

deciding to wait



No matter what you've heard, read, or seen, not everyone your age is having sex, including oral sex and intercourse. In fact, more than half of all teens choose to wait until they're older to have sex. If you have already had sex but are unsure if you should again, then wait before having sex again.

New feelings

Being physically attracted to another person and trying to figure out how to deal with these feelings is perfectly normal. Kissing and hugging are often accompanied by really intense sexual feelings. These feelings may tempt you to "go all the way."

Before things go too far, try asking yourself the following questions:

- Do I really want to have sex?
- Is this person pressuring me to have sex?
- Am I ready to have sex?
- What will happen after I have sex with this person?

Remember, you can show how you feel about someone without having sex (being abstinent) with him or her.

Can you be sexual without having sex?

Yes. Being sexual can mean

- Spending romantic time together
- Holding hands, kissing, or cuddling

Are you ready?

Ask yourself the following questions:

- How do you feel when you are with this person?
- Is this person kind and caring?
- Does this person *respect* you and your opinions?
- Have you talked together about whether to have sex?
- Have you talked together about using some form of protection like condoms to prevent infections, and using condoms or other forms of protection to prevent pregnancy?
- Will you stay together even if one of you does not want to have sex?
- Do you know if your partner has *ever had sex with other people*?
- Do you feel pressured to have sex just to please your partner?

If you and your partner find it hard to talk about sex, it might be a sign that you are not ready to have sex. Open and honest communication is important in any relationship, especially one that involves sex.

Know the risks

It's normal for teens to be curious about sex, but deciding to have sex is a big step.

Sex does increase your chances of becoming pregnant, becoming a teen parent, and getting a sexually transmitted infection (STI), and it may affect the way you feel about yourself or how others feel about you.

Some things to think about before you have sex are

- What would *your parents* say if you had sex?
- Are you ready to be a parent?
- Could you handle being told that you have an STI?
- Do you know where to go for birth control methods?
- How would you feel if your partner tells you *it's over after you have sex*?
- How would you feel if your partner tells people at school the two of you had sex?
- How would you handle feeling guilty, scared, or sad because you had sex?

Set your limits

If you don't want to have sex, set limits before things get too serious. Never let anyone talk you into doing something you don't want to do. Boys and girls need to understand that forcing someone to have sex is wrong.

Stick by your decision

If you don't know what to say, here are some suggestions.

- "I like you a lot, but I'm just not ready to have sex."
- "You're really fun to be with, and I wouldn't want to ruin our relationship with sex."
- "You're a great person, but sex isn't how I prove I like someone."
- "I'd like to wait until I'm older before I make the decision to have sex."

Remember, "no" means "no"—no matter how far you go. If you feel things are going too far sexually, tell your partner to stop.

Better safe than sorry

If you choose to wait to have sex, try to avoid

- Being alone with the same person too often. Spending time with your other friends is important too.
- Giving someone the wrong idea. Stick to your limits. It's also not a good idea for you to kiss a lot or go too far sexually if you don't really want to have sex.

- Using alcohol or drugs. Both of these *affect your judgment*, which may make it hard to stick to your decision not to have sex.
- Giving in to the pressure. It may be tempting to keep up with the crowd, but keep in mind that they may not be telling the truth.

Why wait?

People who wait until they are older to have sex usually find out that it's

- More *special*
- More satisfying
- Less risky to their health
- Easier to act responsibly and take precautions to avoid infections and pregnancy
- More accepted by others

Be patient. At some point, you will be ready for sex. Move at your own pace, not someone else's.

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The information contained in this publication should not be used as a substitute for the medical care and advice of your pediatrician. There may be variations in treatment that your pediatrician may recommend based on individual facts and circumstances.

From your doctor

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get fit, stay healthy



Being fit means you're in **good shape**, you have *energy*, you're active, and you don't get tired easily during the day. Most people who are fit also **feel pretty good** about themselves.

Any type of regular, physical activity can **improve your fitness and your health**—even walking, climbing up a flight of stairs, or mowing the lawn. The most important thing is that you **keep moving!**

Feel better, look better

There are a lot of **benefits** to being physically active. It can help

- **Keep you at a healthy weight.** This doesn't necessarily mean being thin. Everybody's ideal weight is different—it depends on your **height and body size**. Ask your pediatrician what the right weight is for you.
- **Prevent heart disease.** Heart disease is the **leading cause of death** in the United States. Research has shown that the risk factors for heart disease start during childhood. A lack of physical activity is one of the major risk factors of heart disease.
- **Strengthen your bones. Regular exercise keeps bones healthy** and can help prevent a bone disease called osteoporosis. This disease is common in older people and causes bones to break easily.
- **Reduce stress.** We all have stress, but learning to **cope** with it is an important way to stay healthy. Many things can cause stress like problems with parents or friends or the pressures of school. Major things like moving to a new home or breaking up with someone can also cause stress. **Exercise can help you relax** and helps your body handle stress.

Total fitness

To **be fit**, you might find it helpful to work on all aspects of fitness, including the following:

Aerobic endurance—This is how well your heart, lungs, and blood vessels provide oxygen and nutrients throughout your body. When you exercise, you **breathe harder** and your **heart beats faster**. This helps your body get the oxygen it needs. If you are not fit, your heart and lungs have to work extra hard, even to do everyday things like walking up the stairs.

Body fat—How much you weigh is not the only way to tell if you are overweight. It's actually determined by your body mass index (BMI), which includes **your weight and height** and gives an idea of **how much of your body weight comes from fat**. People who are overweight have more body fat in relation to the amount of bone and muscle in their bodies. Eating too much and not exercising enough can cause you to have too much body fat. Your risk of health problems like diabetes, cancer, high blood pressure, knee and back pain, and heart attacks is increased when you're overweight.

Muscle strength and endurance—This is the amount of work and the amount of time that your muscles are able to do a certain activity before they get tired. **The more fit you are, the longer you are able to play a sport**, work out, or do other activities before you have to stop.

Flexibility—This is how well you can **move and stretch** your joints, ligaments, and muscles through a full range of motion. For example, people with good flexibility can bend over and touch the floor easily. Poor flexibility may increase the risk of getting hurt during athletic and everyday activities.

What can I do to become more fit?

Just do it! Make the commitment and **stick to it**. Exercise should be a regular part of your day, like brushing your teeth, eating, and sleeping. It can be in gym class, joining a sports team, or working out on your own.

Stay positive and have fun. A **good mental attitude** is important. Find an activity that you think is fun. You are more likely to keep with it if you choose something you like. A lot of people find it's more fun to **exercise with someone** else, so see if you can find a friend or family member to be active with you.

Take it one step at a time. Small changes can add up to better fitness. For example, walk or *ride your bike to school* or to a friend's house instead of getting a ride. Get on or off the bus several blocks away and walk the rest of the way. **Use the stairs** instead of taking the elevator or escalator.

Get your heart pumping. Whatever you choose, make sure it includes aerobic activity that makes you breathe harder and increases your heart rate. This is the **best type of exercise** because **it increases your fitness level** and makes your heart and lungs work better. It also **burns off body fat**. Examples of aerobic activities are basketball, running, or swimming. (See the Fitness Activity Chart at the end of this brochure for more ideas.)

Don't forget to warm up with some easy exercises or mild stretching before you do any physical activity. This warms your muscles up and may help **protect against injury**. Stretching makes your muscles and joints **more flexible** too. It is also important to stretch out *after* you exercise to cool down your muscles.

How often should I exercise?

Your goal should be to do some type of exercise **every day**. It is best to do some kind of aerobic activity without stopping for at least **20 to 30 minutes** each time. Do the activity as often as possible, but don't exercise to the point of pain.

Like all things, **exercise can be overdone**. You may be exercising too much if

Is it safe to train with weights?

Strength training, also called “weight training” or “resistance training,” is an activity in which you use free weights, weight machines, resistance bands, or even your own weight to increase **muscle strength** and muscle endurance. The goal is **not to bulk up**, but to build strength and coordination. Do not focus on how much weight you are lifting, but rather on doing the exercises slowly and safely. When done correctly, this can be a great way to increase your strength and fitness.

Start with light weights and use smooth, controlled motions. Increase the number of times you lift the weight (repetitions) gradually. Avoid strength training more than 3 times per week and make sure you have **a day of rest in between** each workout. Too much weight training can be harmful and there are no extra benefits to strength training more often.

Safety measures should be taken during strength training. Most strength training injuries happen when exercises are not done correctly, when too much weight is lifted, or when there is no adult supervision.

Weight training isn't the same as weight lifting, power lifting, and body building. Avoid these activities until your body has reached full adult development (usually after the age of 18) because these sports can result in serious injury. Ask your pediatrician when it is a good time for you to start.

- Your **weight falls** below what is normal for your age, height, and build.
- It starts to **get in the way** of school and your other activities.
- You start to have bone, joint, or muscle **pain** that affects your daily activities.
- You are a **girl** and your periods become irregular, sporadic, or stop completely.

If you notice any of these signs, **talk with your parents or pediatrician** before health problems occur.

A healthy lifestyle

In addition to exercise, making **just a few other changes** in your life can help keep you healthy, such as

- **Watch less TV** or spend less time playing computer or video games. (Use this time to exercise instead!) Or exercise while watching TV (for example, sit on the floor and do sit-ups and stretches; use hand weights; or use a stationary bike, treadmill, or stair climber).

- Eat 3 **healthy meals** a day, including at least 4 servings of **fruits**, 5 servings of **vegetables**, and 4 servings of **dairy products**.
- Make sure you **drink plenty of fluids** before, during, and after any exercise (water is best but flavored sports drinks can be used if they do not contain a lot of sugar). This will help replace what you lose when you sweat.
- Stop drinking or drink fewer regular soft drinks.
- **Eat less junk food** and fast food. (They're often full of fat, cholesterol, salt, and sugar.)
- Get 9 to 10 hours of **sleep** every night.
- **Don't smoke** cigarettes, **drink** alcohol, or **do** drugs.

Fitness Activity Chart

Activity	Calories Burned During 10 Minutes of Continuous Activity	
	77-lb Person	132-lb Person
Basketball (game)	60	102
Cross Country Skiing	23	72
Biking (9.3 mph)	36	60
Judo	69	118
Running (5 mph)	60	90
Sitting (complete rest)	9	12
Soccer (game)	63	108
Swimming (33 yd)		
Breaststroke	34	58
Freestyle	43	74
Tennis	39	66
Volleyball (game)	35	60
Walking		
2.5 mph	23	34
3.7 mph	30	43

Modified from Bar-Or O. *Pediatric Sports Medicine for the Practitioner*. New York, NY: Springer-Verlag; 1983: 349–350

Ferguson JM. *Habits, Not Diets*. Palo Alto, CA: Bull Publishing Co; 1988

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DEDICATED TO THE HEALTH OF ALL CHILDREN™

Always Remember

Wear your safety belt.

Statistics show safety belts save lives – and most crashes occur within 10 miles of home – so even if you're just running to the store, buckle yourself in.

Need another reason to buckle up? Missouri's Graduated Driver's License Law requires all drivers holding a permit or an intermediate license – and all passengers – to wear a safety belt at all times when operating a motor vehicle. If you're driving, never pack more people into the car than there are safety belts to restrain them.

Don't drink and drive.

Underage drinking is against the law. It is illegal for anyone under 21 to purchase, possess or consume ANY amount of alcohol in ANY situation. Under Missouri's Zero Tolerance Law, your license will be suspended if you're caught driving with even a trace of alcohol in your system – that means less than one drink can put you over the limit.

Some tips:

- Whatever you do, DO NOT attempt to drive yourself home, even if you think you're okay.
- Ask a friend who hasn't had any alcohol to give you a ride. A designated driver is the person who has had NO alcohol.
- If you and all your friends have been drinking, call a parent, older sibling or even a cab. Everyone will be glad you chose the safe way home.
- If you've been drinking at a friend's house, staying where you are is always safer than gambling with your own life and the lives of others.
- See a friend stumbling to their car? Get their keys and find them a safe way home. You could be saving their life.



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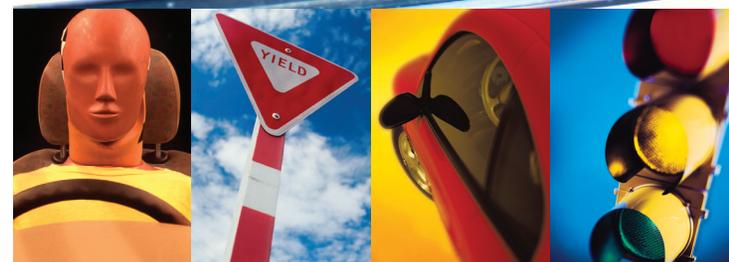
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Getting There

Strategies for Young Drivers



HS11.086

**ARRIVE
ALIVE**

Rules of the Road

Traffic crashes are the leading cause of death for people 15 to 20 years old.

Some of the leading causes of these crashes are:

- Exceeding the speed limit or traveling too fast for road conditions,
- Inattention – distractions that take your attention away from the roadway
- Not staying on your side of the roadway or not utilizing appropriate lanes of traffic for turning
- Drinking and driving, and
- Nonuse of safety belts.

Obey the speed limit.

Speeding is a major cause of traffic crashes. You should always obey the posted speed limit. More drivers are convicted of speeding than any other offense.

Remember, this will affect your ability to apply for your full license under “graduated drivers licensing” and can also affect your insurance rates.

Some important things to remember about your driving speed:

- Always drive at a safe speed. The speed limit is the maximum speed allowed under normal conditions. Adjust your speed to take into account your driving ability, the capability of your vehicle, the roadway and weather conditions.
- Slow down in rain, fog, snow and ice, and keep at least twice the normal stopping distance between you and the vehicle in front of you.
- Slow down when approaching curves, intersections, downhill grades, heavy traffic and work zones.



Give driving your full attention.

Distracted drivers are more likely to be involved in a traffic crash. You can be distracted by anything that takes your attention away from the task of driving.

Some tips:

- Pull off of the road to find a safe place to talk on the cell phone or look for items in the vehicle.
- Program radio stations or make CD selections before you get on the road.
- Do not let others ride with you if they distract you.
- Never read while you are driving.
- Plan your trip before you leave and get directions to your destination.
- Do not put on makeup, shave or eat while driving.

Lane usage and turns.

Many traffic crashes occur because people do not stay on their side of the roadway or they make turns incorrectly.

Some tips:

- Make sure you are in a legal passing zone before passing another vehicle. It is illegal to pass on the right or the shoulder of the roadway.
- Use turn signals about 100 feet before the turn or intersection and when changing lanes.
- Make sure your vehicle is in the proper lane for turning. Do not cross over into another lane of traffic.
- Slow down appropriately (or stop, if it's required) before making a turn.
- Pay attention to your lane position, keeping your vehicle in the center of your lane.
- Do not pass on hills, curves or at intersections.



Bad weather brings extra driving dangers. In bad weather, remember to:

- Turn on your headlights. Headlights aren't just to help you see, they help other drivers see you. Missouri law requires the use of headlights anytime the weather conditions necessitate use of the motor vehicle's windshield wipers to see clearly, during periods of fog or under other low-visibility conditions.
- Double the distance you normally leave between you and the next car. You'll need more space to stop suddenly on slick roads.
- When driving on slippery surfaces like ice or snow, use gentle pressure on the accelerator pedal when starting. If your wheels start to spin, let up on the accelerator until your tires regain traction.
- Don't use cruise control when driving in wet or snowy conditions.

Human papillomavirus (HPV) is a virus that can lead to genital warts and various forms of cancer, including those of the cervix and other reproductive organs. Although most people don't know it, the virus can also cause cancers of the head and neck. HPV is the most common sexually transmitted infection in the United States and around the world; in fact, each year, 300,000 women die from cervical cancer caused by HPV.

Q. What is human papillomavirus?

A. Human papillomavirus (HPV) is a family of viruses that commonly infect the genital area and lining of the cervix. Some types of HPV infect the genital areas of men and women, causing warts. Genital warts can be unsightly and emotionally debilitating. Other types of HPV cause cervical cancer, as well as other cancers of the reproductive organs. On occasion, HPV infections can lead to cancers of the head and neck.

Q. How common is HPV?

A. HPV is the most common sexually transmitted infection in the United States and around the world. More than half of sexually active people will be infected with HPV at some time in their lives. Twenty million Americans are currently infected with HPV, and another 6 million become infected every year. Half of those newly infected with HPV are between 15 and 24 years of age.

Q. Is HPV dangerous?

A. Yes. Most of the time, HPV goes away on its own and doesn't cause any health problems. But sometimes HPV can linger and lead to cancer. Every year in the United States, approximately 25,000 men and women develop cancers caused by HPV. Cervical cancer is one of the most common cancers in women, killing about 300,000 every year worldwide.

Q. How do you get HPV? How can you avoid it?

A. HPV in the genital area is passed from one person to another through genital contact, most often, but not always, during sex. The best way to avoid HPV infection is to abstain from any sexual activity. You can also lower your chance of getting HPV by having sex with only one person who isn't infected with HPV. But most people who have HPV don't know they have it, so it can be hard to avoid. Although condoms are recommended as a way of decreasing sexually transmitted infections, they don't offer complete protection against HPV.

Q. Can't I avoid cervical cancer by getting routine Pap tests?

A. Not always. Once, cervical cancer was the most common cause of U.S. cancer deaths. The Pap test changed that. HPV infection causes changes in the cervix that can result in cancer. The Pap test is performed by scraping cells from the cervix and examining them to see whether they show changes consistent with the early development of cancer (called precancerous changes). If these changes are detected, the doctor can perform surgery on the affected areas before cancer develops. Typically, the length of time from infection with HPV to development of cervical cancer is decades. So, although most HPV infections occur in teenagers and young adults, cervical cancer is more common in women during their 40s and 50s.

The Pap test is one of the most effective cancer screening tests and has dramatically reduced the incidence of cervical cancer in the United States. But the test isn't entirely predictive of cancer, and not all women get tested as often as they should. Further, the Pap test will not detect cancer caused by HPV in areas other than the cervix.

Q. Is there a vaccine to prevent HPV?

A. Yes. There are three vaccines to prevent HPV; they differ in the number of types of HPV that they protect against. The older versions, Cervarix® and Gardasil®, protect against two and four HPV types, respectively. The newest version, Gardasil® 9, protects against nine types of HPV. Studies in thousands of girls and young women found the vaccines to be safe and effective in preventing persistent infections caused by HPV. Studies in boys and young men found that the HPV vaccines known as Gardasil were safe and prevented anal and genital warts. All three vaccines are given as a series of three shots. The second shot is given one or two months after the first, and the third shot is given six months after the first. People who got one or two doses of HPV vaccine can finish the doses with the new Gardasil 9 vaccine if it is available.



more ▶

Human Papillomavirus: What you should know

Q. Who should get the HPV vaccine?

A. The HPV vaccine is recommended for all boys and girls between 11 and 12 years of age. The vaccine can be given to those as young as 9 years of age. It is also recommended for all teenagers and adults between 13 and 26 years of age if they did not get the vaccine when they were younger. Since girls were originally the only ones recommended to get the vaccine, some people wonder why boys are now recommended to get the vaccine also. First,



because boys can get genital warts as well as cancer caused by HPV, they will benefit from receiving the HPV vaccine; in fact, about one-third of the cancers caused by HPV occur in males. Second, by immunizing boys, they will be less likely to transmit the virus to their sexual partners. Finally, studies in boys lagged behind those in girls, but the vaccine has now been shown to be safe and effective in boys as well.

Q. Why is the vaccine recommended for adolescents when it protects against a sexually transmitted disease?

A. Although most 11- and 12- year olds are not sexually active, it is important to get the vaccine at that age for a few reasons. First, studies have shown that the vaccine is more protective when it is received at an earlier age. Second, in order to have the best protection, all three doses should be completed before sexual activity begins and the series takes at least six months to complete. Third, logistically, teens get busier as they get older, so it is often easier to get the three doses completed at the younger age. Finally, because studies indicate that the protection is long-lasting, delaying the vaccine provides no benefit and only increases the risk of cancer.

Q. How is the HPV vaccine made?

A. The HPV vaccine is made using a protein from the surface of the virus. Gardasil protects against four or nine different types of HPV, and Cervarix protects against two types. Both protect against the types of HPV that most commonly cause cervical cancer, but only the Gardasil versions protect against the most common causes of genital warts. For this reason, only Gardasil is approved for use in boys.

Q. Is the HPV vaccine safe?

A. Yes. Because the HPV vaccine is made using only a single protein from each type of the virus, it can't cause HPV and, therefore, can't cause cervical cancer or other cancers. The most common side effect of the vaccine is redness and tenderness at the injection site. The vaccine may also cause a slight fever. Because people of the age group recommended to get the HPV vaccine might faint, it is recommended they remain at the doctor's office for about 15 minutes after receiving this or other vaccines. Although adverse events such as blood clots, neurological damage and death have been reported following receipt of the HPV vaccine, scientific studies have found these events were not caused by the vaccine.

Q. Do young women who get the HPV vaccine still need to get Pap tests?

A. Yes. Because the HPV vaccine does not protect against all HPV types that cause cervical cancer, women should continue to be screened with routine Pap tests.

Q. Do women who have received the HPV vaccine still need to worry about sexually transmitted infections?

A. Yes. The HPV vaccine does not prevent other sexually transmitted infections such as syphilis, gonorrhea, chlamydia and herpes. Also, the vaccine doesn't protect against all HPV types.

Q. Do people who got the HPV vaccine already need to get any doses of the new Gardasil 9 vaccine?

A. At this time, additional doses of the vaccine are not routinely recommended. However, some individuals may wish to have the additional protection afforded by this version. Such individuals should discuss the relative benefits with their healthcare provider.

For additional information about
HPV disease and vaccination,
visit www.prevent-HPV.org.

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 VACCINE EDUCATION CENTER

This information is provided by the Vaccine Education Center at The Children's Hospital of Philadelphia. The Center is an educational resource for parents and healthcare professionals and is composed of scientists, physicians, mothers and fathers who are devoted to the study and prevention of infectious diseases. The Vaccine Education Center is funded by endowed chairs from The Children's Hospital of Philadelphia. The Center does not receive support from pharmaceutical companies.

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making healthy

decisions about sex:

important information for teens



Before you decide to have sex or if you are already having sex, you need to know how to stay healthy. Even if you think you know everything you need to know about sex, take a few minutes and read on. Your doctor wants to make sure you know the facts.

Important reminders

- No one should ever be forced to have sex! If you are ever forced to have sex, it's important to never blame yourself and to tell an adult you trust as soon as possible.
- Not using alcohol and drugs will help you make clearer choices about sex. Too many young people have sex without meaning to when they drink alcohol or use drugs.

Are you ready for sex?

Sex can change your life and relationships. Having sex may affect the way you feel about yourself or how others feel about you.

Many teens believe waiting until they are ready to have sex is important. The right time is different for each teen. For example, some teens may want to wait until they are older (adults); other teens may want to wait until they feel their relationship is ready.

You may feel that your relationship is ready when

- You can be completely honest and trust the other person, and the other person can trust you.
- You can talk with the person about difficult topics, such as feelings, other relationships, and if the person has had a sexually transmitted infection (STI).
- You can be responsible, protecting yourself and your partner against STIs and pregnancy with condoms and birth control.
- You can respect the other person's decisions about not having sex and about using protection.

However, if you are in love or really like someone, you may ignore the signs of an unhealthy relationship. The following signs mean your relationship is *not* ready for sex:

- Your partner is jealous or possessive. For example, your partner prevents you from spending time with your family or other friends, texts or instant messages you constantly, or checks your cell phone to see who you are talking with.
- Your partner pressures you to have sex and refuses to see your point of view.
- Your partner manipulates you by either bullying you or threatening to hurt himself if you end the relationship.

Why wait?

There's nothing wrong if you decide to wait. Not everyone is having sex. Half of all teens in the United States have never had sex. If you decide to wait, stick with your decision. Plan ahead how you are going to say no so you are clearly understood. Stay away from situations that can lead to sex.

Here are reasons why waiting to have sex makes sense.

- Sex can lead to pregnancy. Are you ready to be pregnant or become a teenaged parent? It's a huge responsibility. Are you able to provide food, clothing, and a safe home for your baby?
- Sex has health risks. A lot of infections can be spread during sex. Sexually transmitted infections include chlamydia, gonorrhea, hepatitis B, herpes, HIV (the virus that causes AIDS), human papillomavirus (HPV), or syphilis.
- Sex can lead to emotional pain and distractions. You may feel sad or angry if you let someone pressure you into having sex when you're not really ready. You also may feel sad or angry if you choose to have sex but your partner leaves you. Your partner may even tell other people that you had sex with her.

How can you prevent getting an STI?

Nothing works perfectly to prevent STIs except abstinence (no sex). However, if you're going to have sex, using condoms is the best way to reduce the risk for getting STIs. You can also get a vaccine to protect against HPV.

Remember to use a latex condom every time you have sex—no matter what other type of birth control you and your partner might also use. To protect against getting an infection from having oral sex, use a condom, dental dam, or non-microwavable plastic wrap. Your doctor can explain all these things to you.

To make sure you stay healthy, get regular medical checkups. If you have had sex in the past or are having sex, your doctor may recommend testing for STIs.

What do you need to know about condoms?

- Condoms work best when used correctly.
- Most teens use male latex condoms. Buy the type with a reservoir (nipple) at the tip to catch semen, if available. Female condoms are another option. Never use a male and female condom at the same time; they might tear.
- Follow the instructions on the package to make sure you are using them the right way.
- Check the expiration date on the package. Don't buy or use expired condoms.
- You can carry condoms with you at all times, but do not store them where they will get hot (such as in the glove compartment of a car). Heat can damage a condom.
- The following additional tips about using male condoms are from the "Condom Fact Sheet In Brief" published by the Centers for Disease Control and Prevention.
 - Use a new condom for every act of vaginal, anal, and oral sex throughout the entire sexual act (from start to finish). Before

any genital contact, put the condom on the tip of the erect penis with the rolled side out.

- If the condom does not have a reservoir tip, pinch the tip enough to leave a half-inch space for semen to collect. Holding the tip, unroll the condom all the way to the base of the erect penis.
- After ejaculation and before the penis gets soft, grip the rim of the condom and carefully withdraw. Then gently pull the condom off the penis, making sure that semen doesn't spill out.
- Wrap the condom in a tissue and throw it in the trash where others won't handle it.
- If you feel the condom break at any point during sexual activity, stop immediately, withdraw, remove the broken condom, and put on a new condom.
- Ensure that adequate lubrication is used during vaginal and anal sex, which might require water-based lubricants. Oil-based lubricants (ie, petroleum jelly, shortening, mineral oil, massage oils, body lotions, and cooking oil) should not be used because they can weaken latex, causing breakage.

What types of birth control are effective?

Talk with your doctor about birth control. Your doctor can answer questions about safe and effective methods, side effects, and costs. Here are some forms of birth control (all types for females; condoms for males) from most effective to least effective at preventing pregnancy.

- **Intrauterine devices (IUDs).** IUDs are small T-shaped devices placed inside the uterus by a doctor. They are highly effective at preventing pregnancy and may also be prescribed to help decrease menstrual bleeding and pain. The copper IUD contains a small amount of natural copper and prevents pregnancies for up to 10 years. There are 2 levonorgestrel IUDs, both of which contain a hormone and prevent pregnancy for 3 to 5 years depending on which one is used. Intrauterine devices when used as prescribed are about 99% effective in preventing pregnancy.
- **Contraceptive implant.** A contraceptive implant is a tiny flexible rod that a doctor puts under your skin in your upper arm. It slowly releases a hormone that prevents pregnancy for 3 years. A contraceptive implant when used as prescribed is about 99% effective in preventing pregnancy.
- **Contraceptive injection.** Depo-Provera is a shot given every 3 months. It's effective, and you don't have to remember to take a daily pill. The contraceptive injection when used as prescribed is 99% effective in preventing pregnancy. However, when used typically (eg, women may occasionally forget to get a shot exactly on time), it is 94% effective in preventing pregnancy.
- **Birth control pills, patch, and ring.** "The pill," the birth control patch, and the ring all contain 2 hormones, an estrogen and a progestin.
 - **Birth control pill.** You take one pill each day. Birth control pills when used as prescribed are about 99% effective in preventing pregnancy. However, when used typically (eg, women may occasionally forget to take a pill), they are 91% effective in preventing pregnancy.
 - **Birth control patch.** The birth control patch is an adhesive patch that is placed on the skin. You wear the patch 3 weeks,

remove the patch for 1 week, put on a new patch at the end of the fourth week, and repeat these steps. The birth control patch when used as prescribed is about 99% effective in preventing pregnancy. However, when used typically (eg, women may occasionally forget to replace the patch on time), it is 91% effective in preventing pregnancy.

- **Birth control ring.** You insert the birth control ring in your vagina, it stays in for 3 weeks, you remove it for 1 week, and you put in a new one at the end of the week. The birth control ring when used as prescribed is about 99% effective in preventing pregnancy. However, when used typically (eg, women may occasionally forget to put in a new birth control ring on time), it is 91% effective in preventing pregnancy.
- **Condoms.** Male condoms used the right way have about a 98% chance of preventing pregnancy, and female condoms have a 95% chance, but they must be used each time you have sex and used correctly. When they are not used correctly, male condoms may only have an 82% chance of preventing pregnancy, while female condoms may only be effective 79% of the time.

What are other types of birth control?

The following types of birth control are less common and not as effective at preventing pregnancy:

- **Withdrawal.** The male "pulls out" before he ejaculates or "cums." It does not prevent pregnancy or STIs. Even a small amount of sperm can lead to pregnancy or an STI.
- **The "rhythm method."** You avoid having sex during certain times of your monthly cycle. Because teens tend to have more irregular periods, this method is less effective at preventing pregnancy.
- **Spermicides.** These are creams and foams used during sex to kill sperm. They may add protection to other methods but are not effective when used alone.

What is emergency contraception?

Emergency contraception (EC) is a form of birth control that you use *after* you have unprotected sex. Unprotected sex includes not using birth control, condoms breaking during sex, or forgetting to take birth control pills.

- Emergency contraception can be taken up to 5 days after sex but is most effective when taken as soon as possible after sex.
- You can buy EC pills over the counter and no longer need to show proof of age. The types of EC pills available over the counter are levonorgestrel at 1.5 mg (eg, Plan B One-Step or Next Choice One Dose).
- Another type of EC pill is ulipristal acetate 30 mg (eg, Ella), which you can only get with a prescription.
- A doctor can also put in a copper IUD that will provide both EC and regular birth control.

Resources

Center for Young Women's Health
www.youngwomenshealth.org

The Emergency Contraception Web Site
<http://ec.princeton.edu> or www.not-2-late.com

National Campaign to Prevent Teen and Unplanned Pregnancy
www.stayteen.org and www.bedsider.org

Sex, Etc. (by Answer, Rutgers University)

<http://sexetc.org>

Young Men's Health

www.youngmenshealthsite.org

Remember

If you decide to have sex, it's important that you know the facts about birth control, infections, and emotions. Decisions of when to become sexually active, how to protect yourself from STIs, and how to prevent pregnancy are yours. These are important decisions and are worth talking about with adults who care about you, including your doctor.

For more information, visit the official American Academy of Pediatrics Web site for parents, HealthyChildren.org.

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A Message to Parents of Teen Drivers

Traffic crashes are the leading cause of death for teens and young adults. More than 5,500 young people die every year in car crashes and thousands more are injured. Parents can play an important role in reducing these numbers and keeping their teens alive.

The following are ways you can help keep teens safe on the road:

- **Be a role model.** If you expect your teen to drive safely, you need to drive safely, too.
 - Always wear your seat belt.
 - Don't drink and drive. Never allow any alcohol or illegal drugs in the car.
 - Don't eat, drink, talk or text on your cell phone, or do anything else that could distract you from your driving.
 - Stay within the speed limit and obey all traffic signals.
- **Know the laws in your state.** It is important that you know and understand the graduated driver licensing (GDL) laws where you live. Specifically, you need to know the restrictions and limitations on teen drivers who have permits and provisional licenses. You must also learn about your own legal responsibilities for providing a good supervised driving experience for your teen.
- **Set specific rules.** Before you let your teen drive, set specific rules that must be followed (see Parent-Teen Driving Agreement handout).
 - At first, the restrictions you set should be strict. You can gradually relax the rules after your teen has demonstrated safe driving. And the rules you set should depend on the maturity level of your teen.
 - Because so many crashes occur in the first 6 months of unsupervised driving, your teen shouldn't drive teen passengers or drive after 9:00 pm at first. And don't ask your teen to give rides to younger siblings until he or she has had extensive driving experience.
 - After your teen has demonstrated safe driving for 6 months, you might allow 1 passenger and a later curfew (for example, 10:00 pm). Before allowing more passengers, keep in mind that more passengers may make it more likely that your teen will have a crash. Studies show that 1 passenger increases the risk of a crash by 40%, 2 passengers doubles the risk, and 3 passengers almost quadruples the risk.
- **Enforce strict penalties.** Generally, penalties for breaking the contract should match the seriousness of the rule broken. Punishments for reckless driving, such as speeding or drunk driving, should be strict and may involve loss of driving privileges.

- **Take your teen on the road.** The 6 hours of driving practice in many driver education programs is not enough. Your teen needs a lot more supervised driving practice, and some nighttime driving is important, too. Some states require 50 hours of supervised practice. There are books, videos, and classes for parents on how to teach teen drivers. Remember that you'll probably need a lot of patience.
- **Contact the doctor if your teen is taking medicine** for attention-deficit/hyperactivity disorder (ADHD). The doctor can discuss with you and your teen the possible benefits of taking a short-acting medicine prior to driving at night. Evidence shows that medicine helps the teen driver with ADHD stay better focused and less distracted.
- **Check out the car.** Make sure the car your teen is driving is safe and in good condition. If your teen is buying a car, help your teen research safety ratings and find a mechanic to inspect the car. Air bags and lap-shoulder belts in the rear seat are important safety features.
- **Make a tough decision.** If you're concerned that your teen may not be ready to drive, you can prevent your teen from getting a license. All states allow parents to block their teen from getting a license if the teen is thought to be immature or reckless.

For more information

American Academy of Pediatrics

www.aap.org and www.HealthyChildren.org

AAA Foundation for Traffic Safety

www.aaafoundation.org

National Highway Traffic Safety Administration

www.nhtsa.gov

National Safety Council

www.nsc.org

Network of Employers for Traffic Safety

www.trafficsafety.org

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Parent-Teen Driving Agreement

I, _____, will drive carefully and cautiously and will be courteous to other drivers, bicyclists, and pedestrians at all times.

I promise that I will obey all the rules of the road.

- Always wear a seat belt and make all my passengers buckle up.
- Obey all traffic lights, stop signs, other street signs, and road markings.
- Stay within the speed limit and drive safely.
- Never use the car to race or to try to impress others.
- Never give rides to hitchhikers.

I promise that I will make sure I can stay focused on driving.

- Drive with both hands on the wheel.
- Never eat, drink, or use a cell phone to talk or text while I drive.
- Drive only when I am alert and in emotional control.
- Call my parents for a ride home if I am impaired in any way that interferes with my ability to drive safely.
- Always take my medicine on time (if I am taking medicine for ADHD) and not drive if I am unable to focus my attention completely on driving.

I promise that I will respect laws about drugs and alcohol.

- Drive only when I am alcohol and drug free.
- Never allow any alcohol or illegal drugs in the car.
- Be a passenger only with drivers who are alcohol and drug free.

I promise that I will be a responsible driver.

- Drive only when I have permission to use the car and I will not let anyone else drive the car unless I have permission.
- Drive someone else's car only if I have parental permission.
- Pay for all traffic citations or parking tickets.
- Complete my family responsibilities and maintain good grades at school as listed here: _____
- Contribute to the costs of gasoline, maintenance, and insurance as listed here: _____

I agree to the following restrictions, but understand that these restrictions will be modified by my parents as I get more driving experience and demonstrate that I am a responsible driver.

For the next _____ months, I will not drive after _____ pm.

For the next _____ months, I will not transport more than _____ teen passengers (unless I am supervised by a responsible adult).

For the next _____ months, I won't adjust the stereo or air conditioning/heater while the car is moving.

For the next _____ months, I will not drive in bad weather.

I understand that I am not permitted to drive to off-limit locations or on roads and highways as listed here: _____

I agree to follow all the rules and restrictions in this contract. I understand that my parents will impose penalties (see below), including removal of my driving privileges, if I violate the contract. I also understand that my parents will allow me greater driving privileges as I become more experienced and as I demonstrate that I am always a safe and responsible driver.

Penalties for contract violations

- | | |
|--|------------------------------------|
| Drove after drinking alcohol or using drugs | No driving for _____ months. |
| Got ticket for speeding or moving violation | No driving for _____ months. |
| Drove after night driving curfew | No driving for _____ weeks/months. |
| Drove too many passengers | No driving for _____ weeks/months. |
| Broke promise about seat belts (self and others) | No driving for _____ weeks/months. |
| Drove on a road or to an area that is off-limits | No driving for _____ weeks/months. |

Signatures

Driver _____ Date _____

Parent promise: I also agree to drive safely and to be an excellent role model.

Parent (or guardian) _____ Date _____

Parent (or guardian) _____ Date _____

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Teen Suicide, Mood Disorder, and Depression: What Parents Need to Know



Thousands of teens commit suicide each year in the United States. In fact, suicide is the second leading cause of death for 15- to 24-year-olds.

Suicide does not just happen. Studies show that at least 90% of teens who kill themselves have some type of mental health problem, such as depression, anxiety, drug or alcohol abuse, or a behavior problem. They may also have problems at school or with friends or family, or a combination of all these things. Some teens may have been victims of sexual or physical abuse, or bullied via social media. Others may struggle with issues related to gender and sexual identity. Usually they have had problems for some time.

Most teens do not spend a long time planning to kill themselves. They may have thought about it but only decide to do it after an event that produces feelings of failure or loss, such as getting in trouble, having an argument, breaking up with a partner, or receiving a bad grade on a test.

Why do most teens kill themselves?

Most teens who kill themselves have a **mood disorder** (bipolar disorder or depression). A mood disorder is an illness of the brain. It can come on suddenly or be present on and off for most of a teen's life. A teen with a mood disorder may be in one mood for weeks or months or switch quickly from one feeling to another.

Teens with **bipolar disorder**, also called **manic depression**, may change between *mania* (angry or very happy), *depression* (sad or crabby), and *euthymia* (normal mood). Some teens are more manic, some are more depressed, and some seem normal much of the time. Mania and depression can happen at the same time. This is called a *mixed state*.

Teens in a manic or a mixed state may

- Strongly overreact when things do not go their way
- Become hyper, agitated, or aggressive
- Be overwhelmed with thoughts or feelings
- Sleep less
- Talk a lot more
- Act in impulsive or dangerous ways
- Feel they can do things they really can't
- Spend money they do not have or give things away
- Insist on unrealistic plans for themselves or others

Teens with depression may

- Feel sad, down, or irritable, or not feel like doing things
- Have a change in sleeping or eating habits
- Feel guilty, worthless, or hopeless
- Have less energy, or more trouble paying attention
- Feel lonely, get easily upset, or talk about wanting to die
- Lose interest in things they used to enjoy

Mood disorders can be treated. Ask your teen's doctor about treatment options. Recent declines in teen suicide may be due to an increase in early detection, evaluation, and effective treatment of mood disorders.

What are the warning signs of depression, mood disorder, or suicide?

Signs of a mental health problem, such as a mood disorder, or suicidal thoughts or behavior may include

Changes in activities, such as

- A drop in grades or school performance
- Neglecting personal appearance
- Neglecting responsibilities

Changes in emotions, such as

- Appearing or talking about feeling sad, hopeless, bored, or overwhelmed
- Having outbursts, severe anger, or irritability
- Appearing or talking about feeling more anxious or worried

Changes in behavior, such as

- Getting in trouble or being rebellious, aggressive, or impulsive
- Running away or threatening to run away
- Withdrawing from friends or family or changing friends
- Eating or sleeping less or more
- Losing interest in activities
- Using drugs or alcohol
- Hurting oneself, such as cutting or severe dieting
- Talking, writing, or posting information on social media about suicide or death
- Any suicidal behavior, even if it could not have been lethal, such as taking a small amount of pills

Myths and facts

Myth: Teens who kill themselves are obviously depressed.

Fact: It's not always obvious. Parents are sometimes "the last to know" their teens are so depressed and desperate. Teens are often good at hiding their problems. While depressed adults sometimes seem deeply sad and hopeless for quite a while, depressed teens may seem "OK" some of the time as they swing in and out of depression. Some teens don't ever seem extremely depressed, but they are never OK—these teens are also at increased risk of suicide.

Myth: People who talk about suicide or post messages on social media about suicide do not do it.

Fact: Teens who talk about suicide or wanting to "run away," "get away," "disappear," "end it," or "die" are more likely to kill themselves than those who do not. It's important to respond right away, if your teen talks about suicide or death.

Myth: Low-lethality suicide attempts don't need to be taken seriously.

Fact: A low-lethality attempt, such as taking a small number of pills or cutting the wrists, may be followed by behavior that is more lethal. It can be the first obvious sign of deep emotional problems. No suicide attempt should be dismissed, and steps should be taken to prevent future attempts.

Myth: Asking for or seeking help about suicidal thoughts increases the risk of suicide.

Fact: Research shows that asking about suicide and talking about it with a professional does not increase risk and likely reduces it.

Myth: Teens don't really want to kill themselves; they just want attention.

Fact: Sometimes this may be true; however, the behavior can still be lethal. Teens not intending to die may still take too many pills or miscalculate when someone will rescue them.

What you can do

- **Respond quickly if anyone is in danger.** Bring your teen to a hospital emergency department if you are worried he or she may hurt himself or herself or others.
- **Listen to your teen.** This is harder than it sounds. Focus on what your teen is saying and try not to suggest how to "fix" his or her problems. Here are questions you could ask: What is bothering you? Have you been sad or feeling down? Do you ever feel like you want to end it all or wish you could go to sleep and never wake up? Do you ever feel like hurting yourself, like cutting yourself?
- **Be understanding and supportive.** It's often easier to point out faults. Try to be understanding if your teen is "in trouble" or feels very negative about himself or herself. Let him know that however he feels now, you have an overall positive view of who he is and his future. Showing you care and saying "I love you" can go a long way.
- **Get professional help.** Talk with your teen's doctor about treatment, including an evaluation by a child and adolescent psychiatrist or other mental health professional.

- **Remove firearms from the home.** Studies show that even when firearms in the home are locked up, teens there are more likely to kill themselves than those in homes without firearms. A home is safest without firearms. If you must have a gun, make sure the gun is stored unloaded and locked in a safe or with a trigger lock, and bullets are locked in another place.

Remember

Family support and professional treatment can help teens who are at risk of suicide deal with their difficulties and feel better. Current treatments for mood disorders and other mental health problems, such as individual and family counseling, medications, and other therapies, along with long-term follow-up, can be very helpful.

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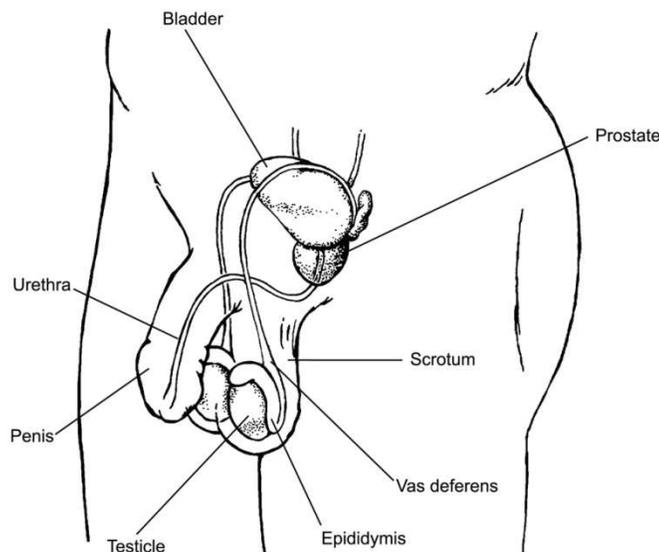
Testicular Cancer

What is testicular cancer?

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other areas of the body. To learn more about how cancers start and spread, see *What Is Cancer?*

Cancer that starts in the testicles is called testicular cancer. To understand this cancer, it helps to know about the normal structure and function of the testicles.

Testicles (also called the *testes*; a single testicle is called a *testis*) are part of the male reproductive system. These 2 organs are each normally a little smaller than a golf ball in adult males and are contained within a sac of skin called the *scrotum*. The scrotum hangs beneath the base of the penis.



Testicles have 2 main functions:

- They make male hormones (androgens) such as testosterone.
- They make sperm, the male cells needed to fertilize a female egg cell to start a pregnancy.

Sperm cells are made in long, thread-like tubes inside the testicles called *seminiferous tubules*. They are then stored in a small coiled tube behind each testicle called the epididymis, where they mature.

During ejaculation, sperm cells are carried from the epididymis through the vas deferens to seminal vesicles, where they mix with fluids made by the vesicles, prostate gland, and other glands to form semen. This fluid then enters the urethra, the tube in the center of the penis through which both urine and semen leave the body.

The testicles are made up of several types of cells, each of which can develop into one or more types of cancer. It is important to distinguish these types of cancers from one another because they differ in how they are treated and in their prognosis (outlook).

Germ cell tumors

More than 90% of cancers of the testicle develop in special cells known as *germ cells*. These are the cells that make sperm. The 2 main types of germ cell tumors (GCTs) in men are:

- Seminomas
- Non-seminomas, which are made up of embryonal carcinoma, yolk sac carcinoma, choriocarcinoma, and/or teratoma

Doctors can tell what type of testicular cancer you have by looking at the cells under a microscope.

These 2 types occur about equally. Many testicular cancers contain both seminoma and non-seminoma cells. These *mixed germ cell tumors* are treated as non-seminomas because they grow and spread like non-seminomas.

Seminomas

Seminomas tend to grow and spread more slowly than non-seminomas. The 2 main subtypes of these tumors are classical (or typical) seminomas and spermatocytic seminomas. Doctors can tell them apart by how they look under the microscope.

Classical seminoma: More than 95% of seminomas are classical. These usually occur in men between 25 and 45.

Spermatocytic seminoma: This rare type of seminoma tends to occur in older men. The average age of men diagnosed with spermatocytic seminoma is about 65. Spermatocytic tumors tend to grow more slowly and are less likely to spread to other parts of the body than classical seminomas.

Some seminomas can increase blood levels of a protein called *human chorionic gonadotropin* (HCG). HCG can be detected by a simple blood test and is considered a tumor marker for certain types of testicular cancer. It can be used for diagnosis and to check how the patient is responding to treatment.

Non-seminomas

These types of germ cell tumors usually occur in men between their late teens and early 30s. The 4 main types of non-seminoma tumors are:

- Embryonal carcinoma
- Yolk sac carcinoma
- Choriocarcinoma
- Teratoma

Most tumors are a mix of different types (sometimes with a seminoma component as well), but this doesn't change the general approach to treatment of most non-seminoma cancers.

Embryonal carcinoma: This type of non-seminoma is present to some degree in about 40% of testicular tumors, but pure embryonal carcinomas occur only 3% to 4% of the time. When seen under a microscope, these tumors can look like tissues of very early embryos. This type of non-seminoma tends to grow rapidly and spread outside the testicle.

Embryonal carcinoma can increase blood levels of a tumor marker protein called *alpha-fetoprotein* (AFP), as well as *human chorionic gonadotropin* (HCG).

Yolk sac carcinoma: These tumors are so named because their cells look like the yolk sac of an early human embryo. Other names for this cancer include yolk sac tumor, endodermal sinus tumor, infantile embryonal carcinoma, or orchidoblastoma.

This is the most common form of testicular cancer in children (especially in infants), but pure yolk sac carcinomas (tumors that do not have other types of non-seminoma cells) are rare in adults. When they occur in children, these tumors usually are treated successfully. But they are of more concern when they occur in adults, especially if they are pure. Yolk sac carcinomas respond very well to chemotherapy, even if they have spread.

This type of tumor almost always increases blood levels of AFP (alpha-fetoprotein).

Choriocarcinoma: This is a very rare and aggressive type of testicular cancer in adults. Pure choriocarcinoma is likely to spread rapidly to distant organs of the body, including the lungs,

bones, and brain. More often, choriocarcinoma cells are present with other types of non-seminoma cells in a mixed germ cell tumor. These mixed tumors tend to have a somewhat better outlook than pure choriocarcinomas, although the presence of choriocarcinoma is always a worrisome finding.

This type of tumor increases blood levels of HCG (human chorionic gonadotropin).

Teratoma: Teratomas are germ cell tumors with areas that, under a microscope, look like each of the 3 layers of a developing embryo: the endoderm (innermost layer), mesoderm (middle layer), and ectoderm (outer layer).

Pure teratomas of the testicles are rare and do not increase AFP (alpha-fetoprotein) or HCG (human chorionic gonadotropin) levels. More often, teratomas are seen as parts of mixed germ cell tumors.

There are 3 main types of teratomas:

- **Mature teratomas** are tumors formed by cells similar to cells of adult tissues. They rarely spread to nearby tissues and distant parts of the body. They can usually be cured with surgery, but some come back (recur) after treatment.
- **Immature teratomas** are less well-developed cancers with cells that look like those of an early embryo. This type is more likely than a mature teratoma to grow into (invade) surrounding tissues, to spread (metastasize) outside the testicle, and to come back (recur) years after treatment.
- **Teratomas with somatic type malignancy** are very rare cancers. These cancers have some areas that look like mature teratomas but have other areas where the cells have become a type of cancer that normally develops outside the testicle (such as a sarcoma, adenocarcinoma, or even leukemia).

Carcinoma in situ of the testicle

Testicular germ cell cancers can begin as a non-invasive form of the disease called *carcinoma in situ* (CIS) or *intratubular germ cell neoplasia*. In testicular CIS, the cells look abnormal under the microscope, but they have not yet spread outside the walls of the seminiferous tubules (where sperm cells are formed). Carcinoma in situ doesn't always progress to invasive cancer.

It is hard to find CIS before it does become an invasive cancer because it generally does not cause symptoms and often does not form a lump that you or the doctor can feel. The only way to diagnose testicular CIS is to have a biopsy (a procedure that removes a tissue sample and looks at it under a microscope). Some cases are found incidentally (by accident) when a testicular biopsy is done for another reason, such as infertility.

Experts don't agree about the best treatment for CIS. Since CIS doesn't always become an invasive cancer, many doctors in the United States consider observation (watchful waiting) to be the best treatment option.

When CIS of the testicle becomes invasive, its cells are no longer just in the seminiferous tubules but have grown into other structures of the testicle. These cancer cells can then spread either to the lymph nodes (small, bean-shaped collections of white blood cells) through lymphatic channels (fluid-filled vessels that connect the lymph nodes), or through the blood to other parts of the body.

Stromal tumors

Tumors can also develop in the supportive and hormone-producing tissues, or stroma, of the testicles. These tumors are known as gonadal stromal tumors. They make up less than 5% of adult testicular tumors but up to 20% of childhood testicular tumors. The 2 main types are Leydig cell tumors and Sertoli cell tumors.

Leydig cell tumors

These tumors develop from the Leydig cells in the testicle that normally make male sex hormones (androgens like testosterone). Leydig cell tumors can develop in both adults and children. These tumors often make androgens (male hormones) but sometimes produce estrogens (female sex hormones).

Most Leydig cell tumors are benign. They usually do not spread beyond the testicle and are cured with surgery. But a small portion of Leydig cell tumors spread to other parts of the body and tend to have a poor outlook because they usually do not respond well to chemotherapy or radiation therapy.

Sertoli cell tumors

These tumors develop from normal Sertoli cells, which support and nourish the sperm-making germ cells. Like the Leydig cell tumors, these tumors are usually benign. But if they spread, they usually don't respond well to chemotherapy and radiation therapy.

Secondary testicular cancers

Cancers that start in another organ and then spread to the testicle are called secondary testicular cancers. These are not true testicular cancers – they are named and treated based on where they started.

Lymphoma is the most common secondary testicular cancer. Testicular lymphoma occurs more often than primary testicular tumors in men older than 50. The outlook depends on the

type and stage of lymphoma. The usual treatment is surgical removal, followed by radiation and/or chemotherapy.

In boys with acute leukemia, the leukemia cells can sometimes form a tumor in the testicle. Along with chemotherapy to treat the leukemia, this might require treatment with radiation or surgery to remove the testicle.

Cancers of the prostate, lung, skin (melanoma), kidney, and other organs also can spread to the testicles. The prognosis for these cancers tends to be poor because these cancers have usually spread widely to other organs as well. Treatment depends on the specific type of cancer.

What are the key statistics about testicular cancer?

The American Cancer Society's estimates for testicular cancer in the United States for 2016 are:

- About 8,720 new cases of testicular cancer will be diagnosed.
- About 380 men will die of testicular cancer.

The incidence rate of testicular cancer has been increasing in the United States and many other countries for several decades. The increase is mostly in seminomas. Experts have not been able to find reasons for this increase. Lately, the rate of increase has slowed.

Testicular cancer is not common; about 1 of every 263 males will develop testicular cancer at some point during his life.

The average age at the time of diagnosis of testicular cancer is about 33. This is largely a disease of young and middle-aged men, but about 7% of cases occur in children and teens, and about 7% occur in men over the age of 55.

Because testicular cancer usually can be treated successfully, a man's lifetime risk of dying from this cancer is very low: about 1 in 5,000. If you would like to know more about survival statistics, see Testicular cancer survival rates.

Visit the American Cancer Society's Cancer Statistics Center for more key statistics.

What are the risk factors for testicular cancer?

A risk factor is anything that changes your chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But having a risk factor, or even several, does not mean that you will get the disease. Just as having no risk factors doesn't mean you won't get the disease. And some people who get the disease may not have had any known risk factors. Even if a person with testicular cancer has a risk factor, it's often very hard to know how much that risk factor contributed to the cancer.

Scientists have found few risk factors that make someone more likely to develop testicular cancer. Even if someone has one or more risk factors for this disease, it's impossible to know for sure how much that risk factor contributes to developing the cancer. Also, most boys and men with testicular cancer do not have any of the known risk factors. Risk factors for testicular cancer include:

- **An undescended testicle**
- **Family history of testicular cancer**
- **HIV infection**
- **Carcinoma in situ of the testicle**
- **Having had testicular cancer before**
- **Being of a certain race/ethnicity**
- **Body size**

These are discussed in more detail below.

Undescended testicle

One of the main risk factors for testicular cancer is a condition called *cryptorchidism*, or undescended testicle(s). This means that one or both testicles fail to move from the abdomen (belly) into the scrotum before birth. Males with cryptorchidism are several times more likely to get testicular cancer than those with normally descended testicles.

Normally, the testicles develop inside the abdomen of the fetus and they go down (descend) into the scrotum before birth. In about 3% of boys, however, the testicles do not make it all the way down before the child is born. Sometimes the testicle remains in the abdomen. In other cases, the testicle starts to descend but remains stuck in the groin area.

Most of the time, undescended testicles continue moving down into the scrotum during the child's first year of life. If the testicle has not descended by the time a child is a year old, it probably won't go down on its own. Sometimes a surgical procedure known as *orchiopexy* is needed to bring the testicle down into the scrotum.

The risk of testicular cancer might be a little higher for men whose testicle stayed in the abdomen as opposed to one that has descended at least partway. If cancer does develop, it is usually in the undescended testicle, but about 1 out of 4 cases occur in the normally

descended testicle. Because of this, some doctors conclude that cryptorchidism doesn't actually cause testicular cancer but that there is something else that leads to both testicular cancer and abnormal positioning of one or both testicles.

Orchiopexy may reduce the risk of testicular cancer if it is done when a child is younger, but it is not as clear if it is helpful if the child is older. The best time to do this surgery is not clear. Experts in the United States recommend that orchiopexy be done soon after the child's first birthday for reasons (such as fertility) that are not related to cancer.

Family history

Having a close blood relative (father or brother) with testicular cancer increases the risk that you will get it, too. But only a small number of testicular cancers occur in families. Most men with testicular cancer do not have a family history of the disease.

HIV infection

Some evidence has shown that men infected with the human immunodeficiency virus (HIV), particularly those with AIDS, are at increased risk. No other infections have been shown to increase testicular cancer risk.

Carcinoma in situ

This condition, described in [What is testicular cancer?](#), often doesn't cause a lump in the testicles or any other symptoms. It isn't clear how often carcinoma in situ (CIS) in the testicles progresses to cancer. In some cases, CIS is found in men who have a testicular biopsy to evaluate infertility or have a testicle removed because of cryptorchidism. Doctors in Europe are more likely than the doctors in this country to look for CIS. This may be why the numbers for diagnosis and progression of CIS to cancer are lower in the United States than in parts of Europe.

Since we don't know how often CIS becomes true (invasive) cancer, it isn't clear if treating CIS is a good idea. Some experts think that it may be better to wait and see if the disease gets worse or becomes a true cancer. This could allow many men with CIS to avoid the risks and side effects of treatment. When CIS is treated, radiation or surgery (to remove the testicle) is used.

Cancer in the other testicle

A personal history of testicular cancer is another risk factor. About 3% or 4% of men who have been cured of cancer in one testicle will eventually develop cancer in the other testicle.

Age

About half of testicular cancers occur in men between the ages of 20 and 34. But this cancer can affect males of any age, including infants and elderly men.

Race and ethnicity

The risk of testicular cancer among white men is about 4 to 5 times that of black men and that of Asian-American men. The risk for American Indians falls between that of Asians and whites. The reason for these differences is not known. Worldwide, the risk of developing this disease is highest among men living in the United States and Europe and lowest among men living in Africa or Asia.

Body size

Several studies have found that tall men have a somewhat higher risk of testicular cancer, but some other studies have not. Most studies have not found a link between testicular cancer and body weight.

Unproven or controversial risk factors

Prior injury or trauma to the testicles and recurrent actions such as horseback riding do not appear to be related to the development of testicular cancer.

Most studies have not found that strenuous physical activity increases testicular cancer risk. Being physically active has been linked with a lower risk of several other forms of cancer as well as a lower risk of many other health problems.

Do we know what causes testicular cancer?

The exact cause of most testicular cancers is not known. But scientists have found that the disease is linked with a number of other conditions, which are described in the section “What are the risk factors for testicular cancer?” A great deal of research is being done to learn more about the causes.

Researchers are learning how certain changes in a cell’s DNA can cause the cell to become cancerous. DNA is the chemical in each of our cells that makes up our genes. Genes tell our cells how to function. They are packaged in chromosomes, which are long strands of DNA in each cell. Most cells in the body have 2 sets of 23 chromosomes (one set of chromosomes comes from each parent), but each sperm or egg cell has only 23 chromosomes. When the sperm and egg combine, the resulting embryo has a normal number of chromosomes in each cell, half of which are from each parent. We usually look like our parents because they are the source of our DNA. But DNA affects more than how we look.

Some genes control when our cells grow, divide into new cells, and die. Certain genes that help cells grow and divide are called *oncogenes*. Others that slow down cell division or make cells die at the right time are called *tumor suppressor genes*. Cancers can be caused by changes in chromosomes that turn on oncogenes or turn off tumor suppressor genes.

Most testicular cancer cells have extra copies of a part of chromosome 12 (called *isochromosome 12p* or *i12p*). Some testicular cancers have changes in other chromosomes as well, or even abnormal numbers of chromosomes (often too many). Scientists are studying these DNA and chromosome changes to learn more about which genes are affected and how this might lead to testicular cancer.

Can testicular cancer be prevented?

Many men with testicular cancer have no known risk factors. And some of the known risk factors, such as undescended testicles, white race, and a family history of the disease, can't be changed. For these reasons, it is not possible now to prevent most cases of this disease.

Experts recommend correcting cryptorchidism in boys for a number of reasons (such as preserving fertility and body image), but it's not clear how much this changes the child's risk for testicular cancer.

Can testicular cancer be found early?

Most testicular cancers can be found at an early stage. In some men, early testicular cancers cause symptoms that lead them to seek medical attention. Most of the time a lump on the testicle is the first symptom, or the testicle might be swollen or larger than normal. But some testicular cancers may not cause symptoms until after they have reached an advanced stage.

Most doctors agree that examining a man's testicles should be part of a general physical exam. The American Cancer Society (ACS) recommends a testicular exam as part of a routine cancer-related checkup.

The ACS advises men to be aware of testicular cancer and to see a doctor right away if they find a lump in a testicle. Because regular testicular self-exams have not been studied enough to show they reduce the death rate from this cancer, the ACS does not have a recommendation on regular testicular self-exams for all men. However, some doctors recommend that all men examine their testicles monthly after puberty.

Each man has to decide for himself whether or not to examine his testicles monthly, so instructions for testicular exams are included in this section. If you have certain risk factors that increase your chance of developing testicular cancer (such as an undescended testicle, previous germ cell tumor in one testicle, or a family history), you should seriously consider monthly self-exams and talk about it with your doctor.

Testicular self-exam

The best time for you to examine your testicles is during or after a bath or shower, when the skin of the scrotum is relaxed.

- Hold your penis out of the way and examine each testicle separately.
- Hold your testicle between your thumbs and fingers with both hands and roll it gently between your fingers.
- Look and feel for any hard lumps or nodules (smooth rounded masses) or any change in the size, shape, or consistency of your testicles.

It's normal for one testicle to be slightly larger than the other, and for one to hang lower than the other. You should also be aware that each normal testicle has a small, coiled tube called the epididymis that can feel like a small bump on the upper or middle outer side of the testis. Normal testicles also contain blood vessels, supporting tissues, and tubes that carry sperm. Some men may confuse these with abnormal lumps at first. If you have any concerns, ask your doctor.

A testicle can get larger for many reasons other than cancer. For example, fluid can collect around the testicle to form a benign condition called a *hydrocele*. Or the veins in the testicle can dilate and cause enlargement and lumpiness around the testicle. This is called a *varicocele*. If your testicle seems larger, have a doctor examine you to be sure you have one of these conditions and not a tumor. The doctor may order an ultrasound exam (see the section "How is testicular cancer diagnosed?"). This is an easy and painless way of finding a tumor.

If you choose to examine your testicles regularly, you will become familiar with what is normal and what is different. Always report any changes to your doctor without delay. For more information about non-cancerous conditions that can affect the testicles, see *Do I Have Testicular Cancer?*

Signs and symptoms of testicular cancer

If you have any of these signs or symptoms, see your doctor without delay. Many of these symptoms are more likely to be caused by something other than testicular cancer. (For more information about these conditions, see *Do I Have Testicular Cancer?*)

But if a tumor is the cause, the sooner it is found, the sooner you can start treatment and the more effective it is likely to be.

Lump or swelling in the testicle

Most often, the first symptom of testicular cancer is a **lump** on the testicle, or the **testicle becomes swollen or larger**. (It's normal for one testicle to be slightly larger than the other, and for one to hang lower than the other.) Some testicular tumors might cause **pain**, but most of the time they do not. Men with testicular cancer can also have a **feeling of heaviness or aching** in the lower abdomen or scrotum.

Breast growth or soreness

In rare cases, germ cell tumors can make breasts grow or become sore. This occurs because certain types of germ cell tumors secrete high levels of a hormone called *human chorionic gonadotropin* (HCG), which stimulates breast development.

Some Leydig cell tumors can make estrogens (female sex hormones), which can cause breast growth or loss of sexual desire.

Early puberty in boys

Some Leydig cell tumors can make androgens (male sex hormones). Androgen-producing tumors may not cause any specific symptoms in men, but in boys they can cause signs of puberty at an abnormally early age, such as a **deepening voice** and the **growth of facial and body hair**.

Symptoms of advanced testicular cancers

Even if testicular cancer has spread to other parts of the body, many men might not have symptoms right away. But some men might have some of the following symptoms:

- **Low back pain**, from cancer spread to the lymph nodes (bean-sized collections of immune cells) in back of the belly
- **Shortness of breath, chest pain**, or a **cough** (even coughing up blood) may develop from cancer spread in the lungs.
- **Belly pain**, either from enlarged lymph nodes or because the cancer has spread to the liver.
- **Headaches or confusion**, from cancer spread in the brain.

A number of non-cancerous conditions, such as testicle injury or inflammation, can cause symptoms similar to those of testicular cancer. Inflammation of the testicle (known as *orchitis*) and inflammation of the epididymis (*epididymitis*) can cause swelling and pain of the testicle. Both of these also can be caused by viral or bacterial infections.

Signs of testicular cancer

Some men with testicular cancer have no symptoms at all, and their cancer is found during medical testing for other conditions. Sometimes imaging tests done to find the cause of infertility can uncover a small testicular cancer.

How is testicular cancer diagnosed?

Testicular cancer is usually found as a result of symptoms that a person is having. It can also be found as a result of tests for another condition. Often the next step is an exam by a doctor.

The doctor will feel the testicles for swelling or tenderness and for the size and location of any lumps. The doctor will also examine your abdomen, lymph nodes, and other parts of your body carefully, looking for any possible signs of cancer spread. Often the results of the exam are normal aside from the testicles. If a lump or other sign of testicular cancer is found, testing is needed to look for the cause.

Ultrasound of the testicles

An ultrasound is often the first test done if the doctor thinks you might have testicular cancer.

This test uses sound waves to produce images of internal organs. A transducer (wand-like instrument) gives off sound waves and picks up the echoes as they bounce off the organs. A computer creates an image on a monitor from the pattern of the echoes.

The pattern of echoes can be used to distinguish certain benign conditions (like hydrocele or varicocele), from a solid tumor that could be a cancer. If the lump is solid, then it's more likely to be a cancer, so the doctor will recommend further tests or even surgery to remove the testicle.

Ultrasound is an easy test to have and it uses no radiation. You are on your back on a table as the technician moves the transducer along the skin of the scrotum. Usually, the skin is first lubricated with gel.

Blood tests for tumor markers

Some blood tests can help diagnose testicular tumors. Many testicular cancers make high levels of certain proteins called *tumor markers*, such as alpha-fetoprotein (AFP) and human chorionic gonadotropin (HCG). When these tumor markers are in the blood, it suggests that there is a testicular tumor.

Rises in AFP or HCG can also help doctors tell which type of testicular cancer it might be. Non-seminomas often raise AFP and/or HCG levels. Pure seminomas occasionally raise HCG levels but never AFP levels, so any increase in AFP means that the tumor has a non-

seminoma component. (Tumors can be mixed and have areas of seminoma and non-seminoma.) Sertoli and Leydig cell tumors do not make these substances. Some cancers are too small to elevate levels of these tumor markers.

A testicular tumor might also increase the levels of an enzyme called *lactate dehydrogenase* (LDH). LDH levels can also be increased in conditions other than cancer. A high LDH level often (but not always) indicates widespread disease.

Tumor marker tests sometimes are also used for other reasons, such as to help estimate how much cancer is present (see “How is testicular cancer staged?”), to follow the patient’s response to treatment, or to look for signs the tumor might have returned.

Surgery to diagnose testicular cancer

Most types of cancer are diagnosed by removing a small piece of the tumor and looking at it under a microscope for cancer cells. This is known as a *biopsy*. But a biopsy is rarely done for a testicular tumor because it might risk spreading the cancer. The doctor can often get a good idea of whether it is testicular cancer based on the ultrasound and blood tumor marker tests, so instead of a biopsy the doctor will very likely recommend surgery to remove the tumor as soon as possible.

The operation to remove a testicular tumor or cancer is called a *radical inguinal orchiectomy*. In this procedure, the surgeon makes a cut (incision) just above the pubic area and then removes the entire tumor along with the testicle and spermatic cord. The spermatic cord contains part of the vas deferens, as well as blood and lymph vessels that could act as pathways for testicular cancer to spread to the rest of the body. To lessen the chance that cancer cells will spread, these vessels are tied off early in the operation.

The entire specimen is sent to the lab, where a pathologist (a doctor specializing in laboratory diagnosis of diseases) looks at pieces of the tumor under a microscope. If cancer cells are found, the pathologist sends back a report describing the type and extent of the cancer.

In rare cases, when a diagnosis of testicular cancer is uncertain, the doctor may biopsy the testicle before removing it. This is done in the operating room. The surgeon makes a cut above the pubic area, withdraws the testicle from the scrotum, and examines it without cutting the spermatic cord. If a suspicious area is seen, a portion of it is removed and looked at right away by the pathologist. If cancer is found, the testicle and spermatic cord are then removed. If the tissue is not cancerous, the testicle can often be returned to the scrotum, and treatment will be surgery to remove only the tumor or the use of appropriate medicines.

If testicular cancer is found, your doctor will order imaging tests of other parts of your body to check for spread outside the testicle. These tests may also be ordered before the diagnosis is confirmed by surgery.

Imaging tests

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Ultrasound of the testicles, described above, is a type of imaging test. Other imaging tests may be done for a number of reasons after a testicular cancer diagnosis, including:

- To learn how far cancer might have spread
- To help determine if treatment has been effective
- To look for possible signs of cancer coming back after treatment

Computed tomography (CT) scan

CT scans can be used to help determine the stage (extent) of the cancer by showing if it has spread to the lymph nodes, lungs, liver, or other organs.

The CT scan uses x-rays to produce detailed cross-sectional images of your body. Instead of taking one picture, like a standard x-ray, a CT scanner takes many pictures of the part of your body being studied as it rotates around you. A computer then combines these pictures into an image of a slice of your body. Before the test, you might be asked to drink a contrast solution and/or get an intravenous (IV) injection of a contrast dye that helps better outline structures in the body. You may need an IV line to inject the contrast dye. The injection can cause some flushing (redness and a warm feeling that often lasts seconds). Some people are allergic to the dye and get hives. Rarely, more serious reactions like trouble breathing and low blood pressure can occur. Medicine can be given to prevent and treat allergic reactions. Be sure to tell the doctor if you have any allergies or if you have ever reacted to any contrast material used for x-rays.

A CT scanner has been described as a large donut, with a narrow table that slides in and out of the middle opening. You need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring you have to lie in while the pictures are being taken.

CT guided needle biopsy: CT scans are sometimes used to guide a biopsy needle precisely into a suspected area of cancer spread. For this procedure, you stay on the CT scanning table while a doctor advances a biopsy needle through the skin toward the mass. CT scans are repeated until the doctor can see that the needle is within the mass. A fine needle biopsy sample (tiny fragment of tissue) or a core needle biopsy sample (a thin cylinder of tissue) is then removed and examined under a microscope.

Magnetic resonance imaging (MRI) scan

MRI scans are particularly helpful in looking at the brain and spinal cord. They are only done in patients with testicular cancer if the doctor has reason to think the cancer might have spread to those areas.

Like CT scans, MRI scans provide detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of body tissue and by certain diseases. A computer translates the pattern into a very detailed image of parts of the body. A contrast material might be injected just as with CT scans. MRI scans take longer than CT scans – often up to an hour – and are a little more uncomfortable. You lie on a table that slides inside a narrow tube, which is confining and can upset people with a fear of enclosed spaces. Special, more open MRI machines can help with this if needed, but the images may not be as sharp in some cases. The MRI machine makes buzzing and clicking noises, so some places will provide earplugs to help block this out.

Positron emission tomography (PET) scan

A PET scan can help spot small collections of cancer cells in the body. It is sometimes useful to see if lymph nodes that are still enlarged after chemotherapy contain cancer or are just scar tissue. PET scans are often more useful for seminomas than for non-seminomas, so they are less often used in patients with non-seminoma.

For this test, a form of radioactive sugar (known as *fluorodeoxyglucose* or FDG) is injected into a vein (IV). (The amount of radioactivity is very low and will pass out of the body over the next day or so.) Because of the way cancer cells in the body grow rapidly, they often take up and use more of the radioactive sugar. After about an hour, you will be moved onto a table in the PET scanner. You lie on the table for about 30 minutes while a special camera creates a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it can provide helpful information about your whole body.

Many centers have special machines that can do both a PET and CT scan at the same time (PET/CT scan). This lets the doctor compare areas of higher radioactivity on the PET with the more detailed appearance of that area on the CT.

Bone scan

A bone scan can help show if a cancer has spread to the bones. It might be done if there is reason to think the cancer might have spread to the bones (because of symptoms such as bone pain) and if other test results aren't clear.

For this test, a small amount of low-level radioactive material is injected into a vein (IV). The substance settles in areas of bone changes throughout the entire skeleton over the course of a

couple of hours. Then, you lie on a table for about 30 minutes while a special camera detects the radioactivity and creates a picture of your skeleton.

Areas of active bone changes attract the radioactivity and show up as “hot spots.” These areas may suggest metastatic cancer, but arthritis or other bone diseases can also cause the same pattern. To distinguish among these conditions, your cancer care team may use other imaging tests such as plain x-rays or MRI scans to get a better look at the areas that light up, or they may even take biopsy samples of the bone.

How is testicular cancer staged?

The stage of a cancer describes how far it has spread. For testicular cancer, the stage is based on the results of the surgery to diagnose the cancer, blood tests for tumor markers, and imaging tests, all of which are described in the section “How is testicular cancer diagnosed?”

The stage of your cancer is very important for planning your treatment and estimating your prognosis (outlook).

If you have testicular cancer, ask your cancer care team to explain the stage in a way that you can understand. Knowing all you can about the stage of your cancer can help you take a more active role in making decisions about your treatment.

The TNM staging system

A staging system is a standard way for your cancer care team to sum up the extent of your cancer. Testicular cancer is staged using the TNM system created by the American Joint Committee on Cancer (AJCC). It’s based on 4 key pieces of information:

- **T** refers to how much the main (primary) **tumor** has spread to tissues next to the testicle.
- **N** describes how much the cancer has spread to regional (nearby) lymph **nodes**.
- **M** indicates whether the cancer has **metastasized** (spread to distant lymph nodes or other organs of the body).
- **S** indicates the **serum** (blood) levels of tumor markers that are made by some testicular cancers.

Letters or numbers appear after T, N, M, and S to provide more details about each piece of information. The numbers 0 through 4 indicate increasing severity. The letters “IS” after the T stand for in situ, which means the tumor is contained in one place and has not yet penetrated to a deeper layer of tissue. The letter X after T, N, M, or S means “cannot be assessed” because the information is not known.

Primary tumor (T)

TX: The primary tumor cannot be assessed

T0: There is no evidence of primary tumor

Tis: Carcinoma in situ (non-invasive cancer cells)

T1: The tumor has not spread beyond the testicle and epididymis (the tubes next to the testicles where sperm mature). The cancer has not reached nearby blood vessels or lymph vessels. The cancer might have grown through the inner layer surrounding the testicle (tunica albuginea), but it has not reached the outer layer covering the testicle (tunica vaginalis).

T2: Similar to T1 except that the cancer has spread to blood or lymph vessels near the tumor, or the tunica vaginalis

T3: The tumor is growing into the spermatic cord (which contains blood vessels, lymph vessels, nerves, and the vas deferens)

T4: The tumor is growing into the skin surrounding the testicles (scrotum)

Regional lymph nodes (N)

NX: Regional (nearby) lymph nodes cannot be assessed

N0: No spread to regional lymph nodes is seen on imaging tests

N1: The cancer has spread to at least one lymph node, but no lymph node is larger than 2 cm (about $\frac{3}{4}$ inch) across

N2: The cancer has spread to at least one lymph node that is larger than 2 cm but is not bigger than 5 cm (2 inches) across

N3: The cancer has spread to at least one lymph node that is larger than 5 cm across

If the lymph nodes were taken out during surgery, there is a slightly different classification:

pNX: Regional (nearby) lymph nodes cannot be assessed

pN0: Examination of regional lymph nodes removed with surgery reveals no cancer spread

pN1: Examination of regional lymph nodes removed with surgery reveals cancer spread in 1 to 5 lymph nodes, but no lymph node is larger than 2 cm (about $\frac{3}{4}$ inch) across

pN2: Examination of regional lymph nodes removed with surgery reveals cancer spread in at least one lymph node that is bigger than 2 cm but not larger than 5 cm across; OR spread to more than 5 lymph nodes that aren't bigger than 5 cm; OR the cancer is growing out the side of a lymph node

pN3: Examination of regional lymph nodes removed with surgery reveals cancer spread in at least one lymph node that is bigger than 5 cm across

Distant metastasis (M)

M0: There is no distant metastasis (no spread to lymph nodes outside the area of the tumor or other organs, such as the lungs)

M1: Distant metastasis is present

- **M1a:** The tumor has metastasized to distant lymph nodes or to the lung
- **M1b:** The tumor has metastasized to other organs, such as the liver, brain, or bone

Serum tumor markers (S)

For staging, serum (blood) levels of tumor markers are measured *after* the testicle containing the cancer has been removed with surgery.

	LDH (U/liter)	HCG (mIU/ml)	AFP (ng/ml)
SX	Marker studies not available or not done.		
S0	Normal	Normal	Normal
S1*	<1.5 x Normal	<5,000	<1,000
S2+	1.5 - 10 x Normal	5,000 - 50,000	1,000 - 10,000
S3+	>10 x Normal	>50,000	>10,000

Note: Normal values vary among laboratories. Check with your doctor for your specific ranges.

LDH = lactate dehydrogenase (measured in Units per liter [U/liter])

HCG = human chorionic gonadotropin (measured in milli-International Units per milliliter [mIU/ml])

AFP = alpha-fetoprotein (measured in nanograms per milliliter [ng/ml])

< Means less than; > means more than.

**All the markers must be in the stated range to be considered S1*

+Only one marker needs to be in the stated range to be considered S2 or S3

Stage grouping

Once the T, N, M, and S categories have been determined, they are combined in a process called *stage grouping* to assign an overall stage (using Roman numerals and letters).

Stage	T	N	M	S
Stage 0	Tis (in situ)	N0	M0	S0
Stage I	T1-T4	N0	M0	SX
Stage IA	T1	N0	M0	S0
Stage IB	T2-T4	N0	M0	S0
Stage IS	Any T	N0	M0	S1-S3
Stage II	Any T	N1-N3	M0	SX
Stage IIA	Any T	N1	M0	S0-S1
Stage IIB	Any T	N2	M0	S0-S1
Stage IIC	Any T	N3	M0	S0-S1
Stage III	Any T	Any N	M1	SX
Stage IIIA	Any T	Any N	M1a	S0-S1
Stage IIIB	Any T	N1-N3	M0	S2
	Any T	Any N	M1a	S2
Stage IIIC	Any T	N1-N3	M0	S3
	Any T	Any N	M1a	S3
	Any T	Any N	M1b	Any S

Recurrent disease

Recurrent disease means that the cancer has come back (recurred) after treatment. Testicular cancer can recur in the testicle (if it was not removed during surgery), in regional lymph nodes, or in another part of the body.

Testicular cancer survival rates

Doctors often use survival rates as a standard way of discussing a person's prognosis (outlook). Some patients with cancer may want to know the survival statistics for people in similar situations, while others may not find the numbers helpful, or may even not want to know them. If you don't want to know them, stop reading here and skip to the next section.

The 5-year survival rate refers to the percentage of patients who live at least 5 years after their cancer is diagnosed. Of course, many people live much longer than 5 years (and many are cured).

Five-year *relative* survival rates assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a better way to see the impact of the cancer on survival.

In order to get 5-year survival rates, doctors have to look at people who were treated at least 5 years ago. Improvements in treatment since then may result in a more favorable outlook for people now being diagnosed with testicular cancer.

Survival rates are often based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any particular person's case. Many other factors may affect a person's outlook, such as your age and how well the cancer responds to treatment. Your doctor can tell you how the numbers below may apply to you, as he or she is familiar with your particular situation.

Survival rates, by stage

The survival statistics below come from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database, and are based on patients who were diagnosed with testicular cancer (of any type) between 2003 and 2009.

The SEER database does not divide survival rates by AJCC TNM stage. Instead, it divides cancers into summary stages: localized, regional, and distant:

- **Localized** means that the cancer is still only in the testicle. This includes most AJCC stage I tumors (stage 0 cancers are not included in these statistics).
- **Regional** means that the cancer has spread to nearby lymph nodes or tissues. This includes T4 tumors and cancers with lymph node spread (all stage II cancers and some stage IIIB and IIIC cancers).
- **Distant** means that the cancer has spread to organs or lymph nodes away from the tumor, such as all M1 cancers (which can be stage IIIA, IIIB, or IIIC).

Stage	5-Year Relative Survival Rate
Localized	99%
Regional	96%
Distant	73%

Other prognostic factors

As can be seen in the table above, how far the cancer has spread at the time it's diagnosed can affect your chances of long-term survival. But in general, the outlook for testicular cancers is very good, and most of these cancers can be cured, even if they have spread.

Some other factors can also affect outlook, such as:

- The type of testicular cancer
- Levels of tumor markers after the testicular tumor has been removed

Ask your doctor how these or other prognostic factors might affect your outlook.

How is testicular cancer treated?

Making treatment decisions

In recent years, a lot of progress has been made in treating testicular cancer. Surgical methods have been refined, and doctors know more about the best ways to use chemotherapy and radiation to treat different types of testicular cancer.

After the cancer is diagnosed and staged, your cancer care team will discuss treatment options with you.

Depending on the type and stage of the cancer and other factors, treatment options for testicular cancer can include:

- Surgery
- Radiation therapy
- Chemotherapy (chemo)
- High-dose chemotherapy and stem cell transplant

In some cases, more than one of type of treatment might be used.

You may have different types of doctors on your treatment team, depending on the stage of your cancer and your treatment options. These doctors may include:

- A urologist: a surgeon who specializes in treating diseases of the urinary system and male reproductive system
- A radiation oncologist: a doctor who treats cancer with radiation therapy
- A medical oncologist: a doctor who treats cancer with medicines such as chemotherapy

Many other specialists might be involved in your care as well, including physician assistants, nurse practitioners, nurses, physical therapists, social workers, and other health professionals. See *Health Professionals Associated With Cancer Care* for more on this.

It's important to discuss all of your treatment options as well as their possible side effects with your doctors to help make the decision that best fits your needs. (See the section "What should you ask your doctor about testicular cancer?" for some questions to ask.)

When time permits, getting a second opinion is often a good idea. It can give you more information and help you feel good about the treatment plan you choose.

Where you are treated is important. There is no substitute for experience. You have the best chance for a good outcome if you go to a hospital that treats many testicular cancer patients.

Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases, they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service at 1-800-303-5691 for a list of studies that meet your medical needs, or see the Clinical Trials section on our website to learn more.

Considering complementary and alternative methods

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some

of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be dangerous.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision. See the Complementary and Alternative Medicine section of our website to learn more.

Help getting through cancer treatment

Your cancer care team will be your first source of information and support, but there are other resources for help when you need it. Hospital- or clinic-based support services are an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, support groups, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists on call 24 hours a day, every day.

The next few sections describe the different types of treatments used for testicular cancers. This is followed by a discussion of the most common treatment options, based on the type and extent of the disease.

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

Surgery for testicular cancer

Surgery is typically the first treatment for all testicular cancers.

Radical inguinal orchiectomy

As described in the section “How is testicular cancer diagnosed?”, this type of surgery removes the testicle (or testicles) containing the cancer. An incision is made just above the pubic area, and the testicle is gently removed from the scrotum through the opening. A cut is made through the spermatic cord that attaches the testicle to the abdomen. The surgeon ties off the blood and lymph vessels in the spermatic cord early in the operation and takes other special precautions to avoid spreading cancer cells into the surgical wound or dislodging them from the tumor into the bloodstream.

All testicular cancers are typically treated with this surgery, even those that have spread.

Retroperitoneal lymph node dissection (RPLND)

Depending on the type and stage of your cancer, some lymph nodes at the back of the abdomen (around the large blood vessels known as the aorta and inferior vena cava) may also be removed at the same time as the orchiectomy or during a second operation. Not all patients with testicular cancer need to have lymph nodes removed, so it's important to discuss this (and the possible alternatives) with your doctor.

This is a complex and long operation. A large incision is typically made down the middle of the abdomen to remove the lymph nodes. It should be done by a surgeon who does this often. Experience counts.

Laparoscopic surgery: In some cases, the surgeon can remove lymph nodes through very small skin incisions in the abdomen by using a laparoscope (a narrow, lighted tube with a small video camera on the end that lets doctors see inside the abdomen) and other long, thin surgical tools. The surgeon's hands are not inside the patient's body during this type of surgery.

In laparoscopic surgery, after being put to sleep, the patient is turned onto his side. Several small incisions are made on the abdomen. A laparoscope and long instruments are inserted through the incisions to remove the lymph nodes. The incisions are then closed and the patient is awakened.

Patients recover much more quickly from this operation than the standard open procedure and are walking soon after surgery. There is usually less pain and patients are eating sooner.

Laparoscopic surgery seems to be a lot easier for the patient, but doctors are not sure if it's as safe and effective as the standard "open" surgery in removing all of the potentially cancerous lymph nodes. Because of this uncertainty, doctors are more likely to recommend chemotherapy after laparoscopic surgery if cancer is found in the lymph nodes.

This procedure is most often used for patients with early stage non-seminomas to see if the lymph nodes contain cancer. As with the standard open procedure, this is a complex operation that should only be done if the surgeon is very experienced.

Possible risks and side effects of surgery

The short-term risks of any type of surgery include reactions to anesthesia, excess bleeding, blood clots, and infections. Most men will have at least some pain after the operation, which can usually be helped with pain medicines, if needed.

Effects of orchiectomy: Losing one testicle usually has no effect on a man's ability to get an erection and have sex. But if both testicles are removed, sperm cells cannot be produced and a man becomes infertile. Also, without testicles, a man cannot make enough testosterone, which can decrease sex drive and affect his ability to have erections. Other effects could include fatigue, hot flashes, and loss of muscle mass. These side effects can be avoided by

taking testosterone supplements, either in a gel, a patch, or a shot. Pills are generally not reliable sources of testosterone.

Usually men with testicular cancer are young and may be concerned that their appearance has changed. They may be dating and worry about a partner's reaction, or they may be athletic and feel embarrassed by the missing testicle when in locker rooms.

To restore a more natural look, a man can have a testicular prosthesis surgically implanted in his scrotum. The prosthesis approved for use in the United States is filled with saline (salt water) and comes in different sizes to match the remaining testicle. When in place, it can look like a normal testicle. There can be a scar after the operation, but it's often partly hidden by pubic hair. Some men might want a prosthesis, while others might not. You should discuss your wishes with your surgeon before considering this surgery. It could also help to talk with someone who has a testicular prosthesis, to hear what it has been like for them.

Effects of lymph node dissection: Surgery to remove retroperitoneal lymph nodes is a major operation. Serious complications are not common, but they can happen. About 5% to 10% of patients have temporary complications after surgery, such as bowel obstruction or wound infections. The standard approach for an RPLND requires a large incision in the abdomen, which will leave a scar and can take some time to heal. Your ability to get up and around after the operation will be limited for some time. This is less likely to be an issue if you have laparoscopic surgery, which uses smaller incisions.

This type of surgery does not cause impotence – a man can still have erections and sexual intercourse. But it might damage some of the nerves that control ejaculation. If these nerves are damaged, when a man ejaculates, the semen is not propelled forward through the urethra to exit the body but rather goes backwards into the bladder. This is known as *retrograde ejaculation*, and it can make it hard to father children.

To save the normal ejaculation function, surgeons have developed a type of retroperitoneal lymph node surgery called *nerve-sparing* surgery that is very successful when done by experienced doctors. Testicular cancer often affects men at an age when they may be trying to have children. These men may wish to discuss nerve-sparing surgery with their doctors, as well as sperm banking (freezing and storing sperm cells obtained before treatment). Men with testicular cancer often have lower than normal sperm counts, which can sometimes make it hard to collect a good sperm sample. See *Fertility and Men With Cancer* to find out more about this.

Radiation therapy for testicular cancer

Radiation therapy uses a beam of high-energy rays (such as gamma rays or x-rays) or particles (such as electrons, protons, or neutrons) to destroy cancer cells or slow their rate of growth. In treating testicular cancer, radiation is used mainly to kill cancer cells that have spread to lymph nodes.

Radiation therapy delivered from a machine outside the body is known as *external beam radiation*. The treatment is much like getting an x-ray, but the radiation is more intense. The procedure itself is painless. Before your treatments start, the medical team will take careful measurements to determine the correct angles for aiming the radiation beams and the proper dose of radiation. Each treatment lasts only a few minutes, but the setup time – getting you into place for treatment – usually takes longer.

In general, radiation therapy is mainly used for patients with seminoma, which is very sensitive to radiation. Sometimes it's used after orchiectomy (the operation to remove the testicle) and is directed at the lymph nodes at the back of the abdomen (the retroperitoneal lymph nodes). This is to kill any tiny bits of cancer in those lymph nodes that can't be seen. It can also be used to treat small amounts of seminoma that have spread to the nodes (based on changes seen on CT and PET scans).

Radiation is also sometimes used to treat testicular cancer (both seminoma and non-seminoma) that has spread to distant organs (such as to the brain).

Possible side effects

Radiation therapy can affect nearby healthy tissue along with the cancer cells. To reduce the risk of side effects, doctors carefully figure out the exact dose you need and aim the beam as accurately as they can to hit the target. Generally, treatment of testicular cancer uses lower radiation doses than those needed for other types of cancer.

Common side effects can include:

- Fatigue
- Nausea
- Diarrhea

Some men have a skin changes such as redness, blistering, or peeling, but those are uncommon.

These side effects improve after the radiation is finished. If radiation reaches the healthy testicle it can affect fertility (sperm counts), so a special protective device is placed over the remaining testicle to help protect it.

Radiation can also have some long-term effects, such as damage to blood vessels or other organs near the treated lymph nodes and an increased risk of getting a second cancer (outside of the testicle) later in life. These risks were higher in the past when higher doses were used and more tissue was exposed to radiation.

More information on radiation therapy can be found in the Radiation section of our website, or in *Understanding Radiation Therapy: A Guide for Patients and Families*.

Chemotherapy for testicular cancer

Chemotherapy (chemo) is the use of drugs to treat cancer. The drugs can be swallowed in pill form, or they can be injected by needle into a vein or muscle. To treat testicular cancer, the drugs are usually given into a vein. Chemo is systemic therapy. This means that the drug travels throughout the body to reach and destroy the cancer cells. Chemo is an effective way to destroy any cancer cells that break off from the main tumor and travel to lymph nodes or distant organs.

Chemo is often used to cure testicular cancer when it has spread outside the testicle or to decrease the risk of cancer coming back after the testicle is removed. It is not used to treat cancer that is only in the testicle.

Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Chemo cycles generally last about 3 to 4 weeks. The main drugs used to treat testicular cancer are:

- Cisplatin
- Etoposide (VP-16)
- Bleomycin
- Ifosfamide (Ifex[®])
- Paclitaxel (Taxol[®])
- Vinblastine

Using 2 or more chemo drugs is often more effective than using any single drug. The chemotherapy regimens most commonly used as the initial treatment for testicular cancer are:

- BEP (or PEB): bleomycin, etoposide, and cisplatin
- EP: etoposide and cisplatin (also known as EP)
- VIP: VP-16 (etoposide) or vinblastine plus ifosfamide and cisplatin

Some doctors use more intensive regimens for patients with high-risk disease, and may suggest a different combination of chemotherapy drugs or even a stem cell transplant (see next section).

Possible side effects

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to certain side effects.

The side effects of chemo depend on the type and dose of drugs used and how long they are given. These side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (extreme tiredness, often from having too few red blood cells)

Some of the drugs used to treat testicular cancer can have other side effects. For example:

- Cisplatin and ifosfamide can cause kidney damage. This can be lessened by giving lots of fluids (usually into a vein – IV) before and after these drugs are given.
- Cisplatin, etoposide, paclitaxel, and vinblastine can damage nerves (known as *neuropathy*). This can lead to numbness or tingling sensations in the hands or feet, and sensitivity to cold or heat. In most cases, this improves once treatment is stopped, but it may last a long time in some people.
- Cisplatin can also cause loss of hearing (called *ototoxicity*)
- Bleomycin can damage the lungs, causing shortness of breath and trouble with physical activity.
- Ifosfamide can cause the bladder to bleed (called *hemorrhagic cystitis*). To prevent this, the patient is given plenty of fluids and the drug mesna is given along with ifosfamide.

Most side effects are short-term and go away after treatment ends, but some can last a long time and may never go away completely. Report any side effects or changes you notice while getting chemo to your medical team so that you can get prompt treatment for them. There are often ways to prevent or lessen side effects. For example, there are drugs to help prevent or reduce nausea and vomiting. In some cases, the doses of the chemo drugs may need to be reduced or treatment may need to be delayed or stopped to prevent the effects from getting worse.

Some of the drugs used to treat testicular cancer can cause long-term side effects. These include some of the things mentioned earlier, like hearing loss and kidney or lung damage. Development of a second cancer (like leukemia) is a very serious but rare side effect of chemo, occurring in less than 1% of testicular cancer patients treated with chemo. People

who have had chemo for testicular cancer seem to have a higher risk of heart problems later in life. Several studies have also suggested that chemotherapy can sometimes cause high blood cholesterol to develop over time, which may later require treatment.

For more information about chemotherapy and its side effects, please see *A Guide to Chemotherapy*.

High-dose chemotherapy and stem cell transplant for testicular cancer

In general, testicular cancers respond well to chemotherapy (chemo), but not all cancers are cured. Even though higher doses of chemo might be more effective, they are not given because they could severely damage the bone marrow, which is where new blood cells are formed. This could lead to life-threatening infections, bleeding, and other problems because of low blood cell counts.

A stem cell transplant allows doctors to use higher doses of chemo. Blood-forming stem cells are collected from the bloodstream in the weeks before treatment using a special machine. In the past the stem cells were taken from the bone marrow, but this is done less often now. The stem cells are frozen, and then the patient receives high-doses of chemo.

After the chemo the patient gets his stem cells back again. This is called a transplant, but it doesn't involve surgery – the cells are infused into a vein much like a blood transfusion. The stem cells settle in the bone marrow and start making new blood cells over the next few weeks.

For testicular cancer, stem cell transplant is most often used to treat cancers that have come back after treatment with chemo. Current studies are exploring whether a stem cell transplant may be valuable in treating some patients with advanced germ cell cancers as part of their first treatment.

A stem cell transplant is a complex treatment that can cause life-threatening side effects because of the high doses of chemotherapy used. Be sure you understand the possible benefits and risks. If the doctors think you might benefit from a transplant, it should be done at a hospital where the staff has experience with the procedure and with managing the recovery phase.

Stem cell transplants often require a long hospital stay and can be very expensive. Even if the transplant is covered by your insurance, your co-pays or other costs could add up to a lot of money. It is important to find out what your insurer will cover before deciding on a transplant to get an idea of what you might have to pay.

For more information on stem cell transplants, see *Stem Cell Transplant (Peripheral Blood, Bone Marrow, and Cord Blood Transplants)*.

Treatment options for testicular cancer, by type and stage

Treatment for testicular cancer is based mainly on the type and stage of the cancer. Among the germ cell tumors, pure seminomas are treated one way, and all other cancers (all types of non-seminomas and mixed germ cell tumors) are treated another way.

Stage 0 germ cell tumors

In this stage, the tumor in the testicle is carcinoma in situ (CIS), the cancer has not spread outside the testicle, and the levels of tumor markers (like HCG and AFP) are not elevated.

If this stage is diagnosed after surgery to remove the testicle, no other treatment is needed.

If the CIS is found after a testicular biopsy (such as for fertility problems), the doctor may recommend that it not be treated right away. Instead, the patient may be watched closely with repeat physical exams, ultrasound of the testicle, and blood tests of tumor marker levels. Treatment may not be needed as long as there are no signs that the CIS is growing or turning into an invasive cancer. If CIS is treated, it is with surgery (to remove the testicle) or with radiation therapy to the testicle.

If tumor marker levels are high, the cancer is not really stage 0 – even when only CIS is found in the testicle and there are no signs of cancer spread. These cases are treated like stage IS cancers.

Stage I germ cell tumors

Stage I seminomas: These cancers can be cured in nearly all patients. They are first treated by surgically removing the testicle and spermatic cord (radical inguinal orchiectomy). After surgery, there are several treatment choices:

- **Careful observation (surveillance):** If the cancer has not spread beyond the testicle, often the preferred option is to be watched closely by your doctor for up to 10 years with treatments like radiation or chemo only if cancer spread is found. This means getting physical exams and blood tests every 3 to 6 months for the first year, and less often after that. Imaging tests (CT scans and sometimes chest x-rays) are often done every 3 months for 6 months, and then less often after that. If these tests do not find any signs that cancer has spread beyond the testicle, no other treatment is needed. In about 15% to 20% of patients the cancer will come back as spread to lymph nodes or other organs, but if it does, radiation or chemo can still usually cure the cancer.

Doctors are less likely to advise surveillance if the tumor invades blood or lymph vessels in the spermatic cord or if it has reached the scrotum. In these cases, either radiation or chemo is likely to be a better option.

- **Radiation therapy:** Radiation aimed at para-aortic lymph nodes (in the back of the abdomen, around the large blood vessel called the aorta) is another option. Because

seminoma cells are very sensitive to radiation, low doses can be used, usually about 10 to 15 treatments (given over 2 to 3 weeks).

The doctor may recommend this because in about 1 in 5 patients with stage I seminoma, cancer cells have spread outside the testicle but cannot be seen on imaging tests like CT scans. Radiation therapy can usually destroy these hidden (occult) metastases.

- **Chemotherapy:** An option that works as well as radiation is to give 1 or 2 cycles of chemotherapy (chemo) with the drug carboplatin after surgery.

Stage IS seminomas: In this stage, the level of one or more tumor markers is still high after the testicle containing the seminoma is removed. This is very rare, but it is often treated with radiation.

Stage I non-seminomas: Nearly all of these cancers can be cured, but the standard treatment is different from that of seminomas. As with seminomas, the initial treatment is surgery to remove the testicle and tumor (radical inguinal orchiectomy). Then the treatment choices depend on the stage.

For stage IA (T1) there are 2 choices:

- **Careful observation (surveillance):** Surveillance might let you avoid the possible side effects of surgery, but it requires a lot of doctor visits and tests. Doctor visits and lab tests are done every 2 months for the first year, with CT scans every 4 to 6 months. Over time, the time between visits and tests gets longer. If the cancer does come back, it is usually within the first year or two. Relapses are generally treated with chemo. Even though more patients will have a relapse with surveillance than with lymph node dissection, the cure rates are similar because the relapses are usually found early enough to be cured.
- **Retroperitoneal lymph node dissection (RPLND):** Removal of lymph nodes at the back of the abdomen has the advantage of a high cure rate but the disadvantages of major surgery, with its possible complications, including losing the ability to ejaculate normally. After RPLND, if cancer is found in the nodes, chemo may be recommended.

For stage IB (T2, T3, or T4) there are up to 3 options:

- **Retroperitoneal lymph node dissection** (removal of lymph nodes at the back of the abdomen). If cancer is found in the lymph nodes, chemo is often recommended.
- **Chemotherapy** with the BEP regimen (bleomycin, etoposide, and cisplatin) for 2 cycles. This has a high cure rate, but it can have side effects (which are mostly short-term). Chemo is used more often in Europe than in the United States.
- **Careful observation (surveillance):** This requires frequent doctor visits and tests for several years. This may be an option for some patients with T2 tumors.

Stage IS non-seminoma: If the tumor marker levels (like AFP or HCG) are still high even after the testicle/tumor is removed but no tumor is seen on a CT scan, chemo is recommended, with either 3 cycles of BEP or 4 cycles of EP (etoposide and cisplatin).

Stage II germ cell tumors

Stage IIA seminomas: After surgery to remove the testicle (radical inguinal orchiectomy), the preferred treatment is radiation to the retroperitoneal lymph nodes. Usually stage II seminomas are given higher doses of radiation than stage I seminomas. The other option is chemo, with either 4 cycles of EP (etoposide and cisplatin) or 3 cycles of BEP (bleomycin, etoposide, and cisplatin).

Stage IIB seminomas: These seminomas have spread to larger lymph nodes or to several different lymph nodes. After surgery to remove the testicle (radical inguinal orchiectomy), chemo is the preferred treatment. Either 4 cycles of EP (etoposide and cisplatin) or 3 cycles of BEP (bleomycin, etoposide, and cisplatin) may be used. Radiation may be an option instead of chemo for patients who don't have lymph nodes enlarged from cancer spread.

Stage IIC seminomas: These cancers are treated with radical inguinal orchiectomy, followed by chemo with 4 cycles of EP or 3 or 4 cycles of BEP. Radiation therapy is generally not used for stage IIC seminoma.

Stage II non-seminomas: After radical inguinal orchiectomy to remove the testicle with the tumor, treatment depends on the remaining levels of tumor markers in the blood and the extent of spread to retroperitoneal lymph nodes. There are 2 main options:

- **Retroperitoneal lymph node dissection (RPLND):** The lymph nodes at the back of the abdomen are removed. This is more often an option for stage IIA disease. If the lymph nodes removed contain cancer, further treatment with chemo may be needed.
- **Chemotherapy:** For many stage II cancers, the preferred treatment is chemo instead of RPLND. Either 4 cycles of EP (etoposide and cisplatin) or 3 cycles of BEP (bleomycin, etoposide, and cisplatin) may be used.

After chemo, a CT scan is repeated to see if the lymph nodes are still enlarged. If they are, they are usually removed by RPLND.

Stage III germ cell tumors

Even though stage III germ cell tumors have spread by the time they are found, most of them can still be cured.

Both stage III seminomas and non-seminomas are treated with radical inguinal orchiectomy followed by chemo with either EP (etoposide and cisplatin) for 4 cycles or BEP (bleomycin, etoposide, and cisplatin) for 3 to 4 cycles. 4 cycles of BEP are needed for patients with poor prognosis non-seminomas (usually because they have spread to distant areas other than the

lungs or because of very high tumor marker levels). If the patient has medical reasons that make treatment with bleomycin unsafe, then he may be treated with VIP (vinblastine, ifosfamide, and cisplatin).

In cases where very high levels of the tumor marker HCG is found in a man, distant spread of cancer is seen on scans, and there is a high suspicion that he may have a testicular choriocarcinoma, chemo may be started without a biopsy or initial removal of a testicle.

If the cancer has spread to the brain, it will be treated with either surgery (if there are only 1 or 2 tumors in the brain), radiation therapy aimed at the brain, or both. If the tumors in the brain are not bleeding or causing symptoms, some doctors may choose to start the chemo first.

Once chemo is complete, the doctor looks for any cancer that is left. Patients with normal scans and normal tumor marker levels are usually watched carefully after this and may need no further treatment.

Sometimes a few tumors are left. These are most often in the lung or in the retroperitoneal lymph nodes. Further treatment at this point depends on the type of cancer.

Seminomas: Small tumors that are still there after chemo or don't "light up" on a PET scan, are often watched with CT scans to see if they grow. If they do, further treatment is needed. If the tumors do light up on a PET scan, they could be cancers, and treatment is needed. Treatment may be surgery (such as a retroperitoneal lymph node dissection) or chemo (using a different combination of drugs).

Non-seminomas: Remaining tumors are usually removed surgically, which may result in a cure. If cancer is found in the tumors removed, further chemo (usually for 2 cycles, often with different drugs) might be needed. Another option might be to start by giving further chemo with different drugs. Surgery might be used after this if any tumors remain.

If the cancer is resistant to chemo or has spread to many organs, the usual doses of chemo may not always be enough. Sometimes the doctor might recommend high-dose chemo followed by a stem cell transplant. Patients might also want to consider enrolling in a clinical trial of newer chemo regimens.

Recurrent germ cell tumors

If the cancer goes away with treatment and then comes back, it is said to have recurred or relapsed. If this happens, it's usually within the first 2 years after treatment. In general, if the cancer recurs, it's probably best to get a second opinion from a center with extensive experience in treating relapsed testicular cancer before starting treatment.

Treatment of recurrent germ cell tumors depends on the initial treatment and where the cancer recurs. Cancer that comes back in the retroperitoneal lymph nodes can be treated by surgery to remove the nodes (RPLND) if the recurrence is small and if the only surgical

treatment given before was orchiectomy. Depending on the results of the surgery, chemo may be recommended as well.

If it looks as if cancer has recurred in a lot of the retroperitoneal lymph nodes or if the cancer has returned elsewhere, chemo is usually recommended. This may be followed by surgery.

If a man's cancer recurs after chemo or if treatment is no longer working, he will be treated with a different chemo regimen, which typically includes ifosfamide, cisplatin, and either etoposide, paclitaxel, or vinblastine.

The treatment of testicular cancer that has come back after chemo is not always as effective as doctors would like, so some doctors may advise high-dose chemo followed by a stem cell transplant. This may be a better option for some men with recurrent disease, rather than standard chemo. (See the section "High-dose chemotherapy and stem cell transplant for testicular cancer" for more information.) Clinical trials of newer treatments can also be considered.

Sertoli cell and Leydig cell tumors

Typically, radical inguinal orchiectomy is the treatment for Sertoli cell and Leydig cell tumors. Radiation therapy and chemo are generally not effective in these rare types of testicular tumors. If the doctor suspects the tumor has spread beyond the testicle, the retroperitoneal lymph nodes may be surgically removed.

More treatment information for testicular cancer

For more details on treatment options – including some that may not be addressed in this document – the National Comprehensive Cancer Network (NCCN) and the National Cancer Institute (NCI) are good sources of information.

The NCCN, made up of experts from many of the nation's leading cancer centers, develops cancer treatment guidelines for doctors to use when treating patients. These are available on the NCCN website (www.nccn.org).

The NCI provides treatment information by phone (1-800-4-CANCER) and on its website (www.cancer.gov). More detailed information intended for use by cancer care professionals is also available on www.cancer.gov.

What should you ask your doctor about testicular cancer?

As you deal with your cancer and the process of treatment, you need to have honest, open discussions with your cancer care team. Ask any question, no matter how small it might seem. Among the questions you might want to ask are:

- What kind of testicular cancer do I have?
- Has my cancer spread beyond the testicle?
- What is the stage of my cancer? What does this mean for me?
- Will I need other tests before we can decide on treatment?
- Will I need to see other doctors?
- How much experience do you have treating this type of cancer?
- What are my treatment choices? What do you recommend? Why?
- Do I need a retroperitoneal lymph node dissection? If so, how many have you done?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What risks or possible side effects can I expect from my treatment?
- How long will it take me to recover from treatment?
- How soon after treatment can I have sex?
- What are the chances I will become infertile? Should I bank sperm?
- What are the chances that my cancer will come back? What will we do if that happens?
- Does one type of treatment reduce the risk of recurrence (cancer coming back) more than another?
- Should I get a second opinion before I start treatment, and when would a second opinion be helpful to me?
- What type of follow-up will I need after treatment?

Along with these sample questions, be sure to write down some of your own. For instance, you might want to ask about clinical trials for which you may qualify. Keep in mind, too, that doctors are not the only ones who can give you information. Other health care professionals, such as nurses and social workers, may have the answers to your questions. You can find more information about communicating with your health care team in *Talking With Your Doctor*.

What happens after treatment for testicular cancer?

For most people with testicular cancer, treatment removes or destroys the cancer. Completing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer coming back. (When cancer comes back after treatment, it is called *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to accept this uncertainty and are living full lives. *Living With Uncertainty: The Fear of Cancer Recurrence* gives more detailed information on this. It can be read online, or call us at 1-800-227-2345 to have a free copy sent to you.

For a few people, the cancer may never go away completely. They may get regular treatments with chemotherapy, radiation therapy, or other therapies to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. *When Cancer Doesn't Go Away* talks more about this.

Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. It is very important to go to all of your follow-up appointments. During these visits, your doctors will examine you and ask questions about any problems you are having and may order lab tests or imaging tests (such as chest x-rays and CT scans) to look for signs of cancer or treatment side effects. Almost any cancer treatment can have side effects. Some may last for a few weeks to months, but others can last the rest of your life. This is the time for you to talk to your cancer care team about any changes or problems you notice and any questions or concerns you have.

Follow-up care is extremely important after treatment of testicular cancer because even if it comes back, it's still often curable. This is why finding it early is so important.

Your health care team will explain what tests you need and how often they should be done. If you had a non-seminoma, follow-up testing will include blood tests of tumor markers, such as alpha-fetoprotein (AFP), human chorionic gonadotropin (HCG), and lactate dehydrogenase (LDH). Tumor markers aren't as helpful for patients with seminoma, so they aren't always checked. Imaging tests (such as CT scans and chest X-rays) are also done to help detect relapse as early as possible. As time goes on, these visits and tests will not have to be done as often. Depending on the type of treatment that you have had, you may also need specific follow-up for the possible complications of treatment.

Make a special effort to keep all appointments with your cancer care team and follow their instructions carefully. Report any new or recurring symptoms to your doctor right away.

Most of the time, if the cancer comes back, it does so in the first 2 years. Still, there is always an outside chance the cancer can come back later. There's also a small chance that you will develop a new cancer in the other testicle, so you should report any changes to your remaining testicle to your doctor.

It's very important to keep health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

Should your cancer come back, *When Your Cancer Comes Back: Cancer Recurrence* can give you information on how to manage and cope with this phase of your treatment.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who doesn't know anything about your medical history. It's important that you be able to give your new doctor the details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have the following information handy:

- A copy of your pathology report(s) from any biopsies or surgeries
- If you had surgery, a copy of your operative report(s)
- If you stayed in the hospital, a copy of the discharge summary that doctors prepare when patients are sent home
- If you had radiation therapy, a copy of the treatment summary
- If you had chemotherapy or other medicines, a list of your drugs, drug doses, and when you took them
- Copies of your CT scans (or other imaging tests) – these can often be stored digitally on a DVD, etc.

Fertility and hormone concerns in boys and men with testicular cancer

Testicular cancer and its treatment can affect hormone levels and can also affect a man's ability to father children after treatment. It's important to discuss the possible effects with your doctor before starting treatment so you are aware of the risks and what your options might be.

Most boys and men develop cancer in only one testicle. The remaining testicle usually can make enough testosterone (the main male hormone) to keep you healthy. If the other testicle needs to be removed because the cancer is in both testicles or if a new cancer develops in the other testicle, you will need to take some form of testosterone for the rest of your life. Most

often this is a gel or patch that is applied to the skin or a monthly injection (given in a doctor's office). If you need testosterone supplements, talk to your doctor about what form is best for you.

Testicular cancer or its treatment can make you infertile (unable to father a child). Before treatment starts, men who might wish to father children may want to consider storing sperm in a sperm bank for later use. But the disease can cause low sperm counts, which may make it hard to get a good sample.

Infertility can also be an issue later in life for boys who have had testicular cancer. If a boy has already gone through puberty, sperm banking is often a good option, since the frozen samples are not damaged by long periods of storage. Researchers are also looking at new techniques that might allow younger boys to someday father children.

In some cases, if one testicle is left, fertility returns after the testicular cancer has been treated. For example, fertility typically returns about 2 years after chemotherapy stops.

Even when sperm counts in semen are very low, men have several options for fathering children. One of these options is *in vitro fertilization*, in which an egg cell that has been removed from a female partner is fertilized with the man's sperm cells in a lab and then returned to her uterus.

Be sure to discuss any fertility concerns with your doctor before your treatment begins. For more information, see *Fertility and Men With Cancer*.

Can I get another cancer after having testicular cancer?

Cancer survivors can be affected by a number of health problems, but often their greatest concern is facing cancer again. If a cancer comes back after treatment it is called a "recurrence." But some cancer survivors may develop a new, unrelated cancer later. This is called a "second cancer." No matter what type of cancer you have had, it is still possible to get another (new) cancer, even after surviving the first.

Unfortunately, being treated for cancer doesn't mean you can't get another cancer. People who have had cancer can still get the same types of cancers that other people get. In fact, certain types of cancer and cancer treatments can be linked to a higher risk of certain second cancers.

Survivors of testicular cancer can get any second cancer, but they have an increased risk of:

- A second testicular cancer (this is different than the first cancer coming back)
- Rectal cancer
- Pancreas cancer
- Bladder cancer

- Kidney cancer
- Thyroid cancer
- Acute myeloid leukemia (AML)

The most common cancer seen in testicular cancer survivors is a second testicular cancer. Overall, 2% to 5% of men who have had cancer in 1 testicle will eventually have it in the other testicle. The second cancer is not from treating the first cancer with radiation or chemotherapy. In fact, those treated with surgery alone still have an increased risk of a second testicular cancer. The chance of getting a second testicular cancer is actually lower in men who were treated with chemotherapy.

Compared with most men in the general population, testicular cancer survivors are up to twice as likely to develop a new cancer outside the testicle. The chance of a second cancer changes over time and depends on which treatments were used and how old the patient was when he was treated.

Treatment with radiation is linked to some cancers after testicular cancer. The risk is highest for cancers in the area that received radiation (the radiation field). Patients treated with radiation to the abdomen and pelvis have increased risks of:

- Bladder cancer
- Colon cancer
- Rectal cancer
- Pancreas cancer
- Stomach cancer
- Kidney cancer
- Prostate cancer

If the radiation field includes the chest, the patient has an increased risk of:

- Lung cancer
- Esophagus cancer
- Mesothelioma (cancer of the outer lining of the lung)
- Thyroid cancer

Radiation treatments also increase the risk of melanoma skin cancer and connective tissue cancer (sarcoma).

The risks of these cancers starts going up within 5 years and doubles after 10 years in those men who were treated with radiation alone. This risk remains high and doesn't seem to go down with time. The risks are generally greater with higher radiation doses or if the patient got both chemotherapy and radiation.

In recent years, radiation therapy for testicular cancer has changed. Lower doses of radiation are used, and preventive radiation treatment to the chest has been stopped. Long-term follow-up studies are needed to see if these changes have lowered the cancer risks.

Chemotherapy is also linked to an increased risk of cancers, which is slightly less than what is seen after radiation.

The increased risk of leukemia and myelodysplastic syndrome (MDS) after treatment for testicular cancer is linked to treatment with chemotherapy. Use of the chemotherapy drug cisplatin is linked most often to leukemia and MDS, although high doses of etoposide (VP-16, Etopophos[®], or Vepesid[®]) are sometimes also a factor (doses higher than what are normally used today). Radiation given with chemotherapy seems to increase risk even more. Leukemia and MDS are both uncommon cancers normally, so even though the risk of these cancers is higher than average, very few patients develop them from their treatment.

Follow-up after treatment

After completing treatment for testicular cancer, you should still see your doctor regularly. You may have tests for a number of years to look for signs the cancer has come back or spread. Experts don't recommend any other testing to look for second cancers in people without symptoms. Let your doctor know about any new symptoms or problems, because they could be caused by the cancer coming back or by a new disease or second cancer.

Survivors can perform regular testicular self-exams to look for cancer in the remaining testicle.

All patients should follow the American Cancer Society guidelines for the early detection of cancer, such as those for colorectal cancer.

The Children's Oncology Group has guidelines for the follow-up of patients treated for cancer as a child, teen, or young adult, including screening for second cancers. These can be found at www.survivorshipguidelines.org.

All survivors of testicular cancer should avoid tobacco smoke, as smoking increases the risk of many cancers.

To help maintain good health, survivors should also:

- Achieve and maintain a healthy weight
- Adopt a physically active lifestyle
- Consume a healthy diet, with an emphasis on plant foods

- Limit consumption of alcohol to no more than 2 drinks per day

These steps may also lower the risk of some cancers.

See *Second Cancers in Adults* for more information about causes of second cancers.

Lifestyle changes after having testicular cancer

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life – making choices to help you stay healthy and feel as well as you can. This can be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even start during cancer treatment.

Making healthier choices

For many people, a diagnosis of cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on alcohol, or give up tobacco. Even things like keeping your stress level under control may help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society for information and support at 1-800-227-2345. A tobacco cessation and coaching service can help increase your chances of quitting for good.

Eating better

Eating right can be hard for anyone, but it can get even tougher during and after cancer treatment. Treatment may change your sense of taste. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. Or you may have gained weight that you can't seem to lose. All of these things can be very frustrating.

If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with these treatment side effects.

One of the best things you can do after cancer treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits. You can get more information

in *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions*.

Rest, fatigue, and exercise

Extreme tiredness, called *fatigue*, is very common in people treated for cancer. This is not a normal tiredness, but a bone-weary exhaustion that often doesn't get better with rest. For some people, fatigue lasts a long time after treatment, and can make it hard for them to exercise and do other things they want to do. But exercise can help reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel better physically and emotionally and can cope better, too.

If you were sick and not very active during treatment, it is normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation. If you haven't been active, you will have to start slowly – maybe just by taking short walks.

Talk with your health care team before starting anything. Get their opinion about your exercise plans. Then, try to find an exercise buddy so you're not doing it alone. Having family or friends involved when starting a new activity program can give you that extra boost of support to keep you going when the push just isn't there.

If you are very tired, you will need to balance activity with rest. It is OK to rest when you need to. Sometimes it's really hard for people to allow themselves to rest when they are used to working all day or taking care of a household, but this is not the time to push yourself too hard. Listen to your body and rest when you need to. (For a list of documents about dealing with fatigue and other treatment side effects, please see the "Additional resources for testicular cancer" section.)

Keep in mind exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- Along with a good diet, it will help you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue and helps you have more energy.
- It can help lower anxiety and depression.
- It can make you feel happier.
- It helps you feel better about yourself.

And long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

Can I lower my risk of testicular cancer coming back?

Most people want to know if there are specific lifestyle changes they can make to reduce their risk of cancer coming back. Unfortunately, for most cancers there is little solid evidence to guide people. This doesn't mean that nothing will help – it's just that for the most part this is an area that hasn't been well studied. Most studies have looked at lifestyle changes as ways of preventing cancer in the first place, not slowing it down or keeping it from coming back.

At this time, not enough is known about testicular cancer to say for sure if there are things you can do that will be helpful. Adopting healthy behaviors such as not smoking, eating well, being active, and staying at a healthy weight may help, but no one knows for sure. Still, we do know that these types of changes can have positive effects on your health that can extend beyond your risk of testicular cancer or other cancers.

How might testicular cancer affect your emotional health?

During and after treatment, you may find yourself overcome with many different emotions. This happens to a lot of people.

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect the cancer has on your family, friends, and career. You may take a new look at your relationships with those around you. Men with testicular cancer are often younger and might have concerns about other issues as well, such as dating, having sex, or fathering children.

Unexpected issues may also cause concern. For instance, you might be stressed by financial concerns resulting from your treatment. You might also see your health care team less often after treatment and have more time on your hands. These changes can make some people anxious.

Almost everyone who is going through or has been through cancer can benefit from getting some type of support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or one-on-one counselors. What's best for you depends on your situation and personality. Some people feel safe in peer-support groups or education groups. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend or counselor. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

The cancer journey can feel very lonely. It's not necessary or good for you to try to deal with everything on your own. And your friends and family may feel shut out if you don't include them. Let them in, and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you. You can also read *Distress in People with Cancer* or see the "Emotional Side Effects" section of our website for more information.

If treatment for testicular cancer stops working

If cancer keeps growing or comes back after one kind of treatment, it is possible that another treatment plan might still cure the cancer, or at least shrink it enough to help you live longer and feel better. But when a person has tried many different treatments and the cancer has not gotten any better, even newer treatments might no longer be effective. If this happens, it's important to weigh the possible limited benefits of trying a new treatment against the possible downsides, including treatment side effects. Everyone has their own way of looking at this.

This is likely to be the hardest part of your battle with cancer – when you have been through many treatments and nothing's working anymore. Your doctor might offer you new options, but at some point you may need to consider that treatment is not likely to improve your health or change your outcome or survival.

If you want to continue to get treatment for as long as you can, you need to think about the odds of treatment having any benefit and how this compares to the possible risks and side effects. Your doctor can estimate how likely it is the cancer will respond to treatment you are considering. For instance, the doctor may say that more treatment might have about a 1 in 100 chance of working. Some people are still tempted to try this. But it's important to have realistic expectations if you do choose this plan.

No matter what you decide to do, you need to feel as good as you can. Make sure you are asking for and getting treatment for any symptoms you might have, such as nausea or pain. This type of treatment is called palliative care.

Palliative care

Palliative care helps relieve symptoms, but is not expected to cure the disease. It can be given along with cancer treatment, or can even be cancer treatment. The difference is its purpose – the main goal of palliative care is to improve the quality of your life, or help you feel as good as you can for as long as you can. Sometimes this means using drugs to help with symptoms like pain or nausea. Sometimes, though, the treatments used to control your symptoms are the same as those used to treat cancer. For instance, radiation might be used to help relieve pain caused by a large tumor. Or chemo might be used to help shrink a tumor and keep it from blocking the bowels. But this is not the same as treatment to try to cure the cancer.

You can learn more about the changes that occur when curative treatment stops working, and about planning ahead for yourself and your family, in our documents *Advanced Cancer* and *Nearing the End of Life*.

Hospice care

At some point, you may benefit from hospice care. This is special care that treats the person rather than the disease; it focuses on quality rather than length of life. Most of the time, it is

given at home. Your cancer may be causing problems that need to be managed, and hospice focuses on your comfort. You should know that while getting hospice care often means the end of treatments such as chemo and radiation, it doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. In hospice the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult time.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there's still hope for good times with family and friends – times that are filled with happiness and meaning. Pausing at this time in your cancer treatment gives you a chance to refocus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

What's new in testicular cancer research and treatment?

Important research into testicular cancer is being done in many university hospitals, medical centers, and other institutions around the world. Each year, scientists find out more about what causes the disease, how to prevent it, and how to improve treatment.

Genetics

In recent years, researchers have found that inherited variations in certain genes, such as *KITLG*, *SPRY4*, *DMRT1*, *BAK1*, *TERT*, and *ATF7IP*, appear to increase the risk of testicular cancer. These findings may help identify men at higher risk, but they need to be studied more.

Scientists are also studying changes in the genes of testicular cancer cells to learn more about the causes of this disease. Their hope is that improved understanding will lead to even more effective treatment. Certain gene mutations found in the testicular cancer cells have been linked to resistance to chemotherapy and predict poor outcomes. These findings may help individualize treatment and help find new drugs to treat testicular cancer that can target these gene mutations. A better understanding of the genetic changes will also help doctors decide which patients need further treatment and which can be safely treated with surgery alone.

Treatment

Clinical trials have refined doctors' approaches to treating these cancers. For example, studies have found factors that help predict which patients have a particularly good prognosis and may not need lymph node surgery or radiation therapy. Studies also have found unfavorable prognostic factors that suggest certain patients may benefit from more intense treatment.

A large amount of work is being done to try to limit the long-term toxicities of treatment while maintaining the high cure rate. Doctors want to be able to predict better whose cancer is more likely to recur and then base the amount of therapy on this, thereby not under- or over-treating anyone. For example, one study reported good results by individualizing treatment in men with metastatic cancer based on the decline of tumor marker (AFP and HCG) levels after chemo, giving more intense treatment to those with a slower decline.

New drugs and new drug combinations are being tested for patients with recurrent cancer. Chemo combinations are being refined to see if eliminating certain drugs, replacing them with others, or lowering doses can reduce side effects for some men without reducing the effectiveness of treatment. And high-dose chemotherapy followed by a stem cell transplant is being studied for men who have tumors with a poor prognosis.

Additional resources for testicular cancer

More information from your American Cancer Society

We have a lot more information that you might find helpful. Explore www.cancer.org or call our National Cancer Information Center toll-free number, 1-800-227-2345. We're here to help you any time, day or night.

Other organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

LIVESTRONG

Toll-free number: 1-855-220-7777

Website: www.livestrong.org

Provides support, care plans, and a Guidebook Planner to track the cancer journey. Fertile Hope is a national LIVESTRONG initiative dedicated to providing reproductive information, support, and hope to cancer patients and survivors, and can be found online at www.fertilehope.org

National Cancer Institute (NCI)

Toll-free number: 1-800-4-CANCER (1-800-422-6237)

TTY: 1-800-332-8615

Website: www.cancer.gov

Offers a wide variety of free, accurate, up-to-date information about cancer to patients, their families, and the general public; also can help people find clinical trials in their area.

National Comprehensive Cancer Network (NCCN)

The NCCN, made up of experts from many of the nation's leading cancer centers, develops cancer treatment guidelines for doctors to use when treating patients. Those are available on the NCCN website.

Telephone number: 1-215.690.0300

Website: [www. www.nccn.org](http://www.nccn.org)

Testicular Cancer Resource Center

Website: <http://tcrc.acor.org>

Has free information on testicular cancer, an email support group, and research opportunity updates

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

References: Testicular cancer detailed guide

American Academy of Pediatrics. Timing of elective surgery on the genitalia of male children with particular reference to the risks, benefits, and psychological effects of surgery and anesthesia. *Pediatrics*. 1996;97:590-594.

American Cancer Society. *Cancer Facts & Figures 2016*. Atlanta, Ga: American Cancer Society; 2016.

American Joint Committee on Cancer. Testis. In: *AJCC Cancer Staging Manual*. 7th ed. New York: Springer; 2010:469-473.

Children's Oncology Group. Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent and Young Adult Cancers. Accessed at www.survivorshipguidelines.org/ on 11/20/14.

Honecker F, Wermann H, Mayer F, et al. Microsatellite instability, mismatch repair deficiency and BRAF mutation in treatment resistant germ cell tumors. *J Clin Oncol*. 2009;27:2129-2136.

Horwich A, Shipley J, Huddart R. Testicular germ-cell cancer. *Lancet*. 2006;367:754-765.

Howlander N, Noone AM, Krapcho M, et al (eds). SEER Cancer Statistics Review, 1975-2011, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2011/, based on November 2013 SEER data submission, posted to the SEER web site, April 2014.

Kanetsky P, Mitra N, Vardhanabhuti S, et al. Common variation in KITLG and at 5q31.3 predisposes to testicular germ cell cancer. *Nat Genet*. 2009;41:811-815.

Kushi LH, Doyle C, McCullough M, Rock CL, Demark-Wahnefried W, Bandera EV, Gapstur S, Patel AV, Andrews K, Gansler T; American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee. American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin*. 2012 Jan-Feb;62(1):30-67.

McMaster M, Feuer EJ, Tucker MA. New Malignancies Following Cancer of the Male Genital Tract. In: Curtis RE, Freedman DM, Ron E, Ries LAG, Hacker DG, Edwards BK, Tucker MA, Fraumeni JF Jr. (eds). *New Malignancies Among Cancer Survivors: SEER Cancer Registries, 1973-2000*. National Cancer Institute. NIH Publ. No. 05-5302. Bethesda, MD, 2006. Accessed on 4/18/2014 at http://seer.cancer.gov/archive/publications/mpmono/MPMonograph_complete.pdf.

National Cancer Institute. Physician Data Query (PDQ). Testicular Cancer Treatment. 7/11/2014. Accessed at www.cancer.gov/cancertopics/pdq/treatment/testicular/HealthProfessional on January 15, 2015.

National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: Testicular Cancer. Version 1.2015. Accessed at www.nccn.org/professionals/physician_gls/pdf/testicular.pdf on December 9, 2015.

Olofsson SE, Tandstad T, Jerkeman M, et al. Population-based study of treatment guided by tumor marker decline in patients with metastatic nonseminomatous germ cell tumor: A report from the Swedish-Norwegian Testicular Cancer Group. *J Clin Oncol*. 2011;29:2032-2039.

Pagliari LC, Logothetis CJ. Cancer of the testis. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th edition. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015:988-1004.

Richiardi L, Scélo G, Boffetta P, et al. Second malignancies among survivors of germ-cell testicular cancer: a pooled analysis between 13 cancer registries. *Int J Cancer*. 2007;120:623-631.

Ryan CJ, Small EJ, Torti FM. Testicular cancer. In: Abeloff MD, Armitage JO, Niederhuber JE, Kastan MB, McKenna WG, eds. *Abeloff's Clinical Oncology*. 4th ed. Philadelphia, Pa: Elsevier; 2008:1713-1744.

Skolarus TA, Bhayani SB, Chiang HC, et al. Laparoscopic retroperitoneal lymph node dissection for low-stage testicular cancer. *J Endourol*. 2008;22:1485-1489.

Travis LB, Fosså SD, Schonfeld SJ, McMaster ML, et al. Second cancers among 40,576 testicular cancer patients: focus on long-term survivors. *J Natl Cancer Inst*. 2005;97:1354-1365.

Turnbull C, Rapley EA, Seal S, et al; UK Testicular Cancer Collaboration. Variants near DMRT1, TERT and ATF7IP are associated with testicular germ cell cancer. *Nat Genet.* 2010;42:604-607.

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1-800-227-2345 or www.cancer.org