

The uterus is a hollow, muscular organ located in the female pelvis. Its primary biological function is to support pregnancy. It is where a fertilized egg implants, grows, and develops into a fetus. When pregnancy does not occur, the uterus sheds its lining. That shedding is menstruation.

Let's define "pelvis" first. The pelvis is the lower part of the torso, formed by pelvic bones. It supports abdominal organs and forms the birth canal. The uterus sits between the bladder (in front) and the rectum (behind).

The uterus is about the size of a small pear in a non-pregnant adult. It typically measures about 7–8 centimeters long, 5 centimeters wide, and 2–3 centimeters thick. During pregnancy, it expands dramatically.

Now let's define "hollow organ." A hollow organ is one that contains an internal cavity. The uterus is hollow because it has a central space called the uterine cavity. That cavity is where implantation occurs.

The uterus has three major structural layers. We must understand each one.

The outermost layer is called the perimetrium. The perimetrium is a thin layer of tissue that covers the outside of the uterus. It is part of the serous membrane (a smooth tissue layer that reduces friction between organs). Its function is protection and structural support.

The middle layer is called the myometrium. "Myo" means muscle. The myometrium is thick, smooth muscle tissue. Smooth muscle is involuntary muscle, meaning it contracts automatically without conscious control.

The myometrium is responsible for uterine contractions. Contractions are rhythmic tightening and relaxing of muscle tissue. During childbirth, powerful contractions of the myometrium push the baby out. During menstruation, milder contractions help expel the uterine lining.

The innermost layer is called the endometrium. The endometrium is the lining of the uterus. This is the layer that thickens each month in preparation for pregnancy.

Let's define "thickens." Thickening means the endometrium builds up with blood vessels, glands, and nutrients. This process is stimulated by hormones.

Hormones are chemical messengers released by glands in the body. In the reproductive system, the main hormones involved are estrogen and progesterone.

Estrogen stimulates the endometrium to grow after menstruation. Progesterone stabilizes and prepares it for possible implantation.

Now define implantation. Implantation occurs when a fertilized egg (called a zygote early on) attaches to the endometrium. Once implanted, the embryo begins to draw nutrients from the uterine lining.

If implantation does not occur, hormone levels drop. When progesterone levels drop, the endometrium sheds. Shedding means the upper portion of the lining breaks down and exits the body through the vagina. This is menstruation.

Now we define menstruation. Menstruation is the monthly discharge of blood and tissue from the uterus when pregnancy has not occurred. It is part of the menstrual cycle.

The menstrual cycle is typically about 28 days, though it can range from 21 to 35 days in adults. It is controlled by hormones from the brain and ovaries.

The uterus has specific regions. The top portion is called the fundus. The fundus is the dome-shaped upper part of the uterus. It is clinically important during pregnancy because doctors measure fundal height to estimate fetal growth.

The central portion is called the body (or corpus). This is the main muscular portion where pregnancy develops.

The lower narrow portion is called the cervix. The cervix connects the uterus to the vagina. It acts as a passageway and protective barrier.

The cervix has a small opening called the cervical os. "Os" means opening. The cervical os allows menstrual blood to exit and sperm to enter.

The uterus is supported by ligaments. Ligaments are bands of connective tissue that anchor organs in place. Important uterine ligaments include the broad ligament, round ligament, and uterosacral ligaments.

The broad ligament helps stabilize the uterus within the pelvis. The round ligament supports the uterus anteriorly (toward the front). The uterosacral ligaments anchor it toward the back.

Blood supply to the uterus comes primarily from the uterine arteries. Arteries are blood vessels that carry oxygen-rich blood from the heart to tissues. Adequate blood flow is essential because the endometrium requires a rich blood supply for pregnancy.

Venous blood (blood returning to the heart) exits through uterine veins. Veins carry oxygen-depleted blood back to the heart.

Now let's discuss how the uterus changes during pregnancy.

During pregnancy, the uterus expands dramatically. This expansion is possible because the myometrium stretches and muscle fibers lengthen. The uterus grows from about 70 grams in weight to over 1,000 grams at full term.

The endometrium transforms into part of the placenta. The placenta is a temporary organ that connects mother and fetus. It allows oxygen and nutrients to pass from mother to baby.

After childbirth, the uterus undergoes involution. Involution means shrinking back to its original size. This process takes several weeks.

Now we address common uterine conditions.

Fibroids are benign (non-cancerous) tumors made of smooth muscle cells that grow in the myometrium. They can cause heavy bleeding or pain.

Endometriosis is a condition where tissue similar to the endometrium grows outside the uterus. This can cause inflammation and pain.

Adenomyosis occurs when endometrial tissue grows into the myometrium. This can cause painful, heavy periods.

Uterine cancer usually refers to endometrial cancer, which begins in the lining of the uterus.

Now let's define fertility in relation to the uterus. Fertility means the ability to conceive and sustain pregnancy. For fertility, the uterus must have a healthy endometrium capable of implantation and adequate blood supply.

The uterus is hormonally responsive. That means it reacts to hormone levels from the ovaries. Without proper hormonal signals, the endometrium cannot prepare properly.

Menopause occurs when ovarian hormone production declines permanently. Without estrogen and progesterone cycling, the endometrium stops thickening monthly. Menstruation stops.

Structurally, the uterus is remarkable because it can remain relatively small for decades, then expand to support a full-term pregnancy, then shrink back again.

Functionally, the uterus is not just a "baby container." It is an active, hormonally sensitive, muscular organ that responds to signals from the brain, ovaries, and bloodstream.

At its core, the uterus has three major functions:

Support implantation

Nourish and protect developing life

Contract to expel contents when necessary (menstruation or childbirth)

Every layer contributes to those functions.

The perimetrium protects.

The myometrium contracts.

The endometrium prepares and nourishes.