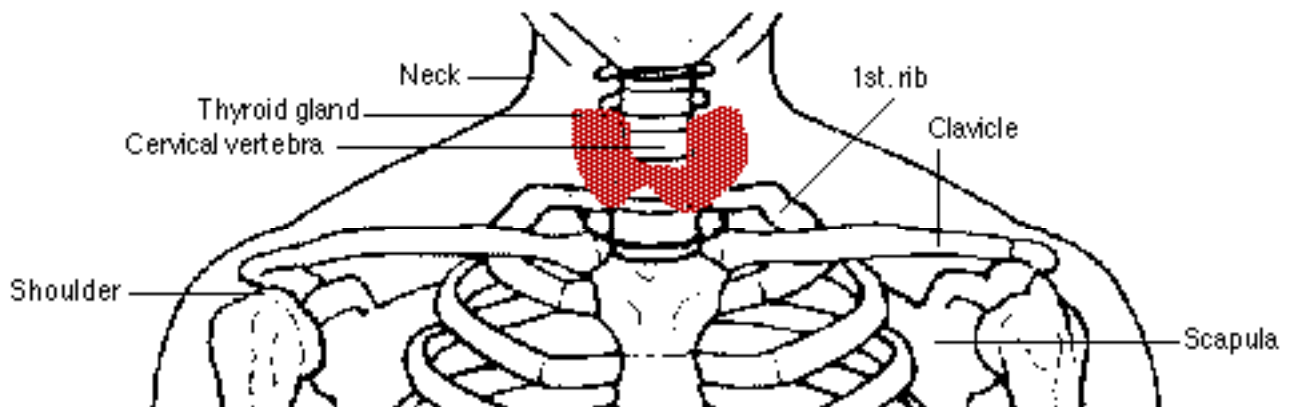


# THYROID DISEASES

Year 2

## THYROID ANATOMY AND PHYSIOLOGY

The thyroid gland controls the rate with which the whole body functions, the rate at which it converts food into energy (metabolism), and the rate of development in adolescence. It is situated at the front of the throat just below the Adam's apple. The gland consists of two wings, rather like a butterfly, one on each side of the windpipe, joined by a narrow isthmus of tissue.



**LOCATION OF THYROID GLAND AT FRONT OF NECK**

To carry out its functions, the thyroid produces the hormone thyroxine. Thyroxine contains iodine, and a certain amount of iodine must be included in the diet to ensure the proper functioning of the thyroid. The amount of iodine required is only small and most normal diets contain enough, especially if iodised salt is used.

The activity of the thyroid gland itself is regulated by the pituitary gland at the base of the brain which produces thyroid stimulating hormone (TSH) and long acting thyroid stimulating hormone (LATS) in response to the amount of thyroxine circulating in the blood. LATS acts as a modulator to prevent rapid changes in thyroxine levels.

Embedded within the thyroid gland are the parathyroid glands, which help regulate the level of calcium in the blood.

## THYROXINE

Thyroxine (T<sub>4</sub>) is the main hormone produced by the thyroid gland. The other significant thyroid hormone is tri-iodothyronine (T<sub>3</sub>).

Thyroxine controls the rate at which every cell in the body functions - high levels increase the rate, low levels decrease it. The amount of thyroxine in the blood can be measured in several ways.

The total thyroxine is a blood test that is a direct measure of all the thyroxine circulating in the blood. The normal range is 64 to 160 nmol/L (5 to 13  $\mu$ g/100 mL).

**Higher** than normal results may indicate the presence of idiopathic hyperthyroidism (Graves' disease - over active thyroid gland), pregnancy, severe infections, excessive vomiting, high altitudes, an inherited trait, acute psychiatric conditions, stress and the use of drugs such as oral contraceptives, frusemide, amiodarone and amphetamines.

**Low** levels may be found in patients with hypothyroidism (under active thyroid gland), nephrotic syndrome (kidney failure), chronic disease, pregnancy, drug use (eg. aspirin,

## THYROID DISEASES

amiodarone, steroids, frusemide, diazepam, lithium, sulfamethoxazole/trimethoprim, phenytoin) and in the elderly.

The free thyroxine test (free T4) measures the amount of thyroxine directly affecting the cell. The normal range for free thyroxine in the blood is 10 to 25 pmol/L (0.8 to 2.0 ng/100 mL).

These result can be varied up or down by steroid medication.

### THYROXINE AS MEDICATION

Thyroxine is also available in tablet form and commonly marketed as Oroxine. In this form it is used for the treatment of an under active thyroid gland (hypothyroidism) and thyroiditis in doses between 50 $\mu$ g. and 250 $\mu$ g. a day. Lower than average doses are necessary in the elderly. Hypothyroidism is common in middle age, particularly in women.

As it is a naturally occurring hormone, thyroxine is safe to use in pregnancy, breastfeeding and children, but it should be used with caution in heart disease, diabetes insipidus and high blood pressure. Do not use it if suffering from angina, an over active thyroid gland (hyperthyroidism) or a recent heart attack.

Side effects only occur with overdosage, but thyroxine may interact adversely with coumarin anticoagulants (eg. warfarin), barbiturates, narcotics, catecholamines, insulin, tricyclic antidepressants, digoxin, corticosteroids, colestipol, phenytoin and the herbs horseradish, kelp and myrrh.

An overdose is serious as it may cause a rapid heart rate, irregular heart beat, angina, restlessness, anxiety, tremor, headache, diarrhoea, vomiting, rapid breathing, fever, a heart attack and death.

## SYMPTOMS OF THYROID DISEASE

If diseased, the thyroid gland may produce too much, too little, or even a normal amount of the hormone thyroxine.

The symptoms will depend primarily on the thyroxine level. If the production of thyroid hormones is too much or too little, the metabolic rate will be either too fast or too slow. If the variation is too far removed from normal, serious disorders may result.

### EXCESS THYROXINE

If too much hormone is produced, the patient will have symptoms such as :-

- hyperactivity
- insomnia
- palpitations
- hand tremors
- excess sweating
- warm skin
- nervousness
- heat intolerance
- weight loss
- diarrhoea
- tachycardia
- proptosis (exophthalmos)
- sometimes severe emotional disturbance.
-

## THYROID DISEASES

### LACK OF THYROXINE

The reverse occurs if too little thyroxine is produced. Everything will slow down and the symptoms may include:-

- tiredness
- weakness
- cold intolerance
- constipation.
- dry skin
- muscle cramps
- hoarseness
- hair loss and thinning
- brittle nails
- weight gain
- dyspnoea
- tongue thickening
- bradycardia

Some children are born without an adequate thyroid gland, in which case they will be subnormal physically and mentally in the condition known as **cretinism**. This is routinely tested for shortly after birth, usually before the newborn leaves the hospital. The condition is then treated, and the children grow up normally and unaffected by cretinism. It is one of the most important screening tests of the newborn, as the consequences of not detecting and treating this condition are very serious.

## SIGNS OF THYROID DISEASE - EXAMINATION

A sign is clinical evidence of a disease or deformity.

A lump, fever, rash, noise or unusual appearance, are all signs.

See Additional Information section of these notes for details of these signs.

### Goitre

A goitre is an enlarged thyroid gland. It may be due to an under or (more commonly) overactive gland, or to a lack of iodine in the diet.

### Hypothyroidism

Hyporeflexia, bradycardia, hypotension, myxoedema, onycholysis, Pemberton's sign, pleural effusion, precocious puberty, shifting dullness (ascites), Hertoghe sign, Osler's sign.

### Hyperthyroidism

Abnormal reflexes, bounding pulse, cachexia, exophthalmos, fasciculation, atrial fibrillation, hypertension, mydriasis, Pemberton's sign, onycholysis, spider naevi, systolic murmur, tachycardia, thyroid glitter, postural tremor, water-hammer pulse.

# INVESTIGATION OF THYROID DISEASE

See Additional Information section of these notes for details of these tests.

## If you suspect hypothyroidism, then tests to consider include -

S.TSH (H)

If TSH abnormally high, or if still suspicious on clinical grounds, then further information can be obtained from S.T<sub>4</sub> (L), S.free thyroxine (L), T<sub>3</sub> uptake (L), FTI (L), S.carotene (H)

## If you suspect hyperthyroidism (thyrotoxicosis), then tests to consider include –

S.TSH (L)

If TSH abnormally low, or if still suspicious on clinical grounds, then further information can be obtained from S.free thyroxine (H), total T<sub>4</sub>(H), S.triiodothyronine [T<sub>3</sub>] (H), S.anti-TSH receptor antibodies (+), FTI (H), S.thyroid microsomal autoantibodies (+), S.thyrotropin receptor antibodies (+ or -)

Commonly used thyroid pathology tests include :-

### Free Thyroxine Index [FTI]

RI: 17 - 50

Ind: Thyroid dysfunction

Int: HIGH - Hyperthyroidism (T<sub>3</sub>, T<sub>4</sub>?)

LOW - Hypothyroidism (T<sub>3</sub>, T<sub>4</sub>?)

Phys:  $FTI = T_4 \times T_3 \text{ uptake}/100$

### T<sub>4</sub>, Serum

#### (Total Thyroxine)

RI: 64-160 nmol/L (5-13 µg/100 mL)

Ind: Thyroid dysfunction

Int: LOW - Hypothyroidism(T<sub>3</sub>?), nephrotic syn., chronic disease, drugs (eg. aspirin, steroids, frusemide, diazepam, lithium, sulfamethoxazole/trimethoprim)

HIGH - Hyperthyroidism (T<sub>3</sub>?), pregnancy, Graves' disease, severe infections, hyperemesis, high altitudes, familial, acute psychiatric conditions, stress, drugs (eg. oral contraceptives, amiodarone, amphetamines)

Phys: Direct measure of total circulating thyroxine

See also *Thyroxine, Free, Serum*

### Thyroid Stimulating Hormone, Plasma [TSH]

RI: 0.2-4.0 mU/mL

Ind: Thyroid disorders

Int: HIGH - Hypothyroidism, autoimmune thyroid disease, iodine deficiency goitres, lithium therapy

LOW - Excess hormone replacement, thyrotoxicosis (T<sub>4</sub>?), pituitary disease, early pregnancy

LOW AFTER 200 µg TRF IMI - Steroid therapy, primary hyperthyroidism

Phys: Produced in anterior pituitary. 200 µg IMI of thyrotropin releasing factor normally causes a rise of TSH to 2 x initial level

### Thyroxine, Free, Serum (Free T<sub>4</sub>)

RI: 10-25 pmol/L (0.8-2.0 ng/100 mL)

Ind: Thyroid gland dysfunction

Int: HIGH - Hyperthyroidism, thyroiditis, stress, drugs (eg. frusemide, amiodarone, amphetamines)

LOW - Hypothyroidism, pregnancy, elderly, drugs (eg. phenytoin)

Phys: Measures the level of thyroxine affecting the cell. Varied by steroid therapy

See also *T<sub>4</sub>, Serum*

## THYROID DISEASES

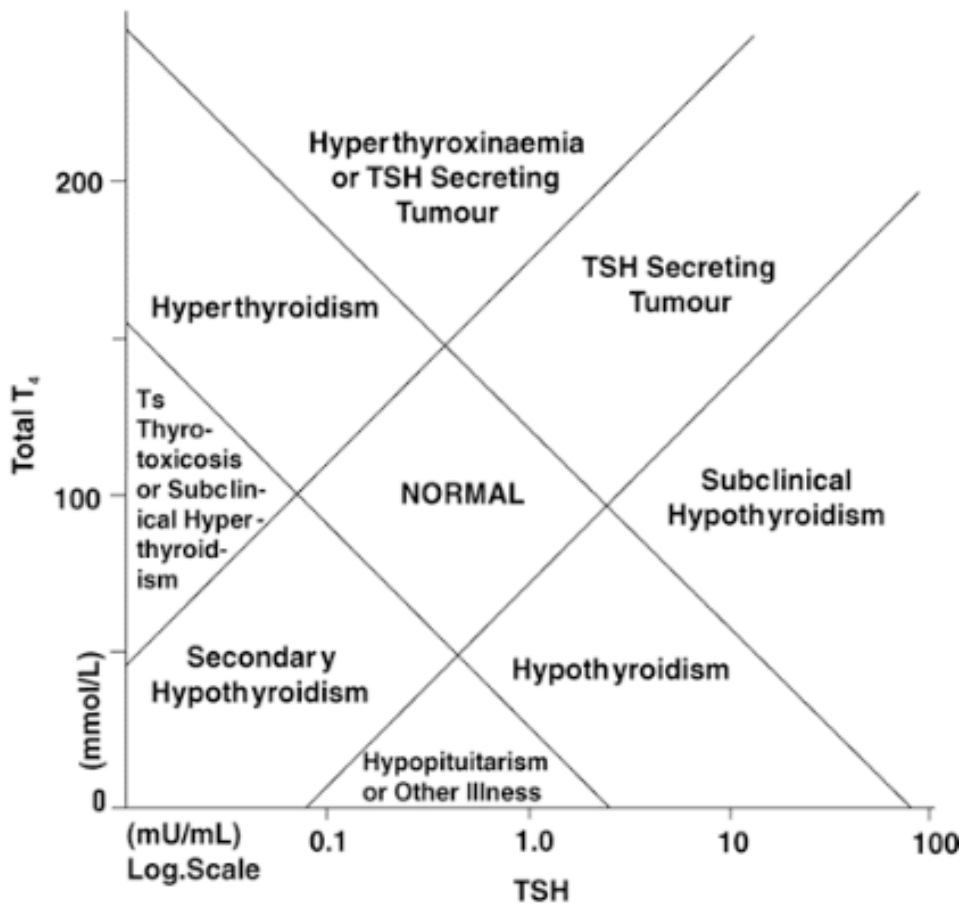
The following table and graph makes thyroid test interpretation easier:-

### Thyroid Function Tests

Parameter	Hyperthyroidism	1° Hypothyroidism	2° Hypothyroidism
FTI	H	L	L
T4 total	H	L	L
T4 free	H	L	L
T3 total	H	L or N	L or N
T3 free	H	L or N	L or N
TSH	L	H	N or L

L = low H = high N = normal

### Thyroid Function Test Interpretation



# THYROID DISEASES

## Hypothyroidism

The most common disease of the thyroid gland is underactivity, and reduced production of thyroxine. If the level of thyroxine is low, cells throughout the body function at a less than normal rate. In children, hypothyroidism causes cretinism.

The thyroid gland tends to fail with advancing age, particularly in women, it may be associated with an enlarged thyroid gland (goitre), and less commonly cysts or tumours may destroy the gland tissue.

Tiredness, weakness, muscle cramps, constipation, dry skin, headaches, nervousness, intolerance to cold weather and a hoarse voice are the most common symptoms. In more severe cases additional symptoms may include thinning of the hair, skin thickening, brittle nails, weight gain, shortness of breath, a thick tongue and a slow heart rate. The more severe symptoms are referred to as myxoedema. The drop in thyroxine levels is usually gradual over many years and the symptoms may be overlooked until the disease is quite advanced. It is diagnosed by blood tests that measure the amount of thyroxine, and other thyroid-related substances.

### TREATMENT

Thyroxine or liothyronine tablets are taken long term to replace that not being produced by the gland. Caution must be used with angina or cardiac failure.

Patients usually notice a remarkable improvement in their quality of life as the thyroxine replacement tablets start to work.

The thyroxine levels should be monitored regularly.

With adequate treatment the patient should lead a normal active life, but untreated, there is an increased risk of developing severe infections and heart failure, and premature death will occur.

## Hyperthyroidism

Hyperthyroidism is overactivity of the thyroid gland. More severe forms may be called **thyrotoxicosis**, **Grave's disease** or **Basedow's goitre**.

The most common cause is an autoimmune disease, in which antibodies attack the thyroid gland and over stimulate it, but there are numerous other rarer causes (Eg. autonomous adenomas – Plummer's disease; pituitary TSH secreting tumours; thyroxine secreting tissue within a teratoma; overdosing with thyroxine supplements; trophoblastic tumour of pregnancy).

Patients sweat excessively, lose weight, are nervous, tired, cannot tolerate hot weather and have a mild diarrhoea. Other effects include a rapid heart rate, slightly protruding eyes, warm skin, and a slight tremor. Patients also tend to fidget, dart quickly in their activity, and speak rapidly. The thyroid gland may be grossly enlarged (a goitre) or normal size.

The complications are serious. The weight loss and muscle wasting may become permanent, liver damage and heart failure may be fatal, psychiatric disturbances may lead to hospitalisation, eye scarring may lead to blindness, and infertility may occur.

The level of thyroxine and gland activity can be measured by blood tests, antibodies (eg. TRAB) can be detected in the patient's blood and abnormalities may also be seen on an electrocardiogram (ECG).

### TREATMENT

The overactivity can only temporarily be controlled by medication (eg. carbimazole, propylthiouracil, propranolol), but a cure can be obtained by surgically removing most of the thyroid gland or destroying it by giving the patient radioactive iodine (sodium iodide or iodine

## THYROID DISEASES

131), which concentrates in the gland as it is an essential component of thyroxine. Because there is usually insufficient thyroid gland left behind after these procedures to produce adequate amounts of thyroxine, it is necessary for most patients to take thyroxine tablets on a daily basis.

If treated early, the prognosis is excellent, but if treatment is delayed until complications occur the outcome is far less favourable.

### Thyroid carcinoma

There are several different types of cancer (carcinoma) of the thyroid gland. Their cause is unknown, but they are more common in elderly women. Cancers may also spread from other organs to the thyroid.

The cancer is usually felt as a painless lump in the gland that steadily enlarges. It does not normally interfere with the workings of the gland until it is very advanced, and there are no other symptoms in the early stages. An advanced cancer may spread to surrounding lymph nodes, bone, liver and other organs. Any hard lump in the thyroid gland is considered to be a cancer until proved otherwise.

The proof usually involves scanning the thyroid gland with radioactive iodine, an ultrasound scan, taking a biopsy of the lump, or removing the lump surgically. It cannot be detected by a blood test.

#### TREATMENT

Surgery to remove the gland (thyroidectomy) is the main treatment. Irradiation (eg. using sodium iodide) and cytotoxic drugs may be added in some cases.

Several different types of cancer occur in the thyroid, and outcome will depend upon the type present. Anaplastic carcinoma of the thyroid has the worst prognosis and usually proceeds rapidly to death, while papillary tumours are rarely fatal.

### Thyroiditis

Thyroiditis is any inflammation or infection of the thyroid gland. The most common type is Hashimoto thyroiditis, while others include de Quervain thyroiditis and Riedel thyroiditis (see below).

#### Bacterial thyroiditis

Suppurative thyroiditis is a rare disorder caused by a bacterial infection of the gland.

#### de Quervain thyroiditis

de Quervain thyroiditis (or subacute thyroiditis) is a relatively common form of thyroid gland inflammation that occurs most commonly in women between 25 and 45, and is thought to be the result of a **viral infection**.

Patients experience painful swelling of the thyroid gland, pain around the neck to the ears, difficulty in swallowing and symptoms of **hyperthyroidism** such as rapid heart rate and excess sweating.

The condition is diagnosed by blood tests and biopsy of the thyroid gland, but there is no specific cure available. Aspirin usually relieves the pain and swelling, and propranolol controls the thyrotoxicosis. Complications may include heart damage from the excess production of thyroid hormone.

Satisfactory control of the thyroid inflammation is usually possible, and it settles spontaneously with time.

## THYROID DISEASES

### Riedel thyroiditis

Riedel thyroiditis is a rare form of inflammation involving the thyroid gland. The normal structure of the thyroid is replaced by **hard fibrous scar tissue** for no known reason.

The gland becomes irregularly enlarged, inadequate thyroid hormone is produced (**hypothyroidism**) and the patient develops a slow heart beat, dry skin, cold intolerance and other symptoms of hypothyroidism (thyroid failure). Other effects are caused by the enlargement of the gland and include difficulty in swallowing, shortness of breath and hoarseness, and it is often associated with other widespread organ damage. It is diagnosed by blood tests and thyroid gland biopsy.

Treatment is satisfactory and involves partial removal of the gland by surgery and taking thyroid hormone tablets long term.

### Hashimoto thyroiditis

Hashimoto thyroiditis is an inflammation of the thyroid gland that occurs for no known reasons, but is possibly an **autoimmune disease**. It may occur at any age, but tends to run in families and is far more common in women.

Patients have a gradual enlargement of the thyroid gland (goitre) over many months or years, and the gland becomes firm, but not tender or painful. Many patients have no other symptoms, and the gland enlargement may be barely noticeable, but in others the gland may gradually cease to function and the patient becomes tired, listless and has other symptoms of **hypothyroidism**. A rapidly progressive form of the disease is also known.

Its diagnosis is made by blood tests (eg. antithyroid peroxidase antibodies) and treated by taking thyroid hormone tablets (thyroxine) on a daily basis indefinitely. The long-term outcome is usually very good with normal life expectancy.

## Thyroid storm

A thyroid storm is a critically dangerous, but rare over activity, of the thyroid gland in which large amounts of the thyroid hormone (thyroxine) are released into the bloodstream (**thyrotoxicosis**). A thyroid storm may be caused by thyroid **infection** or **injury**, or may occur for no apparent reason. Patients have a very high fever, rapid pulse, rapid breathing, general irritability, a feeling of terror, become delirious, develop heart failure and die. Urgent hospitalisation is essential.

Treatment involves IV fluids, IV propranolol and IV steroids.

## Cretinism

Cretinism is **hypothyroidism** (under active thyroid gland) in a child, a condition that occurs in one in every 4000 births. It may be due to congenital aplasia of the thyroid.

In cretinism, the thyroid gland fails to function correctly from birth to cause impaired brain development and intellectual disability (which may be severe). It is diagnosed by specific blood tests that are routinely performed on all babies at birth.

Thyroxine tablets or mixture control the problem, but there may be some degree of brain damage due to lack of thyroxine in the foetus before birth. Most cretins can function normally in society with their intelligence and functional capacity only slightly below average. No further deterioration occurs once treatment is started.



# DIFFERENTIAL DIAGNOSES OF THYROID DISEASES

Other diseases that may be confused with thyroid disease.

## **Hypothyroidism**

Pernicious anaemia, hypopituitarism, nephritis, uraemia, psychoses.

## **Hyperthyroidism**

Anxiety states, hepatic cirrhosis, myasthenia gravis, phaeochromocytoma, thyroid neoplasia, congestive cardiac failure (CCF), atrial fibrillation, myocarditis, pericarditis, rheumatic fever, psychoses

## **CURIOSITY**

### ***BRISSAUD DWARF***

*Short stature due to an underactive thyroid gland (hypothyroidism) in childhood is called Brissaud dwarfism.*

# ADDITIONAL INFORMATION

## THYROID PATHOLOGY TESTS

Not essential to be known by a medical student, but may be useful for reference.

RI = Reference Index (normal values)      Ind = Indication for performing test  
Int = Interpretation of test result      Phys = Physiology of test

### Anti-Microsomal Antibodies

See Thyroid Microsomal Autoantibody Titre, Serum

### Anti-Thyroglobulin Antibody, Serum (Thyroglobulin Antibody)

RI: <60 U/mL

Ind: Thyroid disease

Int: HIGH - Hyperthyroidism (25% of cases), autoimmune thyroiditis, thyroid carcinoma

### Anti-Thyroid Peroxidase Antibodies, Serum

RI: <60 U/mL

Ind: Thyroid disease

Int: HIGH - Inflamed thyroid gland, Hashimoto's thyroiditis, other autoimmune conditions affecting the thyroid

*See also Anti-Thyroglobulin Antibody, Serum*

### Anti-TSH Receptor Antibodies, Serum [TRAB]

RI: Negative

Ind: Thyroid disease

Int: POSITIVE - Graves' disease, thyrotoxicosis

Phys: TRAB are the autoantibodies that bind to the TSH receptor and activate it, causing the excess production of thyroid hormones in Graves' disease

### Calcitonin, Plasma

RI: < 27 pmol/L (<100 ng/L)

Ind: Thyroid and parathyroid disease

Int: HIGH - Thyroid carcinoma, primary hyperparathyroidism, pheochromocytoma, Cushing syn., multiple neuromas, carcinoid tumour, carcinomas of other organs (eg. liver, lung, breast, kidney).

Phys: Collect specimen mid-morning. Polypeptide hormone involved in regulation of calcium and bone metabolism

### Effective Thyroxine Ratio [ETR]

RI: 0.93 - 1.06 (93 - 106%)

Ind: Thyroid disease

Int: LOW - Hypothyroidism

HIGH - Hyperthyroidism

*See also Thyroxine, Free, Serum*

### LATS

See Long Acting Thyroid Stimulator Antibody, Serum

### Long Acting Thyroid Stimulator Antibody, Serum [LATS]

RI: Negative

Ind: Thyroid disease

Int: POSITIVE - Hyperthyroidism

Phys: May be normal in up to 40% of cases of thyrotoxicosis

## THYROID DISEASES

### Thyroglobulin Antibody, Serum

See Anti-Thyroglobulin Antibody, Serum

### Thyroglobulin, Serum

RI: <38µg/L

Ind: Thyroid inflammation or cancer

Int: HIGH - Thyroiditis, thyroid cancer, intrinsic thyrotoxicosis

Phys: Used to check for recurrence of thyroid cancer after total thyroidectomy

### Thyroid Antibodies, Serum

See Anti-Thyroid Peroxidase Antibodies, Serum; Anti-Thyroglobulin Antibody, Serum; Thyroid Microsomal Autoantibody Titre, Serum

### Thyroid Microsomal Autoantibody Titre, Serum (Anti-Microsomal Antibody Titre)

RI: <100

Ind: Thyroid disease

Int: HIGH - Hashimoto's thyroiditis, hyperthyroidism

### Thyrotropin Receptor Antibody, Serum

RI: Negative

Ind: Thyroid disease

Int: POSITIVE - Some cases of hyperthyroidism

### Thyrotropin Releasing Hormone Stimulation Test

RI: See table

Ind: Thyroid disease

Int: See table below:

Status	Base TSH	TSH after TRF	Base T4	T4 after TRF
Normal	N	H	N	H
Hyperthyroidism	L	L	H	H
Primary hypothyroidism	H	VH	L	L
Secondary hypothyroidism	N or L	N or L	L	L

N = normal H = high VH = very high L = low

Phys: Blood specimens for basal TSH and T4 thyroxine taken. 200 µg of TRF is given rapidly IV. Further samples for TSH testing are taken 20 and 60 minutes after injection

See also T4, Serum; Thyroid Stimulating Hormone

### Triiodothyronine, Free, Serum (Free T3)

RI: 4-8 pmol/L

Ind: Thyroid disease

Int: LOW - Hypothyroidism, sick euthyroid syn.  
HIGH - Thyroiditis

Phys: Only drops late in hypothyroidism

### Triiodothyronine, Total, Serum (Total T3)

RI: 0 to 5 years: 1.6-3.3 nmol/L

5 to 10 years: 1.5-3.0 nmol/L

> 10 years: 1.5-2.7 nmol/L

Ind: Thyroid disease

Int: HIGH - T3 thyrotoxicosis, hyperthyroidism

Phys: More sensitive test for hyperthyroidism than free thyroxine (free T4)

## SIGNS OF THYROID DISEASE

### **Bounding Pulse**

Full, exaggerated arterial pulsation due to thyrotoxicosis, fever, pregnancy, anaemia, other hyperkinetic circulatory states, drugs (eg. adrenaline)

Caused by vasodilatation and increased cardiac output that exaggerates peripheral pulsations

### **Exophthalmos (Proptosis)**

Exophthalmos is protrusion of the eyeballs within sockets. Marked amount of sclera visible above iris in normal forward vision

The causes include hyperthyroidism, cerebral tumour, optic or orbital tumour, Cushing's disease, cavernous sinus thrombosis, Hand-Schueller-Christian disease, pituitary tumours, osteomas, neurofibromatosis, Wegener's granulomatosis, metastatic carcinoma, xanthomas, malignant hypertension, uraemia, cellulitis, vascular malformation, lacrimal tumours, mucocele, rhabdomyosarcoma, Apert syn., Crouzon syn., Sturge-Weber syn.

The conditions cause an increase in the volume of orbital contents

### **Fasciculation, Muscular (Twitching)**

Fibrillary twitching of voluntary muscles visible through the skin. Exacerbated by tapping muscle bundles

May be caused by depolarising drugs, muscular dystrophies, amyotrophic lateral sclerosis, lower motor neurone lesions, motor neurone disease, poliomyelitis, Guillain-Barré syn., syringomyelia, hypocalcaemia, severe viral diseases, thyrotoxicosis, polymyositis

May occur without neurological cause.

Due to uncoordinated depolarisation of muscle fibres

### **Hertoghe Sign**

Lack of the outer one third of the eyebrow due to atopic dermatitis, neurodermatitis, hypothyroidism and systemic sclerosis.

### **Mydriasis**

Mydriasis is abnormal dilatation of pupils

Causes include being in the dark, hyperthyroidism, anxiety, iritis, traumatic or inflammatory adhesions, iris sphincter paralysis, iris dilator muscle spasm, syphilis, lead or carbon monoxide poisoning, post-seizure, botulism, diphtheria, syringomyelia, midbrain lesions, third nerve palsy, Parinaud syn., Tolosa-Hunt syn., Holmes-Adie syn., coma, drugs (eg. atropine, cocaine, amphetamines, cannabis)

It may be due to damage to or inhibition of the iris and its musculature or innervation

### **Myxoedema**

Myxoedema is a form of tissue swelling affecting the hands, feet, face and shins that occurs in severe cases of hypothyroidism (an underactive thyroid gland).

### **Onycholysis**

Distal separation of nail plate from nail bed and impaired viability of distal nail bed

Causes include trauma, chemicals, fungal infections, psoriasis, eczema, lichen planus, pemphigus, Raynaud's phenomenon, diabetes mellitus, other causes of impaired peripheral

## THYROID DISEASES

circulation, hypothyroidism, hyperthyroidism, SLE, iron deficiency, yellow nail syn., drugs (eg. tetracycline)

### **Osler's Sign**

Pretibial myxoedema due to severe hypothyroidism.

### **Pemberton's Sign**

When patient raises both hands above head, dyspnoea, vertigo, facial flushing, dysphagia and syncope occur due to a large intrathoracic goitre

Superior mediastinal pressure on the trachea, oesophagus and surrounding veins and arteries are the cause.

### **Thyroid Glitter**

A "glitter" of light in the eyes may be due to thyrotoxicosis. The cause is conjunctival oedema

### **Water-Hammer Pulse (Collapsing Pulse)**

With patient's hand raised as high as possible above head, a pulse is felt that appears to hammer at the examiner's fingers and then suddenly collapse

Causes include aortic incompetence, arteriovenous fistula (eg. patent ductus arteriosus), severe anaemia, ventricular septal defect, complete heart block, fever, thyrotoxicosis and vasodilatory drugs

It is due to a low diastolic pressure and subsequent flaccidity of arterial walls.

## **TOTALLY, COMPLETELY AND UTTERLY USELESS INFORMATION**

*Northwest Tasmania, around Burnie, has a lack of iodine in the soil. Many people living in this area in the nineteenth century developed goitres and were mentally slow as a result due to their chronic hypothyroidism. This may have been the source of the salacious rumour that Tasmanians are all a bit slow. The compulsory addition of iodine to salt and bread has prevented iodine deficiency in Australia since early in the twentieth century. Your lecturer was born in Burnie.*

### ADVERTISEMENT

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