# Endocrine Disorders

Dr loai Abu  Sharour
Revised by: Dr. Maha Subih

# Disorders of the Thyroid Gland
# HYPOTHYROIDISM

- inadequate amounts of thyroid hormone in the bloodstream.
- **Pathophysiology/Etiology:**

1. **Primary hypothyroidism** is the most common form and is generally due to:

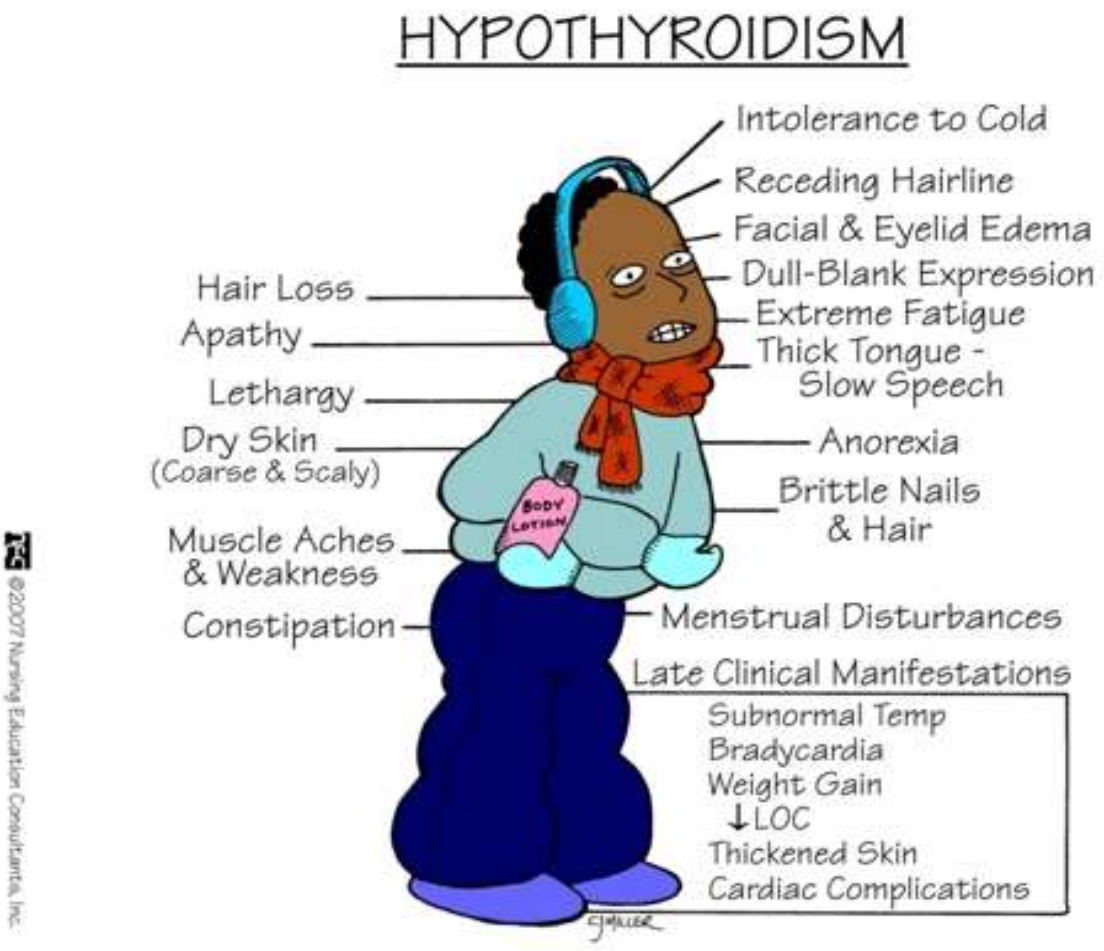
- Autoimmune disease (Hashimoto's thyroiditis)
- Use of radioactive iodine
- Thyroidectomy
- Dietary iodide deficiency , Subacute thyroiditis
- Lithium therapy , Overtreatment with antithyroid drugs

# Pathophysiology/Etiology

2. **Secondary hypothyroidism** is due to inadequate secretion of TSH caused by disease of the pituitary gland (ie, tumor, necrosis).

**Thyroid-stimulating hormone** TSH :is a pituitary hormone that stimulates the thyroid gland to produce thyroxine ($T_4$), and then triiodothyronine ($T_3$) which stimulates the metabolism of almost every tissue in the body.

# Hypothyroidism

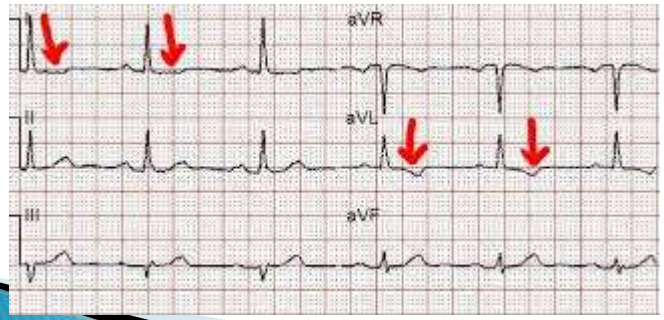


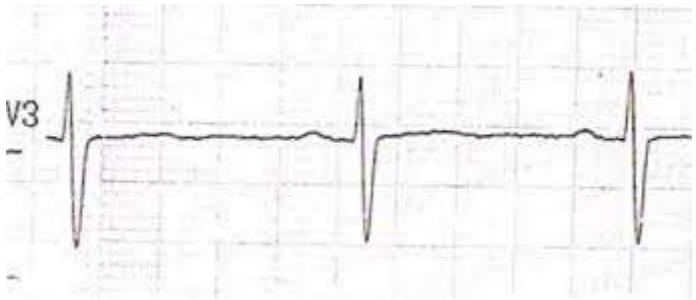
# Clinical Manifestations

- Fatigue and lethargy , Weight gain , complaints of cold hands and feet
- unable to tolerate cold and desires increased room temperature
- Reduced attention span; impaired short-term memory
- Severe constipation , swelling in hands, feet, and eyelids
- Hair thins; loss of the lateral one-third of eyebrow
- Decreased libido
- Neurologic signs—polyneuropathy, cerebellar ataxia, muscle aches or weakness, clumsiness, prolonged deep tendon reflexes (especially ankle jerk)
- cardiomegally
- **In severe hypothyroidism**—hypotension, unresponsiveness, bradycardia, hypoventilation, hyponatremia, (possibly) convulsions, hypothermia, cerebral hypoxia, and myxedema
- High mortality rate in the case of severe hypothyroidism (myxedema coma)

# Diagnostic Evaluation

- Low T3 and T4 levels
- Elevated TSH levels in primary hypothyroidism
- Elevation of serum cholesterol
- Electrocardiogram (ECG)—sinus bradycardia, low voltage of QRS complexes, and flat or inverted T waves



# Management / Nursing intervention

- hormone replacement
- vital sign
- cardiac examination
- Patient Education/ Health Maintenance

1. Thyroid hormone replacement therapy is a life-long treatment.
2. How and when to take medications???
3. Signs and symptoms of insufficient and excessive medication;
4. having blood evaluations periodically to determine thyroid levels
5. Energy conservation techniques and need to increase activity gradually
6. Fluid intake and use of fiber to prevent constipation
7. Control of dietary intake to limit calories and reduce weight

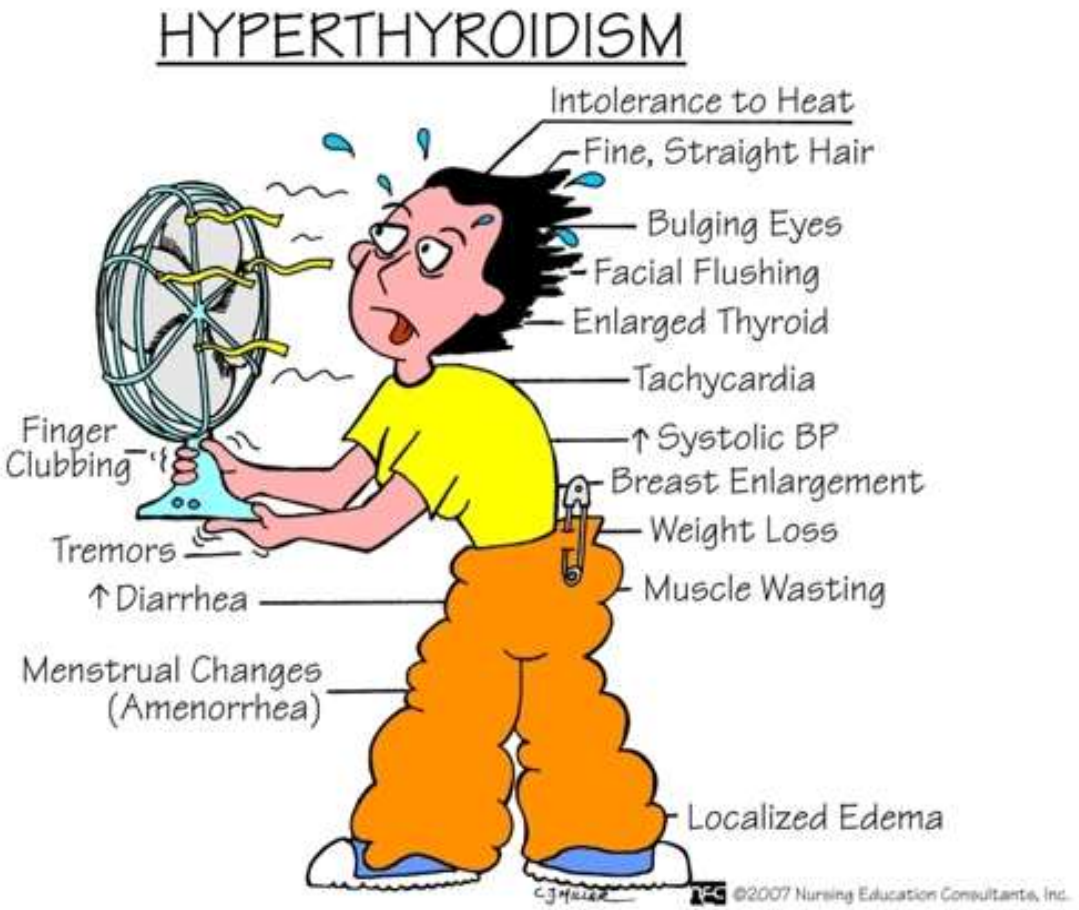
# HYPERTHYROIDISM

- This hypermetabolic condition is characterized by excessive amounts of thyroid hormone in the bloodstream.
- More common in women than in men.
- Graves' disease : diffuse hyperfunction of the thyroid gland with autoimmune etiology and associated with ophthalmopathy; most common in younger women; may subside spontaneously.

# Pathophysiology/Etiology

- Thyroid-stimulating antibody (TSAb), an immunoglobulin found in the blood of patients with Graves' disease, is capable of reacting with the receptor for TSH on the thyroid plasma membrane and stimulating thyroid hormone production and secretion.
- appear after an emotional shock, infection, or emotional stress.
- Hyperthyroidism ranges from a mild increase in metabolic rate to the severe hyperactivity known as thyrotoxicosis, thyroid storm, or thyroid crisis.
- Hyperthyroidism can also be the result of ingestion of excessive amounts of thyroid hormone medication .

# hyperthyroidism



# Clinical Manifestations

- Nervousness, emotional lability, irritability, apprehension , Difficulty in sitting quietly
- tachycardia at rest as well as on exertion (90 – 160B/min); palpitations
- Heat intolerance; profuse perspiration; flushed skin (eg, hands may be warm, soft, moist)
- Fine tremor of hands; change in bowel habits—constipation or diarrhea
- Increased appetite and progressive weight loss; frequent stools
- Muscle fatigability and weakness;
- Atrial fibrillation possible.
- **Bulging eyes (exophthalmos)**—produces a startled expression
- Thyroid gland may be palpable and a bruit may be auscultated over gland.

- **Thyroid storm or crisis**, an extreme form of hyperthyroidism, is characterized by hyperpyrexia, diarrhea, dehydration, tachycardia, arrhythmias, extreme irritation, delirium, coma, shock, and death if not adequately treated.

# Diagnostic Evaluation

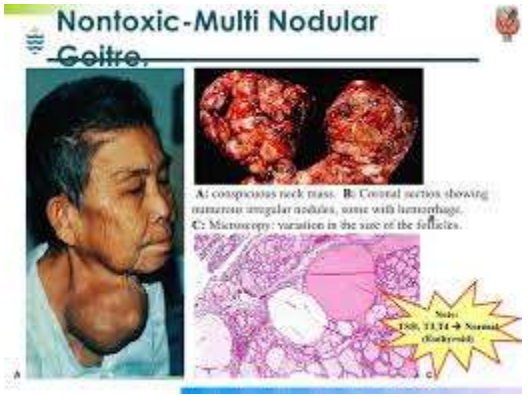
- Elevated T3 and T4
- Radioactive iodine uptake scan may be elevated or below normal depending on the underlying cause of the hyperthyroidism.

# Management

- Antithyroid drugs???, radiation, or surgery .
- Nodular toxic goiter —surgery or use of radioiodine is preferred.
- Thyroid carcinoma—surgery or radiation is used.
- Goal of therapy: To bring the metabolic rate to normal as soon as possible and maintain it at this level.
- Pharmacotherapy

## Thyroid carcinoma

## toxic goiter



# Nursing interventions

- Provide high-calorie foods and fluids consistent with the patient's requirements
- Avoid soap to prevent drying and use lubricant skin lotions to pressure points.
- Assess skin turgor, mucous membranes, and neck veins for signs of increased or decreased fluid volume.
- teaching about medications

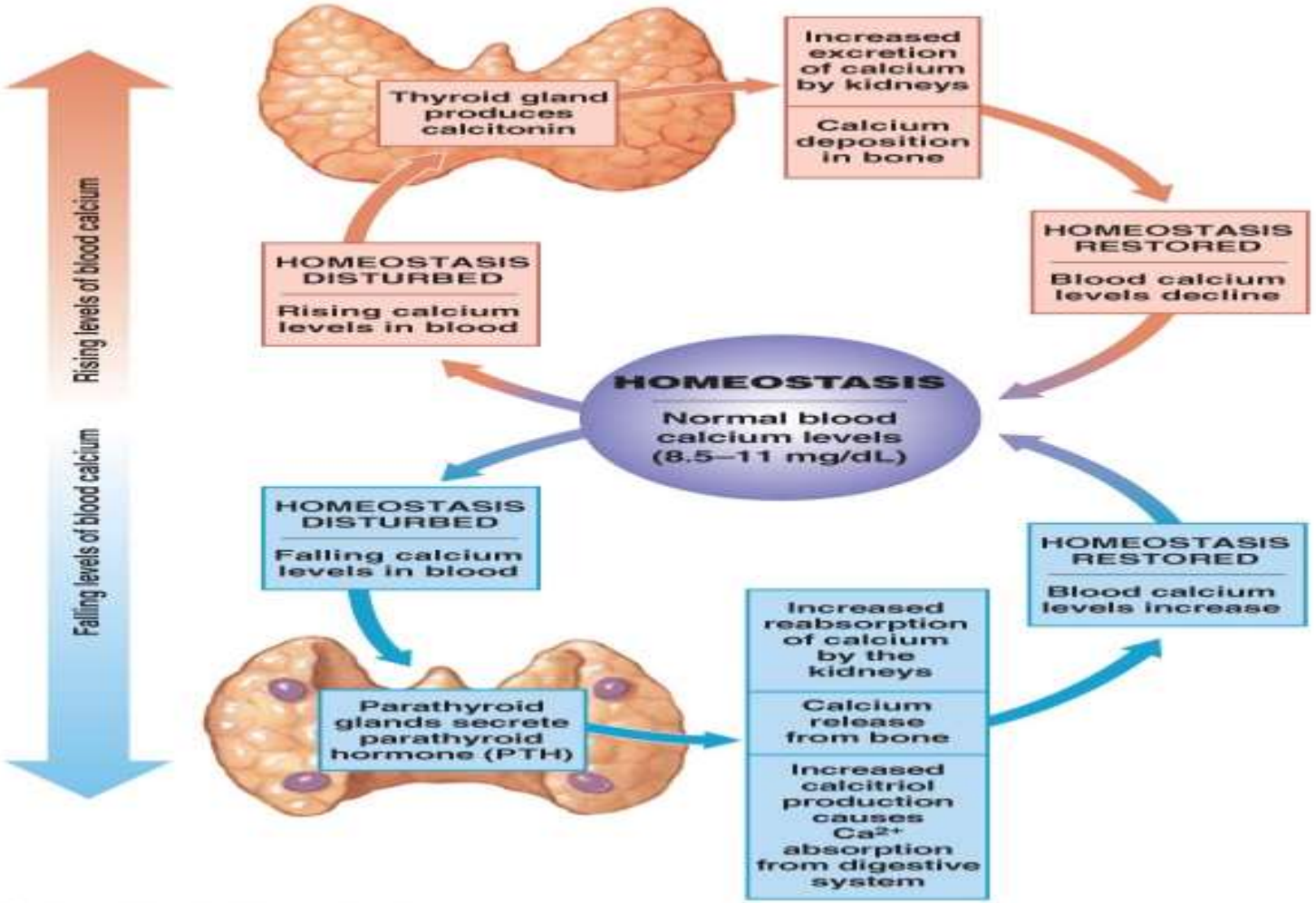
## Hypothyroidism

- Hair loss
- Inability to think clearly
- Goiter (enlarged thyroid)
- Reduced heart rate
- Strong fatigue
- Sensitivity to cold
- Dry skin
- Weight gain
- Puffiness
- Memory problems
- Constipation
- Irregular menstrual periods
- Severe PMS
- Depression, mood swings
- Joint, muscle pain
- High cholesterol

## Hyperthyroidism

- Hair loss
- Bulging eyes
- Goiter (enlarged thyroid)
- Heart palpitations
- Tremors
- Heat intolerance
- Sleep disturbances
- Weight loss
- Shortness of breath
- Diarrhoea
- Increased appetite
- Irregular menstrual periods
- Muscle weakness
- Sweating
- Anxiety, nervousness
- Depression, mood swings

The opposing effects of parathyroid hormone and calcitonin on calcium ion levels in body fluids



# HYPERPARATHYROIDISM

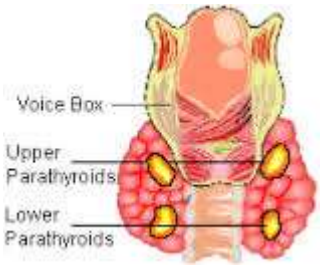
- Most common among women over the age of 50.

**Primary hyperparathyroidism**

- Single parathyroid adenoma is the most common cause (about 80% of cases).
- Parathyroid hyperplasia accounts for about 20% of cases.
- Parathyroid carcinoma accounts for less than 1% of cases.

**Secondary hyperparathyroidism**

- Primarily the result of renal failure



# Clinical Manifestations

- Decalcification of bones
- Skeletal pain, backache, pain on weight-bearing, pathologic fractures, deformities, formation of bony cysts
- Formation of bone tumors— overgrowth of osteoclasts
- Formation of calcium-containing kidney stones
- Depression of neuromuscular function
- The patient may drop objects, show general fatigue, loss of memory for recent events, emotional instability, changes in level of consciousness with stupor and coma.
- Cardiac arrhythmias, hypertension, cardiac standstill

# Diagnostic Evaluation


- Hypercalcemia (11 mg/100 mL).
- PTH levels are increased.
- alkaline phosphatase are elevated and hypophosphatemia.
- Skeletal changes are revealed by x-ray.
- Early diagnosis often is difficult. (Complications may occur before this condition is diagnosed.)
- (CT) will disclose parathyroid tumors more readily than x-ray.

# Management

**Treatment of Hypercalcemia**

1. Hydration (IV saline) and diuretics
2. Oral phosphate
3. Dietary calcium is restricted

**Treatment of Primary Hyperparathyroidism** Surgery for removal of abnormal parathyroid tissue

**Complications**:

- renal stones, calcification of kidney parenchyma, RF
- Ulceration of upper GIT leading to hemorrhage and perforation
- Demineralization of bones, cysts and fibrosis of marrow—leading to fractures, especially of vertebral bodies and ribs
- Hypoparathyroidism after surgery

# Nursing interventions

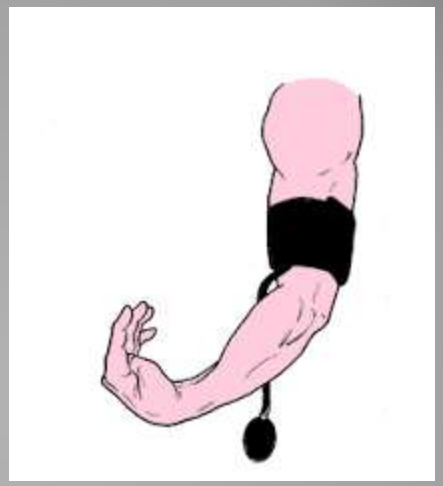
- Achieving Fluid and Electrolyte Balance
- Provide adequate hydration—administer water, and electrolytes orally or IV as prescribed.
- Promoting Urinary Elimination
- Increasing Physical Mobility

# HYPOPARATHYROIDISM

- common cause is accidental **removal or destruction of parathyroid** tissue or its blood supply during thyroidectomy or radical neck dissection for malignancy.
- **Decrease in gland function** (idiopathic Hypoparathyroidism); may be autoimmune or familial in origin
- **Malignancy or metastasis** from a cancer to the parathyroid glands
- Resistance to PTH action
- **inadequate PTH secretion**, there is decreased resorption of Ca from the renal tubules, decreased absorption of calcium in the GIT and decreased resorption of calcium from bone.
- **Blood calcium falls to a low level**, causing symptoms of muscular hyperirritability, uncontrolled spasms, and hypocalcemic tetany.
- In response to hypocalcemia and in the absence of PTH, the **phosphate rises and phosphate excretion by the kidneys decreases**

# Clinical Manifestations

- **Tetany:** muscular hypertonia; attempts at voluntary movement result in tremors and spasmodic; fingers classic tetanic position.
- **Chvostek's sign—a** spasm of facial muscles when muscles or branches of facial nerve are tapped
- **Trousseau's sign—carpopedal** spasm within 3 minutes after a BP cuff is inflated 20 mm Hg above the patient's systolic pressure



# C/M: cont

- Laryngeal spasm
- Severe anxiety and apprehension
- Renal colic
- **Dx Evaluation**
- Hyperphosphetemia
- Hypocalcemia
- Low PTH: normal or elevated in pseudohypoparathyroidism
- **Management:**
- **IV Calcium** slowly. It is highly irritating, and causes thrombosis; patient experiences unpleasant burning flush of skin and tongue.
- **Treat kidney stones**
- **Monitor blood calcium** level periodically; variations in vitamin D may affect calcium levels.