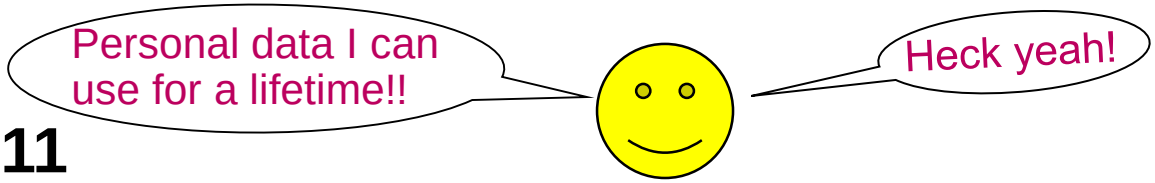


BI 121 Lecture 11

I. ***Announcements*** **Blood Chem Lab today! Fun day!!**
Personal data!!! If you haven't already done so, please review Lab 5 in LM & in e-mail. Thanks sincerely!
Lab Manual & Exam I Remaining Returns. Q from last t?

II. ***Safety & Techniques Review for Blood Chem Lab*** **Q?**

III. ***Endocrine Connections*** **LS ch 17, DC Module 13, SI Fox +…**

- **A. Endocrine/hormone classes** ~ LS pp 495 – 6
- **B. Hypothalamus (Master) – Pituitary (subcontroller)**
  DC pp 104-6 + LS pp 499-506
- **C. Posterior pituitary+hormones** DC p 108, LS fig 17-4 p 502
- **D. Anterior pituitary hormones** DC pp 105-7, LS pp 502-6
- **E. Endocrine feedback + reflexes** LS p 540 fig 17-7
- **F. GH: Body builder's dream? Fountain of youth?**
  LS pp 506-10, fig 17-10, 17-11
- **G. Peripheral endocrine organs** DC pp 109-13, LS pp 513-36
  1. Pancreas 2. Thyroid 3. Adrenals

No food, drink or gum in lab today! Thanks sincerely!

…Healthy, tasty & fresh, but not in lab!!

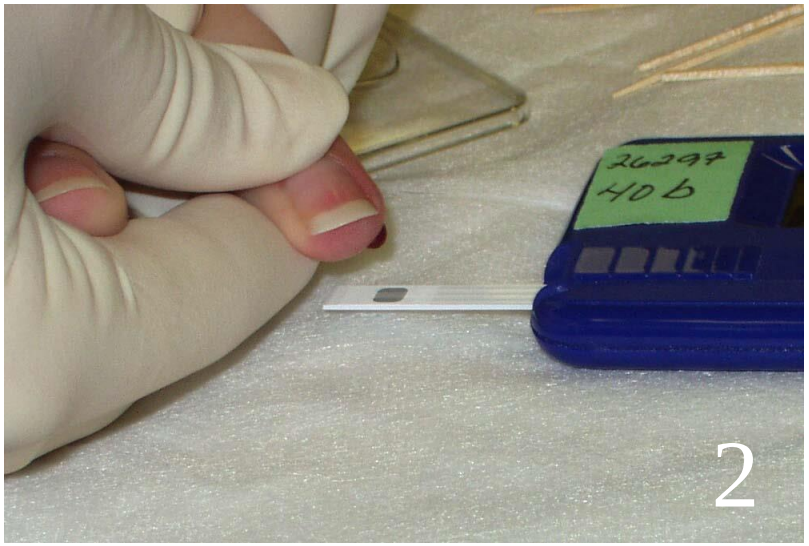
PREPARATION

WASH & DRY

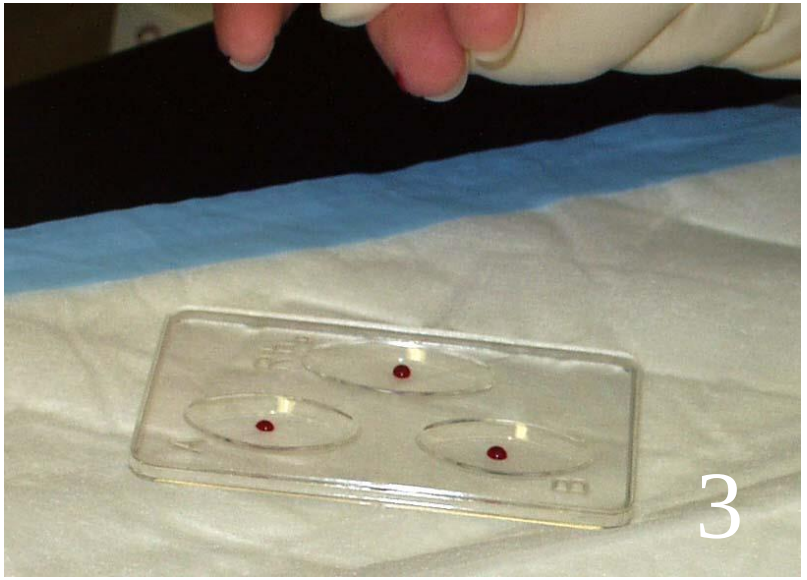
ALCOHOL

SAMPLE+TESTS

OBTAIN μSAMPLE

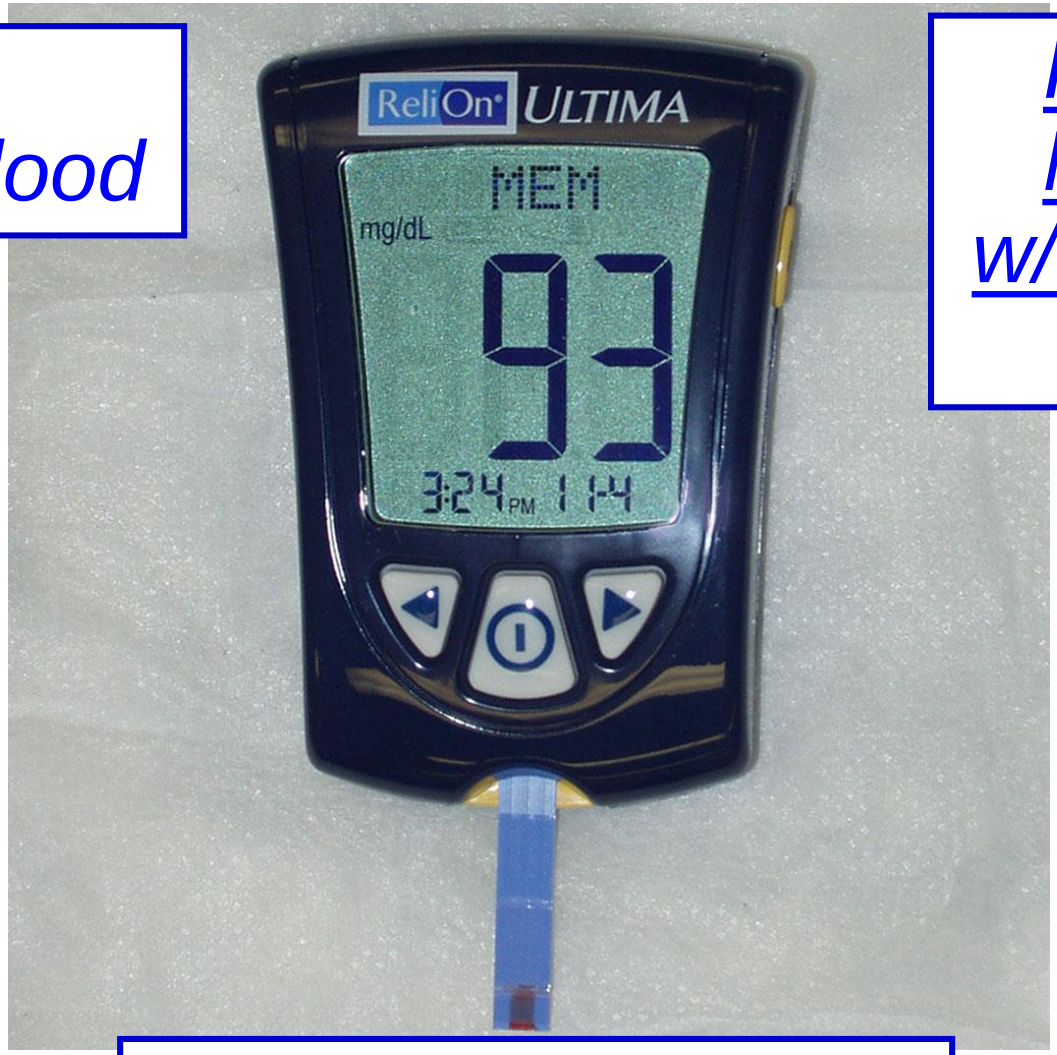


BLOOD GLUCOSE



BLOOD TYPING

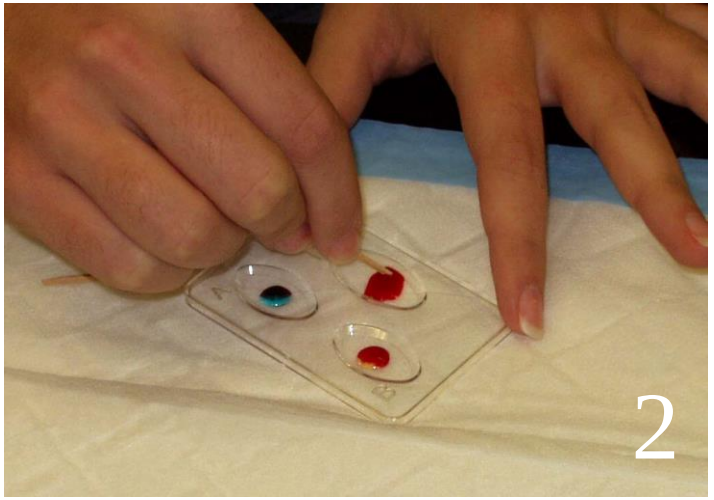
Glucose:
Sugar in blood



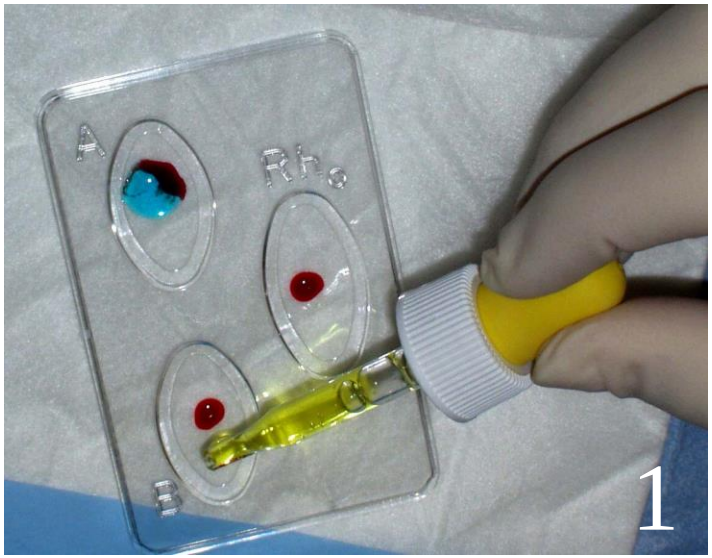
Record in Notebook w/dominant hand!

Normal: 70-99
Pre-Diabetes: 100-125
Diabetes: ≥ 126 mg/dL

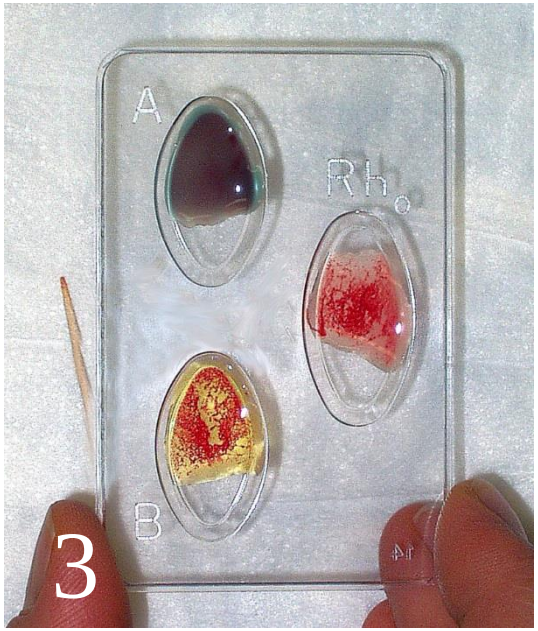
BLOOD TYPING



MIX W/TOOTHPICKS



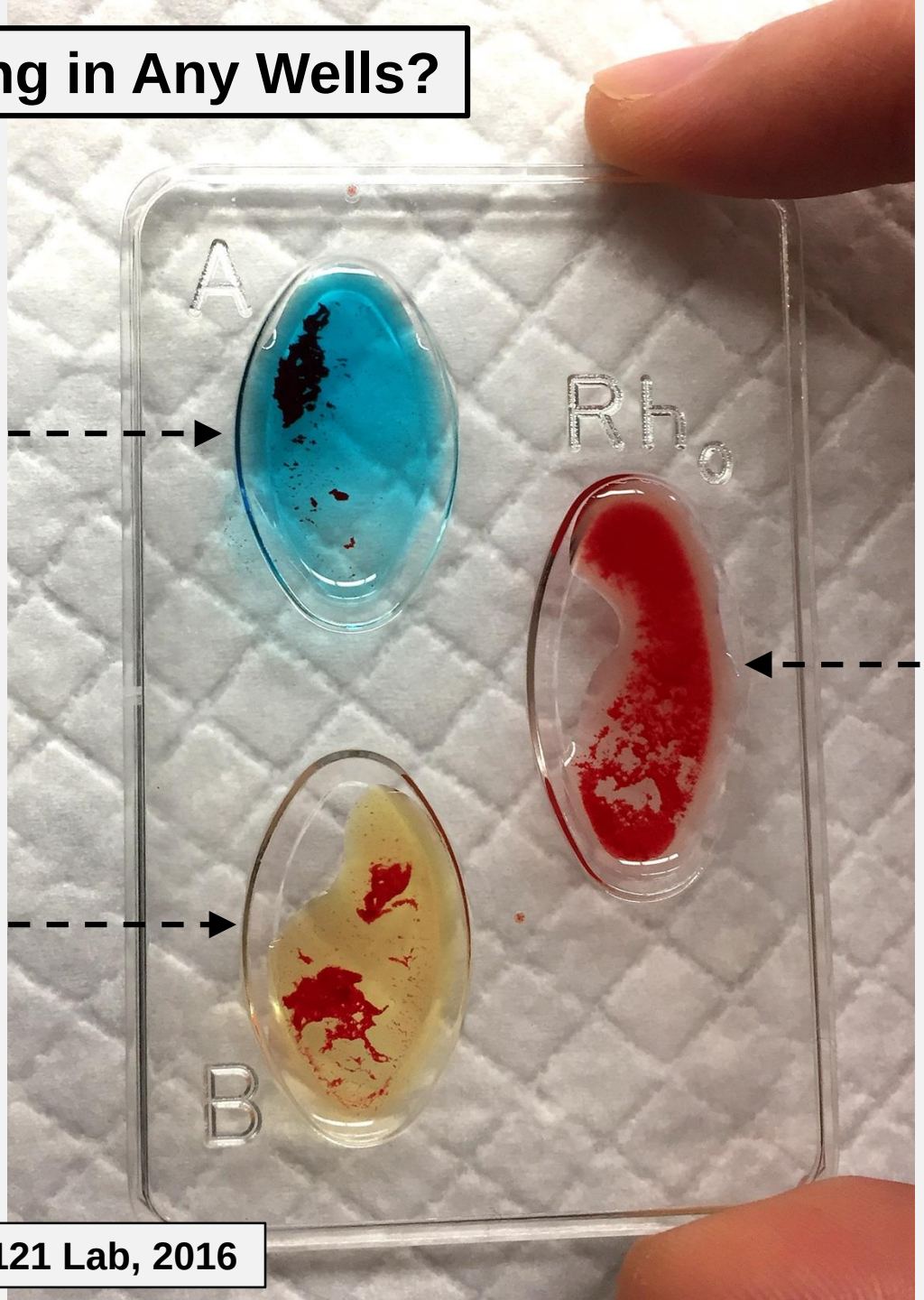
ADD ANTISERA



READ & RECORD!!

1^0 Q? Clumping in Any Wells?

Type AB+



Here?

Here?

Here?

Source: S Wong, BI 121 Lab, 2016

CLEAN-UP!

FOLD DIAPER

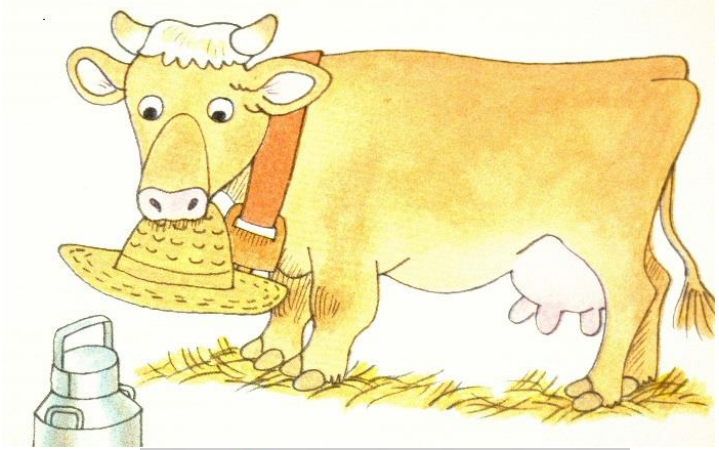
BLOOD PRODUCTS

REWASH!!

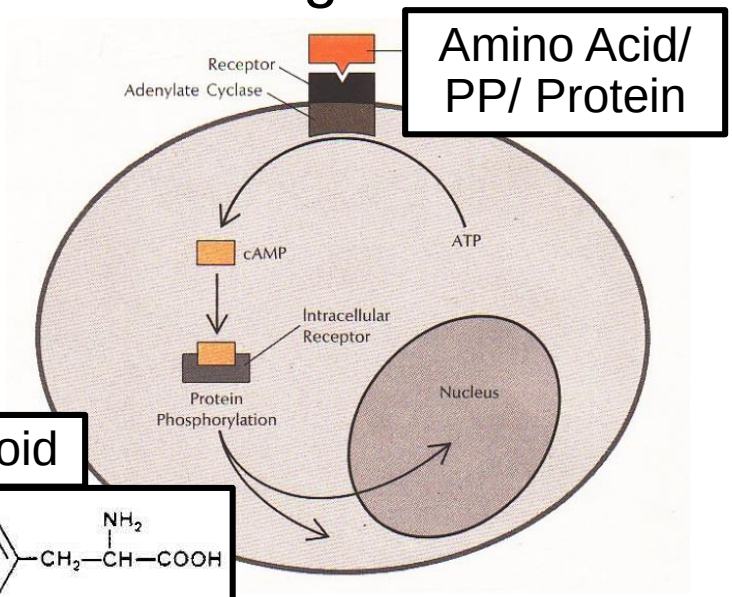
Blood Chem Lab Q?

Hormone/Endocrine Classifications?

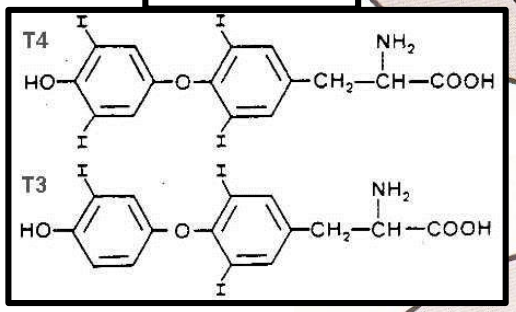
Exogenous

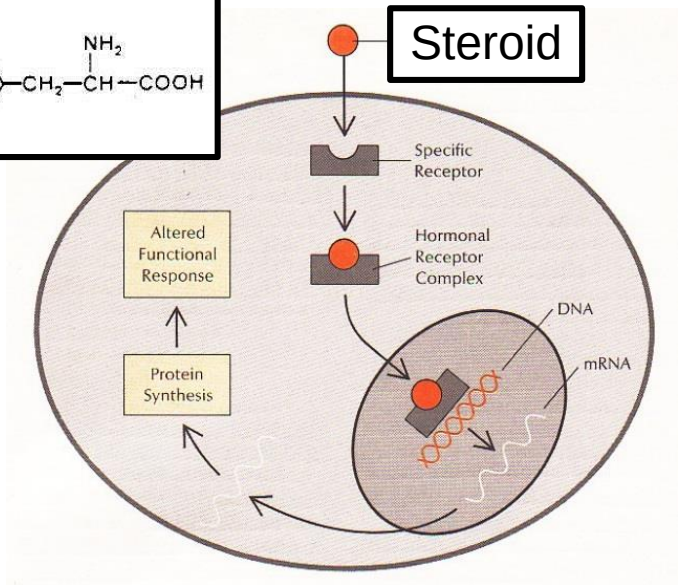


Endogenous

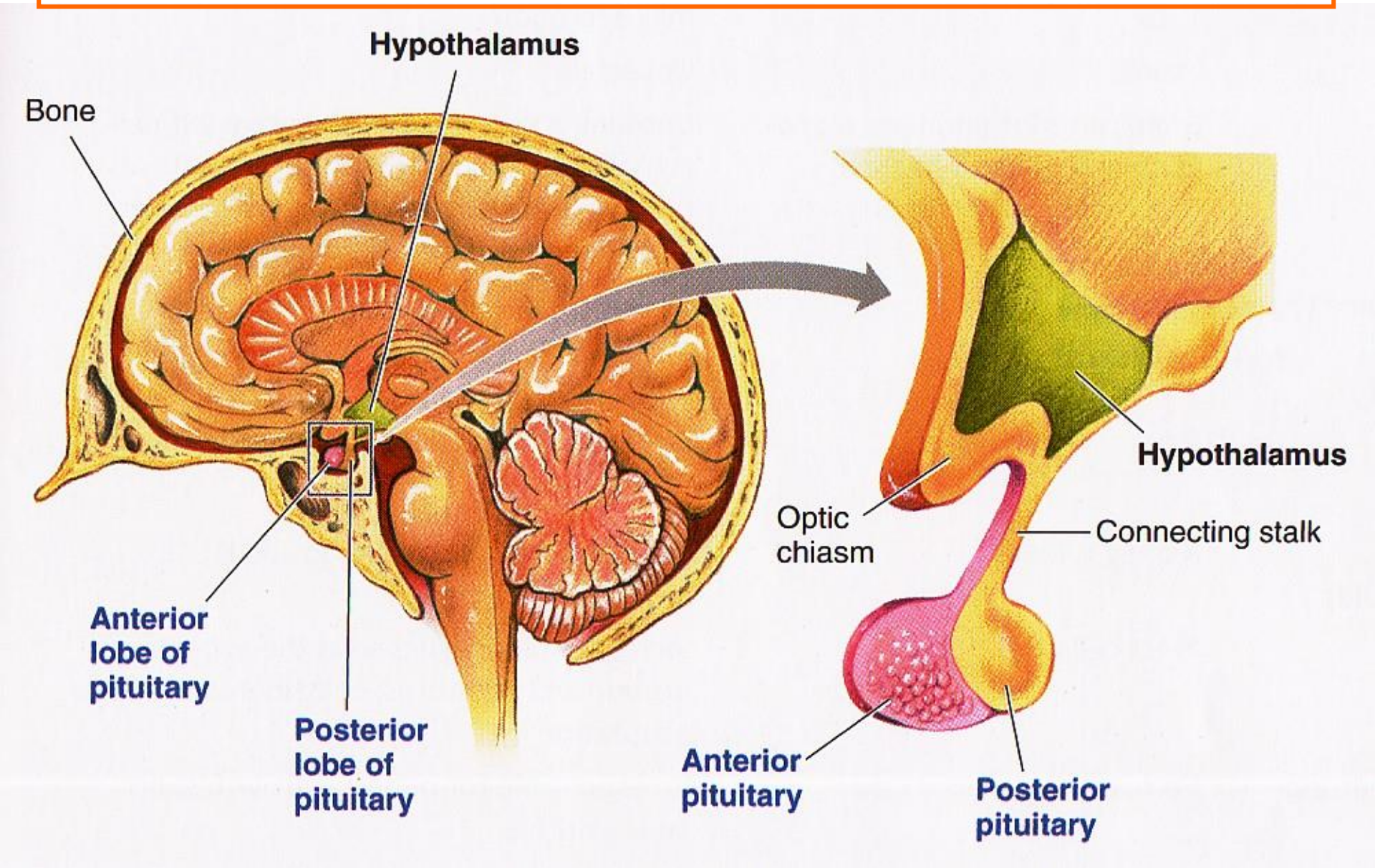


Thyroid



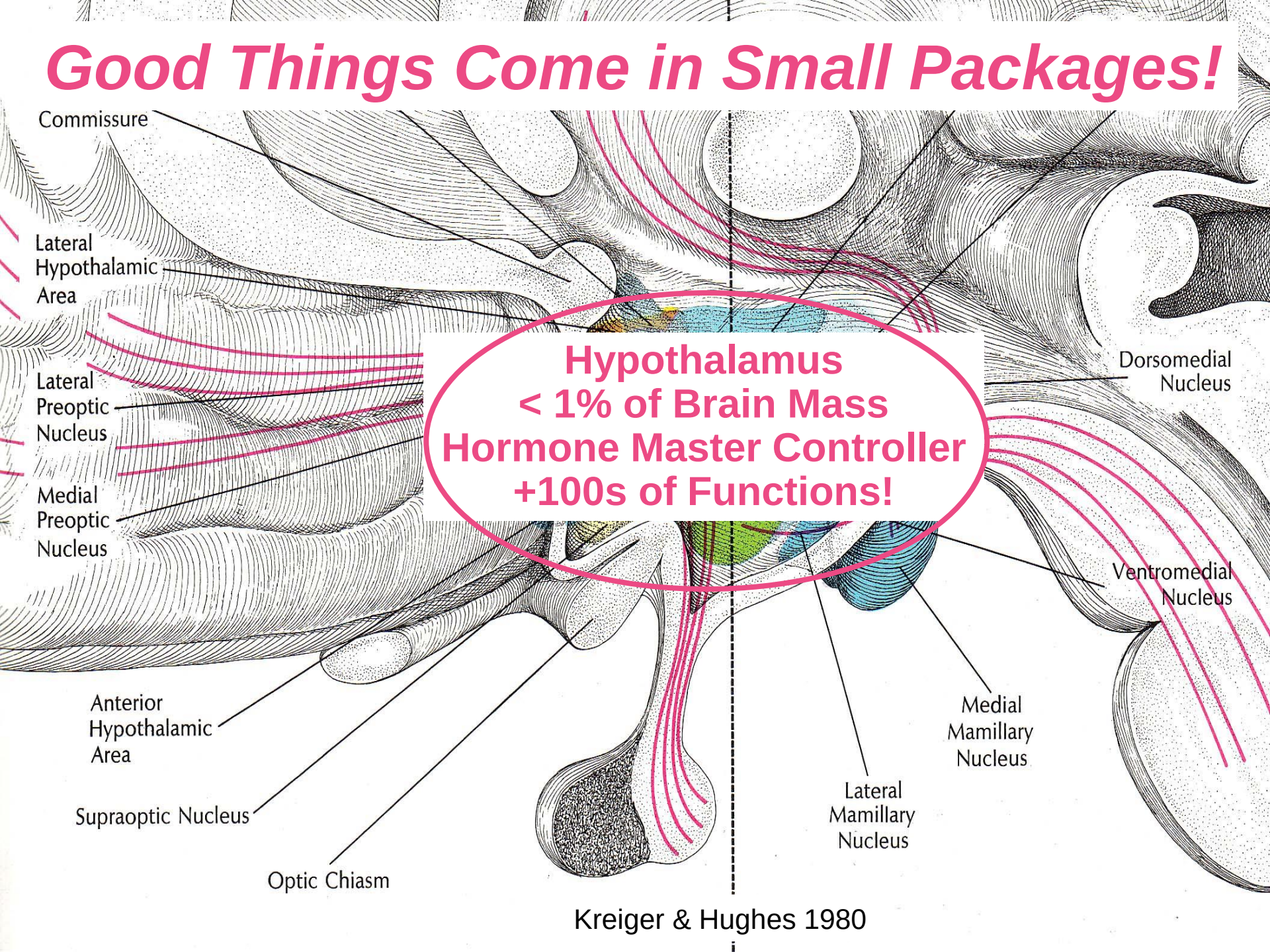


Hypothalamus & Pituitary: Intimate Relationship



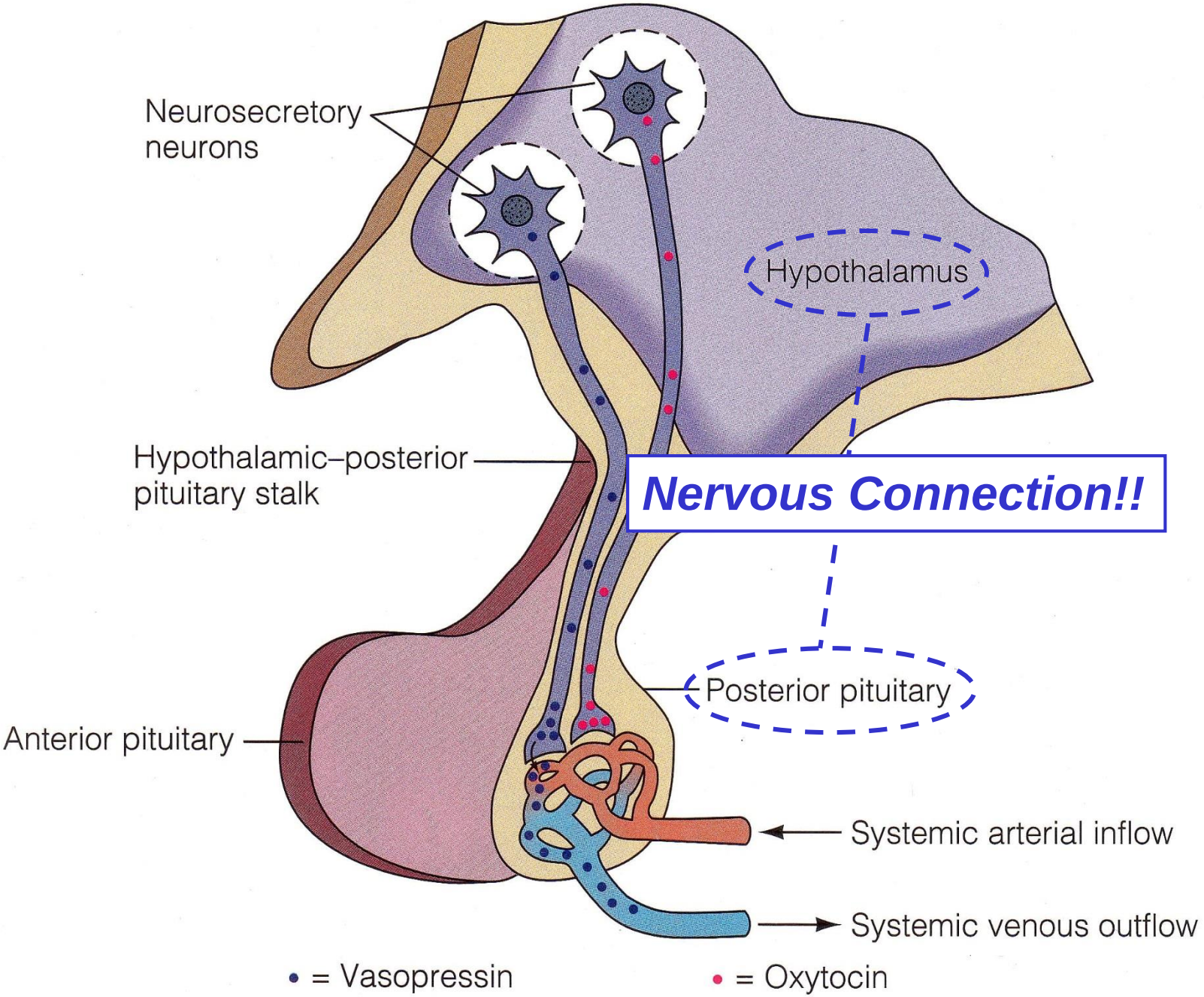
LS 2012 fig 17-3

Good Things Come in Small Packages!



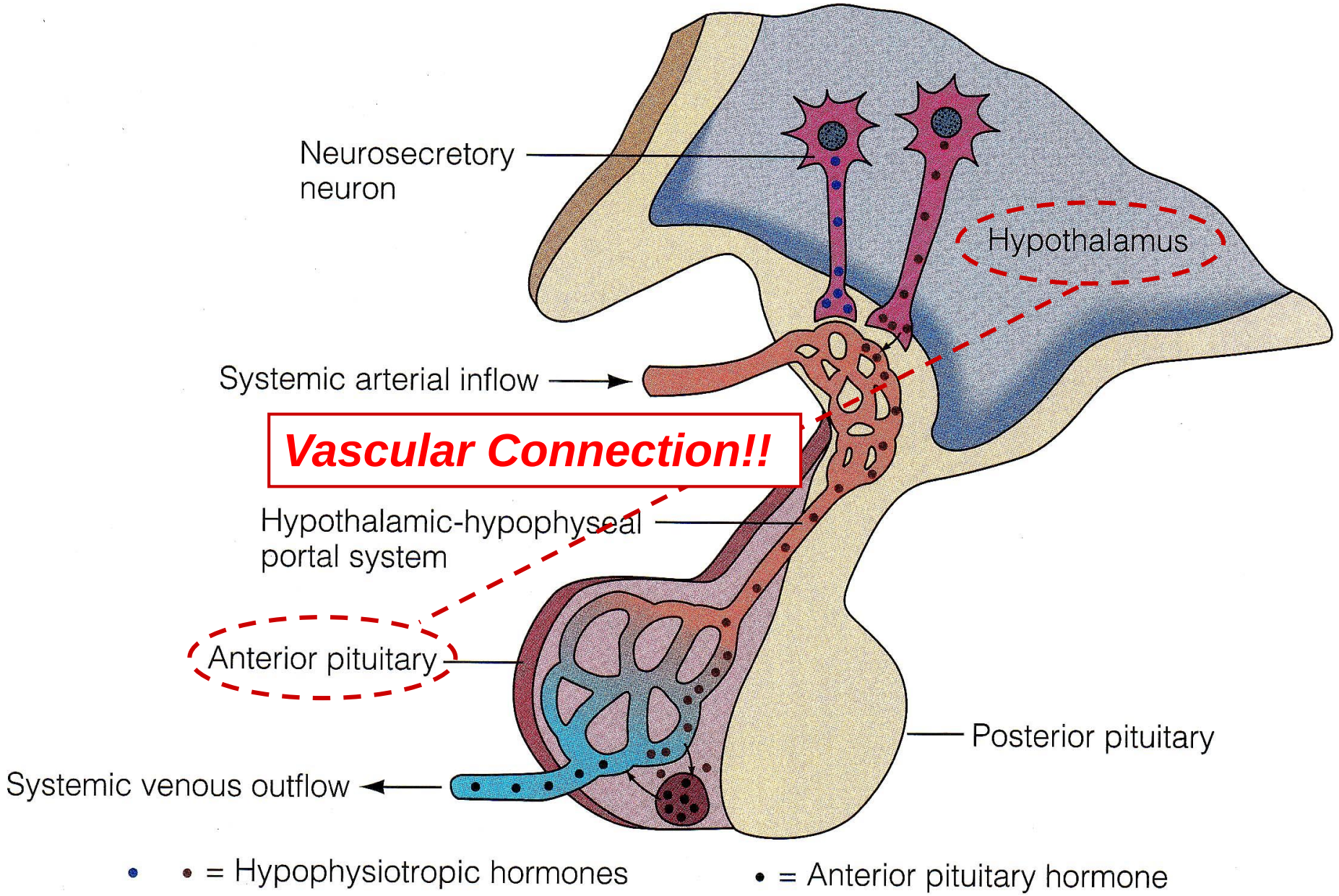
Hypothalamus
< 1% of Brain Mass
Hormone Master Controller
+100s of Functions!

Kreiger & Hughes 1980

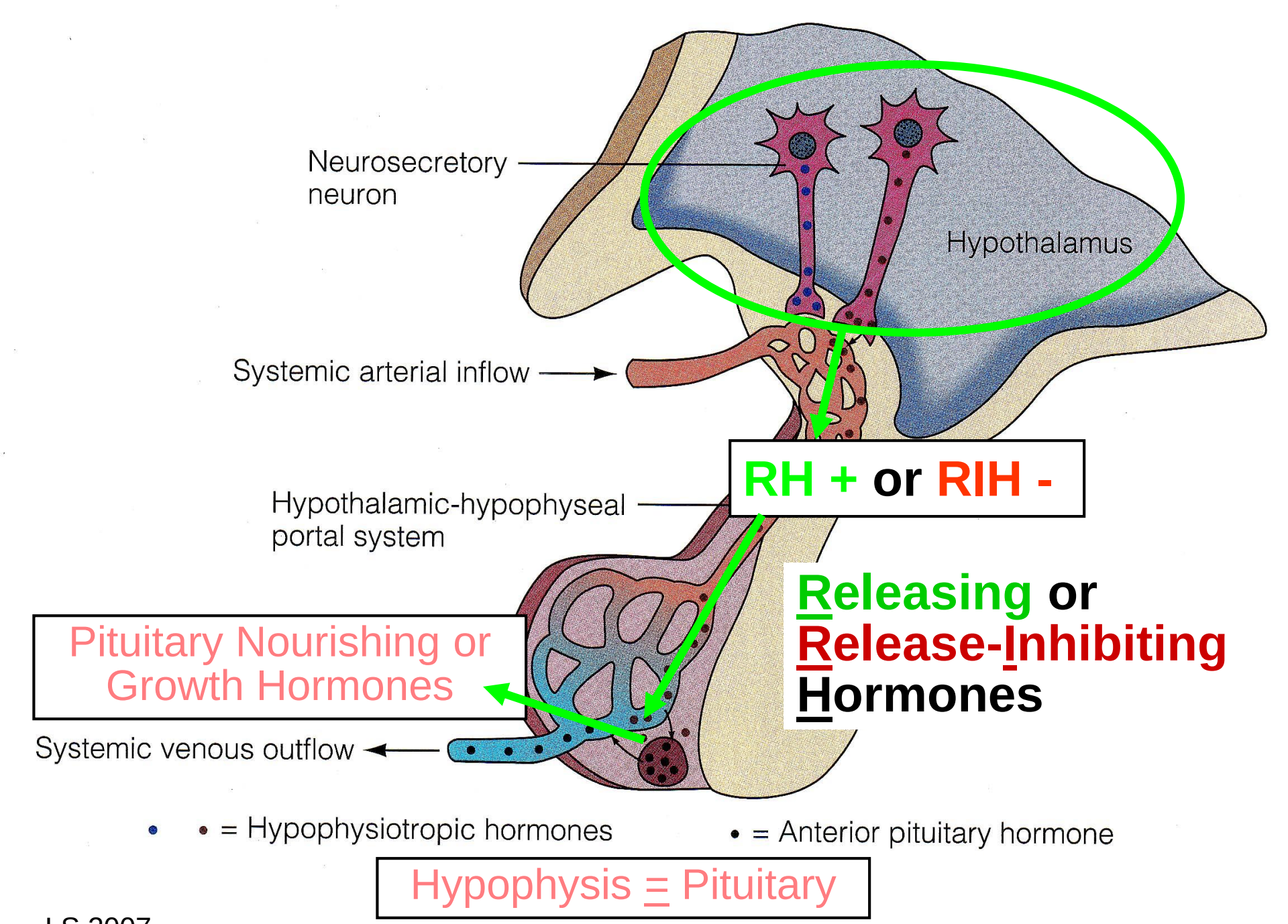

Neurosecretory neurons
Hypothalamus
Hypothalamic–posterior pituitary stalk
Nervous Connection!!
Posterior pituitary
Anterior pituitary
Systemic arterial inflow
Systemic venous outflow
• = Vasopressin
• = Oxytocin

LS 2007

Hypothalamus-Anterior Pituitary Vascular Connection!

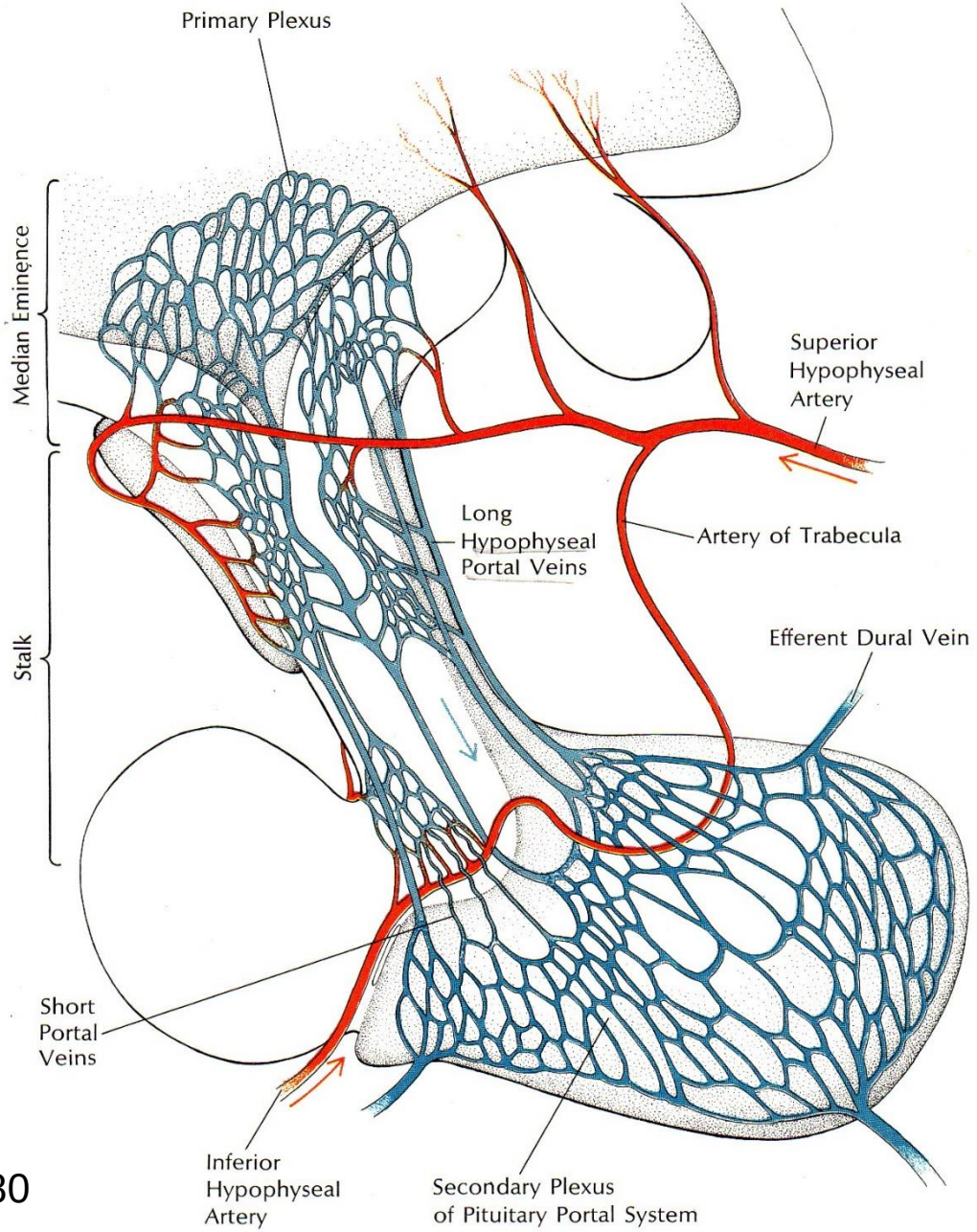


LS 2007

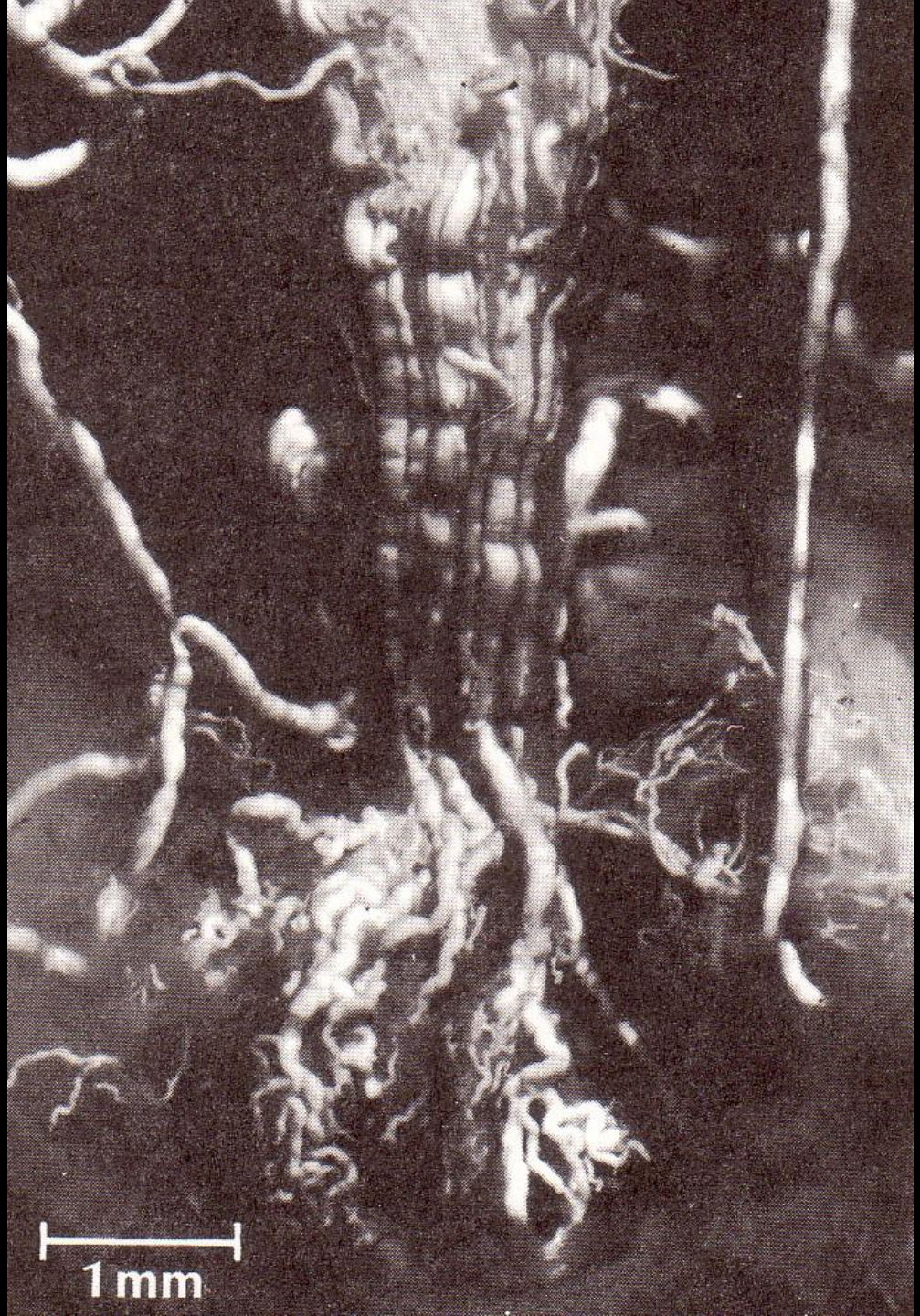

Neurosecretory neuron
Hypothalamus
Systemic arterial inflow
RH + or RIH -
Hypothalamic-hypophyseal portal system
Releasing or Release-Inhibiting Hormones
Pituitary Nourishing or Growth Hormones
Systemic venous outflow
• • = Hypophysiotropic hormones
• = Anterior pituitary hormone
Hypophysis = Pituitary

LS 2007

Capillary-Venule-Capillary Intimate Circulation

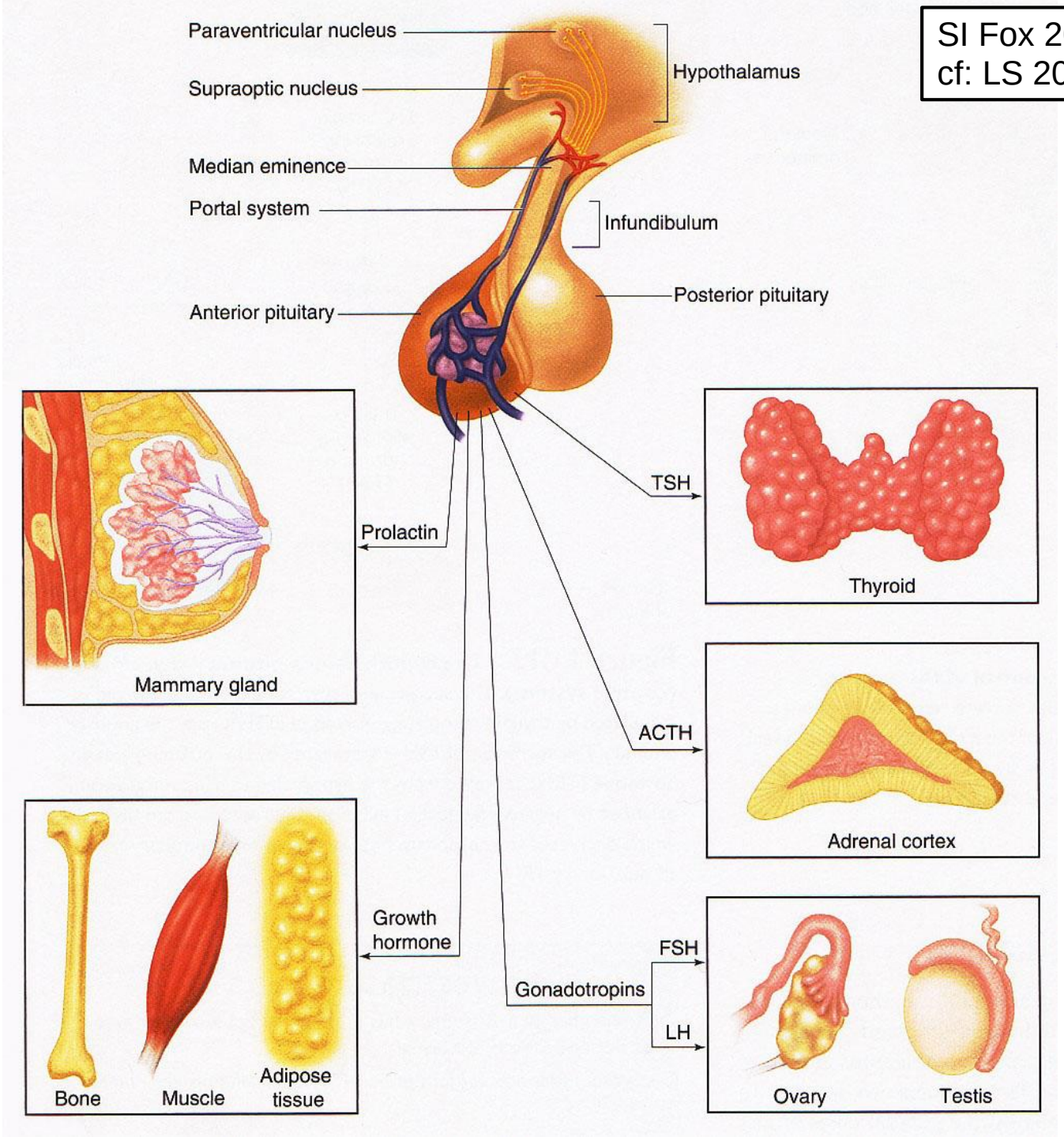


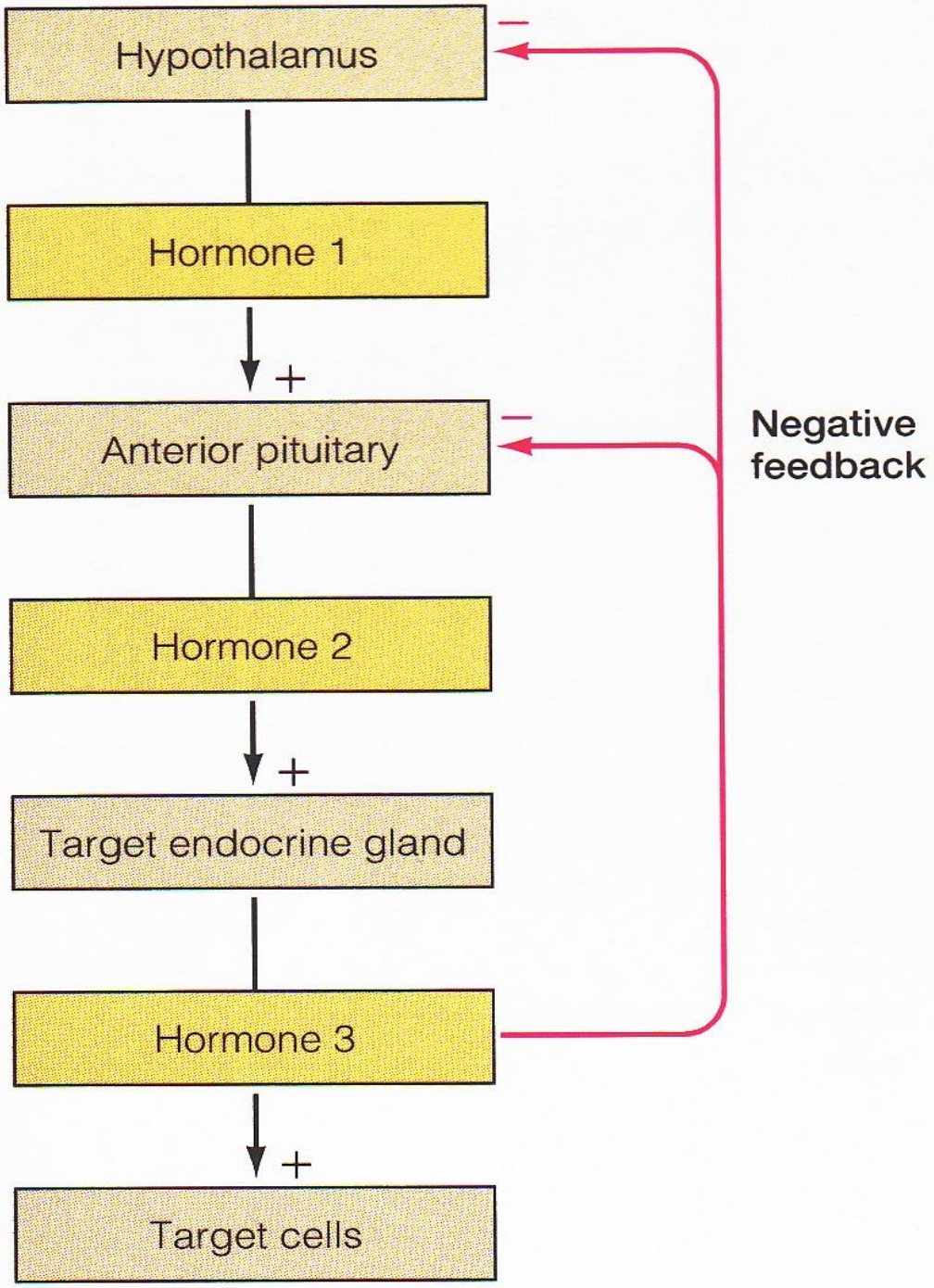
Krieger & Hughes 1980



Krieger & Hughes 1980

SI Fox 2008
cf: LS 2012 fig 17-5

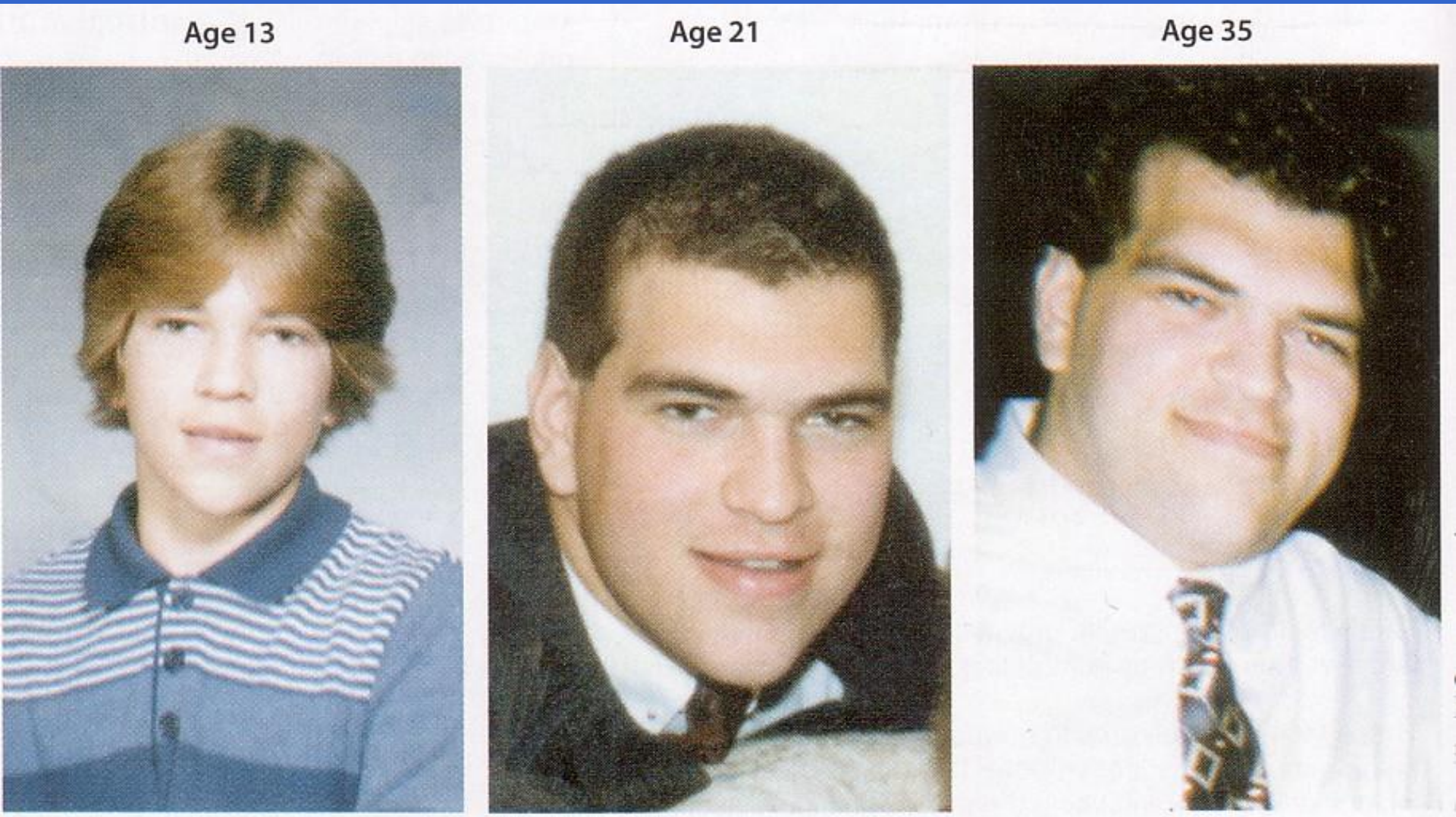



Hypothalamus
Hormone 1
+
Anterior pituitary
Hormone 2
+
Target endocrine gland
Hormone 3
+
Target cells
−
−
Negative feedback

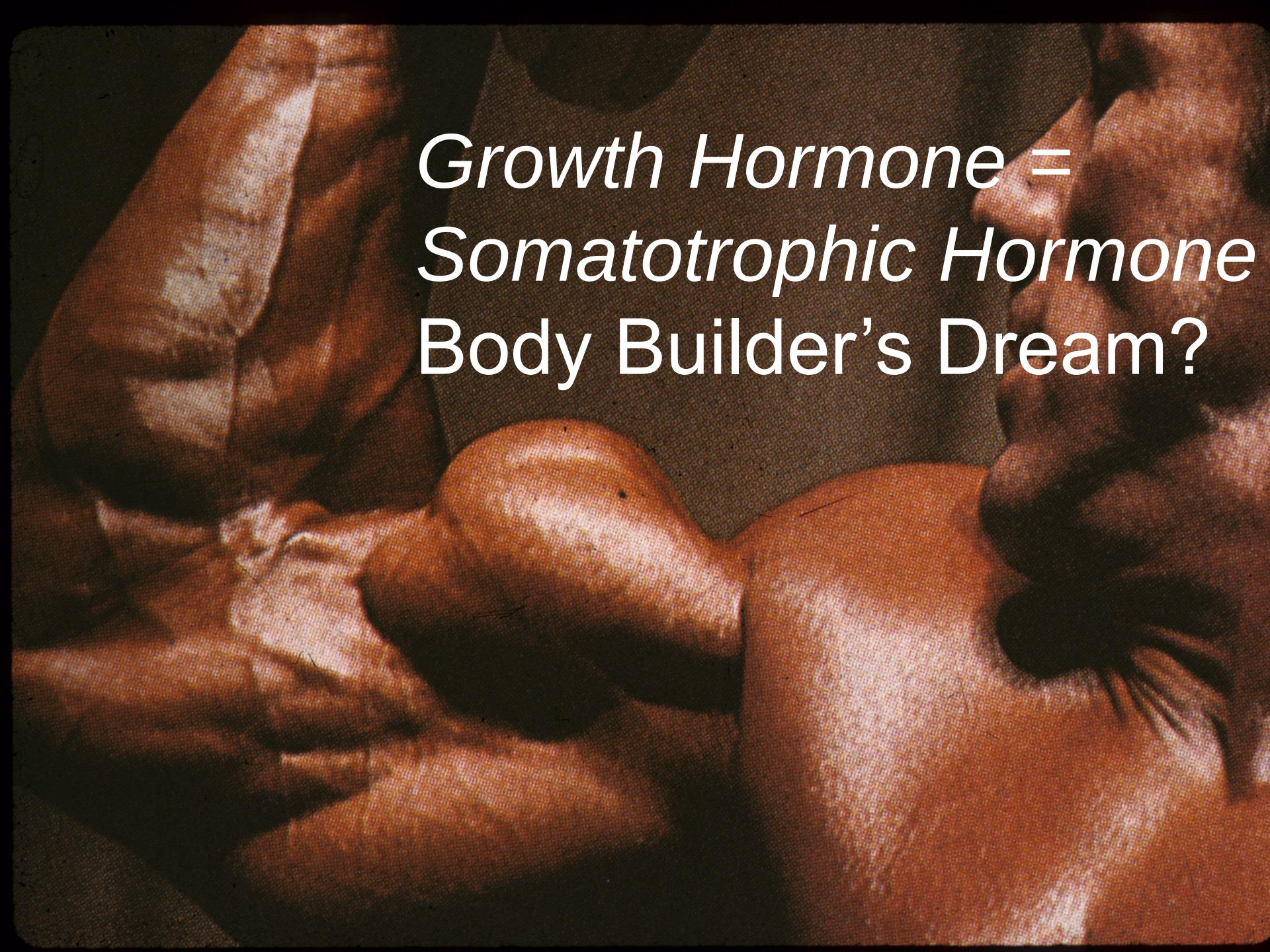
LS 1991

LS 2006, cf: LS 2012
fig 17-10

Progression & Development of Acromegaly



LS 2012 fig 17-11


Growth Hormone =
Somatotrophic Hormone
Body Builder's Dream?

GH/STH Effects: Insulin Resistance/Type II Diabetes?

↑ Amino Acid uptake & Protein synthesis

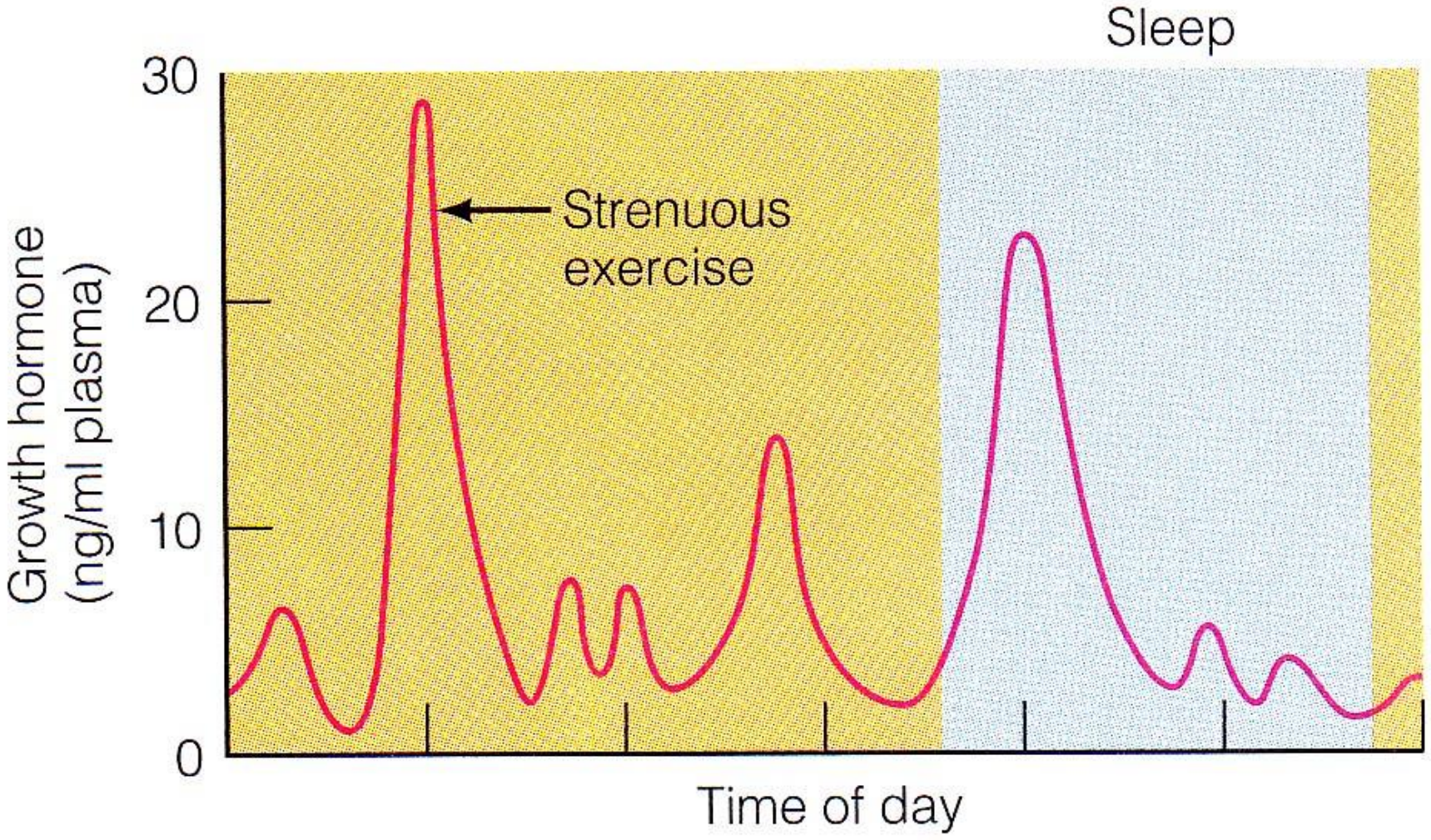
↑ Lipolysis & Fatty Acid mobilization

↓ Glucose uptake
(skeletal muscle & adipocytes)

↑ Glucose production
(liver glycogenolysis)

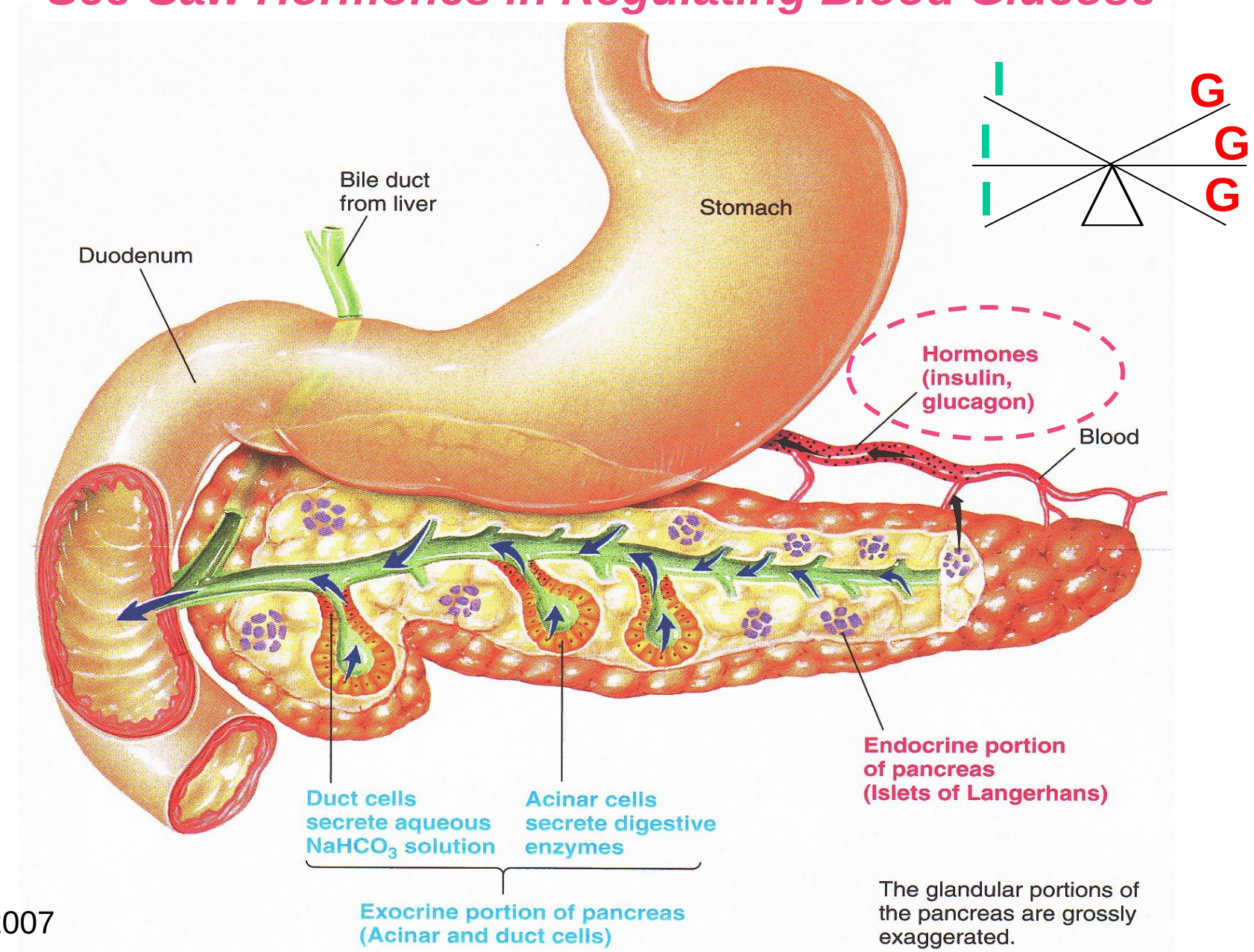
↑ Insulin secretion

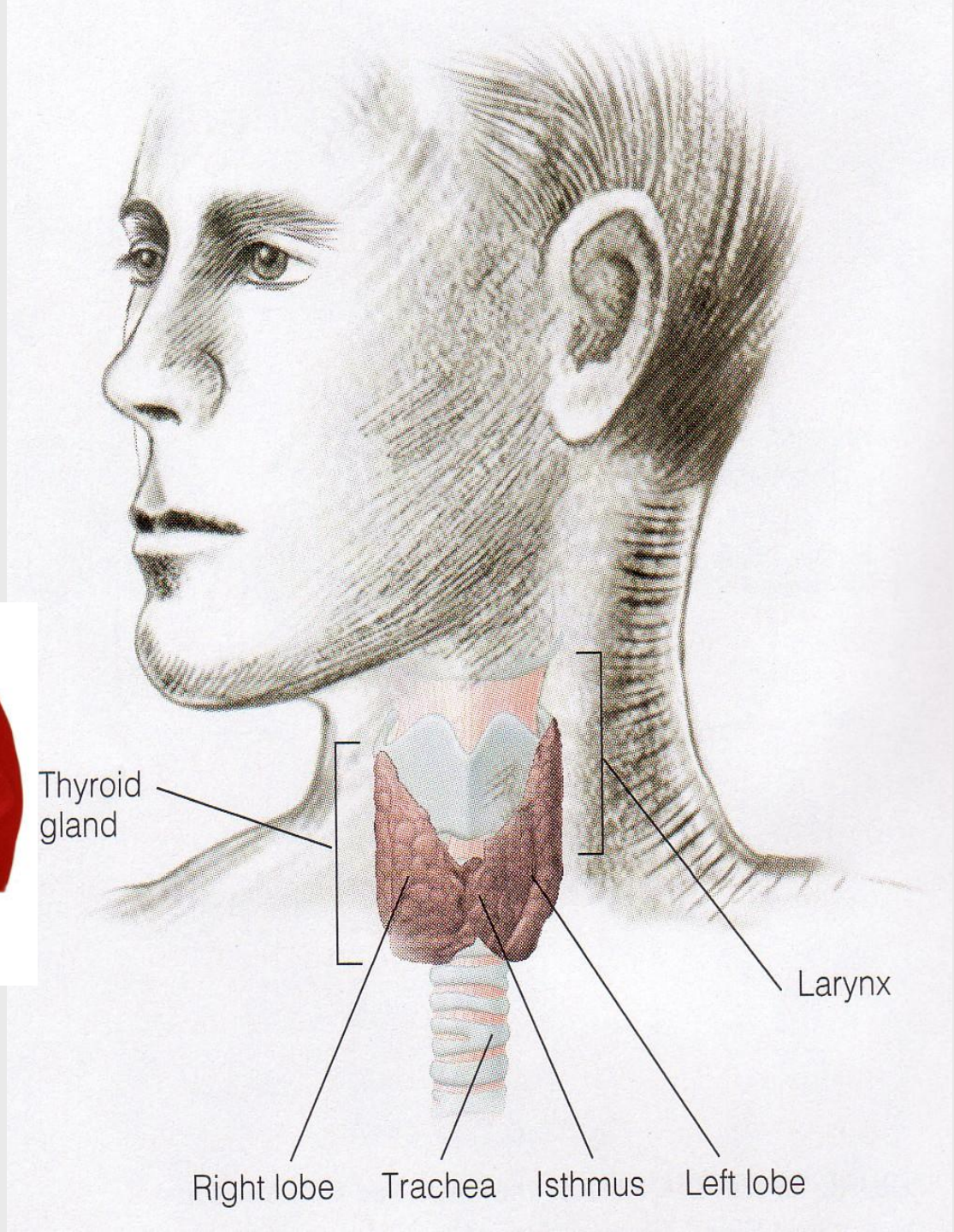
Increase GH naturally with exercise & sleep!!



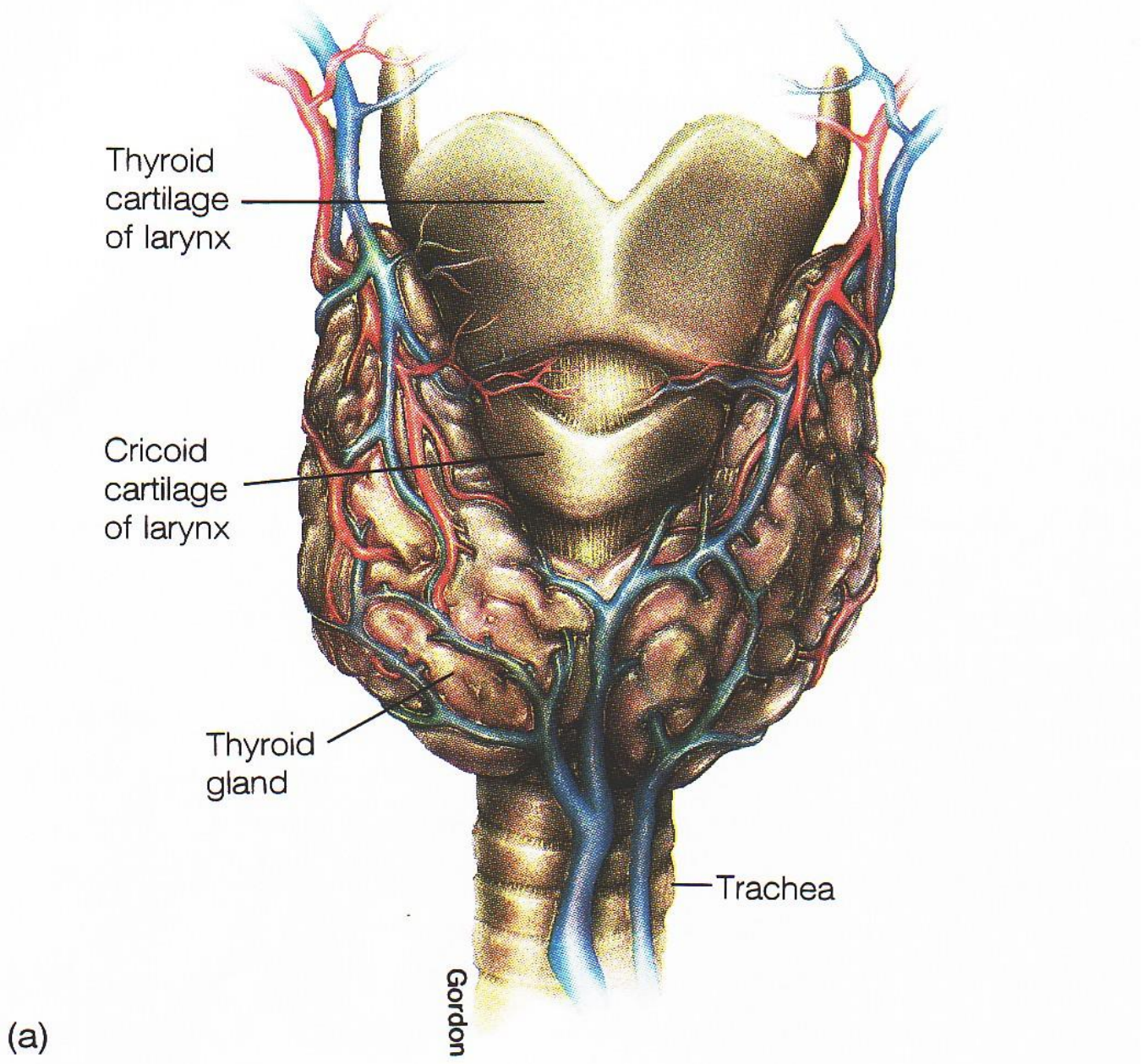
ng/ml = nanograms per mililiter

Endocrine Pancreas: Insulin (I) & Glucagon (G) See-Saw Hormones in Regulating Blood Glucose





DC 2003


Thyroid cartilage of larynx
Cricoid cartilage of larynx
Thyroid gland
Trachea
Gordon
(a)

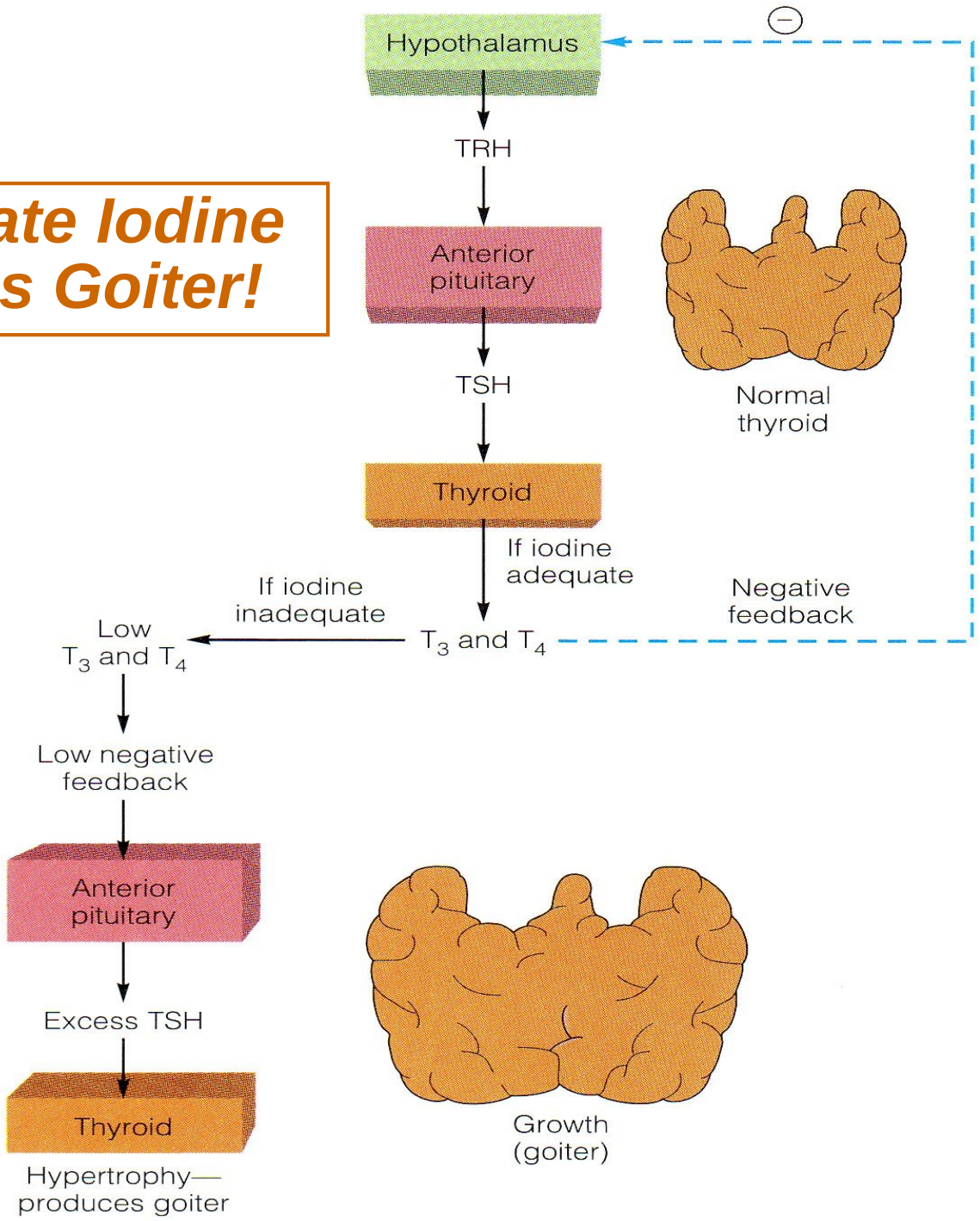
DC 2003


DC 2003

LS 2012 fig 17-16

LS 2012 fig 17-17

Inadequate Iodine Promotes Goiter!



DC 2003

Guyton & Hall 2000

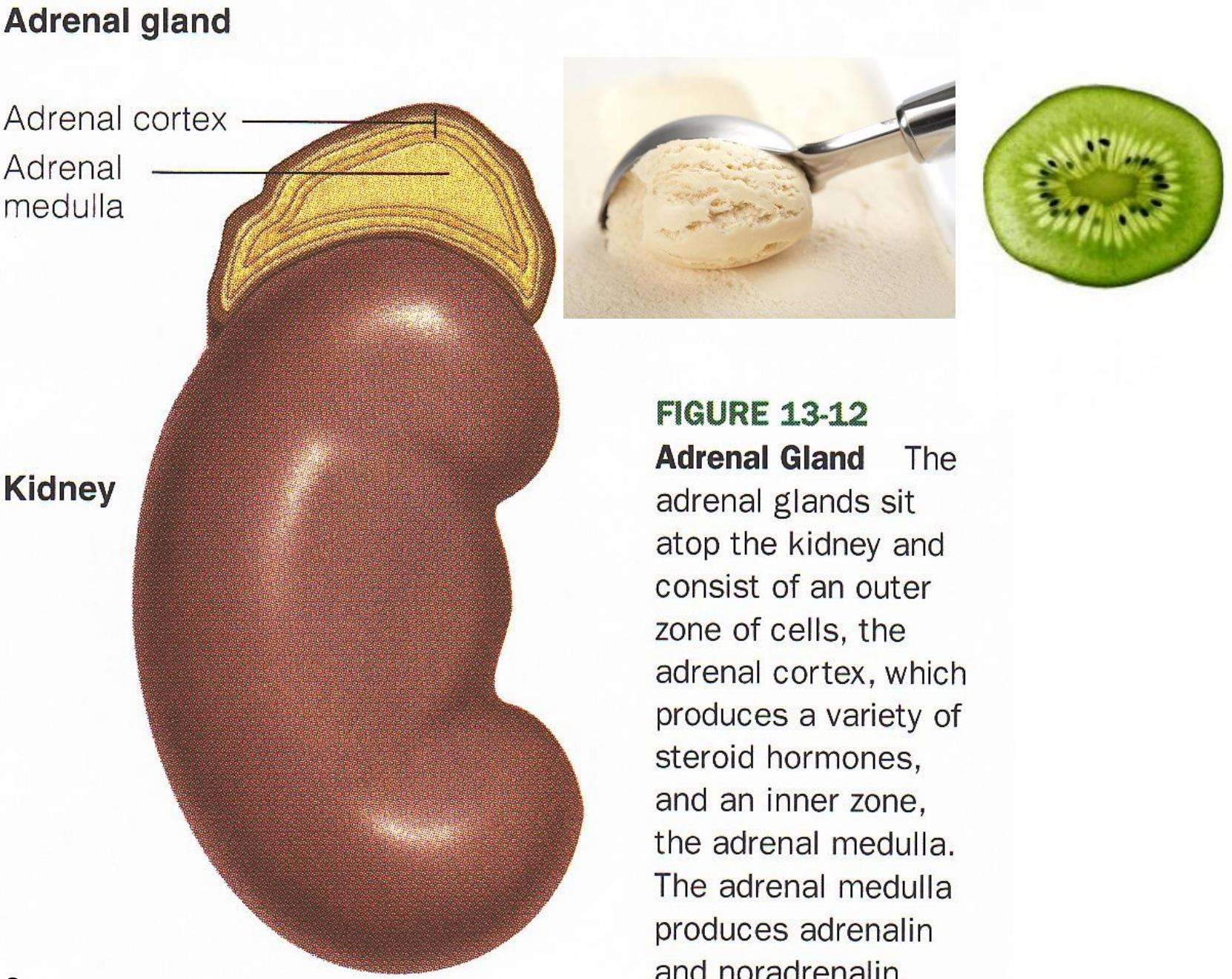
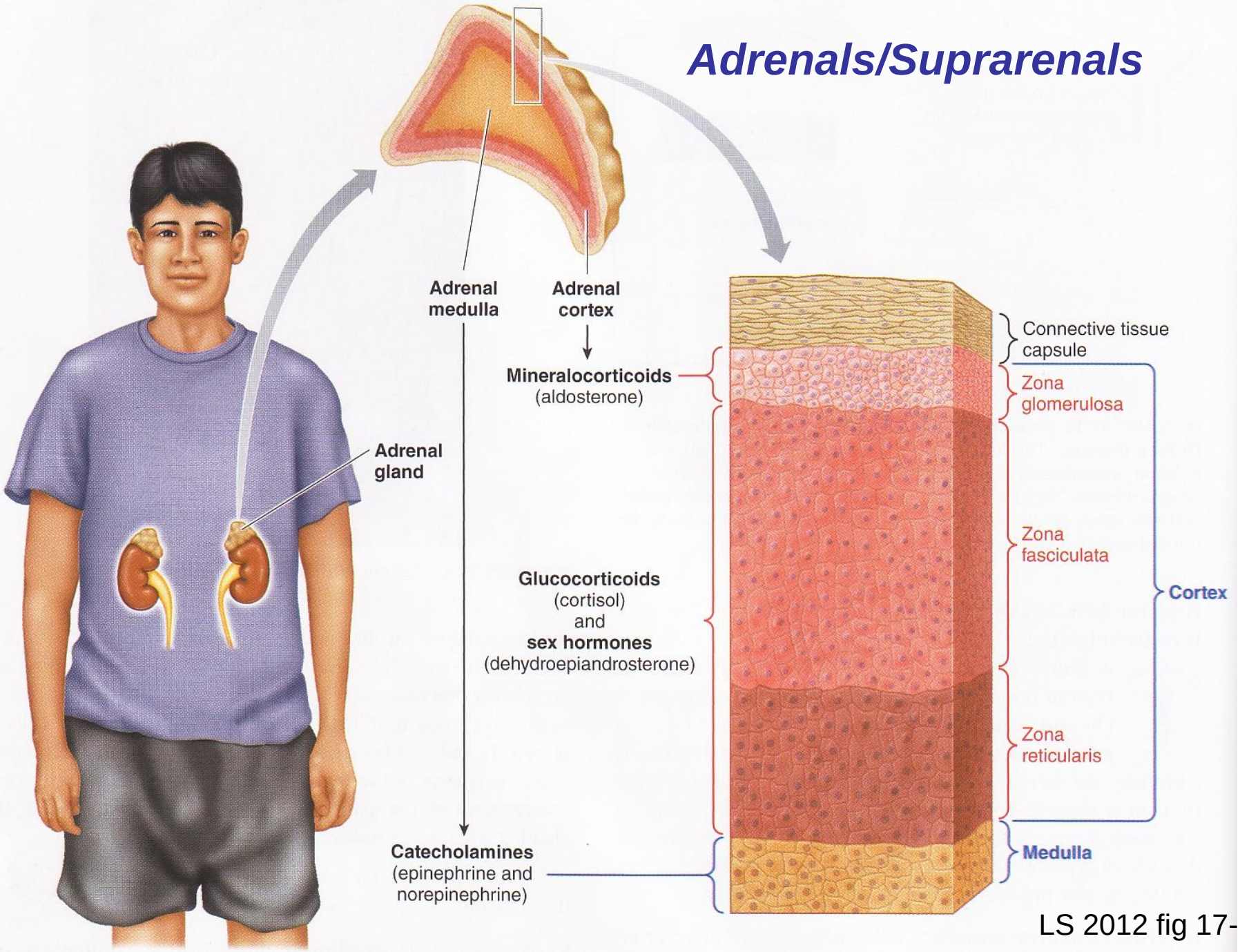


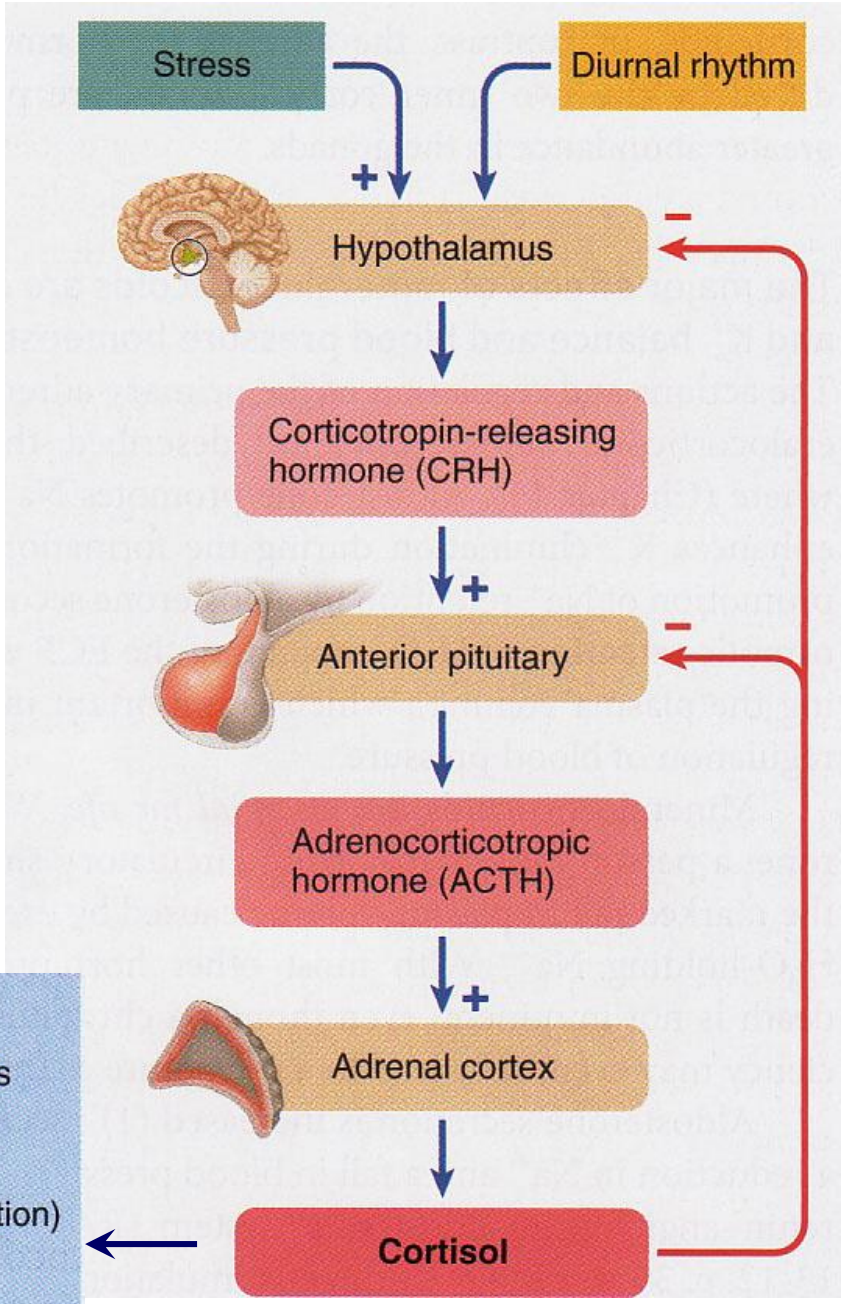
FIGURE 13-12
Adrenal Gland The adrenal glands sit atop the kidney and consist of an outer zone of cells, the adrenal cortex, which produces a variety of steroid hormones, and an inner zone, the adrenal medulla. The adrenal medulla produces adrenalin and noradrenalin.

Adrenals/Suprarenals



LS 2012 fig 17-18

Stress Promotes Cortisol Secretion

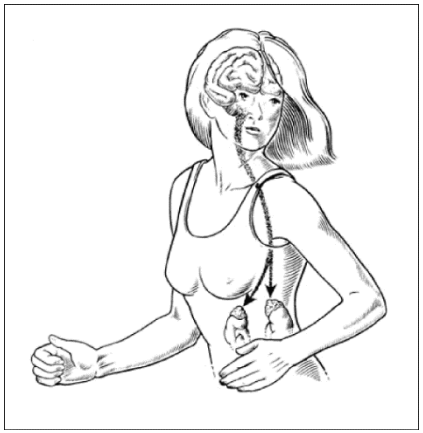


Metabolic fuels and building blocks available to help resist stress

- ↑ Blood glucose (by stimulating gluconeogenesis and inhibiting glucose uptake)
- ↑ Blood amino acids (by stimulating protein degradation)
- ↑ Blood fatty acids (by stimulating lipolysis)

LS 2012 fig 17-19

Epinephrine 80%
Norepinephrine 20%



Guyton & Hall 2000

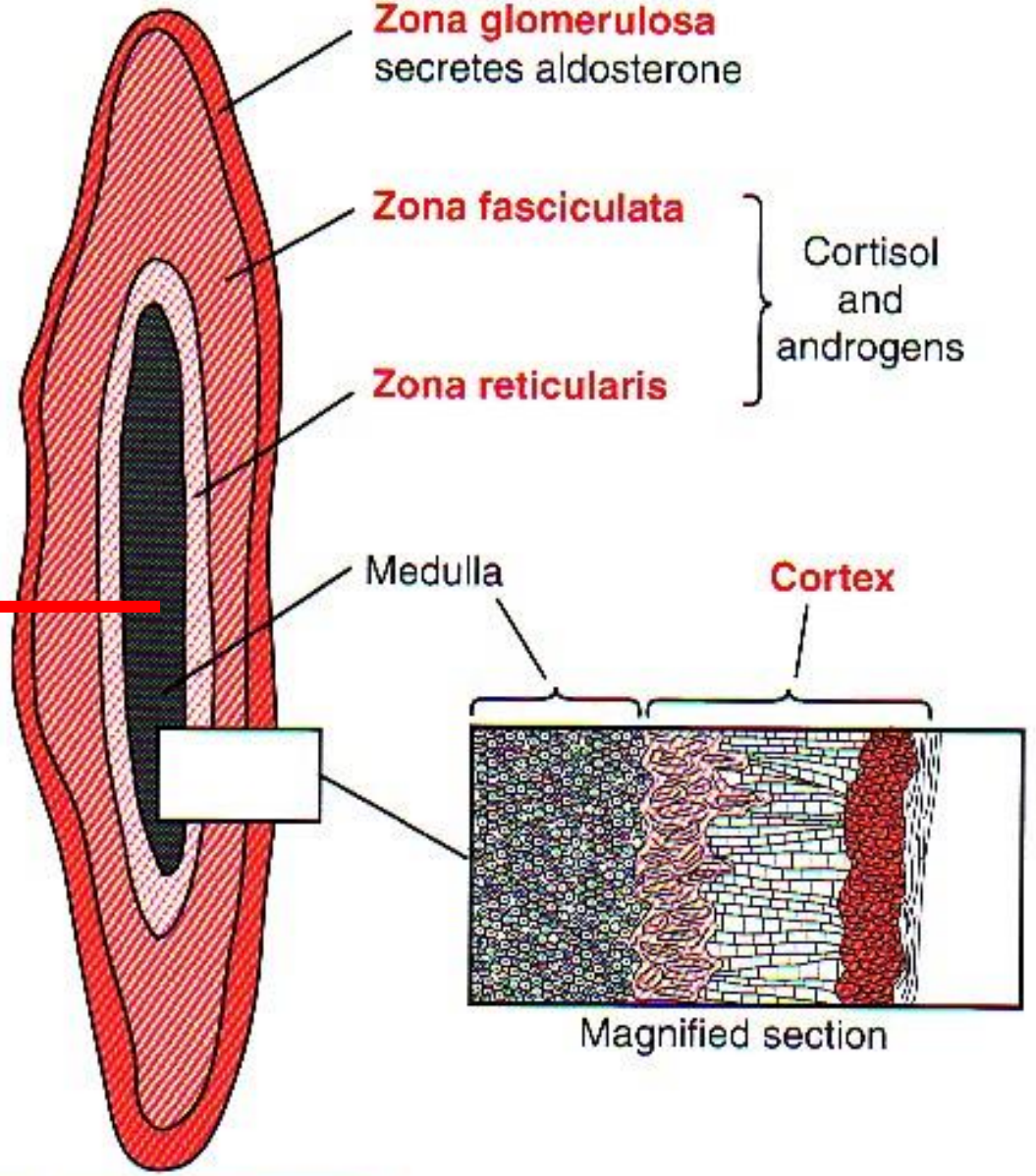


FIGURE 77-1

Secretion of adrenocortical hormones by the different zones of the adrenal cortex.