**Hypothyroidism**

**Classic case:** Lethargic Golden Retriever with **weight gain**, bilateral **nonpruritic alopecia**, “tragic” face

**Presentation:** Very common endocrine disease of DOGS

- **History and Signalment**
  - ANY dog 2-9 yo, no gender predilection
  - Predisposed breeds
    - Mixed breeds, Boxers, Doberman Pinschers, Dachshunds, Golden Retrievers, Irish Setters, Miniature Schnauzers
  - Cats – **iatrogenic** hypothyroidism due to hyperthyroid treatment
  - Congenital
    - Foals –
      - Pregnant mares grazing on plants containing goitrogens or dietary iodine imbalance (too much or too little)
      - Thyroid gland hyperplasia and multiple congenital musculoskeletal anomalies
    - Dogs –
      - Disproportionate dwarfism
      - Impaired mental development (cretinism)

- **Clinical signs (adult onset) stem from decreased basal metabolic rate**
  - Gradual onset
  - **Weight gain without increased appetite**
  - **Dullness, lethargy, exercise intolerance**
  - Heat seeking
  - **Tragic facial expression**
    - Droopy eyes
    - Myxedema – thickening of skin, mostly on forehead and face
  - **Bilateral nonpruritic truncal alopecia**
    - Flaky skin, seborrhea, pyoderma
    - Failure to cycle, decreased libido, infertility
  - Neuropathy – weakness, facial paralysis, ataxia, bark change
  - Myxedema coma – rare syndrome
    - Lethargy, stupor, coma
    - Hypoventilation
    - Hypotension
    - Bradycardia
    - Profound hypothermia
Hypothyroidism

Extended Version

DDX:
- Obesity, weight gain, alopecia, seborrhea from other causes. Hyperadrenocorticism, hyperestrogenism, ectoparasites, neoplasia

Test(s) of choice:

- **Serum concentrations of total T4, free T4, and TSH**
  - **Total T4**
    - About 90% sensitive
    - Could also be low due to sick euthyroid syndrome
  - **Free T4 – by dialysis**
    - More useful in distinguishing euthyroid from hypothyroid dogs
  - **T3** – may be low, normal, or high in hypothyroidism
  - **TSH** – must be species specific assay
    - Normal or increased TSH
      - Evaluate in light of T4, cholesterol, etc
      - Hypothyroid
    - Normal or low TSH
      - Sick euthyroid, early hypothyroid, or pituitary (rare)
    - High TSH with normal T4
      - Early hypothyroid, recovery from sick euthyroid illness, antibody interference
  - Thyroid levels may be decreased by other factors
    - **Certain breeds:** Greyhounds, Scottish Deerhounds, Alaskan sled dogs
    - **Phenobarbital**, KBr, **prednisone**, clomipramine, propranolol, some **NSAIDs** and other medications

- **Fasting hypercholesterolemia (80% of cases) – excellent screening test**
  - May see normochromic target cells secondary to hypercholesterolemia

- Normocytic, normochromic regenerative anemia (40-50% of cases)

- **TSH stimulation test – Gold standard**
  - Accurate but TSH is expensive

- Circulating thyroid hormone autoantibodies against T3 or T4 (Extremely rare)

- Therapeutic trial with thyroxine supplementation
Hypothyroidism

Rx of choice:
- Levothyroxine sodium (synthetic T₄)
  - Use brand name as bioavailability varies in generics

Prognosis:
- Good to Excellent for primary hypothyroidism
- Usually Guarded for secondary hypothyroidism – pituitary neoplasia most common

Prevention:
- Monitor T₄ levels periodically after diagnosis to prevent recurrence of clinical signs

Pearls:
- Obesity far more prevalent than hypothyroidism
- If concurrent disease, treat other disease first
- 2 most common causes of adult onset primary hypothyroidism
  - Lymphocytic thyroiditis
  - Idiopathic atrophy of thyroid gland


My Notes: