

**TABLE 62-1** PITUITARY–TARGET ORGAN HORMONE AXIS

HYPOTHALAMIC HORMONE	PITUITARY TARGET CELL	PITUITARY HORMONE AFFECTED	PERIPHERAL TARGET GLAND	PERIPHERAL HORMONE AFFECTED
<b>STIMULATORY</b>				
<b>Anterior Lobe of Pituitary Gland</b>				
Thyrotropin-releasing hormone (TRH)	Thyrotroph	Thyroid-stimulating hormone (TSH)	Thyroid gland	Thyroxine (T <sub>4</sub> ) Triiodothyronine (T <sub>3</sub> )
Growth hormone-releasing hormone (GHRH)	Somatotroph	Growth hormone (GH)	Liver	Insulin-like growth factor-I (IGF-I)
Gonadotropin-releasing hormone (GnRH)	Gonadotroph	Luteinizing hormone (LH)	Ovary Testis	Progesterone Testosterone
		Follicle-stimulating hormone (FSH)	Ovary Testis	Estradiol Inhibin
Corticotropin-releasing hormone	Corticotroph	Adrenocorticotrophic hormone (ACTH)	Adrenal gland	Cortisol
<b>Posterior Lobe of Pituitary Gland</b>				
Vasopressin (AVP)			Kidney	
Oxytocin			Uterus Breast	
<b>INHIBITORY</b>				
Somatostatin	Somatotroph	GH	Thyroid	
	Thyrotroph	TSH	Liver	
Dopamine	Lactotroph	Prolactin	Breast	

Pituitary tumors are classified by size and functionality or secretory capacity. Tumors that are smaller than 10 mm in diameter are called *microadenomas*, whereas lesions 10 mm or larger are called *macroadenomas*. Hormone-producing tumors are called *secretory adenomas*, and those that do not secrete a hormone are known as *nonsecretory adenomas*. Pituitary tumors may be composed of any of the anterior pituitary cell types, with multiple cell types forming plurihormonal tumors or nonsecretory tumors. Prolactin-secreting pituitary tumors are the most common type. [Table 62-2](#) reviews the prevalence of the various pituitary tumors, and [Table 62-3](#) describes the screening tests used to determine the secretory status of a new pituitary tumor.

The clinical manifestations of pituitary tumors are usually signs and symptoms caused by hormone overproduction or underproduction or mass effect. Common clinical features of pituitary mass effect include headaches, visual field defects, and cranial nerve palsies. Superior extension of a tumor compresses the optic chiasm, causing bitemporal hemianopsia; lateral

**TABLE 62-2** PREVALENCE OF PITUITARY TUMORS

TUMOR	PREVALENCE (%)
Prolactinomas	40-45
Somatotroph adenomas	20
Corticotroph adenomas	10-12
Gonadotroph adenomas	15
Null cell adenomas	5-10
Thyrotroph adenomas	1-2

extension into the cavernous sinuses results in ophthalmoplegia, diplopia, or ptosis due to compression of cranial nerves III, IV, or VI or facial pain due to compression of V1 or V2. Compromise of normal pituitary tissue by a tumor can cause hormone loss or hypopituitarism. Screening tests for pituitary hormone deficiency are shown in [Table 62-3](#); typically, a destructive pituitary lesion causes loss of pituitary hormones in the following progression: first GH, then FSH and LH, then TSH, and finally ACTH.

## Disorders of Anterior Pituitary Hormones

### ● PROLACTIN

#### Definition and Epidemiology

The mature prolactin polypeptide contains 199 amino acids and is formed after a 28-amino acid signal peptide is proteolytically cleaved from the prolactin prohormone (preprolactin). Prolactin synthesis and secretion by pituitary lactotrophs is under tonic inhibitory control by hypothalamic-derived dopamine, which keeps prolactin at its basal levels. Factors stimulating prolactin synthesis and secretion, in addition to reduced dopamine availability to the lactotrophs, include

thyrotropin-releasing hormone (TRH), estrogen, vasoactive intestinal polypeptide (VIP), AVP, oxytocin, and epidermal growth factor.

Prolactin levels physiologically increase during pregnancy. After delivery, prolactin induces and maintains lactation of the primed breast. Once lactation has been initiated by these elevations in prolactin, prolactin falls to basal levels and lactation is maintained by the infant's suckling reflex. Hyperprolactinemia, regardless of the etiology, can cause hypogonadism through its inhibitory effect on gonadotropin release, infertility, galactorrhea, and/or bone loss from the hypogonadism.

