

gland, or the absence of an enzyme required for glandular synthesis of its specific hormone.

2. The endocrine gland may be damaged or destroyed by impaired blood flow, infection or inflammation, autoimmune disorders, or neoplasms.
3. The endocrine gland may atrophy and become less able to produce its hormone because of aging, drug therapy, disease, or unknown reasons.
4. The endocrine gland may produce adequate hormone, but the hormone may not be able to function normally because of receptor defects (not enough receptors or the receptors present are unable to bind with the hormone).
5. Even if there is adequate hormone and adequate binding to receptors, intracellular metabolic processes (eg, enzyme function, protein synthesis, energy production) may not respond appropriately.

## Hyperfunction

Hyperfunction is usually characterized by excessive hormone production. Excessive amounts of hormone may occur from excessive stimulation and enlargement of the endocrine gland, from a hormone-producing tumor of the gland, or from a hormone-producing tumor of nonendocrine tissues (eg, some primary lung tumors produce antidiuretic hormone and adrenocorticotropic hormone).

## GENERAL CHARACTERISTICS OF HORMONAL DRUGS

1. Hormones given for therapeutic purposes include natural hormones from human or animal sources and synthetic hormones. Many of the most important hormones have been synthesized, and these preparations may have more potent and prolonged effects than the naturally occurring hormones.
2. Hormones are given for physiologic or pharmacologic effects. *Physiologic* use involves giving small doses as a replacement or substitute for the amount secreted by

a normally functioning endocrine gland. Such use is indicated only when a gland cannot secrete an adequate amount of hormone. Examples of physiologic use include insulin administration in diabetes mellitus and adrenal corticosteroid administration in Addison's disease. *Pharmacologic* use involves relatively large doses for effects greater than physiologic effects. For example, adrenal corticosteroids are widely used for anti-inflammatory effects in endocrine and nonendocrine disorders.

3. Hormones are powerful drugs that produce widespread therapeutic and adverse effects.
4. Administration of one hormone may alter effects of other hormones. These alterations result from the complex interactions among hormones.
5. Hormonal drugs are more often given for disorders resulting from endocrine gland hypofunction than for those related to hyperfunction.



## Review and Application Exercises

1. How do hormones function in maintaining homeostasis?
2. What is the connection between the nervous system and the endocrine system?
3. What is meant by a negative feedback system?
4. Because classic hormones are secreted into blood and circulated to essentially all body cells, why do they not affect all body cells?
5. What are the functions and characteristics of the pituitary gland?

## SELECTED REFERENCES

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