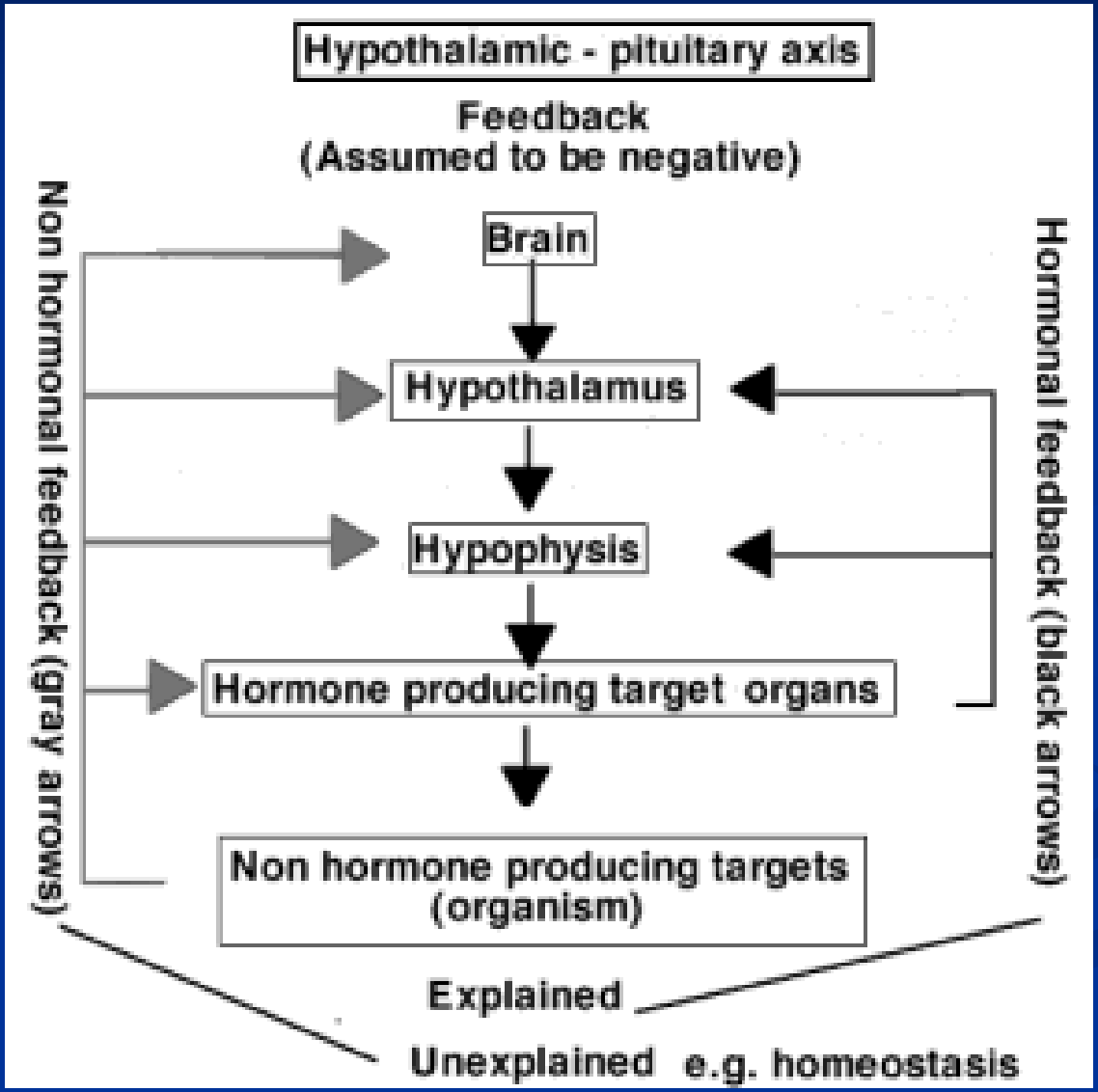
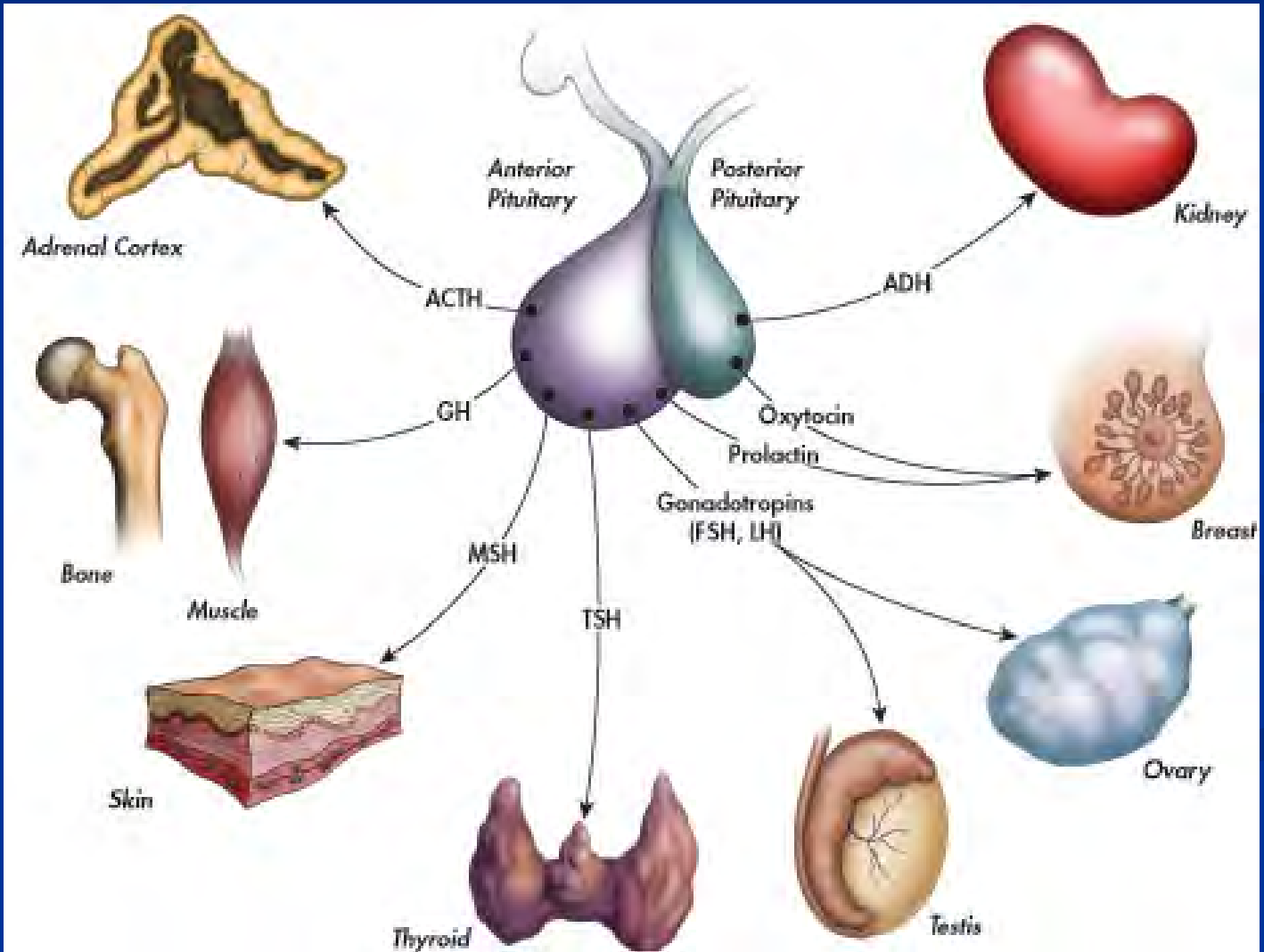
ENDOCRINE DISORDERS IN THE ELDERLY (part 2)

TANJA KEMP
INTERNAL MEDICINE: ENDOCRINOLOGY

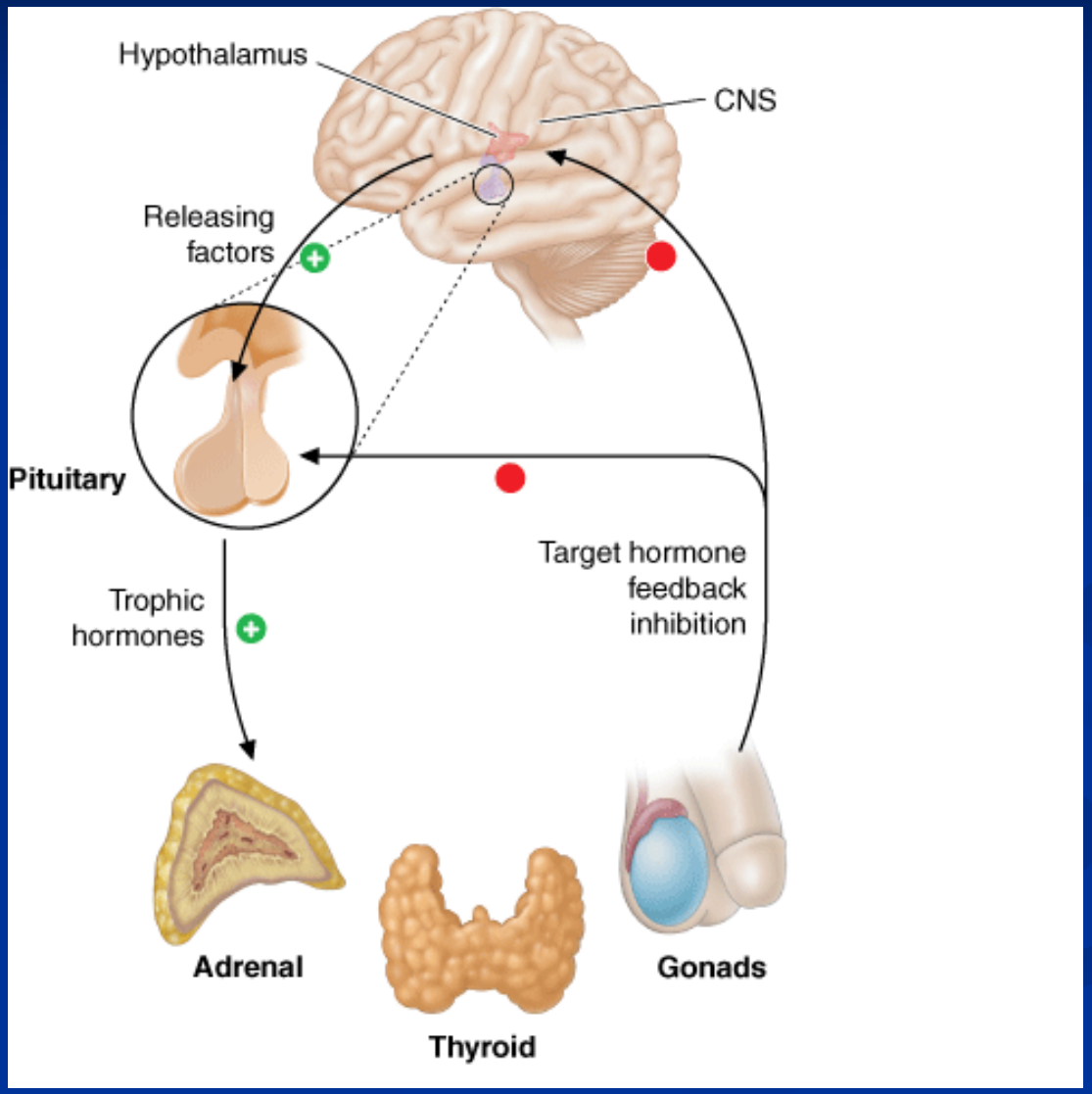
Pituitary axis



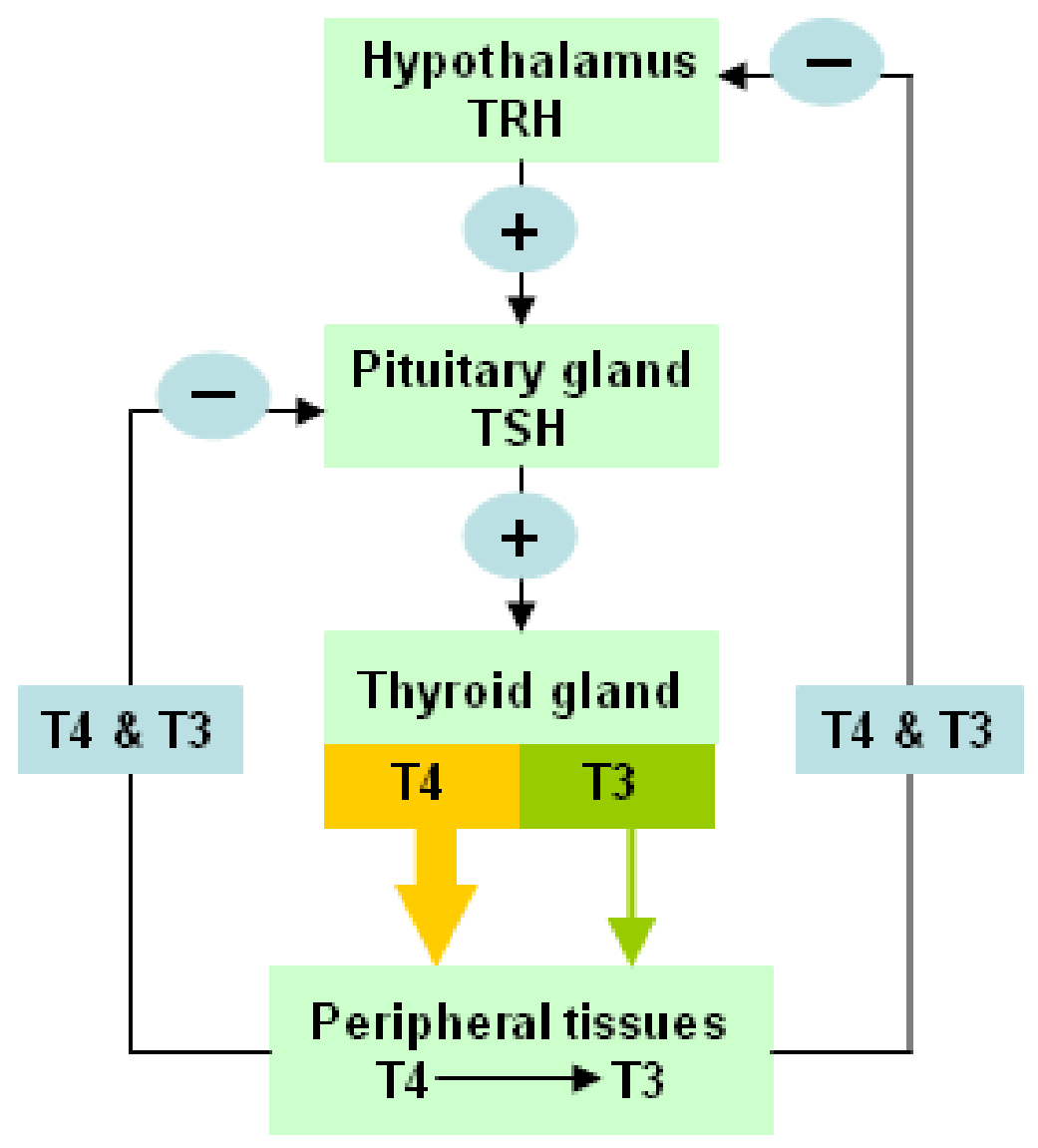
Target organs of the pituitary gland



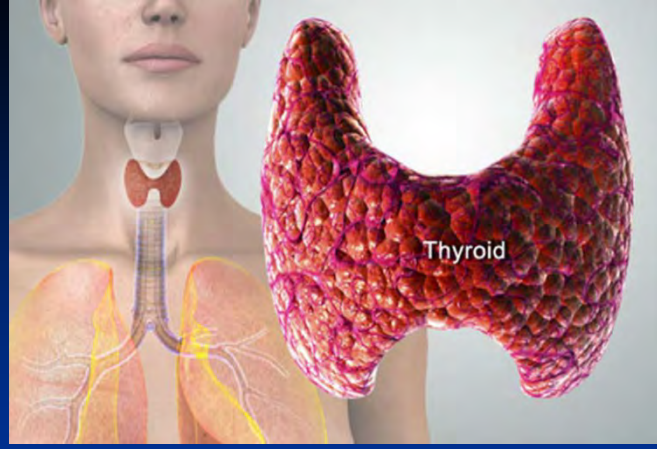
Negative feedback



Hypothalamus-Pituitary-Thyroid axis



Thyroid disease



- The prevalence of thyroid disease in the elderly is twice that in younger people
- **Hypothyroidism:** 2-7%; **hyperthyroidism:** 2%
- Up to 9% of hospitalized elderly patients have overt thyroid disease
- **Subclinical hypothyroidism:** 6-13% in the elderly
- **Subclinical hyperthyroidism:** 2%

Thyroid disease (cont)

- **Hypothyroidism:**

  - underactive thyroid

  - low T4; high TSH

- **Hyperthyroidism:**

  - overactive thyroid

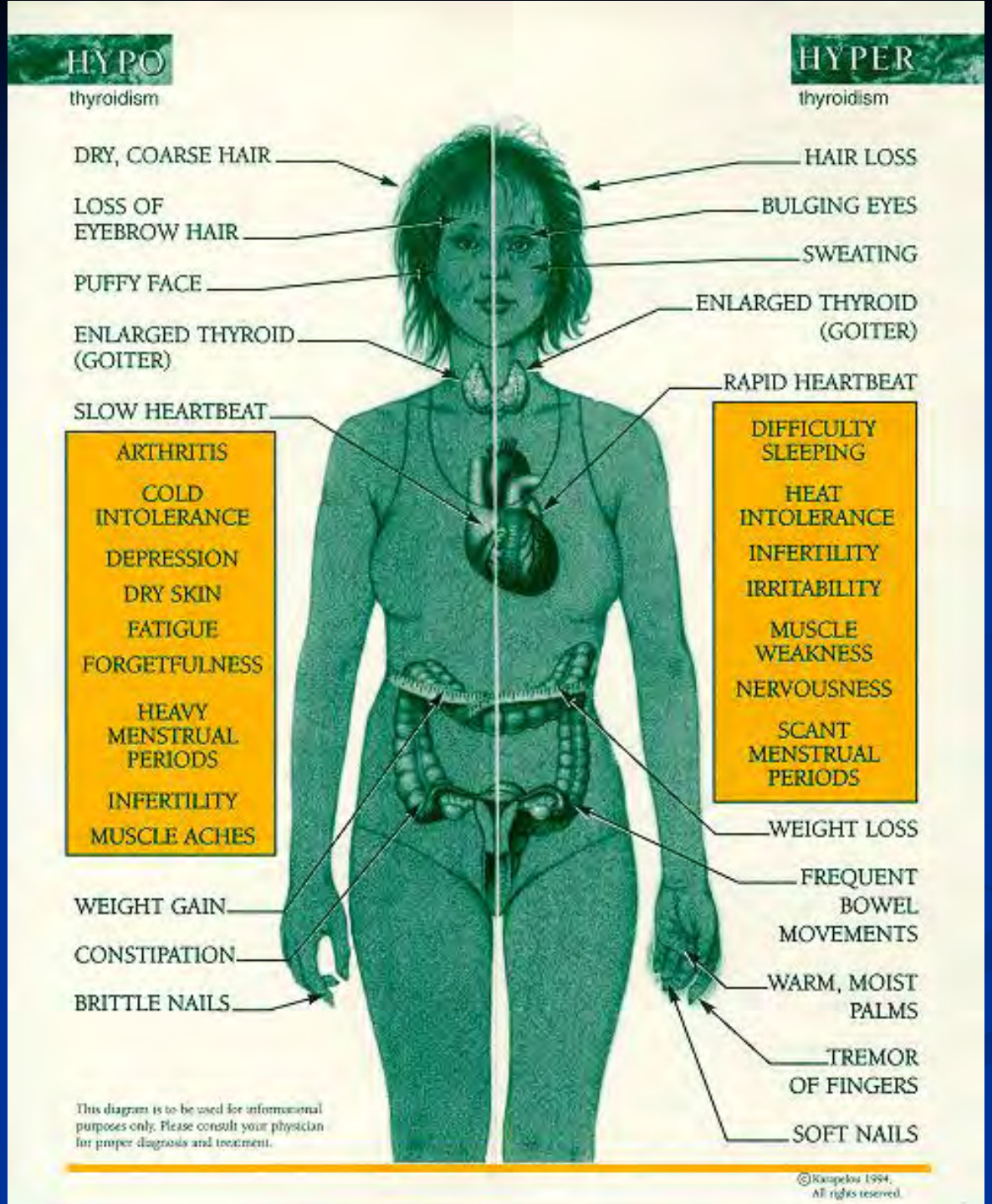
  - high T4; low TSH

- **Subclinical "mild" hypothyroidism:**

  - normal T4; elevated TSH

- **Subclinical "mild" hyperthyroidism:**

  - normal T4; suppressed TSH


HYPO
thyroidism
HYPER
thyroidism
DRY, COARSE HAIR
LOSS OF EYEBROW HAIR
PUFFY FACE
ENLARGED THYROID (GOITER)
SLOW HEARTBEAT
ARTHRITIS
COLD INTOLERANCE
DEPRESSION
DRY SKIN
FATIGUE
FORGETFULNESS
HEAVY MENSTRUAL PERIODS
INFERTILITY
MUSCLE ACHES
WEIGHT GAIN
CONSTIPATION
BRITTLE NAILS
HAIR LOSS
BULGING EYES
SWEATING
ENLARGED THYROID (GOITER)
RAPID HEARTBEAT
DIFFICULTY SLEEPING
HEAT INTOLERANCE
INFERTILITY
IRRITABILITY
MUSCLE WEAKNESS
NERVOUSNESS
SCANT MENSTRUAL PERIODS
WEIGHT LOSS
FREQUENT BOWEL MOVEMENTS
WARM, MOIST PALMS
TREMOR OF FINGERS
SOFT NAILS
This diagram is to be used for informational purposes only. Please consult your physician for proper diagnosis and treatment.
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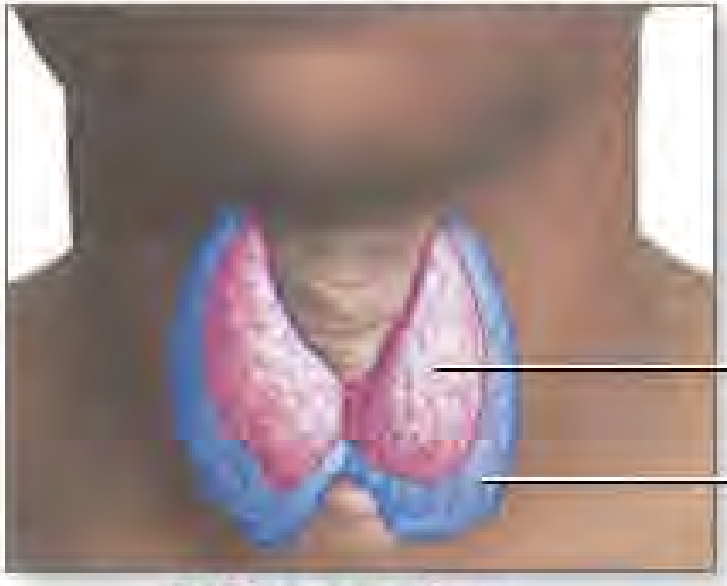
Hyperthyroidism

- Thyroid hormone controls the **metabolic rate** of many tissues
- TRH (hypothalamus) → TSH (pituitary) → Thyroid hormone (thyroid: T4, T3) → distant tissues → negative feedback
- **Causes:** - Graves' disease (most common, especially young females)
  - multinodular or solitary toxic nodule
  - drugs
  - thyroiditis

Clinical features

- Loss of weight, wasting
- Palpitations, atrial fibrillation
- Sweatiness
- Tremor
- Anxiety/irritability
- Heat intolerance
- Diarrhoea
- Hyperkinesis
- Proximal myopathy
- Palmar erythema/warm peripheries

Exophthalmos (bulging eyes)



Diffuse goiter

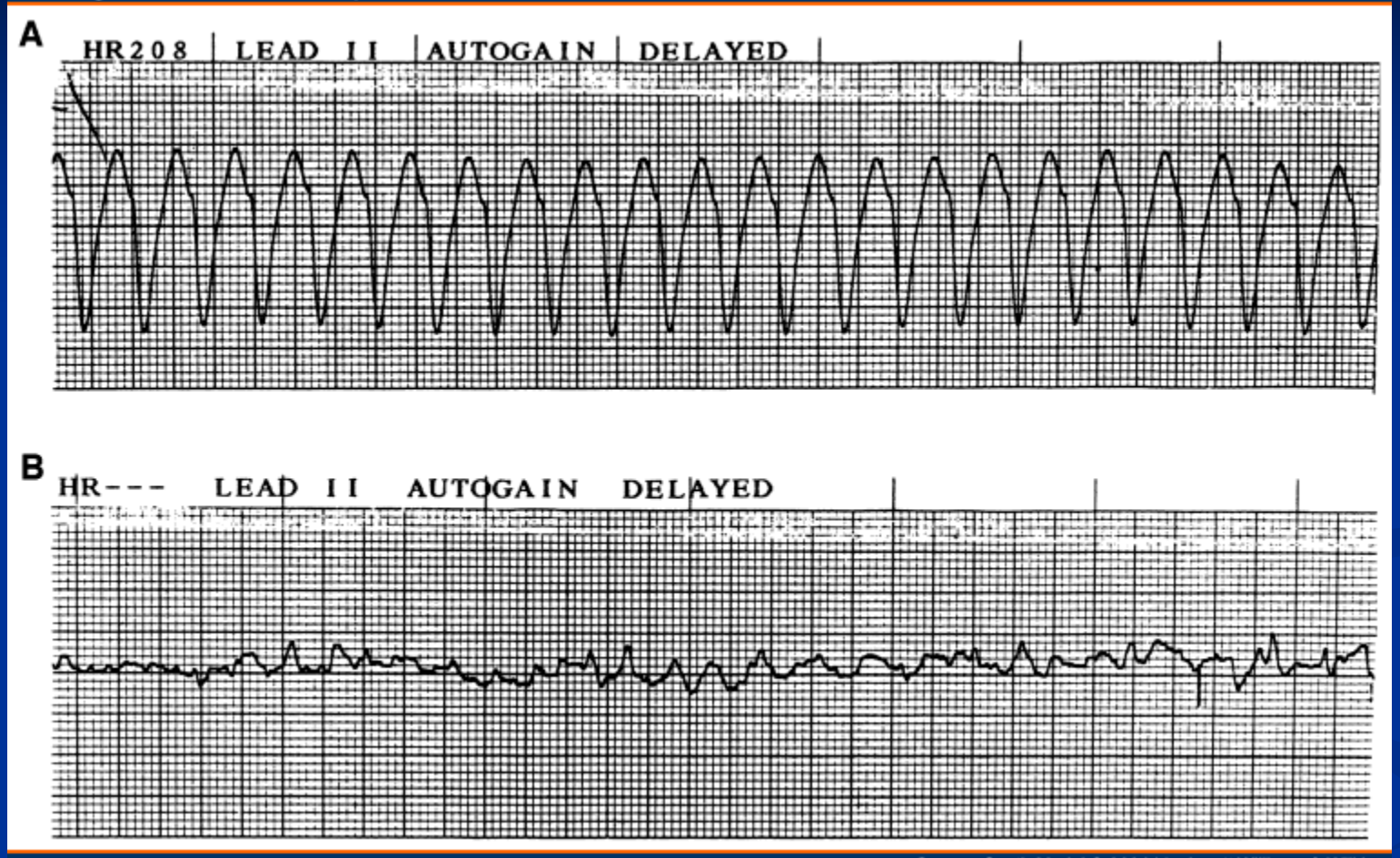
Graves' disease is a common cause of hyperthyroidism, an over-production of thyroid hormone, which causes enlargement of the thyroid and other symptoms such as exophthalmos, heat intolerance and anxiety

ADAM.

Goitre

Thyroid Eye signs

- Exopthalmos
- Lid lag
- Palsies



Treatment

- **Drugs**
  - Neomercazole
  - Beta-blockers
- **Radioactive iodine**
  - Multinodular / single toxic nodule
  - Grave's disease
- **Surgery**
  - If a malignancy is suspected
  - If there is compressive symptoms

Differences in the Elderly: Symptoms / Signs

- **Graves' disease** is still the most common cause, but multinodular goitre or toxic nodule(s) are more common than in younger patients
- Tend to present with symptoms / signs in the **most vulnerable organ system**
- Usually **cardiovascular system**: atrial fibrillation, congestive cardiac failure, angina, acute myocardial infarction **OR:**
- **Central nervous system**: apathy, depression, confusion, lassitude

More common than in younger patients:

- Muscle wasting, failure to thrive, anorexia, weight loss, occasionally constipation
- Degeneration of the sinus node and cardiac conduction system: **less likely to have palpitations** / sinus tachycardia
- Falls, bone loss, fractures
- Often normal thyroid size or not palpable
- Lid lag or ophthalmopathy less common

The same as in younger patients:

- Weight loss in spite of an increased appetite
- Fine tremor
- Eyelid retraction
- Increased perspiration
- Increased frequency of bowel movements

“Apathetic hyperthyroidism”

Therapy

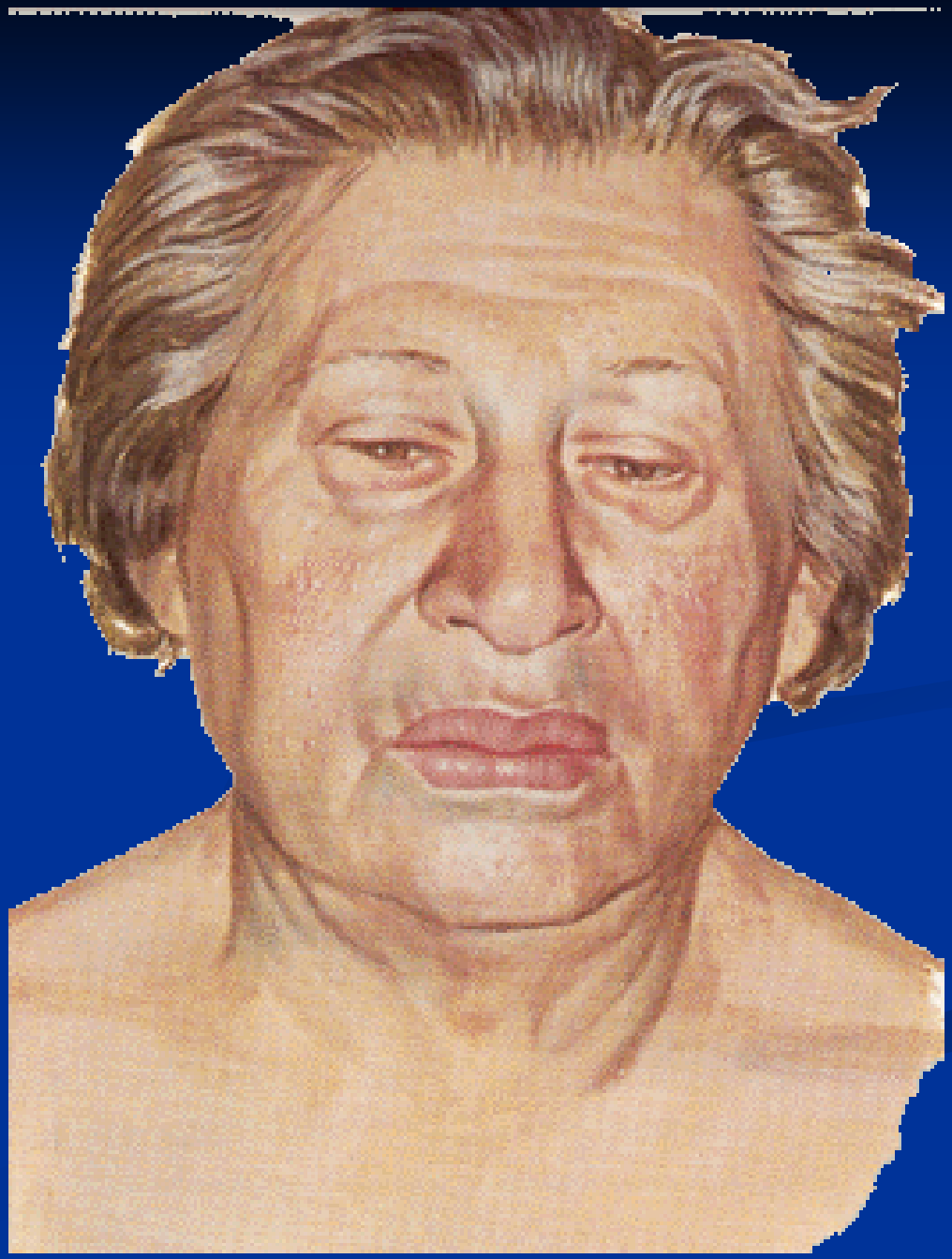
- Beta-blockers to alleviate symptoms
- **Radioactive iodine is the therapy of choice in the elderly**
- Can use antithyroid drugs prior to ablation to render patient euthyroid (not definitive treatment)
- Hypothyroidism develops in >80%
- Rarely surgery: increased morbidity
- **Doses of other medications** may have to be decreased once patient isn't hyperthyroid anymore

Hypothyroidism

-Very common, especially in older women

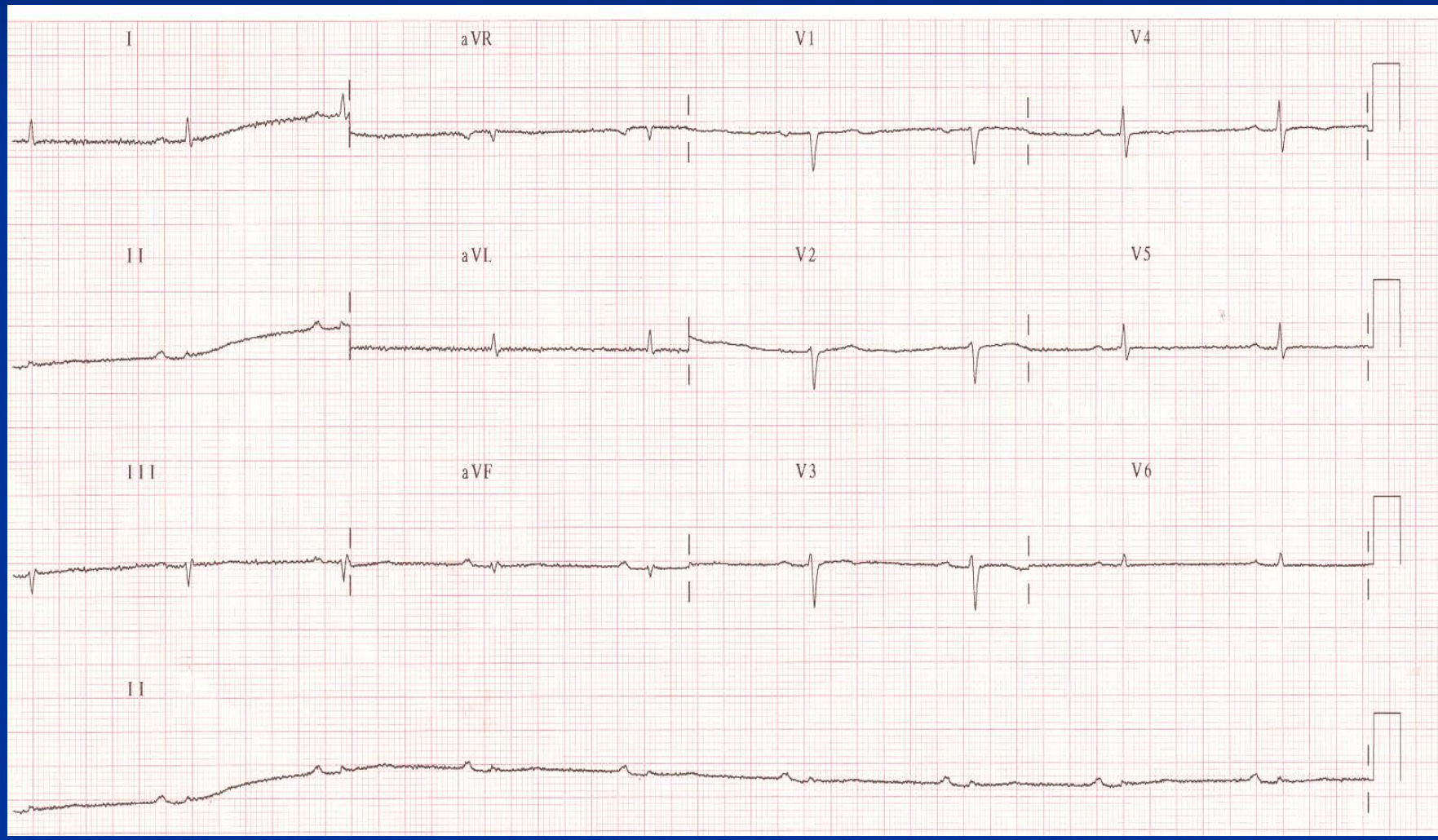
- Weight gain
- Arthralgia
- Myalgia
- Bradycardia
- Proximal myopathy
- Slowly relaxing reflexes
- Carpal tunnel syndrome

- Depression, tiredness
- Dry coarse hair
- Hair loss (also outer 1/3rd of eyebrows)
- Puffy face/eyelids
- Dry thickened skin
- Mental slowness
- Cold intolerance
- Hoarse voice
- Constipation



In this patient with advanced pretibial myxedema, these striking skin changes are due to accumulations of mucopolysaccharides ("myxedema"). These changes are reversible with thyroid hormone.

ECG in Patient with Myxoedema Coma



Treatment

- **Thyroid hormone replacement:**

  - T4 (Eltroxin)

  - T3/T4 combination

Differences in the Elderly

- Hypothyroidism in the elderly **most likely due to past:**

  - Hashimoto's thyroiditis

  - Thyroidectomy

  - Radioactive iodine ablation

- Risk of developing hypothyroidism is increased if positive serum antithyroid antibodies

Symptoms / Signs

- Can **easily overlook** hypothyroidism in an older patient; symptoms **nonspecific** and common in older people (eg cold intolerance, poor appetite)
- More likely than younger patients to present with **cardiovascular symptoms** (CCF, angina)
- More often **neurologic findings** (cognitive impairment, confusion, depression, psychosis, coma)

- Physical findings often **nonspecific**
- Puffy face, delayed deep tendon reflexes, myxoedema support diagnosis

Therapy

- **Doses** of thyroid hormone required **decrease** with age ("start low, go slow")
- Elderly patients should be started on 25-50 microgram per day of **levothyroxine** (even lower doses if ischaemic heart disease is present)
- Dose should be increased by 25 microgram every 4-6 weeks until the TSH is within the normal limit (slower increase if IHD)
- Avoid T3; can be cardiotoxic

- On average, the **dose** of levothyroxine is 1 microgram/kg/d in the elderly compared to 1.7 microgram/kg/d in younger patients
- The **metabolic clearance of other drugs** is decreased in hypothyroidism; the doses of these drugs may have to be increased as hypothyroidism is treated

- **Unsure** whether treating **subclinical** hypothyroidism in the elderly is beneficial
- Follow them up carefully for disease progression, especially if positive antibodies or past radioablation

Other Endocrinology of Aging

- **Menopause** (↓ oestrogen)
- **Andropause** (↓ testosterone)
- **Adrenopause** (↓ DHEAS/DHEA)
- **Somatopause** (↓ growth hormone)

"Fountain of Youth"

- (Oestrogen: not anymore due to risk profile)
- Potent androgenic steroids (**testosterone**)
- Dehydroepiandrosterone (**DHEA**): 'nutritional supplement'
- Human growth hormone (**hGH)** off-label

Hypothalamus-Pituitary-Gonadal axis