Core knowledge content

Supplemental Content

The supplemental information has been included to ensure that the teacher has all the information he/she may need to teach puberty classes. It is most important to discuss the reproductive anatomy and functioning that will help students understand the changes of puberty.

Some people are assigned a sex at birth based on their sexual and reproductive anatomy. Based on first physical appearances, when a person has anatomy that includes a vagina they are assigned female and when a person has anatomy that includes a penis they are assigned male.

For people assigned female at birth, the body parts that develop may include the vulva, vagina, cervix, uterus, ovaries, fallopian tubes, endometrium, and clitoris. They may also develop breasts and menstruate for the first time.

For people assigned male at birth, the body parts that develop may include the penis, scrotum, testicles, urethra, prostate gland, seminal vesicles, and vas deferens. They may also become more muscular, get deeper voices, grow facial and body hair, and their penis and testicles may grow larger.

Reproductive System for a Person Assigned Female at Birth

Internal Organs

Breasts

The breasts contain glandular tissue. After puberty this glandular tissue, called **mammary glands** begin to develop in response to estrogen. This gland is responsible for lactation/milk production. These mammary glands only produce milk after childbirth. Breast feeding is a natural and healthy way to feed our babies.

For a person assigned female at birth, their breasts stop developing when they are completely mature. This can be as late as 22 years of age. It is normal for one breast to be

slightly larger than the other. Some people might experience a bit of discomfort and or tenderness as their breasts develop. People might find it more comfortable to wear a bra, as their breasts get bigger. This is normal.

People who are assigned male at birth might also notice some minor breast development. This is a result of hormones as they go through the process of establishing and regulating themselves.

Ovaries

Ovaries are the reproductive glands in a person assigned female at birth, and are responsible for the production **estrogen** and **progesterone**. There is one ovary on each side of the lower abdomen, which is the size of an almond. This is also the storage of **ova** (eggs).

Ovum

The ovum, which is also called an egg cell and is about the size of a period (dot) or the head of a pin. This is the largest cell in the body and once united with a sperm, it can create a baby (fertilization). A person who is assigned female is born with a supply of about 250,000 immature ova. During puberty, a female begins to release one ovum a month, which is called **ovulation**.

Fallopian Tubes

Two narrow hollow tubes on either side of the uterus with a diameter about the size of strand of spaghetti and 8-10 cm long. These tubes are the passageway from the ovary to the uterus and is where the egg travels when released from the ovary.

Uterus

Also called the womb, it is very low in the abdomen (nowhere near the stomach). In an adult, the uterus is the size and shape of a clenched fist. It is the place where the unborn baby grows. It prepares for a pregnancy each month by forming a thick, nutrient-rich lining of blood and tissue.

Cervix

The lower part of the uterus. It is normally in a nearly closed or collapsed state but opens/dilates to 10cm during labour to allow the baby to be born vaginally and also opens a tiny bit to allow for menstrual flow.

Vagina

The flexible passageway between the uterus and the outside of the body, which is lined with mucous membrane. The vagina is the passageway through which baby leaves the person's body (birth canal), where menstrual blood and lining leaves the body, and where sperm is deposited in the vagina to travel towards an ovum (egg).

Vulva

The area of soft skin on the external vagina that is located in between the legs of a person assigned female at birth. Consists of the **labia majora** and **labia minora** (outer and inner folds of skin) that function to protect the internal reproductive organs.

Urethra

The tube through which urine (liquid waste or pee) leaves the body. It is the opening just above the vagina. It is not part of the reproductive system, but the urinary system.

Anus

The opening at the end of the digestive tract where feces (solid waste or poo) leaves the body. **It is not part of the reproductive system,** but instead is part of the digestive system.

External Organs

Clitoris

Located above urinary opening, where inner folds of skin (labia minora) come together. It is a very sensitive, and it provides pleasure when touched/stimulated.

Hymen

A thin membrane that surrounds the vaginal opening. It may not be noticeable.

Mons Pubis

The area where fat under the skin covers the pubic bone. Hair grows in this area during puberty.

Changes in the reproductive organs at puberty

Discharge

Once puberty begins, a person with a vagina may notice some discharge/fluid on their underwear or on toilet paper. It varies from a whitish colour to clear. This means their body is starting to mature and is a sign that their period may be starting sometime soon. It is normal and keeps the vagina clean and healthy. If the discharge smells bad or the area is itchy, it could signal infection and requires medical treatment. Normal vaginal discharge is odorless, cloudy white, and is an indication that a body is preparing for menstruation (a period).

Ovulation

Once the ovaries start producing hormones, the message is given to start maturing and releasing one ovum, once a month from one ovary into the fallopian tube. Is a natural process that a person usually doesn't feel, but it is the time of the month they may get pregnant. Once the egg is in the fallopian tube it is possible for a sperm, if present, to fertilize

it. If the egg is not fertilized in approximately 24 – 48 hours it dissolves. Ovulation happens in between the menstrual periods, approximately 14 days before the start of her next period.

Menstruation (also known as a period)

People assigned female at birth are born with about 250,000 tiny, immature eggs, called ova in each ovary (teachingsexualhealth.ca). At puberty, hormones tell the ovaries it is time to start the process of maturing and releasing ova. Usually one egg (ovum) at a time matures and is released from an ovary – this process is called **ovulation**.

During ovulation, hormones from the ovaries send messages to the uterus to grow a thick, soft lining of tissue and blood on the inside wall in preparation for a possible pregnancy. The lining, which is called the **endometrium,** has lots of tiny blood vessels and is there to protect and feed an egg that has been fertilized by a sperm. If an egg is not fertilized by a sperm, then the lining is not needed to nourish a baby. A hormonal message from the ovary tells the uterus to shed the lining and come away from the walls of the uterus. This causes blood to flow through the cervix and out of the body through the vagina.

It usually takes about 5-7 days to shed the lining of the uterus – this is called **menstruation** or also referred to as “having a period”. The amount of blood lost can be anywhere from a few tablespoons to about half a cup. Once the lining is completely shed, a new one begins to grow

Ovulation happens over and over again, hence the monthly pattern is called the **menstrual cycle.** It usually happens in intervals of 4 weeks, but can vary, particularly during first 2 years of menstruation. No one can tell exactly when menstruation will start but usually acne, pubic hair, breast development and vaginal discharge tend to happen before menstruation begins.

At first there may not be any pattern to when you get your next period (e.g. may even skip a month or two between periods). Eventually most people who menstruate have a regular cycle so they know approximately when their next period will happen. The length of a cycle is from the first day of bleeding one month to the first day of bleeding the next time it happens. Each person is different, so some people may have a period every 23 days, some every 28 days and some every 35 days. People can keep a calendar to help them keep track when they have their period and how long it lasts or they can search for an app to use as well.

Some people may experience **P.M.S. – pre-menstrual syndrome**. Symptoms of P.M.S. may appear after ovulation and can include lower abdominal cramping, backache and bloating. These symptoms can be relieved by limiting salt intake, drinking plenty of water, participating in light exercise (stretching or walking), applying heat through a heating pad, or taking a pain reliever. Remind students that they should always ask their parents before taking any medication.

The menstrual cycle stops temporarily during a pregnancy - lack of a period is an early sign of pregnancy. Menstruation stops permanently between the ages of 45 & 60 years, this is called **menopause**. Once stopped – women are not able to become pregnant any longer.

Personal care during menstruation

Menstruation is a normal change of puberty. It is not a sickness or a reason to stop regular daily activities. However, some people have symptoms that might impact them from participating in regular daily activities.

Personal hygiene (i.e. bathing, washing hair) are even more important at this time due to an increase in hormone production and to prevent bacterial growth. No one will know that a person is having their period unless they are told. The fluid usually comes out a bit at a time and is something you have no control over, it will start and stop at different times no matter whether you are sitting, standing or lying down.

Pads or Sanitary Napkins

Pads (or sanitary napkins) are made of material that absorbs the fluid. Most have a sticky strip on one side to hold the pad to the underwear, come in a variety of sizes and shapes. Different size pads are chosen to meet the needs of varying menstrual flow. It's important to wear a pad 24 hours a day while menstruating, changing pads about every 3-4 hours while awake (this will help prevent buildup of bacteria and eliminate odour. Since pads are not flushable, do not dispose of them in the toilet. Wrap the used pad in its plastic film (or toilet paper) and throw it in a garbage or specified container (usually in public washrooms). Panty-liners are similar to pads and are used to catch light menstrual flow or vaginal discharge. Keep pads in a backpack, locker or bag.

Tampons

Tampons are a small plug of material that fits inside the vagina to absorb the blood and lining. It is held in place by the muscles in the vagina and a string is used to remove tampon – very strong so no fear of breakage. Some people like to use tampons, especially if they are doing physical activities (i.e. swimming, dance, and gymnastics) but it is personal choice. Sometimes people choose to avoid using tampons when they first start their period. Some people also decide not to use tampons during their period for different reasons. They still may be learning to become comfortable with their body and the process of menstruation. They may still be learning to insert a tampon properly and prefer different options when menstruating. **Remind students that most tampon boxes come with instructions**.

Not practicing good hand and body hygiene and/or not changing tampons regularly could cause **Toxic Shock Syndrome (TSS)**, a rare but serious and sometimes life-threatening infection. Some symptoms of TSS are headache, sore throat, sudden fever, vomiting, diarrhea, achy muscles and a rash that looks like a sunburn. Hand washing is important both before and after changing tampons. They need to be changed regularly, every 4-6 hours and should never be worn overnight. Used tampons are not to be flushed down the toilet, but wrapped in toilet paper and disposed in a garbage or specified container (usually in public washrooms). It's important to read the instruction guide in the tampon package to learn more about insertion and disposal instructions. A person wanting to use tampons and are unsure how to do so should talk to a parent or trusted adult.

Reproductive Organs for a Person Assigned Male at Birth

External Organs

Penis

The penis is a tube-like organ of spongy tissue, nerves and blood vessels; and varies in size. It takes a while for the penis to grow and it will grow as the rest of the body grows. There is less of a difference in penis size when the penis is erect. Testicles grow first. The **foreskin** is the name given to the skin on the end of the penis that pulls back when the penis gets hard (**erection**). Sometimes this skin is removed in a procedure called **circumcision**, which is usually done soon after birth. Some of the factors that play into parent's decision include: religious reasons, personal and cultural beliefs. For people who have not been circumcised, they should cleanse beneath the foreskin of the penis regularly by gently pulling

it back from the glans, rinsing the glans and inside of the foreskin with warm water, then pulling the foreskin back over the head of the penis.

Testicles

Testicles are the reproductive glands of a person assigned male at birth. There are usually two testicles which are about the size of walnuts. However, a person only needs one in order to be able to reproduce. If a person has only one testis (born that way or sometimes an accident or cancer causes the loss) the remaining testis doubles its sperm production. Sometimes one can grow faster than the other at puberty, and it is common for one to hang lower than the other. The two functions testicles have include the **production of testosterone**, which causes the changes of puberty, and the **production of sperm** (**spermatogenesis**). These are special cells produced in the testicles after the onset of puberty called sperm cells. One sperm cell, the tiniest cell in the body, can reproduce when united with the special egg cell (ovum). They are very small – you would need a microscope to see them. Once a person starts to make sperm they will continue to make about 400 million each day for the rest of their life. Sperm builds up in tubes around the testicles called the **epididymis**. As sperm are being produced, the older ones die off and will be reabsorbed by the body. **Ejaculation** is the process when sperm is going to leave the body. The sperm travels through the **vas deferens** and mixes with fluids released from both the **seminal vesicles** and **prostate gland** to form a white sticky fluid called **semen**.

Scrotum

The scrotum is the sac of skin that holds the testicles. The scrotum pulls the testicles closer to the body if it is cold and lowers away from the body if it is hot. The testicles have to be kept at a certain temperature just below body temperature in order to produce healthy sperm, which is why they are on the outside of the body. During puberty the scrotum will grow and turn darker in colour. It is a very sensitive area – easily damaged – important to protect during sports activities by wearing a jock. A person with testicles and a scrotum should never be deliberately kicked there.

Internal Organs

Cowper's glands

These are about the size of a pea and are located at the base of the penis. When sexually aroused, the glands produce a mucous like fluid called pre-ejaculate. The purpose of this fluid is to neutralize any acidity from urine which may be in the urethra after urinating (going pee).

Epididymis

The coiled tube at the back of the testicle that holds and carries sperm.

Vas Deferens

The tube which carries sperm out of the testicles. Also known as the sperm duct. Since there are 2 testicles, there are 2 vas deferens. Both join with the urethra, which is the tube located under the bladder.

Seminal Vesicles

Two small pouches behind the bladder and above the prostate gland that produce fluid. This fluid mixes with sperm and other fluid to produce semen.

Prostate gland

Donut shaped gland under the bladder which is the size of a chestnut. Surrounds the urethra. The testicles produce sperm and the vas deferens carries this sperm to the prostate gland, where it mixes with fluid from the prostate and seminal vesicles. The purpose of these fluids produced at puberty is to nourish the sperm and keep them alive. Sperm + fluid = substance called **semen**.

Urethra

The tube that runs the length of the penis. It has 2 branches – one to bladder, one to vas deferens. The urethra provides a passageway for both urine and semen to leave the body. Urine and semen cannot come out at the same time as the acidity of the urine would destroy the sperm cells in the semen. When the penis is ready to release semen (**ejaculation**), a valve blocks off the branch to the bladder so urine cannot escape.

Anus

The opening of the end of the digestive tract where feces/solid waste/poo leaves the body. It is not part of the reproductive system, but instead is part of the digestive system.

Changes in the reproductive organs at puberty

Erections

The tissue that makes up the penis is called **spongy tissue**. Under a microscope this tissue has many tiny holes in it. When these tiny holes fill up with extra blood, the penis to get bigger, harder and stand out from the body. This is what is called an **erection**.

Erections happen for physical reasons before puberty, even before birth. They can also happen when the penis is touched or when excited. Sexual thoughts send a message to the penis, causing it to thicken and stick out from the body. Erections can happen when it is least expected or wanted (e.g. first thing in the morning when you have a full bladder, during sleep, when you are anxious or frightened, no reason at all), not always related to sexual thoughts. Although this can be frightening and embarrassing, it is a normal process of growing up. An erection does not mean that sperm will be released (ejaculation). Erections will go away on their own. A person can cope with an unwanted erection by trying to focus on something else.

Ejaculations

Ejaculation is the release of semen from penis. The penis must be erect before an ejaculation occurs. It usually has to be some extra touching of the penis for this to happen (e.g. during sexual intercourse or masturbation). Muscles push the semen into the urethra and out the penis. There are millions of sperm in one ejaculation. Ejaculations may also happen during sleep (**nocturnal emissions or "wet dreams"**).

Wet dreams (Nocturnal Emissions)

Wet dreams ejaculation of semen during sleep and is the one instance that semen comes out without touching of the penis. If a person wakes up and finds a wet, sticky spot on his clothes and bedsheets, this indicates that semen came out when he was sleeping. Although this may be alarming, remind students to throw the soiled clothes and bedsheets in the wash

and know that everything is going to be OK. Remind students that this is normal and a part of growing up.

Jock itch

There is increased perspiration during puberty, including in the pubic area. Sweaty underwear or jock straps can lead to a scaly, itchy rash in the genital area. It is important to keep clean, and keep the skin dry (e.g. dry well after bathing or showering; use of corn starch). It can be treated with anti-fungal preparations available at the drugstore without a prescription. If the problem persists, see your health care professional.

Fertilization and Conception

Fertilization is the union of one sperm and one ovum (egg). The process takes place in the fallopian tube and happens when a mature egg cell meets with a sperm cell. Although there are millions of sperm in this semen, only around 1,000 make it as far as the fallopian tubes. The semen containing sperm travel from the vagina, through the cervix, to the uterus and finally into the fallopian tube in search of the ovum. If this process happens around the time of ovulation there could be an ovum (egg) in the fallopian tube. When the sperm penetrates the ovum, this is the moment of **fertilization**. The remaining sperm cells will die off and dissolve.

These two cells then become one cell, which is neither a sperm nor an ovum (egg), but is called a **zygote** (ball of cells). This zygote spends the next few days traveling down the fallopian tube. As it travels, it begins to divide within itself into two identical cells, and those two into four, and those four into eight and so on. This zygote is now called a **blastocyst**. The blastocyst is made up of an inner group of cells and an outer group of cells. The inner group of cells will become the baby (**embryo)** and the outer group of cells will become structures which nourish and protect the baby. Once inside the uterus and securely attached to the wall of the uterus, the process of **implantation** is complete and the **placenta** begins to form. This is the point that the process of **conception** is complete.

Sometimes the process of conception can result in more than one baby being created. Twins can either be identical or fraternal. Identical twins may or may not share the same amniotic sac, depending on how early the single fertilized egg divides into two. Fraternal twins are

two separate fertilized eggs; they usually develop two separate amniotic sacs, placentas, and supporting structures.

The baby, called an embryo, is not able to eat or breathe on its own so all functions are assisted by a structure called the **placenta**. The food the mother eats and the oxygen she breathes go into her bloodstream as very tiny pieces (molecules). These nutrients and oxygen travel through the mother's bloodstream to her placenta, through the **umbilical cord** and into the baby's body. The baby eats and breathes inside the uterus. After the baby is born, the umbilical cord is clamped, cut, dries up and falls off, leaving the umbilicus/belly button.

The **amniotic sac** is a bag of fluid inside the uterus where the embryo grows and develops. It is filled with fluid, in which the embryo floats and moves. The **amniotic fluid** helps to cushion the embryo from bumps and injury, as well as providing them with fluids that they can breathe and swallow.

The person who is carrying the baby's lifestyle is very important when they are pregnant. Alcohol, nicotine and other drugs can cross the placenta and cause damage to the unborn baby.

A person does not menstruate while they are pregnant because the lining is needed to support the pregnancy. The lining nourishes the developing embryo.

The process of pregnancy takes about nine months or 40 weeks to complete. This time period is divided into three stages called **trimesters**. Trimester one includes the first three months, trimester two includes months four-six and trimester three includes months seven-nine.

The first trimester is a critical time in the baby's life. It is the period of rapid growth and development. By the end of these three months, all of the baby's organs will be formed and functioning and its bones and teeth will begin to form. The baby moves around in the amniotic fluid but these movements cannot be felt by the mother yet. The baby's heartbeat may be heard with an electronic listening device.

During the second trimester the brain develops a lot. The fetus cannot live outside of the mom's body because its lungs, heart and blood systems have not developed enough yet. By 20 weeks, the mom is able to feel her baby's movements. By the end of the fifth month,

the baby is about half the length of a newborn and can open its eyes. The baby's outline may be felt through the abdomen (some refer to as the baby is kicking).

During the third trimester the baby could survive if born before it is full term, but would need special care. The closer to full term, the more ready the baby is to cope with the birth process and life outside the uterus. The baby can hear and respond to sounds. Its pupils can react to light and fat forms underneath the baby's skin.

In order to provide the baby with the best possible conditions to develop in, the birthing parent (or person carrying the baby) should avoid smoking and second hand smoke; avoid alcohol and drugs; eat a well-balanced diet; get lots of rest and exercise and see her doctor early and through the rest of her pregnancy. In fact, many people see their doctor before they get pregnant and to have a check-up to make sure they are in the best health possible.

The pregnant person will need a lot of help/support from their partner, family members, friends, etc. Some of the roles include attending health care provider appointments, prenatal classes, helping with housework/chores and cooking healthy meals to help the baby have the healthiest environment possible in which to grow.

Pregnancy, Labour and Child Birth

After months of growing in the uterus, a mother will begin to feel the start of *labour.* Labour is the work the uterus does to help the baby come out. The uterus contracts (tightens) and relaxes during labour, which makes the cervix (opening of the uterus) thin and open wider. For a first baby, labour may last 12-20 hours.

Contractions will continue throughout labour and become stronger and stronger. The mother will begin to feel the need to push. Once the cervix opens to 10 cm, contractions and the mother's pushing will move the baby down the birth canal (vagina) and the baby will be born. The placenta will detach and come out of the uterus approximately 30 minutes after the baby has been born. Mild contractions will continue and help the uterus shrink back to its normal size.

Resources

Kids Help Phone. (visit https://kidshelpphone.ca/ or call 1-800-668-6868)

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