

# Three mistakes of my life essay sample



**ASSIGN  
BUSTER**

The endocrine system is the system of glands, each of which secretes different types of hormones directly into the bloodstream to regulate the body. The endocrine system is an information signal system like the nervous system, yet its effects and mechanism are classifiably different. Hormones are substances (chemical mediators) released from endocrine tissue into the bloodstream where they travel to target tissue and generate a response. Hormones regulate various human functions, including metabolism, growth and development, tissue function, sleep, and mood. \* Endocrine system includes

- \* Hypothalamus
- \* Pineal body (epiphysis)
- \* Pituitary gland (hypophysis)
- \* Thyroid
- \* Adrenal glands
- \* Parathyroid
- \* Testes
- \* Ovaries

Among the above glands I am choosing thyroid gland for this project.

#### THYROID GLAND

The thyroid gland is one of the largest endocrine glands. The thyroid gets its name from the Greek word for “ shield”, due to the shape of the related thyroid cartilage. The thyroid gland is found in the neck, below the thyroid cartilage. The thyroid gland controls how quickly the body uses energy, makes proteins, and controls how sensitive the body is to other hormones. It does this by producing thyroid hormones, like triiodothyronine (T3) and

thyroxine also known as tetraiodothyronine (T4). These hormones regulate the rate of metabolism. The thyroid also produces calcitonin, which plays a role in calcium homeostasis. Hormonal output from the thyroid is regulated by thyroid-stimulating hormone (TSH) produced by the anterior pituitary, which itself is regulated by thyrotropin-releasing hormone (TRH) produced by the hypothalamus.

### ANATOMY OF THYROID GLAND

The thyroid gland is a butterfly-shaped organ and is composed of two cone-like lobes or wings, right lobe and left lobe, connected via the isthmus. The thyroid is one of the larger endocrine glands, weighing 2-3 grams in neonates and 18-60 grams in adults, and is increased in pregnancy. The organ is situated on the anterior side of the neck, lying against and around the larynx and trachea, reaching posteriorly the oesophagus and carotid sheath. It starts cranially at the oblique line on the thyroid cartilage and extends inferiorly to approximately the fifth or sixth tracheal ring. The thyroid gland is covered by a thin fibrous sheath, the capsula glandulae thyroidea, composed of an internal and external layer. The external layer is anteriorly continuous with the lamina pretrachealis fasciae cervicalis and posteriorolaterally continuous with the carotid sheath.

The gland is covered anteriorly with infrahyoid muscles and laterally with the sternocleidomastoid muscle. On the posterior side, the gland is fixed to the cricoid and tracheal cartilage and cricopharyngeus muscle by a thickening of the fascia to form the posterior suspensory ligament of Berry. In variable extent, Lalouette's Pyramid, a pyramidal extension of the thyroid lobe, is present at the most anterior side of the lobe. In this region, the recurrent laryngeal nerve and the inferior thyroid artery pass next to or in the ligament

and tubercle. The thyroid is supplied with arterial blood from the superior thyroid artery, a branch of the external carotid artery, and the inferior thyroid artery, a branch of the thyrocervical trunk, and sometimes by the thyroid ima artery, branching directly from the brachiocephalic trunk.

The venous blood is drained via superior thyroid veins, draining in the internal jugular vein, and via inferior thyroid veins, draining via the plexus thyroideus impar in the left brachiocephalic vein. Lymphatic drainage passes frequently the lateral deep cervical lymph nodes and the pre- and paratracheal lymph nodes. The gland is supplied by parasympathetic nerve input from the superior laryngeal nerve and the recurrent laryngeal nerve.

#### EMBRYOLOGY

In the fetus at 3–4 weeks of gestation, the thyroid gland appears as an epithelial proliferation in the floor of the pharynx at the base of the tongue between the tuberculum impar and the copula linguae. Over the next few weeks, it migrates to the base of the neck, passing anterior to the hyoid bone. During migration, the thyroid remains connected to the tongue by a narrow canal, the thyroglossal duct. Thyrotropin-releasing hormone (TRH) and thyroid-stimulating hormone (TSH) start being secreted from the fetal hypothalamus and pituitary at 18–20 weeks of gestation, and fetal production of thyroxine (T<sub>4</sub>) reach a clinically significant level at 18–20 weeks.

#### PHYSIOLOGY

The thyroid gland uses iodine (mostly available from the diet in foods such as seafood, bread, and salt) to produce thyroid hormones. The primary function of the thyroid is production of the hormones triiodothyronine (T<sub>3</sub>),

thyroxine (T4) which account for 99% and 1% of thyroid hormones present in the blood respectively, and calcitonin. Up to 80% of the T4 is converted to T3- the active hormone that affects the metabolism of cells. by peripheral organs such as the liver, kidney and spleen.

### Role of hormones

The thyroid hormones act on nearly every cell in the body.

- \* They act to increase the basal metabolic rate.
- \* They affect protein synthesis.
- \* They help regulate long bone growth (synergistically with growth hormone)
- \* Help in neuronal maturation.
- \* The thyroid hormones are essential to proper development and differentiation of all cells of the human body. \* These hormones also regulate protein, fat, and carbohydrate metabolism, \* They also stimulate vitamin metabolism.
- \* Thyroid hormone leads to heat generation in humans.

### TRIIODOTHYRONINE

#### (T3)

Triiodothyronine, also known as T3, is a thyroid hormone. Production of T3 is activated by thyroid-stimulating hormone (TSH), which is released from the pituitary gland. As the true hormone, the effects of T3 on target tissues are roughly four times more potent than those of T4. In any case, the concentration of T3 in the human blood plasma is about one-fortieth that of T4. \* T3 increases the basal metabolic rate

- \* It increases the production of the Na<sup>+</sup>/K<sup>+</sup> -ATPase
- \* T3 stimulates the production of RNA polymerase I and II and, therefore, increases the rate of protein synthesis and also the rate of protein degradation. \* It increases the rate of glycogen breakdown and glucose synthesis in gluconeogenesis. \* T3 increases the heart rate and force of contraction, thus increasing cardiac output \* It increases the rate of lipolysis.
- \* It affects the lungs and influences the postnatal growth of the central nervous system. THYROXINE

(T4)

Thyroxine is the main hormone secreted into the bloodstream by the thyroid gland. It is inactive and most of it is converted to an active form called triiodothyronine by organs such as the liver, spleen and kidneys. Thyroxine is also known as T4, tetraiodothyronine, thyroxin Thyroxine is formed by the molecular addition of iodine to the amino acid tyrosine while the latter is bound to the protein thyroglobulin. \* Stimulate the consumption of oxygen

- \* Regulates body's metabolic rate.
- \* Regulates heart and digestive functions
- \* Regulates muscle control
- \* Helps in brain development and maintenance of bones.

THYROID STIMULATING

HORMONE(TSH)

Thyroid-stimulating hormone (also known as TSH or thyrotropin) is a hormone that stimulates the thyroid gland to produce thyroxine (T4), and then triiodothyronine (T3) which stimulates the metabolism of almost every

tissue in the body. It is a glycoprotein hormone synthesized and secreted by thyrotrope cells in the anterior pituitary gland, which regulates the endocrine function of the thyroid gland. **THYROTROPIN RELEASING**

### **HORMONE (TRH)**

Thyrotropin-releasing hormone (TRH), also called thyrotropin-releasing factor (TRF), thyroliberin or protirelin, is a tropic, tripeptidal hormone that stimulates the release of TSH and prolactin from the anterior pituitary.

### **DISORDERS RELATED TO**

### **THYROID GLAND**

Thyroid disorders include hyperthyroidism (abnormally increased activity), hypothyroidism (abnormally decreased activity) and thyroid nodules, which are generally benign thyroid neoplasms, but may be thyroid cancers. All these disorders may give rise to goiter, that is, an enlarged thyroid. Thyroid problems are more common in women than men. Thyroid problems are among the most common medical conditions but, because their symptoms often appear gradually, they are commonly misdiagnosed.

### **HYPOTHYROIDISM**

Hypothyroidism is the underproduction of the thyroid hormones T3 and T4. It is estimated that 3% to 5% of the population has some form of hypothyroidism. The condition is more common in women than in men, and its incidence increases with age. Hypothyroid disorders may occur as a result of congenital thyroid abnormalities autoimmune disorders such as \*

Hashimoto's thyroiditis

- \* iodine deficiency

- \* By the removal of the thyroid following surgery to treat severe hyperthyroidism or thyroid cancer or from radioactive iodine. \* Lymphocytic thyroiditis (which may occur after hyperthyroidism) \* Pituitary or hypothalamic disease

Negative feedback mechanisms result in growth of the thyroid gland when thyroid hormones are being produced in sufficiently low quantities as a means of increasing the thyroid output. SYMPTOMS OF HYPOTHYROIDISM

Patients with mild hypothyroidism may have no signs or symptoms. The symptoms generally become more obvious as the condition worsens Other symptoms are-

- \* Fatigue
- \* Modest weight gain
- \* Cold intolerance
- \* Excessive sleepiness
- \* Dry, coarse hair and dry skin
- \* Constipation
- \* Vague aches and pains
- \* Increased cholesterol levels
- \* Swelling of the legs
- \* Menstrual Irregularities

As the disease becomes more severe, there may be puffiness around the eyes, a slowing of the heart rate, a drop in body temperature, and heart failure.



## TREATMENT OF HYPOTHYROIDISM

Hypothyroidism is treated with hormone replacement therapy, such as levothyroxine, which is typically required for the rest of the patient's life.

Thyroid hormone treatment is given under the care of a physician and may take a few weeks to become effective. Treatment of Underactive Thyroid is long term.

## HOMEOPATHIC TREATMENT

Homeopathic treatment aims at stimulating the Thyroid gland to produce its own thyroid hormones. External supply of the hormone is not the treatment but an arrangement. This is possible in many cases if not all. If achieved successfully, lifelong need for thyroid supplement may not require.

## CASE STUDY OF HYPOTHYROIDISM

A 32-year-old woman has a history of nephrotic syndrome. She has complaining of numbness of her right index and ring fingers had gained about 6kg the previous year. She exhibited a tired look with slight periorbital puffiness. For the last six months she had noted dry skin, decreased energy and a change in her voice. Thyroid function tests

## TEST OBSERVED VALUE NORMAL RANGE

Free thyroxine 0.39 nq/dl 0.8-2.0 nq/dl

TSH 68µIU/ml 0.2-5.5µIU/ml What is the diagnosis for this reaction ?

According to the above report the patient had been suffering from all the above mentioned symptoms of hypothyroidism also patient's thyroid function test indicates that the TSH observed value and thyroxine observed value is high and low respectively when compared to the normal value.

Therefore patient is suffering from hypothyroidism and should follow the treatment for the same under endocrinologist . HYPERTHYROIDISM

Hyperthyroidism, or overactive thyroid, is the overproduction of the thyroid hormones T3 and T4, and is most commonly caused by the development of Graves' disease an autoimmune disease in which antibodies are produced which stimulate the thyroid to secrete excessive quantities of thyroid hormones. The disease can result in the formation of a toxic goiter as a result of thyroid growth in response to a lack of negative feedback mechanisms. SYMPTOMS OF HYPERTHYROIDISM

It presents with symptoms such as :

- \* Thyroid goiter
- \* Protruding eyes
- \* Palpitations
- \* Excess sweating
- \* Diarrhea
- \* Weight loss
- \* Muscle weakness
- \* Unusual sensitivity to heat
- \* The appetite is often increased.

TREATMENT OF HYPERTHYROIDISM

Beta blockers are used to decrease symptoms of hyperthyroidism such as increased heart rate, tremors, anxiety and heart palpitations. Anti-thyroid drugs are used to decrease the production of thyroid hormones, in particular, in the case of Graves' disease. These medications take several months to

take full effect and have side-effects such as skin rash or a drop in white blood cell count. These drugs involve frequent dosing (often one pill every 8 hours) and often require frequent doctor visits and blood tests to monitor the treatment. Due to the side-effects and inconvenience of such drug regimens, some patients choose to undergo radioactive iodine-131 treatment.

Radioactive iodine is administered in order to destroy a portion of or the entire thyroid gland, since the radioactive iodine is selectively taken up by the gland and gradually destroys the cells of the gland. Alternatively, the gland may be partially or entirely removed surgically.

## CONCLUSION

The thyroid is the master gland of metabolism and energy, and problems with the gland affect everything from weight, to mental health, to fertility, heart disease risk, and many other important aspects of our day-to-day health. Thyroid issues are becoming more and more of a problem for people, and are a growing concern in the medical field. But, many thyroid conditions can be easily prevented with a proper diet and lifestyle. A healthy diet, exercise, proper nutrition, and stress reduction can all minimize the chance of developing thyroid disease. Reducing stress using effective mind-body techniques can play a part in preventing thyroid disease. Preventing thyroid problems can help you live a long and happy life, and may even help to prevent other conditions that result from thyroid problems.

## CASE STUDY OF HYPERTHYROIDISM

A 55-year-old man complained of nervousness and fatigue which had been apparent for 3 months. He had lost 10 pounds. He is a thin, anxious

appearing man, Pulse is 110 BPM and blood pressure is 140/70 mmHg.. He is unable to move his eyes completely into the superior-temporal position. The thyroid gland is moderately firm and symmetrically enlarged to an estimated 50 g (normal, 15-20 g). The skin is warm and smooth. Hair is of fine texture.

#### THYROID FUNCTION TEST

##### TEST OBSERVED VALUE NORMAL RANGE

TSH 0. 1  $\mu$ IU/ml 0. 5-4. 6  $\mu$ IU/ml

T4 free 3. 8 ng/dL 0. 7-2. 0 ng/dl

What is the diagnosis for the above report ?

According to the above report the patient had been suffering from all the above mentioned symptoms of hyperthyroidism also patient's thyroid function test indicates that TSH and free T4 observed value is less and more than normal range respectively. a