

Thyroid & Pancreas

7 yr old Dobermann

- lethargic
- poor exercise tolerance
- obese

clinical examination

- thickened skin
- bilateral symmetrical alopecia

diagnosis

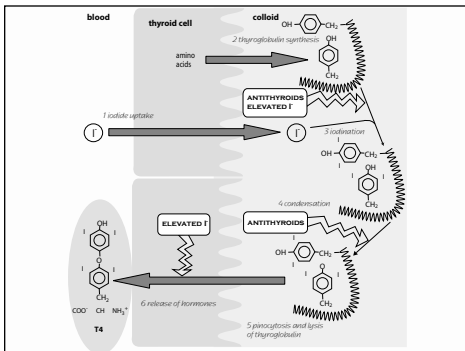
- hypothyroidism
- confirmed by blood T4 level

treatment

- **thyroxin**
 - levothyroxin (INN)
 - T4

beware overdose

- **polyuria**
- **polydipsia**
- **nervousness**
- **panting**
- **tachycardia**
- **voracious appetite**



thyroid hormones

- **dietary iodine important**
- **4x as much T4 as T3 produced**
- **most T4 converted to T3 in cells**
- **binds to nuclear receptors**
- **increases protein synthesis**

actions

- **metabolism**
 - increased metabolism in most cells
 - modulates other hormones, eg insulin
 - upregulates β receptors
- **growth and development**
 - direct effect on cells
 - potentiates GH & parathormone

hypothyroidism

- **dogs**
 - primary
- **cats**
 - rare
 - iatrogenic
 - secondary

drugs

- **thyroxin**
 - T4
 - levothyroxin (INN)
 - Eltroxin
- **tri-iodothyronine**
 - T3
 - liothyronine (INN)
 - Tertroxin

thyroxin

- **cheap**
- **converted to T3**
- **use low dose and work up**
- **monitor progress**

kinetics

- **highly protein bound**
- **half life 12 hr in dogs**
- **cleared faster with enzyme inducers**

liothyronine

- **short half life - 6 hr**
- **rapid effect**
- **only used when T4 does not work**
 - (suppression test in cats)

progress on T4

- **week 1**
 - more active and alert
- **week 2**
 - neurological signs improved
- **week 4**
 - hair starting to regrow
- **variable**
 - weight loss

therapeutic monitoring

- **if no response in 2 months**
- **blood sample before dosing & after 6 hours**

treating hypothyroid dogs

① start with thyroxine 20µg/kg once daily
stop all other drugs if possible

② reassess clinical signs at:
2 weeks
6 weeks
12 weeks
then every six months

③ **good response**
continue treatment

still hypothyroid
assess 6 hour post pill T4
<35nM - increase dose
>35nM - check diagnosis

hyperthyroid
assess 6 hour post pill T4
decrease dose

hypothyroidism

- **brassica poisoning**
 - cattle and sheep
 - vinylthioxazolidine
 - produces goitre in longer term

12 yr old cat

- **losing weight despite eating lots**
- **restless**
- **looks rough**



examination

- **heart rate 240**
- **small kidneys**
- **nodules in neck**

diagnosis

- **hyperthyroidism**

treatment

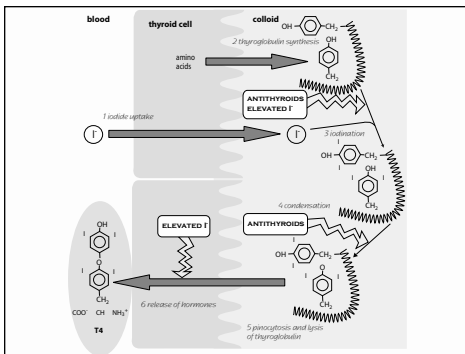
- **surgery**
- **antithyroid drugs**
- **radioactive iodine**

surgery

- **β blockers**
- **iodine premed**
- **calcium post op**
- **may make renal failure worse**
- **commonest in practice**

antithyroid drugs

- **carbimazole**
- **(methimazole)**
- **(propylthiouracil)**



side effects

- vomiting
- anorexia
- lethargy
- leucopaenia
- (thrombocytopenia & bleeding)

radioactive iodine

- ^{131}I
- β 0.6Mev
- γ 0.08Mev
- half life 8 days

radioactive iodine

- **advantages**
 - single iv injection (also sc or po)
 - relatively safe and specific
 - 85 - 90% cure
- **disadvantages**
 - isolation for 3 weeks
 - potential danger to people
 - lots of red tape

thyroid

- **dogs - hypothyroid**
 - give thyroxin
- **cats - hyperthyroid**
 - surgery
 - carbimazole
 - radioactive iodine

Pancreas

diabetes mellitus

- **type 1**
 - insulin dependent
 - dogs & cats
- **type 2**
 - non insulin dependent
 - horses

diabetes mellitus

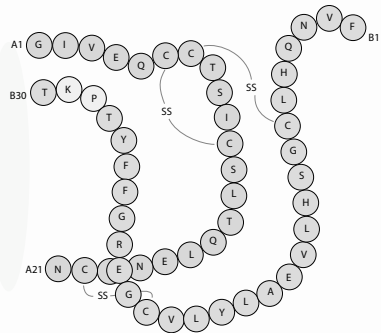
- **low insulin**
- **high blood glucose**
 - osmotic diuresis
 - polyuria / polydipsia
- **ketone production**

treatment

- **type 1**
 - insulin
- **type 2**
 - oral hypoglycaemics ± insulin
- **both**
 - diet

insulin

- **polypeptide 6kDa**
- **species differences**
 - human recombinant
 - Caninsulin is from pigs
- **radidly broken down**



insulin

- **very fast action**
 - lyspro / aspart
- **fast action**
 - soluble
- **medium action**
 - isophane
 - amorphous insulin zinc suspension
- **slow action**
 - crystalline insulin zinc suspension
 - glargine

fast acting

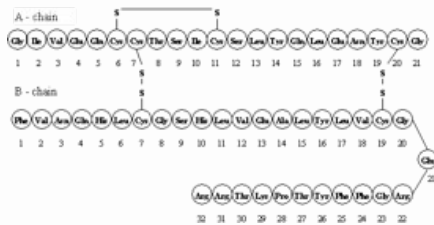
- **soluble**
 - acetate buffered solution
 - can be given iv
 - onset immediate
 - lasts up to 2 hr

medium acting

- **isophane**
 - complexed with protamine
- **amorphous insulin zinc**
 - small crystals with zinc chloride
 - given sc
 - onset 1 - 2 hr
 - lasts 12 - 24 hr

long acting

- **crystalline insulin zinc**
- **insulin glargine**
 - given sc
 - onset 2 - 8 hr
 - duration 24 hr
 - used in cats



side effects

- **hypoglycaemia**
 - give glucose iv
- **rebound hyperglycaemia**
 - Somogyi effect
 - reflex response to hypoglycaemia

oral hypoglycaemics

- **type 2 diabetes**
- **cats**
- **many new human drugs**
 - glipizide
 - (tolbutamide)
 - (metformin)

diabetic coma

- **soluble insulin iv**
- **intensive care**
 - acidosis
 - dehydration
 - heart
 - lungs

diabetes in dogs

- **sort out diet**
- **insulin**
- **measure blood glucose**
- **hospitalise until stable**
- **monitor urine glucose**

diabetes in cats

- **sort out diet**
- **oral hypoglycaemics**
- **insulin**
- **measure blood glucose etc**

diabetes

- **dogs - type 1**
 - give insulin
- **cats type 2 / 1**
 - insulin
 - oral hypoglycaemics