Introduction to the Reproductive System

Within the context of producing offspring, the reproductive system has four functions:

* To produce egg and sperm cells
* To transport and sustain these cells
* To nurture the developing offspring
* To produce hormones

These functions are divided between the primary and secondary, or [accessory](https://api.seer.cancer.gov/rest/glossary/latest/id/542eeea0102c1d14697ef869), reproductive organs. The primary reproductive organs, or gonads, consist of the ovaries and testes. These organs are responsible for producing the egg and sperm cells gametes), and hormones. These hormones function in the maturation of the reproductive system, the development of sexual characteristics, and regulation of the normal [physiology](https://api.seer.cancer.gov/rest/glossary/latest/id/5559060ce4b031c70bba2b8b) of the reproductive system. All other organs, ducts, and glands in the reproductive system are considered secondary, or accessory, reproductive organs. These structures transport and sustain the gametes and nurture the developing offspring.

Female Reproductive System



The organs of the [female reproductive system](https://api.seer.cancer.gov/rest/glossary/latest/id/5503539de4b0c48f31d6a310) produce and sustain the female sex cells (egg cells or [ova](https://api.seer.cancer.gov/rest/glossary/latest/id/55a8d505e4b05cd0cddbf2d8)), transport these cells to a [site](https://api.seer.cancer.gov/rest/glossary/latest/id/55417cc2e4b0426fced21fda) where they may be fertilized by sperm, provide a favorable environment for the developing [fetus](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0853e4b0d965832b0438), move the fetus to the outside at the end of the development period, and produce the female sex hormones. The female reproductive system includes the ovaries, Fallopian tubes, [uterus](https://api.seer.cancer.gov/rest/glossary/latest/id/55035691e4b0c48f31d6a438), [vagina](https://api.seer.cancer.gov/rest/glossary/latest/id/54fb800ee4b0c48f31d32344), [accessory](https://api.seer.cancer.gov/rest/glossary/latest/id/542eeea0102c1d14697ef869) glands, and [external](https://api.seer.cancer.gov/rest/glossary/latest/id/55022533e4b0c48f31d6204b) genital organs.

* [Ovaries](https://training.seer.cancer.gov/anatomy/reproductive/female/ovaries.html)
* [Genital Tract](https://training.seer.cancer.gov/anatomy/reproductive/female/tract.html)
* [External Genitalia](https://training.seer.cancer.gov/anatomy/reproductive/female/genitalia.html)
* [Female Sexual Response and Hormonal Control](https://training.seer.cancer.gov/anatomy/reproductive/female/response.html)
* [Mammary Glands](https://training.seer.cancer.gov/anatomy/reproductive/female/glands.html)

Genital Tract

Fallopian Tubes

There are two uterine tubes, also called Fallopian tubes or oviducts. There is one tube associated with each [ovary](https://api.seer.cancer.gov/rest/glossary/latest/id/55040431e4b0c48f31d6bb1f). The end of the tube near the ovary expands to form a funnel-shaped infundibulum, which is surrounded by fingerlike extensions called [fimbriae](https://api.seer.cancer.gov/rest/glossary/latest/id/55a2326ee4b05cd0cdd91c54). Because there is no direct connection between the [infundibulum](https://api.seer.cancer.gov/rest/glossary/latest/id/546e3003e4b0d965832b2aa0) and the ovary, the [oocyte](https://api.seer.cancer.gov/rest/glossary/latest/id/55a8d1b7e4b05cd0cddbf0ff) enters the [peritoneal cavity](https://api.seer.cancer.gov/rest/glossary/latest/id/546f59e4e4b0d965832bb154) before it enters the [Fallopian tube](https://api.seer.cancer.gov/rest/glossary/latest/id/55035bcee4b0c48f31d6a6d8). At the time of [ovulation](https://api.seer.cancer.gov/rest/glossary/latest/id/5553956de4b0426fced983df), the fimbriae increase their activity and create currents in the [peritoneal fluid](https://api.seer.cancer.gov/rest/glossary/latest/id/5510a71ce4b0c48f31dbabc0) that help propel the oocyte into the Fallopian tube. Once inside the Fallopian tube, the oocyte is moved along by the rhythmic beating of [cilia](https://api.seer.cancer.gov/rest/glossary/latest/id/55a186a8e4b05cd0cdd8fa92) on the epithelial lining and by peristaltic action of the [smooth muscle](https://api.seer.cancer.gov/rest/glossary/latest/id/55056329e4b0c48f31d6f003) in the wall of the tube. The journey through the Fallopian tube takes about 7 days. Because the oocyte is [fertile](https://api.seer.cancer.gov/rest/glossary/latest/id/5559ff53e4b031c70bba7144) for only 24 to 48 hours, [fertilization](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0836e4b0d965832b041f) usually occurs in the Fallopian tube.

Uterus

The [uterus](https://api.seer.cancer.gov/rest/glossary/latest/id/55035691e4b0c48f31d6a438) is a muscular [organ](https://api.seer.cancer.gov/rest/glossary/latest/id/54da499ae4b07fe4ff776889) that receives the fertilized oocyte and provides an appropriate environment for the developing [fetus](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0853e4b0d965832b0438). Before the first pregnancy, the uterus is about the size and shape of a pear, with the narrow portion directed inferiorly. After childbirth, the uterus is usually larger, then regresses after [menopause](https://api.seer.cancer.gov/rest/glossary/latest/id/5558f129e4b031c70bba2470).



The uterus is lined with the [endometrium](https://api.seer.cancer.gov/rest/glossary/latest/id/550356f4e4b0c48f31d6a466). The [stratum](https://api.seer.cancer.gov/rest/glossary/latest/id/55a939b7e4b05cd0cddc40f0) functionale of the endometrium sloughs off during [menstruation](https://api.seer.cancer.gov/rest/glossary/latest/id/5558f615e4b031c70bba253a). The deeper [stratum basale](https://api.seer.cancer.gov/rest/glossary/latest/id/55a939e8e4b05cd0cddc414f) provides the foundation for rebuilding the stratum functionale.

Vagina

The [vagina](https://api.seer.cancer.gov/rest/glossary/latest/id/54fb800ee4b0c48f31d32344) is a fibromuscular tube, about 10 cm long, that extends from the [cervix](https://api.seer.cancer.gov/rest/glossary/latest/id/55035ab7e4b0c48f31d6a676) of the uterus to the outside. It is located between the [rectum](https://api.seer.cancer.gov/rest/glossary/latest/id/5505a55fe4b0c48f31d6fd77) and the [urinary bladder](https://api.seer.cancer.gov/rest/glossary/latest/id/550b50ade4b0c48f31d9ac92). Because the vagina is tilted posteriorly as it ascends and the cervix is tilted anteriorly, the cervix projects into the vagina at nearly a right angle. The vagina serves as a passageway for menstrual flow, receives the erect [penis](https://api.seer.cancer.gov/rest/glossary/latest/id/550421c3e4b0c48f31d6bf72) during intercourse, and is the birth [canal](https://api.seer.cancer.gov/rest/glossary/latest/id/55a27c86e4b05cd0cdd9322c) during childbirth.

Female Hormone Control

[Follicle-stimulating hormone](https://api.seer.cancer.gov/rest/glossary/latest/id/55043159e4b0c48f31d6c194), luteinizing [hormone](https://api.seer.cancer.gov/rest/glossary/latest/id/5521c15ae4b0bc5c16bfeb3a), [estrogen](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0451e4b0d965832afed2), and [progesterone](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5df6e4b0d965832bb537) have major roles in regulating the functions of the [female reproductive system](https://api.seer.cancer.gov/rest/glossary/latest/id/5503539de4b0c48f31d6a310).

At [puberty](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5ea4e4b0d965832bb5ef), when the ovaries and [uterus](https://api.seer.cancer.gov/rest/glossary/latest/id/55035691e4b0c48f31d6a438) are mature enough to respond to hormonal stimulation, certain stimuli cause the [hypothalamus](https://api.seer.cancer.gov/rest/glossary/latest/id/5508a22ae4b0c48f31d84d2e) to start secreting [gonadotropin](https://api.seer.cancer.gov/rest/glossary/latest/id/546e14fde4b0d965832b0fa5)-releasing hormone. This hormone enters the [blood](https://api.seer.cancer.gov/rest/glossary/latest/id/54ac2835e4b0d965833ce0f4) and goes to the [anterior](https://api.seer.cancer.gov/rest/glossary/latest/id/55021d54e4b0c48f31d61808) [pituitary gland](https://api.seer.cancer.gov/rest/glossary/latest/id/542eee9f102c1d14697ef812) where it stimulates the secretion of follicle-stimulating hormone and luteinizing hormone. These hormones, in turn, affect the ovaries and uterus and the monthly cycles begin. A woman's reproductive cycles last from [menarche](https://api.seer.cancer.gov/rest/glossary/latest/id/55a27e64e4b05cd0cdd9338c) to [menopause](https://api.seer.cancer.gov/rest/glossary/latest/id/5558f129e4b031c70bba2470).

The monthly [ovarian cycle](https://api.seer.cancer.gov/rest/glossary/latest/id/55a8d56ae4b05cd0cddbf303) begins with the [follicle](https://api.seer.cancer.gov/rest/glossary/latest/id/555a032be4b031c70bba7623) development during the follicular phase, continues with [ovulation](https://api.seer.cancer.gov/rest/glossary/latest/id/5553956de4b0426fced983df) during the ovulatory phase, and concludes with the development and [regression](https://api.seer.cancer.gov/rest/glossary/latest/id/551ff4a5e4b0bc5c16bf899f) of the [corpus luteum](https://api.seer.cancer.gov/rest/glossary/latest/id/546cf595e4b0d965832a94a2) during the luteal phase.

The uterine [cycle](https://api.seer.cancer.gov/rest/glossary/latest/id/546b68a9e4b0d9658329c4ac) takes place [simultaneously](https://api.seer.cancer.gov/rest/glossary/latest/id/546a1c29e4b0d96583293621) with the ovarian cycle. The uterine cycle begins with [menstruation](https://api.seer.cancer.gov/rest/glossary/latest/id/5558f615e4b031c70bba253a) during the menstrual phase, continues with repair of the [endometrium](https://api.seer.cancer.gov/rest/glossary/latest/id/550356f4e4b0c48f31d6a466) during the proliferative phase, and ends with the growth of glands and blood vessels during the secretory phase.

Menopause occurs when a woman's reproductive cycles stop. This period is marked by decreased levels of ovarian hormones and increased levels of pituitary follicle-stimulating hormone and luteinizing hormone. The changing hormone levels are responsible for the symptoms associated with menopause.

Mammary Glands

Functionally, the [mammary](https://api.seer.cancer.gov/rest/glossary/latest/id/55208911e4b0bc5c16bfad74) glands produce milk; structurally, they are modified [sweat glands](https://api.seer.cancer.gov/rest/glossary/latest/id/55022ea5e4b0c48f31d62459). Mammary glands, which are located in the [breast](https://api.seer.cancer.gov/rest/glossary/latest/id/550b5441e4b0c48f31d9addf) .

Externally, each breast has a raised [nipple](https://api.seer.cancer.gov/rest/glossary/latest/id/5520821be4b0bc5c16bfaac7), which is surrounded by a circular pigmented area called the [areola](https://api.seer.cancer.gov/rest/glossary/latest/id/5523d3bae4b0bc5c16c0e05d). The nipples are sensitive to touch, due to the fact that they contain [smooth muscle](https://api.seer.cancer.gov/rest/glossary/latest/id/55056329e4b0c48f31d6f003)

 Internally, the adult female breast contains 15 to 20 lobes of glandular [tissue](https://api.seer.cancer.gov/rest/glossary/latest/id/55097ed2e4b0c48f31d89a03) that radiate around the nipple. The lobes are separated by [connective tissue](https://api.seer.cancer.gov/rest/glossary/latest/id/546cf544e4b0d965832a941f) and [adipose](https://api.seer.cancer.gov/rest/glossary/latest/id/5547bb8de4b0426fced4dda3).

[Mammary gland](https://api.seer.cancer.gov/rest/glossary/latest/id/550b5441e4b0c48f31d9addf) function is regulated by hormones. At [puberty](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5ea4e4b0d965832bb5ef), increasing levels of [estrogen](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0451e4b0d965832afed2) stimulate the development of glandular tissue in the female breast. Estrogen also causes the breast to increase in size through the accumulation of adipose tissue. [Progesterone](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5df6e4b0d965832bb537) stimulates the development of the duct [system](https://api.seer.cancer.gov/rest/glossary/latest/id/55590de9e4b031c70bba2fb2).

During pregnancy, these hormones enhance further development of the mammary glands. [Prolactin](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5e1de4b0d965832bb56a) from the [anterior](https://api.seer.cancer.gov/rest/glossary/latest/id/55021d54e4b0c48f31d61808) pituitary stimulates the production of milk within the glandular tissue, and [oxytocin](https://api.seer.cancer.gov/rest/glossary/latest/id/550434dfe4b0c48f31d6c27e) causes the ejection of milk from the glands.

Ovaries

The primary female reproductive organs, or gonads, are the two ovaries. Each [ovary](https://api.seer.cancer.gov/rest/glossary/latest/id/55040431e4b0c48f31d6bb1f) is a solid, ovoid structure about the size and shape of an almond, about 3.5 cm in length, 2 cm wide, and 1 cm thick. The ovaries are located in shallow depressions, called ovarian [fossae](https://api.seer.cancer.gov/rest/glossary/latest/id/546e096fe4b0d965832b0551), one on each side of the [uterus](https://api.seer.cancer.gov/rest/glossary/latest/id/55035691e4b0c48f31d6a438), in the [lateral](https://api.seer.cancer.gov/rest/glossary/latest/id/55021d80e4b0c48f31d6182e) walls of the pelvic [cavity](https://api.seer.cancer.gov/rest/glossary/latest/id/5522c2dfe4b0bc5c16c04c7c). They are held loosely in place by [peritoneal](https://api.seer.cancer.gov/rest/glossary/latest/id/55205c0be4b0bc5c16bf9a14) ligaments.

Structure

The ovaries are covered on the outside by a layer of simple cuboidal [epithelium](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0400e4b0d965832afe7b) called germinal (ovarian) epithelium. This is actually the [visceral peritoneum](https://api.seer.cancer.gov/rest/glossary/latest/id/554bc66ce4b0426fced7269f) that envelops the ovaries. Underneath this layer is a dense [connective tissue](https://api.seer.cancer.gov/rest/glossary/latest/id/546cf544e4b0d965832a941f) [capsule](https://api.seer.cancer.gov/rest/glossary/latest/id/5522bcd7e4b0bc5c16c0437c), the [tunica albuginea](https://api.seer.cancer.gov/rest/glossary/latest/id/55a98dd6e4b05cd0cddc67ae). The substance of the ovaries is distinctly divided into an outer [cortex](https://api.seer.cancer.gov/rest/glossary/latest/id/546cf5aee4b0d965832a94bf) and an inner [medulla](https://api.seer.cancer.gov/rest/glossary/latest/id/55a27cfae4b05cd0cdd93295). The cortex appears more dense and granular due to the presence of numerous [ovarian follicles](https://api.seer.cancer.gov/rest/glossary/latest/id/55a8d598e4b05cd0cddbf352) in various stages of development. Each of the follicles contains an [oocyte](https://api.seer.cancer.gov/rest/glossary/latest/id/55a8d1b7e4b05cd0cddbf0ff), a female [germ cell](https://api.seer.cancer.gov/rest/glossary/latest/id/5521d5c1e4b0bc5c16bff382). The medulla is a loose connective tissue with abundant [blood](https://api.seer.cancer.gov/rest/glossary/latest/id/54ac2835e4b0d965833ce0f4) vessels, lymphatic vessels, and [nerve](https://api.seer.cancer.gov/rest/glossary/latest/id/55207ef2e4b0bc5c16bfa8fd) fibers.

Ovarian Follicle Development



Beginning at puberty, follicle-stimulating hormone stimulates changes in the primordial follicles. The follicular cells become cuboidal, the primary oocyte enlarges, and it is now a primary follicle. The follicles continue to grow under the influence of follicle-stimulating hormone, and the follicular cells proliferate to form several layers of granulose cells around the primary oocyte. Most of these primary follicles degenerate along with the primary oocytes within them, but usually one continues to develop each month.

After about 10 days of growth the follicle is a mature vesicular (graafian) follicle, which forms a "blister" on the surface of the ovary and contains a secondary oocyte ready for ovulation.

Ovulation

Ovulation, prompted by luteinizing [hormone](https://api.seer.cancer.gov/rest/glossary/latest/id/5521c15ae4b0bc5c16bfeb3a) from the [anterior](https://api.seer.cancer.gov/rest/glossary/latest/id/55021d54e4b0c48f31d61808) pituitary, occurs when the mature follicle at the surface of the ovary ruptures and releases the secondary oocyte into the [peritoneal cavity](https://api.seer.cancer.gov/rest/glossary/latest/id/546f59e4e4b0d965832bb154). The ovulated secondary oocyte, ready for fertilization is still surrounded by the zona pellucida and a few layers of cells called the corona radiata. If it is not fertilized, the secondary oocyte degenerates in a couple of days. If a sperm passes through the corona radiata and zona pellucida and enters the cytoplasm of the secondary oocyte, the second meiotic division resumes to form a polar body and a mature ovum

After ovulation and in [response](https://api.seer.cancer.gov/rest/glossary/latest/id/55523c3be4b0426fced8d697) to luteinizing hormone, the portion of the follicle that remains in the ovary enlarges and is transformed into a [corpus luteum](https://api.seer.cancer.gov/rest/glossary/latest/id/546cf595e4b0d965832a94a2). The corpus luteum is a glandular structure that secretes [progesterone](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5df6e4b0d965832bb537) and some [estrogen](https://api.seer.cancer.gov/rest/glossary/latest/id/546e0451e4b0d965832afed2). Its fate depends on whether fertilization occurs. If fertilization does not take place, the corpus luteum remains functional for about 10 days; then it begins to degenerate into a corpus albicans, which is primarily [scar tissue](https://api.seer.cancer.gov/rest/glossary/latest/id/5547bd23e4b0426fced4dfcc), and its hormone output ceases. If fertilization occurs, the corpus luteum persists and continues its hormone functions until the [placenta](https://api.seer.cancer.gov/rest/glossary/latest/id/546f5acde4b0d965832bb2b5) develops sufficiently to secrete the necessary hormones. Again, the corpus luteum ultimately degenerates into corpus albicans, but it remains functional for a longer period of time.