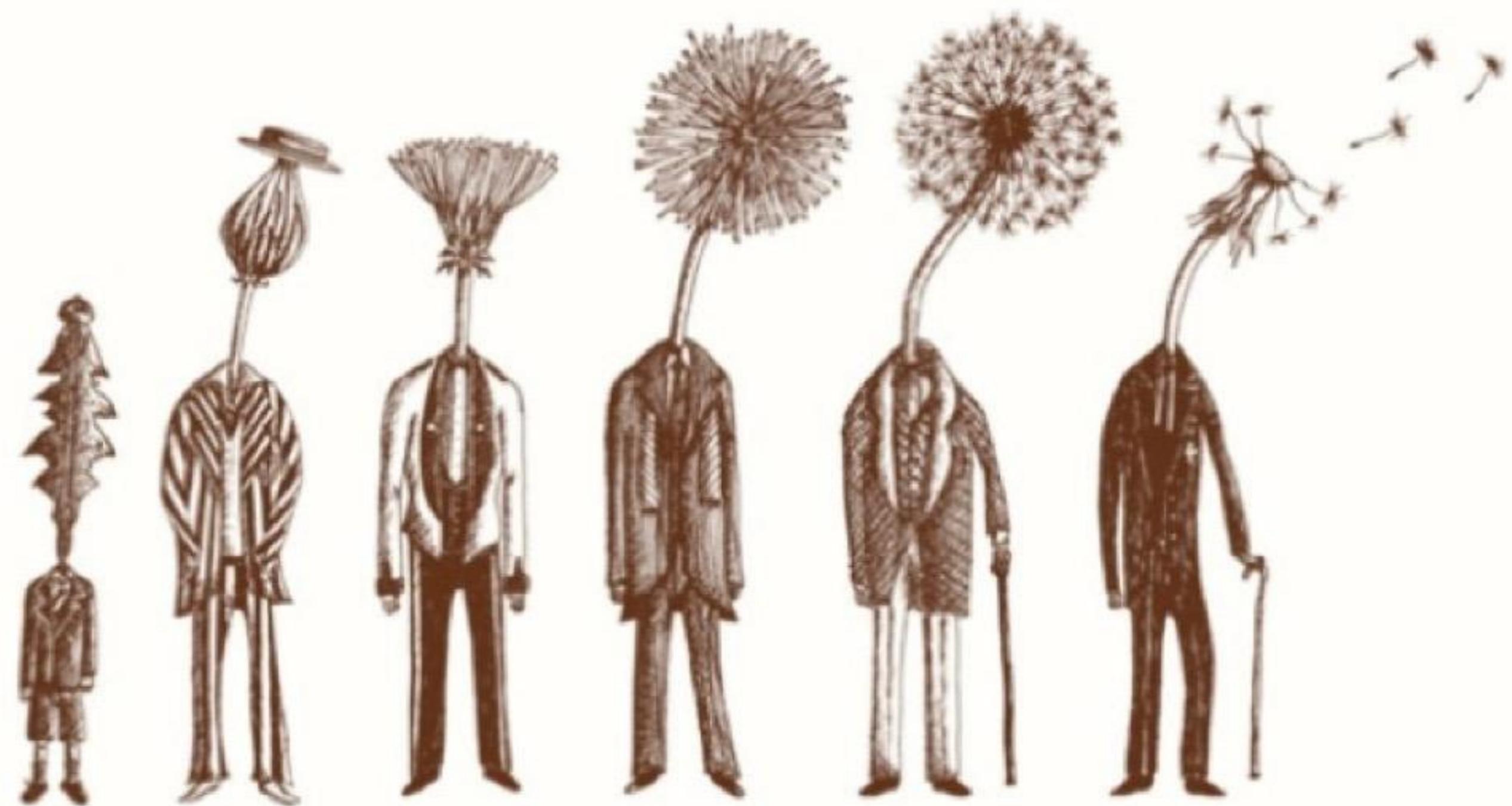


Pediatric endocrinology

Dóra Török MD, PhD

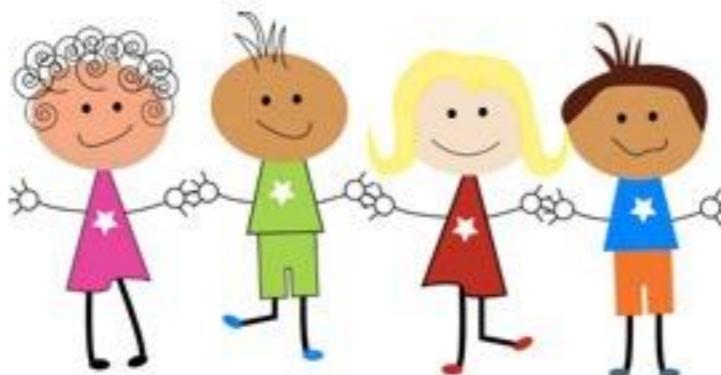
Semmelweis University, 2nd Dept of
Pediatrics





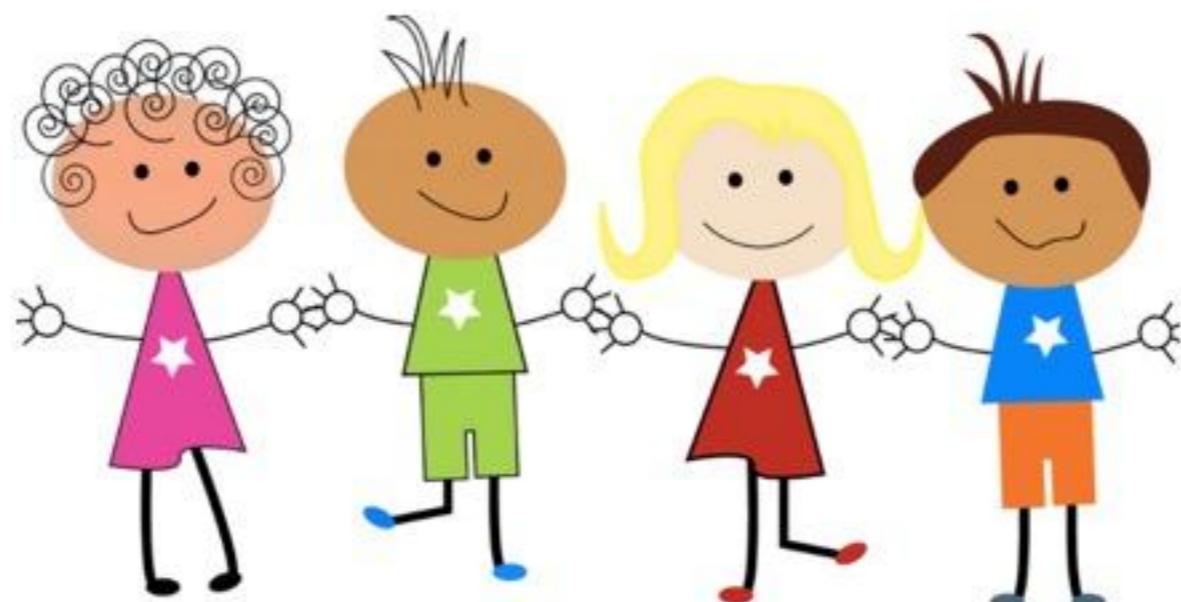
Outline

- General remarks
- Patients assessment
- Growth
- Puberty
- Main pediatric endocrine diseases
- Differential of some endocrine symptoms



Children are special

- growth vs development
- the endocrine system is poorly developed at birth
- some parts of endocrine control takes effect only after 12-18 months
- homeostasis might be very labile in infants (fluids, electrolytes, glucose)



Endocrine assessment of a patient

History:

birth weight, GA
onset of puberty/menarche

Family history:

endocrine diseases in the family
parental height

Physical:

Percentiles: weight, height

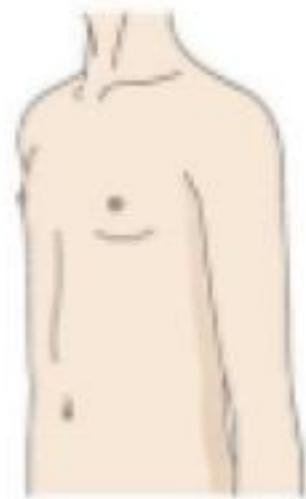
Body proportions, distribution of body fat
facial or other morphological features

Tanner staging, Ferriman-Gallwey score

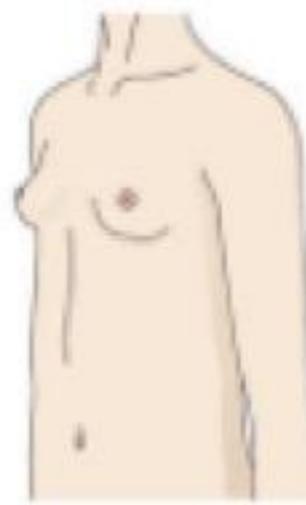
thyroid palpation

disease specific: morphology of bones, subcutan nodes in diabetes, eyes, skin texture, etc

TANNER STAGES



STAGE I



STAGE II



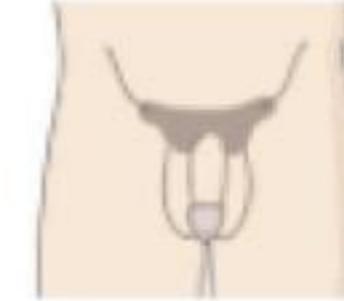
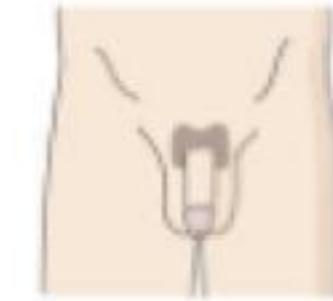
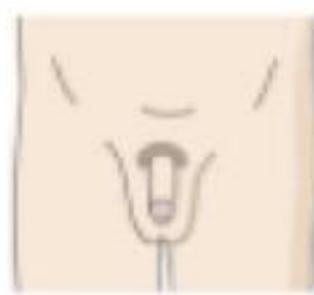
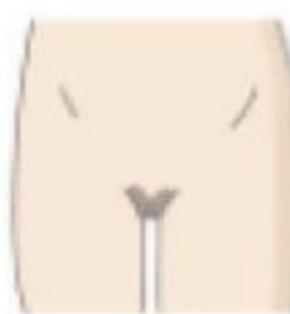
STAGE III



STAGE IV



STAGE V



STAGE I

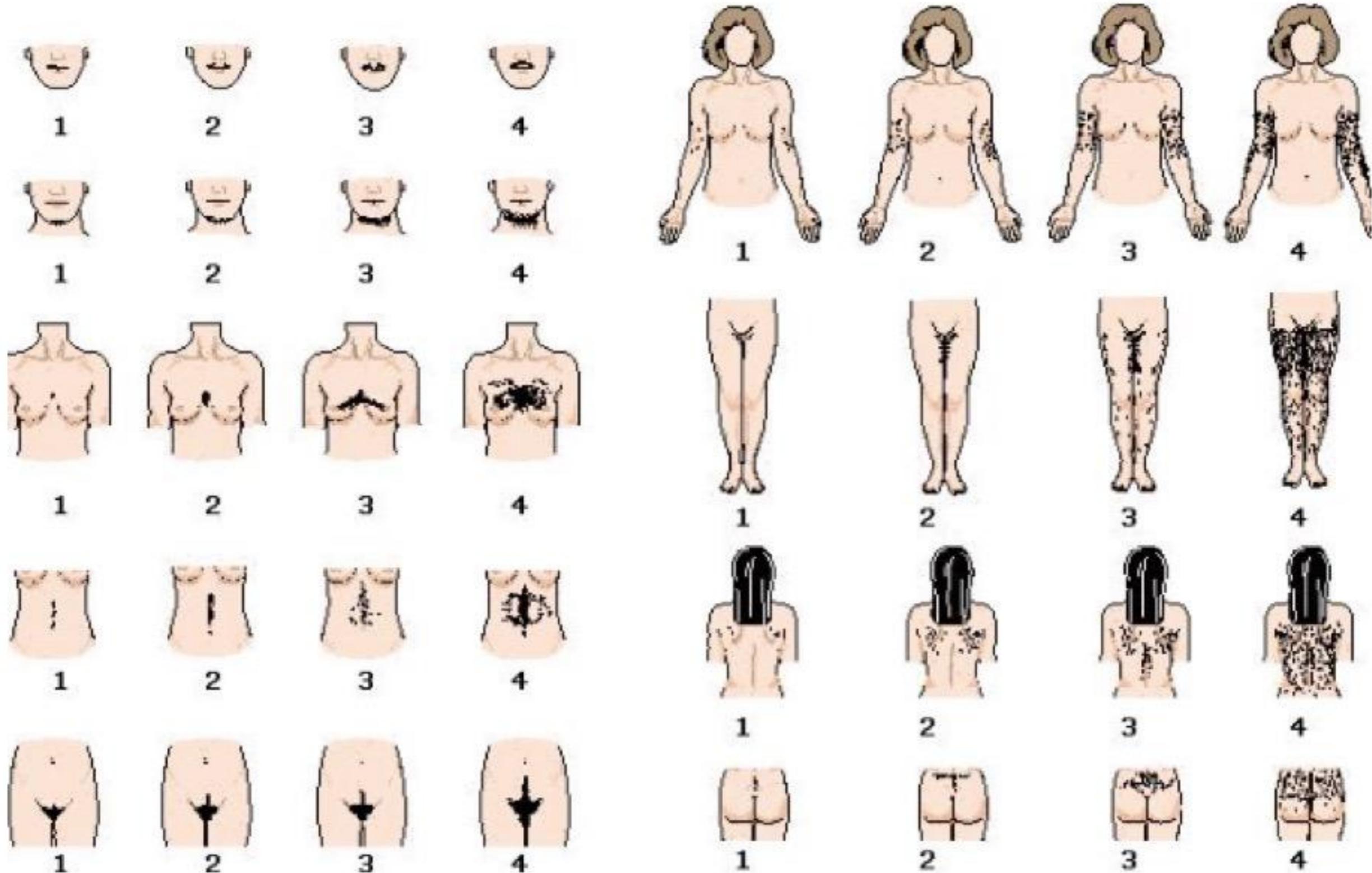
STAGE II

STAGE III

STAGE IV

STAGE V

Ferriman-Gallwey score



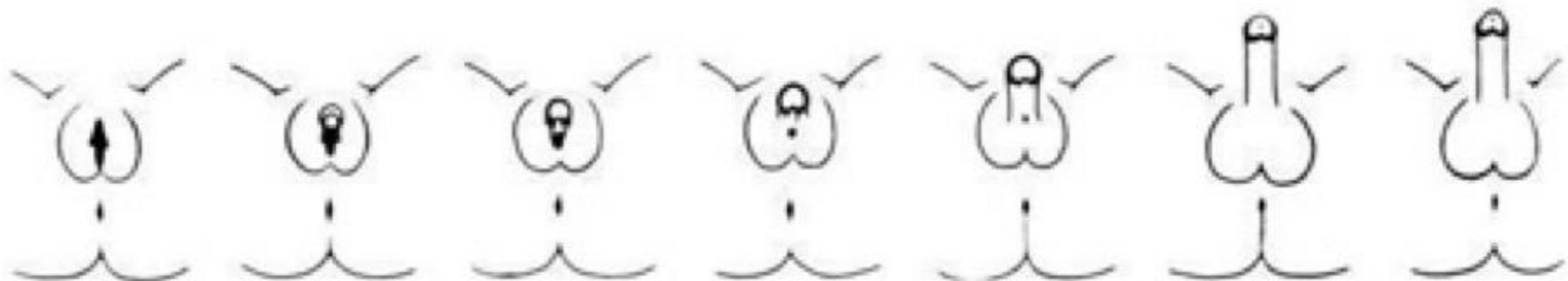
Thyroid Gland: Palpation

- Locate the Cricoid cartilage & move 2/3 rings below the Cricoid
- As you palpate, feel for the thyroid isthmus
- Move laterally to both thyroid lobes
- Ask the patient to swallow while you palpate
- Note the surface consistency & borders/margins of each lobe
- The left lobe is pushed to the right as you feel the right lobe
- Do the opposite for palpation of the left lobe



Prader score

Normal ♀ I II III IV V Normal ♂



Growth

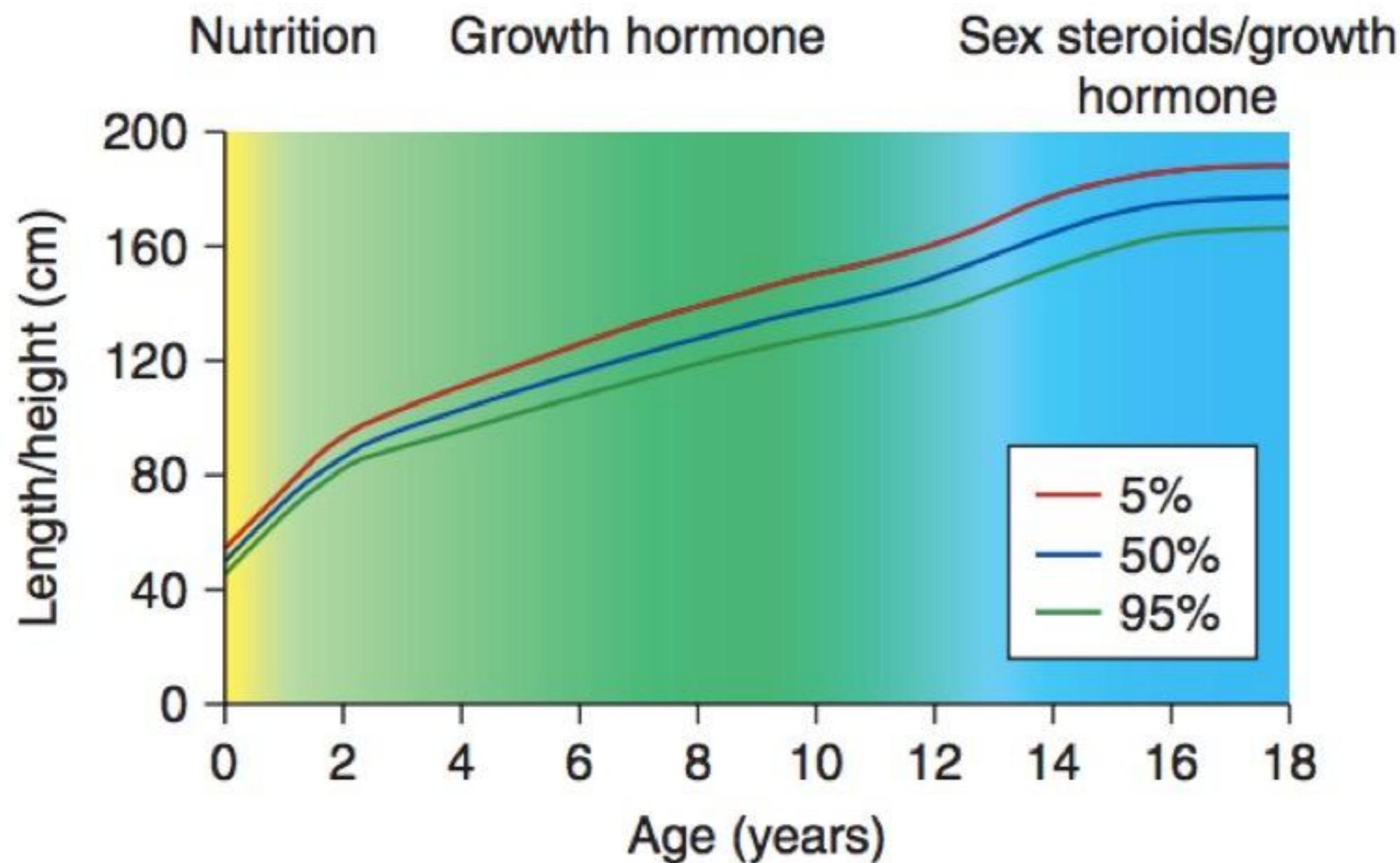
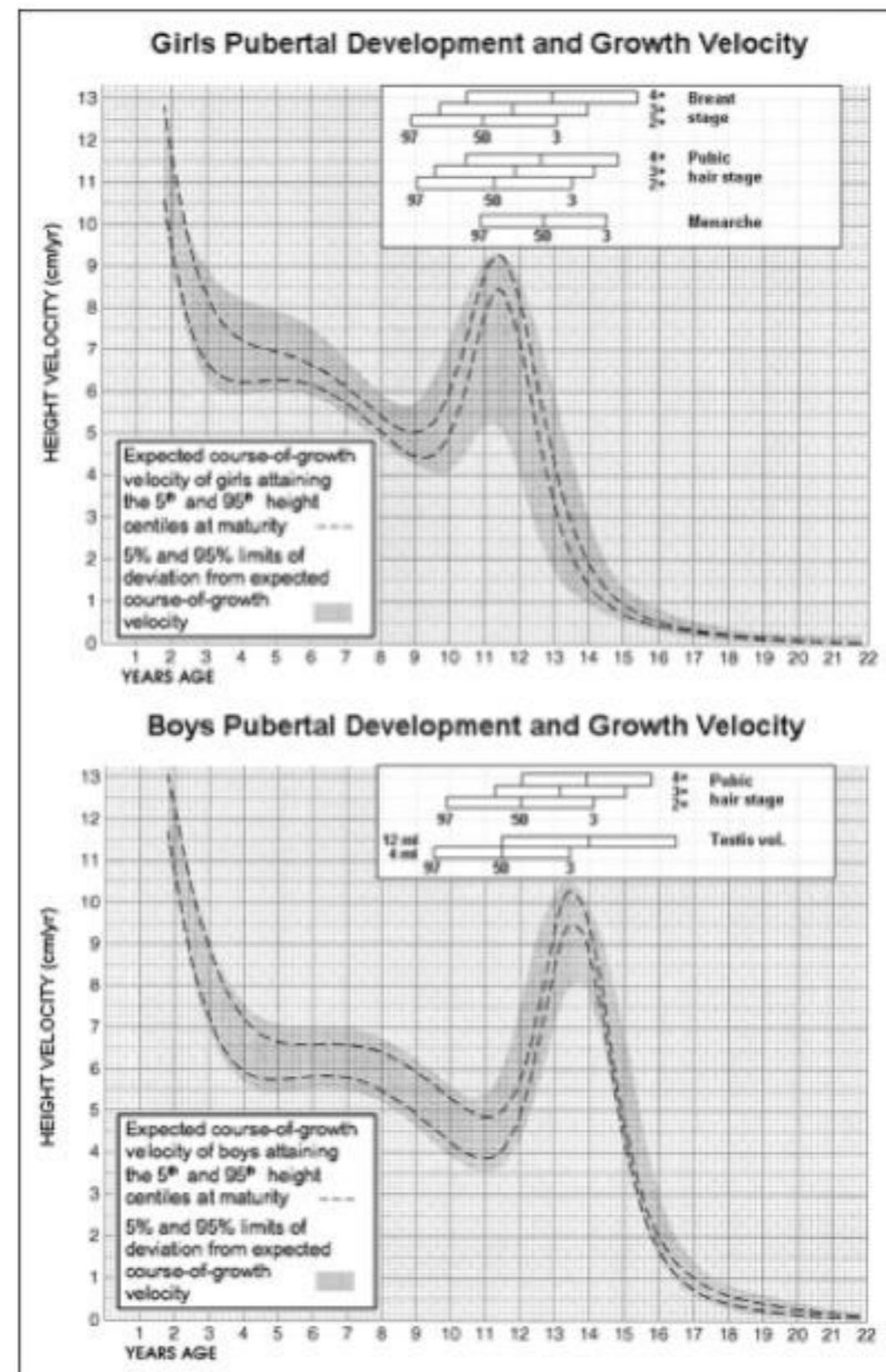
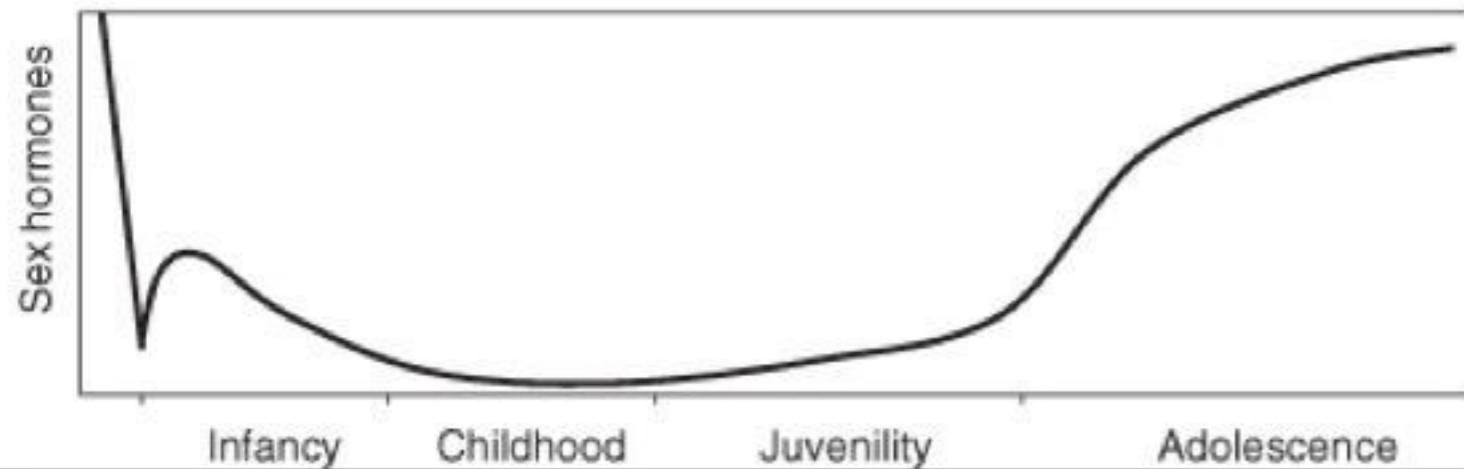
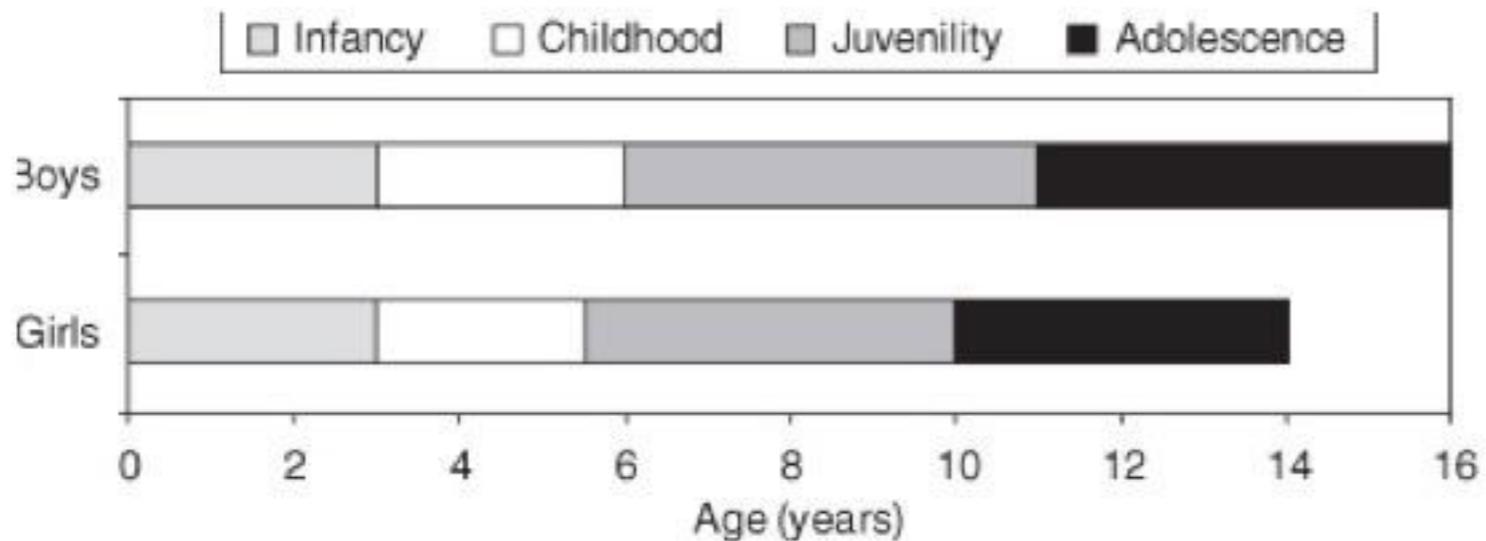


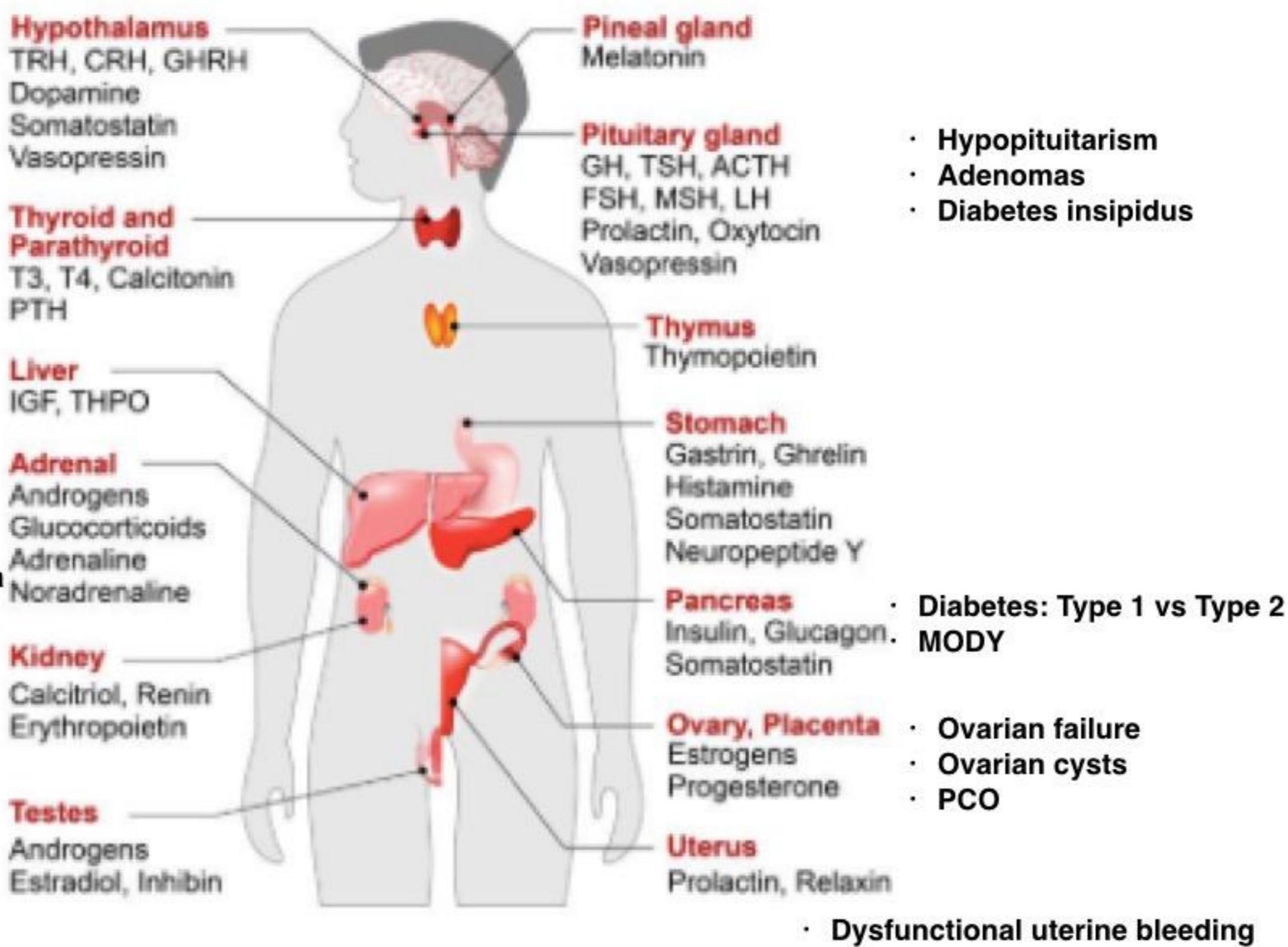
FIGURE 2-1 ■ Phases of childhood growth. (Redrawn from Karlberg J. *On the construction of the infancy-childhood-puberty growth standard*. Acta Paediatr Scand Supl. 1989;356:26.)

Puberty and mini puberty

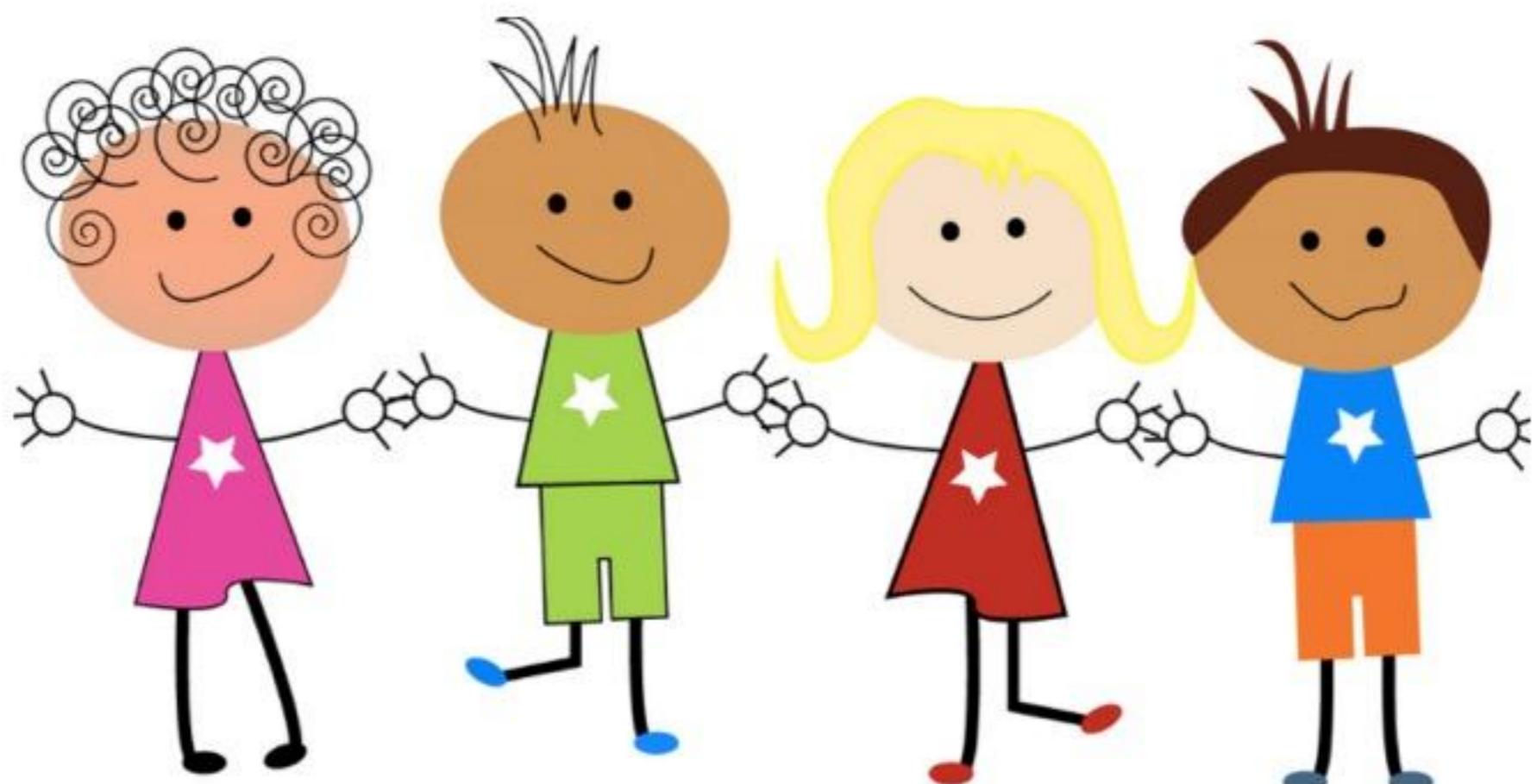


Some of the main paediatric endocrine disorders

- Precocious puberty
- Delayed puberty
- Hypothyroidism
- screening!
- Hashimoto
- Graves
- Papillary carcinoma
- Hypoparathyroidism
- Adrenarche praecox
- CAH
- Addison
- Phaeochromocytoma
- MEN
- Rickets
- Testicular tumors
- Testicular failure

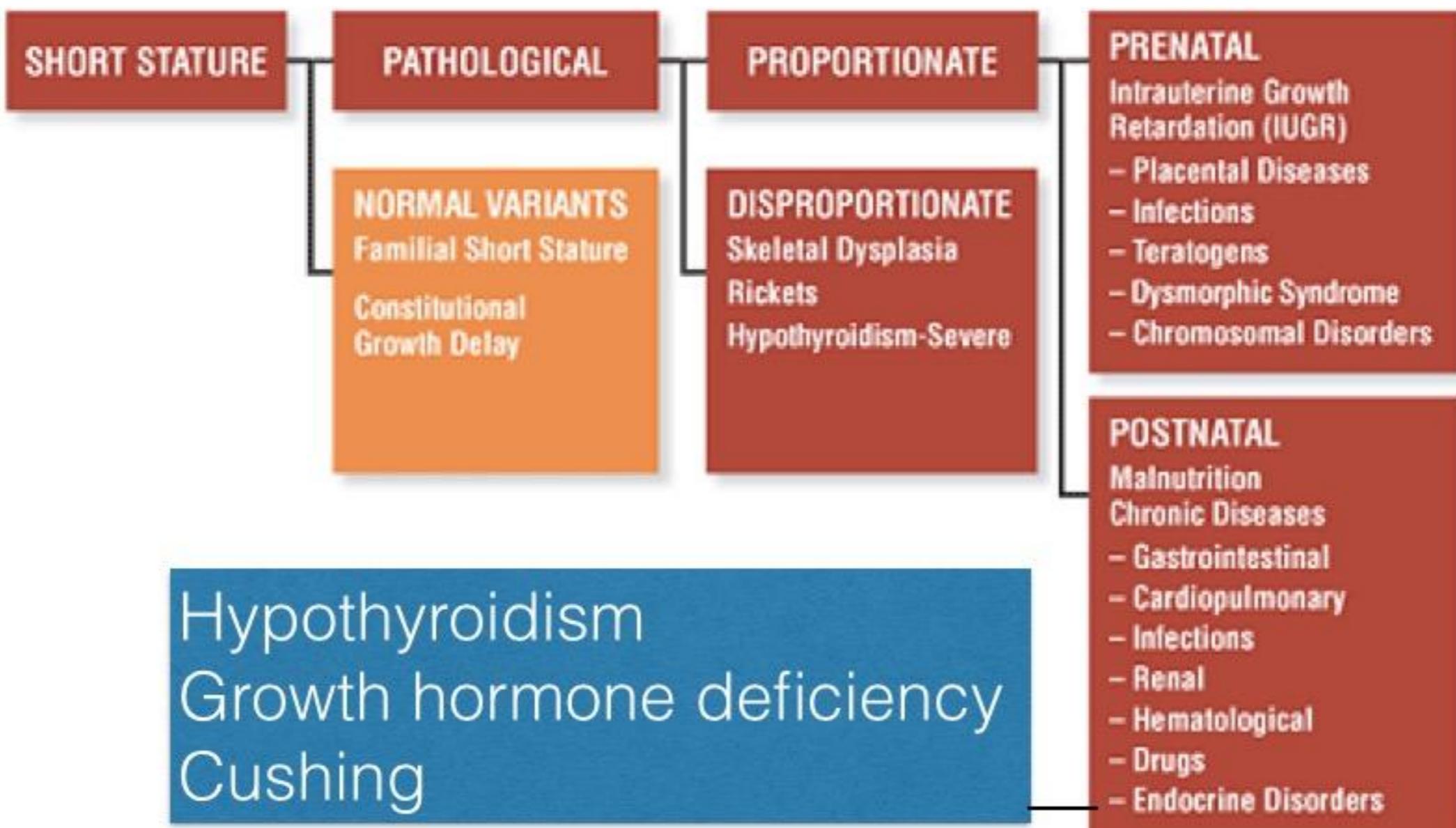


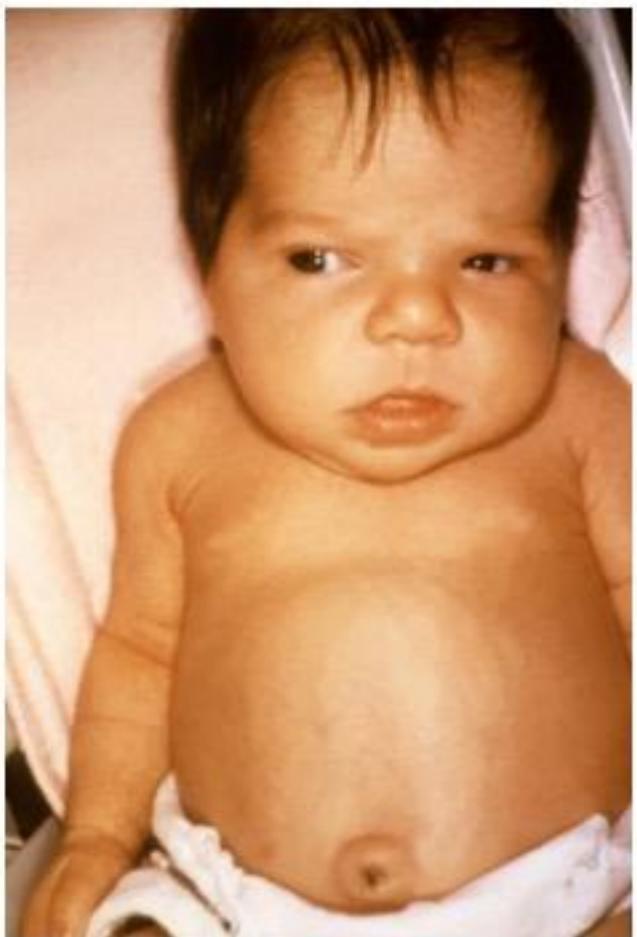
Endocrine differential



Short stature

- History
- MPH
- Physical
- Measure and plot
- Think





Obesity

- History
- Physical
- Measure and plot
- Think



Idiopathic

Endocrine:
Hypothyroidism
Cushing
Growth hormone deficiency



Genetic:
Prader-Willi syndrome
Down syndrome





Tall stature

- History
- MPH
- Physical
- Measure and plot
- Think



TALL STATURE

PATHOLOGICAL

SYNDROMIC

Klinefelter
Beckwith-Wiedeman
other

NORMAL VARIANT

- constitutional
- obesity

ENDOCRINE

- GH excess
- Precocious puberty
- Untreated thyrotoxicosis



Ambiguous genitalia



- Family and birth history
- Physical
- Think first THEN
- Speak carefully



Sex Chromosome DSD	46,XY DSD			46,XX DSD	
• 45,X Turner and Variants	Disorders of Testicular Development	Disorders of Androgen Synthesis/Action	Disorders of Ovarian Development	Fetal Androgen Excess	
• 47,XXY Klinefelter and Variants	•Complete Gonadal Dysgenesis	•Androgen Synthesis Defect	•Ovotesticular DSD	CAH	Non CAH
• 45,X/46XY MGD	•Partial Gonadal Dysgenesis	•LH-Receptor Defect	•Testicular DSD (eg. SRY+, dup SOX9)	•21-OH Deficiency	•Aromatase Deficiency
• Chromosomal Ovotesticular DSD	•Gonadal Regression	•Androgen Insensitivity	•Gonadal Dysgenesis	•11-OH Deficiency	•POR Gene Defect
	•Ovotesticular DSD	•5α-Reductase Deficiency			•Maternal Luteoma
		•Disorders AMH			•Iatrogenic
		•Timing Defect			
		•Endocrine Disrupters			
		•Cloacal Extrophy			





Weight loss

- History
- Physical
- Measure and plot
- Think



Malignant disease :	(16%-36%)
Psychiatry disorder :	(9% 24%)
Gastrointestinal disease :	(6-19%)
Endocrine disorder:	(4%-11%)—
Cardiovascular disease:	(2%-9%)
Nutritional disorders:	(4%-8%)
Respiratory disease:	(6%)
Neurological disease:	(2%-7%)
Chronic infection:	(2%-5%)
Renal Disease	(5%)
Connective tissue disease	(2%-4%)
Drug-induced	(2 %)
Unknown	(10%-36%)

Hyperthyroidism
Adrenal insufficiency
Genetic: Silver-Russel





Polydipsia, polyuria

- History
- Physical
- Measure fluid intake
- Think



ENDOCRINE:

- hypercalcemia
- diabetes mellitus
- diabetes insipidus
 - central
 - nephrogenic

PSYCHOGENIC POLYDIPSIA

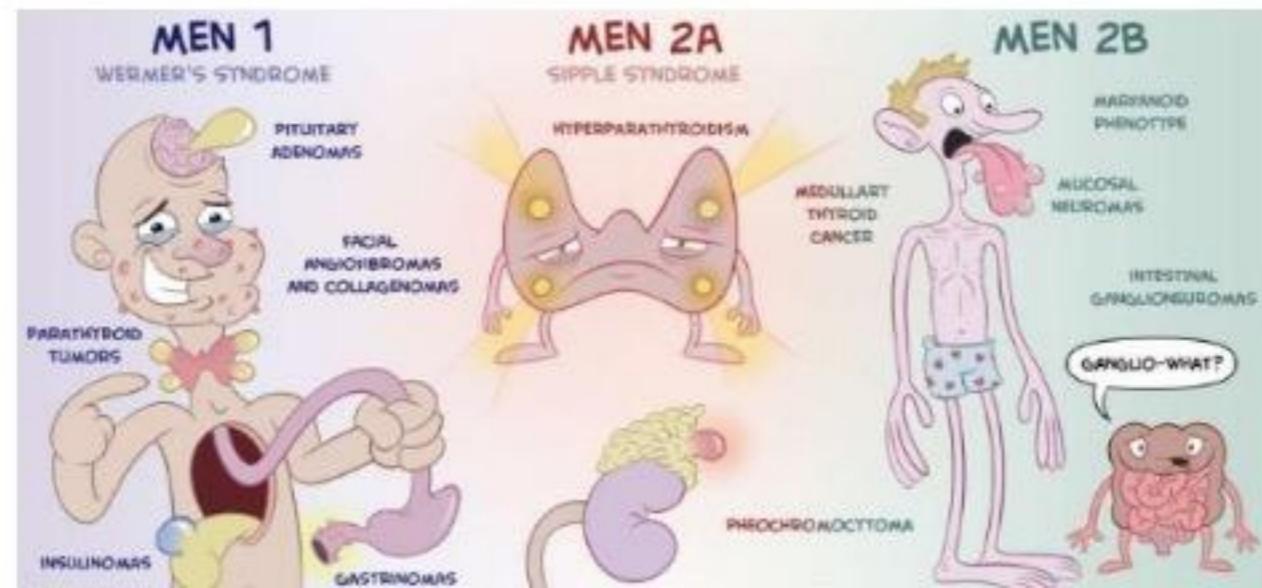


Hypertension

- History
- Physical
- Measure height, ABPM
- Think

ENDOCRINE:

- Conn's syndrome
- CAH
- phaeochromocytoma
- hyperthyroidism
- Cushing's disease





**"Hormone replacement therapy will make you
feel much better. I'm replacing your hormones
with rainbows, sunshine and glitter."**