

Hyperthyroidism

Dr Piyush Tailor
Associate Professor

Dr Piyush Tailor

Etiology

1 Grave's disease

- Autoimmune disease
- Antibodies to TSH receptors
- Associated with other autoimmune diseases

2 Toxic multi-nodular goiter

3. Toxic adenoma

- More common in young patients

4 Subacute Thyroiditis

- Due to leakage of hormones
- Follows Viral infection
- Hashimoto's thyroiditis
- Postpartum

Etiology

5 Treatment Induced Hyperthyroidism

- Excess iodine
- Exposure to radiographic contrast media
- Medication – Amiodarone
- Ingestion of excess thyroxin to lose weight

6 Tumor

- Thyroid cancer
- Ovarian tumor that produces thyroid hormone
- TSH secreting tumor

Cardinal Features in Hyperthyroidism

- Weight Loss with increase appetite
- Diarrhea
- Tremor
- Exophthalmus

- Led Lag
- Muscle Weakness
- Irritable behaviour
- Tachycardia
- In female menorrhagia
- Heat intolerance

Clinical symptoms

Skin

- ✓ Warm
- ✓ Erythematous
- ✓ Sweaty and heat intolerance
- ✓ Hyperpigmentation
- ✓ Due increase ACTH secretion
- ✓ Thinning of hair

Respiratory System

- ✓ Dyspnea on rest
- ✓ Exertion, Fatigue
 - ✓ Due Oxygen consumption and CO₂ production increases.
- ✓ Respiratory muscle weakness
- ✓ Decreased exercise capacity

GI System

- ✓ Weight loss
- ✓ Diarrhea
- ✓ Polyphagia

Eyes

- ✓ Exophthalmus
 - ✓ Due to Inflammation of extraocular muscles, orbital fat and connective tissue.
- ✓ Periorbital Edema
- ✓ Conjunctival edema
- ✓ Lid Lag
- ✓ Corneal ulceration

Psychiatric

- ✓ Irritability
- ✓ Anxiety
- ✓ Decreased concentration
- ✓ Insomnia

Clinical symptoms

Genito-Urinary System

- ✓ Oligomenorrhea
- ✓ Amenorrhea
- ✓ Anovulatory infertility
- ✓ Gynecomastia
- ✓ Decreased libido
- ✓ Erectile dysfunction
- ✓ Decreased sperm count

Neuromuscular System

- ✓ Tremors - outstretched hand
- ✓ Hyperactive tendon reflexes

Skeletal System

- ✓ Osteoporosis
- ✓ Fractures

Dr. Vijaysh Tailor

Exophthalmus With Led Lag



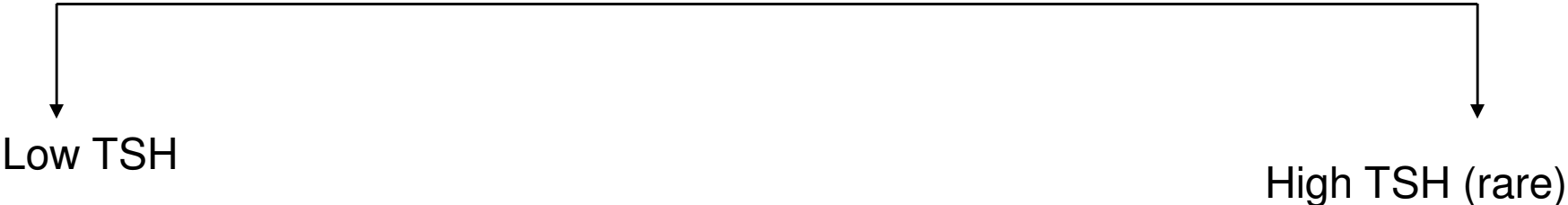
Diagnosis

- TSH
- Thyroxin Binding Globulin
- Free T3 & Free T4 level
- Radio-Iodine Uptake Scan
- Thyroid Stimulating Antibody
- TSH receptor-binding inhibitory immunoglobulins (TBII)
- Antithyroglobulin antibodies (Anti-Tg Ab)
- Antithyroid peroxidase antibody (Anti-TPO Ab).
- Ultra Sonography
- FNAC

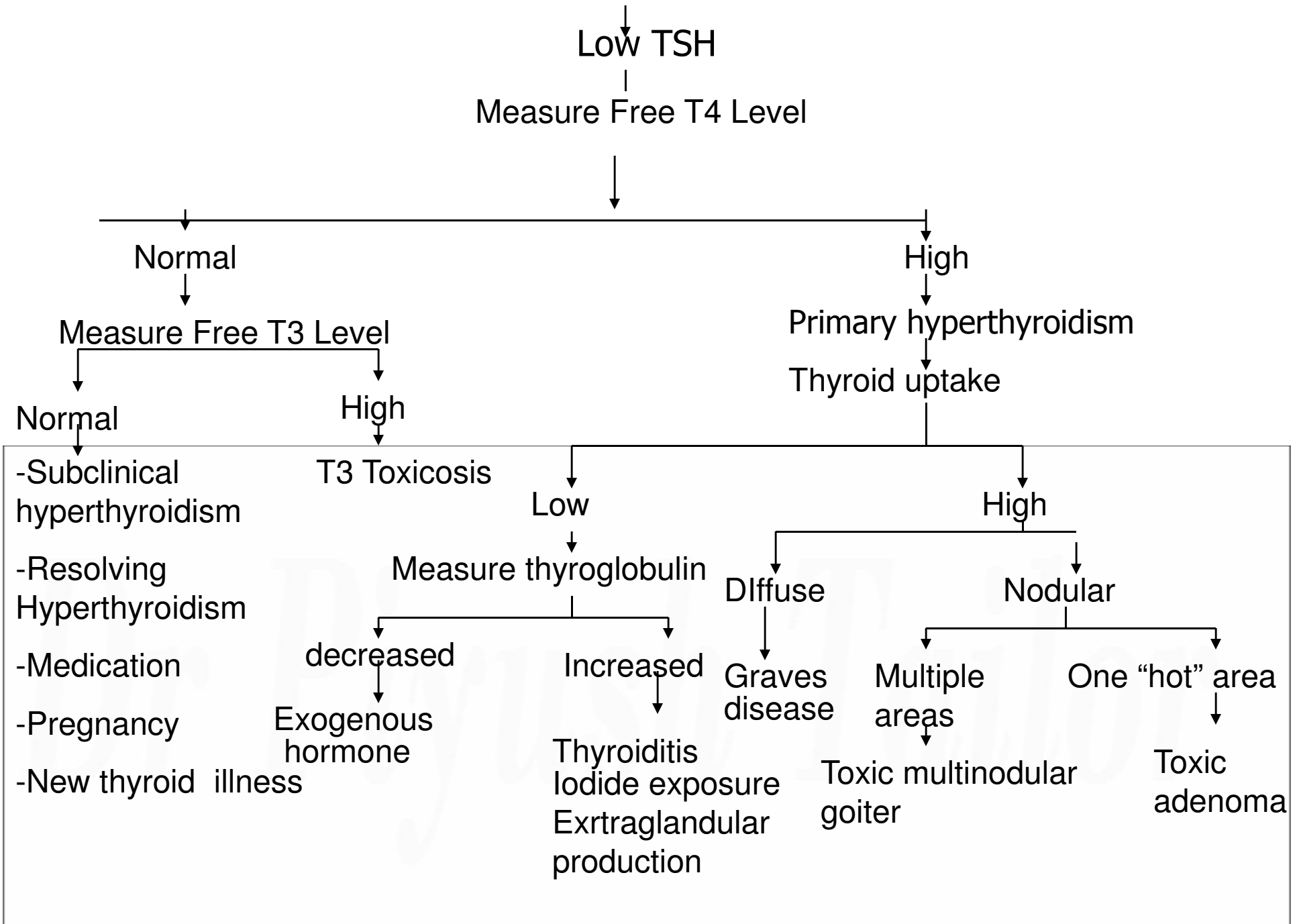
Signs and symptoms of hyperthyroid



TSH level



Dr Piyush Tailor



Differential Diagnosis

- Tuberculosis
- Malabsorption Syndrome
- Cardiac Disease
- Muscular Dystrophy
- Psychiatric disorder

Dr Piyush Tailor

Treatment

- Anti-thyroid drugs
 - Methimazole
 - Carbimazole
 - Propylthiouracil
- Beta Blocker
 - Propranolol

- Radioactive iodine
- Surgery
- Adjuvant therapy for
 - Exophthalmus
 - Cardiac complication
 - Muscle wasting

- **Beta-blocker and iodides are adjuncts to above treatment**

Anti-thyroid Drugs

Carbimazole / Methimazole

Interfere with organification of iodine

Suppress thyroid hormone levels

Contraindicated in Pregnancy

Drug of choice = because of :

- Low cost
- Long half life
- Can be given in conjunction with beta-blocker
- Beta-blockers can be tapered off after 4-8 weeks of therapy

Mechanism of Methimazole

- Inhibits the enzyme Thyroperoxidase
- Which oxidizing the anion iodide (I^-) to iodine (I_2)

Anti-thyroid Drugs

Propyl Thiouracil

- Preferred for Pregnant patients
- Dose 100 mg TDS
- Maintenance 100-200 mg/day
- Routine WBC monitoring require
- Advised to stop drug if they develop sudden fever or sore throat

Complications

- Agranulocytosis
- Mostly reversible with supportive Tx
- **Mechanism of Propyl Thiouracil :**
- Inhibits the enzyme Thyroperoxidase
 - Which oxidizing the anion iodide (I^-) to iodine (I_2)
- Inhibiting the enzyme 5'-deiodinase (tetraiodothyronine 5' deiodinase)
 - which converts T_4 to the more active form T_3

Beta Blockers

- Propranolol widely used
- Prompt relief of adrenergic symptoms
- Start with 10-20 mg q6h
- Increase progressively until symptoms are controlled

Dr Piyush Tailor

Iodides

- Blocks peripheral conversion of T4 to T3.
- Inhibits hormone release.
- Not used for routine treatment because it can increase hormone release with prolonged use

Indication :

- When Beta blockers does not reduces symptoms
- Decrease vascularity before surgery

Dr Piyush Tailor

Radioactive Iodine

Advantage :

- Highly effective & Treatment of choice
 - Grave's disease
 - Toxic nodular goiter
- Inexpensive
- Highly effective
- Easy to administer

Disadvantage :

- Higher dose increases chance of hypothyroidism

Safety Precaution

- It eliminated from urine, saliva and feces in 4-8 weeks.
- Have double flushing of toilet
- Frequent hand washing for several weeks
- No close contact with children and pregnant patients for 48-72 hours

Surgery

- Radioactive iodine has replaced surgery for Tx of hyperthyroidism
- Subtotal thyroidectomy is most common
- This limits incidence of hypothyroidism to 25%
- Total thyroidectomy in large goiter or severe disease

Dr Piyush Tailor

New Treatment

- Endoscopic subtotal thyroidectomy
- Embolization of thyroid arteries
- Plasmaphoresis
- Percutaneous ethanol injection into toxic nodule

Dr Piyush Tailor