

# The Endocrine Glands

The endocrine or ductless glands are those that deliver their secretory products ( hormones ) in to the blood , lymph or tissue fluid which transports them to the largest organs .

Endocrinology :- Is one of the most important and currently most active branches of biological and clinical medicine sciences .

There are three types of endocrine organs may be recognized

1- Comprises the few discrete organs of a primary endocrine nature

- \* Pituitary gland ( Hypophysis)
- \* Pineal gland
- \* Thyroid gland and parathyroid gland
- \* Adrenal gland

2- Comprises those organs that combine major endocrine with other important related function

- \* Pancreas
- \* Testes
- \* Ovaries
- \* Placenta

3- Comprises organs not included with major combination with endocrine, but could be secrete hormones through individual cells:-

**Kidney, Liver, Heart, Thymus and GastrointestinalTract .**

### **Pituitary Gland ( Hypophysis )**

Is sometimes described as the master gland since produce certain hormones that directly influence the activities of other endocrine glands it is located as an appendage of the brain at the ( floor ) of brain , also relay between the nervous and hormonal mechanism , that jointly control certain functions .

It is dark ellipsoidal body measuring 1X 0.75 X 0.5 cm. in the medium sized dog. It is suspended below the hypothalamus by a narrow fragile stalk and the gland is covered by the reflection of dura matter of meninges , so called " diaphragmatic sella" .

A large venous channel ( cavernous sinus ) is related to the lateral sides of the gland provide a longitudinal connection between the ophthalmic plexus and thus the vein and the face rostrally and the external Jugular vein and the vertebral venous plexus caudally, by transverse intervenous sinuses .

### **Boundaries :**

- laterally is the cavernous sinus and cranial nerves which supply the eye ball which are **III ,IV ,VI** and ophthalmic nerve .
- Anteriorly---- optic chiasma
- Posteriorly----Dorsum sella

The gland is divided of

Posterior lobe ( Neurohypophysis)

## Anterior lobe ( Adenohypophysis)

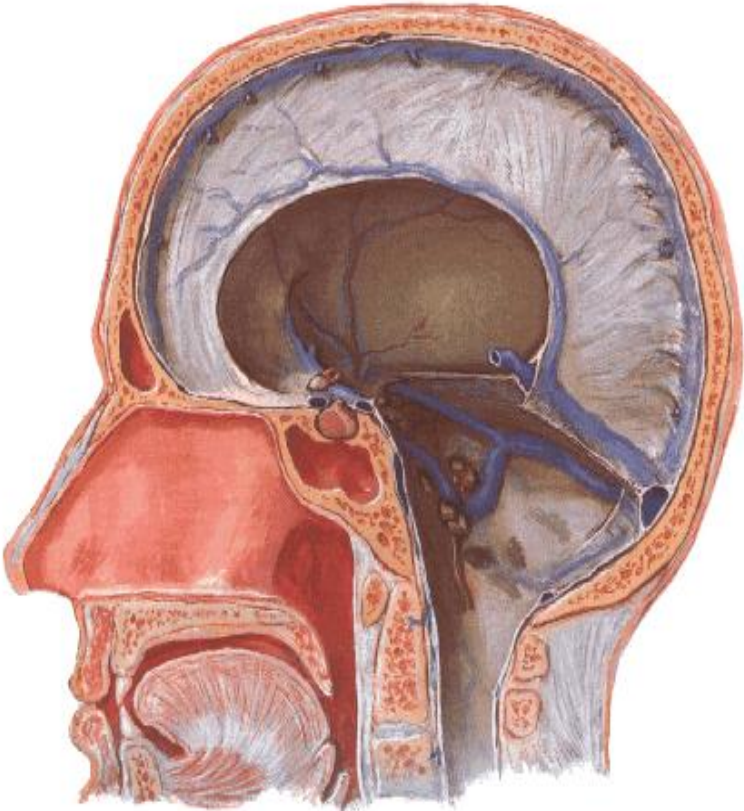
- **Posterior lobe**

Is formed by a down growth of the hypothalamus via a stalk that persist which connect the gland to the brain

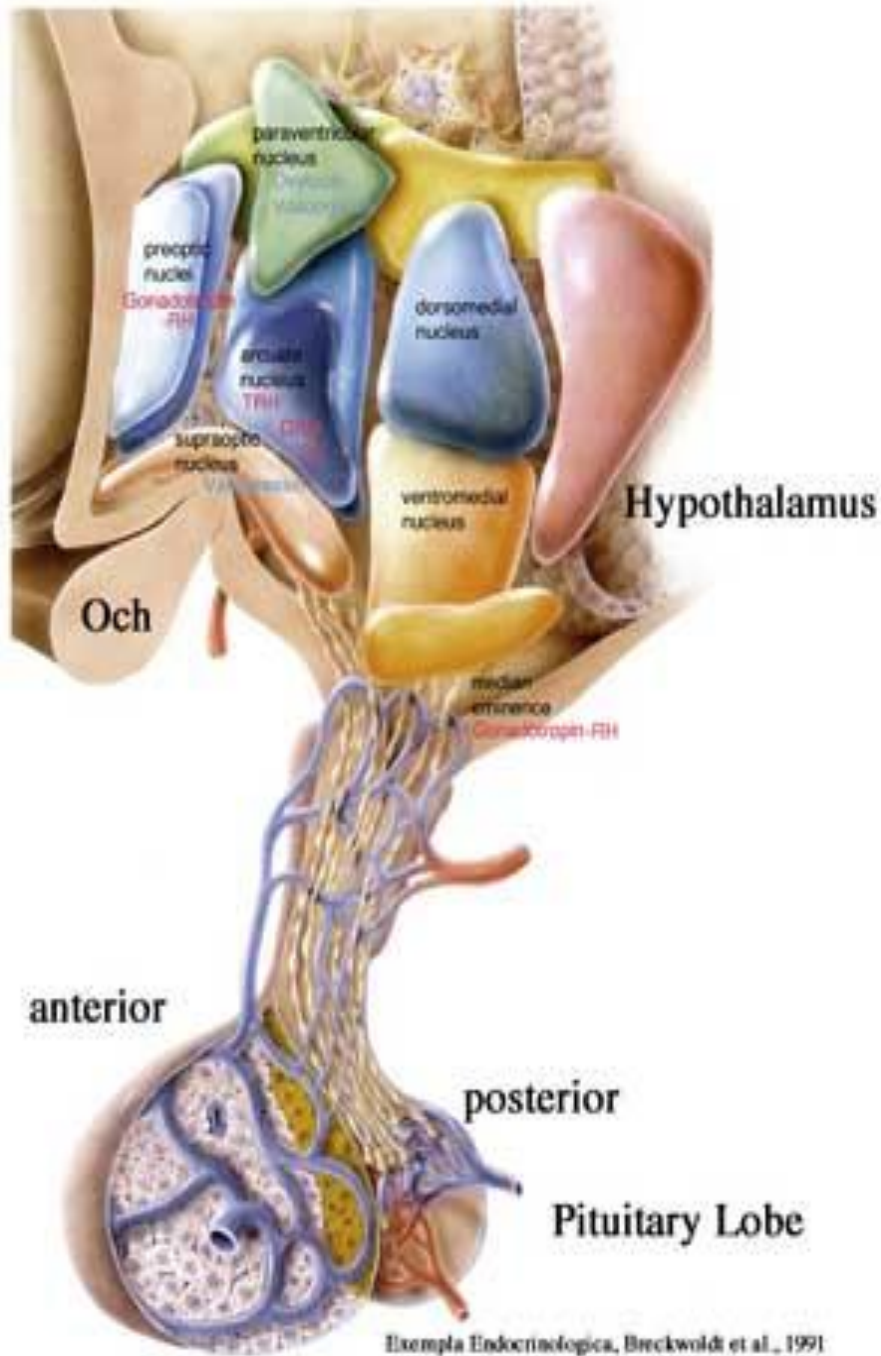
- **Anterior lobe**

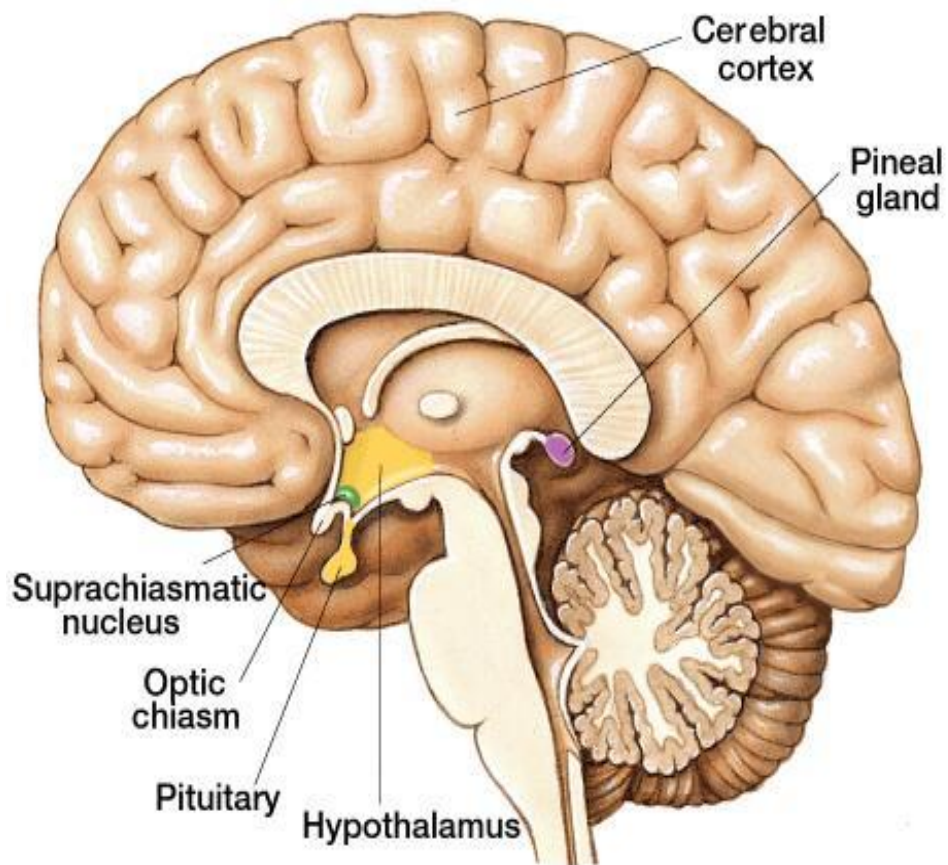
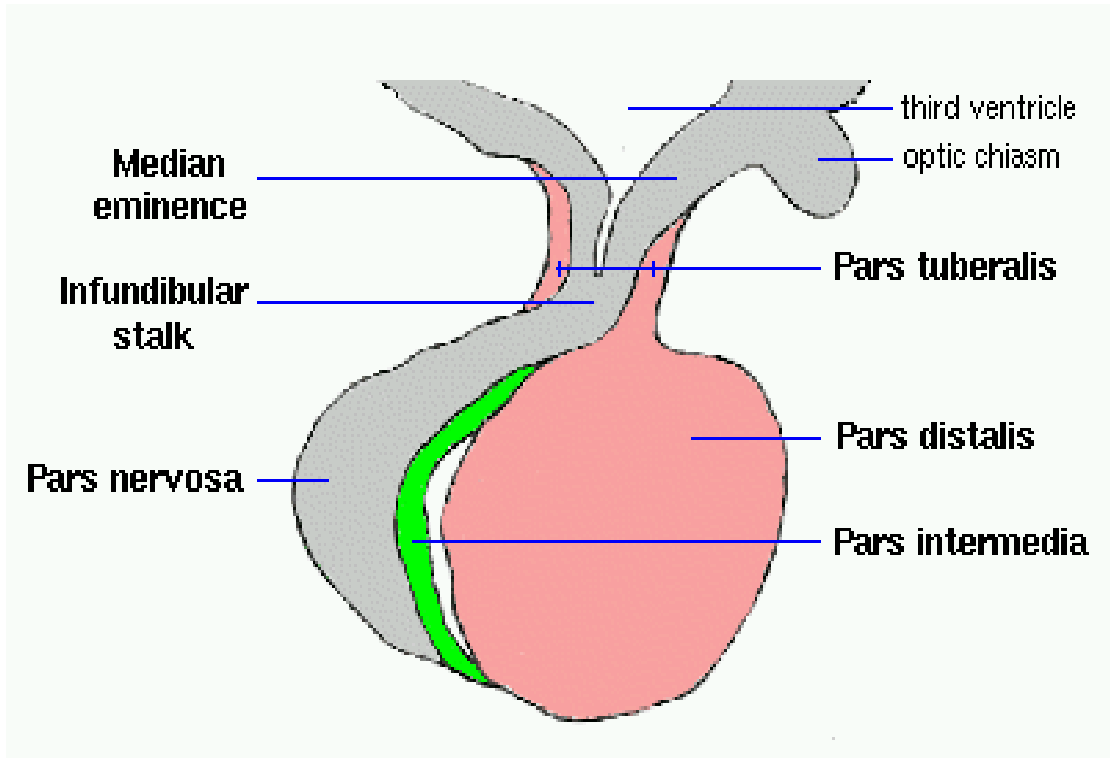
Is formed by epithelial cells which emerge as outgrowth of the roof of the developing mouth. This lobe contains a small lobe called intermediate lobe

**Dural Venous Sinuses**  
Sagittal Section



*F. Netter*  
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## The thyroid gland

Lies on the trachea directly, behind and sometimes overlapping the larynx, its form varies greatly, in the dog and cat the gland consists of separate masses "lobes" that are connected by an isthmus, there is an large medium lobe (pyramidal) in addition to the lateral lobes mainly in the human and pig .

The gland arising from the pharyngeal floor that contribute to the tongue so form in early stages of life " Thyroglossal duct " which become regress later .

The mature gland is enclosed within the capsule, inside it there are numerous follicles, surrounded by follicular cells containing the hormone " Thyroxine ."



The gland in the dog from outside is smooth, so it is not palpable. While in cow it is irregular surface and rough, present in the neck, so it is palpable .

The size of the thyroid gland varies greatly depending to iodine contents in the diet. If there is deficiency iodine, there is large gland called " Goiter "

The standard size of gland in dog is 6 X 1.5 X 0.5 cm .

The blood supply of the gland is by cranial and posterior or caudal thyroid arteries of the common carotid artery .

The venous drainage from cranial, middle thyroid vein drain to the internal jugular vein

The nerve supply is sympathetic and parasympathetic , from vagus nerve

The lymph drainage is to the deep cervical lymph node.

## **Position and form of the thyroid gland**

The thyroid gland is located to either side, ventral to the trachea at its most cranial part, sometime overlapping the larynx.

In all domestic mammals, other than the pig, it consists of left and right lobes, that are connected caudally by a connective tissue strand ( isthmus) extending on the ventral side of the trachea.

In the cat, the flat, spindle – shaped lobes lay on the dorso- lateral aspect of the trachea extending over the first seven to ten tracheal rings. Their caudal poles are connected by a thin isthmus of about 1-2 mm.

In the dog, the thyroid gland consists of two elongated, oval lobes on the dorso- lateral aspect of the trachea that extend from the fifth to eighth tracheal ring. The isthmus is often formed of glandular parenchyma, especially in large breed dogs.

Unlike in the other domestic mammals the thyroid gland of the pig is an unpaired, compact organ on the ventral aspect of the trachea. Its cranial pole lies at the thyroid cartilage, while the pointed caudal end reaches the thoracic inlet, its surface has a granular appearance.

In the ox the two lobes are irregularly shaped with a granular appearance, that roughly resembles pyramids. They are situated dorsally on the lateral side of the cricopharyngeal and cricothyroid muscles. The lobes are connected by a substantial isthmus that crosses the ventral aspect of the second tracheal ring.

In small ruminants the spindle to cylindrical shaped lobes lay on the dorso-lateral aspect of the cranial tracheal rings . The isthmus is not present in all animals.

In the horse the lobes of the thyroid are oval- shaped and about the size of a plumb. They are situated dorsolateral to the second to third tracheal rings and are joined ventrally by a narrow strand of connective tissue.

### **Blood supply**

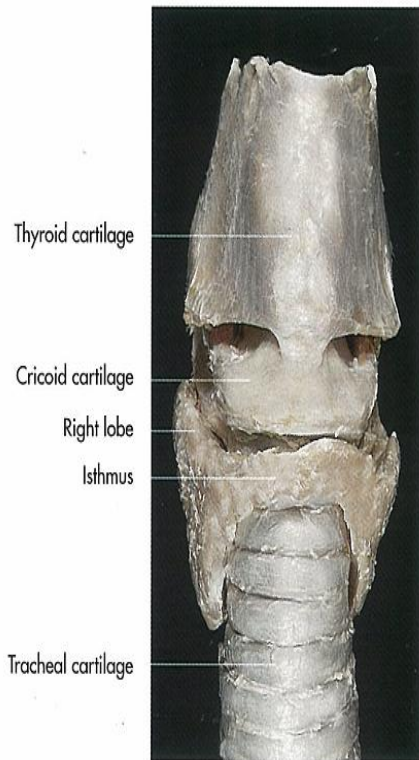
Branches of the common carotid artery , main branch is the cranial thyroid artery that branch to parts of the larynx. Addition vascular supply

is provided by caudal thyroid artery which is frequently absent in ox and goat.

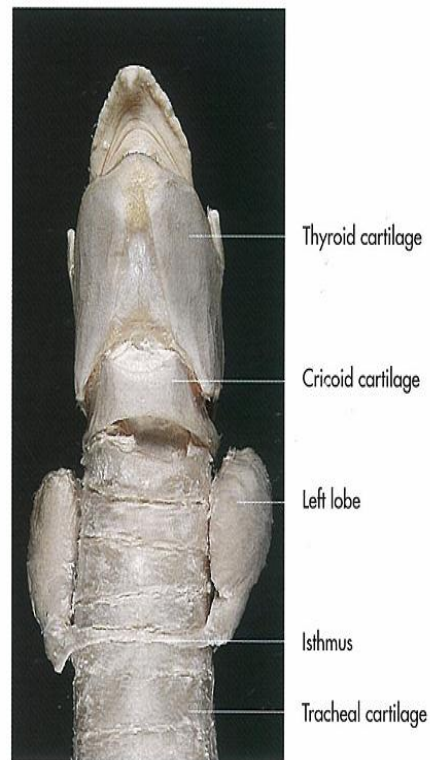
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**Fig. 15-5.** Thyroid gland of a dog, with trachea and larynx, ventral aspect.



**Fig. 15-6.** Thyroid gland of a goat, with trachea and larynx, ventral aspect.



**Fig. 15-7.** Thyroid gland of an ox, with trachea and larynx,

**Fig. 15-8.** Thyroid gland of a horse, with trachea and larynx,



Fig. 15-12. Thyroid gland of a dog, left lobe (courtesy of PD Dr. S. Reese, Munich)



Fig. 15-13. Thyroid gland of a pig (courtesy of PD Dr. S. Reese, Munich)

## **The adrenal Glands**

Are two small flattened organs lie in contact with the anterior part of the medial border of the kidneys. They are ductless, in the horse red-brown in color ( 9-10 cm) long, 3-4 cm wide and ( 1.5 cm) thickness, the weight is ( 28- 56 gm ).

The right adrenal gland is related medially to the posterior vena cava , the anterior end is contact to the liver .

The left adrenal is little shorter than the right one. It is related medially to the renal artery and aorta and inferiorly is related with the right adrenal glands to the pancreas. The gland is formed by cortex and medulla.

### **The vessels and nerves**

The adrenal receive blood supply through adrenal arteries from renal arteries and aorta.

The veins pass from central vein of medulla to the posterior vena cava and the left renal vein.

The lymph vessels go to the renal lymph glands.

The nerve are sympathetic from celiac and renal plexus of medulla only because the cortex have no nerve supply.