

The 28-day human female reproductive cycle, initiated and maintained by hormones, involves significant alterations in follicular and endometrial structure. The cycle, which begins at about 12 years of age (*menarche*) and ends at about 45 years of age (*menopause*), is characterized by periods of endometrial breakdown and discharge (**menstruation**). During each cycle, the progressive changes that occur in the ovary and uterus serve to develop and release the female germ cell for possible fertilization by the male germ cell and to prepare the endometrium for implantation of the fertilized ovum.

The *menstrual period* constitutes the first five days of the cycle, with loss of endometrial tissue and attendant bleeding. Endometrial growth begins on about the fifth day of the **menstrual cycle**. This growth is precipitated by hormones from the ovarian follicles (regulated by hormones from the anterior pituitary gland [FSH and LH]). The hormonal levels are relatively flat, but look at the endometrial growth! During the last few days of the previous cycle and the first several days of the next, these hormones (**FSH and LH**) and estrogen drive uterine development and stimulate follicular development.

Follicular development starts to produce estrogen on about day 7; note the increase in estrogen levels and its influence on endometrial growth. On about day 14, the spike in LH blood level, in conjunction with the rising titers of FSH and estrogen, brings on **ovulation**. This leads to bursting of the **mature ovarian follicle** and release of the immature ovum into the fimbriae of the uterine tube. Following ovulation, the burst follicle undergoes significant reconstruction (**corpus luteum**) influenced by luteinizing hormone (**LH**). On about the 21st day, the corpus luteum secretes **progesterone** and **estrogen**, a winning combination for enhancing endometrial **gland** development. The fibrous stroma soon becomes edematous with secretions. **Spiral arteries** are physically forced to take tortuous turns around the many proliferating glands. If fertilization occurs on or about day 16, the corpus luteum becomes the principal source of hormones for the next 90 days.

In the absence of fertilization, the corpus luteum begins to involute (forming a **corpus albicans**) about day 26, and estrogen/progesterone levels drop precipitously. In the absence of hormonal stimulation, the endometrium experiences reduced glandular secretion while fluid absorption by the local veins continues unabated, and in a short time the tissues collapse like a delicate cake in the oven when the oven door is slammed shut! The spiral arteries are flexed by these events, rupture, and **hemorrhage** with considerable hydraulic force, disrupting the epithelial lining, glands, and fibrous tissues. But for its stratum basale, the structural integrity of the endometrium is essentially destroyed. Reflex vasoconstriction limits hemorrhage. Disrupted tissue (menstruum, glandular tissue, and secretions), blood, and one or more unfertilized ova gravitate toward the vagina. After 3–5 days of **menstruation**, only about 1 mm (in height) of endometrium remains for regeneration. Within the next two weeks, it will regenerate 500% to a height of about 5 mm.

