PITUITARY DWARFISM III
(PANHYPOPITUITARISM)

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- the anterior pituitary has different cell types that produce factors responsible for signaling hormones to be formed and released by endocrine glands leading to various biological effects

- thyrotropic cells
  - release thyroid stimulating hormone (TSH)
  - TSH signals thyroid follicular cells to produce thyroid hormone
  - thyroid hormone controls various functions including basal metabolic rate, growth, heat production, and sweating

- somatotropic cells
  - release growth hormone (GH)
  - GH signals liver cells to produce insulin-like growth factor (IGF)
  - IGF controls especially bone, cartilage, and muscle growth
  - GH also helps promote formation of blood sugar that is needed as a fuel during growth

- gonadotropic cells
  - release luteinizing hormone (LH) and follicle stimulating hormone (FSH)
  - LH signals testes to produce testosterone
  - LH in combination with FSH signals the ovaries to produce estrogen
  - testosterone and estrogen are necessary for normal sexual development at puberty in males and females, respectively

- corticotropic cells
  - release adrenocorticotropic hormones (ACTH)
  - ACTH signals the adrenal glands to produce cortisol
  - cortisol is needed for response to stress by signaling the body to mobilize fuels as sugar and fat
Figure 1. Specific cells of the anterior pituitary receive signals from the hypothalamus to release a factor specific to that cell (see preceding slide for abbreviations). Each anterior pituitary factor targets an endocrine gland (i.e., thyroid, liver, gonad or adrenals) to release hormones that produce a range of biological effects. In pituitary dwarfism III, the entire anterior pituitary loses function (X) so that none of the signaling factors is produced for release into the blood. Hence all of the hormonal effects are lost and treatment requires replacement of the various hormones – thyroid hormone, growth hormone, cortisol and sex steroid (testosterone or estrogen as appropriate at puberty).