

Health and stress

(week 11)

Endocrinology

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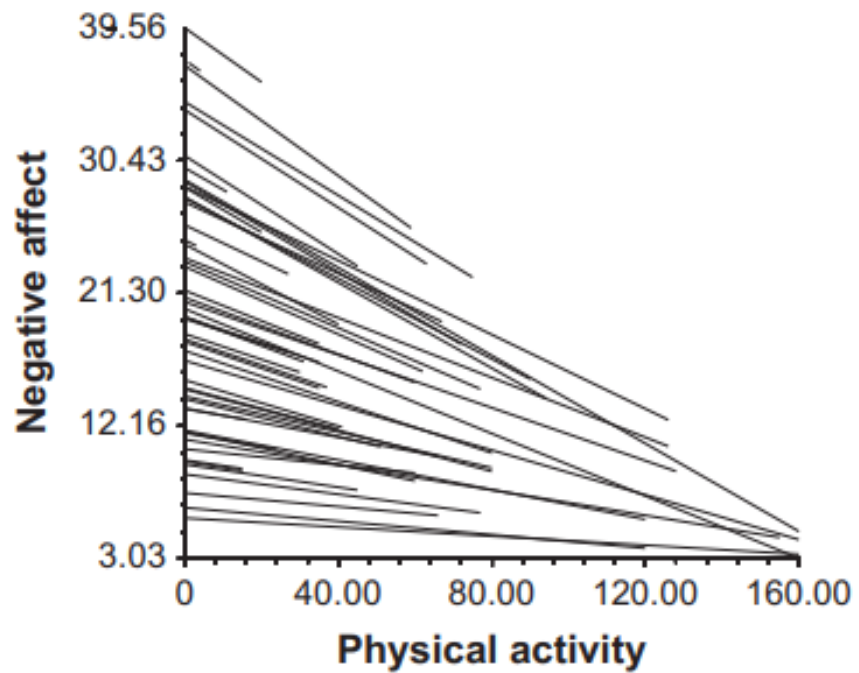
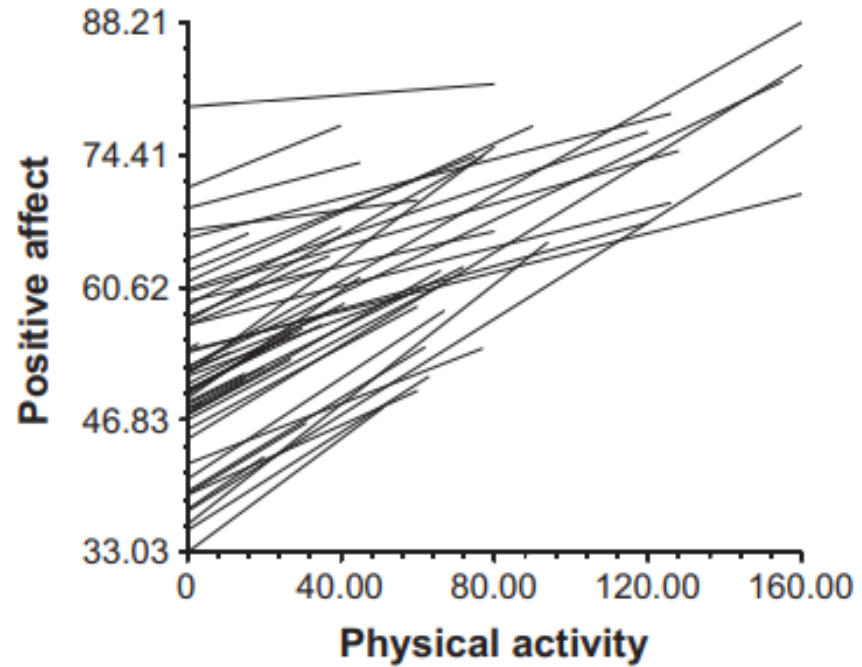
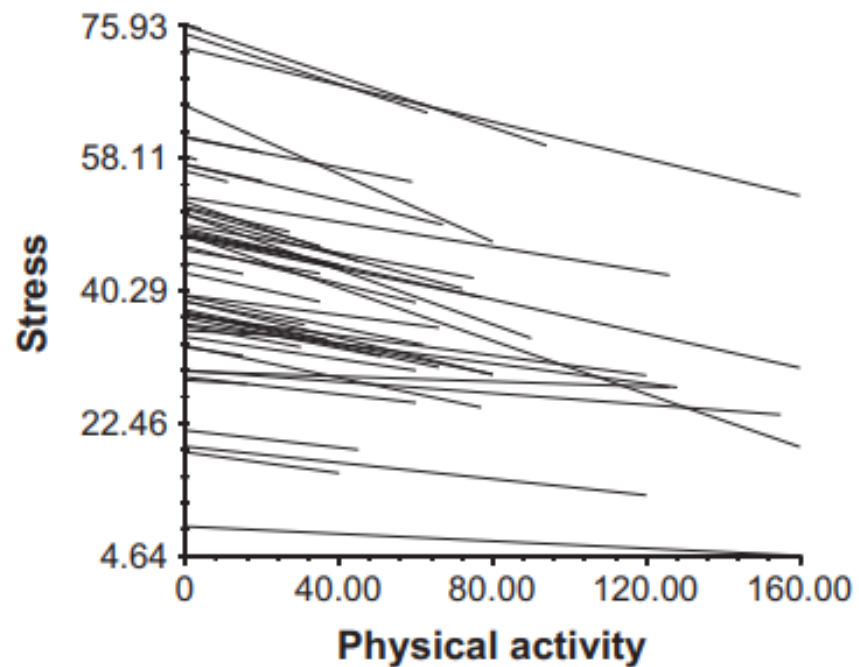
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Bidirectional relationship of stress and affect (sensation or feeling) with physical activity and healthy eating.

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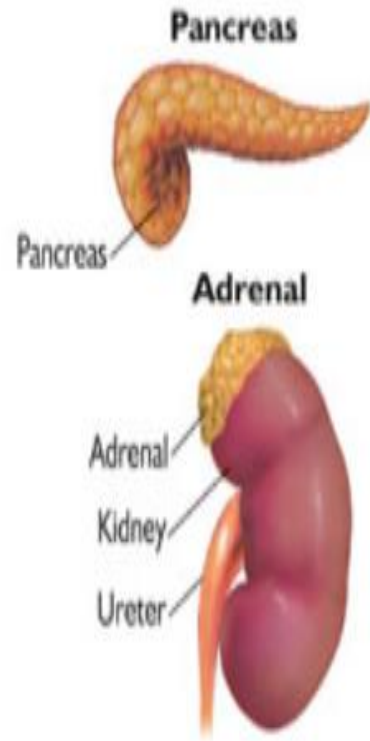
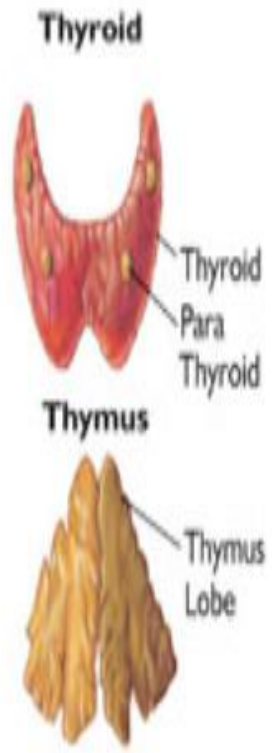
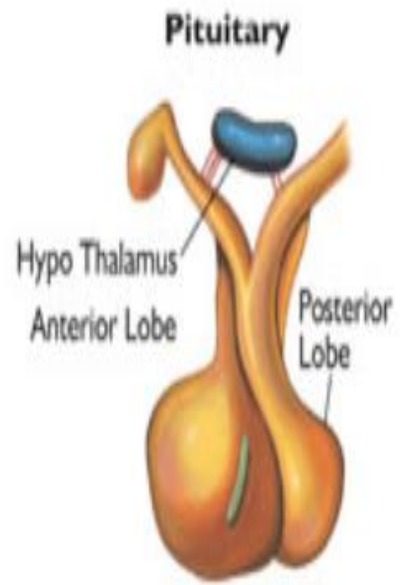
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Objectives

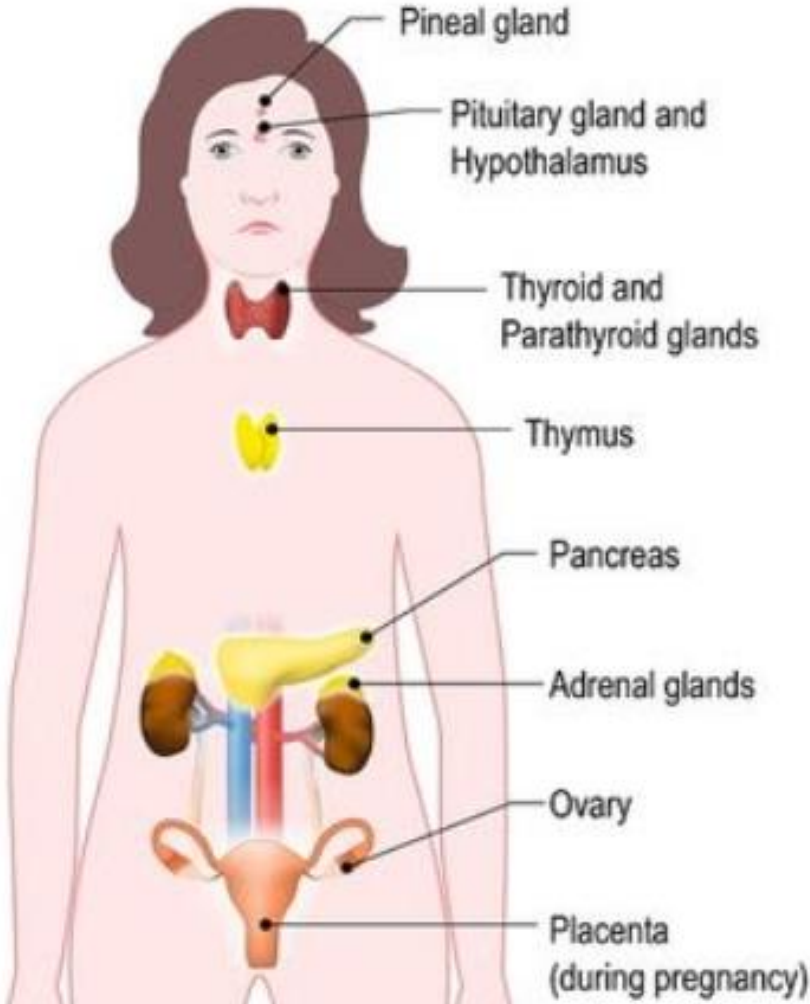
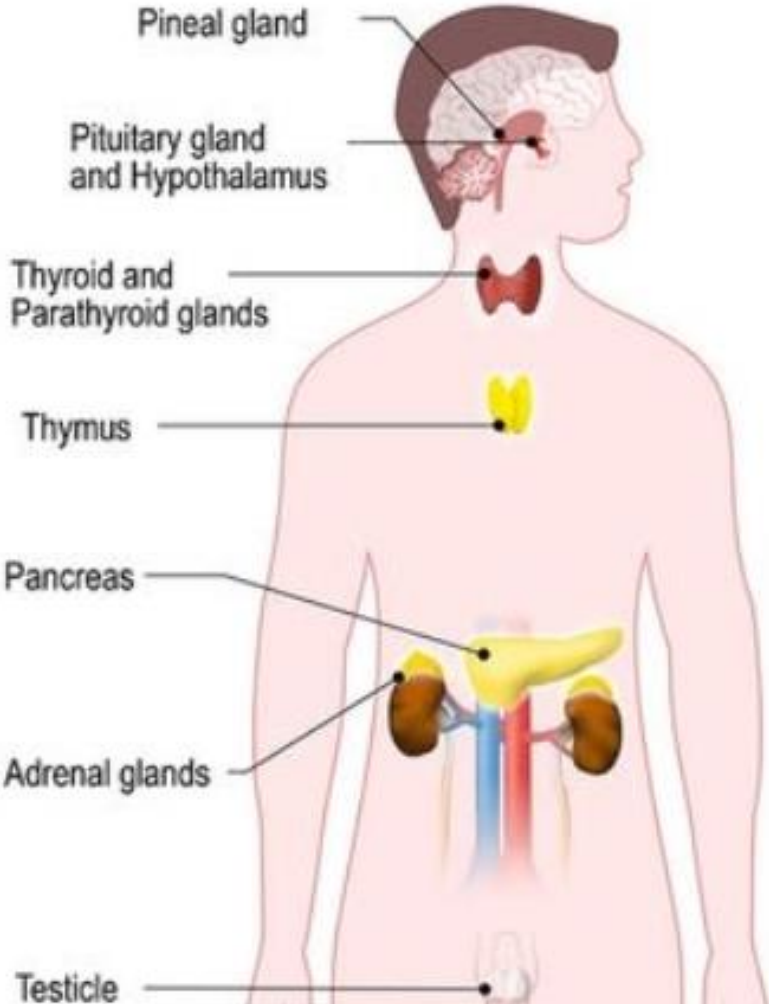
- The structure and function of endocrine system.
- Understand how the endocrine system works and the impact of its role in maintaining health.
- The role of endocrine system with the types, actions and control of hormones.
- The gross structure of the **pituitary** and **thyroid glands**.
- **Disorders of the thyroid gland.**
- Growth hormone, the pancreas and adrenal glands.

What is endocrinology?

- Endocrinology is the study of hormones.
- Hormones are essential for our every-day survival.
- They control our **temperature, sleep, mood, stress, growth and more.**
- An **endocrinologist** is a doctor that treats diseases related to problems with hormones.
- A hormone is a **chemical messenger** that travels **from one cell to another.**



ENDOCRINE SYSTEM



Hormones

- **Hormones** are released in one part of the body, travel in the blood stream and **have an effect on other part of the body**.
- This helps different parts of the human body to communicate with each other.
- Hormones are secreted by endocrine glands, such as the **pituitary, thyroid or adrenal glands**.
- **Not all glands are classified as endocrine glands; for example, sweat glands or lymph glands are not endocrine glands.**

How do hormones influence the normal metabolism and pathology in human being?

- Hormones are found in plants and animals.
- They influence or control a wide range of physiological activities, such as **growth, development, puberty, level of alertness, sugar regulation and appetite, bone growth**, etc.
- Contribute to some of the major diseases of mankind; for example, **diabetes, thyroid conditions, pituitary conditions, some sexual problems, some neurological problems, appetite and obesity, bone problems, cancer**, etc.

Sub- specialties

- devoted to specific areas where hormones work. For example:
- **Pediatric endocrinology**, looking at hormones in children
- **Thyroid endocrinology**, looking at how the thyroid affects metabolism
- **Endocrine-disrupting chemicals**, where chemicals which mimic the effects of hormones are present in the environment
- **Comparative endocrinology**, which looks at the way similar hormones work in different species (e.g. from insects, through to fish, birds, mammals, etc).

Functions of hormones and their regulation

- The word hormone is derived from the Greek *hormao* meaning 'I **excite or arouse**'.
- Hormones communicate this effect by their **unique chemical structures** **recognized by:**
 1. specific receptors on their target cells.
 2. their patterns of secretion.
 3. their concentrations in the general or localized circulation.

Classification:

a. by structure of the major human hormones*

b. Hormone synthesis, secretion and transport

c. Hormone receptors and signal transduction processes

d. Interactions between the endocrine, nervous and immune systems

e. Genetics of endocrinology

a. Classification by structure of the major human hormones*

1. Hypothalamic hormones: (peptide /Protein)

- Releasing hormone (TRH) Thyrotrophin
- Corticotrophin releasing hormone (CRH)
- Arginine vasopressin (AVP)
- Gonadotrophin releasing hormone (GnRH)
- Growth hormone releasing hormone (GHRH)
- Somatostatin
- Prolactin releasing factor (PRF)
- Dopamine

2. Anterior pituitary hormones: (peptide /Protein)

- Thyroid-stimulating hormone (TSH)
- Adrenocorticotrophic hormone (ACTH)
- Luteinizing hormone (LH)
- Follicle-stimulating hormone (FSH)
- Somatotrophin/growth hormone (GH)
- Prolactin (PRL)
- Melanocyte-stimulating hormone (MSH)

3. Posterior pituitary hormones: (peptide /Protein)

- Oxytocin
- Arginine vasopressin

4. Thyroid hormones: (Amino acid or fatty acid derived)

- Thyroxine (T_4)
- Triiodothyronine (T_3)

Reference

- Stephen Nussey and Saffron Whitehead, 2001, Endocrinology: An Integrated Approach, Oxford: BIOS Scientific Publishers; ISBN-10: 1-85996-252-1.