TSH, Thyroid stimulating hormone
ACTH, Adrenocorticotropic hormone
FSH, Follicle-stimulating hormone
LH, Luteinizing hormone
MSH, Melanophore-stimulating hormone
GH, Growth Hormone
PRL, Prolactin
The rate of growth

• The growth period in boys extend from birth till the age of about 20 years (18 years in girls).
• The rate of growth is high immediately after birth (5 cm ‘in the first month).
• This rate drops sharply in the first two years down to about 8 mm/month then the drop continues at a slower rate.
• At the onset of puberty (12 - 14 yrs in boys, 11 - 12 yrs in girls), there is a pubertal spurt of growth but this is followed by rapid decline, then arrest of growth due to union of epiphyses.
• The size of the viscera also increases.
• The increase in the size of the heart without parallel increase in its blood supply leads to high tendency of myocardial ischemia and a special type of cardiomyopathy “acromegalic cardiomyopathy”.
• Glucose tolerance is reduced and frank diabetes is common.
• Pressure on the optic chiasma by the pituitary tumor could lead to bitemporal hemianop sia.
Dwarfism

• Dwarfism is a state of short stature with normal proportions which results from lack of growth hormone activity during the growth period.

• According to the mechanism which causes the lack of GH activity, there are four types of dwarfism:
  
  a. **Pituitary dwarfism**
  
  Caused by deficiency in hypothalamic GRH or in pituitary GH. Can be treated by synthetic GRH or GH.

  b. **Laron dwarfism**: Caused by lack of response of the tissues to the secreted GH due to absence of GH receptors on the cells can be treated by IGF-I
• Treatment of all types of dwarfism should always start before puberty (i.e. before union of epiphysis).

• Except for their small size, and some acceleration of the aging process, dwarfs have normal functioning of different organs. At the age of puberty, there is a little spurt of growth due to the direct action of androgens, but this is followed shortly by arrest of growth because of the union of epiphyses.

• There is normal maturation of the sexual organs and functions. Mental development and brain functions are normal. The metabolic rate is normal.
Effects of hyper secretion of prolactin

• Hyper prolactinemia results from “prolactinomas”- prolactin-secreting tumors of the mammotropes of the anterior pituitary.

• Prolactinomas are the most common type of pituitary tumors.

• It is found in over 10% of the population, but clinical manifestations appear in a small minority.
Treatment

• Dopamine or dopamine agonists, e.g. bromocriptine are successful in suppressing prolactin secretion and reducing the size of the tumor.

• The manifestations disappear with successful treatment..
The pituitary gonadotropins

- Gonadotropins are hormones which act on the gonads (testes or ovaries).
- Two gonadotropins are secreted by the anterior pituitary, i.e. the follicle-stimulating hormone (FSH) and the luteinizing hormone (LH).
- Both hormones are secreted in response to stimulation by the hypothalamic gonadotropin-releasing hormone (GnRH)
Lutinizing hormone (lh)

• Actions
• In the male: It stimulates the interstitial cells of Leydig in the testis to secrete testosterone.
• In the female: It reduces ovulation by rupture of the graafian follicle, formation of the corpus, formation of the corpus luteum, and secretion of estrogen and progesterone by the corpus luteum.
Manifestations

• A) Hypofunction of other glands:

• i) Hypoadrenocorticism: There is atrophy of the zonae fasciculata and reticularis of the adrenal cortex, with resultant drop in plasma glucocorticoids and adrenal androgens.

• The patient can not tolerate stressful conditions.

• In females, there is decrease in libido, and lack of axillary, and pubic hair.
• Zona glomerulosa, and its aldosterone secretion are maintained.
• The stress-induced increase in aldosterone does not occur any more, but the increase induced by salt depletion persists.
• Salt depletion does not occur, except in long-standing cases.
ii) Hypothyroidism → decrease in general metabolism → less metabolic waste products:

E) Pallor of skin:
This due to lack of ACTH and other hormones with melanocyte stimulating hormone MSH) activity.

F) Bodyweight:
There is no loss of weight. Only some decrease in protein mass may be found, but patients with pituitary insufficiency tend to be well nourished.

The cachexia and emaciation which was reported before in cases of hypopituitarism was due to “anorexia nervosa” which may be present in some cases.