

# Lecture

# 2



**TSH (PRIMARY) /**



**T4,T3**

## Hypothyroidism

### ■ Cretinism (child)

- Impaired CNS & bone growth
- Mental retardation
- Short stature
- Coarse facial features
- Protruding tongue
- Umbilical hernia

### ■ Myxedema (adult)

- Slow physical and mental activity
- Cold intolerance
- Over weight
- Low cardiac output
- Constipation and decreased sweating
- Cool pale thick skin

# CAUSES OF HYPOTHYROIDISM:

## Primary

Postablative

Surgery, radioiodine therapy, or external irradiation

Autoimmune hypothyroidism

Hashimoto thyroiditis\*

Iodine deficiency\*

Drugs (lithium, iodides, p-aminosalicylic acid)\*

Congenital biosynthetic defect (dyshormonogenetic goiter) (rare)\*

Genetic defects in thyroid development (rare)

Thyroid hormone resistance syndrome (rare)

} **MOST  
COMMON**

## Secondary (Central)

Pituitary failure (rare)

Hypothalamic failure (rare)

# Hypothyroidism

## Symptoms:

Extreme Tiredness/Lethargy/  
Lack of Stamina/Motivation

Memory Loss/"Brain Fog"

Depression/  
Mood Swings

Hearing Loss

Weight  
Gain

3pm  
crash

Broken  
Sleep

Brittle/  
Ridged  
Nails

Joint/  
Muscle  
Pain

Hair  
Loss

Constipation

Prmenstrual Tension

Intolerance to Cold/Heat/  
Sweating/Low Body Temperature

Tingling & Numbness in Extremities

## Signs:

Sparse Eyebrows  
Especially outer ends

Swelling of the Face

Especially around Eyes  
(Oedema)

Changes at the back of  
the Eye (at Fundus Oculi)

Wasting of Tongue

Listless, dull to look Eyes

Hoarseness

Rapid Heart  
Rate with  
weak force  
of contraction

Slow Thinking

Slow Pulse  
Rate

Non pitting oedema of ankles

Cold/dry/sore/scaly skin/brittle nails

Low basal activity level temperature

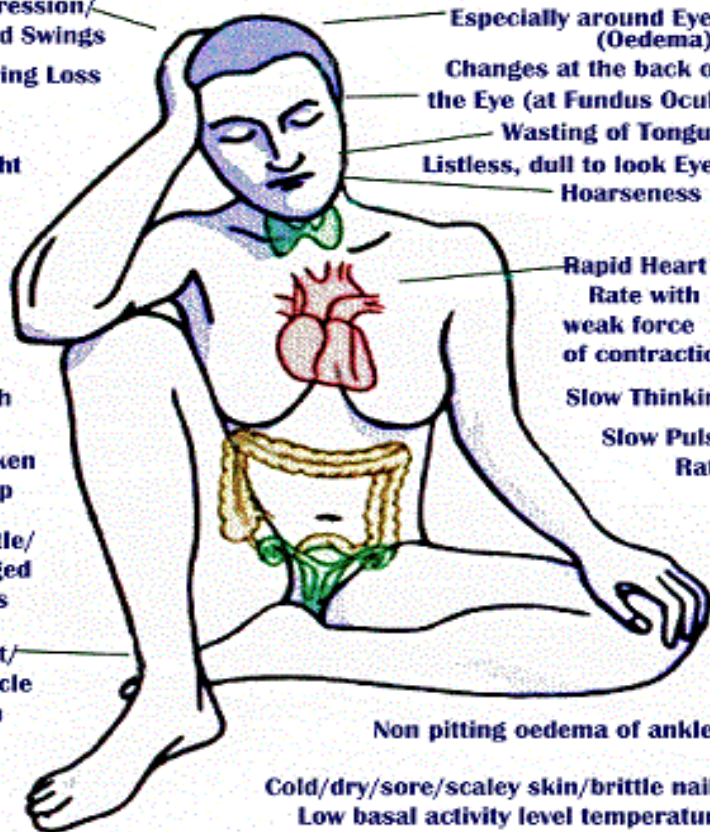
Dry/course/brittle hair or hair loss

Unexplained Weight Gain

Pounding Heart Beat

Nervousness

Sluggish  
Movement



# Hyperthyroidism

## Symptoms:

Protusion of one or both  
eyeballs (exophthalmos)

Breathlessness

Nervousness

Difficulty  
Sleeping/  
Insomnia

Fatigue

Itching  
-overall

Heartbeat  
Sensations

Palpitations

Weakness

Diarrhoea

Increased Bowel Movements

Heat Intolerance

Light or Absent  
Menstrual Periods

## Signs:

Protruding Eyes  
(exophthalmos)

Hair Loss

Staring Gaze

Nausea & Vomiting

Warm Moist Skin

Goitre

Fast  
Heart  
Rate

Trembling  
Hands

Skin Blushing/ Flushing

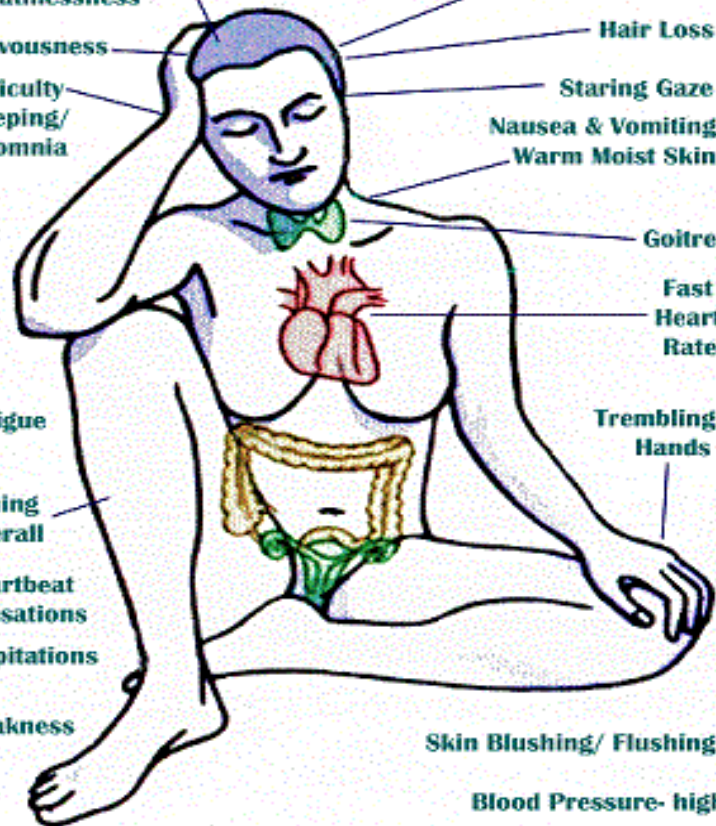
Blood Pressure- high

Pulse- Pounding

Weight Loss

Muscle Weakness

Breast Development in Men



# AUTOIMMUNE THYROID DISEASES

Hashimoto thyroiditis

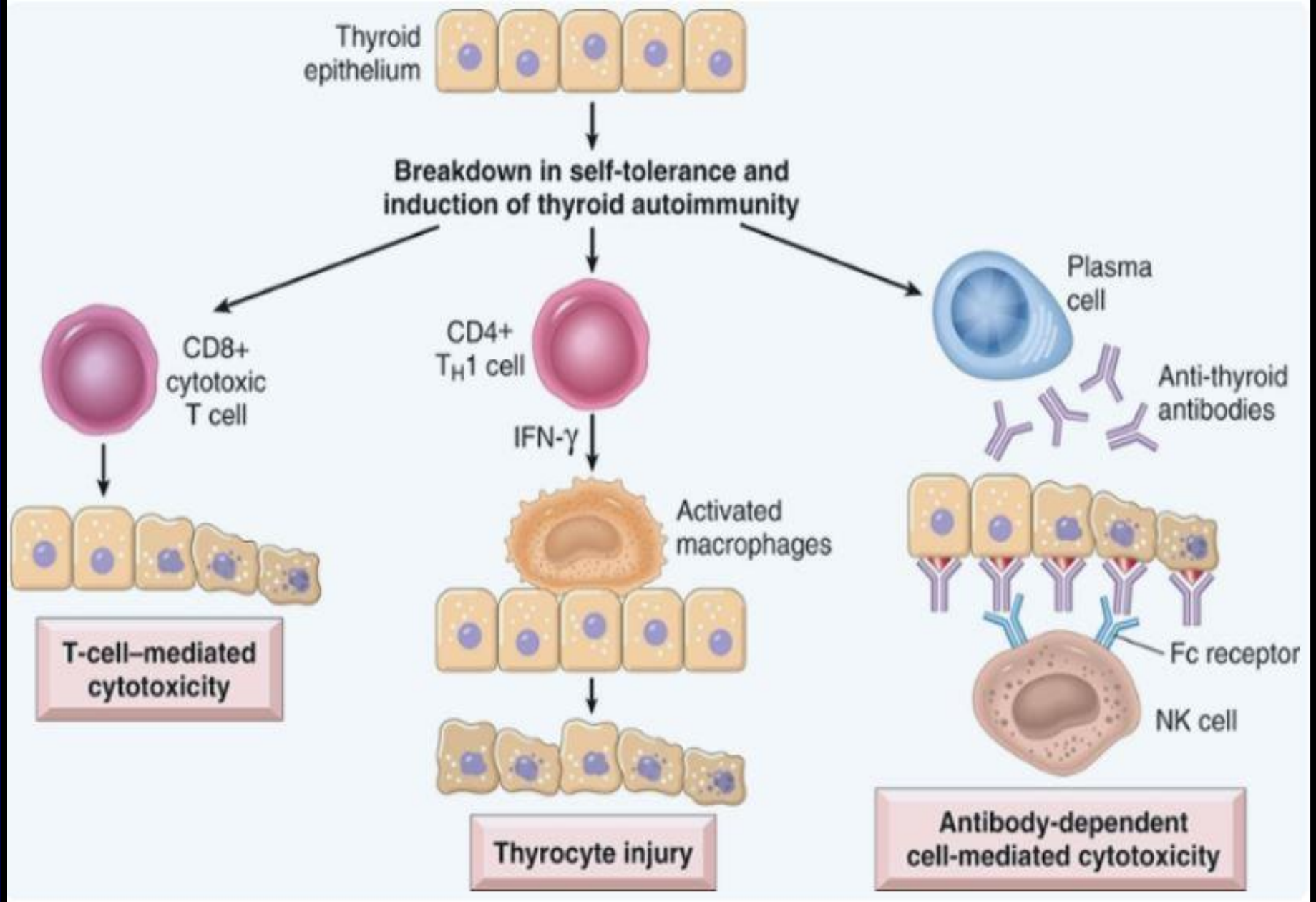
Granulomatous  
thyroiditis (de Quervain)

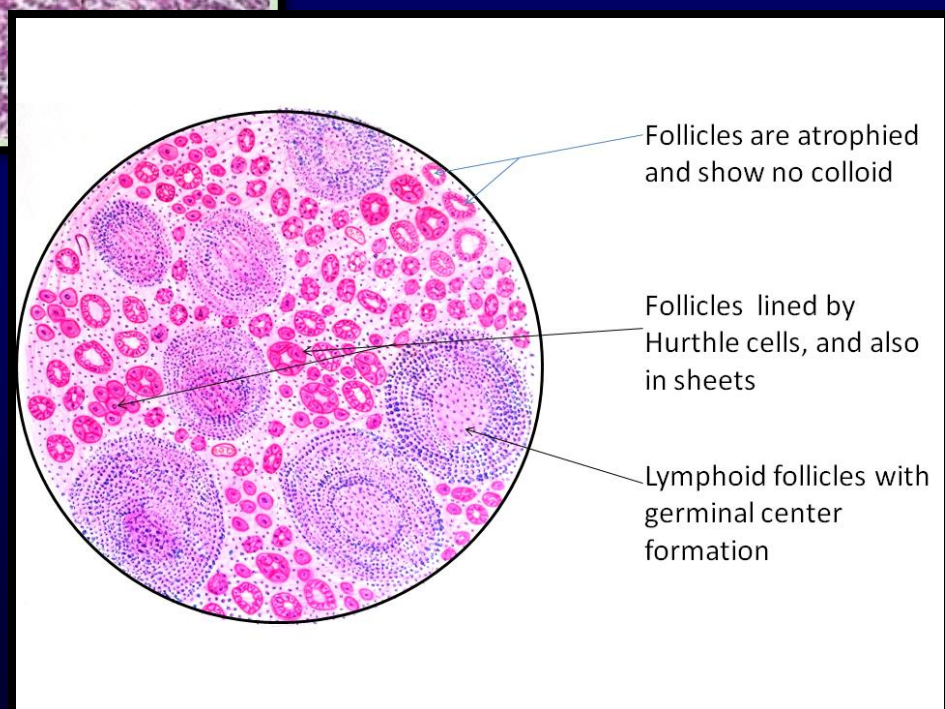
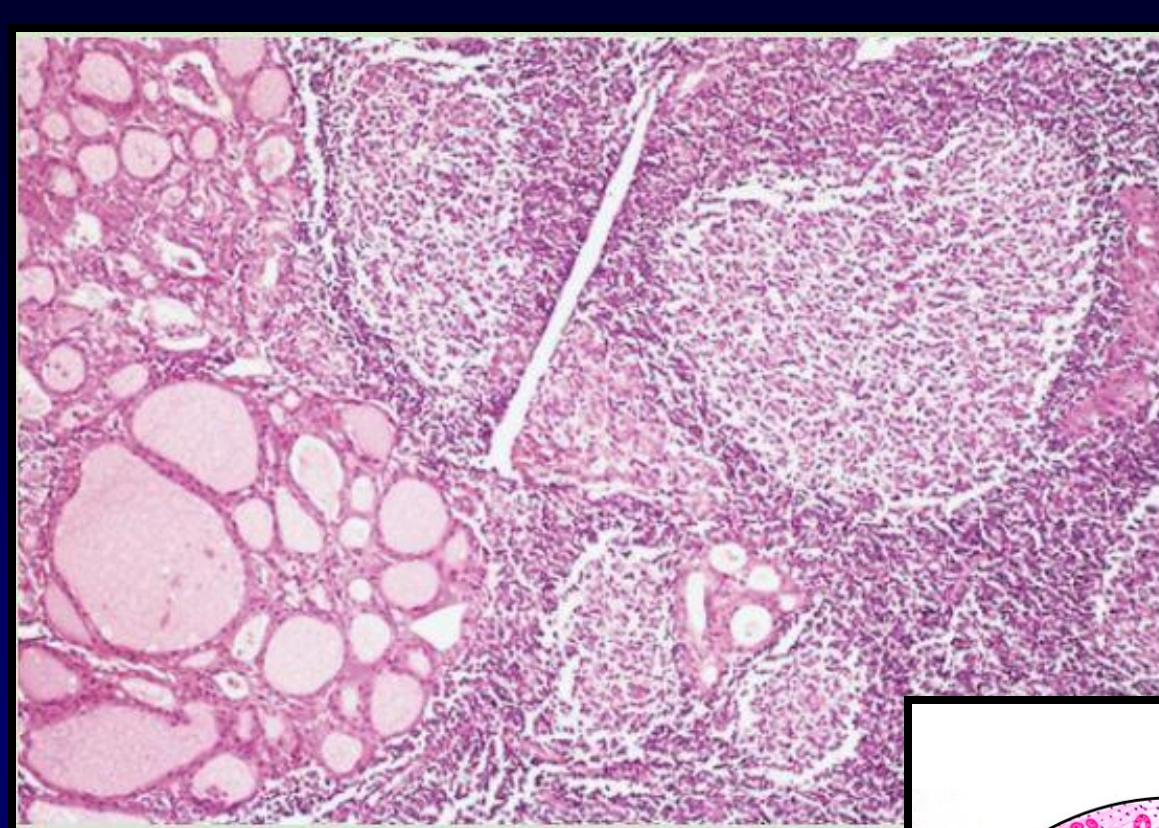
Subacute lymphocytic  
thyroiditis



# **HASHIMOTO THYROIDITIS (CHRONIC LYMPHOCYTIC THYROIDITIS)**

- **Most common cause of hypothyroidism in areas with no iodine deficiency**
- **Gradual hypothyroidism (rarely initial transient Hashitoxicosis)**
- **Middle aged females (45-60years)**
- **Autoimmune destruction of thyroid epithelial cells, high anti-thyroid antibodies**
- **Increase risk for papillary thyroid carcinoma and B-cell NH lymphoma**







# **SUBACUTE GRANULOMATOUS (De Quervain) THYROIDITIS**

- **Granulomatous thyroiditis, more acute with neck pain, firm thyroid**
- **? Virally associated or induced**
- **Females, 30-50 years**
- **Maybe initial transient thyrotoxicosis followed by hypothyroidism**
- **Self limiting disease (6-8 weeks)**

# OTHER LESS COMMON THYROIDITIS:

- Subacute lymphocytic thyroiditis: middle aged women, post partum, initial transient thyrotoxicosis then gradual hypothyroidism. Autoimmune with circulating antibodies. Gland is usually normal size. Lymphocytic thyroiditis
- Riedel thyroiditis: IgG4 associated disease, stony-hard thyroid due to severe fibrosis

# **GRAVES DISEASE (TOXIC DIFFUSE GOITER)**

- **Described by Robert Graves in 1835**
- **Most common cause of endogenous hyperthyroidism**
- **Triad: thyrotoxicosis + ophthalmopathy (exophthalmos) + dermopathy (pretibial myxedema)**
- **Autoimmune, HLA-DR3 and CTLA-4**
- **Women, 20-40 years**

# GRAVES DISEASE (TOXIC DIFFUSE GOITER)

## GRAVES DISEASE

Autoimmune disease that destroys the thyroid gland



Women to men ratio is 8:1



1<sup>st</sup> described by Robert Graves in 1835



Affects 6 per 1000 persons in the US



Causes 50–80% cases of hyperthyroidism in the US



Fatigue is present in 70% of the patients



Palpitations and weight loss are seen in 50% of the patients



Other symptoms include heat intolerance, hair loss & hand tremor



Diagnosed by blood tests & radiography of thyroid gland

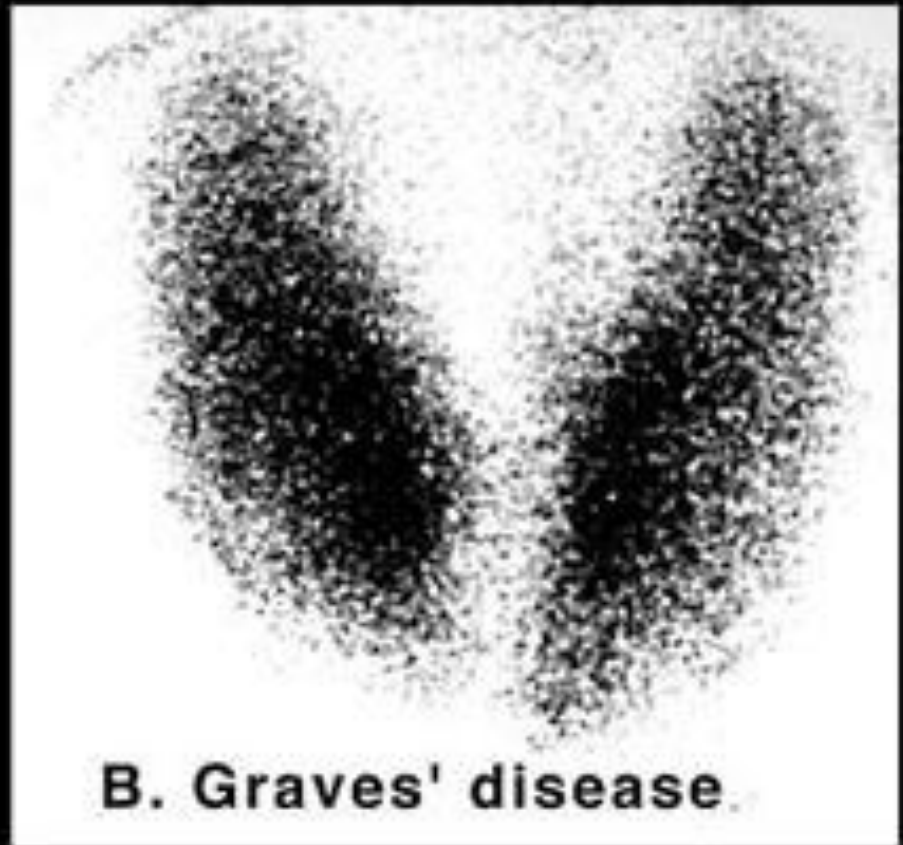
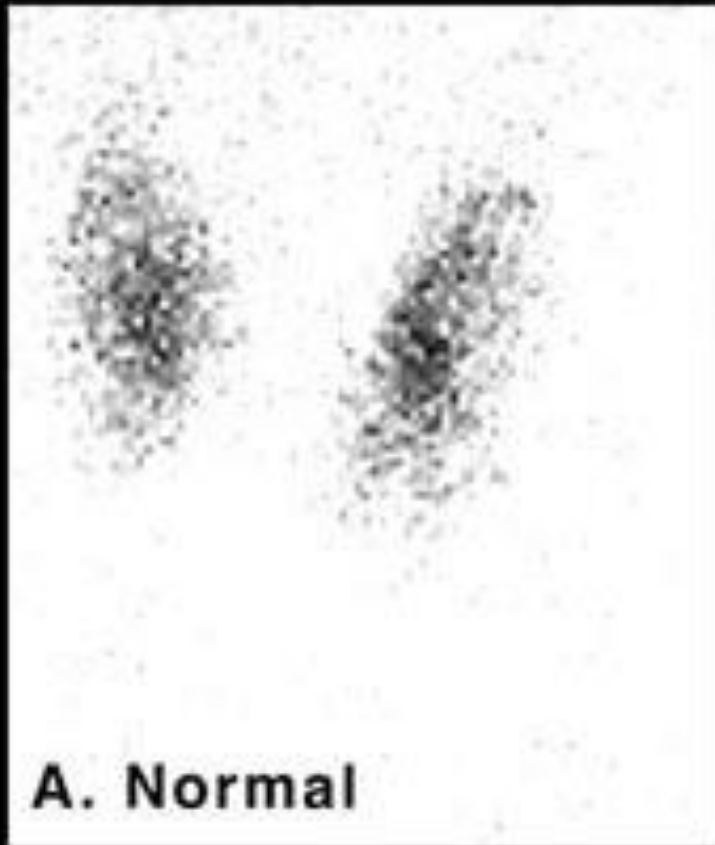


Treatment includes radioiodine therapy, medications & thyroid surgery

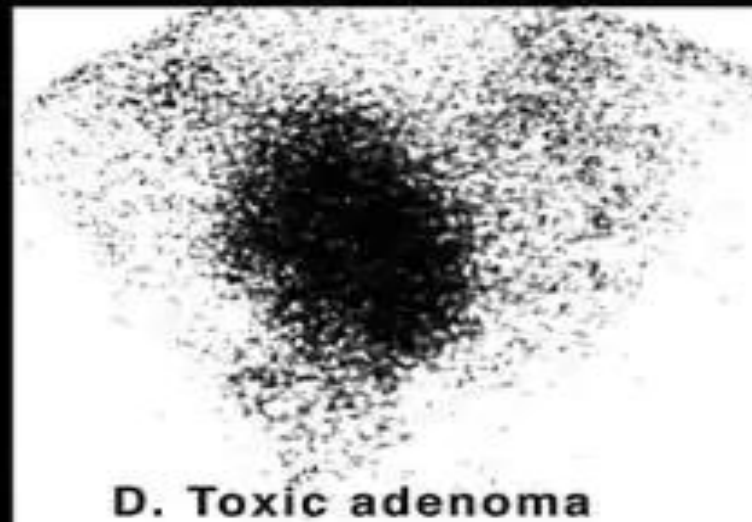
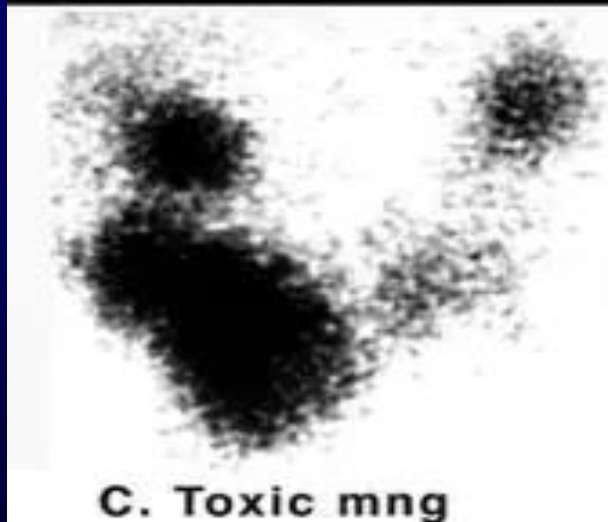
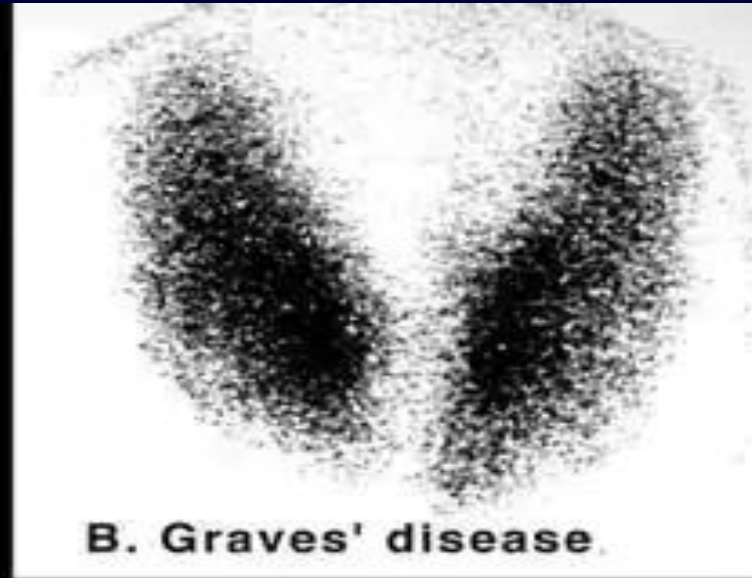
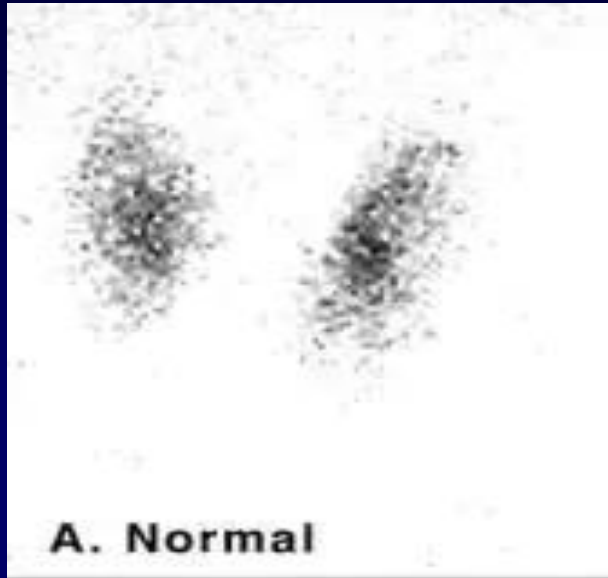




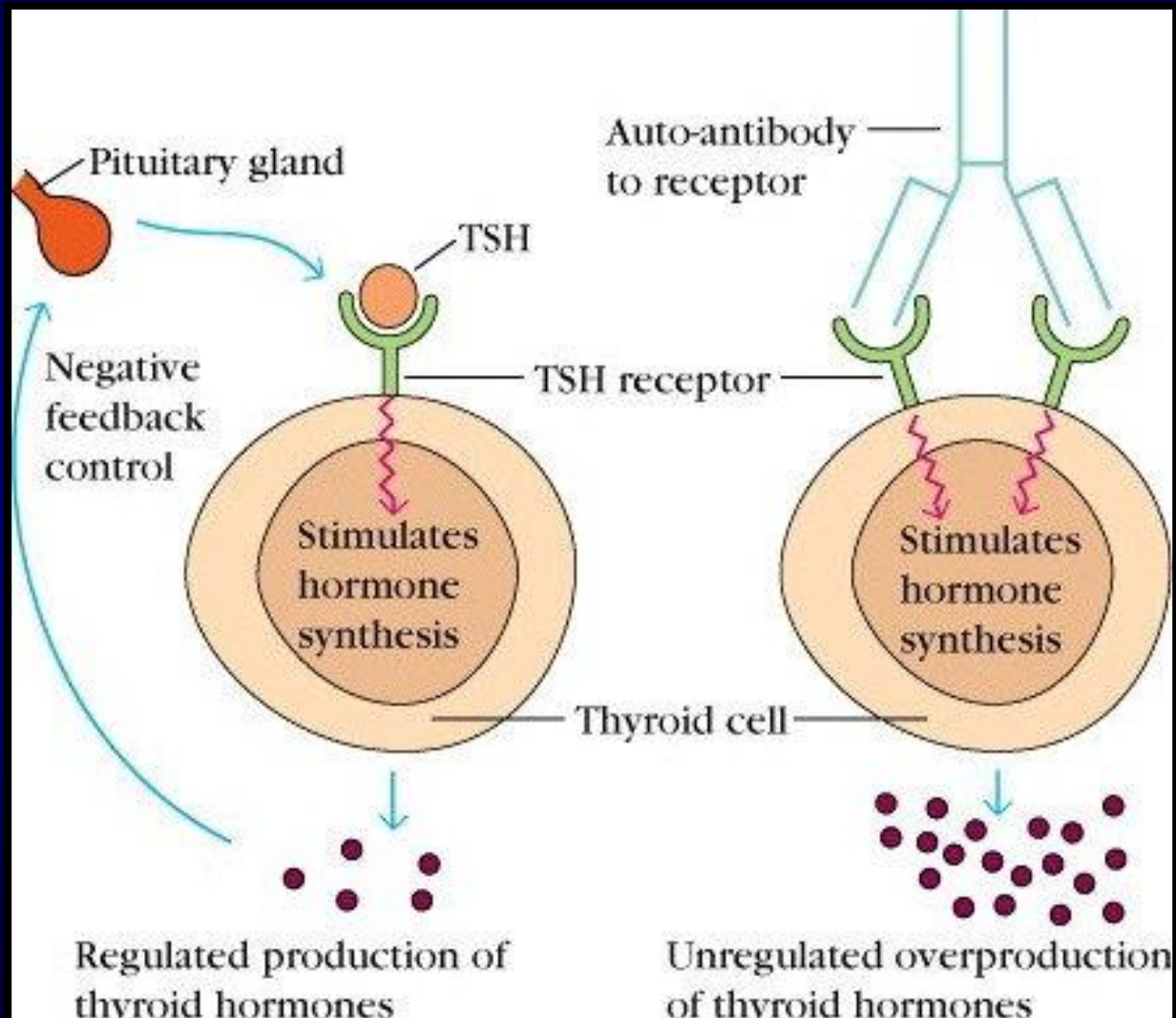
# **RADIOACTIVE IODINE UPTAKE (RAIU) SCAN/TEST**



# EXAMPLES:

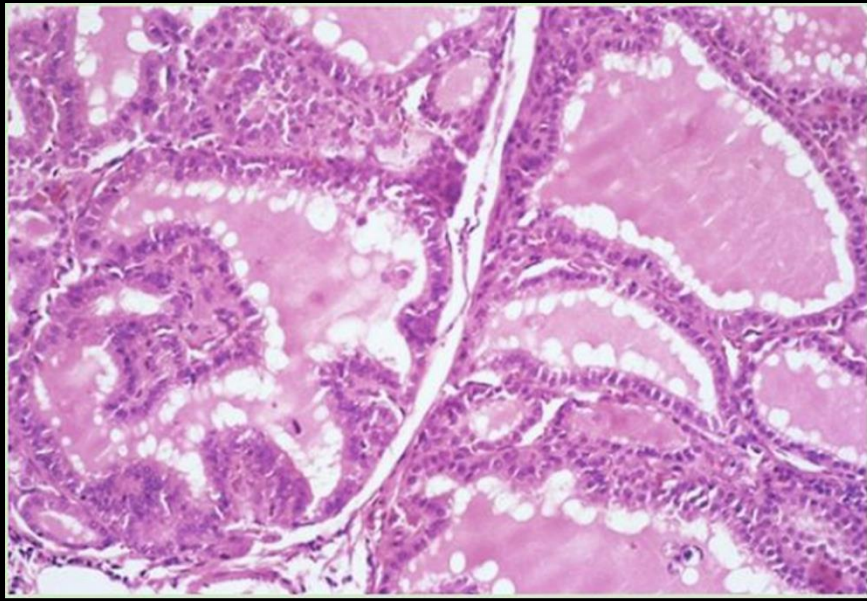


# AUTOANTIBODIES OF GRAVES DISEASE:



**+ Sometimes TSH-binding inhibitor Ig, may cause hypothyroidism**





**EXOPHTHALMOS**



# **HISTOLOGY**

**PRETIBIAL  
MYXEDEMA**





# **DIFFUSE AND MULTINODULAR GOITER:**

- Very common; most common thyr disease
- Impaired hormone synthesis, iodine deficiency
- ↑ TSH, hyperplasia & hypertrophy
- In most cases; euthyroid; rarely goitrous hypothyroidism
- Endemic or sporadic. Females
- Initially diffuse then multinodular
- Clinically: mass effects and cosmetic
- Rare: toxic MNG (Plummer syndrome)

# PATHOLOGIC FEATURES:

