

# Alterations in Thyroid Function

Thyroid Hormones: Thyroxine (T4) & Triiodothyronine (T3)

Control the metabolic rate of all cells; Regulate protein, fat, CHO metabolism; Affects O<sub>2</sub> consumption & body heat production; ↑ absorption of glucose from GI tract; Insulin antagonist

## Hypothyroidism

- **Causes**
  - ↓ amt of thyroid tissue (atrophy due to aging, surgery, RAI therapy)
  - Thyroid CA
  - Autoimmune disease (Hashimoto's)
  - Meds (lithium)
  - Iodine deficiency or excess
  - Inadequate TSH prod from a pituitary or hypothalamus tumor
- **MYXEDEMA COMA**
  - Most severe form
  - Untreated prolonged hypo
  - Rapid w/d of thyroid meds
  - Exposure to cold, surgery, infections, trauma
  - **LIFE THREATENING COND**
  - Hypothermia, bradypnea, hypotension, lethargy
  - S/S: extreme fatigue, hair loss, dry skin, brittle nails, husky voice, weight gain, intolerance to cold, masklike expression
- **Pharmacological Therapy**
  - Synthroid/Levothyroid (levothyroxine)
    - ↑ levels of T3 & T4, ↑ metabolic rate

## Diagnostic Studies

- **Total Thyroxine (T4)**
  - ↑ c hyper, ↓ c hypo
- **Total Triiodothyronine (T3)**
  - ↑ c hyper, ↓ c hypo
- **Thyroid Stimulating Hormone (TSH)**
  - Best 1<sup>st</sup> line diagnostic
  - ↓ c hyper (thyroid d/o)
  - ↑ c hyper (pituitary d/o)
  - ↑ c hypo (thyroid d/o)
  - ↓ c hypo (pituitary d/o)
- **Thyroid Scan**
  - Thyroid size & masses
- **Radioactive Iodine Uptake Test**
  - ↑ c hyper, ↓ c hypo
- **Radio Immunoassays**
- **Urine Tests**
- **Stimulation & Suppression Tests**

## Hyperthyroidism

- **Causes**
  - Excessive TH secretion
  - Most common endocrine prob 2<sup>o</sup> DM
- **GRAVES' DISEASE**
  - Occurs in younger women (30-40)
  - Antibodies attach to TSH receptors on thyroid & cause excessive hormone prod & gland enlargement
- **Pharmacological Therapy**
  - Thioamides (Hormone Control)
  - Beta-Blockers (BP Control)
  - Radioactive Iodine (RAI)
  - Iodine Solution (rarely used)
- **THYROID STORM/CRISIS**
  - Un-dx hyperthyroidism
  - Poorly controlled hyperthyroidism
  - Post-thyroidectomy
  - Stress, infections, trauma, surgery
  - **LIFE THREATENING COND**
  - S/S: Extreme hyperthyroidism, HTN, tachycardia, fever