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Sperm transport in the female reproductive tract;

The passage of sperm through the female reproductive tract is regulated to maximize the chance of fertilization and ensure that sperm with normal morphology and vigorous motility will be the ones to succeed. Sperm transport within the female reproductive tract is a cooperative effort between the functional properties of the sperm and seminal fluid on the one hand and cyclic adaptations of the female reproductive tract that facilitate the transport of sperm toward the ovulated egg. Much of the story of sperm transport in the female [reproductive system](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/reproductive-system) involves the penetration by the sperm of various barriers along their way toward the egg. During [coitus](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/coitus) in the human, semen is deposited in the upper **vagina** close to the cervix. The normal environment of the vagina is inhospitable to the survival of sperm, principally because of its low pH.

The low pH of the vagina is a protective mechanism for the woman against many sexually transmitted pathogens, because no tissue barrier exists between the vagina (outside) and the peritoneal cavity (inside). The acidic pH of the vagina is bacteriocidal and is the reflection of an unusual functional adaptation of the vaginal epithelium. Alone among the stratified squamous epithelia in the body, the cells of the vaginal lining contain large amounts of **glycogen**. Anaerobic [lactobacilli](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/lactobacillus) within the vagina break down the glycogen from shed vaginal epithelial cells, with the production of **lactic acid** as a byproduct. The lactic acid is responsible for the lowered [vaginal pH](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/vagina-ph).

Within the semen and altered vaginal fluids, the sperm have begun to swim actively. A critical element in sperm motility is the availability of [fructose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/fructose), a nutrient provided by the seminal vesicles, within the semen. Because of their paucity of cytoplasm, spermatozoa require an external energy source. Unusually for most cells, spermatozoa have a specific requirement for fructose rather than glucose, the more commonly utilized carbohydrate energy source.

Around the time of ovulation, however, the estrogenic environment of the female reproductive system brings about a change in cervical mucus, rendering it more watery and more amenable to penetration by sperm (E mucus).

The openings of the uterine tubes into the uterus (**uterotubal junction**) represent another barrier to sperm transport. With two uterine tubes and usually only one ovulated egg, any spermatozoon that enters the empty uterine tube is automatically doomed to reproductive failure. Roughly 10,000 or fewer sperm cells of the millions in the ejaculate enter the correct tube. These sperm cells collect in the lower part of the uterine tube and attach to the epithelium of the tube for about 24 hours.