

SIDE EFFECTS and LATE SIDE EFFECTS

Information and pictures from *National Cancer Institute* unless otherwise specified

Quick Summary of Section

NIH (NCI)

<https://www.cancer.gov/about-cancer/treatment/side-effects>

SIDE EFFECTS

- Anemia
- Appetite Loss
- Bleeding & Bruising (Thrombocytopenia)
- Constipation
- Delirium
- Diarrhea
- Edema (Swelling)
- Fatigue
- Fertility Issues in Girls and Women
- Hair Loss (Alopecia)
- Infection and Neutropenia
- Memory or Concentration Issues
- Mouth and Throat Problems
- Nausea and Vomiting
- Nerve Problems (Peripheral Neuropathy)
- Pain
- Skin and Nail Changes
- Sleep Problems
- Urinary and Bladder Problems
- Bone Loss
- Brain Changes

LATE EFFECTS

- Eye Problems
- Hearing Loss
- Heart Problems
- Hot Flashes and Night Sweats
- Joint Changes
- Lung Problems
- Mouth Changes
- Joint Changes

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Anemia</p> <p>*Chemotherapy *Radiation therapy</p> | <ul style="list-style-type: none"> • Anemia is a condition that can make you feel very tired, short of breath, and lightheaded. • Other signs of anemia may include feeling dizzy or faint, headaches, a fast heartbeat, and/or pale skin. • Cancer treatments, such as chemotherapy and radiation therapy can cause anemia. • When you are anemic, your body does not have enough red blood cells. Red blood cells are the cells that carry oxygen from the lungs throughout your body to help it work properly. • You will have blood tests to check for anemia. Treatment for anemia is also based on your symptoms and on what is causing the anemia. | <p>Save your energy and ask for help. Choose the most important things to do each day. When people offer to help, let them do so. They can take you to the doctor, make meals, or do other things you are too tired to do.</p> <p>Balance rest with activity. Take short naps during the day, but keep in mind that too much bed rest can make you feel weak. You may feel better if you take short walks or exercise a little every day.</p> <p>Eat and drink well. Talk with your doctor, nurse, or a registered dietitian to learn what foods and drinks are best for you. You may need to eat foods that are high in protein or iron.</p> |
| <p>Appetite Loss</p> <p>*Chemotherapy *Radiation therapy</p> | <ul style="list-style-type: none"> • Cancer treatments may lower your appetite or change the way food tastes or smells. • Side effects such as mouth and throat problems, or nausea and vomiting can also make eating difficult. • Cancer-related fatigue can also lower your appetite. • Talk with your health care team if you are not hungry or if you find it difficult to eat. Don't wait until you feel weak, have lost too much weight, or are dehydrated, to talk with your doctor or nurse. It's important to eat well, especially during treatment for cancer. | <p>Drink plenty of liquids. Drinking plenty of liquids is important, especially if you have less of an appetite. Losing fluid can lead to dehydration, a dangerous condition. You may become weak or dizzy and have dark yellow urine if you are not drinking enough liquids.</p> <p>Choose healthy and high-nutrient foods. Eat a little, even if you are not hungry. It may help to have five or six small meals throughout the day instead of three large meals. Most people need to eat a variety of nutrient-dense foods that are high in protein and calories.</p> <p>Be active. Being active can actually increase your appetite. Your appetite may increase when you take a short walk each day.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Bleeding & Bruising (Thrombocytopenia)</p> <p>*Chemotherapy *Targeted therapy</p> | <ul style="list-style-type: none"> • Some cancer treatments, such as chemotherapy and targeted therapy, can increase your risk of bleeding and bruising. • These treatments can lower the number of platelets in the blood. Platelets are the cells that help your blood to clot and stop bleeding. When your platelet count is low, you may bruise or bleed a lot or very easily and have tiny purple or red spots on your skin. This condition is called thrombocytopenia. • It is important to tell your doctor or nurse if you notice any of these changes. • Call your doctor or nurse if you have more serious problems, such as: <ul style="list-style-type: none"> ○ Bleeding that doesn't stop after a few minutes; bleeding from your mouth, nose, or when you vomit; bleeding from your vagina when you are not having your period (menstruation); urine that is red or pink; stools that are black or bloody; or bleeding during your period that is heavier or lasts longer than normal. ○ Head or vision changes such as bad headaches or changes in how well you see, or if you feel confused or very sleepy. | <p>Avoid certain medicines. Many over-the-counter medicines contain aspirin or ibuprofen, which can increase your risk of bleeding. When in doubt, be sure to check the label. Get a list of medicines and products from your health care team that you should avoid taking. You may also be advised to limit or avoid alcohol if your platelet count is low.</p> <p>Take extra care to prevent bleeding. Brush your teeth gently, with a very soft toothbrush. Wear shoes, even when you are inside. Be extra careful when using sharp objects. Use an electric shaver, not a razor. Use lotion and a lip balm to prevent dry, chapped skin and lips. Tell your doctor or nurse if you are constipated or notice bleeding from your rectum.</p> <p>Care for bleeding or bruising. If you start to bleed, press down firmly on the area with a clean cloth. Keep pressing until the bleeding stops. If you bruise, put ice on the area.</p> |

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| <p>Constipation</p> <p>*Chemotherapy *Pain medications</p> | <ul style="list-style-type: none"> • Constipation is when you have infrequent bowel movements and stool that may be hard, dry, and difficult to pass. • You may also have stomach cramps, bloating, and nausea when you are constipated. • Cancer treatments such as chemotherapy can cause constipation. • Certain medicines (such as pain medicines), changes in diet, not drinking enough fluids, and being less active may also cause constipation. • It is easier to prevent constipation than to treat its complications which may include fecal impaction or bowel obstruction. | <p>Eat high-fiber foods. Adding bran to foods such as cereals or smoothies is an easy way to get more fiber in your diet. Ask your health care team how many grams of fiber you should have each day. If you have had an intestinal obstruction or intestinal surgery, you should not eat a high-fiber diet.</p> <p>Drink plenty of liquids. Most people need to drink at least 8 cups of liquid each day. You may need more based on your treatment, medications you are taking, or other health factors. Drinking warm or hot liquids may also help.</p> <p>Try to be active every day. Ask your health care team about exercises that you can do. Most people can do light exercise, even in a bed or chair. Other people choose to walk or ride an exercise bike for 15 to 30 minutes each day.</p> <p>Learn about medicine. Use only medicines and treatments for constipation that are prescribed by your doctor, since some may lead to bleeding, infection, or other harmful side effects in people being treated for cancer. Keep a record of your bowel movements to share with your doctor or nurse.</p> |

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| <p>Delirium</p> <p>Causes may include:</p> <ul style="list-style-type: none"> *Advanced cancer *Older age *Dehydration *Infection *Taking certain medicines, such as high doses of opioids *Withdrawal from or stopping certain medicines <p><i>Early monitoring of someone with these risk factors for delirium may prevent it or allow it to be treated more quickly.</i></p> | <ul style="list-style-type: none"> • Delirium is a confused mental state that includes changes in awareness, thinking, judgment, sleeping patterns, as well as behavior. • Although delirium can happen at the end of life, many episodes of delirium are caused by medicine or dehydration and are reversible. • The symptoms of delirium usually occur suddenly (within hours or days) over a short period of time and may come and go. • Although delirium may be mistaken for depression or dementia, these conditions are different and have different treatments. <p>Types of Delirium:</p> <ul style="list-style-type: none"> • <i>Hypoactive delirium:</i> The patient seems sleepy, tired, or depressed • <i>Hyperactive delirium:</i> The patient is restless, anxious, or suddenly agitated and uncooperative • <i>Mixed delirium:</i> The patient changes back and forth between hypoactive delirium and hyperactive delirium <p>Changes caused by delirium can be upsetting for family members and dangerous to the person with cancer, especially if judgment is affected. People with delirium may be more likely to fall, unable to control their bladder and/or bowels, and more likely to become dehydrated. Their confused state may make it difficult to talk with others about their needs and make decisions about care.</p> | <p>Treat the causes of delirium: If medicines are causing delirium, then reducing the dose or stopping them may treat delirium. If conditions such as dehydration, poor nutrition, and infections are causing the delirium, then treating these may help.</p> <p>Control surroundings: If the symptoms of delirium are mild, it may help to keep the room quiet and well lit, with a clock or calendar and familiar possessions. Having family members around and keeping the same caregivers, as much as possible, may also help.</p> <p>Consider medicines: Medicines are sometimes given to treat the symptoms of delirium. However, these medicines have serious side effects and patients receiving them require careful observation by a doctor.</p> <p>Sometimes sedation may help: After discussion with family members, sedation is sometimes used for delirium at the end of life, if it does not get better with other treatments. The doctor will discuss the decisions involved in using sedation to treat delirium with the family.</p> |

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| <p>Diarrhea</p> <ul style="list-style-type: none"> *Treatments for cancer *Medications *Infections *Stress *Certain Cancers | <ul style="list-style-type: none"> • Diarrhea means having bowel movements that are soft, loose, or watery more often than normal. • If diarrhea is severe or lasts a long time, the body does not absorb enough water and nutrients. This can cause you to become dehydrated or malnourished. • Cancer treatments, or the cancer itself, may cause diarrhea or make it worse. • Some medicines, infections, and stress can also cause diarrhea. • Tell your health care team if you have diarrhea. • Diarrhea that leads to dehydration (the loss of too much fluid from the body) and low levels of salt and potassium (important minerals needed by the body) can be life threatening. • Call your health care team if you feel dizzy or light headed, have dark yellow urine or are not urinating, or have a fever of 100.5 °F (38 °C) or higher. | <p>Drink plenty of fluid each day. Most people need to drink 8 to 12 cups of fluid each day. Ask your doctor or nurse how much fluid you should drink each day. For severe diarrhea, only clear liquids or IV (intravenous) fluids may be advised for a short period.</p> <p>Eat small meals that are easy on your stomach. Eat six to eight small meals throughout the day, instead of three large meals. Foods high in potassium and sodium (minerals you lose when you have diarrhea) are good food choices, for most people. Limit or avoid foods and drinks that can make your diarrhea worse.</p> <p>Check before taking medicine. Check with your doctor or nurse before taking medicine for diarrhea. Your doctor will prescribe the correct medicine for you.</p> <p>Keep your anal area clean and dry. Try using warm water and wipes to stay clean. It may help to take warm, shallow baths. These are called sitz baths.</p> |
| <p>Edema (Swelling)</p> <ul style="list-style-type: none"> *Chemotherapy *Radiation *Certain Cancers *Unrelated conditions | <p>Edema, a condition in which fluid builds up in your body’s tissues, may be caused by some types of chemotherapy, certain cancers, and conditions not related to cancer.</p> <p>Signs of edema may include:</p> <ul style="list-style-type: none"> • Swelling in your feet, ankles, and legs • Swelling in your hands and arms • Swelling in your face or abdomen • Skin that is puffy, shiny, or looks slightly dented after being pressed • Shortness of breath, a cough, or irregular heartbeat <p>Tell your health care team if you notice swelling. Your doctor or nurse will determine what is causing your symptoms, advise you on steps to take, and may prescribe medicine.</p> <p>Some problems related to edema are serious. Call your doctor or nurse if you feel short of breath, have a heartbeat that seems different or is not regular, have sudden swelling or swelling that is getting worse or is moving up your arms or legs, you gain weight quickly, or you don’t urinate at all or urinate only a little.</p> | <p>Get comfortable. Wear loose clothing and shoes that are not too tight. When you sit or lie down, raise your feet with a stool or pillows. Avoid crossing your legs when you sit. Talk with your health care team about wearing special stockings, sleeves, or gloves that help with circulation if your swelling is severe.</p> <p>Exercise. Moving the part of your body with edema can help. Your doctor may give you specific exercises, including walking, to improve circulation. However, you may be advised not to stand or walk too much at one time.</p> <p>Limit salt (sodium) in your diet. Avoid foods such as chips, bacon, ham, and canned soup. Check food labels for the sodium content. Don’t add salt or soy sauce to your food.</p> <p>Take your medicine. If your doctor prescribes a medicine called a diuretic, take it exactly as instructed. The medicine will help move the extra fluid and salt out of your body.</p> |

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| <p>Fatigue</p> <ul style="list-style-type: none"> *Chemotherapy *Immunotherapy *Radiation therapy *Bone marrow transplant *Surgery *Anemia *Pain *Medications *Emotions | <ul style="list-style-type: none"> • Fatigue is a common side effect of many cancer treatments, including chemotherapy, immunotherapy, radiation therapy, bone marrow transplant, and surgery. • Conditions such as anemia, as well as pain, medications, and emotions, can also cause or worsen fatigue. • People often describe cancer-related fatigue as feeling extremely tired, weak, heavy, run down, and having no energy. • Resting does not always help with cancer-related fatigue. Cancer-related fatigue is one of the most difficult side effects for many people to cope with. • Tell your health care team if you feel extremely tired and are not able to do your normal activities or are very tired even after resting or sleeping. • There are many causes of fatigue. Keeping track of your levels of energy throughout the day will help your doctor to assess your fatigue. Write down how fatigue affects your daily activities and what makes the fatigue better or worse. | <p>Make a plan that balances rest and activity. Choose activities that are relaxing for you. Many people choose to listen to music, read, meditate, practice guided imagery, or spend time with people they enjoy. Relaxing can help you save your energy and lower stress. Light exercise may also be advised by your doctor to give you more energy and help you feel better.</p> <p>Plan time to rest. If you are tired, take short naps of less than 1 hour during the day. However, too much sleep during the day can make it difficult to sleep at night. Choose the activities that are most important to you and do them when you have the most energy. Ask for help with important tasks such as making meals or driving.</p> <p>Eat and drink well. Meet with a registered dietitian to learn about foods and drinks that can increase your level of energy. Foods high in protein and calories will help you keep up your strength. Some people find it easier to eat many small meals throughout the day instead of three big meals. Stay well hydrated. Limit your intake of caffeine and alcohol.</p> <p>Meet with a specialist. It may help to meet with a counselor, psychologist, or psychiatrist. These experts help people to cope with difficult thoughts and feelings. Lowering stress may give you more energy. Since pain that is not controlled can also be major source of fatigue, it may help to meet with a pain or palliative care specialist.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | CANCER TREATMENTS MAY AFFECT YOUR FERTILITY |
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| <p>Fertility Issues in Boys and Men</p> <p>Possible Cause: See 2nd column <i>Cancer Treatments May Affect Your Fertility</i></p> | <p>Many cancer treatments can affect a boy's or a man's fertility. Most likely, your doctor will talk with you about whether or not cancer treatment may lower fertility or cause infertility. However, not all doctors bring up this topic. Sometimes you, a family member, or parents of a child being treated for cancer may need to initiate this conversation.</p> <p>Whether or not your fertility is affected depends on factors such as:</p> <ul style="list-style-type: none"> • Your baseline fertility • Your age at the time of treatment • The type of cancer and treatment(s) • The amount (dose) of treatment • The length (duration) of treatment • The amount of time that has passed since treatment • Other personal health factors <p><i>Emotional Considerations and Support for Fertility Issues</i></p> <p>For some men, infertility can be one of the most difficult and upsetting long-term effects of cancer treatment. Although it might feel overwhelming to think about your fertility right now, most people benefit from having talked with their doctor (or their child's doctor, when a child is being treated for cancer) about how treatment may affect their fertility and learning about options to preserve their fertility.</p> <p>Although most people want to have children at some point in their life, families can come together in many ways. For extra support during this time, reach out to your health care team with questions or concerns, as well as to professionally led support groups.</p> | <p>Cancer treatments are important for your future health, but they may harm reproductive organs and glands that control fertility. Changes to your fertility may be temporary or permanent. Talk with your healthcare team to learn what to expect based on your treatment(s):</p> <p>Chemotherapy (especially alkylating drugs) can damage sperm in men and sperm-forming cells (germ cells) in young boys.</p> <p>Hormone therapy (also called endocrine therapy) can decrease the production of sperm.</p> <p>Radiation therapy to the reproductive organs as well as radiation near the abdomen, pelvis, or spine may lower sperm counts and testosterone levels, causing infertility.</p> <ul style="list-style-type: none"> • Radiation may also destroy sperm cells and the stem cells that make sperm. Radiation therapy to the brain can damage the pituitary gland and decrease the production of testosterone and sperm. • For some types of cancers, the testicles can be protected from radiation through a procedure called testicular shielding. <p>Surgery for cancers of the reproductive organs and for pelvic cancers (such as bladder, colon, prostate, and rectal cancer) can damage these organs and/or nearby nerves or lymph nodes in the pelvis, leading to infertility.</p> <p>Stem cell transplants such as bone marrow transplants and peripheral blood stem cell transplants, involve receiving high doses of chemotherapy and/or radiation. These treatments can damage sperm and sperm-forming cells.</p> <p>Other treatments: Talk with your doctor to learn whether other types of treatment, such as immunotherapy and targeted cancer therapy, may affect your fertility.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | CANCER TREATMENTS MAY AFFECT YOUR FERTILITY |
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| <p>Fertility Issues in Girls and Women</p> <p>Possible Cause: See 2nd column</p> <p><i>Cancer Treatments May Affect Your Fertility</i></p> | <p>Many cancer treatments can affect a girl's or woman's fertility. Most likely, your doctor will talk with you about whether or not cancer treatment may increase the risk of, or cause, infertility. However, not all doctors bring up this topic. Sometimes you, a family member, or parents of a child being treated for cancer may need to initiate this conversation.</p> <p>Whether or not your fertility is affected depends on factors such as:</p> <ul style="list-style-type: none"> • Your baseline fertility • Your age at the time of treatment • The type of cancer and treatment(s) • The amount (dose) of treatment • The length (duration) of treatment • The amount of time that has passed since treatment • Other personal health factors <p><i>Emotional Considerations and Support for Fertility Issues</i></p> <p>For some women, infertility can be one of the most difficult and upsetting long-term effects of cancer treatment. While it might feel overwhelming to think about your fertility right now, most people benefit from having talked with their doctor (or their child's doctor, when a child is being treated for cancer) about how treatment may affect their fertility and about options to preserve fertility.</p> | <p>Cancer treatments are important for your future health, but they may harm reproductive organs and glands that control fertility. Changes to your fertility may be temporary or permanent. Talk with your health care team to learn what to expect, based on your treatment(s):</p> <p>Chemotherapy (especially alkylating agents) can affect the ovaries, causing them to stop releasing eggs and estrogen. This is called primary ovarian insufficiency (POI).</p> <ul style="list-style-type: none"> • Sometimes POI is temporary and your menstrual periods and fertility return after treatment. Other times, damage to your ovaries is permanent and fertility doesn't return. • You may have hot flashes, night sweats, irritability, vaginal dryness, and irregular or no menstrual periods. • Chemotherapy can also lower the number of healthy eggs in the ovaries. • Women who are closer to the age of natural menopause may have a greater risk of infertility. • The National Institute for Child Health and Human Development (NICHD) has more information about primary ovarian insufficiency. <p>Hormone therapy (also called endocrine therapy) used to treat cancer can disrupt the menstrual cycle, which may affect your fertility. Side effects depend on the specific hormones used and may include hot flashes, night sweats, and vaginal dryness.</p> <p>Bone marrow transplants, peripheral blood stem cell transplants, and other stem cell transplants involve receiving high doses of chemotherapy and/or radiation. These treatments can damage the ovaries and may cause infertility.</p> <p>Other treatments: Talk with your doctor to learn whether or not other types of treatment such as immunotherapy and targeted cancer therapy may affect your fertility.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Hair Loss (Alopecia)</p> <p>*Chemotherapy *Radiation (Localized)</p> | <ul style="list-style-type: none"> • Some types of chemotherapy cause the hair on your head and other parts of your body to fall out. • Radiation therapy can also cause hair loss on the part of the body that is being treated. • Hair loss is called alopecia. <p><i>Ways to Care for Your Hair When It Grows Back</i></p> <p>Be gentle. When your hair starts to grow back, you will want to be gentle with it. Avoid too much brushing, curling, and blow-drying. You may not want to wash your hair as frequently.</p> <p>After chemotherapy. Hair often grows back in 2 to 3 months after treatment has ended. Your hair will be very fine when it starts to grow back. Sometimes your new hair can be curlier or straighter—or even a different color. In time, it may go back to how it was before treatment.</p> <p>After radiation therapy. Hair often grows back in 3 to 6 months after treatment has ended. If you received a very high dose of radiation your hair may grow back thinner or not at all on the part of your body that received radiation.</p> | <p><i>Ways to Manage Hair Loss</i></p> <p>Talk with your health care team about ways to manage before and after hair loss:</p> <p>Treat your hair gently. You may want to use a hairbrush with soft bristles or a wide-tooth comb. Do not use hair dryers, irons, or products such as gels or clips that may hurt your scalp. Wash your hair with a mild shampoo. Wash it less often and be very gentle. Pat it dry with a soft towel.</p> <p>You have choices. Some people choose to cut their hair short to make it easier to deal with when it starts to fall out. Others choose to shave their head. If you choose to shave your head, use an electric shaver so you won't cut yourself. If you plan to buy a wig, get one while you still have hair so you can match it to the color of your hair. If you find wigs to be itchy and hot, try wearing a comfortable scarf or turban.</p> <p>Protect and care for your scalp. Use sunscreen or wear a hat when you are outside. Choose a comfortable scarf or hat that you enjoy and that keeps your head warm. If your scalp itches or feels tender, using lotions and conditioners can help it feel better.</p> <p>Talk about your feelings. Many people feel angry, depressed, or embarrassed about hair loss. It can help to share these feelings with someone who understands. Some people find it helpful to talk with other people who have lost their hair during cancer treatment. Talking openly and honestly with your children and close family members can also help you all. Tell them that you expect to lose your hair during treatment.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Infection and Neutropenia</p> <p>*Surgery *Chemotherapy</p> | <ul style="list-style-type: none"> • An infection is the invasion and growth of germs in the body, such as bacteria, viruses, yeast, or other fungi. • An infection can begin anywhere in the body, may spread throughout the body, and can cause one or more of these signs: <ul style="list-style-type: none"> ○ Fever of 100.5 °F (38 °C) or higher or chills ○ Cough or sore throat ○ Diarrhea ○ Ear pain, headache or sinus pain, or a stiff or sore neck ○ skin rash ○ Sores or white coating in your mouth or on your tongue ○ Swelling or redness, especially where a catheter enters your body ○ Urine that is bloody or cloudy, or pain when you urinate • Call your health care team if you have signs of an infection. • Infections during cancer treatment can be life threatening and require urgent medical attention. • Be sure to talk with your doctor or nurse before taking medicine—even aspirin, acetaminophen (such as Tylenol®), or ibuprofen (such as Advil®) for a fever. These medicines can lower a fever but may also mask or hide signs of a more serious problem. • Some types of cancer and treatments such as chemotherapy may increase your risk of infection. This is because they lower the number of white blood cells, the cells that help your body to fight infection. During chemotherapy, there will be times in your treatment cycle when the number of white blood cells (called neutrophils) is particularly low and you are at increased risk of infection. • Stress, poor nutrition, and not enough sleep can also weaken the immune system, making infection more likely. | <p><i>Ways to Prevent Infection</i></p> <p>Your health care team will talk with you about these and other ways to prevent infection:</p> <p>Wash your hands often and well. Use soap and warm water to wash your hands well, especially before eating. Have people around you wash their hands well too.</p> <p>Stay extra clean. If you have a catheter, keep the area around it clean and dry. Clean your teeth well and check your mouth for sores or other signs of an infection each day. If you get a scrape or cut, clean it well. Let your doctor or nurse know if your bottom is sore or bleeds, as this could increase your risk of infection.</p> <p>Avoid germs. Stay away from people who are sick or have a cold. Avoid crowds and people who have just had a live vaccine, such as one for chicken pox, polio, or measles. Follow food safety guidelines; make sure the meat, fish, and eggs you eat are well cooked. Keep hot foods hot and cold foods cold. You may be advised to eat only fruits and vegetables that can be peeled, or to wash all raw fruits and vegetables very well.</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Memory or Concentration Issues</p> <p>*Chemotherapy *Immunotherapy *Radiation therapy (brain)</p> | <ul style="list-style-type: none"> • Whether you have memory or concentration problems (sometimes described as a mental fog or chemo brain) depends on the type of treatment you receive, your age, and other health-related factors. • Cancer treatments such as chemotherapy may cause difficulty with thinking, concentrating, or remembering things. • So can some types of radiation therapy to the brain and immunotherapy. • These cognitive problems may start during or after cancer treatment. Some people notice very small changes, such as a bit more difficulty remembering things, whereas others have much greater memory or concentration problems. • Your doctor will assess your symptoms and advise you about ways to manage or treat these problems. Treating conditions such as poor nutrition, anxiety, depression, fatigue, and insomnia may also help. | <p>It's important for you or a family member to tell your health care team if you have difficulty remembering things, thinking, or concentrating. Here are some steps you can take to manage minor memory or concentration problems:</p> <p>Plan your day. Do things that need the most concentration at the time of day when you feel best. Get extra rest and plenty of sleep at night. If you need to rest during the day, short naps of less than 1 hour are best. Long naps can make it more difficult to sleep at night. Keep a daily routine.</p> <p>Exercise your body and mind. Exercise can help to decrease stress and help you to feel more alert. Exercise releases endorphins, also known as "feel-good chemicals," which give people a feeling of well-being. Ask what light physical exercises may be helpful for you. Mind-body practices such as meditation or mental exercises such as puzzles or games also help some people.</p> <p>Get help to remember things. Write down and keep a list handy of important information. Use a daily planner, recorder, or other electronic device to help you remember important activities. Make a list of important names and phone numbers. Keep it in one place so it's easy to find</p> |

| SIDE EFFECT AND POSSIBLE CAUSE | DESCRIPTION | WAYS TO MANAGE |
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| <p>Mouth and Throat Problems</p> <p>*Chemotherapy *Immunotherapy *Radiation therapy (head & neck) *Medications</p> <p><i>See Eating Hints</i></p> | <ul style="list-style-type: none"> • Cancer treatments may cause dental, mouth, and throat problems. • Radiation therapy to the head and neck may harm the salivary glands and tissues in your mouth and/or make it hard to chew and swallow safely. • Some types of chemotherapy and immunotherapy can also harm cells in your mouth, throat, and lips. • Drugs used to treat cancer and certain bone problems may also cause oral complications. <p>Mouth and throat problems may include:</p> <ul style="list-style-type: none"> ○ Changes in taste or smell ○ Dry mouth (xerostomia) ○ Infections and mouth sores ○ Pain or swelling in your mouth (oral mucositis) ○ Sensitivity to hot or cold foods ○ Swallowing problems (dysphagia) ○ Tooth decay (cavities) <p>Mouth problems are more serious if they interfere with eating and drinking because they can lead to dehydration and/or malnutrition.</p> <p>It's important to call your doctor or nurse if you have pain in your mouth, lips, or throat that makes it difficult to eat, drink, or sleep or if you have a fever of 100.5 °F (38 °C) or higher.</p> <p>Ways to Prevent Mouth and Dental Problems</p> <ul style="list-style-type: none"> • Get a dental check-up before starting treatment. <ul style="list-style-type: none"> ○ Before you start treatment, visit your dentist for a cleaning and check-up. Tell the dentist about your cancer treatment and try to get any dental work completed before starting treatment. • Check and clean your mouth daily. <ul style="list-style-type: none"> ○ Check your mouth every day for sores or white spots. ○ Rinse your mouth throughout the day with a solution of warm water, baking soda, and salt. ○ Gently brush your teeth, gums, and tongue after each meal and before going to bed at night. Use a very soft toothbrush or cotton swabs. ○ If you are at risk of bleeding, ask if you should floss. | <p>Your health care team may suggest that you take these and other steps to manage these problems:</p> <p>For a sore mouth or throat: Choose foods that are soft, wet, and easy to swallow. Soften dry foods with gravy, sauce, or other liquids. Use a blender to make milkshakes or blend your food to make it easier to swallow. Ask about pain medicine, such as lozenges or sprays that numb your mouth and make eating less painful. Avoid foods and drinks that can irritate your mouth; foods that are crunchy, salty, spicy, or sugary; and alcoholic drinks. Don't smoke or use tobacco.</p> <p>For a dry mouth: Drink plenty of liquids because a dry mouth can increase the risk of tooth decay and mouth infections. Keep water handy and sip it often to keep your mouth wet. Suck on ice chips or sugar-free hard candy, have frozen desserts, or chew sugar-free gum. Use a lip balm. Ask about medicines such as saliva substitutes that can coat, protect, and moisten your mouth and throat. Acupuncture may also help with dry mouth.</p> <p>For changes to your sense of taste: Foods may seem to have no taste or may not taste the way they used to or food may not have much taste at all. Radiation therapy may cause a change in sweet, sour, bitter, and salty tastes. Chemotherapy drugs may cause an unpleasant chemical or metallic taste in your mouth. If you have taste changes it may help to try different foods to find ones that taste best to you. Trying cold foods may also help. Here are some more tips to consider:</p> <ul style="list-style-type: none"> • If food tastes bland, marinate foods to improve their flavor or add spices to foods. • If red meat tastes strange, switch to other high-protein foods such as chicken, eggs, fish, peanut butter. • If foods taste salty, bitter, or acidic, try sweetening them. • If foods taste metallic, switch to plastic utensils and non-metal cooking dishes. • If you have a bad taste in your mouth, try sugar-free lemon drops, gum, or mints. |

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| <p>Nausea and Vomiting</p> <p>Cancer treatments, including, but not limited to chemotherapy</p> | <ul style="list-style-type: none"> • Nausea is when you feel sick to your stomach, as if you are going to throw up. • Vomiting is when you throw up. • There are different types of nausea and vomiting caused by cancer treatment, including anticipatory, acute, and delayed nausea and vomiting. • Controlling nausea and vomiting will help you to feel better and prevent more serious problems such as malnutrition and dehydration. • Your doctor or nurse will determine what is causing your symptoms and advise you on ways to prevent them. • Medicines called anti-nausea drugs or antiemetics are effective in preventing or reducing many types of nausea and vomiting. The medicine is taken at specific times to prevent and/or control symptoms of nausea and vomiting. <p>These foods and drinks may be easy on your stomach:</p> <p>SOUPS</p> <ul style="list-style-type: none"> • Clear broth, such as chicken, beef, and vegetable <p>DRINKS</p> <ul style="list-style-type: none"> • Clear soda, such as ginger ale • Cranberry or grape juice • Oral rehydration drinks, such as Pedialyte® • Tea • Water <p>MAIN MEAL AND SNACKS</p> <ul style="list-style-type: none"> • Chicken—broiled or baked without the skin • Cream of wheat or rice cereal • Crackers or pretzels • Oatmeal • Pasta or noodles • Potatoes—boiled, without the skin • White rice • White toast <p>FRIUITS and SWEETS</p> <ul style="list-style-type: none"> • Bananas • Canned fruit such as applesauce, peaches, and pears • Gelatin (Jell-O®) • Popsicles and sherbet • Yogurt (plain or vanilla) | <p>You may be advised to take these steps to feel better:</p> <p>Take an anti-nausea medicine. Talk with your doctor or nurse to learn when to take your medicine. Most people need to take an anti-nausea medicine even on days when they feel well. Tell your doctor or nurse if the medicine doesn't help. There are different kinds of medicine and one may work better than another for you.</p> <p>Drink plenty of water and fluids. Drinking will help to prevent dehydration, a serious problem that happens when your body loses too much fluid and you are not drinking enough. Try to sip on water, fruit juices, ginger ale, tea, and/or sports drinks throughout the day.</p> <p>Have enough to eat and drink. Take small sips of water during the day, if you find it hard to drink a full glass at one time. Eat 5 or 6 small meals during the day, instead of 3 big meals.</p> <p>Avoid certain foods. Don't eat greasy, fried, sweet, or spicy foods if you feel sick after eating them. If the smell of food bothers you, ask others to make your food. Try cold foods that do not have strong smells, or let food cool down before you eat it.</p> <p>Try these tips on treatment days. Some people find that it helps to eat a small snack before treatment. Others avoid eating or drinking right before or after treatment because it makes them feel sick. After treatment, wait at least 1 hour before you eat or drink.</p> <p>Learn about complementary medicine practices that may help. Acupuncture relieves nausea and/or vomiting cause by chemotherapy in some people. Deep breathing, guided imagery, hypnosis, and other relaxation techniques (such as listening to music, reading a book, or meditating) also help some people.</p> <p><i>See Eating Hints</i></p> |

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| <p>Nerve Problems (Peripheral Neuropathy)</p> | <ul style="list-style-type: none"> Some cancer treatments cause peripheral neuropathy, a result of damage to the peripheral nerves. These nerves carry information from the brain to other parts of the body. Side effects depend on which peripheral nerves (sensory, motor, or autonomic) are affected. <p>Damage to sensory nerves (nerves that help you feel pain, heat, cold, and pressure) can cause:</p> <ul style="list-style-type: none"> Tingling, numbness, or a pins-and-needles feeling in your feet and hands that may spread to your legs and arms Inability to feel a hot or cold sensation, such as a hot stove Inability to feel pain, such as from a cut or sore on your foot <p>Damage to motor nerves (nerves that help your muscles to move) can cause:</p> <ul style="list-style-type: none"> Weak or achy muscles. You may lose your balance or trip easily. It may also be difficult to button shirts or open jars. Muscles that twitch and cramp or muscle wasting (if you don't use your muscles regularly). Swallowing or breathing difficulties (if your chest or throat muscles are affected) <p>Damage to autonomic nerves (nerves that control functions such as blood pressure, digestion, heart rate, temperature, and urination) can cause:</p> <ul style="list-style-type: none"> Digestive changes such as constipation or diarrhea Dizzy or faint feeling, due to low blood pressure Sexual problems; men may be unable to get an erection and women may not reach orgasm Sweating problems (either too much or too little sweating) Urination problems, such as leaking urine or difficulty emptying your bladder | <p><i>Ways to Prevent or Manage Problems Related to Nerve Changes</i></p> <p>You may be advised to take these steps:</p> <p>Prevent falls. Have someone help you prevent falls around the house. Move rugs out of your path so you will not trip on them. Put rails on the walls and in the bathroom, so you can hold on to them and balance yourself. Put bathmats in the shower or tub. Wear sturdy shoes with soft soles. Get up slowly after sitting or lying down, especially if you feel dizzy.</p> <p>Take extra care in the kitchen and shower. Use potholders in the kitchen to protect your hands from burns. Be careful when handling knives or sharp objects. Ask someone to check the water temperature, to make sure it's not too hot.</p> <p>Protect your hands and feet. Wear shoes, both inside and outside. Check your arms, legs, and feet for cuts or scratches every day. When it's cold, wear warm clothes to protect your hands and feet.</p> <p>Ask for help and slow down. Let people help you with difficult tasks. Slow down and give yourself more time to do things.</p> <p>Ask about pain medicine and integrative medicine practices. You may be prescribed pain medicine. Sometimes practices such as acupuncture, massage, physical therapy, yoga, and others may also be advised to lower pain. Talk with your health care team to learn what is advised for you.</p> |

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| <p>Pain</p> <p>See 1st Column</p> <p><i>Different cancer treatments may cause specific types of pain.</i></p> | <ul style="list-style-type: none"> • Cancer itself and the side effects of cancer treatment can sometimes cause pain. • Pain is not something that you have to “put up with.” Controlling pain is an important part of your cancer treatment plan. • Pain can suppress the immune system, increase the time it takes your body to heal, interfere with sleep, and affect your mood. <p>Talk with your health care team about pain, especially if:</p> <ul style="list-style-type: none"> • The pain isn’t getting better or going away with pain medicine • the pain comes on quickly • The pain makes it hard to eat, sleep, or perform your normal activities • You feel new pain • You have side effects from the pain medicine such as sleepiness, nausea, or constipation <p><i>Different cancer treatments may cause specific types of pain.</i></p> <p>Patients may have different types of pain depending on the treatments they receive, including:</p> <ul style="list-style-type: none"> • Spasms, stinging, and itching caused by intravenous chemotherapy. • Mucositis (sores or inflammation in the mouth or other parts of the digestive system) caused by chemotherapy or targeted therapy. • Skin pain, rash, or hand-foot syndrome (redness, tingling, or burning in the palms of the hands and/or the soles of feet) caused by chemotherapy or targeted therapy. • Pain in joints and muscles throughout the body caused by paclitaxel or aromatase inhibitor therapy. • Osteonecrosis of the jaw caused by bisphosphonates given for cancer that has spread to the bone. | <p>Here are some steps you can take, as you work with your health care team to prevent, treat, or lessen pain:</p> <p>Keep track of your pain levels. Each day, write about any pain you feel. Writing down answers to the questions below will help you describe the pain to your doctor or nurse.</p> <ul style="list-style-type: none"> • What part of your body feels painful? • What does the pain feel like (is it sharp, burning, shooting, or throbbing) and where do you feel the pain? • When does the pain start? How long does the pain last? • What activities (such as eating, sleeping, or other activities) does pain interfere with? • What makes the pain feel better or worse? For example, do ice packs, heating pads, or exercises help? • Does pain medicine help? How much do you take? How often do you take it? • How bad is the pain, on a scale of 1 to 10, where “10” is the most pain and “1” is the least pain? <p>Take the prescribed pain medicine.</p> <ul style="list-style-type: none"> • Take the right amount of medicine at the right time. • Do not wait until your pain gets too bad before taking pain medicine. Waiting to take your medicine could make it take longer for the pain to go away or increase the amount of medicine needed to lower pain. • Do not stop taking the pain medicine unless your doctor advises you to. • Tell your doctor or nurse if the medicine no longer lowers the pain, or if you are in pain, but it’s not yet time to take the pain medicine. <p>Meet with a pain specialist. Specialists who treat pain often work together as part of a pain or palliative care team. These specialists may include a neurologist,</p> |

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| | <ul style="list-style-type: none"> • Pain syndromes caused by radiation, including: <ul style="list-style-type: none"> ○ Pain from brachytherapy. ○ Pain from the position the patient stays in during radiation therapy. ○ Mucositis. ○ Inflammation of the mucous membranes in areas treated with radiation. ○ Dermatitis (inflammation of the skin in areas treated with radiation). ○ Pain flares (a temporary worsening of pain in the treated area). | <p>surgeon, physiatrist, psychiatrist, psychologist, or pharmacist. Talk with your health care team to find a pain specialist.</p> <p>Ask about integrative medicine. Treatments such as acupuncture, biofeedback, hypnosis, massage therapy and physical therapy may also be used to treat pain.</p> <p><i>Pain may affect quality of life after treatment ends.</i></p> <ul style="list-style-type: none"> • Pain that is severe or continues after cancer treatment ends increases the risk of anxiety and depression. • Patients may be disabled by their pain, unable to work, or feel that they are losing support once their care moves from their oncology team back to their primary care team. • Feelings of anxiety and depression can worsen pain and make it harder to control. |
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| <p>Skin and Nail Changes</p> <ul style="list-style-type: none"> *Radiation therapy *Chemotherapy *Biological therapy *Targeted therapy | <p>Cancer treatments may cause a range of skin and nail changes. Talk with your health care team to learn whether or not you will have these changes, based on the treatment you are receiving.</p> <p>Radiation therapy can cause the skin on the part of your body receiving radiation therapy to become dry and peel, itch (called pruritus), and turn red or darker. It may look sunburned or tan and be swollen or puffy.</p> <p>Chemotherapy</p> <ul style="list-style-type: none"> • May damage fast growing skin and nail cells. This can cause problems such as skin that is dry, itchy, red, and/or that peels. • Some people may develop a rash or sun sensitivity, causing you to sunburn easily. • Nail changes may include dark, yellow, or cracked nails and/or cuticles that are red and hurt. • Chemotherapy in people who have received radiation therapy in the past can cause skin to become red, blister, peel, or hurt on the part of the body that received radiation therapy; this is called radiation recall. <p>Biological therapy may cause itching (pruritus).</p> <p>Targeted therapy May cause a dry skin, a rash, and nail problems. These skin problems are more serious and need urgent medical attention:</p> <ul style="list-style-type: none"> • Sudden or severe itching, a rash, or hives during chemotherapy. These may be signs of an allergic reaction. • Sores on the part of your body where you are receiving treatment that become painful, wet, and/or infected. This is called a moist reaction and may happen in areas where the skin folds, such as around your ears, breast, or bottom. | <p>Depending on what treatment you are receiving, you may be advised to take these steps to protect your skin, prevent infection, and reduce itching:</p> <p>Use only recommended skin products. Use mild soaps that are gentle on your skin. Ask your nurse to recommend specific lotions and creams. Ask when and how often to use them. Ask what skin products to avoid. For example, you may be advised to not use powders or antiperspirants before radiation therapy.</p> <p>Protect your skin. Ask about lotions or antibiotics for dry, itchy, infected or swollen skin. Don't use heating pads, ice packs, or bandages on the area receiving radiation therapy. Shave less often and use an electric razor or stop shaving if your skin is sore. Wear sunscreen and lip balm or a loose-fitting long-sleeved shirt, pants, and a hat with a wide brim when outdoors.</p> <p>Prevent or treat dry, itchy skin (pruritus). Your doctor will work to assess the cause of pruritus. There are also steps you can take to feel better. Avoid products with alcohol or perfume, which can dry or irritate your skin. Take short showers or baths in lukewarm, not hot, water. Put on lotion after drying off from a shower, while your skin is still slightly damp. Keep your home cool and humid. Eat a healthy diet and drink plenty of fluids to help keep your skin moist and healthy. Applying a cool washcloth or ice to the affected area may also help. Acupuncture also helps some people.</p> <p>Prevent or treat minor nail problems. Keep your nails clean and cut short. Wear gloves when you wash the dishes, work in the garden, or clean the house. Check with your nurse about products that can help your nails.</p> <p>If your skin hurts in the area where you get treatment, tell your doctor or nurse. Your skin might have a moist reaction. Most often this happens in areas where the skin folds, such as behind the ears or under the breasts. It can lead to an infection if not properly treated. Ask your doctor or nurse how to care for these areas.</p> |

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| <p>Sleep Problems</p> | <ul style="list-style-type: none"> • Sleeping well is important for your physical and mental health. A good night’s sleep not only helps you to think clearly, it also lowers your blood pressure, helps your appetite, and strengthens your immune system. • Sleep problems such as being unable to fall asleep and/or stay asleep, also called insomnia, are common among people being treated for cancer. Studies show that as many as half of all patients have sleep-related problems. These problems may be caused by the side effects of treatment, medicine, long hospital stays, or stress. • Talk with your health care team if you have difficulty sleeping, so you can get help you need. • Sleep problems that go on for a long time may increase the risk of anxiety or depression. • Your doctor will do an assessment, which may include a polysomnogram (recordings taken during sleep that show brain waves, breathing rate, and other activities such as heart rate) to correctly diagnose and treat sleep problems. Assessments may be repeated from time to time, since sleeping problems may change over time. | <p>There are steps that you and your health care team can take to help you sleep well again.</p> <p>Tell your doctor about problems that interfere with sleep. Getting treatment to lower side effects such as pain or bladder or gastrointestinal problems may help you sleep better.</p> <p>Cognitive behavioral therapy (CBT) and relaxation therapy may help. Practicing these therapies can help you to relax. For example, a CBT therapist can help you learn to change negative thoughts and beliefs about sleep into positive ones. Strategies such as muscle relaxation, guided imagery, and self-hypnosis may also help you.</p> <p>Set good bedtime habits. Go to bed only when sleepy, in a quiet and dark room, and in a comfortable bed. If you do not fall asleep, get out of bed and return to bed when you are sleepy. Stop watching television or using other electrical devices a couple of hours before going to bed. Don’t drink or eat a lot before bedtime. While it’s important to keep active during the day with regular exercise, exercising a few hours before bedtime may make sleep more difficult.</p> <p>Sleep medicine may be prescribed. Your doctor may prescribe sleep medicine, for a short period if other strategies don’t work. The sleep medicine prescribed will depend on your specific problem (such as trouble falling asleep or trouble staying asleep) as well as other medicines you are taking.</p> |

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| <p>Urinary and Bladder Problems</p> <p>*Radiation therapy *Chemotherapy *Immunotherapy *Surgery</p> | <p><i>Symptoms of a Urinary Problem</i></p> <p>Some urinary or bladder changes may be normal, such as changes to the color or smell of your urine caused by some types of chemotherapy. Your health care team will determine what is causing your symptoms and will advise on steps to take to feel better.</p> <p>Irritation of the bladder lining (radiation cystitis):</p> <ul style="list-style-type: none"> • Pain or a burning feeling when you urinate • Blood in your urine • Trouble starting to urinate • Trouble emptying your bladder completely • Feeling that you need to urinate urgently or frequently • Leaking a little urine when you sneeze or cough • Bladder spasms, cramps, or discomfort in the pelvic area <p>Urinary tract infection (UTI):</p> <ul style="list-style-type: none"> • Pain or a burning feeling when you urinate • Urine that is cloudy or red • Fever of 100.5 °F (38 °C) or higher, chills, and fatigue • Pain in your back or abdomen • Difficulty urinating or not being able to urinate <p>In people being treated for cancer, a UTI can turn into a serious condition that needs immediate medical care. Antibiotics will be prescribed if you have a bacterial infection.</p> | <p><i>Ways to Prevent or Manage</i></p> <p>Here are some steps you may be advised to take to feel better and to prevent problems:</p> <p>Drink plenty of liquids. Most people need to drink at least 8 cups of fluid each day, so that urine is light yellow or clear. You'll want to stay away from things that can make bladder problems worse. These include caffeine, drinks with alcohol, spicy foods, and tobacco products.</p> <p>Prevent urinary tract infections. Your doctor or nurse will talk with you about ways to lower your chances of getting a urinary tract infection. These may include going to the bathroom often, wearing cotton underwear and loose fitting pants, learning about safe and sanitary practices for catheterization, taking showers instead of baths, and checking with your nurse before using products such as creams or lotions near your genital area.</p> <p><i>Drink more liquids</i></p> <ul style="list-style-type: none"> • Drink liquids such as water, soup, milkshakes, and cranberry juice. Add extra water to the juice. • Ask your doctor or nurse how many cups of liquid you should drink each day. Most people need to drink at least 8 cups a day. • Keep drinking liquids even if you have to go to the bathroom a lot. Liquids help your body to work well. <p>Some liquids can make bladder problems worse. Talk with your doctor or nurse to learn what you should stop drinking or drink less of. These include:</p> <ul style="list-style-type: none"> • Drinks with caffeine, such as coffee, black tea, and soda. • Drinks with alcohol, such as beer, wine, mixed drinks, and liquor. |