This module introduces female and male reproductive anatomy and physiology and provides opportunities to apply this knowledge to family planning scenarios.

SECTION 1

Section 1: Female reproductive anatomy and physiology

External female genital anatomy

Internal female reproductive anatomy

Activity: Internal female reproductive anatomy
SECTION 2

Section 2: Male reproductive anatomy and physiology

External male genital anatomy

Internal male reproductive anatomy

Activity: Internal male reproductive anatomy

Male reproductive system hormones and sexual response

SECTION 3

Section 3: Pregnancy and contraception

Videos: Pregnancy

Contraception

Reproductive anatomy education scenario

Quiz

Conclusion

References
Navigation tutorial

For the best experience, use Firefox or Chrome to view this course.

To learn how to navigate the module, click the play button below.
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Welcome to the Introduction to Reproductive Anatomy and Physiology eLearning module.

This module includes:

1. Section 1: Female Reproductive Anatomy and Physiology
2. Section 2: Male Reproductive Anatomy and Physiology
3. Section 3: Pregnancy and Contraception

Throughout the module, you will be asked to read new information and complete activities to learn about the structure, organization, and functions of the reproductive systems and
conception. The module provides practical, evidence-informed strategies for counseling clients of reproductive age.

**By the end of this module, participants will be able to:**

- Understand reproductive anatomy and physiology
- Describe how pregnancy occurs and ways to prevent pregnancy
- Put into practice knowledge about anatomy and physiology to provide appropriate and accurate family planning counseling

For the purpose of this module, and in the context of family planning services, we will talk about male and female anatomy and physiology as they relate to conception. However, it is important to tailor this information to the unique needs of your clients. For training related to communicating and serving diverse clients, complete the *Cultural Competency in Family Planning Care* eLearning course available on fpntc.org.
Section 1: Female reproductive anatomy and physiology

Understanding reproductive anatomy and physiology, and being comfortable talking about these body parts, is important to family planning counseling.
This section introduces the parts and functions of both internal and external female anatomy, as well as the physiology of the menstrual cycle and menopause.
The external female genital area is made up of many parts, which together are called the vulva.

These parts include:

**Clitoris**

The clitoris is a small, sexually sensitive organ full of nerve endings and composed of erectile tissue. It is located at the front of the vulva where the labia minora meet.

Most of the clitoris is located under the skin and is not visible. The visible part of the clitoris is called the glans. The glans is about the size of a pearl and covered with a fold of skin called the prepuce.

The clitoris becomes engorged with blood during sexual excitement, providing sexual sensation.
**Vaginal lips**

The labia majora (large lips) and labia minora (small lips) surround the vaginal opening.

The labia majora are the outer lips of the vulva and protect the urethral opening and vagina. The labia majora are covered with pigmented skin and hair on the outer surface of the vulva and are smooth and free from hair on the inner surface. They are made up of fat and glands.

The labia minora are the inner lips that form a protective covering over the clitoris and urethral opening.

**Vaginal opening**

The vaginal opening connects the female external and internal reproductive parts. It is the middle of three openings, between the urethral opening and anus.

- The urethra is the pathway urine travels through to exit the body.
- The anus is the opening through which feces leave the body. Technically, the anus is not part of the reproductive system. However, you should be prepared to discuss it with your clients, especially with reference to anal sex and sexually transmitted diseases (STDs).
- The vaginal opening is completely separate from the urethral opening and anus.
Menstrual blood and other secretions pass from the uterus through the opening of the cervix, into the vagina, and out through the vaginal opening.

The hymen is a mesh of fibers that surrounds or partly covers the vaginal opening. Appearance of the hymen does not accurately or reliably reflect sexual activity or experience. Some girls are born without a hymen, or it may be stretched during use of a tampon, sports, insertion of a finger or medical instrument, or during sexual activity. Some hymens are elastic enough to stretch without rupturing, even with intercourse. As with many body parts, the hymen may look different from one person to the next. It may not be visible at all in some people.

Hormonal changes throughout the life course affect the anatomy of the hymen, so its appearance changes over time.

While all parts of the vulva contribute to sexual arousal (excitement and sensation) and orgasm, pregnancy can occur without having an orgasm.
Internal female reproductive anatomy

The female reproductive system has four main activities related to conception:

1. To produce egg cells
2. To transport and sustain these cells
3. To nurture a developing embryo/fetus
4. To produce hormones

The internal anatomy of the female reproductive system includes the uterus and two ovaries, two fallopian tubes, and a vagina. Two breasts, or mammary glands, are considered accessory organs of the female reproductive system.

These organs produce and sustain the egg cells, transport these cells to a place where they may be fertilized by sperm, provide an environment for the developing fetus, move the fetus to the outside of the body at the end of pregnancy, and produce the female sex hormones.
Ovaries

Ovaries are where the egg cells (ova) grow and develop. There are two ovaries, each about the size and shape of an almond. The ovaries are located in the pelvis, one on each side of the uterus.

Beginning in puberty, follicle-stimulating hormone supports the growth of egg cells each month. About two weeks before menstruation, ovulation occurs. Ovulation is the process of an egg leaving one of the ovaries.

The ovaries produce estrogen, progesterone and androgens. Estrogen regulates the menstrual cycle and supports the development of secondary sex characteristics, such as breast development and pubic hair growth. It also affects many other parts of the body, including the musculoskeletal and cardiovascular systems, and the brain. Progesterone readies the
endometrium to support a fertilized egg, should conception occur. If pregnancy does not occur, the progesterone levels in the body decrease, causing menstruation. During pregnancy, progesterone prevents premature uterine contractions and prepares the breasts for milk production.

**Fallopian Tubes**

The fallopian tubes (uterine tubes or oviducts) connect the ovaries and the uterus. If an egg is fertilized by a sperm cell within about 24 hours after ovulation, the fertilized egg will travel along the fallopian tube for about seven days until it reaches the uterus for implantation. If the egg is not fertilized, the egg will dissolve in the fallopian tube.
These are the tubes that are blocked when female sterilization is performed. Scar tissue in the fallopian tubes can be caused by chlamydia and gonorrhea infection. This can lead to infertility or ectopic pregnancy. Ectopic pregnancies occur when a fertilized egg implants outside of the uterine cavity, most often in a fallopian tube. This can be life-threatening to a woman if not detected early.

**Uterus**

The uterus (womb) is a hollow organ. A fallopian tube extends from each side of the uterus. The uterus is made up of muscular walls, an inner lining called the endometrium, and a cervix. It is located in the pelvis between the bladder and the rectum.
The uterus plays a role in three important functions: menstruation, pregnancy, and childbirth.

The endometrium, or lining of the uterus, responds to changing hormone levels throughout a menstrual cycle. It gets thicker to provide nutrients for a fertilized egg to implant and grow. If implantation doesn’t happen, then the top layers of the endometrium shed as menstrual bleeding, while the deeper layers remain to rebuild for the next cycle.

If the uterus receives a fertilized egg, it provides an environment for the fertilized egg to develop into a fetus and then the fetus to grow throughout pregnancy. Before the first pregnancy, the uterus is about the size and shape of a pear, with the narrow portion directed down toward the vagina. After childbirth the uterus is usually larger and it regresses after menopause.
Cervix

The cervix is the lower part of the uterus where it joins the vagina. The cervix opens to allow passage of the baby out of the uterus during labor. Different types of normal, healthy secretions are produced here. These secretions change throughout the month.

Sometimes they are white and sticky, sometimes they are clear and stretchy. Through the opening of the cervix, menstrual blood and other secretions pass from the uterus, into the vagina, and out of the body.

Cervical mucus is a healthy secretion and a sign of fertility.

A few days after the menstrual period ends, the genitals begin to secrete fluids. As the days go by, the amount of wetness increases.

After ovulation, the genital wetness begins to decrease and dry up, until the next cycle.

The pap test screens for cancer of the cervix. The test is done by swabbing cells on the cervix. For best accuracy, the test should not be done during menstruation.
Vagina

The vagina is a muscular tube-like structure that extends from the cervix of the uterus to the outside of the body. It is located between the rectum and the bladder. The vagina provides sexual sensation due to its many nerve endings, especially in the outer third. It is three inches long when not aroused and five to six inches long when aroused.

The vagina produces fluid daily to cleanse and lubricate itself and help sperm travel.

The vagina serves as a passageway for menstrual flow. It is very stretchy and can expand during sexual arousal to receive the erect penis during intercourse, and during childbirth to allow a baby to leave the body.
This is where tampons can be inserted during menstruation. A few days after the menstrual period ends, the secretions leave the body as vaginal discharge. As the days go by, the amount of discharge increases. Mid-cycle, after ovulation, the amount of vaginal discharge begins to decrease until the next cycle.

Sometimes people use the word vagina incorrectly to refer to all of the female genitals.
Activity: Internal female reproductive anatomy

Instructions:
This exercise contains a list of the parts of the female anatomy. Match the part name and function below.
# Internal Female Reproductive Anatomy

This exercise contains the list of the parts of the female anatomy. Match the part name and function below.

<table>
<thead>
<tr>
<th>VAGINA ___</th>
<th>a) Where the sex hormones estrogen, progesterone, and androgens are produced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALLOPIAN TUBES ___</td>
<td>b) The passageway for the eggs, where fertilization takes place.</td>
</tr>
<tr>
<td>CERVIX ___</td>
<td>c) Where a fertilized egg develops into a fetus.</td>
</tr>
<tr>
<td>OVARIIES ___</td>
<td>d) The lower part of the uterus where it joins the vagina.</td>
</tr>
<tr>
<td>UTERUS ___</td>
<td>e) The muscular tube that leads from the external genitals to the cervix.</td>
</tr>
</tbody>
</table>

**Correct Responses:**
Vagina (e); Fallopian Tubes (b); Cervix (d); Ovaries (a); Uterus (c)
The female sexual response cycle caused by sexual excitement and stimulation includes engorgement of the clitoris, wetness on the vulva, and vaginal lubrication and expansion.
Orgasm occurs when the tension from sexual stimulation is released in a series of muscle spasms and the release of endorphins. During orgasm, some people ejaculate from the vulva and some people don't, either is normal.

Orgasm in women is thought to have an evolutionary role in conception via the "insuck" or "upsuck" mechanism.
Menstrual cycle

The menstrual cycle begins on the first day of bleeding (period) and ends the day before the next period begins.

Menstrual cycle length varies from person to person, with a normal range from 23–35 days, if not pregnant. That means having a period every 23 days is normal or getting a period every 35 days is normal. Anything outside that range should be evaluated by a medical provider, unless there is a known reason (for example, due to their birth control method).

The average age of the first period, called menarche, is 12–13 years, but menarche may normally occur between 8 and 15 years of age. For the first few years after menarche, the menstrual cycle may be irregular. Menstrual cycles are often irregular during adolescence, particularly from the first to second cycles.

Click on the image below to learn more about the phases of a normal menstrual cycle.
Menstrual Phase

This is the time in the cycle when the uterine lining (endometrium) breaks down, causing a period. While most periods last for three to five days, a period lasting only two days to as many as seven days is still considered normal.
**Follicular Phase**

This is the time in the cycle when estrogen rises and the uterine lining (endometrium) begins to build up. This phase usually lasts from days six to ten.
Ovulatory Phase

This is the time in the cycle when estrogen peaks and an egg is released from the ovary (ovulation). During days 11–14, one of the developing follicles will form a fully mature egg (ovum). On about day 14, a sudden increase in luteinizing hormone causes the ovary to release its egg.
**Luteal Phase**

This is the time in the cycle when the egg travels through the fallopian tube to the uterus. The progesterone hormone increases, causing the uterine lining (endometrium) to thicken, preparing to receive a fertilized egg. Pregnancy occurs if the egg becomes fertilized by a sperm and attaches itself to the uterine wall. If pregnancy does not occur, estrogen and progesterone levels drop and the uterus contracts, preparing to shed the built-up uterine lining.
Menopause is the time in life when changes in hormones cause many changes in the body, including causing menstrual periods to stop. It is considered
Menopause after periods have stopped for 12 months in a row.

The transition to menopause, called perimenopause, usually starts in the mid-to-late 40s. Perimenopause can last between two and eight years but usually lasts about four years. During perimenopause the body's production of estrogen and progesterone, two hormones made by the ovaries, varies greatly.

Symptoms of menopause include vaginal dryness, hot flashes, chills, night sweats, sleep problems, mood changes, weight gain, and slowed metabolism. Encourage clients to talk to their health care providers if their symptoms are concerning. Remind them that it is still possible to become pregnant during perimenopause, so contraception is still important, if desired.
Section 2: Male reproductive anatomy and physiology

This section introduces the parts and functions of both internal and external male anatomy and physiology.
External male genital anatomy

The external male genital area is made up of three main parts:

**Penis**

The penis is a sexually sensitive organ made of spongy tissue, blood vessels, and many nerve endings. It contains the urethra, the pathway that urine and semen travel through to exit the body.

The penis has a root, body (shaft), and glans. The root of the penis attaches it to the pubic arch. The body is the visible, pendant portion.

When sexually excited, the penis fills with blood and becomes harder and larger; this is called an erection.
Glans

The glans is the sensitive, rounded, head of the penis. A loose fold of skin (the foreskin) covers the glans, or head of the penis, and provides sexual sensation.

Circumcision is the removal of the foreskin and an important aspect of some religions and cultures. It is normal for a penis to be either circumcised or not circumcised.
The scrotum is a sack of skin that hangs between the legs and behind the penis. It is divided internally into two parts, left and right, each containing one testicle. The left side of the scrotum usually hangs down a little more than the right. The scrotum helps to maintain the ideal temperature for normal sperm development by contracting and relaxing to move the testicles closer to the body for warmth or farther away to cool the temperature.
Internal male reproductive anatomy

The male reproductive system has three main activities related to conception:

1. To produce sperm cells
2. To transport and sustain these cells
3. To produce hormones

Testes

The testes, or testicles, are two organs that hang inside the scrotum. From puberty on, the testicles produce sperm every day.

The testes also produce male sex hormones, mainly testosterone, that in turn produce male secondary sex characteristics, such as pubic hair growth, facial hair, and deepening of one’s voice.
**Epididymis**

The epididymis is a small, tightly-coiled tube that is attached to the top and to the back of each testicle.

Immature sperm cells move from the testicles into the epididymis, where they finish maturing and are stored temporarily.

It takes about twenty days for the sperm to mature, becoming both mobile and fertile. They are stored in the epididymis for up to six weeks. During ejaculation, the epididymis expels sperm into the vas deferens. If ejaculation does not occur after six weeks, the sperm are absorbed into the body.
**Vas Deferens**

The vas deferens are an extension of the epididymis. They are coiled tubes that carry sperm from the testes, over the bladder, past the seminal vesicles and to the urethra. The seminal vesicles are pouches that attach to the vas deferens near the bladder. They produce a fluid that provides sperm with an energy source.

During male sterilization, the vas deferens are cut or sealed to prevent sperm from entering the urethra.
**Prostate Gland**

The prostate gland is a firm structure located below the bladder. It is about the size of a walnut and surrounds the urethra as it leaves the bladder.

The prostate produces a milky colored, alkaline substance that makes up the largest part (60%) of seminal fluid. This substance helps to activate and transport the sperm.

**Cowper’s Glands**
The Cowper’s glands are located near the base of the penis. They are small, about the size of a pea. In response to sexual stimulation, the Cowper’s glands produce a fluid that neutralizes the acidity of the urine residue in the urethra and the acidity of the vagina. It also provides some lubrication for the tip of the penis.

The released fluid is called the pre-ejaculate. It is rare for pre-ejaculate fluid to contain sperm; however, it can transmit sexually transmitted infections (STIs), including HIV.

Urethra

The urethra is a tube located in the center of the penis. It is the pathway that urine and semen travel through to exit the body.
A man cannot ejaculate and urinate at the same time, as the opening of the bladder stays closed during ejaculation so that urine stays in the bladder.
Activity: Internal male reproductive anatomy

Instructions:
This exercise contains the list of the parts of the male anatomy. Match the part name and function below.
INTRO TO REPRODUCTIVE ANATOMY AND PHYSIOLOGY: WORKSHEET

INTERNAL MALE REPRODUCTIVE ANATOMY

This exercise contains the list of the parts of the male anatomy. Match the part name and function below.

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROSTATE GLAND</td>
<td>a) Where the sex hormones estrogen, progesterone, and androgens are produced.</td>
</tr>
<tr>
<td>URETHRA</td>
<td>b) Where mature sperm are stored.</td>
</tr>
<tr>
<td>VAS DEFERENS</td>
<td>c) The tubes that carry sperm from the testes to the urethra.</td>
</tr>
<tr>
<td>TESTES</td>
<td>d) Produces a substance that helps to activate and transport the sperm.</td>
</tr>
<tr>
<td>EPIDIDYMIS</td>
<td>e) Produces a fluid that neutralizes the acidity and provides lubrication.</td>
</tr>
<tr>
<td>COWPER’S GLAND</td>
<td>f) The pathway urine and semen travels through to exit to the outside of the body.</td>
</tr>
</tbody>
</table>

Correct Responses:
Prostate Gland (d) ; Urethra (f); Vas Deferens (c); Testes (a); Epididymis (b); Cowper’s Gland (e)
Male reproductive system hormones and sexual response
There are three hormones that regulate the male reproductive system.

1. Follicle-stimulating hormone stimulates the production of sperm.
2. Luteinizing hormone stimulates the production of testosterone.
3. Testosterone stimulates the development of male secondary sex characteristics and the production of sperm.

The male sexual response cycle includes erection—due to sexual excitement and stimulation—and orgasm. Orgasm occurs when the tension from sexual stimulation is released in a series of muscle spasms and is accompanied by ejaculation of semen and the release of endorphins.

Following orgasm, there is a recovery time during which it is not possible to have another erection. The length of this recovery time varies.
Section 3: Pregnancy and contraception

This section describes how pregnancy happens and ways contraception prevents pregnancy.
Pregnancy occurs when an egg is fertilized by sperm and then implants in the uterus to grow and develop. The entire process to achieve pregnancy can take two to three weeks after sex.

Click on the tabs below to learn more about each step. Press the play button to watch the animated video for each step.

Ovulation is the release of an egg from the ovary into the fallopian tube. An egg is released about midway through each menstrual cycle. The egg can be fertilized for about 24 hours following ovulation.

If fertilization does not happen, the egg dissolves and pregnancy does not occur.
If semen, containing millions of sperm, enters the vagina, the sperm swim through the cervix and uterus and into the fallopian tubes. Sperm remain capable of fertilizing an egg in the female reproductive tract for about five days. This means pregnancy can occur any time in a six–day window during each menstrual cycle.

Fertilization occurs when one sperm enters an egg. Both the egg and sperm contain threadlike structures that carry genetic information, called chromosomes, which combine during fertilization. The fertilized egg then travels down the fallopian tube toward the uterus. As it travels, the fertilized egg divides into more and more cells, forming a ball of cells called a blastocyst. The blastocyst takes about three or four days to reach the uterus.
With implantation, specialized cells produce hormones that maintain the pregnancy. The blastocyst develops into an embryo. The embryo connects with the mother’s blood supply, which nourishes the embryo until the placenta forms. The placenta is an organ that grows attached to the wall of the uterus and connects the mother and baby through an umbilical cord. The placenta provides the fetus with oxygen, nutrients, and waste exchange while in the uterus.
Contraception

It is important to help your clients understand the range and characteristics of available contraceptive methods.

Contraceptive methods work in a variety of ways to prevent pregnancy. For example:

- **Condoms** act as a barrier to prevent sperm from entering the vagina.

- **Female sterilization**, or tubal ligation, is often called “having your tubes tied.” It is a procedure that permanently blocks the fallopian tubes, so the egg cannot move to the uterus and the sperm cannot reach the egg.

- **Hormonal methods** stop the body from releasing an egg, so no egg can be fertilized.

- **Intrauterine devices (IUDs)** are placed inside the uterus by a trained health care provider. Both copper and progesterone-containing IUDs work by preventing fertilization.

- **Male sterilization** is a simple procedure in which the vas deferens is cut and sealed, so that sperm cannot enter the urethra and exit the penis.

Download the job aids below to review the full list of contraceptive method options and how they work.

Birth Control Methods Options Chart
Explaining Contraception Job Aids for Health Care Providers

Contraception Counseling and Education eLearning

For more training related to contraceptive methods, explore the resources available on the Family Planning National Training Center website (fpntc.org).
Reproductive anatomy education scenario

Educating Amelia About Reproductive Anatomy

Amelia is at the clinic for her first visit. Her period didn’t come last month but a pregnancy test was negative. For each interaction, choose the best option to continue the conversation.

Scene 1 Slide 1
You ask Amelia how long her last menstrual cycle was, and she tells you it was 5 days.

1. Talk to Amelia about the menstrual cycle and clarify that her period is one part of the cycle.
2. Tell Amelia 5 days is normal for a period.
Next you talk with Amelia about her sexual activity. She shares that she and her boyfriend use condoms, but not every time they have sex. When they don’t use a condom, he pulls out.

Praise Amelia for using condoms. Explain pre-ejaculate fluid can transmit STIs, including HIV. Encourage them to always use condoms.

1 Praise Amelia for using two methods to prevent pregnancy.
Amelia doesn't want to become pregnant until after college. She heard copper IUDs last a long time but she doesn't want to have to insert something into her vagina every time she has sex.

Agree with Amelia that it can be inconvenient to think about birth control every time she has sex.

Clarify that IUDs are placed inside the uterus by a trained health care provider. Demonstrate with an IUD and model of a uterus.
After talking about birth control options, Amelia says she’s excited about a birth control method she doesn’t have to think about and wants to understand how it prevents pregnancy.

Tell her not to worry about it and simply trust that it works.

Describe ovulation, fertilization, and implantation. Explain copper IUDs affect sperm movement, stopping them from reaching an egg.
Now let’s review what we’ve covered during this module. For each question, select the response option you think is correct.

**Question 01/05**

The entire area of the external female reproductive anatomy is called the:

- Vagina
- Vulva
- Hymen

**Question 02/05**

Menstrual cycles that range from ______ to ______ days are considered normal.

- 18 to 40 days
- 20 to 30 days
- 23 to 35 days
The following are parts of a penis:

- Root
- Body (shaft)
- Glans
- All of the above

Physical signs of fertility include:

- No cervical secretions
- Menstrual blood
- Wet, slippery cervical secretions
Where does fertilization occur?

- Vagina
- Uterus
- Ovary
- Fallopian tubes
This is the end of the Introduction to Reproductive Anatomy and Physiology module.

Thank you for joining us. Your feedback is important to us!

Please complete a brief evaluation of this module. After completing the evaluation, you can download your certificate of completion from your FPNTC training account.

Course Evaluation
This module was developed by JSI Research & Training Institute, Inc. for the Family Planning National Training Center and supported by Award No. FPTPA006028-04-00 from the Office of Population Affairs (OPA). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of OPA or HHS.

Section 1: Female reproductive anatomy and physiology


Section 2: Male reproductive anatomy and physiology


Section 3: Pregnancy and contraception

