FALLOPIAN TUBES

Uterine Tubes, Salpinges, Tuba Uterina, Oviductus

Two very fine tubes that transport sperm toward the egg, and allow passage of the fertilized egg back to the uterus for implantation.

About Fallopian tubes

Function

Following ovulation, the secondary oocyte surrounded by a few granulosa cells is released into the peritoneal cavity. The nearby uterine tube, either left or right, receives the oocyte. Unlike sperm, oocytes lack flagella, and therefore cannot move on their own. High concentrations of estrogen that occur around the time of ovulation induce contractions of the smooth muscle along the length of the uterine tube. These contractions occur every 4 to 8 seconds and the result is a coordinated movement that sweeps the surface of the ovary and the pelvic cavity. Current flowing toward the uterus is generated by coordinated beating of the cilia that line the outside and lumen of the length of the uterine tube. These cilia beat more strongly in response to the high estrogen concentrations that occur around the time of ovulation. As a result of these mechanisms, the oocyte–granulosa cell complex is pulled into the interior of the tube. Once inside, the muscular contractions and beating cilia move the oocyte slowly toward the uterus. When fertilization does occur, sperm typically meet the egg while it is still moving through the ampulla. The release of a mature egg does not alternate between the two ovaries and seems to be random. After removal of an ovary, the remaining one produces an egg every month. Occasionally the embryo implants into the fallopian tube instead of the uterus, creating an ectopic pregnancy, commonly known as a "tubal pregnancy".
Development

Embryos have two pairs of ducts to let gametes out of the body; one pair (the Müllerian ducts) develops in females into the Fallopian tubes, uterus and vagina, while the other pair (the Wolffian ducts) develops in males into the epididymis and vas deferens. Normally, only one of the pairs of tubes will develop while the other regresses and disappears in utero. The homologous organ in the male is the rudimentary appendix testis.

Anatomical structure

The fallopian tubes, also known as uterine tubes and salpinges (singular salpinx), are two very narrow tubes that start from the uterine horn and funnel into the abdominal cavity near the ovary. Each uterine tube is approximately 7 to 12 cm in length and less than 1 cm in diameter and connects a single ovary to the uterus.

Fallopian tubes are uterine appendages located bilaterally at the superior portion of the uterine cavity. They consist of three parts (lateral to medial) (Pic. 1):

- **Infundibulum** with its associated fimbriae near the ovary - the largest of these is ordinarily in contact with the ovary and is known as the ovarian fimbria. The ovum must enter through the open end of a tube if fertilization is to occur. This opening is of considerable clinical importance as blood, ascending infections, or pus can pass out of the tube to invade the abdominal cavity, with resultant pain, endometriosis, or pelvic infection.
- **Ampullary region** that represents the major portion of the lateral tube, the place where fertilization occurs.
- **Isthmus** which is the narrower part of the tube that links to the uterus. There is some evidence that the isthmus may act as a sphincter.
- **Interstitial** (also known as intramural) part that transverses the uterine musculature.

The point where the tubal canal meets the peritoneal cavity is called tubal ostium, while the uterine opening of the fallopian tube is the entrance into the uterine cavity, the utero-tubal junction.

The uterine tubes have three layers of musculature:

- inner longitudinal
- middle circular layer
- outer longitudinal layer

Histological structure
A cross section of fallopian tube shows four distinct layers:

- serosa
- subserosa
- lamina propria
- innermost mucosal layer

The serosa is the outermost layer derived from visceral peritoneum. Subserosa is composed of loose adventitious tissue, blood vessels, lymphatics, an outer longitudinal and inner circular smooth muscle coats. This layer is responsible for peristaltic action of fallopian tube. Lamina propria is a vascular connective tissue.

There are two types of cells within the simple columnar epithelium of the fallopian tube (oviduct) (Pic. 2):

- **Ciliated cells** that predominate throughout the tube, but are most numerous in the infundibulum and ampulla. Estrogen increases the production of cilia on these cells.
- **Secretory peg cells** that are interspersed between the ciliated cells, contain apical granules and produce the tubular fluid. This fluid contains nutrients for spermatozoa, oocytes and zygotes. The secretions also promote capacitation of the sperm by removing glycoproteins and other molecules from the plasma membrane of the sperm. Progesterone increases the number of peg cells, while estrogen increases their height and secretory activity. Tubal fluid flows against the action of the ciliae, that is toward the fimbrial end.

As mentioned above, the tubal epithelium is responsive to the estrogen and progesterone levels during the menstrual cycle, pregnancy, and the menopause. The proliferative phase is characterized by elevated epithelium with ciliated and secretory cells of equal height. The luteal phase shows lower ciliated cells with higher and more prominent cytoplasm, sometimes with rupture and extrusion of the cytoplasm into the lumen. During menstruation and post-menstruation, cells are lower and smaller. During pregnancy, tubal epithelium remains low. There is considerable variation in postmenopausal changes in the tubal epithelium. Apparently significant secretory activity ceases, but the onset of atrophy is variable and deciliation may not occur until years after the menopause.
**Asherman’s syndrome**
A medical condition, where the walls of the uterus stick to one another due to bands of scar tissue.
Learn more at: [www.fertilitypedia.org/therapy/diag/asherman-s-syndrome](http://www.fertilitypedia.org/therapy/diag/asherman-s-syndrome)

**Bicornuate uterus**
Inborn morphological deviation of the uterus - one of the Müllerian duct anomalies where the uterine cavity is divided in the upper part.
Learn more at: [www.fertilitypedia.org/therapy/diag/bicornuate-uterus](http://www.fertilitypedia.org/therapy/diag/bicornuate-uterus)

**Endometrial cancer**
Cancer that arises from the endometrium, the lining of the uterus.
Learn more at: [www.fertilitypedia.org/therapy/diag/endometrial-cancer](http://www.fertilitypedia.org/therapy/diag/endometrial-cancer)

**Endometrial polyp**
The finger like overgrowths attached to the inner wall of the uterus that extend into the uterine cavity which are made of endometrial tissue
Learn more at: [www.fertilitypedia.org/therapy/diag/endometrial-polyp](http://www.fertilitypedia.org/therapy/diag/endometrial-polyp)

**Endometriosis**
A state in which pieces of the tissue alike to the lining of the uterus (endometrium) grow in other parts of the body.
Learn more at: [www.fertilitypedia.org/therapy/diag/endometriosis](http://www.fertilitypedia.org/therapy/diag/endometriosis)

**Fallopian tube blockage**
An obstruction prevents the egg or sperm from traveling down the tube, thus making fertilization impossible.
Learn more at: [www.fertilitypedia.org/therapy/diag/fallopian-tube-blockage](http://www.fertilitypedia.org/therapy/diag/fallopian-tube-blockage)

**Hematosalpinx**
Hematosalpinx is a medical condition involving bleeding into the fallopian tube.
Learn more at: [www.fertilitypedia.org/therapy/diag/hematosalpinx](http://www.fertilitypedia.org/therapy/diag/hematosalpinx)

**Hydrosalpinx**
A hydrosalpinx is an abnormal pouch containing liquid in a fallopian tube.
Learn more at: [www.fertilitypedia.org/therapy/diag/hydrosalpinx](http://www.fertilitypedia.org/therapy/diag/hydrosalpinx)
**Hypogonadism**
A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/hypogonadism](http://www.fertilitypedia.org/therapy/diag/hypogonadism)

**Hysterectomy**
A surgery performed to remove a woman’s uterus.
Learn more at: [www.fertilitypedia.org/therapy/diag/hysterectomy](http://www.fertilitypedia.org/therapy/diag/hysterectomy)

**Oligomenorrhea**
Light or infrequent menstrual flow at intervals of 39 days to 6 months or 5–7 cycles in a year.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligomenorrhea](http://www.fertilitypedia.org/therapy/diag/oligomenorrhea)

**Ovarian cancer**
A type of cancer in which abnormal cells begin to grow in one or both of a woman’s ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/ovarian-cancer](http://www.fertilitypedia.org/therapy/diag/ovarian-cancer)

**Ovariectomy**
Surgical removal of one or both ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/ovariectomy](http://www.fertilitypedia.org/therapy/diag/ovariectomy)

**Pelvic adhesions**
A form of abdominal adhesions in the pelvis.
Learn more at: [www.fertilitypedia.org/therapy/diag/pelvic-adhesions](http://www.fertilitypedia.org/therapy/diag/pelvic-adhesions)

**Pelvic Inflammatory Disease**
Infection of the upper part of the female reproductive system and a common complication of some sexually transmitted diseases.

**Pyosalpinx**
A distally blocked Fallopian tube filled with pus.
Learn more at: [www.fertilitypedia.org/therapy/diag/pyosalpinx-do-rf](http://www.fertilitypedia.org/therapy/diag/pyosalpinx-do-rf)

**Tubal ligation**
A permanent form of female sterilization, in which the fallopian tubes are severed and sealed or "pinched shut", in order to prevent fertilization.
Learn more at: [www.fertilitypedia.org/therapy/diag/tubal-ligation](http://www.fertilitypedia.org/therapy/diag/tubal-ligation)
**Tubal phimosis**
The type of blockage that affects the part of the fallopian tube end towards the ovary.
Learn more at: [www.fertilitypedia.org/therapy/diag/tubal-phimosis](http://www.fertilitypedia.org/therapy/diag/tubal-phimosis)

**Uterine fibroids**
The most common benign smooth muscle tumors of the uterus encountered in women of reproductive age.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-fibroids](http://www.fertilitypedia.org/therapy/diag/uterine-fibroids)

**Uterine malformations**
A type of female genital malformation resulting from an abnormal development of the Müllerian duct(s) during embryogenesis.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-malformations](http://www.fertilitypedia.org/therapy/diag/uterine-malformations)

**Uterus duplex**
Congenital uterine malformation where both Müllerian ducts develop but fail to fuse, thus the woman has a "double uterus".
Learn more at: [www.fertilitypedia.org/therapy/diag/uterus-duplex](http://www.fertilitypedia.org/therapy/diag/uterus-duplex)

**Uterus septus**
A form of a congenital malformation where the uterine cavity is partitioned by a longitudinal septum. It is one of Müllerian duct anomalies.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterus-septus](http://www.fertilitypedia.org/therapy/diag/uterus-septus)

**Mainorgan**

**Ovary**
The ovum-producing organs of the internal female reproductive system
Learn more at: [www.fertilitypedia.org/edu/organs/ovary](http://www.fertilitypedia.org/edu/organs/ovary)

**Reproductive cells**

**Zygote**
The cell formed by the union of a sperm and an oocyte.
Learn more at: [www.fertilitypedia.org/edu/reproductive-cells/zygote](http://www.fertilitypedia.org/edu/reproductive-cells/zygote)

**Symptoms**
**Cardiovascular disease**
A disease involving the heart and the blood vessels, such as coronary artery disease.
Learn more at: [www.fertilitypedia.org/edu/symptoms/cardiovascular-disease](http://www.fertilitypedia.org/edu/symptoms/cardiovascular-disease)

**Infertility**
The failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.
Learn more at: [www.fertilitypedia.org/edu/symptoms/infertility](http://www.fertilitypedia.org/edu/symptoms/infertility)

**Post tubal ligation syndrome**
A side effect, comprising menstrual pain, abnormal bleeding and changes in behavior, observed in some patients after tubal ligation.
Learn more at: [www.fertilitypedia.org/edu/symptoms/post-tubal-ligation-syndrome](http://www.fertilitypedia.org/edu/symptoms/post-tubal-ligation-syndrome)

**Retrograde menstruation**
Retrograde flow of menstrual fluid through fallopian tubes into the pelvic cavity.
Learn more at: [www.fertilitypedia.org/edu/symptoms/retrograde-menstruation](http://www.fertilitypedia.org/edu/symptoms/retrograde-menstruation)

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**Gallery**

**Pic**
*Uterus and uterine tubes*

**Pic**
*Microscopic view, with a stain, of a fallopian tube*

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**Sources**