Truth? Fiction?

T / F? A name for the external female genitals is derived from Latin roots that mean “something to be ashamed of.”

T / F? Women, but not men, have a sex organ whose only known function is the experiencing of sexual pleasure.

T / F? Women urinate and engage in sexual intercourse through the same bodily opening.

T / F? One may determine whether or not a woman is a virgin by examining her hymen.

T / F? Women with larger breasts produce more milk while nursing.

T / F? Women who have had abortions are at greater risk of breast cancer.

T / F? The American Cancer Society recommends that women engage in a breast self-examination once a month.

T / F? The ancient Romans believed that menstrual blood soured wine and killed crops.

T / F? At menopause, women experience debilitating hot flashes.

T / F? Menopause signals an end to women’s sexual appetite.
Female Sexual Anatomy and Physiology

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The French have a saying, “Vive la différence!” (“Long live the difference!”). It celebrates the differences between men and women. The differences between the genders, at least their anatomic differences, have often been met with prejudice and misunderstanding, however. Men have historically exalted their own genitals. Too often, the less visible genitals of women have been deemed inferior. The derivation of the word *pudendum*, which refers to the external female genitals, speaks volumes about sexism in the ancient Mediterranean world.

Even today, this cultural heritage may lead women to develop negative attitudes toward their genitals. Girls and boys are both sometimes reared to regard their genitals with shame or disgust. Both may be reprimanded for expressing normal curiosity about them. They may be reared with a “hands-off” attitude, to keep their “private parts” private, even from themselves. Touching them except for hygienic purposes may be discouraged. One woman recalls:

When I was six years old I climbed up on the bathroom sink and looked at myself naked in the mirror. All of a sudden I realized I had three different holes. I was very excited about my discovery and ran down to the dinner table and announced it to everyone. “I have three holes!” Silence. “What are they for?” I asked. Silence even heavier than before. I sensed how uncomfortable everyone was and answered for myself. “I guess one is for pee-pee, the other for doo-doo and the third for ca-ca.” A sigh of relief; no one had to answer my question. But I got the message—I wasn’t supposed to ask “such” questions, though I didn’t fully realize what “such” was about at that time.


In this chapter we tour the female sex organs. Even generally sophisticated students may fill in some gaps in their knowledge. Most of us know what a vagina is, but how many of us realize that only the female gender has an organ that is exclusively dedicated to pleasure? Or that a woman’s passing of urine does not involve the vagina? How many of us know that a newborn girl already has all the **ova** she will ever produce?

As women readers encounter the features of their sexual anatomy in their reading, they may wish to examine their own genitals with a mirror. By following the text and the illustrations, students may discover some new anatomic features. They will see that their genitals can resemble those in the illustrations yet also be unique.
External Sex Organs

Taken collectively, the external sexual structures of the female are termed the pudendum or the vulva. Pudendum, because of its derivation, may be a less desirable term than vulva. Vulva is a Latin word that means “wrapper” or “covering.” Question: What are the parts of the vulva? The vulva consists of the mons veneris, the labia majora and minora (major and minor lips), the clitoris, and the vaginal opening (see Figure 3.1). Figure 3.2 shows variations in the appearance of women’s genitals.

The Mons Veneris

Question: What is the mons veneris? The mons veneris consists of fatty tissue that covers the joint of the pubic bones in front of the body, below the abdomen and above the clitoris. At puberty the mons becomes covered with pubic hair that may be thick and curly but varies from person to person in waviness, texture, and color. The pubic hair captures the chemical secretions that exude from the vagina during sexual arousal. Their scent may allure lovers. The mons cushions a woman’s body during

Figure 3.1. External Female Sex Organs. This figure shows the vulva with the labia opened to reveal the urethral and vaginal openings.

Figure 3.2. Normal Variations in the Vulva. The features of the vulva show a great deal of variation. A woman’s attitude toward her genitals is likely to reflect her general self-concept and early childhood messages rather than the appearance of her vulva per se.
sexual intercourse, protecting her and her partner from the pressure against the pubic bone that stems from thrusting. There is an ample supply of nerve endings in the mons, so that caresses can produce pleasurable sensations.

**The Labia Majora**

**Question: What are the labia majora?** The labia majora are large folds of skin that run downward from the mons along the sides of the vulva. In some women, the labia majora are thick and bulging. In others, they are thinner, flatter, and less noticeable. When close together, they hide the labia minora and the urethral and vaginal openings. The outer surfaces of the labia majora, by the thighs, are covered with pubic hair and darker skin than that found on the thighs or labia minora. The inner surfaces of the labia majora are hairless and lighter in color. They are amply supplied with nerve endings that respond to stimulation and can produce sexual pleasure. The labia majora also shield the inner female genitals. **Question: What are the labia minora?**

**The Labia Minora**

The labia minora are two hairless, light-colored membranes, located between the major lips. They surround the urethral and vaginal openings. The outer surfaces of the labia minora merge with the major lips. At the top they join at the prepuce (hood) of the clitoris. The labia minora differ in appearance from woman to woman. The labia minora of some women form protruding flower shapes that are valued greatly in some cultures, such as that of the Hottentots of Africa. (Hottentot women purposely elongate their labia minora by tugging at them.) Rich in blood vessels and nerve endings, the labia minora are highly sensitive to sexual stimulation. When stimulated they darken and swell, engorging with blood.

**The Clitoris**

By any name, the clitoris is the only sex organ whose only known function is the experiencing of pleasure. Clitoris (Figure 3.1) derives from the Greek word kleitoris, meaning “hill” or “slope.” It receives its name from the manner in which it slopes upward in the shaft and forms a mound of spongy tissue at the glans. The body of the clitoris—the clitoral shaft—is about 1 inch long and ¼ inch wide. The clitoral shaft consists of erectile tissue that contains two spongy masses called corpora cavernosa (“cavernous bodies”) that fill with blood (become engorged) and become erect in response to sexual stimulation. The stiffening of the clitoris is less apparent than the erection of the penis, because the clitoris does not swing free from the body. The prepuce (mean-
ing “before a swelling”), or hood, covers the clitoral shaft. It is a sheath of skin formed by the upper part of the labia minora. The clitoral glans is a smooth, round knob or lump of tissue above the urethral opening. The glans is revealed by gently separating the labia minora and retracting the hood. It is highly sensitive to touch because of the rich supply of nerve endings.

The clitoris certainly has an “indirect” role in reproduction in that it is the female sex organ most sensitive to sexual sensation and thus a motivator of sexual activity. The size of the clitoris varies from woman to woman, just as the size of the penis varies among men. Because the clitoral glans is highly sensitive to touch, women usually prefer to be stroked or stimulated on the mons, or on the clitoral hood, rather than directly on the glans.

In some respects, the clitoris is the female counterpart of the penis. However, a survey of 373 Texas college students found that they had overwhelmingly been taught that the vagina was the counterpart to the penis (Ogletree & Ginsburg, 2000). Nevertheless, both organs—clitoris and penis—develop from the same embryonic tissue, which makes them similar in structure, or homologous. They are not fully similar in function, or analogous, however. Both organs receive and transmit sexual sensations, but the penis is directly involved in reproduction and excretion by serving as a conduit for sperm and urine, respectively.

Surgical removal of the clitoral hood is common among Moslems in the Near East and Africa. As we see in the nearby World of Diversity feature, it is a “rite of passage” to womanhood that leaves many scars—physical and emotional.

The Vestibule

Question: What is the vestibule? The word vestibule, which means “entranceway,” refers to the area within the labia minora that contains the openings to the vagina and the urethra. The vestibule is richly supplied with nerve endings and is very sensitive to tactile or other sexual stimulation. Question: What is the urethral opening?

The Urethral Opening

Urine passes from the female’s body through the urethral opening (see Figure 3.1), which is connected by a short tube (the urethra) to the bladder (see Figure 3.3). The urethral opening lies below the clitoral glans and above the vaginal opening. The urethral opening, urethra, and bladder are unrelated to the reproductive system.

The proximity of the urethral opening to the external sex organs can pose hygienic problems for sexually active women. The urinary tract, which includes the urethra, bladder, and kidneys, may become infected by bacteria from the vagina or rectum. Disease organisms may pass from the male’s sex organs or hands to the urethral opening during sexual intercourse or foreplay. Anal intercourse followed by vaginal intercourse may transfer disease organisms from the rectum to the bladder. For similar reasons, women should first wipe the vulva, then the anus, when using the bathroom.

Cystitis is a bladder inflammation that may stem from any of these sources. Its symptoms include burning and frequent urination (also called urinary urgency). Pus...
**Clitoridectomy—Cultural Practice or Genital Mutilation?**

Despite hundreds of years of tradition, Hajia Zuwera Kassindja would not let it happen to her 17-year-old daughter, Fauziya. Hajia’s own sister had died from it. So Hajia gave her daughter her inheritance from her deceased husband, which amounted to only $3,500 but left Hajia a pauper. Fauziya used the money to buy a phony passport and flee from the African country of Togo to the United States.

Upon arrival in the United States, Fauziya requested asylum from persecution. However, she was put into prison for more than a year. But then the Board of Immigration Appeals finally agreed that Fauziya was fleeing persecution, and she was allowed to remain in the United States.

From what had Hajia’s sister died? From what was Fauziya escaping? **Clitoridectomy.** Cultures in some parts of Africa and the Middle East ritually mutilate or remove the clitoris, not just the clitoral hood. Removal of the clitoris, or **clitoridectomy,** is a rite of initiation into womanhood in many of these predominantly Islamic cultures. It is often performed as a puberty ritual in late childhood or early adolescence (not within a few days of birth, like male circumcision). In modern-day Egypt, the vast majority of female adolescents, aged 10 to 19, are circumcised (El-Gibaly et al., 2002).

The clitoris gives rise to feelings of sexual pleasure in women. Its removal is an attempt to ensure the girl’s chastity, because it is assumed that uncircumcised girls are consumed with sexual desires. Cairo physician Said M. Thabit says “With circumcision we remove the external parts, so when a girl wears tight nylon underclothes she will not have any stimulation.” What effects does it have on the sexuality of women? A study of 250 female patients from the Maternal and Childhood Centers of Ismailia, Egypt, found that those who were circumcised were 80% more likely to complain of dysmenorrhea, 49% more likely to complain of vaginal dryness during intercourse, 45% more likely to lack sexual desire, 49% less likely to be pleased by sex, and 61% more likely to have difficulty reaching orgasm (El-Defrawi et al., 2001).

But some groups in Egypt and in the Sudan simply perform clitoridectomies because it is a social custom that has remained unchallenged (Missailidis & Gebre-Medhin, 2000). It is usually done by women to women (Nour, 2000). Some perceive it as part of their faith in Islam. However, the Koran—the Islamic bible—

or a bloody discharge is common, and there may be discomfort above the pubic bone. These symptoms may disappear after several days, but consultation with a **gynecologist** is recommended, because untreated cystitis can lead to kidney infections. “Honeymoon cystitis” is caused by the tugging on the bladder and urethral wall that occurs during vaginal intercourse. It may occur upon beginning coital activity (though not necessarily on one’s honeymoon) or upon resumption after lengthy abstinence. Figure 3.3 shows the close proximity of the urethra and vagina.

A few precautions may help women prevent serious inflammation of the bladder:

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**Clitoridectomy** Surgical removal of the clitoris.

**Gynecologist** A physician who treats women’s diseases, especially of the reproductive tract. (From the Greek *gynè,* meaning “woman.”)
• Drinking two quarts of water a day to flush the bladder.
• Drinking orange or cranberry juice to maintain an acid environment that discourages growth of infectious organisms.
• Decreasing use of alcohol and caffeine (from coffee, tea, or cola drinks) that may irritate the bladder.
• Washing the hands prior to masturbation or self-examination.
• Washing one’s partner’s and one’s own genitals before and after intercourse.
• Preventing objects that have touched the anus (fingers, penis, toilet tissue) from subsequently coming into contact with the vulva.
• Urinating soon after intercourse to help wash away bacteria.

The typical young woman in this culture does not grasp that she is a victim. She assumes that clitoridectomy is part of being female. As one young woman told gynecologist Nawal M. Nour (2000), the clitoridectomy hurt but was a good thing, because now she was a woman.

In many locales, clitoridectomies are performed under unsanitary conditions without benefit of anesthesia. Medical complications are common, including infections, bleeding, tissue scarring, painful menstruation, and obstructed labor. The procedure is psychologically traumatizing.

An even more radical form of clitoridectomy, called infibulation or Pharaonic circumcision, is practiced widely in the Sudan. Pharaonic circumcision involves complete removal of the clitoris along with the labia minora and the inner layers of the labia majora. After removal of the skin tissue, the raw edges of the labia majora are sewn together. Only a tiny opening is left to allow passage of urine and menstrual discharge (Nour, 2000). The sewing together of the vulva is intended to ensure chastity until marriage. Medical complications are common, including menstrual and urinary problems, even death. After marriage, the opening is enlarged to permit intercourse. Enlargement is a gradual process that is often made difficult by scar tissue from the circumcision. Hemorrhaging and tearing of surrounding tissues are common consequences. It may take three months or longer before the opening is large enough to allow penile penetration. Mutilation of the labia is now illegal in the Sudan, although the law continues to allow removal of the clitoris. Some African countries, including Egypt, have outlawed clitoridectomies, although such laws are often unenforced.

More than 100 million women in Africa and the Middle East have undergone removal of the clitoris and the labia minora. Clitoridectomies remain common, even universal, in nearly 30 countries in Africa, in many countries in the Middle East, and in parts of Malaysia, Yemen, Oman, Indonesia, and the India-Pakistan subcontinent. Thousands of African immigrant girls living in European countries and the United States have also been mutilated (Nour, 2000).

Do not confuse male circumcision with the maiming inflicted on girls in the name of circumcision. Nour (2000) depicts the male equivalent of female genital mutilation as cutting off the penis. The Pulitzer Prize–winning, African American novelist Alice Walker drew attention to the practice in her best-selling novel Possessing the Secret of Joy, and called for its abolition in her book and film Warrior Marks.

OUTLAWED

In 1996, the United States outlawed ritual genital mutilation within its borders. The government also directed American representatives to world financial institutions to deny aid to countries that have not established educational programs to bring an end to the practice. Yet calls from Westerners to ban the practice in parts of Africa and the Middle East have sparked controversy on grounds of “cultural condescension”—that people in one culture cannot dictate the cultural traditions of another. Yet for Alice Walker, “torture is not culture.” As the debate continues, some 2 million African girls undergo clitoridectomy each year.
The Vaginal Opening

When I was five or six, my mother told me about sex. I remember that I was confused about what my mother said, because somehow I couldn’t conceptualize what the female vagina looked like. I was curious to see an actual vagina and not just how it looked diagramed in a book.

Morrison et al., 1980, p. 35

**Question: What is the vaginal opening?** One does not see an entire vagina, but rather the vaginal opening, or introitus, when one parts the labia minora. The introitus lies below and is larger than the urethral opening. Its shape resembles that of the hymen.

The hymen is a fold of tissue across the vaginal opening that is usually present at birth and may remain at least partly intact until a woman engages in coitus. For this reason the hymen has been called the “maidenhead.” Its presence has been taken as proof of virginity, and its absence as evidence of coitus. However, some women are born with incomplete hymens, and other women’s hymens are torn accidentally, such as during horseback riding, strenuous exercise or gymnastics—or even when bicycle riding. A punctured hymen is therefore poor evidence of coital experience. A flexible hymen may also withstand many coital experiences, so its presence does not guarantee virginity.

Figure 3.4 illustrates various vaginal openings. The first three show common shapes of hymens among women who have not had coitus. The fifth drawing shows a parous (“passed through”) vaginal opening, typical of a woman who has delivered a baby. Now and then the hymen consists of tough fibrous tissue and is closed, or imperforate, as in the fourth drawing. An imperforate hymen may not be discovered until after puberty, when menstrual discharges begin to accumulate in the vagina. In these rare cases, a surgical incision will perforate the hymen. A woman may also have a physician surgically perforate her hymen if she would rather forgo the tearing and discomfort that may accompany her initial coital experiences. But this procedure is unnecessary for most women. They experience little pain during initial coitus despite old horror stories. A woman may also stretch the vaginal opening over several days in preparation for intercourse by inserting a finger and gently pressing downward toward the anus. After several repetitions, she may insert two fingers and repeat the process, spreading the fingers slightly after insertion.
The hymen is found only in female horses and humans. It is not present in animal species closest to humans on the evolutionary scale, such as chimps and gorillas. The hymen remains something of a biological mystery, because it serves no apparent biological function.

The Perineum

Question: What is the perineum? The perineum incorporates the skin and underlying tissue between the vaginal opening and the anus. The perineum is rich in nerve endings. Stimulation of the area may heighten sexual arousal. Many physicians make a routine perineal incision during labor, called an episiotomy, to facilitate childbirth.

Structures That Underlie the External Sex Organs

Figure 3.5 shows what lies beneath the skin of the vulva. Question: What structures are found beneath the vulva? The vestibular bulbs and Bartholin’s glands are active during sexual arousal and are found on both sides (shown on the right in Figure 3.5). Muscular rings (sphincters) that constrict bodily openings such as the vaginal and anal openings are also found on both sides.

The clitoral crura are wing-shaped, leglike structures that attach the clitoris to the pubic bone beneath. The crura contain corpora cavernosa, which engorge with blood and stiffen during sexual arousal.

The vestibular bulbs are attached to the clitoris at the top and extend downward along the sides of the vaginal opening. Blood congests them during sexual arousal, swelling the vulva and lengthening the vagina. This swelling contributes to coital sensations for both partners.

Bartholin’s glands lie just inside the minor lips on each side of the vaginal opening. They secrete a couple of drops of lubrication just before orgasm. This lubrication is not essential for coitus. In fact, the fluid produced by the Bartholin’s glands has no known purpose. If the glands become infected and clogged, however, a woman may notice swelling and local irritation. It is wise to consult a gynecologist if these symptoms do not fade within a few days.

It was once believed that the source of the vaginal lubrication or “wetness” that women experience during sexual arousal was produced by the Bartholin’s glands. It is now known that engorgement of vaginal tissues during sexual excitement results in a form of “sweating” by the lining of the vaginal wall. During sexual arousal, the

Figure 3.5. Structures That Underlie the Female External Sex Organs. If we could see beneath the vulva, we would find muscle fibers that constrict the various body openings, plus the crura (“legs”) of the clitoris, the vestibular bulbs, and Bartholin’s glands.

The skin and underlying tissue that lies between the vaginal opening and the anus. (From Greek roots meaning “around” and “to empty out.”)

Episiotomy A surgical incision in the perineum that may be made during childbirth to protect the vagina from tearing. (From the Greek roots episio, meaning “pubic region,” and tome, meaning “cutting.”)

Sphincters Ring-shaped muscles that surround body openings and open or close them by expanding or contracting. (From the Greek for “that which draws close.”)

Crura Anatomical structures resembling legs that attach the clitoris to the pubic bone. (Singular: crus. A Latin word meaning “leg” or “shank.”)

Vestibular bulbs Cavernous structures that extend downward along the sides of the introitus and swell during sexual arousal.

Bartholin’s glands Glands that lie just inside the minor lips and secrete fluid just before orgasm.
pressure from this engorgement causes moisture from the many small blood vessels that lie in the vaginal wall to be forced out and to pass through the vaginal lining, forming the basis of the lubrication. In less time than it takes to read this sentence (generally within 10 to 30 seconds), beads of vaginal lubrication or “sweat” appear along the interior lining of the vagina in response to sexual stimulation, in much the same way that rising temperatures cause water to pass through the skin as perspiration.

Pelvic floor muscles permit women to constrict the vaginal and anal openings. They contract automatically, or involuntarily, during orgasm, and their tone may contribute to coital sensations.

Question: Now that we have examined the external female sexual organs, what are the internal female sex organs?

Internal Sex Organs

The internal sex organs of the female include the innermost parts of the vagina, the cervix, the uterus, and two ovaries, each connected to the uterus by a fallopian tube (see Figures 3.3 and 3.6). These structures comprise the female reproductive system.

The Vagina

Question: What is the vagina? The vagina extends back and upward from the vaginal opening (see Figure 3.3). It is usually 3 to 5 inches long at rest. Menstrual flow and babies pass from the uterus to the outer world through the vagina. During coitus, the penis is contained within the vagina.

The vagina is commonly pictured as a canal or barrel; but, when at rest, it is like a collapsed muscular tube. Its walls touch like the fingers of an empty glove. The vagina expands in length and width during sexual arousal. The vagina can also...
expand to allow insertion of a tampon, as well as the passage of a baby’s head and shoulders during childbirth.

The vaginal walls have three layers. The inner lining, or vaginal mucosa, is made visible by opening the labia minora. It is a mucous membrane similar to the skin that lines the inside of the mouth. It feels fleshy, soft, and corrugated. It may vary from very dry (especially if the female is anxious about something like examinations) to very wet, in which case fingers slide against it readily. The middle layer of the vaginal wall is muscular. The outer or deeper layer is a fibrous covering that connects the vagina to other pelvic structures.

The vaginal walls are rich with blood vessels but poorly supplied with nerve endings. Unlike the sensitive outer third of the vaginal barrel, the inner two-thirds are so insensitive to touch that minor surgery may sometimes be performed on those portions without anesthesia. The entire vaginal barrel is sensitive to pressure, however, which can be experienced as pleasurable.

The vaginal walls secrete substances that help maintain the vagina’s normal acidity (pH 4.0 to 5.0). Normally they taste salty, but their odor and taste may vary during the menstrual cycle. The secretions may contain substances that act as sexual attractants. Women who frequently douche or use feminine deodorant sprays may remove or mask substances that arouse sex partners. Douching or spraying may also alter the natural chemical balance of the vagina, which can increase the risk of infections. Feminine deodorant sprays can also irritate the vagina and evoke allergic reactions. The normal, healthy vagina cleanses itself through regular chemical secretions that are evidenced by a mild white or yellowish discharge.

Vaginitis refers to any vaginal inflammation, whether it is caused by an infection, birth control pills, antibiotics that alter natural body chemistry, an allergic reaction, chemical irritation, or lowered resistance, as may be caused by fatigue or poor diet. Changes in body chemistry or lowered resistance permit microscopic organisms normally found in the vagina to multiply to infectious levels. Vaginitis may be recognized by abnormal discharge, itching, burning of the vulva, and urinary urgency. Women with vaginitis are advised to seek medical attention, but let us note some suggestions that may help prevent vaginitis:

1. Wash your vulva and anus regularly with mild soap. Pat dry (taking care not to touch the vulva after dabbing the anus).
2. Wear cotton panties. Nylon underwear retains heat and moisture that cause harmful bacteria to flourish.
3. Avoid pants that are tight in the crotch.
4. Be certain that sex partners are well-washed. Condoms may also reduce the spread of infections from one’s sex partner.

Douche Application of a jet of liquid to the vagina as a rinse. (From the Italian doccia, meaning “shower bath.”)

Vaginitis Vaginal inflammation.
5. Use a sterile, water-soluble jelly such as K-Y jelly if artificial lubrication is needed for intercourse. Do not use Vaseline. Birth-control jellies can also be used for lubrication.

6. Avoid intercourse that is painful or abrasive to the vagina.

7. Avoid diets high in sugar and refined carbohydrates because they alter the normal acidity of the vagina.

8. Women who are prone to vaginal infections may find it helpful to douche occasionally with plain water, a solution of 1 or 2 tablespoons of vinegar in a quart of warm water, or a solution of baking soda and water. Douches consisting of unpasteurized, plain (unflavored) yogurt may help replenish the “good” bacteria that are normally found in the vagina and that may be destroyed by use of antibiotics. Be careful when douching, and do not douche when pregnant or when you suspect you may be pregnant. Consult your physician before deciding to douche or to apply any preparations to the vagina.

9. Watch your general health. Eating poorly or getting insufficient rest will reduce your resistance to infection.

The Cervix

When someone first said to me two years ago, “You can feel the end of your own cervix with your finger,” I was interested but flustered. I had hardly ever put my finger in my vagina at all, and felt squeamish about touching myself there, in that place “reserved” for lovers and doctors. It took me two months to get up nerve to try it, and then one afternoon, pretty nervously, I squatted down in the bathroom and put my finger in deep, back into my vagina. There it was, feeling slippery and rounded, with an indentation at the center through which, I realized, my menstrual flow came. It was both very exciting and beautifully ordinary at the same time. Last week I bought a plastic speculum so I can look at my cervix. Will it take as long this time? (Boston Women’s Health Book Collective, 1992)

**Question:** What is the cervix? The cervix is the lower end of the uterus. Its walls, like those of the vagina, produce secretions that contribute to the chemical balance of the vagina. The opening in the middle of the cervix, or *os*, is normally about the width of a straw, although it expands to permit passage of a baby from the uterus to the vagina during childbirth. Sperm pass from the vagina to the uterus through the cervical canal. **Question:** What should we know about cervical cancer?

Cervical cancer is relatively uncommon in the United States, although there are about 12,000 new cases a year and 4,100 deaths (American Cancer Society, 2003). Cervical cancer is more common among women who have had many sex partners, who became sexually active at a relatively early age, who come from lower socioeconomic status, and who smoke (Duggirala et al., 2003). The mortality rate is more than twice as high for African American women as for European American women (National Cancer Institute, 2003). All women are at risk, however.

A Pap test examines a sample of cervical cells that are smeared on a slide to screen for cervical cancer and other abnormalities. The American Cancer Society (2003) recommends annual Pap tests along with a pelvic examination for in women who are, or have been, sexually active or who have reached age 18. Most cases of cervical cancer can be successfully treated by surgery and radiotherapy if they are detected early. For women diagnosed with localized cancer, the survival rate is nearly 100% (American Cancer Society, 2003). Cervical cancer can also be prevented when
precancerous changes are detected by Pap test. The overall five-year survival rate is about 70%.

Vaccines are also under development that make women immune to the human papilloma virus (HPV), which is considered to be a key cause of cervical cancer. HPV comes in many forms, and one of them, HPV-16, is believed to lead to half the cases of cervical cancer. In a study of more than 2,300 young women reported in the *New England Journal of Medicine*, half, selected at random, were given a vaccine to immunize them against HPV-16, and half were given a placebo (Koutsky et al., 2002). The vaccine was fully effective in that none of the vaccinated women developed HPV infections or precancerous growths during a 17- to 27-month follow-up period, whereas 41 of the unvaccinated women became infected; and, of these, 9 showed precancerous cervical growths (which were then treated by the researchers).

The Uterus

**Question:** What is the uterus? The uterus, or womb (see Figures 3.3 and 3.6), is the organ in which a fertilized ovum implants and develops until birth. The uterus usually slants forward (is antverted), although about 10% of women have uteruses that tip backward (are retroverted). In most instances a retroverted uterus causes no problems, but some women with one find coitus in certain positions painful. A retroverted uterus normally tips forward during pregnancy. The uterus is suspended in the pelvis by flexible ligaments. In a woman who has not given birth, it is about 3 inches long, 3 inches wide, and 1 inch thick near the top. The uterus expands to house a fetus during pregnancy and shrinks after pregnancy, though not to its original size.

The uppermost part of the uterus is called the fundus (see Figure 3.6). The uterus is shaped like an inverted pear. If a ceramic model of a uterus were placed on a table, it would balance on the fundus. The central region of the uterus is called the body. The narrow lower region is the cervix, which leads downward to the vagina.

Like the vagina, the uterus has three layers (also shown in Figure 3.6). The innermost layer, or endometrium, is richly supplied with blood vessels and glands. Its structure varies according to a woman’s age and phase of the menstrual cycle. Endometrial tissue is discharged through the cervix and vagina at menstruation. In some women, endometrial tissue may also grow in the abdominal cavity or elsewhere in the reproductive system. This condition is called endometriosis, and the most common symptom is menstrual pain. If untreated, it may lead to infertility.

Cancer of the endometrial lining is called endometrial cancer. **Question:** What should we know about endometrial cancer? The risk factors for endometrial cancer include obesity, a diet high in fats, early menarche or late menopause, history of failure to ovulate, and estrogen replacement therapy (Nelson et al., 2002). For women who obtain hormone replacement therapy (HRT), combining estrogen with progesterin mitigates the risk of endometrial cancer (Nelson et al., 2002). Endometrial cancer is symptomized by abnormal uterine staining or bleeding, especially after menopause. The most common treatment is surgery (American Cancer Society, 2003). The five-year survival rate for endometrial cancer is up to 95% if it is discovered early and limited to the endometrium. (Endometrial cancer is usually diagnosed early because women tend to report postmenopausal bleeding to their doctors quickly.) The survival rate drops when the cancer invades surrounding tissues or metastasizes.

The second layer of the uterus, the myometrium, is well muscled. It endows the uterus with flexibility and strength and creates the powerful contractions that propel
a fetus outward during labor. The third or outermost layer, the perimetrium, provides an external cover.

**Hysterectomy** One woman in three in the United States has a hysterectomy by the age of 60. Most women who obtain them do so between the ages of 35 and 45. The hysterectomy is the second most commonly performed operation on women in this country. (Cesarean sections are the most common). A hysterectomy may be performed when a woman develops cancer of the uterus, ovaries, or cervix or another disease that causes pain or excessive uterine bleeding. A complete hysterectomy involves the surgical removal of the ovaries, fallopian tubes, cervix, and uterus. It is usually performed to reduce the risk of cancer spreading throughout the reproductive system. A partial hysterectomy removes the uterus but spares the ovaries and fallopian tubes so that the woman continues to ovulate and produce adequate quantities of female sex hormones.

The hysterectomy can relieve symptoms associated with various gynecological disorders and improve the quality of life for many women (Kjerulff et al., 2000). However, many gynecologists believe that hysterectomy is recommended too often, before proper diagnostic steps are taken or when less radical interventions might alleviate the problem (Broder et al., 2000). We advise women whose physicians advise a hysterectomy to seek a second opinion before proceeding.

**The Fallopian Tubes**

**Question: What are the fallopian tubes?** The fallopian tubes are about 4 inches in length and extend from the upper end of the uterus toward the ovaries (see Figure 3.6). The part of each tube nearest the uterus is the isthmus, which broadens into the ampulla as it approaches the ovary. The outer part, or infundibulum, has fringelike projections called fimbriae that extend toward, but are not attached to, the ovary. Ova pass through the fallopian tubes on their way to the uterus. The fallopian tubes are not just passageways. They help nourish and conduct ova. The tubes are lined with tiny hairlike projections termed cilia (“lashes”) that help propel ova through the tube at about 1 inch per day. Because ova must be fertilized within a day or two after they are released from the ovaries, fertilization usually occurs in the infundibulum within a couple of inches of the ovaries. The form of sterilization called tubal ligation ties ova passages and prevents fertilization.

In an ectopic pregnancy, the fertilized ovum implants outside the uterus, most often in the fallopian tube where fertilization occurred. Ectopic pregnancies can eventually burst fallopian tubes, causing hemorrhaging and death. Ectopic pregnancies are thus terminated before the tube ruptures. They are not easily recognized; however, because their symptoms — missed menstrual period, abdominal pain, irregular bleeding — suggest many conditions. Any of these symptoms is an excellent reason for consulting a gynecologist. Women who are of advanced age, who have had pelvic inflammatory disease (PID), who have undergone tubal surgery, or who have used intrauterine devices (IUDs) are at increased risk of developing ectopic pregnancies (Women’s-Health, 2003).

**The Ovaries**

**Question: What are the ovaries?** The two ovaries are almond-shaped organs that are each about 1½ inches long. They lie on either side of the uterus, to which they are attached by ovarian ligaments. The ovaries produce ova (egg cells) and the female sex hormones estrogen and progesterone. Estrogen is a generic term for several hormones (such as estradiol, estriol, and estrone) that promote the changes of puberty.
and regulate the menstrual cycle. Estrogen also helps older women maintain cognitive functioning and feelings of psychological well-being (Ross et al., 2000). Progesterone also has multiple functions, including regulating the menstrual cycle and preparing the uterus for pregnancy by stimulating the development of the endometrium (uterine lining). Estrogen and progesterone levels vary with the phases of the menstrual cycle.

The human female is born with all the ova she will ever have (about 2 million), but they are immature in form. Of these, about 400,000 survive into puberty, each of which is contained in the ovary within a thin capsule, or follicle. During a woman's reproductive years, from puberty to menopause, only 400 or so ripened ova, typically 1 per month, will be released by their follicles for possible fertilization. How these ova are selected is remains a mystery of nature.

**Ovarian Cancer** Each year some 25,000 women in the United States are diagnosed with ovarian cancer, and about 14,000 die from it (American Cancer Society, 2003). **Question: What should we know about ovarian cancer?** Ovarian cancer most often strikes women between the ages of 40 and 70 and ranks as the fourth leading cancer killer of women, behind lung cancer, breast cancer, and colon cancer. Women most at risk are those with blood relatives who had the disease, especially a first-degree relative (mother, sister, or daughter). Other risk factors are also important, because about 9 women in 10 who develop ovarian cancer do not have a family history of it. Researchers have identified several risk factors that increase the chances of developing the disease: never having given birth, prolonged use of talcum powder between the anus and the vagina, infertility, a history of breast cancer, a diet rich in meat and animal fats, and cigarette smoking (Gnagy et al., 2000; Marchbanks et al., 2000). Questions have been raised as to whether the use of clomiphene, a fertility drug, increases the risk of ovarian cancer. On the other hand, use of acetaminophen (found in Tylenol and some other pain relievers—read the label) may cut the risk of ovarian cancer. Daniel Cramer and his colleagues (1998) studied the use of over-the-counter painkillers in 563 New England women who had ovarian cancer and 523 healthy New England women selected from the general population. They found that 8.8% of the healthy women used acetaminophen, as compared with 4.6% of the women with ovarian cancer.

Early detection is the key to fighting ovarian cancer. When it is detected before spreading beyond the ovary, 95% of victims survive. However, the overall five-year survival rate is about 50% (American Cancer Society, 2003). Unfortunately, ovarian cancer is often "silent" in the early stages, showing no obvious signs or symptoms. The most common sign is enlargement of the abdomen, which is caused by the accumulation of fluid. Periodic, complete pelvic examinations are important. The Pap test, which is useful in detecting cervical cancer, does not reveal ovarian cancer. The American Cancer Society (2003) advises women over the age of 40 to have a cancer-related checkup every year.

Surgery, radiation therapy, and drug therapy are treatment options. Surgery usually includes the removal of one or both ovaries, the uterus, and the fallopian tubes.

**The Pelvic Examination**

Women are advised to have an internal (pelvic) examination at least once a year by the time they reach their late teens (or earlier if they become sexually active) and

---

**Progesterone** A steroid hormone secreted by the corpus luteum or prepared synthetically that stimulates proliferation of the endometrium and is involved in regulation of the menstrual cycle. (From the root pro-, meaning "promoting," and the words gestation, steroid, and one.)

**Follicle** A capsule within an ovary that contains an ovum. (From a Latin word meaning "small bag.")
twice yearly if they are over age 35 or use birth-control pills. **Question: What happens during the pelvic examination?** The physician (usually a gynecologist) first examines the woman externally for irritations, swellings, abnormal vaginal discharges, and clitoral adhesions. The physician normally inserts a speculum to help inspect the cervix and vaginal walls for discharges (which can be signs of infection), discoloration, lesions, or growths. This examination is typically followed by a Pap test to detect cervical cancer. A sample of vaginal discharge may also be taken to test for the sexually transmitted infection (STI) gonorrhea.

To take a Pap smear, the physician will hold open the vaginal walls with a plastic or (hopefully prewarmed!) metal speculum so that a sample of cells (a “smear”) may be scraped from the cervix with a wooden spatula (see Figure 3.7). Women should not douche prior to Pap tests or schedule them during menstruation, because douches and blood confound analysis of the smear.

The speculum exam is normally followed by a bimanual vaginal exam in which the index and middle fingers of one hand are inserted into the vagina while the lower part of the abdomen is palpated (touched) by the other hand from the outside. The physician uses this technique to examine the location, shape, size, and movability of the internal sex organs, searching for abnormal growths and symptoms of other problems. Palpation may be somewhat uncomfortable, but severe pain is a sign that something is wrong. A woman should not try to be “brave” and hide such discomfort from the examiner. She may only be masking a symptom (that is, depriving the physician of useful information). Physical discomfort is usually mild, however, and psychological discomfort may often be relieved by discussing it frankly with the examiner.

Finally, the physician should do a recto-vaginal examination in which one finger is inserted into the rectum while the other is inserted into the vagina. This procedure provides additional information about the ligaments of the uterus, the ovaries, and the fallopian tubes. The procedure also helps the physician evaluate the health of the rectum.

Although it may be somewhat uncomfortable, the pelvic examination is not ordinarily painful. It is normal for a woman who has not had one, or who is visiting a new doctor, to be anxious about the exam. The doctor should be reassuring if the woman expresses concern. If the doctor is not, the woman should feel free to consult another doctor. She should not forgo the pelvic examination itself, however. It is essential for early detection of problems.

**Figure 3.7. Use of the Speculum and Spatula during a Pelvic Examination.** The speculum holds the vaginal walls apart while the spatula is used to gently scrape cells from the cervix. The Pap test screens for cervical cancer and other abnormalities.
Some college women recall:

I was very excited about my breast development. It was a big competition to see who was wearing a bra in elementary school. When I began wearing one, I also liked wearing see-through blouses so everyone would know.

My breasts were very late in developing. This brought me a lot of grief from my male peers. I just dreaded situations like going to the beach or showering in the locker room.

All through junior high and high school I felt unhappy about being “over-endowed.” I felt just too uncomfortable in sweaters—there was so much to reveal and I was always sure that the only reason boys liked me was because of my bustline.

By the time I was eleven I needed a bra. The girls in my gym class in sixth grade laughed at me because my breasts were pretty big and I still didn’t have a bra. I tried to cover myself up when I dressed and undressed. On my eleventh birthday my mom gave me a sailor blouse and inside was my first bra. (It) was the best present I could have received. The bra made me feel a lot better about myself, but I was still unsure of my femininity for a long time.

In some cultures the breasts are viewed merely as biological instruments for feeding infants. In our culture, however, breasts have taken on such erotic significance that a woman’s self-esteem may become linked to her bustline.

Question: What are the breasts? The breasts are secondary sex characteristics. That is, like the rounding of the hips, they distinguish women from men, but they are not directly involved in reproduction. Each breast contains 15 to 20 clusters of milk-producing mammary glands (see Figure 3.8). Each gland opens at the nipple through its own duct. The mammary glands are separated by soft, fatty tissue. It is the amount of this fatty tissue, not the amount of glandular tissue, that largely determines the size of the breasts.

The nipple, which lies in the center of the areola, contains smooth muscle fibers that make the nipple become erect when they contract. The areola, or area

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**Review:** Internal Sex Organs

**Reflect**
Are the female sex organs more complex than you had believed? If so, how? Were any erroneous ideas corrected by the information in this section?

**Critical Thinking**
In the light of your own values, is the termination of an ectopic pregnancy an acceptable form of abortion? Why or why not?

10. The __________ walls have three layers.
11. __________ refers to any vaginal inflammation, regardless of the cause.
12. Sperm pass from the vagina to the uterus through the __________ canal.
13. A(n) __________ test examines cervical cells for cervical cancer and other abnormalities.
14. A fertilized ovum becomes implanted and develops with the __________.
15. The __________ is the second most commonly performed operation on women in the United States.
16. The __________ tubes extend from the uterus toward the ovaries and nourish and conduct ova.
17. The __________ produce ova and female sex hormones.

---

**The Breasts**

Secondary sex characteristics Traits that distinguish women from men but are not directly involved in reproduction.

Mammary glands Milk-secreting glands. (From the Latin *mamma*, which means both “breast” and “mother.”)

Areola The dark ring on the breast that encircles the nipple.
surrounding the nipple, darkens during pregnancy and remains darker after delivery. Oil-producing glands in the areola help lubricate the nipples during breast feeding. Milk ducts conduct milk from the mammary glands through the nipples. Nipples are richly endowed with nerve endings, so that stimulation of the nipples heightens sexual arousal for many women. Male nipples are similar in sensitivity.

Figure 3.9 shows some of the normal variations in the size and shape of the breasts of adult women. The sensitivity of the breasts to sexual stimulation is unrelated to their size. Small breasts may have as many nerve endings as large breasts, but they will be more densely packed.

Women can prompt their partners to provide breast stimulation by informing them that their breasts are sensitive to stimulation. They can also guide a partner’s hands in ways that provide the type of stimulation they desire. The breasts vary in sensitivity with the phases of the menstrual cycle, and some women appear less responsive to breast stimulation than others. However, some less sensitive women may learn to enjoy breast stimulation by focusing on breast sensations during lovemaking in a relaxed atmosphere.

Breast Cancer

The first author’s oldest daughter contracted breast cancer a couple of years ago. She was in her 30s, and a lump “suddenly” appeared in her mammography. She and the family dwelled in fear over the next couple of weeks as tissue from the tumor was biopsied, found to be malignant, and arrangements were made to remove the breast.
Given the “aggressiveness” of the tumor—the rapidity with which it had grown—every physician consulted recommended mastectomy (removing the breast) rather than lumpectomy (just removing the lump). The question arose as to whether or not she should have a prophylactic mastectomy of the healthy breast. A blood test determined that she did not possess gene mutations (BRCA1 or BRCA2) that are connected with early-onset breast cancer (Wooster & Weber, 2003), and so the healthy breast was preserved. There was additional anxiety following the removal of the breast as tissues were examined to determine whether the cancer had spread within the breast or to lymph nodes. Fortunately, it had apparently remained within a duct despite the rapidity of its growth.

Then she dealt with the psychological issues of feeling unwhole, which were to some degree mitigated by attending a support group of women undergoing similar experiences. Reconstruction of the breast was an unexpected and lengthy process during which the muscles that normally underlie breasts were gradually ballooned out to surround and support a silicone implant. A new cosmetic nipple was constructed from thigh tissue. It was decided that she did not need chemotherapy or radiation, but she did go on tamoxifen, a drug that decreases the body’s supply of estrogen—a factor in the development of cancerous tissue in the breast. There is no evidence of remaining malignant tissue, but we have not yet reached the “magical” five-year postsurgical survival date.

Question: What should we know about breast cancer? Breast cancer strikes nearly 211,000 women in the United States each year and takes about 40,000 lives (American Cancer Society, 2003). (An estimated 240 men also die of breast cancer annually.) The disease takes the lives of 2 to 3 of 10 women in the United States who develop it. It is not cancer in the breast that causes death, but rather its spread to vital body parts, such as the brain, bones, lungs, or liver.

Rates of breast cancer are rising slowly in the United States, at about 0.5% a year (American Cancer Society, 2003). More early cases of breast cancer are apparently being detected because of an increased use of mammography, a kind of X-ray that detects cancerous lumps in the breast. Advances in early detection and treatment have led to increased rates of recovery. The five-year survival rate for women whose breast cancers have not metastasized—that is, spread beyond the breast—is more than 90%, up from nearly 80% in the 1940s (American Cancer Society, 2003). The five-year survival rate drops to about 70% if the cancer has spread to the surrounding region and to about 20% if it has spread to distant sites in the body.

Risk Factors Breast cancer is rare in women under age 25. The risk increases sharply with age. About four of five cases develop in women over the age of 50 (Armstrong et al., 2000). The National Cancer Institute (2003) estimates that from birth to age 40, 1 in 217 women will develop breast cancer. By age 50, the risk rises to 1 in 50. By age 60, it rises to 1 in 24, and by age 70, to 1 in 14.

Genetic factors are involved in breast cancer (Lichtenstein et al., 2000; Wooster & Weber, 2003). The risk of breast cancer is higher among women with a family history of the disease (Armstrong et al., 2000), although nobody in the author’s daughter’s family had developed breast cancer. A study of more than 100,000 women nurses showed that those with mothers or sisters who had breast cancer had nearly twice the chance of developing the disease themselves (Golditz et al., 1993). Women who had both a mother and a sister with the disease had between two and three times greater risk. British researcher Julian Peto (2002) followed 1,300 pairs of identical twins and

---

1. Women who inherit BRCA1 or BRCA2 mutations have a 50% to 85% chance of developing breast cancer (American Cancer Society, 2003), as compared with one woman in eight or nine in the general population. They also have an increased risk of developing ovarian cancer.
1,000 pairs of fraternal twins in which one member of the pair had developed breast cancer for several years. The identical twins of women with breast cancer stood a one in three chance of developing the disease themselves, as compared with one woman in nine in the general population. The sisters of fraternal twins with breast cancer were significantly less likely than sisters of identical twins to develop the disease, but more likely than women in the general population.

Genes for breast cancer appear to predict not only whether women will contract the disease but also how deadly it will be. A Dutch study reported in the *New England Journal of Medicine* found that only 5.5% of women whose cancers had a “good” genetic signature died within a decade of diagnosis and treatment, as compared with 45% of women with the most deadly genetic signatures (van de Vijver et al., 2002). Health professionals may soon be testing the genomes of women with breast cancer to help determine how aggressively they should treat the disease by means such as chemotherapy and radiation once the tumors have been removed surgically.

A key risk factor in breast cancer is prolonged exposure to estrogen, which stimulates breast development in young women and also the proliferation of breast cancer cells (Clemons & Goss, 2001; Gruber et al., 2002). The following all heighten the risk of breast cancer because they increase the woman’s exposure to estrogen: early onset of menstruation (before age 14), late menopause (after age 55), delayed childbearing (after age 30), and never giving birth (American Cancer Society, 2003). Despite the fact that birth-control pills contain estrogen, reviews of the research conclude that, generally speaking, there is no connection between using the pill and breast cancer (Marchbanks et al., 2002). However, other research suggests that the pill may increase the risk of breast cancer in women with a family history of the disorder (Dawn et al., 2000; Grabrick et al., 2000). Exercise, by the way, may reduce the risk of breast cancer, presumably by decreasing the amount of fatty tissue in the body. Fat is connected with higher levels of estrogen production.

Heavy drinking of alcohol also heightens the risk of breast cancer (American Cancer Society, 2003; Singletary & Gapter, 2001). It remains unclear whether a high-fat diet contributes to breast cancer (Gruber et al., 2002). Nevertheless, higher amounts of fatty tissue in the body appear to be connected with breast cancer (American Cancer Society, 2003; Calle et al., 2003).

Does abortion increase a woman’s risk of breast cancer? Some writers have speculated that because pregnancy decreases the risk of breast cancer, abortion will indirectly increase the risk (Malec, 2003).

**Detection and Treatment** Women with breast cancer have lumps in the breast, but most lumps in the breasts are not cancerous. Most are either cysts or benign tumors called fibroadenomas. Breast cancer involves lumps in the breast that are malignant.

Early detection and treatment reduce the risk of mortality. The sooner cancer is detected, the less likely it is to have spread to critical organs.

Breast cancer may be detected in various ways, including breast self-examination (“BSE”), physical examination (“clinical breast examination,” or “CBE”), and mammography. Through mammography, tiny, highly curable cancers can be detected—and treated—before they can be felt by touch. By the time a malignant lump is large enough to be felt by touch, it already contains millions of cells. It may even have metastasized—that is, splintered off to form colonies elsewhere in the body. A mammography can detect tiny tumors before metastasis. One study found that 82% of women whose breast cancers were detected early by mammography survived for at least 8 years.
least five years following surgery, as compared to 60% of those whose cancers were discovered later. Note that HRT can impair the accuracy of mammographic screening (Kavanagh et al., 2000).

Early detection may offer another benefit. Smaller lumps can often be removed by lumpectomy, sparing the breast. More advanced cancers are likely to be treated by mastectomy.

Many drugs are also used to treat breast cancer, and others are in the research pipeline. For example, tamoxifen locks into the estrogen receptors of breast cancer cells, thereby blocking the effects of estrogen that would otherwise stimulate the cells to grow and proliferate. However, tamoxifen increases the risks of uterine cancer and of blood clots in the lungs, along with some other side effects. The risks of these side effects were lowest among women below the age of 50. The drug raloxifene (sold under the brand name Evista), which is intended to treat osteoporosis and prevent heart problems in postmenopausal women (Marwick, 2000), has also been shown to dramatically reduce the risk of breast cancer (Cummings et al., 1999). Moreover, raloxifene does not appear to have the side effects associated with tamoxifen. (Nevertheless, after careful consideration and several consultations, the author’s daughter was placed on tamoxifen and not raloxifene.) Other drugs, including Taxol, Herceptin, and many others, are also being studied for use against breast cancer. Ask your gynecologist for the latest research results and which drugs, if any, are right for you, given your risk of breast cancer, your age, and other factors.

Many women who have had mastectomies have had surgical breast implants to replace the tissue that has been removed. Other women have breast implants to augment their breast size. Research suggests that breast implants appear to have no effect of the racial differences, such as the tendency to be diagnosed later, may reflect less access to health care. On the other hand, genetic factors are also likely to be involved. It is usually estrogen that causes the proliferation of breast cancer cells, and thus some drugs, like tamoxifen, treat breast cancer by suppressing the body’s supply of estrogen. However, African American are more likely to develop tumors that are “estrogen-receptor negative.” That is, they develop rapidly even in the absence of estrogen. These tumors are highly aggressive—that is, they grow very rapidly—and are a major factor in the higher mortality rate for African American women (American Cancer Society, 2003; Jetter, 2000).

African American Women and Breast Cancer

Overall, African Americans are more likely than European Americans to develop cancer. The case is somewhat different with breast cancer. As a group, African American women are somewhat less likely than European American women to develop breast cancer. However, when they do, they frequently do so at an earlier age. They tend to be diagnosed with the disease somewhat later, and they are also more likely to die from it (American Cancer Society, 2003; Jetter, 2000). Some aspects of the racial differences, such as the tendency to be diagnosed later, may reflect less access to health care. On the other hand, genetic factors are also likely to be involved. It is usually estrogen that causes the proliferation of breast cancer cells, and thus some drugs, like tamoxifen, treat breast cancer by suppressing the body’s supply of estrogen. However, African American are more likely to develop tumors that are “estrogen-receptor negative.” That is, they develop rapidly even in the absence of estrogen. These tumors are highly aggressive—that is, they grow very rapidly—and are a major factor in the higher mortality rate for African American women (American Cancer Society, 2003; Jetter, 2000).

Lumpectomy Surgical removal of a lump from the breast.
Mastectomy Surgical removal of the entire breast.
on the probability of developing breast cancer, rheumatoid arthritis, and a number of other health problems, casting doubts on previous studies that had implicated them in the development of these problems (Spiegel, 2001; Wooster & Weber, 2003). However, the issue remains controversial. Readers are advised to consult their gynecologists for the latest research evidence.

The American Cancer Society (2003) recommends that women have a clinical breast exam every three years when they are between 20 and 39 years of age and annually thereafter. Mammograms reduce the death rate from breast cancer in women age 50 and above by 25% to 30% (Chlebowski, 2000). The current guidelines of the American Cancer Society, and changes since 1997, are outlined in Table 3.1.

<table>
<thead>
<tr>
<th>Truth? Fiction? Revisited</th>
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<tbody>
<tr>
<td>Monthly breast self-examinations (BSEs) are no longer recommended by the American Cancer Society. However, the nearby “A Closer Look” provides instructions for women who choose to engage in breast self-examination.</td>
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### TABLE 3.1

<table>
<thead>
<tr>
<th>Updated Breast Cancer Screening Guidelines: What Has Changed and Why</th>
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<tbody>
<tr>
<td><strong>Women at average risk</strong></td>
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<tr>
<td>Mammography</td>
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<tr>
<td>Clinical breast examination (CBE)</td>
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<tr>
<td>Breast self-examination (BSE)</td>
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<tr>
<td>Older women and women with serious health problems</td>
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<tr>
<td><strong>Women known to be at increased risk</strong></td>
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<tr>
<td>Women known to be at increased risk</td>
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Source: American Cancer Society; http://www.cancer.org/docroot/NWS/content/NWS_1_1x_Updated_Breast_Cancer_Screening_Guidelines_Released.asp
In sum, more than ever is known about the development of breast cancer. Breast cancer that develops early, for example, is believed to be largely genetic, and genetic markers (BRCA1 or BRCA2 genes) for early-onset breast cancer can indicate whether a particular woman is at risk (ask your gynecologist). Prolonged exposure to estrogen is a known risk factor, because estrogen stimulates the proliferation of breast cancer cells as well as breast development in young women. Exercise is believed to reduce the risk of breast cancer by decreasing the amount of fat in the body. (Estrogen is produced by fat cells as well as by the ovaries.)

Some women with BRCA1 or BRCA2 genes that place them at high risk for breast cancer choose to have their breasts removed prophylactically—that is, to prevent development of breast cancer. Although the procedure is “radical,” it appears to be effective (Meijers-Heijboer et al., 2000, 2001). On the other hand, there are the possibilities of problems with implants and reconstructive surgery, and some women are unhappy with the outcomes (Frost et al., 2000).

Mammography also allows for the detection of tiny, highly curable cancers before they can be felt by clinical examination or touch. Early detection allows many women to have small cancerous lumps removed by lumpectomy (surgical removal of the lump that contains the mass of cancer cells) rather than by mastectomy (removal of the entire breast).

An increasing arsenal of anti-breast-cancer medicines are also available or under development. For example, the drug tamoxifen locks into the estrogen receptors of

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**Review: The Breasts**

**Reflect**

Feminist Germaine Greer wrote “The degree of attention which breasts receive, combined with the confusion about what the breast fetishists actually want, makes women unduly anxious about them. They can never be just right; they must always be too small, too big, the wrong shape, too flabby.” How important is the size and shape of your breasts (or your partner’s breasts) to you? Why?

**Critical Thinking**

The American Cancer Society no longer recommends that women need to conduct breast self-examinations as a means of detecting breast cancer early. Do you believe that it is a good idea for women to do breast-self exams anyhow? Why or why not?

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18. The breasts are (Primary or Secondary?) sex characteristics.

19. Each breast contains 15 to 20 clusters of milk-producing ________ glands.

20. Milk ________ conduct milk from the mammary glands through the nipples.


22. The risk of breast cancer (Increases or Decreases?) with age.

23. The risk of breast cancer is (Higher or Lower?) among women with a family history of the disease.

24. A key risk factor in breast cancer is prolonged exposure to _______, which stimulates the proliferation of breast cancer cells.

25. (African or European?) Americans are more likely to die from breast cancer.

26. Through _______, curable breast cancers can be detected and treated before they can be felt by touch.

27. Smaller cancerous lumps can often be removed by _______, which leaves the non-diseased part of the breast intact.

28. Removal of the breast is termed ________.
breast cancer cells, thus blocking the effects of estrogen. Tamoxifen apparently reduces the probability of developing breast cancer by about 45% (Chlebowski, 2000). Raloxifene is used to treat osteoporosis and prevent heart problems in postmenopausal women (Marwick, 2000), but it also reduces the risk of breast cancer (Cummings et al., 1999). Other drugs including Taxol and Herceptin are being studied for use against breast cancer. Your gynecologist should have the latest research results. Be proactive. Seize the opportunity to evaluate whether or not you have breast cancer. There are more treatment options than ever; the survival rates are higher than ever; and earlier detection is often connected with less radical treatments.

**The Menstrual Cycle**

Menstruation is the cyclical bleeding that stems from the shedding of the uterine lining (endometrium.) Menstruation takes place when a reproductive cycle has not led to the fertilization of an ovum. The word *menstruation* derives from the Latin *mensis*, meaning “month.” The human menstrual cycle averages about 28 days in length.

**Question: What is the menstrual cycle?** The menstrual cycle is regulated by the hormones estrogen and progesterone and can be divided into four phases. During the first phase of the cycle, the proliferative phase, which follows menstruation, estrogen levels increase, causing the ripening of perhaps 10 to 20 ova (egg cells) within...
their follicles and the proliferation of endometrial tissue in the uterus. During the second phase of the cycle, estrogen reaches peak blood levels, and ovulation occurs. Normally only 1 ovum reaches maturity and is released by an ovary during ovulation. Then the third phase—the secretory, or luteal, phase—of the cycle begins. The luteal phase begins right after ovulation and continues through the beginning of the next cycle.

The term luteal phase is derived from corpus luteum, the name given the follicle that releases an ovum. The corpus luteum functions as an endocrine gland and produces large amounts of progesterone and estrogen. Progesterone causes the endometrium to thicken, so that it will be able to support an embryo if fertilization occurs. If the ovum goes unfertilized, however, estrogen and progesterone levels plummet. These falloffs provide the trigger for the fourth phase, the menstrual phase, which leads to the beginning of a new cycle.

Ovulation may not occur in every menstrual cycle. Anovulatory (“without ovulation”) cycles are most common in the years just after menarche. They may become frequent again in the years prior to menopause, but they may also occur irregularly among women in their 20s and 30s.

Although the menstrual cycle averages about 28 days, variations among women, and in the same woman from month to month, are quite common. Girls’ cycles are often irregular for a few years after menarche but later assume reasonably regular patterns. Variations from cycle to cycle tend to occur during the proliferative phase that precedes ovulation. That is, menstruation tends to reliably follow ovulation by about 14 days. Variations of more than 2 days in the postovulation period are rare.

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**Figure 3.10. A Woman Examines Her Breast for Lumps.**

breast is normal. Then move in 1 inch, toward the nipple. Keep circling to examine every part of your breast, including the nipple. This requires at least three more circles. Now slowly repeat the procedure on your left breast. Place the pillow beneath your left shoulder, your left arm behind your head, and use the finger pads on your right hand.

After you examine your left breast fully, squeeze the nipple of each breast gently between your thumb and index finger. Any discharge, clear or bloody, should be reported to your doctor immediately.

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**Ovulation** The release of an ovum from an ovary.

**Corpus luteum** The follicle that has released an ovum and then produces copious amounts of progesterone and estrogen during the luteal phase of a woman’s cycle. (From Latin roots meaning “yellow body.”)

**Endocrine gland** A ductless gland that releases its secretions directly into the bloodstream.

**Menarche** The first menstrual period.
Although hormones regulate the menstrual cycle, psychological factors can influence the secretion of hormones. Stress can delay or halt menstruation. Anxiety that she may be pregnant and thus miss her period may also cause a woman to be late. Many women in otherwise good health stopped menstruating during imprisonment in Nazi concentration camps during World War II.

Regulation of the Menstrual Cycle

The menstrual cycle involves finely tuned relationships between structures in the brain—the hypothalamus and the pituitary gland—and the ovaries and uterus. All these structures are parts of the endocrine system, which means that they secrete chemicals directly into the bloodstream (see Figure 3.11). The ovaries and uterus are also reproductive organs. The chemicals secreted by endocrine glands are called hormones. (Other bodily secretions, such as milk, saliva, sweat, and tears, arrive at their destinations by passing through narrow, tubular structures in the body called ducts.)

Behavioral and social scientists are especially interested in hormones because of their behavioral effects. Hormones regulate bodily processes such as the metabolic rate, growth of bones and muscle, production of milk, metabolism of sugar, and storage of fats, among others. Several hormones play important roles in sexual and reproductive functions.

The gonads—the ovaries in the female and the testes (or testicles) in the male and the ovaries in the female—secrete sex hormones directly into the bloodstream.
The female gonads, the ovaries, produce the sex hormones estrogen and progesterone. The male gonads, the testes, produce the male sex hormone testosterone. Males and females also produce sex hormones of the other gender but in relatively small amounts.

The hypothalamus is a pea-sized structure in the front part of the brain. It weighs about 4 to 5 grams and lies above the pituitary gland and below (hence the prefix hypo-, for “under”) the thalamus. Despite its small size, it is involved in regulating many states of motivation, including hunger, thirst, aggression, and sex. For example, when the rear part of a male rat’s hypothalamus is stimulated by an electric probe, the rat runs through its courting and mating sequence. It nibbles at a female’s ears and at the back of her neck. When she responds, they copulate. Human sexuality is not so stereotyped or mechanical—although in the cases of some people who are highly routinized in their behavior, it may appear so.

The pituitary gland, which is about the size of a pea, lies below the hypothalamus at the base of the brain. Because many pituitary secretions regulate other endocrine glands, the pituitary has also been called the master gland. Pituitary hormones regulate bone and muscle growth and urine production. Two pituitary hormones are active during pregnancy and motherhood: prolactin, which stimulates production of milk and oxytocin, which stimulates uterine contractions in labor and the ejection of milk during nursing. The pituitary gland also produces gonadotropins (literally, “that which ‘feeds’ the gonads”) that stimulate the ovaries: follicle-stimulating hormone (FSH) and luteinizing hormone (LH). These hormones play central roles in regulating the menstrual cycle.

The hypothalamus receives information about bodily events through the nervous and circulatory systems. It monitors the blood levels of various hormones, including estrogen and progesterone, and releases a hormone called gonadotropin-releasing hormone (Gn-RH), which stimulates the pituitary to release gonadotropins. Gonadotropins, in turn, regulate the activity of the gonads. It was once thought that the pituitary gland ran the show, but it is now known that the pituitary gland is regulated by the hypothalamus. Even the “master gland” must serve another.

Phases of the Menstrual Cycle

The menstrual cycle has four stages or phases: proliferative, ovulatory, secretory, and menstrual (see Figure 3.12). It might seem logical that a new cycle begins with the first day of the menstrual flow, because this is the most clearly identifiable event of
Figure 3.13. Changes That Occur During the Menstrual Cycle. This figure shows five categories of biological change: (a) changes in the development of the uterine lining (endometrium), (b) follicular changes, (c) changes in blood levels of ovarian hormones, (d) changes in blood levels of pituitary hormones, and (e) changes in basal temperature. Note the dip in temperature that is connected with ovulation.
the cycle. Many women also count the days of the menstrual cycle beginning with the onset of menstruation. Biologically speaking, however, menstruation is really the culmination of the cycle. In fact, the cycle begins with the end of menstruation and the initiation of a series of biological events that lead to the maturation of an immature ovum in preparation for ovulation and possible fertilization.

**The Proliferative Phase** The first phase, or proliferative phase, begins with the end of menstruation and lasts about 9 or 10 days in an average 28-day cycle (see Figures 3.12 and 3.13). During this phase the endometrium develops, or “proliferates.” This phase is also known as the preovulatory or follicular phase, because certain ovarian follicles mature and the ovaries prepare for ovulation.

Low levels of estrogen and progesterone are circulating in the blood as menstruation draws to an end. When the hypothalamus senses a low level of estrogen in the blood, it increases its secretion of Gn-RH, which in turn triggers the pituitary gland to release FSH. When FSH reaches the ovaries, it stimulates some follicles (perhaps 10 to 20) to begin to mature. As the follicles ripen, they begin to produce estrogen. Normally, however, only one of them—called the graafian follicle—will reach full maturity in the days just preceding ovulation. As the graafian follicle matures, it moves toward the surface of the ovary, where it will eventually rupture and release a mature egg (see Figures 3.13 and 3.14).

Estrogen causes the endometrium in the uterus to thicken to about 1/8 inch. Glands develop that would eventually nourish an embryo. Estrogen also stimulates the appearance of a thin cervical mucus. This mucus is alkaline and provides a hospitable, nutritious medium for sperm. The chances are thus increased that sperm that enter the female reproductive system at the time of ovulation will survive.

**The Ovulatory Phase** During ovulation, or the ovulatory phase, the graafian follicle ruptures and releases a mature ovum near a fallopian tube—not actually into a fallopian tube (see Figure 3.14). The other ripening follicles degenerate and are reabsorbed by the body. If two ova mature and are released during ovulation, and both are fertilized, fraternal (nonidentical) twins will develop. Identical twins occur when one fertilized ovum divides into two separate zygotes.

Ovulation is set into motion when estrogen production reaches a critical level. The hypothalamus detects the high level of estrogen and triggers the pituitary to release copious amounts of FSH and LH (see Figures 3.13 and 3.14). The surge of LH triggers ovulation, which usually begins 12 to 24 hours after the level of LH in the body has reached its peak. The synthetic hormone clomiphene is chemically similar to LH and has been used by women who ovulate irregularly to induce reliable ovulation and thus increase the chances of conceiving.
A woman’s basal body temperature, taken by oral or rectal thermometer, dips slightly at ovulation (Figure 3.13) and rises by about 1°F on the day following ovulation. Many women use this information to help them conceive or avoid conceiving.

Some women have discomfort or cramping during ovulation, termed mittelschmerz. Mittelschmerz is sometimes confused with appendicitis. Mittelschmerz, however, may occur on either side of the abdomen, depending on which ovary is releasing an ovum. A ruptured appendix always causes pain on the right side.

The Secretory Phase

The phase following ovulation is called the postovulatory or secretory phase. Some people refer to it as the luteal phase, which reflects the name given the ruptured (graafian) follicle—the corpus luteum. Figures 3.13 and 3.14 show the transformation of the graafian follicle into the corpus luteum.

Under the influence of LH, the corpus luteum, which has remained in the ovary, begins to produce large amounts of progesterone and estrogen. Levels of these hormones peak at around the 20th or 21st day of an average cycle (see Figure 3.13). These hormones cause the glands in the endometrium to secrete nutrients to sustain a fertilized ovum that becomes implanted in the uterine wall.

If implantation does not occur, the hypothalamus responds to the peak levels of progesterone by signaling the pituitary to stop producing LH and FSH. This feedback process is similar to that of a thermostat in a house reacting to rising temperatures by shutting down the furnace. The levels of LH and FSH decline rapidly, leading the corpus luteum to decompose. After its decomposition, levels of estrogen and progesterone fall precipitously. The corpus luteum sows the seeds of its own destruction: Its hormones signal the brain to shut down secretion of substances that maintain it.

The Menstrual Phase: An End and a Beginning

The menstrual phase occurs when estrogen and progesterone levels decline to the point where they can no longer sustain the uterine lining. The lining then disintegrates and is discharged from the body along with the menstrual flow.

The low estrogen levels of the menstrual phase signal the hypothalamus to release Gn-RH, which in turn stimulates the pituitary to secrete FSH. FSH, in turn, prompts ovarian secretion of estrogen and the onset of another proliferative phase. Thus a new cycle begins. The menstrual phase is a beginning as well as an end.

Menstrual flow contains blood from the endometrium (uterine lining), endometrial tissue, and cervical and vaginal mucus. Although the flow can appear persistent and last for five days or more, most women lose only a total of 2 or 3 ounces of blood (4 to 6 tablespoonfuls). A typical blood donor, by contrast, donates 16 ounces of blood at a sitting. Extremely heavy or prolonged (over a week) menstrual bleeding may reflect health problems and should be discussed with a health professional.

Prior to 1933, women generally used external sanitary napkins or pads to absorb the menstrual flow. In that year, however, tampons were introduced. Tampons are inserted into the vagina and left in place to absorb menstrual fluid. Women who use tampons can swim without concern while menstruating, wear more revealing or comfortable apparel, and feel less burdened.

Questions have arisen about whether or not tampons cause or exacerbate infections, such as toxic shock syndrome (TSS), which is sometimes fatal. Signs of TSS...
include fever, headache, sore throat, vomiting, diarrhea, muscle aches, rash, and dizziness. Peeling skin, disorientation, and a plunge in blood pressure may follow. TSS is caused by the Staphylococcus aureus ("staph") bacterium. In 1980, the peak year for cases of TSS, there were 344 recorded cases of TSS and 28 fatalities. Procter & Gamble removed its "extra absorbent" tampon Rely from the market when it was discovered that 71% of these TSS victims had used the product. A highly absorbent tampon that remains in place for 6 hours or more may create an ideal breeding ground for staph. The number of TSS cases has subsequently declined.

Although some researchers believe that concern over TSS has been exaggerated, many women now use regular rather than superabsorbent tampons. Some women alternate tampons with sanitary napkins during each day of menstruation. Some change their tampons three or four times a day. Other women have returned to external sanitary napkins. Still others use natural sponges. Women are encouraged to consult their health care providers about TSS.

Coitus during Menstruation

Many couples continue to engage in coitus during menstruation, but others abstain. Some people abstain because of religious prohibitions. Others express concern about the "fuss" or the "mess" of the menstrual flow. Question: Is it harmful to engage in coitus during menstruation? Despite traditional attitudes that associate menstruation with uncleanliness, there is no evidence that coitus during menstruation is physically harmful. Ancient societies—and some contemporary ones—have limited understanding of bodily processes, or else they rely on tradition more than science. Science teaches that there is no medical basis to fears of menstruating women and that there are no dangers in menstrual coitus.

We might laugh off these misconceptions as folly and ignorance, if it were not for their profound effect on women. Women who believe the myths about menstruation may see themselves as sources of pollution and endure anxiety, depression, and lowered self-esteem. Negative cultural beliefs concerning menstruation may also contribute to menstrual distress.
harmful to either partner. Ironically, menstrual coitus may be helpful to the woman. The uterine contractions that occur during orgasm may help relieve cramping by dispelling blood congestion. Orgasm achieved through masturbation may have the same effect.

Women may be sexually aroused at any time during the menstrual cycle. The preponderance of the research evidence, however, points to a peak in sexual desire in women around the time of ovulation.

Human coital patterns during the phases of the menstrual cycle apparently reflect personal decisions, not hormone fluctuations. Some couples may decide to increase their frequency of coitus at ovulation, in order to optimize the chances of conceiving, or to abstain during menstruation because of religious beliefs or beliefs linking menses with uncleanness. Some may also increase their coital activity preceding menstruation to compensate for anticipated abstinence during menses or increase coital activity afterwards to make up for deprivation. In contrast, females of other species that are bound by the estrous cycle respond sexually only during estrus, except in relatively rare cases in which the female submits to sexual advances to fend off attacks from an aggressive male.

Menopause, Perimenopause, and the Climacteric

Menopause, or the “change of life,” is the cessation of menstruation. Menopause is a process that most commonly occurs between the ages of 46 and 50 and lasts for about two years. However, it may begin any time between the ages of 35 and 60. There is at least one case of a woman who became pregnant at age 61. Question: What are the differences between menopause, perimenopause, and the climacteric?

The term perimenopause refers to the beginning of menopause and is usually characterized by 3 to 11 months of amenorrhea (lack of menstruation) or irregular periods (Bastian et al., 2003; Torpy et al., 2003). Perimenopause ends with menopause. Menopause, in other words, is a specific event in a longer-term process known as the climacteric (“critical period”). The term climacteric specifically refers to the gradual decline in the reproductive capacity of the ovaries. The climacteric generally lasts for about 15 years, from ages 45 to 60 or so. After about the age of 35, the menstrual cycles of many women shorten, from an average of 28 days to 25 days at age 40 and to 23 days by the mid-40s. By the end of her 40s, a woman’s cycles often become erratic, with some periods close together and others missed.

In menopause, the pituitary gland continues to pour normal levels of FSH and LH into the bloodstream; but, for reasons that are not well understood, the ovaries gradually lose their capacity to respond. The ovaries no longer ripen egg cells or produce the sex hormones estrogen and progesterone.

The deficit in estrogen may lead to a number of unpleasant perimenopausal sensations, such as night sweats and hot flashes (suddenly feeling hot) and hot flushes (suddenly looking reddened) (Bastian et al., 2003; Dennerstein et al., 2000). Hot flashes and flushes may alternate with cold sweats, in which a woman feels suddenly cold and clammy. Anyone who has experienced “cold feet” or hands from anxiety or fear will understand how dramatic the shifting patterns of blood flow can be. Hot flashes and flushes stem largely from “waves” of dilation of blood vessels across the face and upper body. All of these sensations reflect “vasomotor instability.” That is, there are disruptions in the body mechanisms that dilate or constrict the blood vessels to maintain an even body temperature. Additional signs of estrogen deficiency include dizziness, headaches, pains in the joints, sensations of tingling in the hands or feet, burning or itchy skin, and heart palpitations. The skin usually becomes drier.
There is some loss of breast tissue and decreased vaginal lubrication during sexual arousal. Women may also encounter sleep problems, such as awakening more frequently at night and having difficulty falling back to sleep. A Chinese study found that about one perimenopausal woman in six experienced migraine headaches (Wang et al., 2003).

Long-term estrogen deficiency has been linked to brittleness and porosity of the bones—a condition called osteoporosis. Bones break more readily, and some women develop so-called dowager’s hump. Osteoporosis can be severely handicapping, even life threatening. The increased brittleness of the bones increases the risk of serious fractures, especially of the hip, and many older women never recover from these fractures (Marwick, 2000).

Estrogen deficiency also has psychological effects. It can impair cognitive functioning and feelings of psychological well-being (Ross et al., 2000; Yaffe et al., 2000).

**Hormone Replacement Therapy (HRT)** Some women who experience severe physical symptoms have been helped by hormone replacement therapy (HRT), which typically consists of synthetic estrogen and progesterone. **Question: What are the effects—and dangers—of hormone replacement therapy (HRT)?** Synthetic estrogen and progesterone are used to offset the losses of their naturally occurring counterparts. HRT may help reduce the hot flushes and other symptoms brought about by hormonal deficiencies during menopause (den Tonkelaar & Oddens, 2000). It is especially helpful in preventing the development of osteoporosis (Duenwald, 2002). Drinking milk, which is high in calcium, increases bone density among girls and is likely to help prevent against osteoporosis later in life. Calcium supplements also seem to be helpful in decreasing the number of bone fractures among postmenopausal women.

HRT is not without controversy. Although HRT has been helpful to many menopausal women, a study of more than 16,000 postmenopausal women aged 50 to 79 found that exposure to a combination of estrogen and progestin appears to significantly increase the risk of breast cancer (Chlebowski et al., 2003). (Progestin is used along with estrogen because estrogen alone exposes women to a significant risk of developing uterine cancer [Duenwald, 2002].) The Chlebowski study found that in addition to stimulating the growth of breast cancer, the combination of hormones also makes the tumors harder to detect, causing dangerous delays in diagnosis. During the course of the study, which was published in the *Journal of the American Medical Association*, of 8,506 women on HRT, 199 developed invasive breast cancers, as compared with 150 cases among the 8,102 women taking a placebo. Also, despite having yearly mammograms, 25.4% of the women who developed breast cancer while using HRT had cancers that had begun to metastasize, as compared with 16% of those taking the placebo. Because of such concerns, the number of women using HRT has dropped by about 50% within the past couple of years (Grady, 2003a). On the other hand, estrogen replacement apparently lowers the woman’s risk of osteoporosis (Grady, 2003a, 2003b) and colon cancer (Grady, 2003b; Solomon & Dluhy, 2003).

Levels of LDL (“bad cholesterol”) are known to rise among menopausal women, while levels of HDL (“good cholesterol”) decrease (Hall et al., 2002). A number of studies suggest that HRT raises levels of HDL and lowers levels of LDL (Herrington et al., 2000; Nieto et al., 2000; Shlipak et al., 2000). Because high levels of LDL are connected with cardiovascular disease, it was believed, until recently, that HRT may reduce the risk of such disease in postmenopausal women. However, recent research reports show mixed results. The women in the Hormone Replacement Therapy trial
of the Women’s Health Initiative apparently ran a slightly greater risk of heart attacks and strokes (Fletcher & Colditz, 2002). Of the some 25,000 women in the study, nearly 1% of women using HRT developed such problems during the first year of HRT, but the risk tapered off rapidly during subsequent years. On the other hand, a study of nearly 165,000 British women aged 50 to 74 from the General Practice Research Database found that HRT, in the form of either pills or skin patches, did have cardioprotective effects (Varas-Lorenzo et al., 2000).

What can we conclude? The fact of the matter is that research results on some issues with HRT are mixed, and others suggest caution (Grady, 2003b; Solomon & Dluhy, 2003). Women considering HRT are well advised to discuss the latest research findings with their gynecologists and to consider alternatives.

Breast cancer specialist Larry Norton (cited in Duenwald, 2002), of Memorial Sloan-Kettering Cancer Center in New York, notes that progestin alone prevents or lessens hot flashes in about 70% of women. Selective serotonin reuptake inhibitors (SSRIs) like Effexor, Paxil, and Prozac are also of help (Stearns et al., 2003). Women using SSRIs to treat hot flashes usually take half the dose used to treat depression, which is their major type of usage, although they are also helpful with premenstrual syndrome (PMS), premenstrual dysphoric disorder (PMDD), eating disorders, and some other problems.

Vaginal dryness can be treated with estrogens that are used locally—that is, placed in the vagina rather than the bloodstream, as hormones usually are. Creams (e.g., Estrace), suppositories (Vagifem), and a plastic ring (Estring) are available for the purpose.

The “designer estrogen” (meaning it is taken up by only certain estrogen receptors) raloxifene, like HRT, is of help with women with osteoporosis, but it apparently decreases rather than increases the risk of breast cancer. As another alternative, the bisphosphonates (Actonel or Fosamax) also help maintain bone strength.
menopause.) A Dutch study followed 2,103 females aged 46 to 54 for five years. During this time period, the number of women who reached postmenopausal status doubled, and the percentage of women reporting depression increased from 18.5% to 23.7% (Maartens et al., 2002). The increase is unlikely to be due to chance, but more than three out of four women in the study did not report significant levels of depression or anxiety at any time during the experience of menopause.

Much of a woman’s response to menopause reflects its meaning to her, not physical changes (Hunter & O’Dea, 2001). Women who adopt the commonly held belief that menopause signals the beginning of the end of life may develop a sense of hopelessness about the future, which in turn can set the stage for depression. Women whose entire lives have centered around childbearing and child rearing are more likely to experience a sense of loss. Moreover, there is a cultural bias to explain depression and other problems of middle-aged women in terms of menopause, rather than to explore psychosocial factors.

- **Myth 5:** At menopause, women experience debilitating hot flashes. Not so.

- **Myth 6:** A woman who has had a hysterectomy will not undergo menopause afterward. It depends on whether or not the ovaries (the major producers of estrogen) were also removed. If they were not, menopause should proceed normally.

- **Myth 7:** Menopause signals an end to a woman’s sexual appetite. Not at all!

- **Myth 8:** A woman’s general level of activity is lower after menopause. Many postmenopausal women become peppier and more assertive.

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**Review:** The Menstrual Cycle

**Reflect**

Do people from your sociocultural background tend to hold any particular attitudes toward menstruation? What are they? Do you share these attitudes? Explain.

**Critical Thinking**

Would a woman be justified in complaining that she is confused about the evidence concerning the effects of HRT? Do you find the evidence straightforward or confusing? Explain.

29. _________ is the cyclical bleeding that stems from the shedding of the uterine lining (endometrium.)

30. The menstrual cycle is regulated by the hormones estrogen and _________ and is divided into four phases.

31. During the _________ phase, estrogen levels increase, causing the ripening of ova.

32. _________ occurs when estrogen reaches peak blood levels.

33. During the _________ phase, large amounts of progesterone produced by the corpus luteum cause the endometrium to thicken.

34. Dramatic ( Increases or Decreases?) in estrogen and progesterone trigger the menstrual phase.

35. Stress (Can or Cannot?) delay or halt menstruation.

36. The pituitary gland produces _________ that stimulate the ovaries: FSH and LH.

37. The synthetic hormone _________ is chemically similar to LH and induces ovulation.

38. There (Is or Is not?) evidence that coitus during menstruation is physically harmful.

39. _________ is defined as the cessation of menstruation.

40. The term _________ refers to the beginning of menopause and is usually characterized by several months of amenorrhea or irregular periods.

41. A deficit in _________ may lead to perimenopausal sensations such as night sweats, hot flashes, and hot flushes.

42. The latest research suggests that HRT ( Increases or Decreases?) the risk of breast cancer and offers no protection against heart disease.
Menstrual Problems

Although menstruation is a natural biological process, 50% to 75% of women experience some discomfort prior to or during menstruation (Sommerfeld, 2000).

Question: What kinds of menstrual problems do women experience? The Self-Assessment on pages 000–000 contains a list of commonly reported premenstrual symptoms. The problems we explore in this section include dysmenorrhea, mastalgia, menstrual migraine headaches, amenorrhea, premenstrual syndrome (PMS), and premenstrual dysphoric disorder (PMDD).

Dysmenorrhea

Pain or discomfort during menstruation, or dysmenorrhea, is the most common type of menstrual problem. Most women at some time have at least mild menstrual pain or discomfort. Pelvic cramps are the most common manifestation of dysmenorrhea. They may be accompanied by headache, backache, nausea, or bloated feelings. Women who develop severe cases usually do so within a few years of menarche. Primary dysmenorrhea refers to menstrual pain or discomfort in the absence of known organic pathology. Women with secondary dysmenorrhea have identified organic problems that are believed to cause their menstrual problems. Their pain or discomfort is caused by, or secondary to, these problems. Endometriosis, pelvic inflammatory disease, and ovarian cysts are just a few of the organic disorders that can give rise to secondary dysmenorrhea. Yet evidence is accumulating that supposed primary dysmenorrhea is often secondary to hormonal changes, although the precise causes have not been delineated. For example, menstrual cramps sometimes decrease dramatically after childbirth, as a result of the massive hormonal changes that occur with pregnancy.

Symptoms vary from person to person and also according to whether or not the woman has been pregnant. Women who have been pregnant report a lower incidence of menstrual pain but a higher incidence of premenstrual symptoms and menstrual discomfort.

Menstrual cramps appear to result from uterine spasms that may be brought about by copious secretion of hormones called prostaglandins. Prostaglandins apparently cause muscle fibers in the uterine wall to contract, as during labor. Most contractions go unnoticed, but powerful, persistent contractions are discomfitting in themselves and may temporarily deprive the uterus of oxygen, another source of distress. Women with more intense menstrual discomfort apparently produce higher quantities of prostaglandins. Prostaglandin-inhibiting drugs, such as ibuprofen, indomethacin, and aspirin are thus often of help. Menstrual pain may also be secondary to endometriosis.

Pelvic pressure and bloating may be traced to pelvic edema (Greek for “swelling”)—the congestion of fluid in the pelvic region. Fluid retention can lead to a gain of several pounds, sensations of heaviness, and mastalgia—a swelling of the breasts that sometimes causes premenstrual discomfort. Masters and Johnson (1966) noted that orgasm (through coitus or masturbation) can help relieve menstrual discomfort by reducing the pelvic congestion that spawns bloating and pressure. Orgasm may also increase the menstrual flow and shorten this phase of the cycle.

Headaches frequently accompany menstrual discomfort. Most headaches (in both sexes) stem from simple muscle tension, notably in the shoulders, the back of the neck, and the scalp. Pelvic discomfort may cause muscle contractions, thus contributing to the tension that produces headaches. Women who are tense about their menstrual flow are thus candidates for muscle tension headaches. Migraine headaches...
may arise from changes in the blood flow in the brain, however. Migraines are typically limited to one side of the head and are often accompanied by visual difficulties.

Amenorrhea

Amenorrhea is the absence of menstruation and is a primary sign of infertility. Primary amenorrhea describes the absence of menstruation in a woman who has not menstruated at all by about the age of 16 or 17. Secondary amenorrhea describes delayed or absent menstrual periods in women who have had regular periods in the past. Amenorrhea has various causes, including abnormalities in the structures of the reproductive system, hormonal abnormalities, growths such as cysts and tumors, and psychological problems, such as stress. Amenorrhea is normal during pregnancy and following menopause. Amenorrhea is also a symptom of anorexia nervosa, an eating disorder characterized by an intense fear of putting on weight and a refusal to eat enough to maintain a normal body weight, which often results in extreme (and sometimes life-threatening) weight loss. Hormonal changes that accompany emaciation are believed responsible for the cessation of menstruation. Amenorrhea may also occur in women who exercise strenuously, such as competitive long-distance runners. It is unclear whether the cessation of menstruation in female athletes is due to the effects of strenuous exercise itself, to related physical factors such as low body fat, to the stress of intensive training, or to a combination of factors.

Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD)

The term premenstrual syndrome (PMS) describes the combination of biological and psychological symptoms that may affect women during the four- to six-day interval that precedes their menses each month. For many women, premenstrual symptoms persist during menstruation. Premenstrual dysphoric disorder (PMDD) is a more technical term used as a diagnostic category by the American Psychiatric Association in its Diagnostic and Statistical Manual. PMDD is more severe than PMS, and is characterized by the symptoms shown in Table 3.2. The term is not always used precisely, and some make the mistake of confusing it with PMS (Smith et al., 2003). But the diagnosis of PMDD requires that five or more of the following

<table>
<thead>
<tr>
<th>Symptoms of Premenstrual Dysphoric Disorder (PMDD)</th>
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<tbody>
<tr>
<td>1. Feelings of sadness, hopelessness, or worthlessness</td>
</tr>
<tr>
<td>2. Tension, anxious, feeling “on edge”</td>
</tr>
<tr>
<td>3. Notable changes in mood, including frequent crying</td>
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<tr>
<td>4. Persistent irritability and anger, often leading to increased interpersonal conflict</td>
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<tr>
<td>5. Lessened interest in usual activities, possibly with withdrawal from social relationships</td>
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<tr>
<td>6. Difficulty concentrating</td>
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<tr>
<td>7. Fatigue, lethargy, lack of energy</td>
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<tr>
<td>8. Notable changes in appetite, such as binge eating or craving certain foods</td>
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<tr>
<td>9. Hypersomnia (sleeping too much) or insomnia</td>
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<tr>
<td>10. Feeling overwhelmed or out of control</td>
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<tr>
<td>11. Other physical symptoms, for example, tenderness or swelling of the breasts, headaches, joint or muscle pain, feelings of bloating, weight gain</td>
</tr>
</tbody>
</table>


In order to diagnose PMDD, the DSM-IV-TR requires that symptoms have been present for most menstrual cycles over a given year. Five or more of the symptoms must be present most of the time during the week before the period and ending within a few days after period begins. At least one symptom must be one of the first four. The symptoms must notably impaire functioning at work or school or in social activities and relationships.

Anorexia nervosa A psychological disorder of eating characterized by intense fear of putting on weight and refusal to eat enough to maintain normal body weight.

Premenstrual syndrome (PMS) A combination of physical and psychological symptoms (e.g., anxiety, depression, irritability, weight gain from fluid retention, and abdominal discomfort) that regularly afflicts many women during the four- to six-day interval that precedes their menses each month.

Premenstrual dysphoric disorder (PMDD) A diagnosis used by the American Psychiatric Association to describe cases of PMS that are characterized by severe changes in mood and impairment of functioning at work, at school or in social relationships.
symptoms be present most of the time during the week before the period and ending within a few days after period begins. At least one symptom must be one of the first four. In addition, in order to diagnose PMDD, the DSM requires that symptoms have been present for most menstrual cycles over the past year and that they notably impair functioning at work or school or in social activities and relationships.

Nearly three women in four experience some premenstrual symptoms (Sommerfeld, 2000). A study of Chinese women in Taiwan, reported in a Scandinavian journal, reported that the most common symptoms of PMS are minor psychological discomfort, muscular tension, and aches or pains (Hsiao et al., 2002). The great majority of cases involve mild to moderate levels of discomfort. Only a small minority of women report menstrual symptoms severe enough to impair their social, academic, or occupational functioning and to thus be categorized at PMDD. PMS is not unique to our culture. Researchers find premenstrual symptoms equally prevalent among women the world over.

Lifting “the Curse”—Should Monthly Periods Be Optional?
Women have been having menstrual periods for the 150,000 years or so that our species has been in existence, but only in the new millennium are we seriously considering making periods an option rather than a necessity. Health professionals have known for quite some time how the menstrual cycle is regulated by hormones, and they have realized that women can eliminate their periods by adjusting the hormones in their bloodstream. But only now is the general public being made aware of the fact so that women can make informed decisions as to whether or not this option is right for them.

In an essay in the medical journal The Lancet, Charlotte Ellertson (2000), a reproductive health specialist at the Population Council, writes to women who experience difficult periods: “Health professionals and women ought to view menstruation as they would any other naturally occurring but frequently undesirable condition. This means providing those women who want it with safe and effective means to eliminate their menstrual cycles.”

The fact is that the continuous use of oral contraceptives—in effect, tossing out the seven inactive pills that are usually packaged with the active 21 and taking the active tablets only—keeps sex hormone levels constant and eliminates menstruation. Although gynecologists sometimes let certain patients in on this trick—such as those wanting to avoid their periods on their honeymoons—they have generally not given women the option to suppress menstruation for long periods of time. Some doctors don’t feel comfortable prescribing a relatively untested therapy and worry it could increase the pill’s risks (Rako, 2003).

But some gynecologists, endocrinologists, and contraceptive researchers are spreading the word about suppression of menstrual periods. “For many women there is a menstruation-associated health problem month after month and there is no reason they have to put up with it,” says Dr. Sheldon Segal (cited in Sommerfeld, 2000), an endocrinologist at the Population Council and coauthor of the book Is Menstruation Obsolete? (Coutinho & Segal, 2003).

HEALTH BENEFITS
According to the American College of Obstetricians and Gynecologists, 50% to 75% of women suffer some
among women studied in the United States, Italy, and in the Islamic nation of Bahrain (Brody, 1992b).

The causes of PMS and PMDD are unclear, but evidence is accumulating for a biological basis. Researchers are looking to possible relationships between menstrual problems, including PMS and PMDD, and chemical imbalances in the body. Researchers have yet to find differences in levels of estrogen or progesterone between women with PMDD and those with PMS or no symptoms (Bäckström et al., 2003; Mortola, 1998). Research suggests that it is not the levels of these hormones themselves that contributes to PMS and PMDD, but rather an abnormal response to the presence of these hormones (Schmidt et al., 1998). PMS and PMDD also appear to be linked with imbalances in neurotransmitters such as serotonin (Bäckström et al., 2003; Mortola, 1998). (Neurotransmitters are the chemical messengers in the nervous system.) Serotonin imbalances are also linked to changes in appetite. Women

physical or emotional discomfort during or right before their periods. Nearly 50% experience painful cramping. No periods mean no PMS and no cramps—and less monthly discomfort.

Women with endometriosis, which is caused by and made progressively worse by menstruation, may also benefit from skipping periods. The birth control pill has been shown to reduce the risk of endometrial cancer by 50% and ovarian cancer 40%.

SEASONALE—ONE PERIOD PER SEASON?
Seasonale, approved by the FDA in 2003, was the first oral contraceptive marketed specifically for the purpose of suppressing menstruation. Seasonale contains a combination of two hormones commonly used in other oral contraceptives, but in significantly lower doses—an estrogen (ethinyl estradiol) and a progestin (levonorgestrel). The pills are taken for 84 days rather than 21, and then a woman takes seven days off to menstruate. Seasonale works like conventional oral contraceptives by suppressing ovulation, thickening cervical mucus, and preventing the endometrium from thickening enough to enable a fertilized egg to embed itself (Russo, 2003). The hormones in Seasonale suppress growth of the endometrium entirely, causing periods to be lighter than usual. Many women involved in clinical trials had very light periods lasting about two days during their week of placebo pills or no periods at all (Russo, 2003).

Some doctors have concerns about the safety of using the pill for extended periods of time because they were not intended for that purpose (Rako, 2003). While studies have found the birth control pill safe for most women—with exceptions such as those who are over 35 and smoke or who have certain medical conditions such as heart disease, blood clots, or breast cancer—they have suggested that pill users have a slightly higher chance of developing blood clots in the veins and lungs, stroke, and heart attack.

“If you take it continuously, that’s effectively increasing the amount of hormones someone gets by 25%. That will probably up the risks by that percentage,” says Dr. Gerson Weiss (cited in Sommerfeld, 2000), chairman of the department of obstetrics and gynecology at New Jersey Medical School. “A potential increase in [blood clots] is probably the major concern.” But Segal counters that the potential risks of continuous use of the pill are not all that different from those of the typical three-weeks-on, one-week-off regimen. He adds that women today are typically taking lower doses than in the past. Seasonale is also a low-dose pill.

A PERIOD-FREE FUTURE?
Dr. Elsimar Coutinho, a gynecology professor at Federal University of Bahia in Brazil, predicts that in future years women will only be having periods when they want to have them—for example, as part of cycles during which they wish to get pregnant.

Ellerston also envisions a period-free future: “Pills are more frequently being used for reasons other than contraception, for instance to control acne, and menstruation suppression might grow to be just another use for pills.”

But Segal warns that continuous use of oral contraceptives is not all right for all women, and women should not attempt to suppress menstruation without consulting with their gynecologist.
Premenstrual syndrome (PMS) is a group of symptoms that may affect women for the period of about eight days prior to and during menstruation. Research evidence suggests that most women have some of these symptoms but that most often they are not severe enough to seriously impair daily functioning. When they do, they may qualify as PMDD. Women who have severe, even disabling, symptoms, are advised to discuss them with their gynecologists.

Do you experience PMS or PMDD? Complete the following questionnaire to gain insight into whether you do.

**Directions:** Following is a list of psychological and physical symptoms of PMS and PMDD. Indicate whether you encounter these symptoms and how severe they are by checking the appropriate box. Then turn to the answer key in Appendix A to assess your responses.

<table>
<thead>
<tr>
<th>Part I: Psychological Symptoms of PMS</th>
<th>Do not have</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Disabling</th>
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<tr>
<td>Accident prone</td>
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<td>Depression</td>
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<td>Anxiety</td>
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<td>Panic</td>
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<td>Mood swings</td>
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<td>Crying spells</td>
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<td>Sudden anger</td>
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<td>Irritability</td>
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<td>Loss of interest in usual activities</td>
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<td>Difficulty concentrating</td>
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<td>Lack of energy</td>
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<td>Excessive use of alcohol</td>
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<td>Frustration</td>
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<td>Overeating or cravings for certain foods</td>
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<td>Insomnia or excessive sleeping</td>
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<td>Feelings of being out of control or overwhelmed</td>
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<tr>
<td>Paranoia</td>
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<thead>
<tr>
<th>Part II: Physical Symptoms of PMS</th>
<th>Do not have</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Disabling</th>
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<tr>
<td>Migraines</td>
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<td>Breast tenderness</td>
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<td>Joint or muscle pain</td>
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<td>Stiffness</td>
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<td>Weight gain</td>
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<tr>
<td>Feeling bloated</td>
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<td>Blurred vision</td>
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<td>Poor motor coordination</td>
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<tr>
<td>Exhaustion</td>
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<td>Dark circles under the eyes</td>
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<td>Runny eyes</td>
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2. © Lois Fichner-Rathus. All rights reserved.
with PMS and PMDD show greater increases of appetite during the luteal phase than other women do. Another neurotransmitter, gamma-aminobutyric acid (GABA) also appears to be involved in premenstrual problems because medicines that affect the levels of GABA help many women with these problems (Bäckström et al., 2003; Mortola, 1998). PMS and PMDD may well be caused by a complex interaction between ovarian hormones and neurotransmitters (Bäckström et al., 2003; Mortola, 1998).

Only a generation ago, premenstrual disorders were seen as “a woman’s lot”—something women must put up with. No longer. Today there are many treatment options. These include exercise, dietary control (for example, eating several small meals a day rather than two or three large meals; limiting salt and sugar; vitamin supplements), hormone treatments (usually progesterone), and medications that reduce anxiety or increase the amount of serotonin in the nervous system. You can get in touch with whether you have PMS, and how the symptoms affect you, by completing the nearby Self-Assessment. If you have severe or disabling symptoms, you may be diagnosable with PMDD. **Question: What can women do about PMS or PMDD?** Check with your gynecologist and consider the suggestions in the following section.

**How to Handle Menstrual Discomfort**

Most women experience some menstrual discomfort. Women with persistent menstrual distress may profit from the suggestions listed below. Researchers are exploring the effectiveness of these techniques in controlled studies. You might consider trying the techniques that sound right for you—all of them, if you wish. Try them for a few months to see if you reap any benefits.

1. **Don’t blame yourself!** Menstrual problems were once erroneously attributed to women’s “hysterical” nature. This is nonsense. Menstrual problems appear, in large part, to reflect hormonal variations or chemical fluctuations in the brain during the menstrual cycle. Researchers have not yet fully identified all the causal elements and patterns, but their lack of knowledge does not mean that women who have menstrual problems are hysterical.

2. **Keep a menstrual calendar, so that you can track your menstrual symptoms systematically and identify patterns.**

3. **Develop strategies for dealing with days that you experience the greatest distress—strategies that will help enhance your pleasure and minimize the stress affecting you on those days (Hunter et al., 2002).** Activities that distract you from your menstrual discomfort may be helpful. Go see a movie or get into that novel you’ve been meaning to read.

4. **Ask yourself whether you harbor any self-defeating attitudes toward menstruation that might be compounding distress (Hunter et al., 2002).** Do close relatives or friends see menstruation as an illness, a time of “pollution,” a “dirty thing”? Have you adopted any of these attitudes—if not verbally, then in ways that affect your behavior, such as by restricting your social activities during your period?

5. **See a gynecologist about your concerns, especially if you have severe symptoms.** Severe menstrual symptoms can be secondary to medical disorders such as endometriosis and pelvic inflammatory disease (PID). Check it out.

6. **Develop nutritious eating habits—and continue them throughout the entire cycle (that means always).** Consider limiting intake of alcohol, caffeine, fats, salt, and sweets, especially during the days preceding menstruation. Research suggests that a low-fat, vegetarian diet reduces the duration and intensity of menstrual pain and the duration of premenstrual symptoms (Barnard et al., 2000).
7. Eat several smaller meals (or nutritious snacks) throughout the day, rather than a few highly filling meals.

8. Some women find that vigorous exercise—jogging, swimming, bicycling, fast walking, dancing, skating, even jumping rope—helps relieve premenstrual and menstrual discomfort. Evidence suggests that exercise helps to relieve and possibly prevent menstrual discomfort (Ling, 2000; Pearlstein & Steiner, 2000). By the way, develop regular exercise habits—don’t seek to become solely a premenstrual athlete.

9. Check with your doctor about vitamin and mineral supplements (such as calcium and magnesium). Vitamin B6 appears to have helped some women (Chavez & Spitzer, 2002).

10. Ibuprofen (brand names: Medipren, Advil, Motrin, etc.) and other medicines available over the counter may be helpful for cramping. Prescription drugs such as antianxiety drugs (e.g., alprazolam) and antidepressant drugs (selective serotonin reuptake inhibitors, or SSRIs) may also be of help (Bäckström et al., 2003; Hunter et al., 2002; Stearns et al., 2003). “Antidepressants” affect levels of neurotransmitters in a way that can be helpful for women with PMS or PMDD. Their benefits do not mean that women with PMS or PMDD are “basically” depressed. Ask your doctor for a recommendation.

11. Remind yourself that menstrual problems are time limited. Don’t worry about getting through life or a career. Just get through the next couple of days.

In this chapter we have explored female sexual anatomy and physiology. In the following chapter, we turn our attention to the male.

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**Review: Menstrual Problems**

**Reflect**

Do you (or your loved ones) experience PMS or PMDD? What are you (or they) doing about it? Why?

**Critical Thinking**

Critical thinkers avoid oversimplification. Explain how PMS and PMDD can have complex causes that involve both biological and psychological factors. Is there any significance in the fact that the research suggests that both medication and cognitive-behavioral therapy can be of help to women with PMS or PMDD?

43. The most common type of menstrual problem is pain during menstruation, which is termed _________.

44. Menstrual cramps appear to result from _________.

45. _________ is the absence of menstruation.

46. _________ syndrome (PMS) refers to a combination of biological and psychological symptoms that may affect women during the four- to six-day interval that precedes menstruation.

47. Premenstrual ________ disorder (PMDD) is the name given severe PMS that is accompanied by troublesome mood changes and that impairs functioning in school, on the job, or in relationships.

48. Selective _________ reuptake inhibitors (SSRIs) have been found to help many women who experience PMS or PMDD.
1. **What are the parts of the vulva?**
   The female external sexual structures are collectively known as the vulva and consist of the mons veneris, labia majora and minora, the clitoris, the vestibule, and the vaginal opening.

2. **What is the mons veneris?**
   The mons veneris consists of fatty tissue that covers the joint of the pubic bones in front of the body.

3. **What are the labia majora?**
   The labia majora are large folds of skin that run downward from the mons along the sides of the vulva.

4. **What are the labia minora?**
   The labia minora are hairless, light-colored membranes that surround the urethral and vaginal openings.

5. **What is the clitoris?**
   The clitoris is the female sex organ that is most sensitive to sexual sensation, but it is not directly involved in reproduction.

6. **What is the vestibule?**
   The vestibule contains the openings to the vagina and the urethra.

7. **What is the urethral opening?**
   Urine passes from the female’s body through the urethral opening.

8. **What is the vaginal opening?**
   The vaginal opening, or introitus, lies below the urethral opening. The penis, babies, and the menstrual flow go through this opening.

9. **What is the perineum?**
   The perineum is the area that lies between the vaginal opening and the anus.

10. **What structures are found beneath the vulva?**
    These structures include the vestibular bulbs, Bartholin’s glands, the sphincters, and the clitoral crura.

11. **What are the internal female sex organs?**
    The internal female sex organs—or female reproductive system—include the innermost parts of the vagina, the cervix, the uterus, the ovaries, and the fallopian tubes.

12. **What is the vagina?**
    Menstrual flow and babies pass from the uterus to the outer world through the vagina. During coitus, the vagina contains the penis.

13. **What is the cervix?**
    The cervix is the lower end of the uterus. It contains an opening called the os.

14. **What should we know about cervical cancer?**
    Cervical cancer is relatively uncommon but detectable via a Pap test. When detected early, the survival rate approaches 100%.

15. **What is the uterus?**
    The uterus or womb is the pear-shaped organ in which a fertilized ovum implants and develops until birth. The uterine lining is called the endometrium.

16. **What should we know about endometrial cancer?**
    Risk factors include obesity, a diet high in fats, lengthy exposure to estrogen, and estrogen-replacement therapy. For women obtaining HRT, combining estrogen with progestin lessens the risk. Early detection can lead to a 95% five-year survival rate.

17. **What are the fallopian tubes?**
    Two fallopian tubes extend from the upper end of the uterus toward the ovaries. Ova pass through the fallopian tubes on their way to the uterus and are normally fertilized within these tubes.

18. **What are the ovaries?**
    The ovaries lie on either side of the uterus and produce ova and the sex hormones estrogen and progesterone.

19. **What should we know about ovarian cancer?**
    Ovarian cancer usually strikes women between the ages of 40 and 70. Women most at risk are those with first-degree blood relatives who had the disease, but most women who develop it do not have a family history. Risk factors include never giving birth, infertility, breast cancer, a diet rich in meat and animal fats, and cigarette smoking. Early detection is connected with a 95% survival rate.

(continues)
### Recite

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>20. What happens during the pelvic examination?</td>
<td>The gynecologist examines the woman externally for irritations, swellings, abnormal vaginal discharges, and clitoral adhesions. A speculum is used to inspect the cervix and vaginal walls for discharges, discoloration, lesions, or growths. This exam is usually followed by a Pap test.</td>
</tr>
<tr>
<td>21. What are the breasts?</td>
<td>The breasts are secondary sex characteristics that contain mammary glands. In some cultures the breasts are viewed as just a means for feeding infants. In our culture they have acquired erotic significance.</td>
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<tr>
<td>22. What should we know about breast cancer?</td>
<td>Women with breast cancer have lumps in the breast, but most lumps in the breasts are benign. Breast cancer may be detected by clinical breast examination (CBE), mammography, or breast self-examination (BSE). Risk factors include BRCA1 or BRCA2 mutations, exposure to estrogen, alcohol. When detected early, the five-year survival rate exceeds 90%.</td>
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<tr>
<td>23. What is the menstrual cycle?</td>
<td>Menstruation is the cyclical bleeding that stems from the shedding of the endometrium when a reproductive cycle has not led to the fertilization of an ovum. The menstrual cycle involves finely tuned relationships between the hypothalamus, the pituitary gland, and the ovaries and uterus. The cycle has four phases: proliferative, ovulatory, secretory, and menstrual. During the first phase, ova ripen within their follicles and endometrial tissue proliferates. During the second phase, ovulation occurs. During the third phase, the corpus luteum produces copious amounts of progesterone and estrogen that cause the endometrium to thicken. If the ovum goes unfertilized, a plunge in estrogen and progesterone levels triggers the fourth, or menstrual, phase.</td>
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<td>24. Is it harmful to engage in coitus during menstruation?</td>
<td>There is no evidence that coitus during menstruation is harmful.</td>
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<td>25. What are the differences between menopause, perimenopause, and the climacteric?</td>
<td>Menopause is the cessation of menstruation. Perimenopause is the beginning of menstruation and is characterized by several months or irregular periods or amenorrhea. The climacteric is a multiyear process marked by declining levels of estrogen and ending in menopause.</td>
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<tr>
<td>26. What are the effects—and dangers—of hormone replacement therapy (HRT)?</td>
<td>HRT offsets losses of estrogen and progesterone and can help women with perimenopausal and postmenopausal symptoms, including night sweats, hot flashes, hot flushes, dry skin, loss of breast tissue, and decreased vaginal lubrication. However, HRT has been linked to an increased risk of breast and endometrial cancers, and apparently has no protective effect against heart disease.</td>
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<tr>
<td>27. What kinds of menstrual problems do women experience?</td>
<td>Dysmenorrhea—painful menstruation—is the most common menstrual problem, and pelvic cramps are the most common symptom. Amenorrhea—lack of menstruation—can be caused by problems such as abnormalities in the structures of the reproductive system, hormonal abnormalities, cysts, tumors, and stress. Premenstrual syndrome (PMS) occurs during the period prior to and for a few days during menstruation. It can be characterized by depression and anxiety, irritability, difficulty concentrating, migraines, breast tenderness, and bloating. Premenstrual dysphoric disorder (PMDD) is like a severe case of PMS, said to occur when symptoms are extreme and impair functioning in school, at work, or in relationships.</td>
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<tr>
<td>28. What can women do about PMS or PMDD?</td>
<td>PMS and PMDD can be alleviated to some degree by biological and psychological means. Medicines that may help include selective serotonin reuptake inhibitors (SSRIs) and drugs that relieve cramping. Psychological methods include examining attitudes toward menstruating, finding enjoyable activities, and remembering that symptoms are time-limited.</td>
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