**Reproductive System**

**Female reproductive system**

The female reproductive system is all the parts of your body that help you reproduce, or have babies. And it is quite amazing! Consider these **two fabulous** facts:

* Your body likely has hundreds of thousands of eggs that could grow into a baby. And you have them from the time you’re born.
* Right inside you is a perfect place for those eggs to meet with sperm and grow a whole human being!

The **ovaries** are two small organs. Before [puberty](https://girlshealth.gov/body/puberty/index.html), it’s as if the ovaries are asleep. During puberty, they “wake up.” The ovaries start making more [estrogen](https://girlshealth.gov/glossary/websiteGlossary.html#estrogen) and other hormones, which cause body changes. One important body change is that these hormones cause you to start getting your period, which is called menstruating. (Learn more about how your reproductive system works during [your period](https://girlshealth.gov/body/period/index.html).)

Once a month, the ovaries release one egg (ovum). This is called **ovulation.**

The **fallopian tubes** connect the ovaries to the uterus. The released egg moves along a fallopian tube.

The **uterus** — or womb — is where a baby would grow. It takes several days for the egg to get to the uterus.

As the egg travels, estrogen makes the lining of the uterus (called the endometrium) thick with blood and fluid. This makes the uterus a good place for a baby to grow. You can get pregnant if you have sex with a male without birth control and his sperm joins the egg (called fertilization) on its way to your uterus.

If the egg doesn’t get fertilized, it will be shed along with the lining of your uterus during your next period. But don’t look for the egg — it’s too small to see!

The blood and fluid that leave your body during your period passes through your cervix and vagina.

The **cervix** is the narrow entryway in between the vagina and uterus. The cervix is flexible so it can expand to let a baby pass through during childbirth.

The **vagina** is like a tube that can grow wider to deliver a baby that has finished growing inside the uterus.

The **hymen** covers the opening of the vagina. It is a thin piece of tissue that has one or more holes in it. Sometimes a hymen may be stretched or torn when you use a tampon or during a first sexual experience. If it does tear, it may bleed a little bit.

 

The **vulva** covers the entrance to the vagina. The vulva has five parts: mons pubis, labia, clitoris, urinary opening, and vaginal opening.

The **mons pubis** is the mound of tissue and skin above your legs, in the middle. This area becomes covered with hair when you go through puberty.

The **labia** are the two sets of skin folds (often called lips) on either side of the opening of the vagina.

The **labia majora** are the outer lips, and the **labia minora** are the inner lips. It is normal for the labia to look different from each other.

The **clitoris** is a small, sensitive bump at the bottom of the mons pubis that is covered by the labia minora.

The **urinary opening**, below the clitoris, is where your urine (pee) leaves the body.

The **vaginal opening** is the entry to the vagina and is found below the urinary opening.

### Female Reproductive System:

Most species have two sexes: male and female. Each sex has its own unique reproductive system. They are different in shape and structure, but both are specifically designed to produce, nourish, and transport either the egg or sperm.

Unlike the male, the human female has a reproductive system located entirely in the pelvis (that's the lowest part of the abdomen). The external part of the female reproductive organs is called the **vulva**, which means covering. Located between the legs, the vulva covers the opening to the **vagina** and other reproductive organs located inside the body.

The fleshy area located just above the top of the vaginal opening is called the **mons pubis**. Two pairs of skin flaps called the **labia** (which mean lips) surround the vaginal opening. The **clitoris**, a small sensory organ, is located toward the front of the vulva where the folds of the labia join. Between the labia are openings to the **urethra** (the canal that carries urine from the bladder to the outside of the body) and vagina. Once girls become sexually mature, the outer labia and the mons pubis are covered by pubic hair.

 A female's internal reproductive organs are the **vagina, uterus, fallopian tubes**, and **ovaries**.

The vagina is a muscular, hollow tube that extends from the vaginal opening to the uterus. The vagina is about 3 to 5 inches (8 to 12 centimeters) long in a grown woman. Because it has muscular walls it can expand and contract. This ability to become wider or narrower allows the vagina to accommodate something as slim as a tampon and as wide as a baby. The vagina's muscular walls are lined with mucous membranes, which keep it protected and moist. The vagina has several functions: for sexual intercourse, as the pathway that a baby takes out of a woman's body during childbirth, and as the route for the menstrual blood (the period) to leave the body from the uterus.

A very thin piece of skin-like tissue called the **hymen** partly covers the opening of the vagina. Hymens are often different from person to person. Most women find their hymens have stretched or torn after their first sexual experience, and the hymen may bleed a little (this usually causes little, if any, pain). Some women who have had sex don't have much of a change in their hymens, though.

The vagina connects with the **uterus**, or womb, at the cervix. The cervix has strong, thick walls. The opening of the cervix is very small (no wider than a straw), which is why a tampon can never get lost inside a girl's body. During childbirth, the cervix can expand to allow a baby to pass.

The uterus is shaped like an upside-down pear, with a thick lining and muscular walls — in fact, the uterus contains some of the strongest muscles in the female body. These muscles are able to expand and contract to accommodate a growing fetus and then help push the baby out during labor. When a woman isn't pregnant, the uterus is only about 3 inches (7.5 centimeters) long and 2 inches (5 centimeters) wide.

At the upper corners of the uterus, the **fallopian** tubes connect the uterus to the **ovaries** .The ovaries are two oval-shaped organs that lie to the upper right and left of the uterus. They produce, store, and release eggs into the fallopian tubes in the process called **ovulation**. Each ovary measures about 1½ to 2 inches (4 to 5 centimeters) in a grown woman.

There are two fallopian tubes, each attached to a side of the uterus. The fallopian tubes are about 4 inches (10 centimeters) long and about as wide as a piece of spaghetti. Within each tube is a tiny passageway no wider than a sewing needle. At the other end of each fallopian tube is a fringed area that looks like a funnel. This fringed area wraps around the ovary but doesn't completely attach to it. When an egg pops out of an ovary, it enters the fallopian tube. Once the egg is in the fallopian tube, tiny hairs in the tube's lining help push it down the narrow passageway toward the uterus.

The ovaries are also part of the endocrine system because they produce female sex hormones such as **estrogen** and **progesterone**.

The **female reproductive system** enables a woman to:

* produce eggs (ova)
* have sexual intercourse
* protect and nourish the fertilized egg until it is fully developed
* give birth

Sexual reproduction couldn't happen without the sexual organs called the **gonads**. Although most people think of the gonads as the male testicles, both sexes actually have gonads: In females the gonads are the ovaries. The female gonads produce female gametes (eggs); the male gonads produce male gametes (sperm). After an egg is fertilized by the sperm, the fertilized egg is called the **zygote**.

When a baby girl is born, her ovaries contain hundreds of thousands of eggs, which remain inactive until [puberty](http://kidshealth.org/en/teens/puberty.html) begins. At puberty, the pituitary gland, located in the central part of the brain, starts making hormones that stimulate the ovaries to produce female sex hormones, including estrogen. The secretion of these hormones causes a girl to develop into a sexually mature woman.

 **Menstruation**

Toward the end of puberty, girls begin to release eggs as part of a monthly period called the [**menstrual cycle**](http://kidshealth.org/en/teens/menstruation.html). Approximately once a month, during ovulation, an ovary sends a tiny egg into one of the fallopian tubes. Unless the egg is fertilized by a sperm while in the fallopian tube, the egg dries up and leaves the body about 2 weeks later through the uterus. This process is called **menstruation**. Blood and tissues from the inner lining of the uterus combine to form the menstrual flow, which in most girls lasts from 3 to 5 days. A girl's first period is called **menarche**.

It's common for women and girls to experience some discomfort in the days leading to their periods. **Premenstrual syndrome** **(PMS)** includes both physical and emotional symptoms that many girls and women get right before their periods, such as acne, bloating, fatigue, backaches, sore breasts, headaches, constipation, diarrhea, food cravings, depression, irritability, or difficulty concentrating or handling stress. PMS is usually at its worst during the 7 days before a girl's period starts and disappears once it begins.

Many girls also experience abdominal cramps during the first few days of their periods. They are caused by prostaglandins, chemicals in the body that makes the smooth muscle in the uterus contract. These involuntary contractions can be either dull or sharp and intense.

It can take up to 2 years from menarche for a girl's body to develop a regular menstrual cycle. During that time, her body is adjusting to the hormones puberty brings. On average, the monthly cycle for an adult woman is 28 days, but the range is from 23 to 35 days.

 **Puberty**

Pimples. Growing breasts. Body hair. Moody moments. If any of this sounds familiar, you’re likely on the path of puberty. It’s a road everyone travels, and it certainly has its bumps. But it’s also an amazing time.

Puberty is when you start making the change from being a child to being an adult. And it’s when your body develops the ability to have a baby. It all happens thanks to changing hormones, or natural body chemicals.

With everything that’s changing, life can feel a little overwhelming. But you can feel more in control if you take good care of your body. Knowing what to expect can help, too, so keep reading.

**Changes to your breasts**

It’s natural for girls to wonder about their breasts: Are they too big? Too small? If your breasts are large, they may get you unwanted attention. If they’re small, you may worry that they’ll never grow. Remember that your breasts don’t need to look like your friend’s breasts or a magazine model’s breasts. The world would be boring if everyone looked the same!

**What happens to breasts during puberty?**

Throughout [puberty](https://girlshealth.gov/body/puberty/index.html), you will experience changes in your breasts. The first change is developing a very small bump under the nipple. Early on, you may also notice that your breasts feel a little itchy or achy. Later on, they also may feel tender or sore during your period.

Keep in mind that it is very common for your two breasts to be different sizes, especially as they first start to grow. Other people can’t tell that your breasts are different sizes. Give your body time to grow at its own rate and in its own way. Vitamins, herbal teas, and creams — even exercises — won’t change the size of your breasts.

**What about lumps and other changes?**

Most of the changes your breasts will go through are normal. Let your doctor know if you find a lump or have a pain that you are not sure about. Although lumps are common in young women, keep in mind that it is very rare for the lumps to be cancer.

**Should I wear a bra?**

Wearing a bra can help support and protect your breasts. If you find that exercise is not as comfortable when your breasts start to grow, try wearing a sports bra with a snug fit for support.

**Body hair:**

Even before you get your [first period](https://girlshealth.gov/body/period/index.html), you will likely see new hair growing in your [pubic area](https://girlshealth.gov/glossary/websiteGlossary.html#pubic_area), under your arms, and on your legs. The hair may start out light and there won’t be a lot of it, but then it will grow darker and thicker as you go through the stages of [puberty](https://girlshealth.gov/body/puberty/index.html). Hair in the pubic area starts near the opening and spreads up in a V shape over time.

Body hair is normal, and some people think it looks cool. Lots of women and girls remove body hair from places such as their legs and underarms, although there is no real health reason to do so.

If you are thinking about removing hair for the first time, it makes sense to talk to your parents or guardians. They may have an opinion about how old you should be to start removing hair or advice on ways to do it.

**Changes in your mind**

During [puberty](https://girlshealth.gov/body/puberty/index.html), changes don’t happen only to your body — changes happen in your mind, too.

* You are able to understand more complex matters.
* You are starting to make more of your own moral choices.
* You know more about who you are, and what your likes and dislikes are.
* You may have some new, strong emotions.

The teen years can seem like an emotional roller coaster, with worries about your changing looks, the demands of school, and pressure to fit in. You might feel alone on this ride, but everyone struggles with it. And some of your experiences have to do with the physical changes of this age, including shifts in your [hormones](https://girlshealth.gov/glossary/websiteGlossary.html#hormone) and a brain that’s developing just like your body is. Learn more about the changes of these exciting times:

* What’s on your mind? Check out the girlshealth.gov [Your feelings](https://girlshealth.gov/feelings/index.html) section to learn more.
* To read about handling friendships, dating, and your parents, read our [Relationships](https://girlshealth.gov/relationships/index.html) section.
* Did you know that the changing teen brain can be more sensitive to the effects of alcohol and drugs? Learn more in our [Drugs, alcohol, and smoking](https://girlshealth.gov/substance/index.html) section.
* Are you having strong feelings of attraction? We have info on your [sexuality](https://girlshealth.gov/body/sexuality/index.html) and tips for [talking to your parents about sex](https://girlshealth.gov/body/sexuality/talkparents.html).
* Wondering about what lies ahead? Find out about the different paths you can take in our [Future](https://girlshealth.gov/future/index.html) section.



 **The female reproductive system**.

Fertilization occurs if a sperm enters the fallopian tube and burrows into the egg, according to [WebMD](http://www.webmd.com/). While the fertilization usually occurs in the oviducts, it can also happen in the uterus itself. The egg then becomes implanted in the lining of the uterus, where it begins the processes of embryogenesis (in which the embryo forms) and morphogenesis (in which the fetus begins to take shape). When the fetus is mature enough to survive outside of the womb, the cervix dilates and contractions of the uterus propel it through the birth canal.

## ****Diseases of the female reproductive system****

Ovarian cancer tends to have a poorer outcome than other gynecological cancers, Ross noted, because it is not typically diagnosed until it has progressed significantly. “There is no standard screening available for ovarian cancer, so it is very difficult to identify it early.”

 Tests to detect ovarian cancer, as well as cancer of the fallopian tube, and primary peritoneal cancer are currently being studied, according to the [National Cancer Institute](http://www.cancer.gov/cancertopics/pdq/screening/ovarian/patient/page3).

 There are two tests used to screen for cervical cancer. The **Pap test** screens for cellular changes in the cervix called cytology, while the genital **human papilloma virus** (HPV) test identifies the presence of infection with high risk HPV, the strains that are linked to cervical cancer.

 Current guidelines recommend that women first start getting the Pap test alone when they turn 21 and repeat every three years if the test is normal until age 30. A Pap-plus-HPV test, or co-testing, is recommended for women ages 30 to 65, and if both are negative repeated every five years, regardless of whether they have received HPV vaccination. “However, there is compelling scientific evidence that co-testing every three years misses less cases of cancer and pre-cancer than every five year co-testing,” Dubin noted.

While genital HPV is typically associated with females, it is the most common sexually transmitted infection. The majority of sexually active people in the United States — male and female — will have HPV at some time in their lives, but most will not experience any symptoms. In a small portion of women it can result in cervical cancer and genital warts and in men it can cause penile and anal cancer and genital warts, according to the NIH.

 Both genders can develop sexually transmitted diseases, including genital herpes, gonorrhea and syphilis, according to the National Institutes of Health (NIH). HIV/AIDS, a disease of the immune system, is not exclusively transmitted through sexual contact; sexual activity is one of the ways that the HIV virus is spread.

 Another common disorder of the female reproductive system is a vaginal yeast infection, which is caused by a yeast fungus in the vagina. Most can be successfully treated with over-the-counter medications, according to WebMD.

 [**Endometriosis**](http://www.livescience.com/23141-endometriosis.html)is a condition where that normally lines the inside of your uterus — the endometrium — ends up outside of uterus, most commonly in the ovaries, bowel or the tissue lining your pelvis. The endometrial tissue becomes trapped, causing pain, according to the [Mayo Clinic](http://www.mayoclinic.org/).

 **Pelvic inflammatory disease** can involve an infection of any of the female reproductive organs, including the uterus and ovaries. Sexually transmitted diseases, such as gonorrhea and chlamydia, are typical causes of pelvic inflammatory disease, according to the NIH.  “Any of these STIs can cause serious and potentially long term reproductive problems that include chronic pelvic pain and infertility,” Ross said.

## ****Diseases of the male reproductive system****

Treatment for prostate cancer depends on the age, severity of the disease and other health conditions of the patient. The usual treatments for prostate cancer are surgery, radiation therapy, watchful waiting, and hormonal treatment, according to the Cleveland Clinic.

**Erectile dysfunction** is a common condition that affects about one in 10 males on a long-term basis, the Cleveland Clinic noted. It can be linked to vascular disease, neurological disorders such as Multiple Sclerosis, trauma and psychological episodes.

Prostatitis typically involves swelling or inflammation of the prostate gland, according to the Mayo Clinic, and can cause painful or difficult urination and ejaculation.  Nearly half of all men experience symptoms of prostatitis at some point during their lives.

## ****Defining and treating infertility****

Infertility is defined as a couple's inability to conceive after one year of unprotected intercourse.

 In males, infertility is a condition in which they **produce no sperm cells** (azoospermia) or too **few sperm cells** (oligospermia), or their sperm cells are abnormal or die before they can reach the egg. Causes range from chromosomal defects to hormonal imbalance to tumors. Lifestyle factors, such as drug and alcohol use, can also play role. In rare cases, infertility in men is caused by an inherited condition, such as cystic fibrosis, according to the Mayo Clinic.

In women, infertility is defined as a disorder of the reproductive system that hinders the body's ability to ovulate, conceive, or carry an infant to term.

Reproductive conditions are treated by a variety of specialists. In women, many issues are treated by obstetricians/gynecologists and for males urologists handle many disorders of their reproductive systems. There are also infertility experts that treat couples who are unable to conceive and endocrinologists who treat hormonal disorders.

###  Menstrual Cycle

Females of reproductive age experience cycles of hormonal activity that repeat at about one-month intervals. With every cycle, a woman's body prepares for a potential [pregnancy](http://www.webmd.com/baby/default.htm), whether or not that is the woman's intention. The term [*menstruation*](http://www.webmd.com/women/tc/normal-menstrual-cycle-topic-overview) refers to the periodic shedding of the uterine lining. (*Menstru* means "monthly.'')

The average menstrual cycle takes **about 28 days** and occurs in phases:

* The follicular phase,
* The ovulatory phase ([ovulation](http://www.webmd.com/medical_information/health_tools/interactive/ovu_calendar))
* The luteal phase.

There are four major hormones (chemicals that stimulate or regulate the activity of cells or organs) involved in the menstrual cycle: **follicle-stimulating hormone**, [**luteinizing hormone**](http://www.webmd.com/women/luteinizing-hormone)**,**[**estrogen**](http://www.webmd.com/women/guide/normal-testosterone-and-estrogen-levels-in-women)**, and**[**progesterone**](http://www.webmd.com/vitamins-and-supplements/progesterone-uses-and-risks)

**Follicular Phase of the Menstrual Cycle**

This phase starts on the first day of your period. During the follicular phase of the menstrual cycle, the following events occur:

* Two hormones, [follicle stimulating hormone](http://www.webmd.com/women/follicle-stimulating-hormone) (FSH) and luteinizing hormone (LH), are released from the [brain](http://www.webmd.com/brain/picture-of-the-brain) and travel in the [blood](http://www.webmd.com/heart/anatomy-picture-of-blood) to the ovaries.
* The hormones stimulate the growth of about 15 to 20 eggs in the ovaries, each in its own "shell," called a follicle.
* These hormones (FSH and LH) also trigger an increase in the production of the female hormone estrogen.
* As [estrogen levels](http://www.webmd.com/drugs/2/drug-6028/esterified%2Bestrogens%2Boral/details) rise, like a switch, it turns off the production of follicle-stimulating hormone. This careful balance of hormones allows the body to limit the number of follicles that mature.
* As the follicular phase progresses, one follicle in one ovary becomes dominant and continues to mature. This dominant follicle suppresses all of the other follicles in the group. As a result, they stop growing and die. The dominant follicle continues to produce estrogen.

**Ovulatory Phase of the Menstrual Cycle**

The ovulatory phase, or [ovulation](http://www.webmd.com/baby/ss/slideshow-understanding-fertility-ovulation), starts about 14 days after the follicular phase started. The ovulatory phase is the midpoint of the menstrual cycle, with the next menstrual period starting about two weeks later. During this phase, the following events occur:

* The rise in estrogen from the dominant follicle triggers a surge in the amount of luteinizing hormone that is produced by the [brain](http://www.webmd.com/brain/ss/slideshow-concussions-brain-injuries).
* This causes the dominant follicle to release its egg from the ovary.
* As the egg is released (a process called [ovulation](http://www.webmd.com/baby/healthtool-ovulation-calculator)), it is captured by finger-like projections on the end of the fallopian tubes (fimbriae). The fimbriae sweep the egg into the tube.
* Also during this phase, there is an increase in the amount and thickness of mucus produced by the cervix (lower part of the uterus). If a woman were to have intercourse during this time, the thick mucus captures the man's sperm, nourishes it, and helps it to move towards the egg for fertilization.

**Luteal Phase of the Menstrual Cycle**

The luteal phase of the menstrual cycle begins right after ovulation and involves the following processes:

* Once it releases its egg, the empty follicle develops into a new structure called the corpus luteum.
* The corpus luteum secretes the hormone progesterone. Progesterone prepares the uterus for a fertilized egg to implant.
* If intercourse has taken place and a man's sperm has fertilized the egg (a process called conception), the fertilized egg (embryo) will travel through the fallopian tube to implant in the uterus. The woman is now considered pregnant.
* If the egg is not fertilized, it passes through the uterus. Not needed to support a pregnancy, the lining of the uterus breaks down and sheds, and the next menstrual period begins.

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 **Menstrual Problems**

 A variety of menstrual problems can affect girls. Some of the more common conditions are:

* **Dysmenorrhea** : when a girl has painful periods.
* **Menorrhagia**: when a girl has a very heavy periods with excess bleeding.
* **Oligomenorrhea**: when a girl misses or has infrequent periods, even though she's been menstruating for a while and isn't pregnant.
* **Amenorrhea**: when a girl hasn't started her period by the time she is 16 years old or 3 years after starting puberty, has not developed signs of puberty by age 14, or has had normal periods but has stopped menstruating for some reason other than pregnancy.

 **Male Reproductive System**

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| --- |
| Male pelvic structures.svg[Human male reproductive system](https://en.wikipedia.org/wiki/Human_male_reproductive_system). |

Most species have two sexes: male and female. Each sex has its own unique reproductive system. They are different in shape and structure, but both are specifically designed to produce, nourish, and transport either the egg or sperm.

Unlike the female, whose sex organs are located entirely within the pelvis, the male has reproductive organs, or **genitals**, that are both inside and outside the pelvis. The male genitals include:

* the testicles
* the duct system, which is made up of the epididymis and the vas deferens
* the accessory glands, which include the seminal vesicles and prostate gland
* the penis

In a guy who's reached sexual maturity, the two **testicles,** or **testes**, produce and store millions of tiny sperm cells. The testicles are oval-shaped and grow to be about 2 inches (5 centimeters) in length and 1 inch (3 centimeters) in diameter.

 **The testicles** are also part of the endocrine system because they produce hormones, including **testosterone**. Testosterone is a major part of puberty in guys, and as a guy makes his way through puberty; his testicles produce more and more of it. Testosterone is the hormone that causes guys to develop deeper voices, bigger muscles, and body and facial hair, and it also stimulates the production of sperm.

 Alongside the testicles are the **epididymis** and the **vas deferens**, which make up the duct system of the male reproductive organs. The vas deferens is a muscular tube that passes upward alongside the testicles and transports the sperm-containing fluid called **semen**. The epididymis is a set of coiled tubes (one for each testicle) that connects to the vas deferens.

 **The epididymis** and the testicles hang in a pouch-like structure outside the pelvis called the **scrotum**. This bag of skin helps to regulate the temperature of testicles, which need to be kept cooler than body temperature to produce sperm. The scrotum changes size to maintain the right temperature. When the body is cold, the scrotum shrinks and becomes tighter to hold in body heat. When it's warm, the scrotum becomes larger and more floppy to get rid of extra heat. This happens without a guy ever having to think about it. The brain and the nervous system give the scrotum the cue to change size.

 The **accessory glands**, including the seminal vesicles and the prostate gland, provide fluids that lubricate the duct system and nourish the sperm. The **seminal vesicles** are sac-like structures attached to the vas deferens to the side of the bladder. The **prostate gland**, which produces some of the parts of semen, surrounds the ejaculatory ducts at the base of the **urethra** just below the bladder. The urethra is the channel that carries the semen to the outside of the body through the penis. The urethra is also part of the urinary system because it is also the channel through which urine passes as it leaves the bladder and exits the body.

 The **penis** is actually made up of two parts: the **shaft** and the **glans**. The shaft is the main part of the penis and the glans is the tip (sometimes called the head). At the end of the glans is a small slit or opening, which is where semen and urine exit the body through the urethra. The inside of the penis is made of a spongy tissue that can expand and contract.

 All boys are born with a **foreskin**, a fold of skin at the end of the penis covering the glans. Some boys have a **circumcision**, which means that a doctor or clergy member cuts away the foreskin. Circumcision is usually performed during a baby boy's first few days of life. Although circumcision is not medically necessary, parents who choose to have their children circumcised often do so based on religious beliefs, concerns about hygiene, or cultural or social reasons. Penises work the same, whether they are circumcised or not.

 The male sex organs work together to produce and release semen into the reproductive system of the female during sexual intercourse. The male reproductive system also produces sex hormones, which help a boy develop into a sexually mature man during [**puberty**](http://kidshealth.org/en/teens/puberty.html).

When a baby boy is born, he has all the parts of his reproductive system in place, but it isn't until puberty that he is able to reproduce. When puberty begins, usually between the ages of 9 and 15, the **pituitary** **gland** — which is located near the brain — secretes hormones that stimulate the testicles to produce testosterone. The production of testosterone brings about many physical changes.

 Although the timing of these changes is different for every guy, the stages of puberty generally follow a set sequence:

* During the first stage of male puberty, the scrotum and testes grow larger.
* Next, the penis becomes longer, and the seminal vesicles and prostate gland grow.
* Hair begins to appear in the pubic area and later it grows on the face and underarms. During this time, a male's voice also deepens.
* Boys also undergo a [growth spurt](http://kidshealth.org/en/teens/growth-hormone.html) during puberty as they reach their adult height and weight.

 Once a guy has reached puberty, he will produce millions of sperm cells every day. Each sperm is extremely small: only 1/600 of an inch (0.05 millimeters long). Sperm develop in the testicles within a system of tiny tubes called the **seminiferous tubules**. At birth, these tubules contain simple round cells, but during puberty, testosterone and other hormones cause these cells to transform into sperm cells. The cells divide and change until they have a head and short tail, like tadpoles. The head contains genetic material (genes). The sperm use their tails to push themselves into the epididymis, where they complete their development. It takes sperm about 4 to 6 weeks to travel through the epididymis.

 The sperm then move to the vas deferens, or sperm duct. The seminal vesicles and prostate gland produce a whitish fluid called **seminal fluid**, which mixes with sperm to form semen when a male is sexually stimulated. The penis, which usually hangs limp, becomes hard when a male is sexually excited. Tissues in the penis fill with blood and it becomes stiff and erect (an erection). The rigidity of the erect penis makes it easier to insert into the female's vagina during sexual intercourse. When the erect penis is stimulated, muscles around the reproductive organs contract and force the semen through the duct system and urethra. Semen is pushed out of the male's body through his urethra — this process is called **ejaculation**. Each time a guy ejaculates, it can contain up to 500 million sperm.

 When the male ejaculates during intercourse, semen is deposited into the female's vagina. From the vagina the sperm make their way up through the cervix and move through the uterus with help from uterine contractions. If a mature egg is in one of the female's fallopian tubes, a single sperm may penetrate it, and **fertilization**, or **conception**, occurs.

 This fertilized egg is now called a **zygote** (pronounced: ZY-goat) and contains 46 chromosomes — half from the egg and half from the sperm. The genetic material from the male and female has combined so that a new individual can be created. The zygote divides again and again as it grows in the female's uterus, maturing over the course of the pregnancy into an embryo, a fetus, and finally a newborn baby.

### Problems Affecting the Male Reproductive System

* [**Testicular injury**](http://kidshealth.org/en/teens/testicular-injuries.html)**.** Even a mild injury to the testicles can cause severe pain, bruising, or swelling. Most testicular injuries occur when the testicles are struck, hit, kicked, or crushed, usually during sports or due to other trauma. [**Testicular torsion**](http://kidshealth.org/en/teens/torsion.html) , when one of the testicles twists around, cutting off its blood supply, can also happen to some guys. It's a serious problem that needs medical attention, but luckily it's not common.
* [**Varicocele**](http://kidshealth.org/en/teens/varicocele.html) . This is a varicose vein (an abnormally swollen vein) in the network of veins that run from the testicles. Varicoceles commonly develop while a guy is going through puberty. A varicocele is usually not harmful, although in some people it may damage the testicle or decrease sperm production, so it helps for a guy to see his doctor if he's concerned about changes in his testicles.
* **Testicular cancer.** This is one of the most common cancers in men younger than 40. It occurs when cells in the testicle divide abnormally and form a tumor. Testicular cancer can spread to other parts of the body, but if it's detected early, the cure rate is excellent. All guys should do [testicular self-examinations](http://kidshealth.org/en/teens/tse.html) regularly to help with early detection.
* **Epididymitis** is inflammation of the epididymis, the coiled tubes that connect the testes with the vas deferens. It is usually caused by an infection, such as the sexually transmitted disease chlamydia, and results in pain and swelling next to one of the testicles.
* **Hydrocele.** A hydrocele is when fluid collects in the membranes surrounding the testes. Hydroceles may cause swelling in the scrotum around the testicle but are generally painless. In some cases, surgery may be needed to correct the condition.
* **Inguinal**[**hernia**](http://kidshealth.org/en/teens/hernias.html)**.** When a portion of the intestines pushes through an abnormal opening or weakening of the abdominal wall and into the groin or scrotum, it is known as an inguinal hernia. The hernia may look like a bulge or swelling in the groin area. It can be corrected with surgery.

### Fertilization and Pregnancy

 If a female and male have sex within several days of the female's ovulation (egg release), fertilization can occur. When the male ejaculates (which is when semen leaves a man's penis), between 0.05 and 0.2 fluid ounces (1.5 to 6.0 milliliters) of **semen** is deposited into the vagina. Between 75 and 900 million sperm are in this small amount of semen, and they "swim" up from the vagina through the cervix and uterus to meet the egg in the fallopian tube. It takes only one sperm to fertilize the egg.

 About a week after the sperm fertilizes the egg, the fertilized egg (zygote) has become a multi-celled **blastocyst** . A blastocyst is about the size of a pinhead, and it's a hollow ball of cells with fluid inside. The blastocyst burrows itself into the lining of the uterus, called the **endometrium** . The hormone estrogen causes the endometrium to become thick and rich with blood. Progesterone, another hormone released by the ovaries, keeps the endometrium thick with blood so that the blastocyst can attach to the uterus and absorb nutrients from it. This process is called **implantation**.

As cells from the blastocyst take in nourishment, another stage of development, the embryonic stage, begins. The inner cells form a flattened circular shape called the embryonic disk, which will develop into a baby. The outer cells become thin membranes that form around the baby. The cells multiply thousands of times and move to new positions to eventually become the **embryo** .After approximately 8 weeks, the embryo is about the size of an adult's thumb, but almost all of its parts — the brain and nerves, the heart and blood, the stomach and intestines, and the muscles and skin — have formed.

During the fetal stage, which lasts from 9 weeks after fertilization to birth, development continues as cells multiply, move, and change. The **fetus** floats in **amniotic** **fluid** inside the **amniotic sac**. The fetus receives oxygen and nourishment from the mother's blood via the **placenta**, a disk-like structure that sticks to the inner lining of the uterus and connects to the fetus via the **umbilical** **cord**. The amniotic fluid and membrane cushion the fetus against bumps and jolts to the mother's body.

Pregnancy lasts an average of **280 days — about 9 months**. When the baby is ready for birth, its head presses on the cervix, which begins to relax and widen to get ready for the baby to pass into and through the vagina. The mucus that has formed a plug in the cervix loosens, and with amniotic fluid, comes out through the vagina when the mother's water breaks.

When the contractions of **labor** begin, the walls of the uterus contract as they are stimulated by the pituitary hormone **oxytocin**. The contractions cause the cervix to widen and begin to open. After several hours of this widening, the cervix is dilated (opened) enough for the baby to come through. The baby is pushed out of the uterus, through the cervix, and along the birth canal. The baby's head usually comes first; the umbilical cord comes out with the baby and is cut after the baby is delivered.

The last stage of the birth process involves the delivery of the placenta, which is now called the afterbirth. After it has separated from the inner lining of the uterus, contractions of the uterus push it out, along with its membranes and fluids.