PATIENT & CAREGIVER EDUCATION

Neoadjuvant Therapy for Breast Cancer

This information explains what neoadjuvant (NEE-oh-A-joo-vant) therapy for breast cancer is and how different kinds of neoadjuvant therapies work. It also describes how to manage possible side effects and answers some common questions about neoadjuvant therapy.

What is neoadjuvant therapy for breast cancer?

Neoadjuvant therapy is treatment you get before your breast surgery. It's given as a first step to shrink tumors or stop cancer from spreading to other parts of your body. Getting neoadjuvant therapy can help make your surgery easier and less invasive. Surgery that's less invasive uses fewer cuts, and that helps you recover faster.

Neoadjuvant therapy also improves the chances your surgery will be successful. Your doctor will decide which neoadjuvant therapy is right for you.

There are different kinds of neoadjuvant therapy. Your neoadjuvant therapy can be 1 or more of the following:

- **Chemotherapy** (chemo) uses drugs to kill cancer cells by stopping their ability to multiply. It works by killing cells that divide quickly. Chemo can last 3 to 6 months or longer.
- **Hormone therapy** uses medications to stop your body from making some hormones that can help cancer cells grow. It also can change the way these hormones affect your body. Hormone therapy may be taken for years.
- **Antibody therapy** uses antibodies to find and kill cancer cells. It works by attacking certain growth proteins that are common in cancer cells, without

harming normal cells. Antibody therapy can be taken for up to 1 year.

- **Radiation therapy** uses high-energy beams to kill cancer cells. It targets any cancer cells that may be left in in your breast or lymph nodes after surgery. Radiation therapy can last 3 to 7 weeks.

Planning your neoadjuvant therapy for breast cancer

Your treatment plan is created for you based on many factors. Your doctor will look at your full health history and give you a physical exam. Then, they will look at your test results, pathology results, and medical scans.

They will use all this information to make your treatment plan. Everyone's treatment plan is different. Your doctor will go over your treatment plan with you in detail.

Managing possible side effects of neoadjuvant therapy for breast cancer

The information in this section will help you manage possible side effects of neoadjuvant therapy. It also gives tips on how to feel better during your treatment. Your care team is here for you 24 hours a day, 7 days a week. They will help you manage your side effects as you go through treatment.

Key Points

- Take your medications the way your healthcare provider tells you to. This includes:
  - Antinausea medications (medications to keep you from feeling like you're going to throw up).
  - Medications to help you have bowel movements (poop).
- Drink 8 to 10 (8-ounce) glasses of liquids every day. It's very important to stay hydrated (get enough liquids) during your treatment.
- Call your healthcare provider if you:
  - Have a fever of 100.4 °F (38 °C) or higher.
  - Have chills or are shaking.
  - Have signs of infection, such as:
    - A sore throat.
    - A new cough.
    - A burning feeling when you urinate (pee).
    - Redness, swelling, warmth, or pus around your incision (surgical cut) or catheter.
  - Have mouth sores or mouth pain that makes it hard to swallow, eat, or drink.
  - Have nausea (feeling like you're going to throw up) or vomiting (throwing up) even after taking medication to help.
  - Have diarrhea (loose, watery poop) 4 or more times in 24 hours, even after taking medication to help.
  - Have not had a bowel movement or passed gas for more than 2 to 3 days.
  - Have blood in your urine (pee), bowel movements, vomit (throw up), or when you cough.

Nausea and vomiting from chemotherapy

Chemo may cause nausea (feeling like you're going to throw up) and vomiting (throwing up). Nausea and vomiting happen because chemo irritates:

- The areas of your brain that control nausea.

- The lining of your mouth, throat, stomach, and intestines.

If your chemo causes nausea and vomiting, you will get antinausea medication. Taking antinausea medication lowers the chance you will have nausea. You will take it before each chemo treatment, after each treatment, or before and after each treatment.

You will also get a prescription for antinausea medication to take home with you. Your nurse will tell you how to take the medication at home. Taking it the right way will give it the best chance to work.

Nausea can make you want to stop eating and drinking. But it's important that you try to eat and drink when you have nausea. Eating and drinking gives your body the energy it needs to repair itself from the effects of your chemo.

To learn more, read *Eating Well During Your Cancer Treatment* (www.mskcc.org/pe/eating-cancer-treatment).

What you can do to help manage nausea:

- Take your antinausea medication the way your healthcare provider tells you to. Do not hold off on taking the medication to see if your nausea will go away. Antinausea medications work best when you take them at the first sign of nausea.
- Eat dry, starchy foods (such as crackers or pretzels) or suck on hard candy to help prevent nausea.
- Eat small meals often. Do this throughout the day while you're awake. Stop eating before you feel too full.
- Drink 8 to 10 (8-ounce) glasses of non-caffeinated liquids every day. Water, juices mixed with water, or liquids with electrolytes (such as Pedialyte®, Gatorade®, and Powerade®) are good choices. This will help prevent dehydration (not having enough water in your body). Take small sips to avoid feeling more nauseous (like you're going to throw up).
- Practice relaxing. Listen to soft music, breathe deeply, do yoga, or meditate. You can also try to think of pleasant things to distract yourself.

- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

What to avoid if you have nausea:

- Eating fried, greasy, creamy, or spicy foods.
- Eating or cooking foods that have a strong odor (smell).
- Drinking anything that has caffeine (such as coffee, tea, or soda).

Call your healthcare provider if you:

- Vomit (throw up) 3 to 5 times within 24 hours (1 day).
- Have nausea that does not get better after you take your antinausea medication.
- Have diarrhea 4 or more times in 24 hours, even after taking medication to help.
- Cannot drink liquids without vomiting.
- Feel dizzy or lightheaded (like you might faint).
- Have heartburn or stomach pain.

Hair loss or thinning (alopecia) from chemotherapy

Some chemo medications cause the hair on your head to fall out. This hair loss is called alopecia (A-loh-PEE-shuh). Hair loss usually starts about 2 to 4 weeks after your first chemo treatment. If you lose your hair, it should start to grow back once you're no longer getting chemotherapy. Your hair may grow back as a different color or texture. Some hormone therapies can thin your hair as well.

Generally, hair loss is affected by:

- The type of chemo medication(s) you take, the dose (amount) you take, and how long you take it.
- The amount of hair you have before treatment.
- The amount of chemical processing (such as perm and dye) your hair had

before treatment.

What you can do to help manage hair loss or thinning:

- Sign up for a free, virtual Look Good Feel Better class to learn about wigs, makeup, and skincare techniques. To register for an online class, visit lookgoodfeelbetter.org/virtual-workshops.
- Use a mild shampoo, such as Johnson's® Baby Shampoo.
- Talk with your healthcare provider about getting a prescription for a wig before you start treatment. People who lose their hair from cancer treatment may have insurance coverage for a wig. Check with your insurance company to make sure it's covered. To learn more, read *Where To Buy Wigs and Hairpieces* (www.mskcc.org/pe/wigs-hairpieces).
- Wear scarves and soft terry cloth turbans on your head, if you would like. They're very comfortable and add variety to your outfits.
- Use a low-heat setting when blow-drying your hair.
- Ask your doctor if scalp cooling treatment (using a cold cap) is an option for you.
    - A cold cap is a cap filled with cold gel that you wear on your head during chemo treatment. Wearing a cold cap reduces the amount of chemo that reaches your hair follicles. This can help minimize hair loss. To learn more, read *Managing Hair Loss with Scalp Cooling During Chemotherapy for Solid Tumors* (www.mskcc.org/pe/scalp_cooling).
    - Not all health insurance plans cover scalp cooling. We will contact your insurance company to find out if your plan covers scalp cooling before you start. This is called prior authorization.

What to avoid if you have hair loss or thinning:

- Bleaching, dyeing, or perming your hair.
- Using hot rollers or curlers, curling irons, or hair straighteners.

Low white blood cell count (leukopenia) from chemotherapy

Leukopenia (LOO-koh-PEE-nee-uh) is when you have a low number of white blood cells in your blood. Your white blood cells help your body fight off infections. Having a low white blood cell count can raise your risk of getting an infection.

You may start having low white blood cell counts 7 to 14 days after each chemo treatment. There are medications you can take to raise your white blood cell count or keep it from falling. These medications come in the form of injections (shots) or devices that you wear on your arm.

What you can do to help manage a low white blood cell count:

- Take your temperature by mouth every 4 hours if you think you have a fever. You should also do this if you have chills or body aches. **Call your doctor's office if you have a fever of 100.4 °F (38 °C) or higher.** This is very important. If you have a fever after hours, during the weekend, or on a holiday, call your doctor's office. Ask to talk with the person on call (covering) for your doctor.
- Ask your healthcare provider if you can take acetaminophen (Tylenol®).
- Always wash your hands with soap and water for at least 20 to 30 seconds:
  - Before eating a meal.
  - After touching something that may have germs (such as after using the bathroom or shaking hands).
- Protect your hands from cuts and burns:
  - Do not cut your cuticles (layer of skin along the bottom edge of your nails). Push them back instead.
  - Wear gloves when you wash the dishes, cook, or garden.
  - Moisturize your skin to keep it from cracking.
- If you have a cut, wash it with soap and water right away. You can also use an antibacterial ointment or spray on the cut. Watch for any signs of infection,

such as redness, swelling, or pus. If you see any of these signs, call your doctor's office.

What to avoid if you have a low white blood cell count:

- Being around people who are sick or have been exposed to anything that could make you sick. This includes chicken pox, strep throat, tuberculosis (TB), the flu, measles, or the common cold.
- Dental work or dental surgery. Check with your doctor before you schedule any dental work, including cleanings or surgery.
- Using:
  - Suppositories. This is medication that's inserted through your anus (the opening where poop leaves your body), vagina, or penis.
  - Rectal thermometers. This is a thermometer that's inserted into your anus to check your body temperature.
  - Enemas. This is a liquid that's put into your anus to cause you to have a bowel movement (pooping).
- Getting live virus vaccines (such as the shingles vaccine, MMR, and chicken pox vaccine) and the nasal spray flu vaccine.
- Being around anyone who has gotten a live virus vaccine or nasal spray vaccine. You should wait 7 to 10 days after they got it before being around them again.

Call your healthcare provider:

- If you have redness, swelling, or pus around an injury, surgical wound, or catheter.
- If you have a fever of 100.4 °F (38 °C) or higher when taking your temperature by mouth.
- If you have chills or body aches, with or without a fever.
- Before you get any vaccines.

Low red blood cell count (anemia) from chemotherapy

Anemia (uh-NEE-mee-uh) is when your body does not make enough red blood cells. Your red blood cells carry oxygen through your body. When you don't have enough red blood cells, you may have:

- Fatigue (feeling more tired or weak than usual)
- Trouble breathing

Anemia is more likely to happen after you've been getting chemo for some time.

What you can do to help manage a low red blood cell count or to prevent it:

- Eat foods that have iron, which may lower your chances of getting anemia.
  - Examples of iron-rich foods are lean meat, chicken, fish, dried apricots, raisins, beans, and lentils. To learn more about how to get your daily dose of iron, read *Iron in Your Diet* (www.mskcc.org/pe/iron-diet).
- Cut back on work and social activities that you don't need to go to, and on doing household chores.

What to avoid if you have a low red blood cell count:

- Anything that makes you feel tired.
- Being at a high altitude or elevation (such as flying on a plane). This may make you very dizzy.

Call your healthcare provider if you have:

- Dizziness
- Intense fatigue
- Trouble breathing
- Chest pain or pressure

Low platelet count (thrombocytopenia) from chemotherapy

Thrombocytopenia (THROM-boh-sy-toh-PEE-nee-uh) is when you have a low number of platelets in your blood. Your platelets help control bleeding. A low platelet count lowers your body's ability to stop bleeding if you have a cut or an injury. This side effect is not as common as having low red or white blood cell counts.

You may start having a low platelet count 10 to 14 days after chemo. But it's more likely to happen after months of chemo.

If you have a low platelet count, talk with your doctor before taking an anti-inflammatory medication. These medications can increase bleeding and may not be safe for you to take. Examples of anti-inflammatory medications are ibuprofen (Advil®, Motrin®) or naproxen (Aleve®, Naprosyn®). Tell your doctor if you take aspirin or blood thinners for other health conditions.

What you can do to help manage a low platelet count:

- Use a soft toothbrush for your teeth and gums to prevent sores from forming in your mouth.
- If you already floss your teeth, you can keep doing so. Floss gently to avoid causing any bleeding. If you don't floss, do not start now.
- Be careful not to:
    - Get any cuts, scratches, or scrapes.
    - Bump into things or hit things by accident.
    - Trip and fall.
- Look for any unexplained (unusual) bruises or petechiae (peh-TEE-kee-ee). These are tiny, red or purple spots on the skin that don't disappear when you press them.

What to avoid if you have a low platelet count:

- Using sharp objects (such as cuticle scissors, straight razors, and sharp

knives). If you need to shave, use only an electric razor.

- Using rectal thermometers or suppositories.
- Dental work or dental surgery.
- Contact sports (such as football, soccer, or basketball) or any activity that can result in bumping or banging.
- Having more than 3 alcoholic drinks (such as beer and wine) a week.

Call your healthcare provider if you have:

- Blood in your urine (pee), stool (poop), vomit (throw up), or if you cough up blood.
- Unexplained bruising or bleeding from your nose or gums.
- Changes in your vision, such as watery eyes (tearing) or blurry vision.
- Any signs of a stroke, such as:
  - Numbness or weakness in your face, arm, or leg. You may have sudden numbness or weakness, especially on 1 side of your body. For example, one side of your mouth may droop when you try to smile.
  - Trouble speaking or understanding. You may feel confused, slur your words, or have trouble understanding what people are saying to you.
  - Problems seeing through one or both eyes. You may have blurry vision or have trouble seeing at all.
  - Trouble walking. You may stumble, lose your balance, or feel dizzy.
  - A headache. You may get a sudden, very bad headache.

To learn more about ways to lower your risk of bleeding, read *About Your Low Platelet Count* (www.mskcc.org/pe/low-platelet-count).

Muscle, bone, and joint problems from chemotherapy or hormone therapy

Some treatments can affect your muscles, bones, or joints. You can start to have:

- Bone pain
- Joint stiffness (hardness) or pain
- Loss of bone density (when your bones become weaker)

What you can do to help manage muscle, bone, and joint problems:

- Exercise, if you can. Exercise can help keep your bones strong. It can also lower your risk of falls and fractures (breaks). Walking is a great way to stay active.
- Make sure you're getting enough calcium. The best way to get calcium is through food. Examples of calcium-rich foods are milk, cheese, yogurt, canned salmon, tofu, cottage cheese, fortified orange juice, spinach, and almonds.
- Ask your doctor if you can take anti-inflammatory medication, such as ibuprofen (Advil, Motrin) or naproxen (Aleve, Naprosyn).
- Ask your doctor if you should take vitamin D. This can help keep your bones strong and healthy.

Contact your healthcare provider if:

- You start having new pain.
- Your legs are weak, or you have trouble walking.
- Your hands or fingers feel stiff.

To learn more, read *Osteoporosis, Osteopenia, and How to Improve Your Bone Health* (www.mskcc.org/pe/osteo-bone-health).

Numbness or tingling in your hands or feet (neuropathy) from chemotherapy

Some types of chemo can affect the nerves in your hands and feet. You can start to have some numbness or tingling in your fingers, toes, or both. This can feel like “pins and needles” or “electric shocks.” This is called neuropathy (noor-AH-puh-thee).

Neuropathy can last for a short time or for the rest of your life. How long it lasts depends on how long you’re on chemo. Your doctor can give you medication or change the dose of your chemo to help ease your symptoms.

What you can do to help manage neuropathy:

- Talk with your doctor about putting ice on your hands and feet during your treatment. Doing this can help prevent neuropathy. To learn more, read *Nail Cooling During Treatment with Taxane-based Chemotherapy* (www.mskcc.org/pe/nail-cooling-taxane-chemo).
- Be very careful when using the stove, oven, or an iron. You may not be able to feel heat as much as you used to and can burn yourself.

What to avoid if you have neuropathy:

- Using heating pads or hot packs because you can burn yourself.

Contact your healthcare provider if you have:

- Trouble handling small objects, such as holding a pen or buttoning a shirt.
- Pain, burning, numbness, or tingling in your fingers, toes, or both.
- Trouble walking or feeling the ground when you walk.
- Problems with your balance, which causes you to fall.

To learn more, read *Neuropathic Pain* (www.mskcc.org/pe/neuropathic_pain), *About Peripheral Neuropathy* (www.mskcc.org/pe/about-peripheral-neuropathy), and *Managing Peripheral Neuropathy* (www.mskcc.org/pe/managing_peripheral_neuropathy).

Taste changes from chemotherapy

Chemo treatments can cause taste changes that at times can make it hard to eat. The most common changes are feeling bitter and metallic (metal) tastes in your mouth. Sometimes, food does not have any taste. Taste changes are different for everyone, and often stop after treatment ends.

What you can do to help manage taste changes:

- Chew flavored gum.
- Suck on hard candy to lessen the metallic taste. If it happens while you're getting chemo, ask your nurse for a hard candy.
- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

What to avoid if you have taste changes:

- Eating foods that cause an unpleasant taste.
- Using nicotine or any tobacco product. This includes vaping devices, such as vape pens or e-cigarettes.
- Drinking alcohol.

To learn more, read *Managing Taste Changes During Chemotherapy* (www.mskcc.org/pe/taste-changes-chemo).

Diarrhea from chemotherapy

Diarrhea is a loose or watery bowel movement (poop), having more bowel movements (pooping) than what's normal for you, or both. Diarrhea is caused by irritation of the lining of your stomach and intestines during chemo.

What you can do to help manage diarrhea:

- Drink 8 to 10 (8-ounce) glasses of non-caffeinated liquids every day. Water, juices mixed with water, or liquids with electrolytes (such as Pedialyte, Gatorade, and Powerade) are good choices. This will help prevent dehydration.

- Eat small amounts of soft, bland foods, such as bananas, rice, applesauce, and white toast. Eat your food at room temperature.
- Ask your healthcare provider if you can take over-the-counter (medication you buy without a prescription) anti-diarrheal medication to help. This includes bismuth subsalicylate (Kaopectate®) or loperamide (Imodium® A-D).
- Keep your rectal area (a holding area for poop) clean and dry to help reduce skin irritation.
- For rectal irritation, try warm sitz baths. A sitz bath is when you sit in warm water up to your hips to soothe your rectal area. You can also put on a soothing cream. This can be vitamin A&D cream (A&D® ointment), petroleum jelly (Vaseline®), or hemorrhoid cream (Preparation H®).
    - Do not use rectal suppositories until you have checked with your doctor first.
- Place a warm cloth on your stomach. This may soothe cramping. Be careful not to burn yourself.
- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

What to avoid if you have diarrhea:

- High-fiber foods (such as bran, oats, whole wheat or whole-grain bread and cereal, brown rice, and beans).
- Foods and drinks with caffeine or a lot of artificial sweeteners or sugar. This includes coffee, tea, soda, and other soft drinks. Sugar can make your poop watery, which can make your diarrhea worse.
- Dairy products.
- Foods that make you bloated or gassy (such as cabbage and beans).
- Stool softeners or laxatives. Stool softeners make your bowel movements softer and easier to pass. Laxatives help you have a bowel movement.
- Rectal suppositories.

Call your healthcare provider if you have:

- Diarrhea 4 or more times in 24 hours, even after taking medication to help.
- Diarrhea, even after eating bananas, rice, applesauce, and white toast for 2 days.
- Rectal irritation that does not go away.
- Blood in your stool.

To learn more about managing diarrhea, read *Managing Diarrhea* (www.mskcc.org/pe/diarrhea).

Constipation from chemotherapy

Constipation is having 1 or all 3 of these:

- Fewer bowel movements than what's normal for you.
- Hard bowel movements.
- A hard time passing bowel movements.

It's a common side effect of medications used to treat pain and nausea. Some chemo can also cause constipation.

What you can do to help manage constipation:

- Drink 8 to 10 (8-ounce) glasses of non-caffeinated liquids every day. Water, juices mixed with water, or liquids with electrolytes (such as Pedialyte, Gatorade, and Powerade) are good choices.
- Slowly increase the amount of fiber you eat to help prevent gas. Fiber is found in fruits and vegetables. It's also found in grains (such as bran, oats, whole wheat or whole-grain bread and cereal, brown rice, and beans). To learn more about how to get more fiber in your diet, read *A Guide to High Fiber Foods* (www.mskcc.org/pe/high-fiber-foods).
- Do light exercises, if you can. Walking is a great way to stay active, and it helps reduce constipation.
- Ask your healthcare provider if you can take over-the-counter medication

to treat your constipation. One type of medication is a stool softener (such as Colace®), which makes your bowel movements softer and easier to pass. Another type of medication is a laxative (such as Senokot® or MiraLAX®), which helps you have a bowel movement.

- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

What to avoid if you have constipation:

- Rectal suppositories
- Enemas

Call your healthcare provider if you:

- Have not had a bowel movement or passed gas for more than 2 to 3 days.
- Have hard bowel movements for more than 2 to 3 days.
- Have a hard time passing bowel movements for more than 2 to 3 days.

To learn more about managing constipation, read *How to Manage Constipation* (www.mskcc.org/pe/constipation).

Mouth sores (mucositis) from chemotherapy

Chemo can cause mucositis (myoo-koh-SY-tis), which is painful areas or sores in your mouth or throat. Symptoms can start 3 to 10 days after your first chemo treatment. They often last a few days to a week.

What you can do to help manage mouth sores:

- Rinse your mouth every 4 to 6 hours, or more often as needed. Use an alcohol-free mouthwash or make your own solution. To make your own solution, mix 1 to 2 teaspoons of salt with 1 quart (4 cups) of water.
    - Swish the mouthwash or solution in your mouth. Gargle well for 15 to 30 seconds. Then spit it out. Do not swallow it.
    - Gargle with the mouthwash or solution in the morning, after each meal, and at bedtime. If you vomit, clean your mouth well and gargle

afterward.

- Moisturize your lips with lip balm or ointments to keep them from drying out.
- Use a soft toothbrush for your teeth and gums.
- If you have dentures, remove them during your mouth rinses and before bedtime.
- Eat soft foods.
- Ask your healthcare provider if oral cryotherapy is an option for you. Oral cryotherapy is a procedure that uses extreme cold to destroy tissue.
- If you're not able to eat because of your mouth sores, talk with your healthcare provider. They can refer you to a clinical dietitian-nutritionist.

What to avoid if you have mouth sores:

- Mouthwashes that may have alcohol or hydrogen peroxide. These can make your sores worse. Use a mouthwash with no alcohol or sugar (such as Biotène® PBF Oral Rinse or BetaCell™ Oral Rinse).
- Acidic (sour), salty, coarse (rough), sharp, or spicy foods.
- Foods that are hot to touch.
- Smoking or using tobacco products.

Call your healthcare provider if you:

- Get mouth sores often.
- Have pain when eating or swallowing.
- Cannot drink enough liquids to keep yourself hydrated.

To learn more about caring for your mouth, read *Mouth Care During Your Cancer Treatment* (www.mskcc.org/pe/mouth-care).

Allergic reaction to chemotherapy

Sometimes, chemo may cause an allergic reaction while it's being given to you. You will get medication to prevent this, if needed.

If you get medication to take at home, take it the way your doctor tells you to. Make sure to take it before your treatment. If you didn't take it before your treatment, tell your care team. Your nurse will closely monitor (watch) you during your treatment.

Your doctor and nurse will tell you if any of the medications you're getting can cause an allergic reaction.

Call your healthcare provider if you have any of these symptoms during or after your treatment:

- A rash
- Trouble breathing
- Swelling on any part of your body

Pain from chemotherapy or hormone therapy

Getting chemo is not painful. But some chemo can cause aches and pains between treatments. Medications to prevent low blood counts can also cause aches and pains. Some hormone therapies can cause achy joints.

Tell your healthcare provider if you have pain. Your doctor can adjust your medication or prescribe another medication to make you more comfortable. Ask them it's safe to use over-the-counter anti-inflammatory pain medications, such as ibuprofen (Advil or Motrin).

Eye and vision changes from chemotherapy

Some chemo medications can make you have dry eyes or watery eyes (tearing). If this happens, you can use wetting drops or allergy eye drops. If you have blurry vision during your treatment, see your eye doctor. It can be because your eyes are dry or tearing.

Some chemo medications can cause your eyelashes and eyebrows to fall out. If

this happens, it should not last. They should grow back in after your treatment with that medication is over.

Skin and nail changes from chemotherapy

Chemo can cause changes to your skin. The color of your skin, tongue, and the veins that were used to give you chemo can get darker. You may also have general skin changes, such as:

- Dry skin
- Itchy skin
- Cracked skin
- Skin that's sensitive to sunlight
- Rash

Chemo can also cause changes to your nails. The color of your nails can get darker. Your nails can get weak and brittle and may crack.

What you can do to help manage skin and nail changes:

- Keep your hands and feet well moisturized. Use fragrance-free creams or ointments (such as Eucerin®, CeraVe®, or Aquaphor®). Put them on while your skin is still moist, such as after a shower.
- Use a sunscreen with an SPF of 30 or higher every day.
- Avoid direct sunlight. Do not expose your scalp or body to the sun. Wear hats with wide brims, light-colored pants, and long-sleeved shirts.
- Keep your nails short with smooth edges.
- Wear gloves when gardening, cleaning, or washing dishes.
- Ask your healthcare provider if nail cooling treatment is an option for you. Nail cooling treatment is when your hands, feet, or both are wrapped in ice packs or ice bags. This helps to reduce changes in your nails during chemo treatment.

What to avoid if you have skin and nails changes:

- Long, hot baths or showers.
- Long periods of time in direct sunlight.
- Getting your nails done (manicures and pedicures).

Call your healthcare provider if:

- Your skin is peeling or blistering.
- You have a rash.
- You have any new bumps or nodules (lumps) on your skin.
- Your cuticles (layer of skin along the bottom edge of your nails) are red and painful.
- Your nails are peeling (lifting off the nail bed), or fluid is leaking from under your nails.

To learn more, read *Caring for Your Dry Skin* (www.mskcc.org/pe/caring-dry-skin), *Nail Changes During Treatment* (www.mskcc.org/pe/nail-changes-treatment), and *Nail Cooling During Treatment with Taxane-based Chemotherapy* (www.mskcc.org/pe/nail-cooling-taxane-chemo).

Weight changes from chemotherapy or hormone therapy

Some people gain weight during treatment, and others lose weight.

Weight gain can be caused by:

- Fatigue (feeling more tired or weak than usual). This lowers your activity level and makes you burn fewer calories.
- Eating lots of carbohydrates (starchy foods). For some people, eating carbohydrates helps their nausea go away.
- Overeating.
- Drinking more juices and drinks high in sugar.
- Starting menopause during or after treatment. This makes some people's metabolism change, so they're more likely to gain weight.

What you can do to avoid gaining weight:

- Eat a well-balanced diet and avoid extra calories. To learn more, read *Eat Your Way to Better Health* (www.mskcc.org/pe/eat-better-health).
- Make exercise a part of your routine.
- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

Weight loss can be caused by:

- Nausea from medications.
- Mouth sores that make it hard to eat.
- Lack of appetite (not feeling hungry).
- Loss of appetite from medication, constipation, or depression (strong feelings of sadness).

What you can do to avoid losing too much weight:

- Eat a well-balanced diet.
- Eat small meals often if you cannot finish a large meal.
- Add extra calories to your meals and snack in between meals.
- Ask your doctor if there are medications you can take to increase your appetite.
- Ask your healthcare provider to refer you to a clinical dietitian-nutritionist for more suggestions.

Fatigue from chemotherapy or hormone therapy

Many people describe fatigue as feeling unusually tired, weak, and like you have no energy. Fatigue from treatment can range from feeling a little tired to feeling extremely tired. Fatigue can start quickly or grow slowly over time.

What you can do to help manage fatigue:

- Eat a well-balanced diet, including good sources of protein (such as chicken,

fish, eggs, lentils, or peanut butter). Also include grains (such as pasta, rice, bread, and cereals), fruits, and vegetables. To learn more, read *Eat Your Way to Better Health* (www.mskcc.org/pe/eat-better-health).

- Try to be active to keep your energy levels up. People who do light exercise (such as walking), have less fatigue and can handle treatment better. To learn more about how to manage fatigue with exercise, read *Managing Cancer-Related Fatigue with Exercise* (www.mskcc.org/pe/fatigue-exercise).
- If you feel tired, take a rest break. You can take short naps about 15 to 20 minutes long. Taking shorter naps will help with your fatigue throughout the day. Taking shorter naps will also help you sleep better at night.
- Do not be afraid to ask for help. Ask your family and friends for help with tasks or activities that make you feel tired (such as household chores).
- Talk with your healthcare provider for more ways to manage your fatigue. You can also read *Managing Cancer-Related Fatigue* (www.mskcc.org/pe/managing-fatigue) to learn more.

Do not start taking any vitamins or supplements for your fatigue until you talk with your healthcare provider.

Heart problems from chemotherapy

Some chemo treatments can affect the way your heart works. They can make you have a fast heartbeat, have trouble breathing, or feel fatigued. Your doctor will tell you if you need to get any heart tests before you start treatment.

Call your healthcare provider if you have:

- Fast or irregular heartbeats.
- Trouble breathing after physical activity or exercise.
- Chest pain or heaviness in your chest.

Attention, concentration, or memory changes from chemotherapy or hormone therapy

Cancer treatment can sometimes affect your mind. You may notice that you're not able to think clearly or as quickly as you did before treatment. You may also notice you have trouble:

- Concentrating or focusing.
- Doing more than 1 thing at a time.
- Remembering things.

Many things can cause these changes and affect your thinking for some period of time, such as:

- Fatigue
- Mood changes
- Stress
- Anxiety (strong feelings of worry or fear)
- Normal aging
- Hormonal changes
- The cancer itself
- Anesthesia (medication to make you sleep during surgery)

Many people going through treatment don't have attention, concentration, or memory problems. It's hard to tell who may get them. They often go away over time.

If this is something you're worried about, talk with your doctor. If you have any of these problems, an occupational therapist can help you with your everyday activities. They also can help you improve your attention, concentration, and memory.

Things you can do to help manage attention, concentration, or memory problems:

- Make sure you get enough sleep.
- Eat a well-balanced diet.
- Read and talk with others to keep your mind active.
- Talk with your healthcare provider about trying counseling if you have anxiety or depression. They can add to memory problems. Read these resources to learn more about managing anxiety and depression:
  - *Managing Anxiety* (www.mskcc.org/pe/anxiety)
  - *Managing Depression During Cancer Treatment* (www.mskcc.org/pe/depression-cancer-treatment)
- For other helpful tips, read *Improving Your Memory* (www.mskcc.org/pe/improving-memory).

What to avoid if you have attention, concentration, or memory problems:

- Taking medication you don't need that can make you sleepy, such as anti-anxiety medication or sleep aids.
- Being in stressful situations, if you can.

Call your healthcare provider if:

- The changes in your attention, concentration, or memory are keeping you from doing your normal daily activities.
- You also have headaches.
- You also have trouble with your vision or balance.

Hot flashes from chemotherapy or hormone therapy

Cancer treatment can sometimes cause hot flashes or sweating that affects your daily routine or your sleep.

What you can do to help manage hot flashes:

- Check with your doctor before taking any herbs or over-the-counter substances for hot flashes. **Do not use herbal remedies, such as evening**

primrose oil, cohosh, or red clover. These herbs can work like the hormone estrogen (ES-truh-jin) and may cause breast tumors to grow.

- Wear comfortable, loose-fitting cotton clothing and dress in layers.
- Ask your healthcare provider how to manage or treat signs of menopause.
- Keep a log of when you have hot flashes. This can help you figure out what triggers them. Common triggers are hot foods and drinks, spicy food, caffeine, and alcohol. Avoid these triggers to help reduce your hot flashes.

To learn more about managing hot flashes, read *Managing Your Hot Flashes Without Hormones* (www.mskcc.org/pe/managing-hot-flashes).

Body and sexual intimacy changes from chemotherapy or hormone therapy

Breast cancer and breast cancer treatment can change how you look. This may be because of a tumor, radiation, surgery, or a mix of these. Changes in your body from treatment can affect:

- Your confidence and body image. Body image is how you see yourself. It's how comfortable you feel in your body and how you feel about the way you look.
- How comfortable you feel showing your body to another person.
- Your desire for sex. Both men and women may notice they have less interest in sexual activity during chemo.
- How your body responds sexually.
- Your ability to get pregnant and have children.

What you can do to help manage body and sexual intimacy changes:

- Talk with your partner. It's important to share with each other how you're both feeling. You may find that they're worried about causing you pain or discomfort during sex.
- See a specialist in our Female Sexual Medicine & Women's Health Program or Male Sexual & Reproductive Medicine Program. For information or to make

an appointment, call 646-888-5076 to reach the program for females or 646-888-6024 for the program for males.

- Attend MSK's Embodied educational program for information on cancer and body image changes. To learn more or to register, visit www.mskcc.org/events and search for "embodied." You can also email RLAC@mskcc.org.

To learn more about managing body and sexual intimacy changes, read *Sexual Health and Intimacy* (www.mskcc.org/pe/sexual-health-intimacy).

Side effects females may have

Menstrual cycle (period) changes from chemotherapy or hormone therapy

Some treatments can cause changes in your periods. They can become heavy or light, irregular, or stop. Your treatment plan also may include medication or surgery that will stop your periods.

- **If you still have ovaries and a uterus, you can still be ovulating (when your ovaries release an egg). This means you can still get pregnant, even if your periods stop.** If you have ovaries and a uterus, you must use a non-hormonal form of birth control during your treatment. This can be a condom, diaphragm (DY-uh-fram), or non-hormonal IUD (tiny device put into your uterus to prevent pregnancy).
  - To learn more, read *Sex and Your Cancer Treatment* (www.mskcc.org/pe/sex-cancer-treatment).
- Ask your doctor when you can stop using these methods of birth control.
- Hormonal changes caused by medication and your period can give you mood swings (changes in your mood).
- Chemo can cause early menopause (when your periods stop at a young age). Your period is more likely to stop if you're age 40 or older.

Vaginal dryness from hormone therapy

Many people have vaginal dryness after menopause or from hormone treatments. Vaginal dryness is when your vagina becomes drier and less elastic (stretchy). This can make it harder to have sex or make sex painful. It can also make it easier to get urinary tract infections (UTIs).

What you can do to help manage vaginal dryness:

- Use vaginal moisturizers regularly, such as Replens™, K-Y® Silk-E®, or Vitamin E gel caps.
- Use lubricants during sexual activity to reduce discomfort. You can use water-based lubricants, such as Astroglide®, K-Y Jelly, or Liquid Silk.
- Make foreplay longer. This can increase your sexual arousal (the feeling of being turned on).
- Talk with your partner about your vaginal dryness. Make sure they know it's a side effect of the treatment, not your lack of sexual desire.
- Try different sexual positions. Some may be better than others.
- See a specialist in our Female Sexual Medicine & Women's Health Program. For information or to make an appointment, call 646-888-5076.

To learn more, read *Improving Your Vulvovaginal Health* (www.mskcc.org/pe/improving-vulvovaginal-health).

Fertility and pregnancy while on chemotherapy or hormone therapy

You should not get pregnant if you or your partner are on chemo or hormone therapy. These treatments can cause birth defects. These are problems that can affect how a baby's body parts look and how well they work.

Even if your period recently stopped, you can still get pregnant for some time.

Do not use oral birth control (such as birth control pills) if you have breast cancer. Oral birth control contains the hormones estrogen and progesterone (proh-JES-teh-rone). These hormones can make breast tumors grow.

If you or your partner are on chemo, use barrier methods of birth control (such as condoms, diaphragms, or both). Barrier methods of birth control help prevent pregnancy by blocking sperm from entering the uterus.

Some birth control methods don't work as well as others. The following methods will not fully stop you from getting pregnant. Do not use them alone. You must only use them with barrier methods of birth control:

- Withdrawal (also called pulling out) method: When a partner withdraws (pulls out) their penis from a vagina before they ejaculate.
- Rhythm method: When partners don't have sex on the days of the month a person is most likely to get pregnant. This is usually around the time of ovulation (the release of an egg during the person's menstrual cycle).

Chemo or hormone therapy can cause infertility (not being able to get pregnant naturally). Infertility is not always permanent, but often is.

Talk with your doctor about this before you start treatment. You may be able to preserve your fertility by freezing your eggs, sperm, or embryos. Read these resources to learn more:

- *Fertility Preservation Before Cancer Treatment: Options for People Born with Ovaries and a Uterus* (www.mskcc.org/pe/fertility-starting-treatment)
- *Building Your Family After Cancer Treatment: For People Born With Testicles* (www.mskcc.org/pe/building-family-born-testicles)
- *Building Your Family After Cancer Treatment: For People Born With Ovaries and a Uterus* (www.mskcc.org/pe/building-family-ovaries-uterus)

Managing your emotions during neoadjuvant therapy for breast cancer

It's very common to have new, upsetting feelings during your treatment. These feelings are different for everyone. Common ones include:

- Feeling sad, lonely, anxious (nervous or worried), or angry.

- Feeling exhausted (very tired) or restless (like you cannot relax or get comfortable).
- Changes in your mood throughout the day.

What you can do to help manage these emotions:

- Talk with people you're close to. Tell them about your feelings and the changes you're going through. Open communication will help you understand each other better. Friends and family can support and comfort you.
- Ask for help with anything, if you need it. Accept the help that people offer you.
- Share your concerns with your care team. They can tell you more about the emotional changes you have. They can also refer you to other resources at MSK that can help.
- Make an appointment with MSK's Counseling Center. Many people find that counseling helps them deal with their feelings during cancer treatment. Our counselors provide one-on-one counseling and counseling for couples, families, caregivers, and groups. They can also prescribe medications to help if you feel anxious or depressed. To learn more, visit www.mskcc.org/experience/patient-support/counseling or call 646-888-0200.

Breast cancer survivorship

About 2 to 5 years after your treatment ends, your care may be transferred from your doctor to a survivorship nurse practitioner (NP). Your survivorship NP will be a member of MSK's breast cancer team. They will examine you and order tests, focusing on your long-term physical and psychological (mental) needs.

Your survivorship NP will talk with your local doctor about your breast cancer treatment and recovery. In time, your care will be transferred over to your local doctor. To learn more, read *Transitioning Your Breast Cancer Care from MSK to Your Primary Care Provider* (www.mskcc.org/pe/transitioning-breast-care).

Common questions about neoadjuvant therapy for breast cancer

Does someone need to come with me each time I have treatment?

During your treatments, you may get medications that can make you very drowsy (sleepy). If you're getting these medications, it's not safe for you to drive a car or travel alone. If you can, have a friend or family member pick you up at the end of your treatment.

After your first treatment, you will have a better idea of how you feel. You can also ask your healthcare provider if you're likely to feel drowsy after getting your medications.

What can I eat before and after chemotherapy? Are there any foods to avoid?

It's best to eat small meals 4 to 5 times a day before your chemo appointment. This will keep you from feeling too full during your treatment.

Food safety is also important during treatment. Avoid:

- Raw or undercooked meat, fish, and poultry (such as chicken and turkey).
- Unpasteurized products (such as unpasteurized or raw milk, cheese, and other dairy products).

Ask your nurse if you should read *Food Safety During Cancer Treatment* (www.mskcc.org/pe/food-safety).

Drink lots of non-caffeinated liquids before and after your chemo appointment to stay well hydrated.

Do I still need to take antinausea medication if I'm not nauseous (feeling like I'm going to throw up)?

Nausea and vomiting can happen on the day you get chemo, or many days after chemo. If the chemo you're getting can cause nausea, your doctor will prescribe medication to reduce or prevent it. Always take your antinausea medication the way your doctor tells you to. Some medication works best if you take it before you become nauseous. If you're still nauseous after taking your medication, call your healthcare provider.

Why wasn't I able to get my chemotherapy treatment when it was scheduled?

You're supposed to get your chemo treatments on a set schedule, so your body has time to recover between treatments. This is because chemo affects your cancer cells and your normal cells. When your normal cells are damaged or die, your body needs time to make new cells to replace them.

Sometimes, your body may need more time to recover from the side effects of chemo. For example, your body may need time to let mouth sores heal, or blood counts to rise to normal. In this case, your chemo may need to be rescheduled.

Your doctor will decide if your chemo should be rescheduled and will tell you the reasons why.

My chemotherapy treatment was delayed because my ANC was low. What is an ANC?

An ANC is an absolute neutrophil count. A neutrophil is a type of white blood cell that helps your body fight infections. Your ANC count usually falls 7 to 14 days after getting chemo.

If your ANC is low, your doctor may delay your treatment until it's back to normal. This is a precaution (safety measure) to prevent you from getting an infection.

Is there anything I can do to raise my blood counts?

Your blood counts will rise again over time. Your doctor may prescribe medication to raise your white blood cell count or keep it stable. These usually are shots you get between treatments. Sometimes your treatment will be delayed to allow time for your blood counts to recover.

There's no evidence (proof) that vitamins or a special diet will help your blood counts recover faster. But you may need iron supplements if you have anemia (low red blood cell count) and low iron levels. Your doctor will talk with you about this.

I have chills or a fever above 100.4 °F (38 °C), but my doctor's office is closed. How can I reach a doctor?

You can always reach a doctor. During evenings, weekends, or holidays, call the hospital operator at 212-639-2000. Ask to talk with the person on call (covering) for your doctor.

I have not lost my hair yet, and my blood counts have not dropped. Does this mean the chemotherapy is not working?

Chemo can be working even if you don't have hair loss or lowered blood counts. Different therapies cause different side effects. Everyone has different reactions to the same treatment. Your care team will keep track of your progress and how you respond to treatment.

What can I take for a headache?

You can take acetaminophen (Tylenol or Extra Strength Tylenol®) for a headache. If you feel like you have a fever or chills, check your temperature before you take acetaminophen. This is because acetaminophen can lower your temperature and hide a fever, which is usually the first sign of infection.

Call your doctor's office if you have chills or a fever of 100.4 °F (38 °C) or higher.

Ask your doctor if you can take products that have aspirin or ibuprofen (such as

Advil or Motrin). With some chemo, these products can raise the chance of bleeding sometimes. Your nurse can give you a list of products to avoid.

I'm having problems urinating (peeing). Is this normal?

Some chemo can irritate your bladder. Side effects can be:

- An urgency to urinate (feeling you need to pee more often or right away).
- Burning when urinating.
- Blood in your urine.

These can be signs of an infection or irritation. Call your doctor's office if you have any of these symptoms. They may want to collect some of your urine and test it to see if you have an infection.

It's important to drink 8 to 10 (8-ounce) glasses of liquids every day and urinate (pee) often.

Can I still take my other prescription medications?

In most cases, you can keep taking your prescription medications. Tell your doctor the names of all the herbs, supplements, and medications you take. These include prescription and over-the-counter medications, patches, and creams.

Some herbs, supplements, and medications can change the way the chemo works. Do not start any new medications until you talk with your doctor.

Can I take vitamins and mineral, herbal, or other dietary supplements?

You should avoid taking most vitamins and most mineral, herbal, or other dietary supplements. They can interfere with (get in the way of) your treatment or affect your cancer. They also can increase the side effects of your treatment.

Talk with your doctor or clinical dietitian-nutritionist about any vitamins or supplements you're taking right now. Do not start taking any new vitamins or supplements until you talk with your doctor or clinical dietitian-nutritionist.

Can I drink alcohol?

Your liver processes (breaks down) chemo medications and many other medications. Your liver also processes alcohol. This means drinking alcohol while getting chemo can:

- Limit how well your liver processes the chemo, causing more side effects.
- Interact with your other medications and make them less effective (not work as well).
- Make your body lose too much water.
- Make you feel very drowsy.

For these reasons, you should limit alcohol during chemo. If you want to drink alcohol, talk with your doctor.

Can I have dental work?

Do not have any procedure that can cause bleeding, such as dental work. This can let bacteria enter your bloodstream and cause an infection. If your blood counts are low, you're also at a higher risk for a serious infection. Check with your doctor before you schedule any dental work, including cleanings or surgery.

Can I color or perm my hair?

Do not color or perm your hair. Hair dye and perms have chemicals that irritate hair follicles. If you color or perm your hair, it can speed up hair loss during chemo. If you must dye your hair, talk with your doctor first.

Does insurance cover wigs?

People who lose their hair from cancer treatment may have insurance coverage for a wig. Check with your insurance company to make sure it's covered. If you want a wig and your insurance will cover it, ask your doctor for a prescription for one.

Can I travel while I get chemotherapy?

Traveling is sometimes allowed. It's recommended you try to plan your trips around your chemo schedule. It's important you don't miss any of your chemo appointments. If you want to travel, talk with your healthcare provider before making travel plans.

Will I be able to work during treatment?

Many people with breast cancer can keep working during treatment. Being able to work depends on the:

- Type of job you have.
- Side effects of your treatment.
- Symptoms of your breast cancer.

If you're having trouble working, talk with your healthcare provider. Let them know if you want to stop working for a period of time.

Advance care planning

Advance care planning protects your right to make decisions (choices) about your healthcare. It lets you think about important health issues that can come up in the future. You can make clear decisions ahead of time, while you're still healthy.

A medical crisis can leave you too sick to make your own healthcare decisions. That's why it's important to plan ahead. It will help you get the care you want if you're not able to make decisions on your own.

Planning ahead also helps put your loved ones at ease. They won't have to guess what you would want or worry they made the right decision for you.

We recommend you talk with your care team about your wishes. Do this early in your treatment and anytime you feel like things have changed. Your care team can help make sure your choices are documented (put in writing). There are ways to do this that are recognized by the law.

Advance directives are legal documents that have written instructions about your decisions for medical care. The 2 most common types of advance directives are a health care proxy and a living will.

- A **health care proxy** form names your health care agent. Your health care agent is the person who will make medical decisions for you. They will make these decisions if you're not able to make them for yourself.
- A **living will** states your wishes for your medical care. It will go into effect if you become unable to make decisions for yourself. In the living will, you name the medical treatments that you want or don't want. You can also describe the situations in which you do or don't want to get these treatments.

Talk with your nurse if you want to fill out a health care proxy form. To learn more, read *Advance Care Planning for People With Cancer and Their Loved Ones* (www.mskcc.org/pe/advance-care-planning) and *How To Be a Health Care Agent* (www.mskcc.org/pe/health-care-agent).

If you have questions or concerns, contact your healthcare provider. A member of your care team will answer Monday through Friday from 9 a.m. to 5 p.m. Outside those hours, you can leave a message or talk with another MSK provider. There is always a doctor or nurse on call. If you're not sure how to reach your healthcare provider, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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