

Core knowledge content

Puberty

There are 3 periods of rapid growth: conception to birth, birth to the 1st birthday and puberty. Puberty is the stage of development when a person changes from a child to an adult. These changes include physical changes, emotional changes and social changes. The term “adolescent” is sometimes used to refer to a teenager.

When a person’s body is ready to begin puberty, the pituitary gland (think of a “cherry pit” size) which is located at the bottom of the brain sends out chemical messages, called hormones, to get things started. These hormones travel in the blood stream, to different parts of the body depending on whether the child is a female or male.

In females, the hormones target glands called ovaries and in males they target glands called testicles. Both of these glands are then signaled to start making their own hormones. In females the ovaries start making the hormones estrogen and progesterone. In males, the testicles start making a hormone called testosterone. These hormones then travel in the blood stream and tell other parts of the body to start changing. They cause changes allowing children’s bodies to grow into adult bodies. The changes of puberty happen at different times. Similar to a “personal alarm clock” no two clocks are set exactly the same. The timing of puberty is influenced by heredity, nutrition throughout childhood and physical activity levels. According to teachingsexualhealth.ca, females usually experience puberty between 8-16 years and males usually change between 10-18 years. It is very common for females to be taller than males for a while especially during grades 7 and 8. Someone who is at either end of the age range when they start puberty may feel either embarrassed, left out, teased or that something is wrong with them, this is common. The changes are generally complete by 18 for females and 20 for males.

Emotional, Social and Cognitive Changes

Some changes that occur during puberty you can see and others you cannot. Emotional, social and cognitive changes occur because of the changes that are happening to the brains of children. It is now neither a child’s brain nor an adult’s brain but instead is a brain under construction. Construction won’t be complete until the early twenties and these changes will result in emotional, social and cognitive changes as they mature.

Students may want to make decisions quicker than before but they might not always be the right decisions. They often want more independence which may influence the decisions they make. In fact they may assume that by making certain decisions, they would be demonstrating their “grown up” status; however the exact opposite is happening. Students develop a greater desire to be accepted/liked by their peer group; fitting in becomes more important. Puberty is also a time when students may experience increased peer pressure. Some strategies to suggest include: be true to your values and beliefs; be clear about what values are important to you; and use assertive communication. During puberty some students start to become interested in dating. Having a romantic interest in another person is common. It can feel very exciting, but also confusing. These feelings are common and most students are experiencing the same thing.

Mental Health

It is common for students going through puberty to feel like they’re on an “emotional rollercoaster”, happy, positive and confident one minute, sad/angry, withdrawn or nervous the next minute. Students might also identify feelings of confusion, loneliness or excitement.

One in 5 Canadians will have a mental health challenge sometime during their lifetime. The teacher supports students by encouraging them to seek out credible information and to talk to a trusted adult if they are concerned, as their friends may not have the most helpful information. There are different types of supports available to students: social supports (family, friends); school supports (counselors, teachers); and community supports (school nurses, health care providers, doctors, faith leaders, kids help phone, etc.).

Physical Changes

Skin

The role of the skin is to provide protection from heat and cold as well as provide a barrier from infection.

Acne

The increase in hormones during puberty causes oil (sebaceous) glands to produce excess amounts of oil (sebum). There are a lot of oil glands on the face (especially across the forehead, nose, chin and “T-zone”), neck, shoulders, upper chest and back. This excess oil can combine with dead skin cells to clog pores, trap bacteria and cause pimples. Pimples happen to everyone.

Blockages (plugs) exposed to air appear as blackheads whereas whiteheads are closed plugs that can become inflamed.

Most people can reduce the severity of acne by following some basic hygiene steps:

- Wash face with mild soap or cleansers and warm water 2-3x daily
- If acne gets worse the next level would be to buy acne products (washes and creams) which can be purchased over the counter or they may see their doctor for a prescription
- Do not squeeze or pick at pimples as this can cause infection
- Avoid creams and cosmetics that contain oil.
- Remove all cosmetics before going to bed
- Eat a well-balanced diet
- Drink water for thirst and milk/milk alternatives with meals
- Get regular physical activity (see information under physical activity heading)
- Get sufficient sleep (see information under sleep heading)
- Wash hair more often
- Keep hair back off the face

Despite following these basic hygienic responsibilities some people may need to seek treatment from their health care professional (family doctor, nurse practitioner or dermatologist). Usually, acne decreases with age.

Perspiration

People perspire all the time, not just during physical activity. Perspiring is how the body regulates its temperature. As perspiration evaporates from the skin's surface, it cools the body. This sweat doesn't have an odour. At puberty a different set of sweat glands (apocrine glands) start to secrete a different substance along with a salty, watery solution. This in combination with bacteria on the skin results in a body odour. Major sweat glands are located in the underarms, groin area, palms of the hands and soles of feet.

Strategies for minimizing body odour include:

- Bathe or shower daily
- Use deodorants or antiperspirants. Deodorants are meant to cover up the unpleasant odour where antiperspirants slow the sweating process.
- Do not substitute the use of body sprays, perfumes, colognes etc. for showers. If using these products it is important to use sparingly.
- Wear clean clothes

Change socks and underwear daily or more often if physically active. Soap Products

During puberty, skin can be sensitive to strong perfumed soaps or lotions. Use of a mild soap may be necessary. For people who experience difficulty with their skin and/or breakouts, medicated soaps and/or lotions may be prescribed by a health care professional.

Sun Exposure

Frequent sun exposure can cause skin cancer and premature aging.

- **Slip** on clothing to cover your arms and legs
- **Slap** on a wide-brimmed hat
- Slop on sunscreen with a minimum SPF 30
- **Seek** shade
- **Slide** on sunglasses that offer 100 per cent UVA and UVB protection
- Even on cloudy or overcast days it is important to apply sunscreen

Body Hair

During puberty hormones stimulate body hair to grow on the arms and under the arms, in the pubic area (area between legs) and on the legs. In males it also grows on the chest, back and face. Body hair may have had a more important function earlier in our evolution, perhaps to provide protection.

Hair on head

As a result of increased hormone production hair may become oilier, just as skin gets oilier. Regular shampooing and daily brushing/combing of hair is important. Brushing hair daily is important to overall general appearance.

Underarm and leg hair

Increased hair growth during puberty, is one change that students often find embarrassing. Many females have been taught to remove the hair under their arms and on their legs, however this may not be everyone's practice therefore consideration for the practices of others is important.

Voice Changes

The larynx, also known as the voice box, gets bigger during puberty. When males reach puberty, their body begins making lots of testosterone which causes the larynx to grow and the vocal cords to get longer and thicker. When the larynx grows larger during puberty, it sticks out at the front of the throat. This is what's called an Adam's apple. Everyone's larynx grows during puberty, but a female's larynx doesn't grow as much as a male's does which is why most females don't have Adam's apples. You will find this change listed under the "males" changes in the "male, female, both" chart but it is important to also share with the class that females will also have some degree of voice changes as they mature.

Change in body shape

Height: Genes largely determine how tall a person will be and how fast they'll grow. Children could be concerned about their height for different reasons: it might be females feeling too tall and males feeling too short. But some really tall males might not like all that height and some shorter females might get tired of all the jokes or of feeling like they're staying little while their friends are growing up.

Weight: People come in all different shapes and sizes, and the best weight is the one that is right for a child's body type and size. It can be unhealthy to be too thin or too heavy. Eating enough food is like putting gas in a car – if you run out of gas, it stops working! Everyone needs to eat a healthy, balanced diet to grow, to fight off infections, to do well in school and at play, and to just feel good. Eating a variety of healthy foods that meet the requirements of Canada's Food Guide, is the best approach.

Muscles: Some children might wish they could be muscular like their favourite superhero or athlete. This may be especially common in males. Some children talk about going to the gym or

lifting weights to help them develop muscles. However their bodies can't build these adult muscles until puberty is complete. Males and females can however do a lot to build strong, healthy bodies by being physically active and eating a variety of nutritious foods.

http://kidshealth.org/kid/grow/boy/getting_muscles.html

Hips: A females pelvic bones grow and shift during puberty, causing the hips to widen. This change helps to accommodate the growth of the internal reproductive system, but primarily prepares females for potential childbirth.

Other Factors that influence good health

Other factors that influence good health are: nutrition, physical activity, adequate sleep, oral health and choosing not to smoke.

Male Reproductive Organs

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 and parents want their baby to "look like" the father. It is normal either way. Used to be routinely done – now is more common to be based on a person's choice. Males who have not been circumcised 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

The male reproductive glands. There are usually two testicles which are about the size of walnuts. Males only need one in order to be able to reproduce. If a male 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 testicles have two functions, which 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 cell, the tiniest cell in the male body, can reproduce when united with the special female egg cell (ovum). They are very small – need a microscope to see them. Once a male starts to make sperm they will continue to make about 400 million each day for the rest of their life. Sperm are shaped like tadpoles and are able to swim by lashing their tails. Sperm build 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. When sperm are going to leave the body, in a process called **ejaculation** they travel through the **vas deferens** and mix 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. Males should never be deliberately kicked there.

Internal Organs

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 male 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. These tiny holes fill up with extra blood which causes the penis to get bigger, harder and stand out from the body, 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. 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. This can be frightening and embarrassing. This 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. Males can cope with an unwanted erection by:

- Focus on something else until it goes away
 - Sit down
 - Put your hands in your pockets to try to hide it
 - Wear baggy pants if it keeps happening

- At the pool? Jump in or put your towel in front of you
- Erection will go away on its own

Ejaculations

Ejaculation is the release of semen from penis. The penis must be erect before an ejaculation occurs. 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 are ejaculations of semen during sleep. This is one time that semen comes out without any extra touching of the penis. If a male wakes up and finds a wet, sticky spot on his pajamas, semen came out when he was sleeping. A male may be concerned that he has wet the bed but this is not the case. Some males have wet dreams, some don't. Whatever happens is OK. Males should change their PJ's and sheets as needed and then put them in the laundry. It is important to remember that it is a normal 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.

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 not mandatory to introduce students to the information found here but it may help the teacher answer some questions that may arise. Overall, it is most important to discuss the reproductive anatomy and functioning that will help students understand the changes of puberty.

Other Factors that Influence Health

Nutrition

What children put into their body is important for health. Eating a nutritious breakfast every day is a great start. Food choices throughout the day should mainly come from the vegetable and fruit food group of Canada's Food Guide. Children should drink water when thirsty and milk at mealtimes. Eating meals without distraction (video game, cell phone, TV) should be strongly encouraged. See www.brightbites.ca for more information.

Physical activity

Physical activity plays an important role in the health, well-being and quality of life of all Canadians, and it is particularly important for children and youth. Habits formed early can last a lifetime. Physical activity doesn't mean only sports – it can include everyday things like walking the dog, playing tag, building a snowman, tobogganing, and even household chores like raking the leaves. Children aged 5-11 should accumulate at least 60 minutes of moderate to vigorous-intensity physical activity daily. In order for students to make the most of their physical activity, they should try to include vigorous activities at least three days per week.

Adequate sleep

A child's body functions best with a regular schedule which includes a regular sleep routine. Sleep is important as this is the time when the body relaxes, repairs itself, grows and gets ready for the next day. Having a relaxing, predictable bedtime routine helps the child settle into sleep mode. This should involve 20 to 30 minutes of quiet time that the child can use to engage in some wind-down activities such as reading, listening to music or writing in a journal. Stimulating activities such as playing videogames, using the computer, using cell phones or exercising an hour before bedtime

should be discouraged. It is recommended that children ages 7-12 years of age get 9-11 hours of sleep each night.

Oral Health

Brushing teeth 2x/day, including the tongue is important. The Niagara Region Public Health Dental Program offers free programs and services to children and youth 17 years of age and younger. These services include dental screening; fluoride treatments; cleaning (scaling and polishing) as well as sealants.

Choosing to be Tobacco-Free

The large majority (92%) of teenagers choose to be tobacco-free. There are many reasons to be tobacco-free such as looking and feeling healthy, preventing heart and lung disease, preventing mouth and other types of cancer, keeping sense of smell and taste, protecting others around you from secondhand smoke, and not wanting to be addicted to a deadly product.

Chew tobacco, e-cigarettes and flavoured tobacco products are not safe alternatives to smoking cigarettes. These products are targeted towards youth by using flavouring and coloured packaging. Cancer shouldn't come in a candy wrapper. Don't get hooked by tobacco companies and choose to remain tobacco-free.

Male Reproductive Organs

Internal Organs

Cowper's glands

They 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).

Resources

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

Physical & Health Education Canada. *Always Changing*. (Retrieved from: https://phecanada.ca/programs/always-changing_)

References

Alberta Health Services. *Teaching Sexual Health*. (Retrieved from: www.teachingsexualhealth.ca)

Society of Obstetricians and Gynaecologists of Canada, Sex & U. *Puberty*. (Retrieved from: <http://www.sexandu.ca/your-body/puberty/>)

Ontario Student Drug Use and Health Survey (OSDUHS) 2015: (Retrieved from: http://www.camh.ca/en/research/news_and_publications/ontario-student-drug-use-and-health-survey/Pages/default.aspx)