• Hand back Exam #3
• Turn in Alcohol / Tobacco Ad Homework
• Stress Management part 2 due Thursday
• Endocrine System (our final system of the body!)
The Endocrine System

• Utilizes chemical signals called hormones that are secreted by endocrine glands

• Slower response than nervous system
hypothalamus (part of the brain)

pituitary gland, anterior lobe

thyroid gland

parathyroid glands (four)

thymus gland

adrenal gland (one pair)

pancreatic islets

ovaries (one pair of female gonads)

testes (one pair of male gonads)
Hormone “Partnerships”

• Opposing interaction: effect of one hormone opposes the effect of another


• Synergistic interaction: two or more hormones cooperate to trigger an effect


• Permissive interaction: one hormone must “prime” target cell before another hormone can have an effect


THEN
Types of Hormones

- Steroid Hormones: Made from lipids; produced by adrenal glands and ovaries / testes
• Nonsteroid Hormones: Made from amino acids; produced by gland or organ other than adrenal gland or gonads
Hypothalamus & Pituitary Gland

- Hypothalamus integrates nervous and endocrine systems
- Pituitary cooperates with hypothalamus
Posterior Lobe of Pituitary Gland

- Stores and secretes ADH and oxytocin which are produced in the hypothalamus.
Anterior Lobe of Pituitary Gland

- Produces six hormones, including Growth Hormone (GH)
Growth Hormone (GH)

• Stimulates growth of cartilage and bone, increases muscle mass (banned in athletics)

Gigantism: Too much GH during childhood

Acromegaly: Too much GH during adulthood
• Pituitary Dwarfism: Too little GH or receptors not responding normally
Thyroid Gland

- Secretes Thyroid Hormone (TH) which affects metabolic rate, growth, & development
Thyroid Disorders

Goiter caused by lack of iodine

Hypothyroidism (before & after treatment)

Hyperthyroidism (Graves’ disease)
Parathyroid Glands

• Secrete ParaThyroid Hormone (PTH) which regulates calcium levels in blood

Decrease in calcium ion concentration in blood

Parathyroid glands

PTH

stimulates

Calcium ion level increases.

Osteoclasts release calcium ions from bone.

Kidney tubules increase calcium ion reabsorption.

Intestine increases calcium ion absorption.
Adrenal Glands

- One found on top of each kidney
- 2 parts: adrenal cortex, adrenal medulla
Adrenal Medulla

- Releases epinephrine and norepinephrine which trigger “Fight or Flight” response
- Stimulated by sympathetic division of autonomic nervous system
Adrenal Cortex

- Responds to signals from hypothalamus instead of nervous system
- Releases glucocorticoids (metabolism of glucose) and mineralocorticoids (salt & water balance)
Pancreas

- Clusters of endocrine cells called “islets”
- Produce glucagon and insulin to regulate blood sugar
Hypoglycemia

- Too much insulin leads to too little sugar in the blood – can lead to “insulin shock”
Gonads: Testes & Ovaries

- Produce Androgens (mostly testes) – development & maintenance of male reproductive system
- Produce Estrogens, Progestins (mostly ovaries) – development & maintenance of female reproductive system
Pineal Gland

- Produces & secretes melatonin
- Regulates biological rhythms to light/dark, seasonal cycles