Thyroid gland

The thyroid gland, or simply the thyroid /ˈθaɪrɔɪd/, is one of the largest endocrine glands in the body, and consists of two connected lobes. It is found in the anterior neck, below the laryngeal prominence (Adam's apple). The thyroid gland controls rate of use of energy sources, protein synthesis, and controls the body's sensitivity to other hormones. It participates in these processes by producing thyroid hormones, the principal ones being thyroxine (T4) and triiodothyronine (T3), which is more active. These hormones regulate the growth and rate of function of many other systems in the body. T3 and T4 are synthesized from iodine and tyrosine. 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.

The thyroid may be affected by some frequent thyroid diseases. Hyperthyroidism occurs when the gland produces excessive amounts of thyroid hormones, the most common cause being Graves' disease—an autoimmune disorder. In contrast, hypothyroidism is a state of insufficient thyroid hormone production. Worldwide, the most common cause is iodine deficiency. Thyroid hormones are important for development, and hypothyroidism secondary to iodine deficiency remains the leading cause of preventable intellectual disability.

In iodine-sufficient regions, the most common cause of hypothyroidism is Hashimoto's thyroiditis—also an autoimmune disease. In addition, the thyroid gland may also develop several types of nodules and cancer.

Patients with epilepsy are frequently required to take antiepileptic drugs (AEDs) for a long period of time. Many studies have shown that AEDs have a negative influence on endocrine function including the thyroid gland [1)].

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Shih FY, Chuang YC, Chuang MJ, Lu YT, Tsai WC, Fu TY, Tsai MH. Effects of antiepileptic drugs on thyroid hormone function in epilepsy patients. Seizure. 2017 Mar 19;48:7-10. doi: 10.1016/j.seizure.2017.03.011. [Epub ahead of print] PubMed PMID: 28364656.