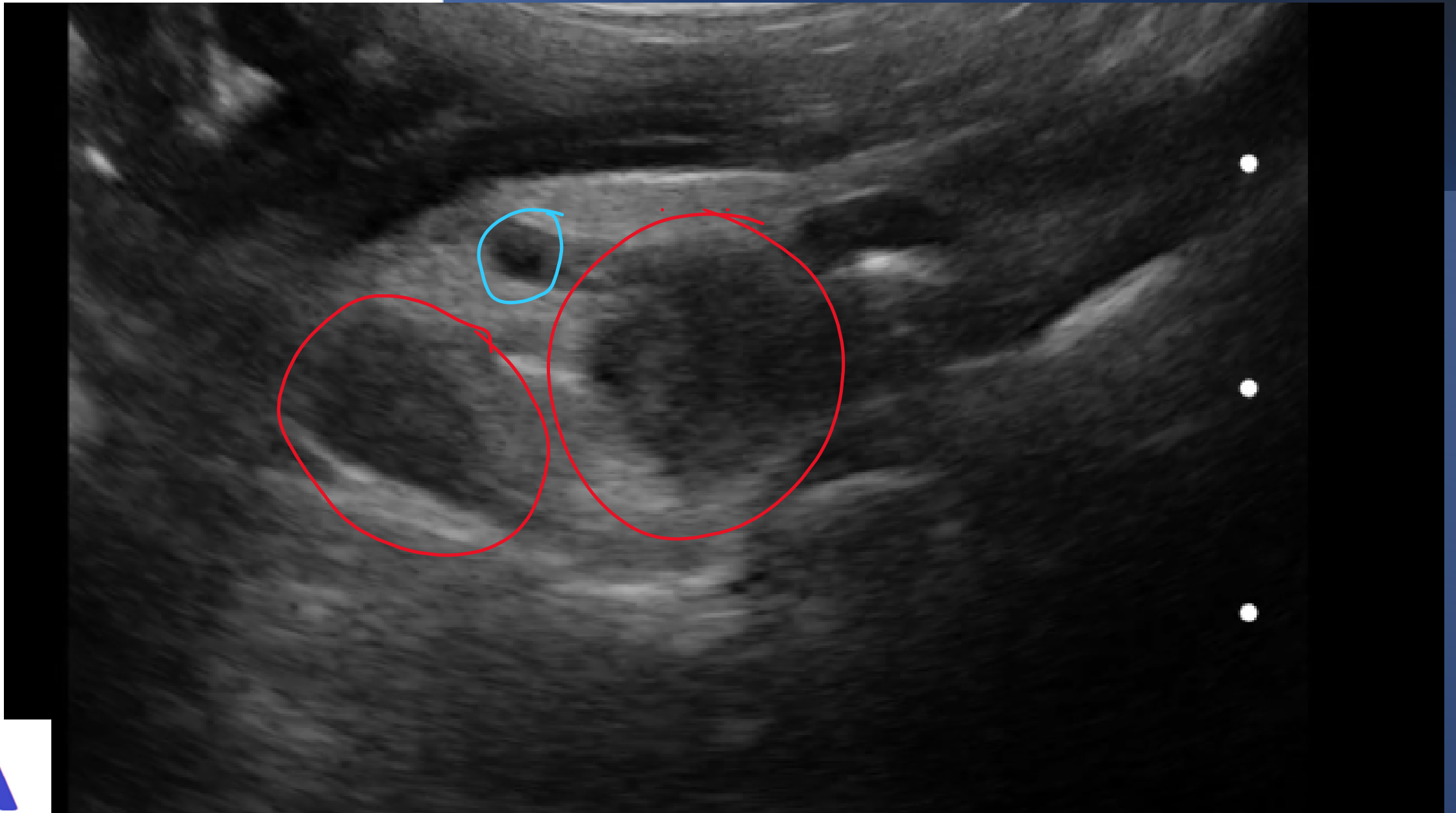
Slide ventrally down body and 2 long hypoechoic lymph nodes with the cranial mesenteric artery between them may be seen.

They may also be found when performing a castle pattern on the jejunum.

# Case

- Signalment – Mn, 13yo, DSH
- History - diarrhoea
- Clinical examination - Palpated small mass in abdomen.





# Fine needle aspirate results

- Cytological findings are consistent with aspiration of hyperplastic/reactive lymphoid tissue associated with antigenic stimulation and eosinophilic inflammation

# Outcome

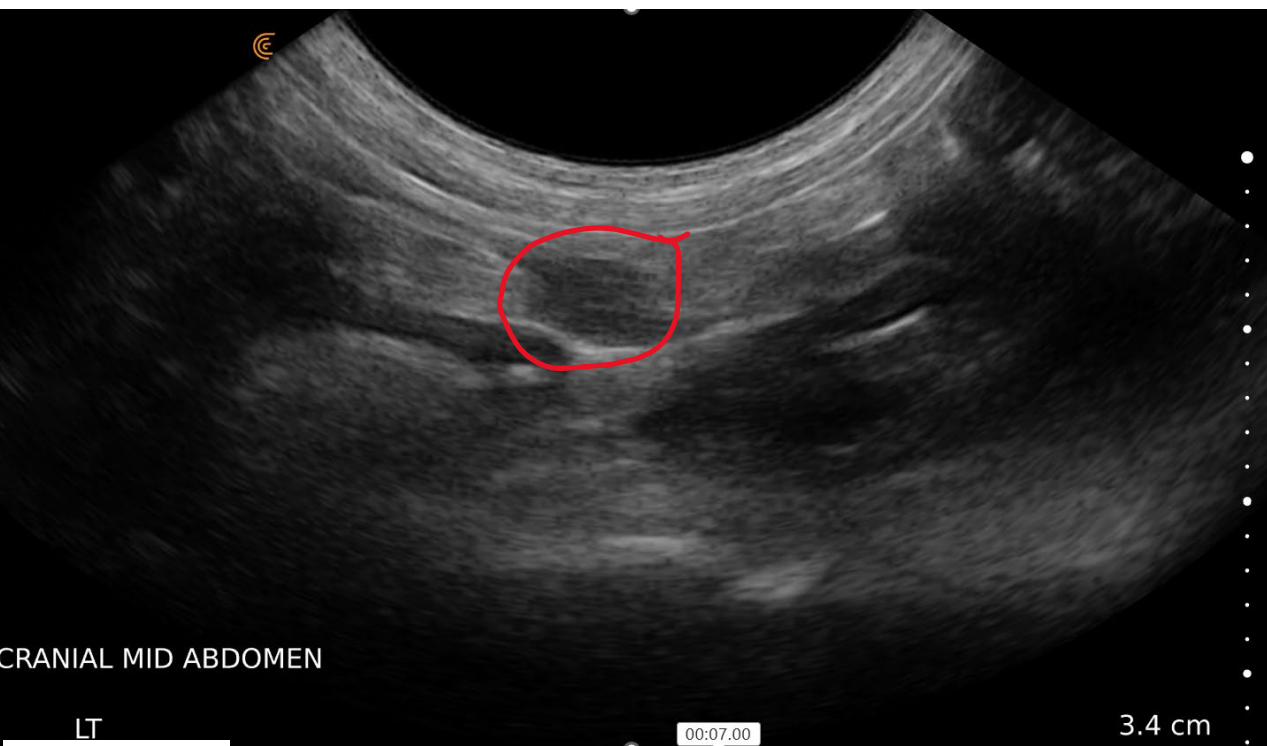
- In this case continued medical treatment for diarrhoea caused by feline inflammatory bowel disease.



# Case

- Signalment – Fn, 12yo, DSH
- History – Chronic diarrhoea



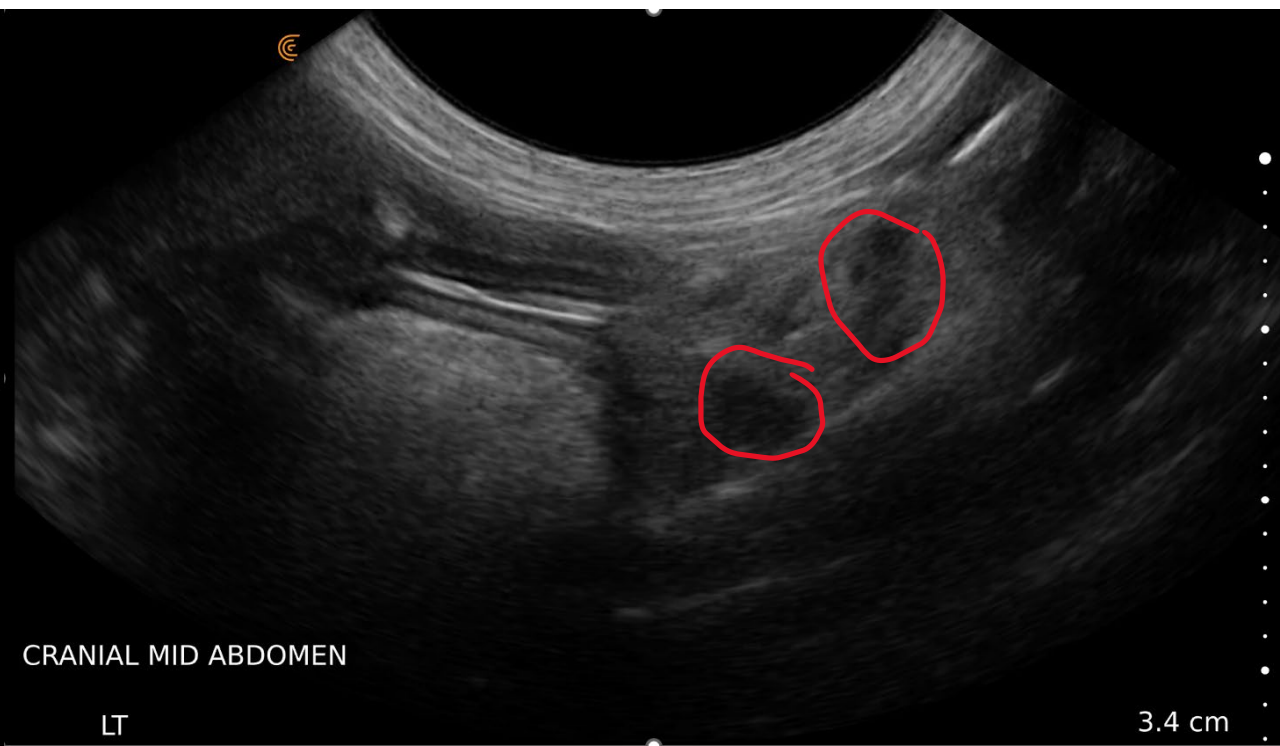


CRANIAL MID ABDOMEN

LT

00:07.00

3.4 cm



CRANIAL MID ABDOMEN

LT

3.4 cm

# Fine needle aspirate results

- Reactive process most likely but limited cells obtained.

# Outcome

- Although the inflammatory, reactive lymph nodes may have been associated with the diarrhoea, the cat also suffered from chronic renal failure so owners decided no further interventions.

# What are the take home messages today?

- **Know what you're looking for**
  - Often paired around a vessel
  - Ovoid
  - Slightly hypoechoic/isoechoic to surrounding tissue
  - Difficult to spot when normal!
- **What changes are you looking for?**
  - Shape – rounded
  - Size <1cm dogs, < 0.5cm cats.
  - Echogenicity – heterogenous/increased hypoechogenicity
- **PRACTICE PRACTICE PRACTICE!**



# Thank you!

**Free gift**

EBOOK & Clarius C7V HD3 review

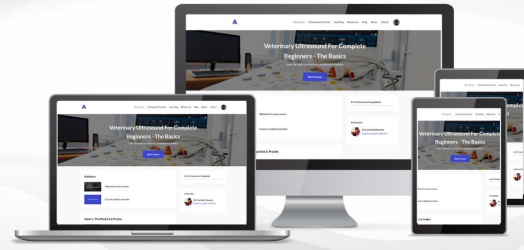
[www.fovu.co.uk/Clarius](http://www.fovu.co.uk/Clarius)

Get in touch with any questions

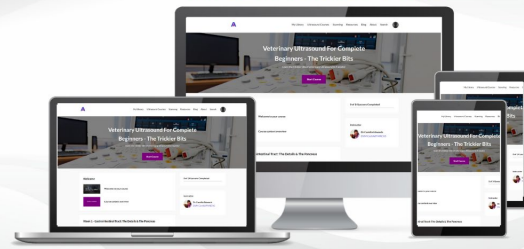
[Camilla@fovu.co.uk](mailto:Camilla@fovu.co.uk)



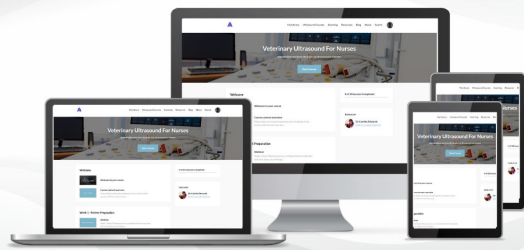
Veterinary Ultrasound  
for Complete Beginners  
**The Basics**



Veterinary Ultrasound  
for Complete Beginners  
**The Trickier Bits**



Veterinary Ultrasound  
for Nurses



# FOVU courses

The Basics  
19<sup>th</sup> September 2021

4 weeks online – pre-recorded webinars

The Trickier Bits  
13<sup>th</sup> June 2021  
4 weeks online – pre-recorded webinars

Veterinary Ultrasound for Nurses and  
Techs

6 weeks online – pre-recorded webinars – start anytime

[www.fov.uco.uk/ultrasound-courses](http://www.fov.uco.uk/ultrasound-courses)

# “Live Demonstration



**Shelley Guenther**

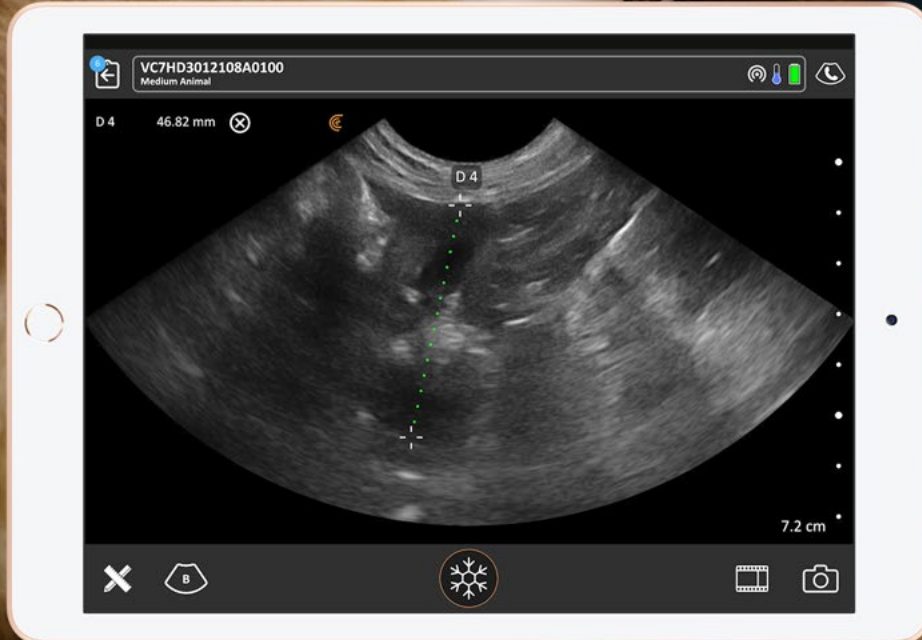
*Clinical Marketing Manager*

# 5 Ways POCUS Can Help Your Practice

1. In-house access to ultrasound speeds diagnosis on the 1st visit.
2. Better clinical results with more rapid patient treatment.
3. App-based ultrasound is easier to learn and use.
4. Cageside and low impact with minimal restraint.
5. Word of mouth referrals, client satisfaction and revenues.

# Clarius C7 Vet HD3

- *30% Smaller & More Affordable*
- *Wireless Freedom*
- *High-Definition Imaging*
- *Easy App for iOS & Android*
- *Clarius Cloud Storage*
- *Clarius Live Telemedicine*
- *Unlimited Users*





# Questions?



*Dr. Camilla Edwards*



*Dr. Oron Frenkel*



*Thank you!*