**Endocrine System Study guide**

Structures - be able to identify the anatomic location and hormone(s) secreted by each:

1. Gonads
   1. Male \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Female \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Pituitary (see diagram) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Thymus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Thyroid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Parathyroid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Adrenal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Pancreas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Pineal-Not sure we talked about this. It is located in base of the brain; it produces melatonin at the direction of the Pituitary gland (anterior lobe)

**Practice** structures/functions and identification of disorders, signs/symptoms and treatments:

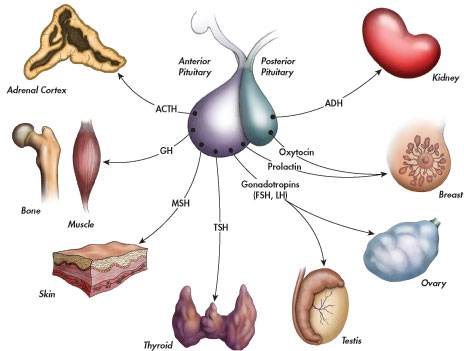
1. The type of gland that must go through a duct is called an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (exocrine / endocrine) gland.
2. Another name for Growth Hormone is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Somatotropin / Norepinephrine)
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are called ductless glands because their hormones are secreted directly into the blood stream.
4. The organ that **produces** the hormone secretion is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the organ that **responds** to the secretion is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ.
5. Which gland is also considered a structure in the lymphatic system? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Which gland is considered an associated structure of the digestive system? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Insulin and glucagon are produced by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (melanocytes / islet of Langerhans) cells. Both hormones secrete via act via a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (negative / positive) feedback loop to maintain a stable blood sugar.
8. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (thyroid / pituitary) gland is the MASTER GLAND. It communicates with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cerebellum / hypothalamus). The part of the brain considered the **CONTROL CENTER** is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (brain stem / hypothalamus).
9. The process by which a drop in a hormone level stimulates the production and release of more hormones into the blood is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
10. The function of glucagon is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (increase / decrease) the level of glucose in the blood stream. Failure of the Islets of Langerhans to release this hormone will result in \_\_\_\_\_\_\_\_\_\_\_(hypoglycemia / hyperglycemia). Immediate treatment for this state includes drinking orange juice (sweet drink) and/or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ injection. If left unrecognized or untreated, will result in a life threatening state called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
11. Adrenalin is the Fight of Flight hormone secreted by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.. Another name for adrenalin is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. Overproduction of Growth Hormone results in the condition called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
13. Underproduction of Growth Hormone results in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ condition.
14. The function of insulin is to promote the utilization of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (glucose / electrolytes) in the cells, which is necessary for carbohydrate metabolism. Lack of insulin secretion causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hyperglycemia / hypoglycemia).
15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (FSH / Oxytocin) is the hormone needed for uterine contractions.
16. The hormone that is secreted during lactation (milk production) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Prolactin / LH).
17. Exophthalmos and/or goiters are signs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hypothyroidism / hyperthyroidism). The name of the disease is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (acromegaly / Grave’s disease).
18. Excessive secretion of glucocorticords in the blood is due to the hyper-function of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (adrenal cortex /adrenal medulla) and can cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Addison’s / Cushing’s).
19. Moon face and a buffalo hump (on back) are characteristic signs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (diabetes mellitus / Cushing’s syndrome).
20. Hypothyroidism can be due to a **deficiency of iodine**. Treatment is to use iodized salt (this is not common in the US since we use iodized salt). Another form of this disease is an autoimmune disease that destroys the thyroid gland from producing thyroxin. Without treatment, this can lead to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cretinism / hirsutism) in children and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cretinism / myxedema) in adults. The treatment is daily administration of thyroid medication.
21. Myxedema is a condition that results from the dysfunction of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (parathyroid / thyroid) gland. The signs of this condition include \_\_swelling, weight gain, memory failure.
22. Hypo-function of the adrenal cortex result in a disease that has signs / symptoms that include low blood sugar, low blood pressure and the appearance of a tan (hyperpigmentation) even during the winter months. This disease is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Acromegaly / Addison’s).
23. Use of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (excessive iodine / anabolic steroids) can result in liver damage, heart disease, testicular changes and breast development in males.
24. The treatment for hyperthyroidism includes:
25. total or partial removal of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
26. administration of drugs to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (inhibit / promote) thyroxin secretion
27. radioactive iodine can also be used because it can suppress the activity of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gland.
28. Diabetes I (**Juvenile** onset that is considered autoimmune; islets of langerhans cells are destroyed) requires close monitoring of blood sugar to avoid the effects of severe swings in blood sugar:
29. High blood sugar signs/symptoms (slow onset)
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    2. Severely High blood sugar can lead to the life threatening condition called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
30. Low blood sugar signs/symptoms (characteristic – rapid onset)
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    2. Severely Low blood sugar can lead to the life threatening condition called \_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. Treatment: give sugar quickly (ie: Orange juice); glucagon IV.
31. Signs of Type I diabetics include (the 3 poly’s):
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    4. Weight loss
32. Treatment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
33. **Diabetes Mellitus** (adult onset diabetes) is a state of hyperglycemia. It is commonly found in:
34. Overweight people, Middle age people, and People with family members who have diabetes
35. Signs / symptoms:
    1. Flushing of skin, drowsy, lethargic, lapses in consciousness, fruity odor to breath, glycosuria, blood sugar > 150.
36. Treatment: insulin and fluids
37. The greatest risk factor for Diabetes mellitus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
38. Removal of the parathyroid glands will result in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (acromegaly / tetany).
39. Normal blood sugar level: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mg/dL blood

**Pertinent prefixes / suffixes / terms**:

1. -phagia:
2. -dypsia:
3. Acro-
4. Adreno -
5. Exo-
6. Endo-
7. -crine
8. Tetany
9. Exophthalmos
10. Goiter
11. Hirsutism

|  |  |  |
| --- | --- | --- |
| **Hormone** | **Function** | **Location/name of secreting organ** |
| Thyroxine (T4) and  Triiodothyronine (T3) | increases metabolism; promotes normal growth and development. Signs of over active function include nervousness and weight loss. | Butterfly shaped mass of tissue on the anterior side of larynx/upper trachea: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| 1. Glucocorticords 2. Aldosterone (mineral corticoid) 3. Sex hormones (androgens) | 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Superior Surface of each kidney : =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| 1. epinephrine 2. norepinephrine | Increases heart rate, BP and blood flow (fight or flight) | Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Organ = Adrenal Medulla |
| Calcitonin | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Thyroid organ |
| Thymosin | Produces T-lymphocytes to create immunity to specific disease | Location - Dorsal to the upper part of the sternum (close to heart):  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Develops primary and secondary sexual characteristics; stimulates the maturation of sperm | Male gonads are located in the  =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| 1. Insulin 2. Glucagon | 1. critical to metabolism of carbs; reduces blood sugar levels 2. stimulates the liver to release glycogen – converts it to glucose to increase blood sugar levels | Location - Feather shaped organ behind the stomach  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ  The cell responsible for insulin production: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. GH 2. TSH (acts on thyroid) 3. ACTH (acts on adrenal cortex) 4. MSH (acts on pineal gland) 5. FSH (female/male) 6. LH (female) 7. ICSH (male) | 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Location: Master Gland** – grape sized gland located on the base of brain; communicates with the hypothalamus: secreted by the Anterior Lobe of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gland |
| 1. Estrogen 2. Progesterone | 1. Stimulate the development of the reproductive organs and secondary sex characteristics (breasts, etc) 2. Works with estrogen in building up the lining of the uterus for the fertilized egg | Female gonads are located in the  =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Regulates the exchange of calcium between bones and blood | Location/description: 4 rice sized glands on the posterior surface of the thyroid gland: = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ |
| 1. Oxytocin 2. ADH (vasopressin) | 1. Stimulates uterine contractions during childbirth; mild release from mammary glands 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Location: Master Gland** – grape sized gland located on the base of brain; communicates with the hypothalamus: secreted by the Posterior Lobe of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gland |

Master Gland functions:



Review the locations of the endocrine glands from your notes (also on BB and in your book)