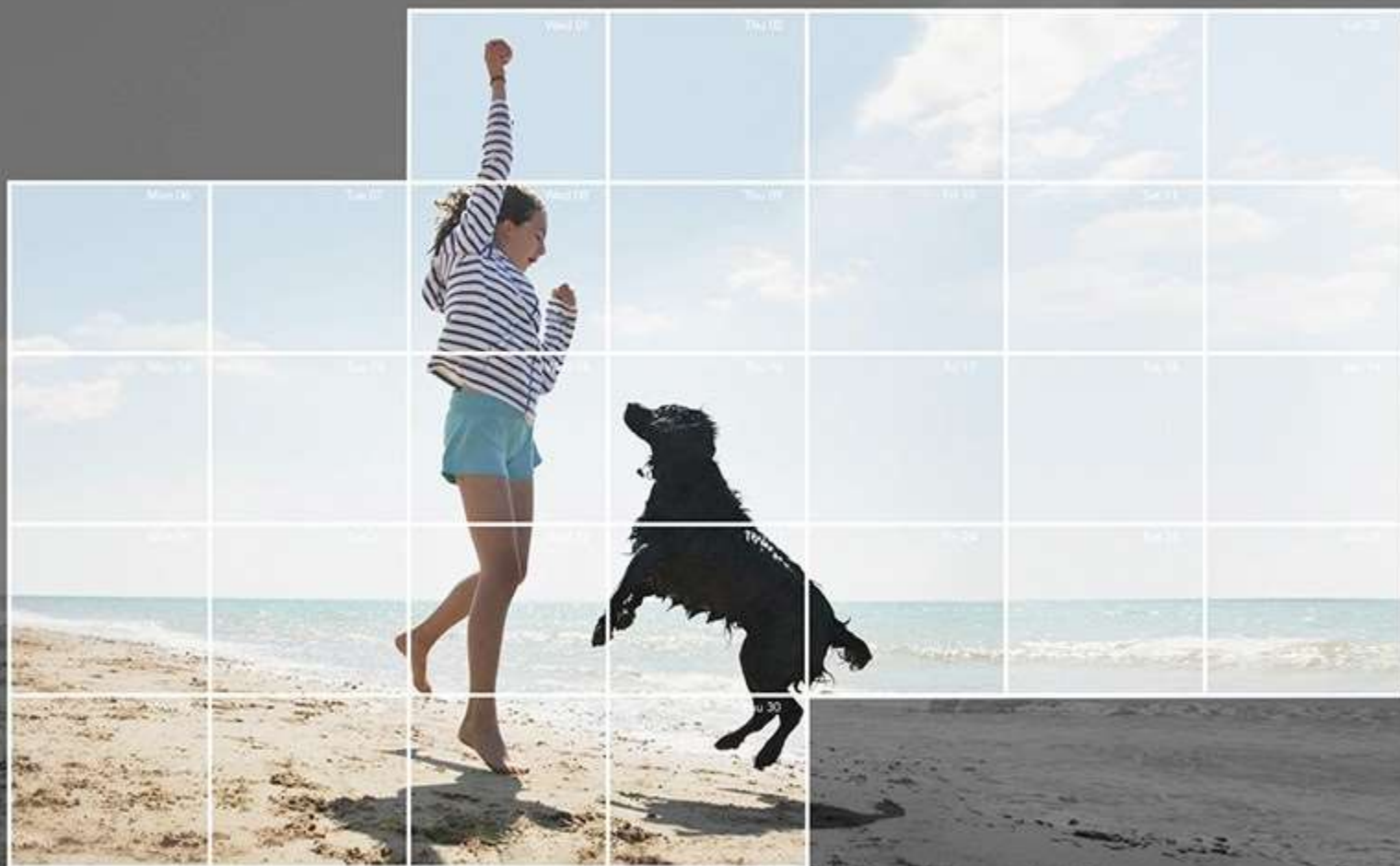
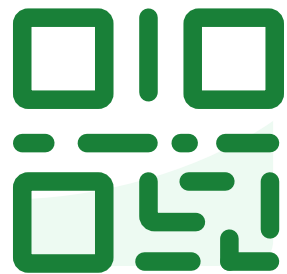


# Thyforon<sup>®</sup>

BETTER TIMES AHEAD





**Join at [slido.com](https://slido.com)  
#2862045**

**<sup>i</sup> The Slido app must be installed on every computer  
you're presenting from**



# What does a dog with hypothyroidism look like?

i The Slido app must be installed on every computer you're presenting from

# What does a dog with hypothyroidism look like?



Thyforon®  
L-thyroxine sodium tablets



**Thyforon®**  
BETTER TIMES AHEAD



# Introduction

**Ceri Bailey BVSc MRCVS**

Companion Animal Veterinary  
Technical Manager at Dechra

Nice to meet you!



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# Meet MEG

9-year-old, FN, Cocker Spaniel.



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# MEG

9-year-old, FN, Cocker Spaniel.

Recurrent 'hot spots'. Owner also noted lethargy.

On clinical exam:

- Hair loss on the bridge of the nose
- Thinning of the hair at the tail base
- Greasy seborrhoea dorsum and focal ulcerated area
- BCS 6/9 & 2kg weight gain





# What is on your differential diagnosis list?

<sup>i</sup> The Slido app must be installed on every computer you're presenting from



# Clinical Signs



7 years





80%



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

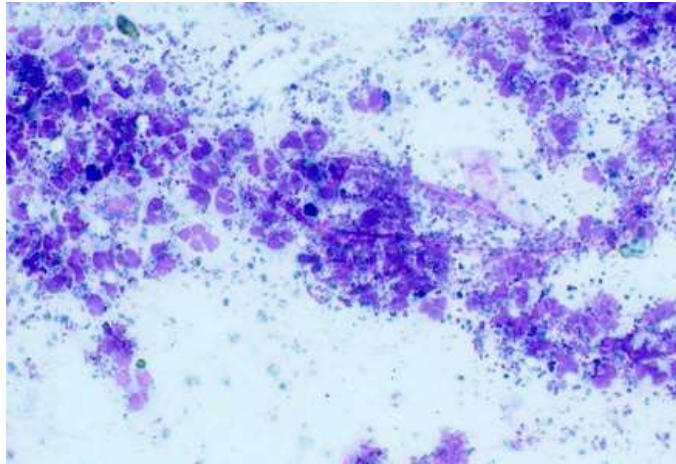
# MEG

Skin Cytology:

- Gram +ve cocci

Routine Database:

- Increased cholesterol
- tT4 low
- Rest WNL



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# MEG

Skin Cytology:

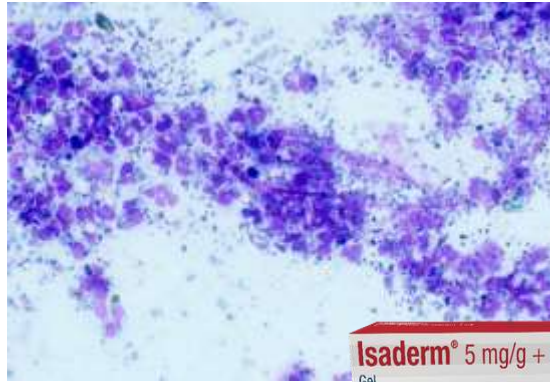
- Gram +ve cocci

Routine Database:

- Increased cholesterol
- tT4 low
- Rest WNL

**Can you make a diagnosis of hypothyroidism?**

**✘ No**



Hotspot clipped, cleaned with chlorhexidine and prescribed topical fucidic acid & betamethasone.



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# Is it really hypothyroidism?



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# Headache hack #1

## Rule out non- thyroidal illness first

Biochemistry  
Haematology  
Urinalysis

- Changes usual
- Elevations in lipids, triglycerides, hepatic enzymes
  - Mild chronic anaemia

**Top tip!**  
If changes support another disease process-  
investigate this first!



Thyforon®  
BETTER TIMES AHEAD

# Headache hack #2

## Avoid this Pitfall!

Laboratories often include total thyroxine (tT4) in their biochemistry panels.

You cannot diagnose hypothyroidism on tT4 alone.



# Thyroid function tests

Total T4 (tT4)

Thyroid Stimulating Hormone (TSH)

Free T4 (fT4)

Thyroglobulin autoantibodies (TgAA)

- **Beware**, this can falsely increase tT4
- Interpret with clinical picture and other thyroid function tests



# Diagnosis

Building a more informed picture

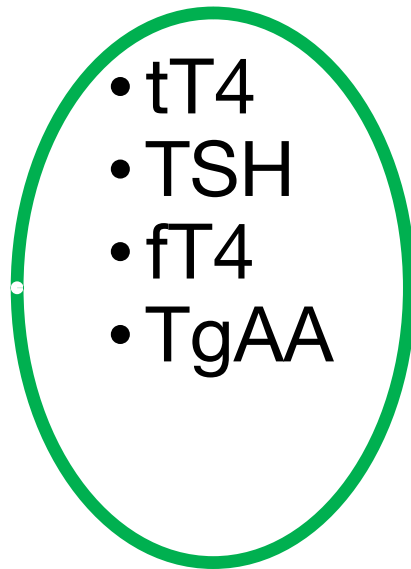
- tT4
- TSH
- fT4
- TgAA

Minimum information



# Diagnosis

Building a more informed picture



**Ideal information**



# Thyroid function tests

## Quick fire



- Tina, 10 Year Old FN Labrador, 23kg
- Presented for lethargy and poor hair coat

tT4	fT4	TSH	TgAA
Low	Low	High	Negative

What would be your diagnosis?

- Euthyroid
- Hypothyroid due to thyroiditis
- Hypothyroid due to idiopathic atrophy
- Non-thyroidal illness likely





# What would be your diagnosis?

<sup>i</sup> The Slido app must be installed on every computer you're presenting from

# Thyroid function tests

## Quick fire



- Tina, 10 Year Old FN Labrador, 23kg
- Presented for lethargy and poor hair coat

tT4	fT4	TSH	TgAA
Low	Low	High	Negative

What would be your diagnosis?

- a. Euthyroid
- b. Hypothyroid due to thyroiditis
- c. Hypothyroid due to idiopathic atrophy**
- d. Non-thyroidal illness likely



# Thyroid function tests

## Quick fire



Suki, 7 Year Old FN Golden Retriever, 28kg  
Presented for a progressive history of weight gain and lethargy

tT4		TSH	
Normal		High	

What would be your diagnosis?

a. Euthyroid

b. Hypothyroid due to thyroiditis

c. Hypothyroid due to idiopathic atrophy

d. Non-thyroidal illness likely



# Thyroid function tests

## Quick fire



Ally, 8 Year Old ME Cocker Spaniel, 16kg  
Presented for lethargy and occasional vomiting

tT4	fT4	TSH	TgAA
Low	Normal	Normal	Negative

What would be your diagnosis?

- a. Euthyroid
- b. Hypothyroid due to thyroiditis
- c. Hypothyroid due to idiopathic atrophy
- d. Non-thyroidal illness likely



# MEG

9-year-old, FN, Cocker Spaniel.

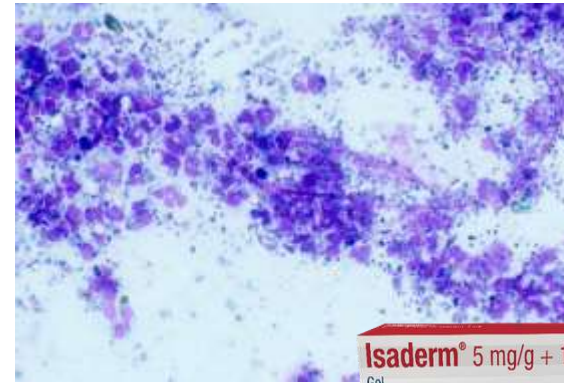
- Recurrent hot spots
- Alopecia
- BCS 6/9
- Lethargy

Mild elevations ALKP/ALT, increased cholesterol, rest WNL, tT4 low.

Can you make a diagnosis  
of hypothyroidism?



**No**



# MEG

- Signalment
- History
- Clinical Signs
- NTI
- Supportive routine database



**What would you do next?**



# Full Thyroid Profile

Full Thyroid Profile		
Total T4	<b>13</b>	15 – 64 nmol/l
Free T4	<b>8</b>	9 – 39 pmol/l
TSH	<b>0.75</b>	0 – 0.58 ng/ml
TgAA	<b>Positive</b>	

How could previous medication (if prescribed) have affected these results?

- Betamethasone in Isaderm
- Some antibiotics (e.g. TMPS)
- Psychotropic medication (e.g. barbiturates)



# Headache hack #3

## Don't cut corners with history



Glucocorticoids: ↓ tT4, fT4

Phenobarbital: ↓ tT4, fT4, ↑ TSH  
(depending on duration)

Sulfonamides: ↓ tT4, fT4, ↑ TSH



tT4 ↓ with age



Sighthounds have ↓  
tT4, fT4

Bolton TA, Panciera DL.  
Influence of medications  
on thyroid function in  
dogs: An update. J Vet  
Intern Med. 2023



Recommended reading!



# What to include on your lab form

- Age
- Breed
- Medication history
- Concurrent disease



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# MEG

Thyroid panel performed

Results:

tT4 low

TSH high

fT4 low

TgAA positive

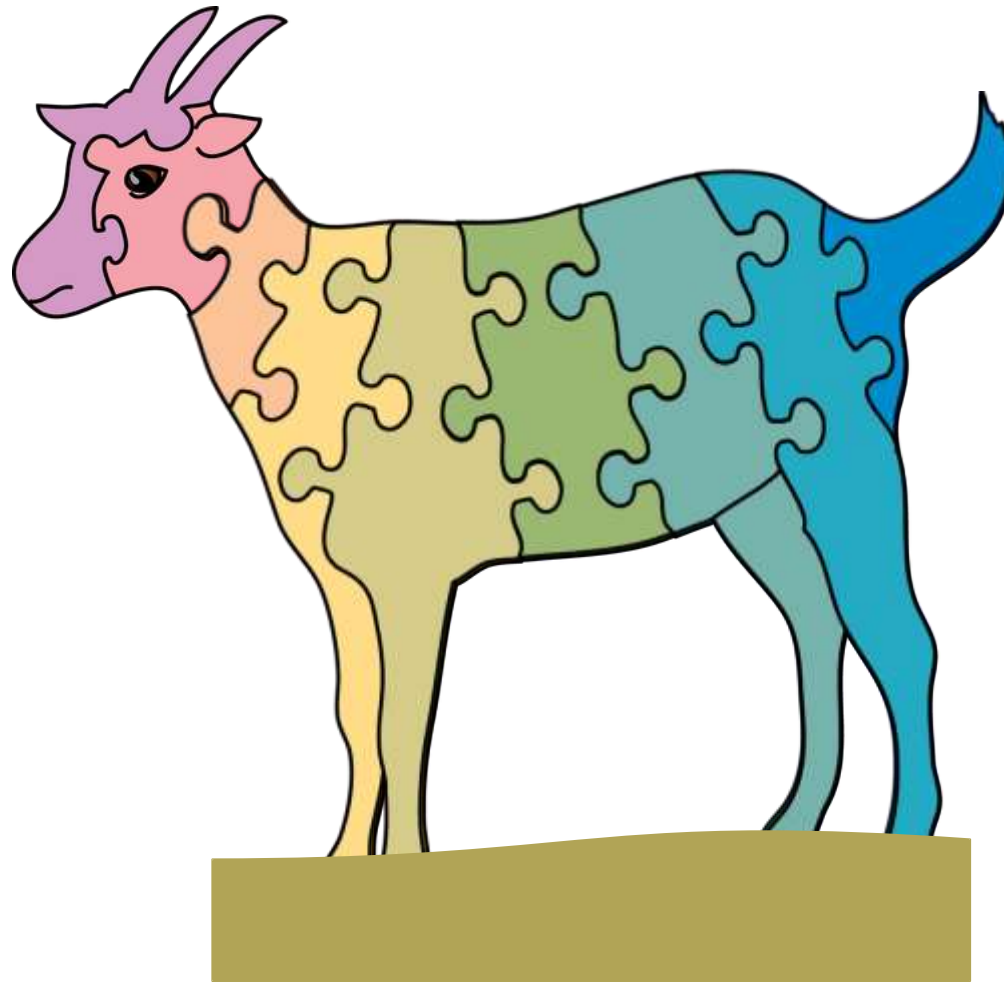
Does this patient have  
hypothyroidism?



**Yes**



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# Treatment

*Why treat hypothyroidism?*



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# Medical Management: Thyforon

Levothyroxine treatment of  
choice for hypothyroidism

Titrated to effect

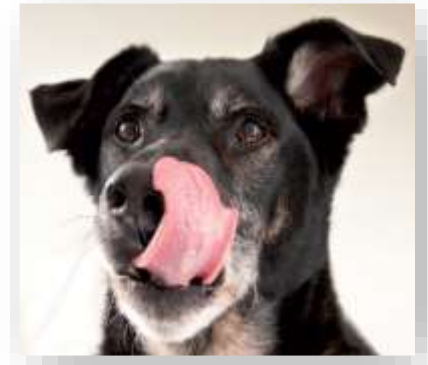
**Thyforon** = double divisible,  
flavoured levothyroxine



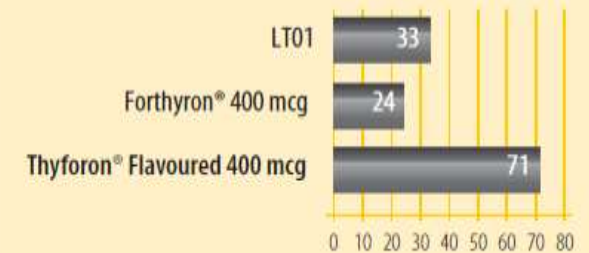
**Thyforon®**  
BETTER TIMES AHEAD

# Medical Management: Thyforon

- Flavoured
- Double Divisible
- Tablet portions in use for 4 days
- Available in blister packs



% Voluntary full acceptance of commercial levothyroxine products in dogs (n=60)



**Thyforon®**  
BETTER TIMES AHEAD

# Medical Management: Thyforon

Starting dose: **10 µg/kg BID**

Re-test after **4 weeks**

Titrate to individual dog based on clinical signs  
and **tT4**

Adjust dose in 50 - 200 µg increments if  
required



**Thyforon®**  
BETTER TIMES AHEAD

# Timeline



Day 0



1 week



1 month



3 months



6 months



6



Thyforon®  
BETTER TIMES AHEAD

# Monitoring Visits

## Focus on clinical response

1. Is the patient well?
2. Are signs of hypothyroidism improved?
3. Have they gotten better or worse?

# Focus on clinical response

- When to recheck?

**4 weeks** after starting medication

- What time post medication?

**3 hours** (peak)

Aim for tT4 of **30-47 nmol/L**.



# Owner Communication



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# MEG



Hypothyroidism Confirmed



Started on 200 µg Thyforon BID

Re-check at 4 weeks:

- Well, coat improved
- Much brighter and more energy
- Owner happy with her improvement



**Thyforon®**  
BETTER TIMES AHEAD

# MEG

- Is Meg well?

**YES**



- Are signs of hypothyroidism improved?

**YES**



- Has she gotten better or worse?

**BETTER**



Will she likely need a dose adjustment?

**NO**



# Dose Adjustment

tT4 = 42 nmol/L L  
(30-47nmol/L)

Is a dose adjustment needed?

 **No**



# Long Term Monitoring

Every 6 – 12 months unless the animal's health status changes



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

Thyforon®  
BETTER TIMES AHEAD



# CALLIE

9 yo

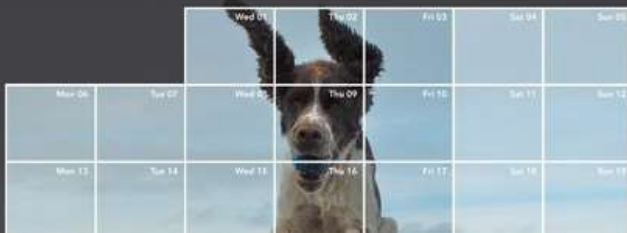
Female neutered

Golden retriever cross breed

History of otitis that resolved with treatment 3 months ago

Presented again smelly discharge from ear

Callie has got progressively lethargic



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD

# CALLIE

BCS 7/9

Otoscopy:

- Bilat erythroceruminous otitis.
- Slimy discharge R ear.

Hair thinning on the flank

Rest of exam within normal limits





# What is on our problem list?

<sup>i</sup> The Slido app must be installed on every computer you're presenting from

# CALLIE

1. Otitis externa

Cytology



2. Bilateral flank alopecia

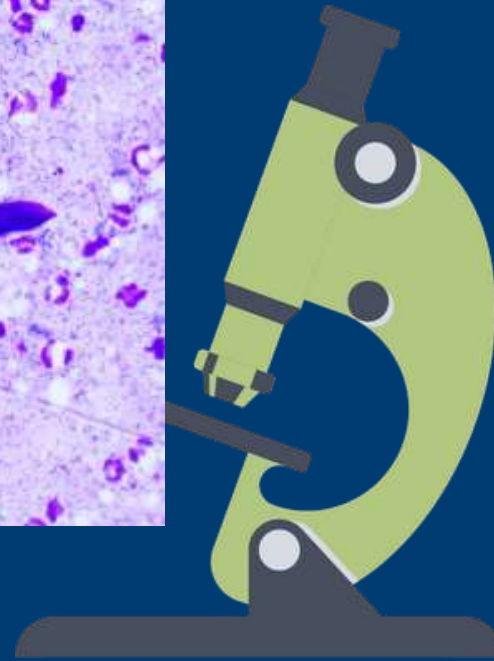
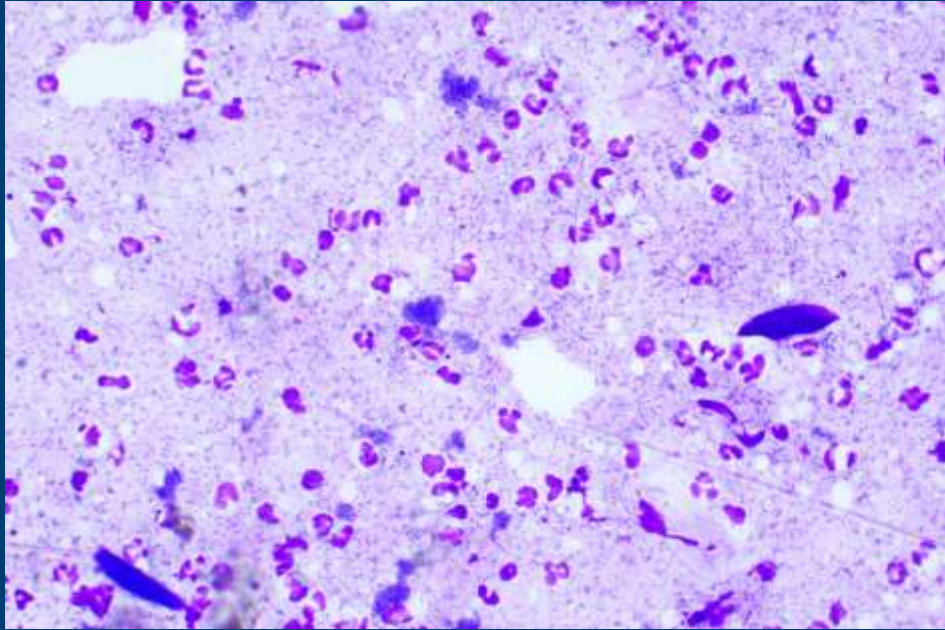
Hair plucks



3. Lethargy and exercise intolerance

Biochemistry/  
Haematology





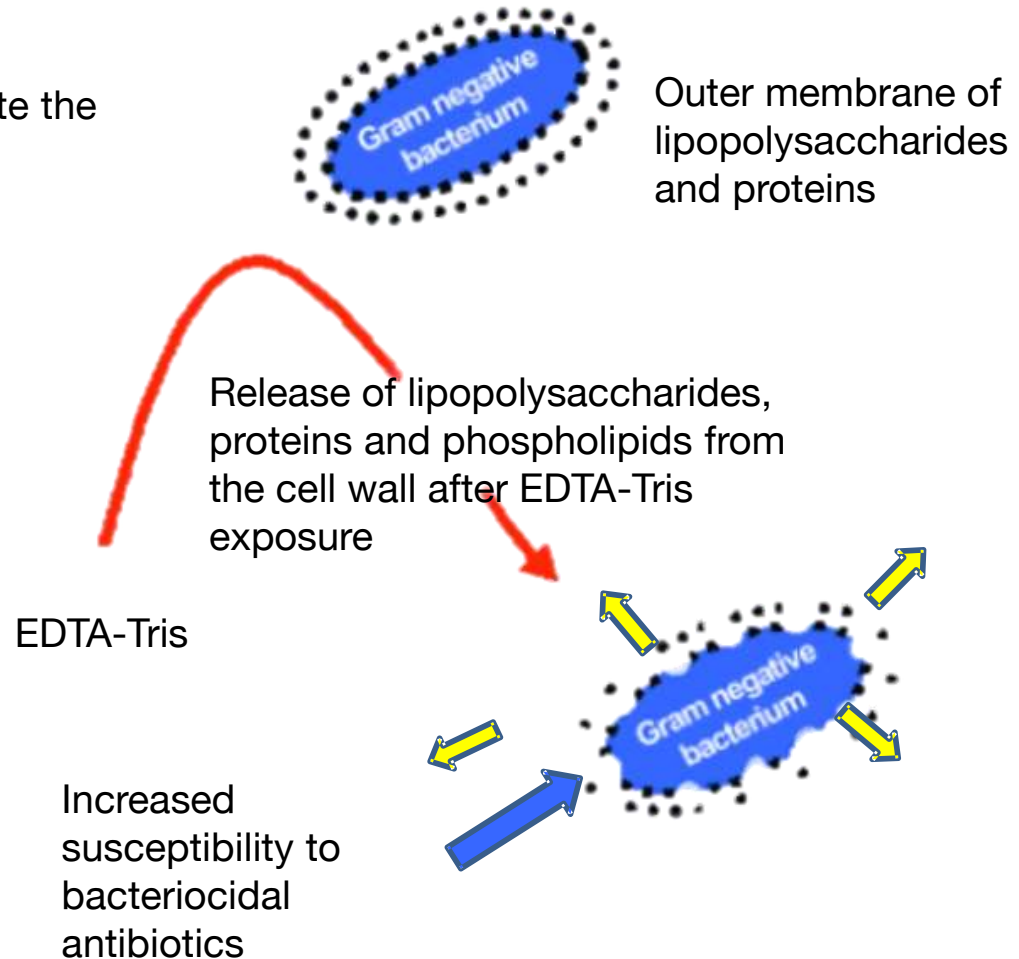
**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD



# Why add TrizEDTA?

Schematic diagram to demonstrate the action of EDTA-Tris on Gram negative bacteria<sup>2</sup>

TrizEDTA has been shown to have biofilm combatting qualities<sup>6</sup>



6 Finnegan S, Percival SL. EDTA: An Antimicrobial and Antibiofilm Agent for Use in Wound Care. *Adv Wound Care* (New Rochelle). 2015 Jul 1;4(7):415-421. doi: 10.1089/wound.2014.0577. PMID: 26155384; PMCID: PMC4486448.



# CALLIE



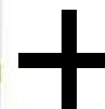
Cytology

1. Otitis externa

2. Bilateral flank alopecia

3. Lethargy and exercise intolerance

**Biofilm  
Gram -ve  
rods**



Culture & sensitivity

Hair  
plucks

**Telogen**

Biochemistry/  
Haematology



# CALLIE

Test Results – Abnormalities Only			
Name	Result	Units	Interval
<b>Full Blood Count</b>			
WBC	H 16.4	$\times 10^9/L$	6.0 - 15
RBC	L 4.68	$\times 10^{12}/L$	5.00 - 8.50
HCT	L 35.2	%	37.0 - 55.0
<b>Biochemistry</b>			
Cholesterol	H 10.6	mmol/l	2.8 - 8.3
Triglycerides	H 2.30	mmol/l	0.34 - 1.97
Total T4	L < 3.9	nmol/l	10.0 - 55.0

Non thyroidal illness

Drugs

Hypothyroid

**How can we confirm our suspicion of hypothyroidism?**



**Thyforon<sup>®</sup>**  
BETTER TIMES AHEAD



## What additional tests should we run?

<sup>i</sup> The Slido app must be installed on every computer you're presenting from

# CALLIE



Cytology

Biofilm



1. Otitis externa
2. Bilateral thinning hair on flanks
3. Tired after exercise and lethargic

Hair plucks

Telogen

Biochemistry/  
Haematology

↓tT4  
↑TSH  
TgAA +ve



Thyforon®  
BETTER TIMES AHEAD

# Headache hack #4



80%



Thyforon<sup>®</sup>  
BETTER TIMES AHEAD

Thyforon<sup>®</sup>  
BETTER TIMES AHEAD



# MAX

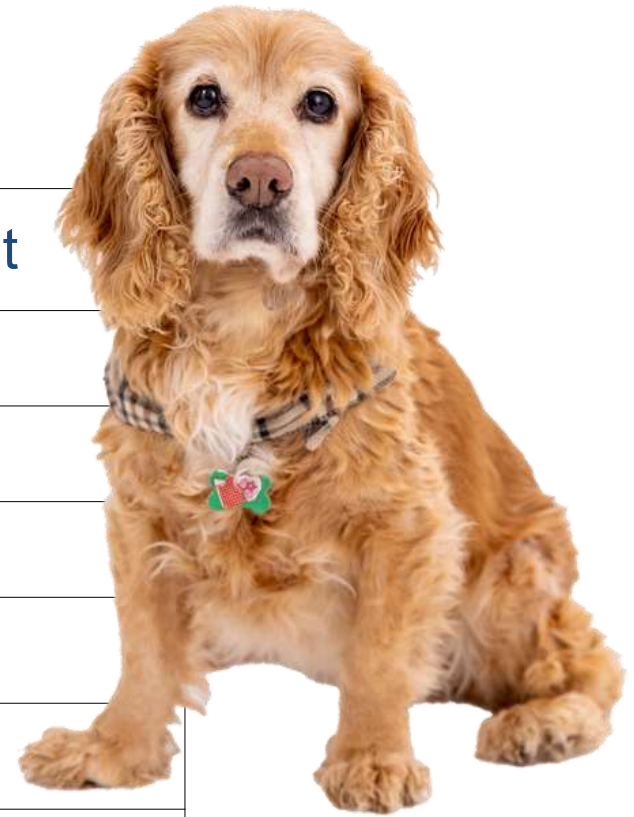
8 year old, M(N) Terrier

Presented for lethargy, exercise intolerance, polyuria and polydipsia and polyphagia

Clinical exam revealed a body condition score of 4/9, abdominal enlargement and bilateral non pruritic flank alopecia



# MAX



Blood Parameter	Reference Range	Result
Stress Leukogram		
ALKP	13 – 152 U/L	<b>650</b>
ALT	18 – 110 U/L	<b>112</b>
Cholesterol	3.5 – 9.5 mmol/L	<b>11.2</b>
Triglycerides	0.3 – 2.8 mmol/L	<b>3.6</b>
tT4	15 – 64 nmol/l	<b>8</b>

Urinalysis: USG = 1.018

## Does this dog have hypothyroidism?



**Thyforon**<sup>®</sup>  
BETTER TIMES AHEAD

# When You Suspect Cushing's And Hypothyroidism

Clinical similarities between diseases

- ✓ Lethargy
- ✓ Exercise intolerance
- ✓ Alopecia
- ✓ Poor coat quality
- ✓ Biochemical changes

Can have both conditions

Neither disease typically life threatening in short term

Better to take time in diagnosis before commencing any treatment



# Headache hack #5

When You Suspect Cushing's And Hypothyroidism.....

**Investigate Cushing's FIRST**

Cushing's is a NTI

Diagnose and manage first.

Investigate hypothyroidism if still suspicion once Cushing's is controlled

Start levothyroxine at manufacturer's recommended starting dose

Monitor both diseases as per label recommendation



# MAX

LDDST= Canine Cushing's Syndrome confirmed

Vetoryl started at 2mg/kg SID.

At 3 month check – clinically well controlled. Owner happy with progress.

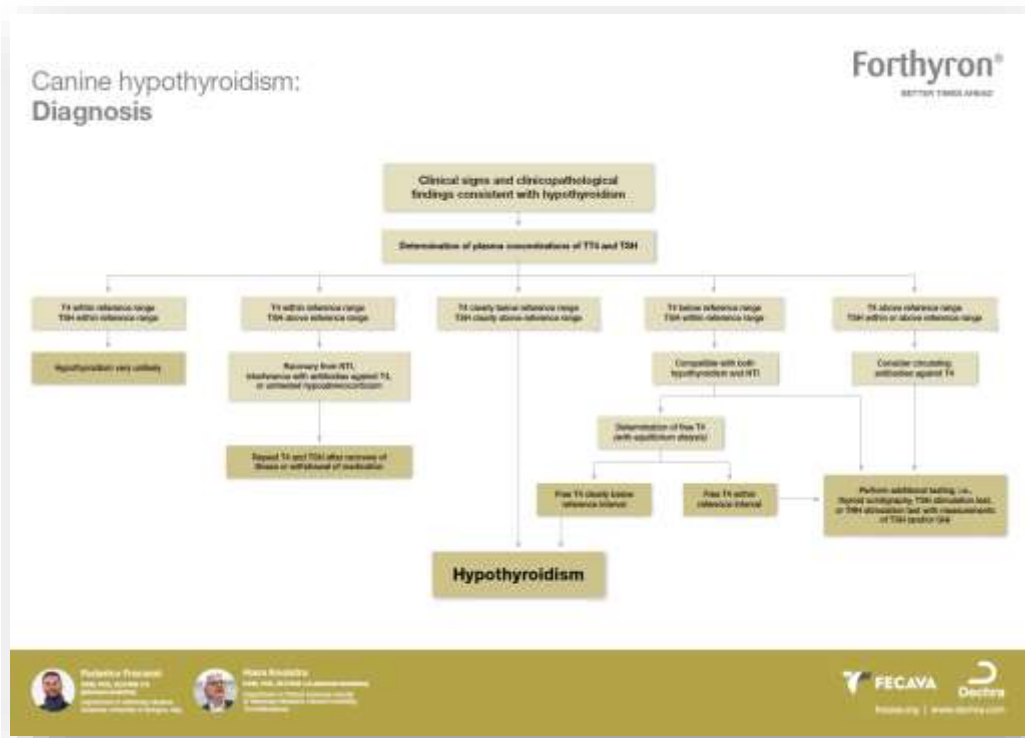
No clinical signs of Cushing's OR hypothyroidism.

tT4 = 24 nmol/l



# NEW!

# FECAVA Endocrinology Guidelines



### Primary Hypothyroidism in Dogs: A Diagnostic Challenge

**Introduction**

- Hypothyroidism, one of the most common endocrinopathies in dogs, is the clinical syndrome resulting from deficient production of thyroid hormones.
- In about 80% of cases hypothyroidism is a primary disorder of the thyroid gland and in about 20% it may be due to Exogenous (T4) antibodies (i.e. central hypothyroidism).
- Spontaneous primary hypothyroidism is usually caused by progressive autoimmune disease leading to lymphocytic infiltration and atrophy of the thyroid follicles. The clinical signs, characterised by thyroid atrophy without inflammatory infiltrate, is also thought to be the result of an autoimmune disorder.
- Advanced primary hypothyroidism is nearly a condition of aging adult and middle-aged dogs. Dogs of large breeds are affected more than those of small breeds. Some dogs, especially pit bull terriers, German shepherds, Boxers, Doberman Pinschers and Great Danes, have been reported to be affected. The incidence is equally distributed between males and females.
- Thyroid hormones influence the function of all tissues of the body and thus the clinical clinical picture of overt hypothyroidism involves manifestations from nearly all organ systems. Overt or the clinical signs are usually a history of lethargy and physical inactivity. Most hypothyroid dogs have some degree of weight gain, lethargy and alopecia to varying degrees.

**Endocrine diagnosis**

- The first step in a dog with clinical signs and laboratory abnormalities consistent with hypothyroidism is determination of the basal plasma concentrations of both free T4 and TSH.
- In a patient with basal hypothyroidism, thyroid T4 levels to be increased only if Exogenous T4 is produced exclusively by the thyroid gland, while T4 exogenous is largely derived from peripheral conversion of L-T4 to T4.
- In most dogs with hypothyroidism, circulating concentrations of total T4 (T4) and free T4 (FT4) are markedly below their respective reference ranges. The circulating T4 concentration is more specific than the plasma T4 concentration but less sensitive. Moreover, several severe T4 assays are not suitable, especially in dogs, for the most method to determine the free T4 concentration.
- Although not a reason why diagnosing canine hypothyroidism is challenging, in that free plasma T4 concentration may also be decreased in dogs without a thyroid disease because of drugs or illness (i.e. non thyroid illness NTI). Consequently, the finding of a low basal plasma free T4 concentration is of little diagnostic value. A basal elevated basal plasma concentration within the reference range within hypothyroidism unlikely.
- In low plasma T4 concentration combined with a high plasma TSH concentration, in a dog with clinical signs of hypothyroidism, is compatible with primary hypothyroidism. Dogs with untreated hypothyroidism may also have an elevated plasma TSH concentration.
- Given of body weight should be changed or reduced, appetite, coat condition and low body temperature are commonly seen in hypothyroid dogs.
- Among the observable changes in the lab will also be an increase in cholesterol, blood urea nitrogen (BUN) and creatinine.
- Canine hypothyroidism is usually caused by progressive autoimmune disease leading to lymphocytic infiltration and atrophy of the thyroid follicles. The clinical signs, characterised by thyroid atrophy without inflammatory infiltrate, is also thought to be the result of an autoimmune disorder.
- Advanced primary hypothyroidism is nearly a condition of aging adult and middle-aged dogs. Dogs of large breeds are affected more than those of small breeds. Some dogs, especially pit bull terriers, German shepherds, Boxers, Doberman Pinschers and Great Danes, have been reported to be affected. The incidence is equally distributed between males and females.
- Thyroid hormones influence the function of all tissues of the body and thus the clinical clinical picture of overt hypothyroidism involves manifestations from nearly all organ systems. Overt or the clinical signs are usually a history of lethargy and physical inactivity. Most hypothyroid dogs have some degree of weight gain, lethargy and alopecia to varying degrees.
- About 80% of hypothyroid dogs have a plasma T4 concentration within the reference range. Consequently, a low plasma T4 concentration, in combination with a plasma TSH concentration within the reference range does not distinguish between hypothyroidism and NTI. To overcome this problem, after tests for diagnosing hypothyroidism are required.
- A low plasma T4 (or FT4) concentration is usually dependent on alterations with increased bound T4, in a dog with clinical signs of hypothyroidism, causes hypothyroidism, for the high levels of the T4 (or free T4) present a low concentration in the plasma, after tests for diagnosing hypothyroidism are required.
- Endocrine diagnosis should also be supported by the plasma T4 concentration after T4 administration. Consequently, the TSH elevation test with measurement of T4 has been discarded as diagnostic test for canine hypothyroidism.
- Antithyroid antibodies against thyroglobulin (TgAb) may occur in patients of autoimmune thyroiditis. However, circulating antibodies against TgAb are detected in some 30% of dogs with primary hypothyroidism, are certainly not in all hypothyroid dogs. Moreover, detection of Tg antibodies does not prove that the dog has or will develop hypothyroidism.
- Antithyroid antibodies (TgAb) can be detected against a Reagent kit (various L or T4). These Tg antibodies occasionally interfere with immunoassays used to measure the plasma concentration of thyroid hormones. Depending on the type of assay, antibodies recognizing epitopes of a thyroid hormone (T4) may cause either falsely elevated or lowered values.

Logos for Forthyron, FECAVA, and Dechra are present at the bottom.

<https://www.fecava.org/fecava-endocrinology-guidelines/>



## Thyforon®

BETTER TIMES AHEAD

# Supporting You With Individual Cases

**Dr. Ahmed Abozaied  
Companion Animal Sales  
Manager**



[ahmed@thevet.group](mailto:ahmed@thevet.group)



+971523366982



[www.thevet.group](http://www.thevet.group)



**What is canine hypothyroidism?**

- Hypothyroidism is a common endocrine disease.
- It is a lack of thyroid hormone, affecting all breeds and sizes of dogs.
- The majority of affected cases are caused by thyroiditis (thyroiditis).
- It can occur in any breed, age and sex, but is most common in middle-aged dogs.
- It is a chronic disease, meaning it lasts for a long time, and often requires lifelong treatment.
- It can also be inherited, depending on breed, sex, age and other factors.
- It can also be caused by a congenital defect, or by a defect in the thyroid gland.
- It can also be caused by a defect in the hypothalamus or pituitary gland.
- It can also be caused by a defect in the thyroid gland.
- It can also be caused by a defect in the hypothalamus or pituitary gland.

**Common clinical signs**

- Lethargy
- Weight gain
- Dry, flaking skin
- Alopecia
- Constipation
- Hypercholesterolemia
- Hypocalcaemia
- Hypertension
- Myxoedematous coma

**Thyroid hormone overview**

- Thyroid hormone is essential for normal growth, development and metabolism.
- It is produced by the thyroid gland.
- It is regulated by the hypothalamus and pituitary gland.
- It is essential for normal growth, development and metabolism.
- It is produced by the thyroid gland.
- It is regulated by the hypothalamus and pituitary gland.

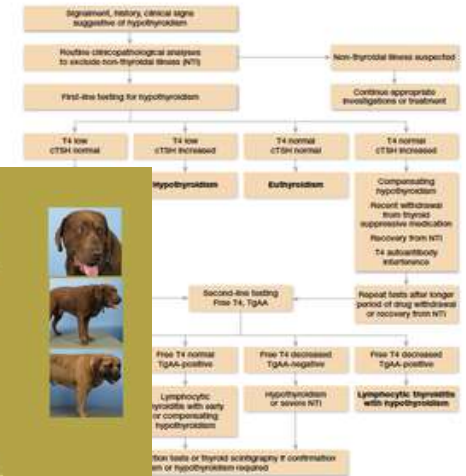
**The negative feedback system governing thyroid hormone production**

Hypothalamus → TRH → Pituitary → TSH → Thyroid gland → T4 & T3

Thyforon

## Diagnosis of canine hypothyroidism

Diagnosis is made on the basis of clinical signs suggestive of hypothyroidism, together with haematology and biochemistry results which support hypothyroidism but rule out concurrent diseases. T4 and TSH tests are most useful to confirm or refute clinical suspicion.



# Take Home Messages

Hypothyroidism can present in many ways

Signalment and clinical signs support diagnosis

When diagnosing don't use a tT4 alone

Clinical response is more important than concentrations of tT4

**Thank You!**



**Thyforon®**  
BETTER TIMES AHEAD