PROSTATE

Prostata, Prostate Gland

A walnut-sized structure that is located below the urinary bladder in front of the rectum.

♀ Organ  ♂ Male

About Prostate

Function

The function of the prostate is to secrete a slightly alkaline fluid, milky or white in appearance, that in humans usually constitutes roughly 30% of the volume of the semen along with spermatozoa and seminal vesicle fluid. Contains protein (human less than 1% by volume), particularly immunoglobulins, acid phosphatase, protease, and prostate-specific antigen, polyamines (spermine and spermidine), prostaglandins, citric acid and zinc. Semen is made alkaline overall with the secretions from the other contributing glands, including, at least, the seminal vesicle fluid.

The alkalinity of semen helps neutralize the acidity of the vaginal tract, prolonging the lifespan of sperm. The prostatic fluid is expelled in the first ejaculate fractions, together with most of the spermatozoa. In comparison with the few spermatozoa expelled together with mainly seminal vesicular fluid, those expelled in prostatic fluid have better motility, longer survival and better protection of the genetic material.

To function properly, the prostate needs male hormones (androgens), which are responsible for male sex characteristics. The main male hormone is testosterone, which is produced mainly by the testicles. It is dihydrotestosterone, a metabolite of testosterone that regulates the prostate.
Development

The prostatic part of the urethra develops from the pelvic (middle) part of the urogenital sinus (endodermal origin). Endodermal outgrowths arise from the prostatic part of the urethra and grow into the surrounding mesenchyme. The glandular epithelium of the prostate differentiates from these endodermal cells, and the associated mesenchyme differentiates into the dense stroma and the smooth muscle of the prostate.

The prostate gland represents the modified wall of the proximal portion of the male urethra and arises by the 9th week of embryonic life in the development of the reproductive system. Condensation of mesenchyme, urethra and Wolffian ducts gives rise to the adult prostate gland, a composite organ made up of several glandular and non-glandular components tightly fused.

Anatomical structure

As shown in pictures (Pic. 1), (Pic. 2) the centrally located prostate gland sits anterior to the rectum at the base of the bladder surrounding the prostatic urethra (the portion of the urethra that runs within the prostate). About the size of a walnut, the prostate is formed of both muscular and glandular tissues. The mean weight of the normal prostate in adult males is about 11 grams, usually ranging between 7 and 16 grams. It excretes an alkaline, milky fluid to the passing seminal fluid - now called semen - that is critical to first coagulate and then decoagulate the semen following ejaculation.

The temporary thickening of semen helps retain it within the female reproductive tract, providing time for sperm to utilize the fructose provided by seminal vesicle secretions. When the semen regains its fluid state, sperm can then pass farther into the female reproductive tract. The prostate also contains some smooth muscles that help expel semen during ejaculation. The prostate normally doubles in size during puberty. At approximately age 25, it gradually begins to enlarge again. This enlargement does not usually cause problems; however, abnormal growth of the prostate, or benign prostatic hyperplasia, can cause constriction of the urethra as it passes through the middle of the prostate gland, leading to a number of lower urinary tract symptoms, such as a frequent and intense urge to urinate, a weak stream, and a sensation that the bladder has not emptied completely.

Histological structure

The secretory epithelium is mainly pseudostratified, comprising:

- tall columnar cells
- basal cells which are supported by a fibroelastic stroma (Pic. 3),
containing randomly oriented smooth muscle bundles that's continuous with the bladder.
The epithelium is highly variable and areas of low cuboidal or squamous epithelium are also present, with transitional epithelium in the distal regions of the longer ducts. Within the prostate, the urethra coming from the bladder is called the prostatic urethra and merges with the two ejaculatory ducts.

**Further comprising the prostate cells:**

- glandular cells
- myoepithelial cells
- subepithelial interstitial cells

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#### Diagnoses

**Anejaculation**
The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
Learn more at: [www.fertilitypedia.org/therapy/diag/anejaculation](http://www.fertilitypedia.org/therapy/diag/anejaculation)

**Aspermia**
Male diagnosis connected with male infertility characterised by the complete absence of semen.
Learn more at: [www.fertilitypedia.org/therapy/diag/aspermia](http://www.fertilitypedia.org/therapy/diag/aspermia)

**Azoospermia**
Complete absence of sperm in the ejaculate of a man.
Learn more at: [www.fertilitypedia.org/therapy/diag/azoospermia](http://www.fertilitypedia.org/therapy/diag/azoospermia)

**Delayed ejaculation**
A man's inability for or persistent difficulty in achieving orgasm, despite typical sexual desire and sexual stimulation.
Learn more at: [www.fertilitypedia.org/therapy/diag/delayed-ejaculation](http://www.fertilitypedia.org/therapy/diag/delayed-ejaculation)

**Ejaculatory disorders**
A class of sexual disorders defined as the subjective lack of normal ejaculation.
Learn more at: [www.fertilitypedia.org/therapy/diag/ejaculatory-disorders](http://www.fertilitypedia.org/therapy/diag/ejaculatory-disorders)
**Erectile dysfunction**
The inability (that lasts more than 6 months) to develop or maintain an erection of the penis during sexual activity.
Learn more at: [www.fertilitypedia.org/therapy/diag/erectile-dysfunction](http://www.fertilitypedia.org/therapy/diag/erectile-dysfunction)

**Hypospermia**
A condition in which a man has an unusually low ejaculate (or semen) volume.
Learn more at: [www.fertilitypedia.org/therapy/diag/hypospermia](http://www.fertilitypedia.org/therapy/diag/hypospermia)

**Obstructive azoospermia**
Medical condition where sperm are produced but not ejaculated due to physical obstruction.
Learn more at: [www.fertilitypedia.org/therapy/diag/obstructive-azoospermia](http://www.fertilitypedia.org/therapy/diag/obstructive-azoospermia)

**Oligozoospermia**
Semen with a low concentration of sperm and is a common finding in male infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligozoospermia](http://www.fertilitypedia.org/therapy/diag/oligozoospermia)

**Painful ejaculation**
A physical syndrome described by pain or burning sensation of the urethra or perineum during or following ejaculation.
Learn more at: [www.fertilitypedia.org/therapy/diag/painful-ejaculation](http://www.fertilitypedia.org/therapy/diag/painful-ejaculation)

**Prostatitis**
An inflammation of the prostate gland.
Learn more at: [www.fertilitypedia.org/therapy/diag/prostatitis](http://www.fertilitypedia.org/therapy/diag/prostatitis)

**Retrograde ejaculation**
The semen, which would normally be ejaculated via the urethra, is redirected to the urinary bladder.
Learn more at: [www.fertilitypedia.org/therapy/diag/retrograde-ejaculation](http://www.fertilitypedia.org/therapy/diag/retrograde-ejaculation)

**Symptoms**

**Anejaculation**
The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
Learn more at: [www.fertilitypedia.org/edu/symptoms/anejaculation](http://www.fertilitypedia.org/edu/symptoms/anejaculation)
Avoidance of sex
A medical condition whose main symptom is low sexual desire.
Learn more at: www.fertilitypedia.org/edu/symptoms/avoidance-of-sex

Frequent and urgent urination
The need to urinate more often than usual and a sudden, compelling urge to urinate.
Learn more at: www.fertilitypedia.org/edu/symptoms/frequent-and-urgent-urination

Lowered libido
The absence of sexual appetite.
Learn more at: www.fertilitypedia.org/edu/symptoms/lowered-libido

Painful urination
A burning or stinging sensation during urination.
Learn more at: www.fertilitypedia.org/edu/symptoms/painful-urination-1

Sexual frustration
A frustration caused by a discrepancy between a person’s desired and achieved sexual activity.
Learn more at: www.fertilitypedia.org/edu/symptoms-sexual-frustration
Prostate and nearby organs.

Prostate with seminal vesicles and seminal ducts, viewed from in front and above.

Microscopic glands of the prostate.

Sources