



GYNECOLOGIC CANCER INSTITUTE
of CHICAGO

Navigating the Side Effects of Chemotherapy

Chemotherapy works by killing cells that divide rapidly. Cancer cells grow rapidly but so do many normal cells in your body, like the cells in your bone marrow, cells that line your mouth, stomach and intestines and cells that make your hair grow. That is why you may experience some side effects to chemotherapy. Not everyone has side effects and if you do not have any, it does not mean that the chemotherapy is not working.

This section will talk about some of the common side effects and what you can do to help control them.

INFECTION

White blood cells help your body to fight infection. They are some of the fastest dividing cells in your body and are often affected by chemotherapy. There are different types of white blood cells. One kind that your doctor and nurse will follow closely is called a neutrophil, because these are especially important to fight infection.

When this type of cell is low (often around 10 -14 days after treatment), it is very important to watch for any signs of infection.

Some signs of infection are:

- Fever of 100.5 or higher
- Chills, shaking or dizziness
- Coughing up yellow or green mucous
- Sores in your mouth
- Burning when you urinate
- Diarrhea
- Difficult breathing or feeling short of breath

What you can do to manage or prevent infection

- Good hand washing with soap and water is your best defense against infection. It is especially important to wash your hands before preparing food or eating; after

you cough, sneeze, or blow your nose; after you use the bathroom or touch animals. If you have pets ask someone else to change the litter or be the “pooper – scooper”. Carry some hand sanitizer with you to use if you are not able to use soap and water.

- Clean surfaces that you touch like telephones, computers, doorknobs with disinfecting wipes.
- Try to stay away from people who are sick.
- Take good care of your mouth. Brush your teeth at least twice a day using a soft toothbrush and rinse your mouth with an alcohol free mouth wash or a salt and baking soda rinse (½ teaspoon of salt and ½ teaspoon of baking soda in 2 cups of water).
- Eat a well balanced diet. Wash raw fruits and vegetables well before eating. Do not eat raw seafood (sushi) or undercooked meat or chicken as these may contain bacteria.
- Call your doctor or health care provider right away if you have a fever of 100.5 F or higher or think you have an infection.

SIDE EFFECTS AND HOW TO MANAGE THEM

FATIGUE

Fatigue means feeling tired or weak and it is not always relieved by rest or sleep. It may last for a few days between treatments or be constant throughout treatment



and last for a few weeks or months after your treatment is complete. If you are receiving radiation treatment along with chemotherapy, you may feel even more tired.

Fatigue can be a side effect of the chemotherapy drugs but some other causes of fatigue include:

- Anemia (low red blood cells). Red blood cells carry oxygen throughout your body. Chemotherapy can cause you to have fewer red blood cells and make it harder for your body to get the oxygen it needs.
- Some of the medicines we use to treat nausea, anxiety, or pain can also cause fatigue.
- Stress or depression can increase fatigue. Having cancer and receiving chemotherapy is stressful. It can affect your family life, work and finances. We have support available to help you handle the increased stress in your life. Please talk to your doctor or nurse about your feelings, so we can get you the help you need.

What you can do to manage fatigue

- Try to get 8 hours of sleep each night. Listen to your body. You may need a short nap or to sit down and put up your feet for a bit during the day. (Do not sleep more than an hour during the day so that you can still sleep at night).
- Getting some exercise each day such as walking or riding a stationary bike may help reduce fatigue.
- Try to balance periods of rest and activity. Let family and friends help you with some of your chores or errands.
- Eat a well balanced diet and drink 8 to 10 glasses of fluids each day. (We have dietitians who can help you with planning to meet your dietary needs. Ask your nurse to arrange a visit).
- Attending support groups or talking with a therapist can help you control the stress you experience.

BLEEDING OR CLOTTING

Platelets are cells that cause your blood to clot. Chemotherapy can lower the number of platelets that you have which can increase your risk for bleeding. Some types of chemotherapy work by targeting the blood vessels a tumor needs to grow. These medicines can also increase your risk for bleeding or forming a blood clot.

What you can do to manage bleeding or clotting

- Use a soft toothbrush to clean your teeth.
- Use an electric shaver instead of a razor.
- Be careful when using sharp objects.
- Blow your nose gently. It may help to use nasal saline

spray to keep your nose moist.

- Wear shoes, even indoors, to protect your feet.
- Do not play contact sports or other activities that could injure you.
- Drink plenty of fluids and increase fiber in your diet to prevent straining to have a bowel movement.
- Try not to cross your legs when sitting as this can affect your blood circulation.
- Do not take aspirin or over the counter medicines, vitamins or herbal supplements unless you check with your doctor or nurse.

Call our office if:

- You have bleeding from your nose or a cut that you cannot stop with firm pressure.
- You have red or pink colored urine.
- You have blood in your bowel movements or they look black and tarry.
- You have heavy vaginal bleeding during your period or bleeding when you are not having a period.
- Swelling, warmth, or tenderness in your leg or arm.
- You have headaches or changes in your vision.

NAUSEA AND VOMITING

Some chemotherapy can cause you to feel sick to your stomach (nausea) or like you are going to throw up (vomiting). Usually the risk of this is greatest in the first 24 to 48 hours after you are treated. There are many good drugs to control nausea and vomiting. If you are receiving a treatment which can cause nausea, your nurse will give you some medicine before the chemotherapy to help prevent it. You will also be given prescriptions for medicine to take at home with instructions on when and how to use it.

What you can do to manage nausea and vomiting:

- Take your medications exactly the way your nurse instructs you, even if you do not think you need it. It is easier to prevent nausea than get rid of it after it happens. If your medicine does not seem to work, please call your nurse or doctor. There are many different kinds of anti nausea medicine and if one doesn't work we can prescribe another.
- Eat simple, bland (non-spicy) foods on the day you are treated like soup, eggs, toast or plain pasta. You may also find it easier to eat small, frequent meals instead of 3 large ones.
- Foods that are not too hot or too cold may be better tolerated.



- Try to stay away from foods with strong smells.
- Drink 8-10 glasses of clear, caffeine free fluid daily.
- Acupuncture may also help with nausea.

Call our office if:

- You are experiencing nausea and vomiting at home despite taking your anti nausea medicine
- You feel weak or dizzy.
- You are not making as much urine as you usually do or it is dark in color.

HAIR LOSS

Some chemotherapy drugs damage the cells that cause your hair to grow. You may lose all of your hair or just have some thinning of your hair. Hair loss can affect all of your body hair – face, eyebrows, eyelashes, arms, legs, underarms, and pubic hair. If you are receiving a drug that causes hair loss, it usually starts about 2 to 3 weeks after your first treatment. It may gradually thin or fall out in clumps. Many people find it easier to cut their hair short or shave their heads when this happens. Your scalp may feel tender or tingly when hair loss is about to begin. Your hair usually begins to grow back about 2 months after completing treatment but it may be different in color or texture.

What you can do to manage hair loss

- Ask your doctor or nurse if you are likely to have hair loss.
- Be gentle with your hair. Use baby shampoo and pat it dry. Avoid use of hair dryers, curling irons, hair dyes, or perms as these can damage your hair. If you are interested in obtaining a wig, it is best to do this before you start chemotherapy so that you can match your color and style. Some insurance companies will pay for a wig with a prescription from your doctor. The American Cancer Society can also provide a wig for you.
- Some people are more comfortable covering their heads with a scarf or hat.

DIARRHEA

Diarrhea means that you have bowel movements more often than normal, and they may be watery or very soft. If you have an ostomy, diarrhea means that your bag is filling up faster and your stool may be softer or more watery. Some types of chemotherapy can cause diarrhea. Radiation therapy to your abdomen or pelvis can also cause diarrhea.

What you can do to manage diarrhea:

- Imodium (loperamide) is an over the counter medicine used to control diarrhea. Use it the way your nurse or doctor tells you (this may be more often than the package directs). If it does not work be sure to let your nurse know as there are other medications that can be used.
- Drink 8 to 12 glasses of fluids every day to stay well hydrated. Water, clear soda like ginger ale, apple juice, clear chicken broth or Pedialyte are good choices. Alcohol and caffeine can make diarrhea worse.
- Eat small frequent meals instead of 3 large ones. Avoid greasy or spicy foods, or foods that cause gas like cabbage or broccoli.
- Soft, bland foods like bananas, white rice, applesauce, toast, eggs, plain noodles, jello, or baked chicken or turkey without the skin are good choices.
- Clean your skin gently after a bowel movement. Use a baby wipe or squirt bottle with warm water to clean yourself. You may need to use an ointment like Desitin or A&D to soothe your skin.

Call our office if:

- You have a fever of 100.5 degrees F or higher.
- You feel weak, dizzy, or short of breath.
- The medicines you are taking for diarrhea are not helping.
- You notice blood in your stools or dark, tarry stools.

CONSTIPATION

Constipation means that it is hard to have a bowel movement. Your stools may be harder than normal and you may have more gas and bloating. Some chemotherapy can cause constipation. Pain medicines or some of the medicines to prevent nausea can cause this too.

What you can do to manage constipation:

- Drink plenty of liquids. Try to drink at least 8-10 glasses every day. Prune juice or other fruit/ vegetable juices may help.
- Eat high fiber foods like bran, whole wheat bread, fruits, vegetables, nuts, or popcorn
- Stay active! Walking or riding an exercise bike can help.
- Your doctor or nurse may recommend a laxative like Senna –S or Miralax. Do not use an enema or suppository without asking your nurse or doctor first.

Call our office if:

- You have not had a bowel movement for 3 days.



MOUTH SORES

Some types of chemotherapy can cause your mouth to feel dry or cause sores in your mouth, throat or around your lips (like canker sores). This can make it harder for you to eat and drink.

What you can do to manage mouth sores:

- If possible, see a dentist before starting chemotherapy to have your teeth cleaned and take care of any problems you may have. If you must go to the dentist while on chemotherapy, let your doctor or nurse know so they can check your blood counts and make sure it is safe.
- Keep your mouth clean. Brush your teeth after eating and at bedtime using a soft tooth brush.
- Rinse your mouth frequently (4 or 5 times a day) with a salt and soda solution (½ teaspoon salt and ½ teaspoon baking soda in 2 cups water. Or you may use Biotene available over the counter. Do not use mouth wash that has alcohol in it as this can dry your mouth more.
- If your mouth is sore eat foods that are soft and moist like scrambled eggs, mashed potatoes with gravy, or pudding. Stay away from citrus (oranges, lemon or grapefruit), crunchy foods or foods that are spicy.
- Tobacco and alcohol can also aggravate mouth sores.
- If your mouth is dry, suck on hard candy or chew sugarless gum.
- Sucking on ice chips or popsicles may also help dry mouth and to relieve pain if mouth is sore.
- Keep your lips moist with a moisturizer like petroleum jelly (Vaseline) or lip balm.

Call our office if:

- You have sores in your mouth that are making it hard to eat or drink. You may need pain medication or a special mouth rinse to help.
- If you have a fever of 100.5 degrees or higher.

NEUROPATHY

Some types of cancer treatments can damage nerves. This is called neuropathy. There are different types of nerve related symptoms that you could have. They usually get better after treatment is finished but it can take many months and some may not go away completely.

- Numbness, tingling or burning especially of your hands and feet.
- Pain when you walk.
- Jaw pain.
- Shaking or trembling

- Constipation
- Trouble buttoning clothing or picking things up.
- Hearing loss
- Sometimes you may feel like it is harder to talk or feel strange sensations in your mouth or tongue during or shortly after treatment. This usually goes away quickly.

What you can do to manage neuropathy:

- Talk to your doctor or nurse about any symptoms you have. It may be necessary to change the doses on some of your drugs or medicines may be prescribed to help.
- Be safe! Wear rubber sole (non-skid) shoes inside and outside. Place a bath mat in your tub or shower. Remove any area rugs or cords that you could trip on. Make sure your bath/ shower water is not too hot.
- Use hot pads to protect your hands in the kitchen when cooking, and be very careful when using knives or scissors.
- Wear gloves when working outside or washing dishes. Use gloves or pads to protect your hands when getting something from the refrigerator or freezer. Let cold foods come to room temperature before eating.

SKIN AND NAIL CHANGES

Chemotherapy can cause changes in your skin and fingernails. Your skin may feel dry and itchy or you may notice tenderness and peeling especially of the palms of the hands and soles of the feet or have a rash. Some drugs can cause a rash that looks like acne on your face, neck, back and chest. Your nails may be brittle and crack or you may get tender areas around your nail beds. You may also get a sunburn more quickly when on chemotherapy. Some drugs may cause darkening along your veins where the IV medicine was given.

What you can do to manage skin changes:

- If you are getting a drug that is likely to cause a rash, your doctor may have you see one of our dermatologists (skin doctor) who will give you medicines and creams to help.
- To help with dry skin, take quick showers instead of long baths; use a mild moisturizing soap; pat dry gently and use lotion or creams while skin is still damp.
- A dusting of cornstarch may help itching or using a colloidal oatmeal bath (you can buy over the counter) may also help.
- Avoid direct sunlight; wear a hat when outdoors and use a sunscreen with an SPF of at least 15 (30 is better!)



PRESCRIBE

This is a function that allows us to submit your prescription electronically to your preferred pharmacy so it is ready when you arrive. Please remember to give us your pharmacy information.

COMMON SIDE EFFECTS:

There are several side effects and symptoms related to cancer and chemotherapy we can help to alleviate with over the counter (OTC) and prescription (Rx) medications. We have listed many options below; your provider will help suggest which medications are best for you.

- Allergic reactions
- Nausea
- Constipation
- Muscle/Joint aches
- Mouth Sores
- Peripheral Neuropathy *
- Skin reactions *
- Hot Flashes *
- Fatigue *
- Depression/Anxiety *

**Talk to your provider about management*

PREVENTING ALLERGIC REACTIONS

Decadron (Dexamethasone):

This is a steroid medication used as a pre-medication prior to Taxane based chemotherapy drugs to help prevent allergic reactions. It is also used after chemotherapy to help control nausea. Decadron can increase your blood sugar. If you have diabetes, we may adjust your dose.

Decadron 4mg tablets Rx

For Taxol:

Take _____ tablets the night before (6 pm - 10pm) with food.

For Taxotere:

Take _____ tablets twice a day starting the day prior to chemotherapy and continue for ____ days. (8am and 8pm)

Benadryl/Allegra/Claritin OTC

Anti-allergy medication. Take only if recommended by your health care provider.

Anti-nausea Medication

We will suggest which medications are appropriate based on your chemotherapy regimen. All of the following are available by prescription only (Rx).

ACUTE nausea +/- vomiting = a few minutes to hours after chemo until 24 hours

DELAYED nausea +/- vomiting = >24 hours, peaks 48-72 hours and can last up to 7 days

MEDICATIONS TO MANAGE OR PREVENT CHEMOTHERAPY SIDE EFFECTS

Decadron (dexamethasone) 4mg tablets before and/or after chemotherapy to prevent ACUTE and early DELAYED nausea after chemo:

Take _____ tablet(s) twice a day starting the morning after chemotherapy and continue for _____ days.

Ativan (lorazepam) 0.5mg, 1-2 tablets every 6 hours as needed for nausea ANYTIME.

- Can make you sleepy

Compazine (prochlorperazine) 10mg tablets every 6 hours or 25mg rectal suppository every 12 hours as needed for nausea ANYTIME.

- Can make you sleepy. Do not combine with Reglan.

Zofran (ondansetron) 8mg ODT's (dissolves under the tongue) every 8 hours as needed for nausea ACUTE or DELAYED. Others in this drug class are Anzemet or Kytril.

- Can cause headache and constipation. Take stool softeners and laxatives as needed.
- May be taken at the same time as any of the other meds listed here.

Reglan (metoclopramide) 20mg every 4-6 hours as needed for nausea ANYTIME.

- Best taken 30 minutes prior to meals
- Do not combine with Compazine.

Emend (aprepitant) 125mg before chemotherapy/ or may be given IV in the office for ACUTE or DELAYED nausea. This is followed by 80mg day 2 and day 3 after chemotherapy.

Aloxi (palonosetron) 0.25mg IV (long-acting form of



Zofran) to be given before chemotherapy for ACUTE or DELAYED nausea.

- Can cause headache and constipation
- We often use this when patients have nausea despite the use of Zofran.

Scopolamine Patch 1.5mg. Change patch every 3 days.

Good for nausea related to dizziness

- Can cause dry mouth and blurry vision

Haloperidol 1-2mg oral every 4-6 hours as needed

Non-pharmacological interventions likely to be effective:

- Acupuncture
- Accupressure
- Guided imagery
- Music therapy
- Progressive muscle relaxation
- Psychoeducational support

PREVENTION OF CONSTIPATION RELATED TO CHEMOTHERAPY

Many people notice increased constipation the week after receiving Taxol chemotherapy. If not effective, see the “constipation action plan” below.

Colace (docusate sodium) 100mg OTC. Take 1 tab twice daily starting 2-3 days prior to chemotherapy (stool softener).

Senokot (Senna) OTC take 1-2 tabs the night after your chemotherapy, then once daily for 3 days, then as needed.

CONSTIPATION ACTION PLAN

Non medication things to try:

- Drink 2-3 liters of fluid per day (especially if you take fiber supplement or have a high-fiber diet)
- Try to get moderate exercise 20-30 minutes per day
- Limit alcohol to 1 glass per night
- Try ground fresh flax seeds over your cereal. Also tastes great toasted then ground with a little salt
- Try fresh celery sticks
- Try prune juice or pureed prune baby food (still a great option after all these years)

STEP 1:

Metamucil, Citrucel, Benfiber (fiber supplement) OTC.

Take as directed (1-2 tsp. 1-3x/day) with a full glass of water. This will not help you if you are not able to drink enough fluids or if you regularly take opioid medications.

Colace (docusate sodium) 100mg OTC. Take 1-4 tabs daily. (stool softener). If no BM in 24 hours then increase doses listed above

STEP 2: If no BM in 48 hours then continue Step 1 and add:

Dulcolax (bisacodyl) pills 5mg (Rx) 2-3 tabs before bed or up to 3x/day

Or

Miralax 17g (OTC or Rx). Mix with water or juice 1-3x a day.

Or

Milk of Magnesia. Take as directed (30 to 60ml) 1-2x/ day.

Or begin an osmotic laxative:

Lactulose 30ml. Take 1-2x a day as needed for constipation.

Magnesium Citrate Solution (flavored carbonated) (OTC) 300 ml/24 hours by mouth

STEP 3: If no BM in 72 hours you may need to determine if you are impacted (this occurs when large amounts of hard, dry feces accumulates in the rectum and cannot be eliminated. You may even have small amounts of liquid stool seeping from around the impacted stool. You may feel rectal discomfort, lower abdominal or back pain, pain when defecating, or urine incontinence. Sometimes you may need a digital rectal exam to determine if you are impacted).

If you are not impacted, begin stimulant laxative:

Senokot (senna)

Senna tea (Smooth Moves by Traditional Medicinals).

Senokot-S (laxative + stool softener) Take 2 tabs before bed day 1, if no BM then take 2 tabs the next am, if no BM then take 3 tabs before bed, if no BM then continue 3 tabs 2x/day

If you are impacted, begin suppository or enema:



□ **Glycerin suppository (OTC).** 1 suppository per rectum as needed or

□ **Dulcolax suppository (OTC)** 1 suppository per rectum 1-2x as needed or

- **Fleet enema** 21.3Gm instill rectally as needed
- Try topical anesthetic to decrease pain
 - Please lubricate rectum with KY jelly or Astroglide or mineral oil enema
 - Gently disimpact with a gloved finger, may follow with soap suds or tap water enema THEN, begin Senna protocol in column 1

A word about constipation for the gynecologic cancer patient.

We receive many phone calls to our office related to concerns for this problem and it is understandable.

- Most of our patients have had an abdominal surgery that may have involved a resection of the colon and were strongly encouraged to have soft bowel movements (BM) in the post-operative period
- Many patients take opioid pain medications which are well known to cause constipation
- Some patients may have known scar tissue or tumor implants in their abdomen or near the colon and are concerned about a risk for a bowel obstruction (see below)
- Many chemotherapies cause constipation

Signs/symptoms of a bowel obstruction:

- Waves of crampy abdominal pain (especially around the umbilicus)
- Vomiting
- No bowel movements and inability to pass gas (although sometimes diarrhea and gas may be present with a bowel obstruction)
- Abdominal bloating

When to call the office:

- If you are concerned about symptoms of a bowel obstruction call 24 hours per day
- If you have not had a BM in 3 days despite trying the options listed above or have questions about management, try to call between the hours of 8-5.

**PREVENTION OF MUSCLE / JOINT ACHES
AFTER CHEMOTHERAPY**

OTC:

□ **Tylenol (acetaminophen)** 500mg. Take 1-2 tabs every 6 hours as needed for pain.

□ **Motrin (Ibuprofen).** Take 200mg. Take 1-2 tabs every 4-6 hours as needed for pain.

- Do not take while on blood thinners or if you have low platelets.

□ **Aleve (naprosyn)** 1 tab every 12 hours

Rx:

□ **Ultram (tramadol)** 50mg. Take 1-2 tabs every 4 hours as needed for pain.

- This will not make you sleepy. It is a mild pain medication.

□ **Norco (acetaminophen/hydrocodone)** Take 1-2 tabs every 4 hours as needed for pain.

- This medication is combined with Tylenol-do not combine additional Tylenol with it.
- Causes drowsiness and constipation. Add a stool softener +/-or laxative if you are taking this.

**PREVENTION OF LOW WHITE BLOOD CELL
COUNTS**

□ **Neupogen (filgrastim)** 300mcg subcutaneous injection

- This medication is given by injection daily for 3-7 days as instructed.
- The nurses will teach you or a family member how to do the injections at home.
- It is used to help prevent your white blood cell count from getting too low and helps to prevent fever and infections associated with low white blood cell counts.
- This is used only when your provider is concerned about low white blood cell counts. It is NOT used with every chemotherapy regimen.
- It can cause body aches and bone pain that can be relieved with Tylenol or other prescription pain medication.

□ **Neulasta (pegfilgrastim)** 6mg subcutaneous ONE time the day of or the day after chemotherapy.

- This is a LONG ACTING form of Neupogen.
- It is given once after chemotherapy.
- We can give it to you in the office.
- You should not receive chemotherapy again for at least



14 days after this injection.

- It can cause body aches and bone pain that can be relieved by Tylenol or other prescription pain medication.

PREVENTION OF MOUTH SORES (MUCOSITIS)

If you have mild soreness or mouth redness:

- Brush with a soft toothbrush 4x/day and floss daily
- Rinse with a bland salt and soda rinse (1/4 teaspoon baking soda , 1/8 teaspoon salt, 1 cup of warm water) Mix well until salt dissolves. Rinse your mouth gently, being careful not to swallow the mixture.
- Follow this with a plain water rinse to clean out any remaining salt or soda.
- Apply a lip moisturizer

If you have painful redness, swelling, or ulcers:

- Call the office if you have pain that prevents you from eating, drinking, or swallowing
- Increase the bland mouth rinse and oral hygiene above to every 2-4 hours
- Try oral analgesics such as Tylenol, or Norco
- Use protective agents: Gelclair Dosepack concentrated gel (RX only, often pharmacies do not carry) to coat the mouth
- Use numbing agents: Magic mouthwash The most popular formulation of magic mouthwash contains viscous lidocaine as a topical anesthetic, diphenhydramine (Benadryl elixer) as an anti-inflammatory, and Maalox to help coat the tissues in the mouth. Other formulations include antifungals, corticosteroids and/or antibiotics. These are not considered effective in treating mucositis, but may temporarily help the pain. These are typically compounded in a pharmacy by prescription only. We can prescribe a “recipe” for the pharmacist. Common ingredients include:
 - Diphenhydramine - an antihistamine to reduce inflammation
 - Glucocorticoids - to reduce inflammation
 - Lidocaine - a local anesthetic to relieve pain
 - Maalox - an antacid formulation which acts as a coating agent
 - Nystatin- an antifungal for candidiasis
 - Sucralfate - a coating agent
 - Tetracycline - an antibiotic
 - Erythromycin- an antibiotic

For for crusted sores use Peroxide Rinse

- 1 cup hydrogen peroxide
- 1 cup water or
- 1 cup saltwater (1 teaspoon of salt in 4 cups of water)

If you have crusty mouth sores, try using this rinse three or four times a day for two days. Don't use it for more than two days at a time, because it will prevent mucositis from healing. Use a non-peroxide rinse for two days, before returning to this mixture.

COGNITIVE CHANGES DURING CHEMOTHERAPY

Cancer treatments such as chemotherapy and radiation therapy can cause problems with cognitive (mental) functioning. Patients can experience changes such as trouble with concentration or memory. The effects are sometimes referred to as “chemobrain” or “chemo fog”. Health care providers are unable to predict which patients might be affected by this treatment side effect. Patients may notice this problem during chemotherapy treatment as well. Typically, patients find these difficulties greatly improve or no longer exist within one year of treatment.

Symptoms:

- Trouble remembering things (difficulty with short-term memory)
- Trouble paying attention or with concentration
- Trouble finding the right word
- Difficulty with new learning
- Difficulty multitasking
- Taking longer to do things
- Trouble setting priorities

Causes:

The exact cause of cognitive changes is unclear. The possible causes that can contribute to these difficulties include:

- Low blood counts
- Stress
- Depression or Anxiety
- Fatigue or difficulty sleeping
- Certain medications
- Hormone changes from some treatments

What You Can Do to Cope:

- Make lists. Carry a pad with you and write down the things you need to do. For example, keep lists of things



to buy, errands to run, phone calls to return, and even the times you need to take your medicines. Cross items off as you finish them.

- Use a portable planner or personal organizer. These can help you stay on top of day-to-day tasks and keep track of appointments and special days like birthdays and anniversaries. Paper and electronic versions are available.
- Organize your environment. Keep things in familiar places so you will remember where you put them.
- Avoid distractions. Work, read, and do your thinking in an uncluttered, peaceful environment. This can help you stay focused for longer periods of time.
- Keep your mind active. Do crossword puzzles and word games, or go to a lecture on a subject that interests you.
- Proofread. Double-check the things you write to make sure you've used the right words and spelling.
- Exercise, eat well and get plenty of rest and sleep. Research shows that these things help keep your memory working at its best.
- Tell your loved ones what you're going through. Depending on how private a person you are, you might tell your family and friends, so that they'll understand if you forget things you normally wouldn't forget. They may be able to help and encourage you.

LAB RESULTS AND HOW TO INTERPRET THEM

While you are receiving chemotherapy blood (and sometimes urine) tests will be done on a regular basis usually the day of your treatment—in order to monitor how your body responds to treatment and to help prevent side effects.

The most common lab tests include:

COMPLETE BLOOD COUNT (CBC)

This test measures the different types of blood cells—red blood cells, white blood cells, and platelets. Each of these types of cells has a different job to do in your body and all can be affected by chemotherapy.

Red Blood Cells

Red Blood Cells (RBCs) carry oxygen throughout your body. When levels of healthy red blood cells in the body drop to levels that are below normal, the condition is called anemia. Anemia can occur due to the disease itself, or often related to treatment with chemotherapy agents.

What are symptoms of anemia?

- Dizziness, weakness, or fatigue
- Feeling cold or chilled

- Shortness of breath
- Rapid heart beat
- Sometimes people exhibit no symptoms

What are treatments for anemia?

Your treatment will depend on the cause of your anemia. It will also depend on how severe your symptoms are and the lab value exhibited. Your doctor can tell you more about treatment options and their risks and benefits for you. Treatments include the following:

- **RBC transfusion.** This can reverse anemia very quickly. RBC transfusions are safe. However, there are some risks. Your doctor will discuss them with you. You may need to sign a consent form before receiving treatment.
- **Erythropoiesis stimulating agent (ESA).** This is medication that causes the body to make more RBCs. An ESA is given as a shot. It may be given along with iron (see below). An ESA takes several weeks or months to reverse anemia. There are special risks with ESA treatment. You may need to sign a consent form before receiving treatment

White Blood Cells

White Blood Cells (WBCs) fight infection. There are several different types of white blood cells, but the most important infection fighting WBC is the neutrophil. Your nurse and doctor will follow this number closely to determine your risk for infection. If it is low, your doctor may hold or reduce the doses of your treatment.

What is an Absolute Neutrophil Count (ANC)?

You may hear your doctor or nurse talk about your absolute neutrophil count or ANC. This is the number of neutrophils you have in a certain amount of blood. Your health care team will use this number to get an idea of how well your immune system might work during treatment. It's important to watch for early signs of infection and tell your health care team about them right away. This way treatment can be started as early as possible.

Signs and symptoms of an infection might include:

- Body temperature of more than 100.4° F or higher taken by mouth
- Shaking chills or sweats (often goes along with fever)
- Sore throat
- Cough or shortness of breath
- Nasal congestion



- Burning or pain when passing urine; bloody or cloudy urine
- Redness, swelling, drainage, or warmth at the site of an injury, surgical wound, or skin
- Pain or tenderness in the stomach or abdomen (the belly). Your doctor will check your white blood count often.

There's nothing you can personally do to help increase your white blood cell count, but there are some precautions:

- Wash your hands frequently (before and after meals, after using the bathroom, and after sneezing/blowing your nose).
- Avoid anyone who seems to have a cold or is ill with a virus.
- Avoid contact with any children/infants who have recently been vaccinated (within the past 2 weeks).
- Cook all meats well and avoid raw meats or fishes. DO drink plenty of fluids.
- Avoid large crowds (i.e., movie theatres, restaurants, etc.).
- Avoid any cleaning activities that would unsettle dust (i.e. vacuuming, sweeping, dusting, etc.).

Platelets

Platelets are the blood cells that help stop bleeding by plugging up damaged blood vessels and helping your blood to clot. If you don't have enough platelets, you may bleed or bruise more easily than usual, even from a minor injury. A shortage of platelets is called thrombocytopenia

What are signs of thrombocytopenia?

- Unexpected bruising
- Small flat red spots under your skin
- Red or pink urine (unless you have received adriamycin within the past 24-48 hours)
- Black or bloody bowel movement
- Any bleeding from your gums or nose
- Bad headaches
- Dizziness
- Pain in joints and muscles

Your doctor will check your platelet count often during your treatment. If it falls too low, you may need a platelet transfusion. There is nothing you can do to help increase your platelet count, but there are some precautions you can take:

- Do not take medications that interfere with the platelets being able to form a clot
- No aspirin
- No ibuprofen

- Do not use rectal suppositories or taking of your temperature rectally
- Use caution or avoid flossing your teeth
- Use a very soft bristle toothbrush or oral swabs as recommended
- Avoid activities that increase your risk of bleeding when you have low blood platelet count
- Avoid or limit the use of sharp objects such as knives or razors
- Hold pressure on any cut for at least 5-10 minutes
- Go to the Emergency room immediately if:
 - Bleeding will not stop after 5-10 minutes of pressure
 - Bleeding that occurs spontaneously (by itself), without injury

CHEMISTRY PANEL

This test measures many different things including your sugar (glucose), electrolytes like calcium, potassium, sodium, and magnesium, as well as other substances that can tell us how well your kidneys and liver are functioning. Sometimes you may receive extra hydration or electrolyte repletion.

CA-125 TUMOR MARKER

The CA-125 blood test is used to measure the level of CA-125. Elevated levels of CA-125 are often in higher-than-normal amounts in the blood of women with ovarian cancer. Overall, more than 80 percent of women with advanced ovarian cancer will have an elevated CA-125 level (greater than 30 u/ml), yet the test is not useful in detecting early stage disease (approximately 50% accurate). Unfortunately CA-125 is even less reliable for detecting cancer in pre-menopausal women since it is frequently elevated by non-cancerous conditions such as pregnancy, endometriosis, uterine fibroids, liver disease, and benign ovarian cysts. Most gynecologic oncologists employ CA-125 for surveillance of ovarian cancer after the diagnosis has been surgically confirmed since it is a sensitive indicator of persistent or recurrent disease. We typically measure CA-125 in our patients with ovarian cancer at the beginning of each chemotherapy cycle and then routine follow-up visits. Ideally the CA-125 is elevated when the patient is first diagnosed with ovarian cancer and then decreases to a normal range (<30) after a few cycles of chemotherapy. Once the CA-125 returns to a normal range we follow it at each visit. A subsequent increase of the CA-125 above 30, especially a doubling, prompts a re-evaluation with examination, and possibly CT Scans and PET scan looking for evidence of cancer recurrence.