

16 - A. Pituitary gland

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© SPM Course 4. Neuroendocrinology A. Pituitary gland The pituitary gland has an anterior and posterior lobe. The anterior lobe secretes many hormones that are regulated by regulatory neurohormones produced by parvocellular neurons of the hypothalamus. The posterior lobe releases 2 hormones that are synthesized in the magnocellular cells of supraoptic nuclei and paraventricular nuclei of the hypothalamus. □ Growth hormone excess causes acromegaly in adults or gigantism in children; low levels are associated with dwarfism. Exercise, sleep and stress increase GH release. The GH response to GHRH and the normal sleep-associated release of GH are altered in depression and anorexia nervosa. □ Prolactin release is inhibited by dopamine from the hypothalamus; TRH, on the other hand, may facilitate the release of prolactin. Prolactin levels are increased during pregnancy, nursing and during sleep and exercise. Antipsychotics remove the inhibitory control of dopamine by blocking D2 receptors in the tuberoinfundibular tract. This leads to hyperprolactinaemia, gynecomastia in males and galactorrhea in females. Long standing prolactin increase may lead to osteoporosis. □ Vasopressin (ADH) and oxytocin are peptides differing from each other in only two amino acids in their sequences. Vasopressin is thought to play a role in attention, memory, and learning. Release of vasopressin is increased by pain, stress, exercise, morphine, nicotine, and barbiturates and is decreased by alcohol. Oxytocin is implicated in mammalian bonding behavior, particularly in the initiation and maintenance of maternal behavior, social bonding, and sexual receptivity.

Region	Hormonal output
Anterior pituitary	o GH - growth hormone o LH - luteinizing hormone (a gonadotrophin) o FSH - follicle stimulating hormone (a gonadotrophin) o ACTH - adreno corticotrophic hormone (corticotrophin) o TSH - thyroid stimulating hormone (thyrotropin) o Prolactin
Posterior pituitary	o Vasopressin (ADH - antidiuretic hormone) o Oxytocin
Hypothalamus	o CRH - corticotrophin releasing hormone o GHRH - growth hormone releasing hormone o GnRH - gonadotrophin releasing hormone o TRH - thyrotrophin releasing hormone o SST - somatostatin (inhibits GH) o PIF - prolactin inhibitory factor (dopamine)

Revision #1

Created 2026-01-04 20:02:53 UTC by Omar Ayman

Updated 2026-01-04 20:02:53 UTC by Omar Ayman