

## Chapter Overview

In this chapter, you will learn about hormones as they relate to a variety of issues including development, sexuality, and reproduction. You will also learn about how hormones change with age and how that impacts sexuality with age.

## Learning Objectives

In this chapter, you will

- discover how important hormones are to sexual development, sexuality, and reproduction;
- come to understand how hormones connect the brain and nervous system to the reproductive system; and
- find out how hormonal changes associated with aging influence sexuality.

## List of Key Terms

**Apocrine glands** Glands that open at the surface of the skin and whose cells bleb off a portion of themselves in the release of their secretions. In humans, they are located only in certain areas, which include the axillae (armpits), the pubic area, and the breasts. (p. 120)

**Bonding** Joining together for social and physical support, as through affiliation. (p. 119)

**Endocrine organs** Organs that secrete hormones into the blood to affect tissues distant from the site of the gland. (p. 112)

**Feedback signal** The part of a control system that provides a measure of the level of a certain substance. (p. 112)

**Follicular phase** The first phase of the menstrual cycle during which the ovarian follicles mature and estrogen stimulates the growth of the endometrium. (p. 114)

**Gonads** Glands in which gametes (eggs and sperm) are produced; in humans, the ovaries and the testes. (p. 112)

**Hormone** A chemical released by a cell or group of cells (gland) in one part of an organism that affects cells in other parts of the organism via the bloodstream. (p. 111)

**Hypogonadism** A condition in which the gonads produce little or no hormones. (p. 123)

**Hypothalamus** A portion of the brain that plays a role in functions such as sex and that connects the nervous system to the endocrine system via the pituitary. (p. 112)

**Libido** Sex drive. (p. 118)

**Luteal phase** The third phase of the menstrual cycle, which can end with pregnancy. (p. 114)

**Major histocompatibility complex (MHC)** A group of genes that code for proteins found on the surfaces of cells that help the immune system to recognize foreign substances. (p. 120)

**Menstrual cycle** The monthly cycle of changes in the ovaries, sex hormones, and the lining of the uterus, starting with the preparation of an egg for fertilization. When the follicle of the egg breaks, it is released for fertilization, and ovulation occurs. Unless fertilization occurs, the cycle ends with the shedding of the part of the uterine lining (menstruation) that was built up in anticipation of a fertilized egg. (p. 114)

**Perimenopause** The years prior to menopause when hormonal levels are fluctuating and declining and a woman is transitioning from having regular periods to not having any. (p. 121)

**Pheromones** Smells that trigger a social response in members of the same species. (p. 120)

**Pituitary** A pea-sized gland in the brain that controls the function of most other endocrine glands; also known as the “master gland.” (p. 112)

**Premenstrual dysphoric disorder (PMDD)** A mood disorder associated primarily with the luteal phase of the menstrual cycle and characterized by feelings of anxiety, anger, and depression. (p. 115)

**Premenstrual syndrome (PMS)** A wide range of physical and/or emotional symptoms typically occurring 5 to 11 days prior to menstruation. (p. 116)

**Puberty** A stage of life in which an adolescent reaches sexual maturity and becomes capable of reproduction. (p. 113)

**Sexual brain** The part of the brain that mediates sexual behaviour. (p. 116)

## Online Resources

- Sex Hormone Secrets in Psychology Today  
<http://www.psychologytoday.com/articles/200612/the-sex-hormone-secrets>
- Sex hormones and cognitive functioning  
<http://www.news-medical.net/news/20131112/Research-reveals-unexpected-roles-that-sex-hormones-may-play-in-cognitive-function.aspx>
- The Truth About Pheromones (from the Smithsonian Institute)  
<http://www.smithsonianmag.com/science-nature/the-truth-about-pheromones-100363955/?no-ist=>
- The Brain: Where Does Sex Live in the Brain? From Top to Bottom  
<http://discovermagazine.com/2009/oct/10-where-does-sex-live-in-brain-from-top-to-bottom>
- Premenstrual syndrome (PMS)  
<http://www.mayoclinic.org/diseases-conditions/premenstrual-syndrome/basics/definition/con-20020003>

## Review Questions

For answers, see below.

1. What are the five main human sex hormones?
2. What makes a hormone a “sex hormone”?
3. How is human reproduction affected by the seasons?
4. What are the two phases of the menstrual cycle and how are hormone levels different in each phase?
5. What does the story of David Reimer tell us about the role of hormones in shaping sexuality?
6. What substances are both hormones and neurotransmitters and what is their general function?
7. What hormone changes lead to “andropause” and what are the physical characteristics of andropause?

## Review Questions: Answers

1. Androgens, estrogens, progestogens, oxytocin and vasopressin (p. 112)
2. Hormones are considered sex hormones if they play a large role in sexual maturity and reproduction (p. 112).
3. Humans are slightly more likely to conceive children in the darkest part of winter and give birth in late summer/early fall. This pattern is less significant now than it was before the industrial era, but it is still a significant effect (p. 112).
4. Two phases are the follicular phase and the luteal phase. During the follicular phase, estrogen increases until ovulation occurs. LH and FSH levels are only high during ovulation (the point where the follicular phase becomes the luteal phase). During the luteal phase estrogen rises slightly (compared to during ovulation) and then there is a surge of progesterone but progesterone drops if fertilization does not occur. Low levels of estrogen and progesterone cause the uterine lining to be shed (menstruation) (pp. 113; 115).
5. David Reimer was raised as a girl when he lost his penis but he never adjusted to that gender role. David Reimer's case suggests that hormones influence the brain before birth, determining sexuality independent of how we are raised (p. 116).
6. Oxytocin and vasopressin are both hormones and neurotransmitters. Both are related to breast feeding and feelings of well-being, affiliation and social bonding (p. 119).
7. Andropause may be caused by decreased testosterone and is characterized by low libido (with or without erectile dysfunction); decreased strength, energy, and/or stamina; increased irritability, and a decreased enjoyment of life. There may also be changes in cognitive function as well as loss of bone and muscle mass, increased visceral fat, testicular atrophy, and the development of breasts (p. 123).