



Patient

Orientation Guide



MISH

Infusion Center

11217 Lakeview Ave. Lenexa, KS 66219

(913)-258-2802

9AM to 5PM

Monday through Friday. Closed Saturday and Sunday.

Patient Orientation Guide

Our goal in the infusion center is to provide top quality care in a calm and comforting environment. We provide chemotherapy, biotherapy, and supportive therapy to treat many types of diseases. Your care will be provided by specially trained chemotherapy certified nurses who have a passion for oncology. You are our priority when you are here receiving treatment. In order to maintain our commitment to you we ask that you please review the following guidelines.

11217 Lakeview Ave.
Lenexa, Kansas 66219
913-322-7401

MAPQUEST.
Click here for MapQuest map and directions.

From College Blvd. (111th St.)

1. Turn South onto Lakeview Avenue off College Blvd.
2. The Minimally Invasive Surgery Hospital is the 2nd building on the left hand side (Look for the black granite Minimally Invasive Surgery Hospital sign).

From Renner Blvd.

1. Turn East onto 113th street off Renner Blvd.
2. At the second intersection on 113th street turn left (north) onto Lakeview Avenue.
3. The Building on the corner on the right hand side is the Minimally Invasive Surgery Hospital (look for the black granite Minimally Invasive Surgery Hospital sign).

Cancer and Chemotherapy

The purpose of this guide is to aid you and your loved ones through the chemotherapy treatment process. Your oncologist has already talked to you about your cancer and the need for drug treatment.

This guide contains:

- Information about the potential complications that come with drug treatment, how to manage these complications and when to call for help.
- The process of more common procedures and/or labs that may be required during your treatment.
- An extensive resource directory covering topics at the local and national level such as; Financial assistance, Insurance information and assistance, cancer, wigs, transportation, home care/hospice, clinical trials, spiritual and emotional support, and more..

The Infusion center

Your chemotherapy treatments will all be scheduled at the MISH Infusion Center. You will be given separate appointments for each treatment you receive. Our schedulers will do everything they can to get you an appointment that works well for you. Infusion times are highly specialized and can range from 15 minutes to over 6 hours. Because of this, you will be scheduled in a specific chair for each treatment.

Please note: arranging to have your blood drawn the day prior to your treatment will help reduce your waiting time significantly. Labs can be drawn on the day of treatment but it will delay the start of your treatment.

We ask that you please arrive at your scheduled appointment time. If you arrive more than 15 minutes late for your scheduled appointment, you may be asked to reschedule. If you are unable to come for your treatment appointment, please call the infusion center as soon as possible at 913-258-2802.

We understand your desire to have family and friends present during your treatments. Only one adult visitor may come with you into the infusion area at a time. Any other visitors will be asked to wait in the waiting room during your treatment. For their safety, no visitors under the age of 12 will be allowed in the infusion area. We also restrict visitors that are exhibiting cold or flu symptoms due to the increased risk of infection for our patients.

You must have a ride home after your treatment.

Please feel free to bring in your own electronic devices such as iPads, laptops, cell phones, etc. Don't forget to charge your devices before coming. We do have free Wi-Fi available. We respectfully ask that you place these devices on mute or use earphones in order to not disturb other patients. You are also welcome to bring in books, e-readers, crossword puzzles, or handiwork, such as knitting, crochet needlework, etc. We do have a small collection of magazines to offer as well.

A small nourishment area is located within the infusion area. The refreshments are available free of charge for patients and include coffee, juice, tea, soda, chips and crackers. We recommend bringing a sack lunch or snacks for the day.

We look forward to taking care of you in the infusion center. Patient satisfaction is a priority and we are always open to your comments and feedback. Please let us know how we can help at any time.

Labs, Radiology, and Chemotherapy Complications

Below we have listed common radiology procedures, labs, line care, and complications that can occur with chemotherapy drug treatment, with the corresponding page number you will find the facts, what to expect with these complications, what you can do about them and tips on how to handle them.

I. Chemotherapy Complications:

- ☞ Alopecia
- ☞ Anxiety
- ☞ Constipation
- ☞ Diarrhea
- ☞ Fatigue and Anemia
- ☞ Mucositis and Mouth Care
- ☞ Nausea and Vomiting
- ☞ Nutrition

II. Labs :

- ☞ Bleeding and Thrombocytopenia
- ☞ Blood Cell Count
- ☞ Neutropenia

III. Radiology :

- ☞ Common Radiology Procedures that may be ordered for you

IV. Permanent Line Care :

- ☞ General Information
- ☞ Care of your central venous access

If you have further questions or need more information, please contact your oncologist or infusion center.

I. Chemotherapy Complications

Alopecia

What are the facts?

- Your scalp has approximately 100,000 hairs and is constantly growing, with old hairs falling out and being replaced by new ones.
- With chemotherapy, the drug travels throughout the body to kill cancer cells and some drugs damage hair follicles, causing the hair to fall out
- Hair loss is highly variable
 - ◆ Scalp only-may be total hair loss, losing patches, or thinning of hair
 - ◆ Body hair-face, eyebrows, arms, legs, and private areas
 - ◆ Both scalp and body hair
 - ◆ No loss

What to expect

- Hair may come out in clumps, during shampooing or brushing your hair
- Hair Re-growth often begins even before therapy is completed and may be a different color or texture than your hair before it fell out
- Radiation therapy to the head can result in permanent hair loss
- It is normal to feel distressed about hair loss

What can you do?

- Choose a wig at the beginning of your treatment
 - ◆ Get a prescription for a wig from your doctor as the cost may be less if covered by insurance if not covered completely
 - ◆ Obtain a list of wig shops in your area from the doctor, nurse or yellow pages
 - ◆ If you have long hair consider using it for a custom wig
- Shave your head once your hair begins to come out
- Wear a hat or scarf outdoors in cold weather, and avoid loss of body heat \sunscreen for the hot sun
- Avoid too much brushing or heat on your hair directly to slow the process of hair loss

Anxiety

What are the facts?

- Anxiety is an inevitable part of life and is often appropriate and reasonable
- Anxiety can appear in different forms and at different levels of intensity, from a mere twinge of uneasiness to a full blown panic attack
- Anxiety affects your whole being, it is a psychological, behavioral, and biological reaction all at once
- Anxiety can be what we all call situational (arising from a specific situation) or anticipatory (arising by merely thinking about a particular situation)

What to expect

Symptoms can include :

- Shortness of breath, choking
- Heart palpitating
- Trembling or shaking
- Sweating, hot flashes or chills
- Numbness, dizziness, or unsteadiness
- Nausea or abdominal distress
- Feeling detached or out of touch with yourself
- Fear of losing control or fear of dying

What you can do

- Practice relaxation techniques including breathing exercises and progressive muscle relaxation
- Use positive self talk and improve overall coping strategies
- Limit or eliminate caffeine and improve overall nutrition

What to report

- Any physical symptoms associated with anxiety
- Concerns and worries regarding your medical condition

Constipation

What are the facts?

- Defined as being unable to move your bowels, having to push harder to move your bowels or moving them less often than usual; stool may be small, dry or hard
- May be caused by Chemotherapy, some pain medications or the cancer itself. Also may be caused by decreased food and fluid intake, inactivity or lack of fiber in the diet
- Can lead to discomfort when having a bowel movement, stomach cramping or gas, lack of appetite, nausea and vomiting or, in severe cases, tearing of the lining of your intestines
- Prevention is key and can be controlled by medications or changing your diet

What to expect

- Constipation may be very uncomfortable and how to manage your bowels is very individualized
- Be able to describe to health care professionals the frequency and quality of your bowel movements and what methods have or have not been successful in relieving your constipation

What you can do

- The most important thing you can do to prevent constipation is recognize it as early as possible
- Drink at least two liters (2000mL) of fluids daily; prune juice and hot liquids may stimulate bowel activity
- Eat foods high in fiber and bulk such as bran, whole grain breads, cereals, fruits and vegetables
- Avoid foods that may constipate such as cheese or refined grain products
- Exercise is VERY important- walk at least three times a day for 15 minutes
- Establish a regular time of the day for bowel movements and ensure that you have privacy and comfort
- Go to the bathroom right away when you have the urge to have a bowel movement –don't try to hold it

- You may need to use a stool softener and laxatives if directed to by your healthcare provider

What to report

- No bowel movement for two days (if this is abnormal for you)
- You have tried making diet and activity changes and your constipation is not relieved
- You have other symptoms including stomach cramps, nausea\vomiting, abdominal pain or excess gas
- Laxatives as recommended by your doctor are not effective
- You have loose stool, but still feel like you need to have a bowel movement

Diarrhea

What are the facts?

- Defined as frequent liquid /loose bowel movements
- May be caused by chemotherapy, radiation, other medications, infections or emotional distress
- Often requires medications to get under control

What to expect

- Lots of diarrhea may make you feel weak, dehydrated and cause your rectal area to be tender and sore
- Keep track of the number of diarrhea stools and record the volume of diarrhea
- Be able to describe the diarrhea to a healthcare professional to include frequency, consistency, color and presence of blood, cramping and/or fever

What you can do

- Prevent dehydration by drinking at least two liters (2000 mL) of fluids per day such as water, tea broth or fruit juice; other fluids also may help replace electrolytes such as Gatorade
- Avoid foods that may make diarrhea worse such as foods high in fat or fiber , milk products, carbonated or caffeinated drinks, liquids that are very hot or cold, gas forming foods or foods that are spicy, rich or fried
- Prevent infection with frequent hand washing after stools
- Prevent irritations and soreness by keeping the rectal area clean with mild soap and water and patting dry and using a water-repellent cream such as Vaseline, A&D -Ointment or Desitin
- Consider using unscented baby wipes or Tucks instead of toilet paper
- A warm bath may be soothing or ask your nurse or doctor about Sitz bath
- Eat small, frequent meals with food low in fiber and high in protein, calories and potassium
- Get plenty of rest and try to do activities that are relaxing as anxiety may increase diarrhea
- Take medication for diarrhea as directed by your doctor

What to report

- New onset diarrhea (>3 stools per day)
- Diarrhea that is uncontrolled by medications
- Stool that is bloody, burgundy or black
- Fever and stomach cramping hat occurs with diarrhea

Fatigue and Anemia

What are the facts?

- Anemia is a shortage of red blood cells (RBC); anemia impairs the amount of oxygen that can get to your working muscles cells, which means your muscle cells tire more easily
- Anemia is one cause of cancer-related fatigue and is no more severe than normal fatigue or tiredness; it can make you feel like you have little or no energy and your reserves of energy are depleted; you can feel this way with or without activity
- Fatigue is a common symptom experienced by those undergoing cancer treatments like chemotherapy or radiation therapy
- Chronic fatigue is not relieved by rest and is commonly associated with other symptoms like weakness, dizziness, and decreased concentration; those experiencing fatigue often describe this feeling as being tired “tired all the time” or “not having the energy that I used to”

What to expect

- If you show symptoms of anemia like fatigue, pale skin, dizziness, headache, or shortness of breath, or your hemoglobin is very low, you may receive a transfusion of red blood cells
- Fatigue may last a few weeks to several months during and after chemotherapy or radiation therapy
- Fatigue may interfere with your simple daily activities such as showering or getting dressed; it can make it hard for you to finish usual tasks such as household chores or cooking
- Fatigue can be felt when a person is worried, upset, depressed or grieving; fatigue can be mistaken for depression, but can also mask true signs of depression
- Fatigue may make you experience physical weakness like heavy arms and legs

What you can do

- Keep a daily journal of how fatigued you feel during various activities and times of the day; look for patterns and trends in your fatigue and plan your activities around these patterns
- Alternate active periods with periods of rest; plan ahead to rest between activities
- Try to prioritize activities in order to save your energy; set goals of what you need to get done today and what can wait if you do not have enough energy, be flexible enough to change your goals if you become fatigued
- Maintain good nutrition: side effects from the various treatments you will undergo can make it difficult to keep up healthy eating habits; make easy to prepare foods, have snacks readily available and drink BOOST or ENSURE to give your body extra protein and calories
- Get some exercise: twenty to thirty minutes every day can build your muscle strength and help you stay alert
- Try to do activities that relax you such as listening to music, taking a long bath, or reading a book; take time to boost your spirits
- Go to bed at the same time every night and get up at the same time every morning whether you feel rested or not; this will help your body stay on one sleep cycle, take one or two short naps during the day if needed

What to report

- Report any symptoms of anemia that you may be experiencing such as:
 1. Dizziness
 2. Headache
 3. Shortness of breath
 4. Increased heart rate
 5. Increased tiredness

6. Pale skin

7. Feeling cold

8. Feeling increasingly sad or depressed; do not ignore these feelings if they become worse as treatment progresses

Mucositis and Mouth Care

What are the facts?

- Mucositis is an inflammation of the mouth and gastrointestinal lining as a result of chemotherapy or radiation therapy
 - ☞ Mild mucositis- presence of sores, redness, discomfort, and patient is restriction to soft diet
 - ☞ Severe mucositis- all of the above may require IV nutritional support and pain medication management
- Chemotherapy drugs used to kill cancer cells may also interfere with the reproduction of healthy cells inside the mouth and GI tract causing cell damage that may result in soreness, dryness, sores or infection
- Mucositis often begins 5-10 days following chemotherapy or radiation therapy and usually lasts 7-14 days

What to expect

Possible symptoms may include

- Mouth sores may be very red or have small white patches
- Gums are red and shiny
- Irritation inside of the mouth and throat, you may have difficulty swallowing, eating and drinking
- Saliva becomes thick
- Dryness of the mouth also called xerostomia
- Bleeding in the mouth may occur
- White or yellow film in the mouth
- Increased sensitivity to hot or cold foods

What you can do

- Examine your mouth at least three times daily looking for any areas of redness, white patches or sore areas
- Maintain good mouth care using a soft bristle toothbrush; brush mouth, tongue, and gums gently especially after every meal
- Report changes or mouth pain to your doctor or nurse
- Keep the mouth moist by rinsing with designated mouthwash (normal saline, Biotene, or ½ tsp of salt with normal warm water) swishing in mouth for 30 seconds then spit out; repeat at least four times daily- generally after meals and at bedtime
- Apply mouth moisturizer to your lips and oral cavity as needed (Biotene gel, Biotene gum, chap stick, or hard candy)
- Remove dentures and keep out during the period of mucositis and when you are doing mouth care; keep dentures in only during meals
- Use magic mouthwash or lidocaine rinses before eating
- Take pain medication prior to meals if needed
- Avoid foods that may cause further irritation such as citrus fruits, tomatoes, or other acidic\ spicy foods
- No tobacco or alcohol

- Nutrition is important - you can eat foods such as applesauce, cooked cereal, creamed soups, pudding, custard, eggs, and mashed potatoes
- Eat soft\bland food - a liquid or puree diet may be needed
- Drink cool or room temperature fluids
- Try frozen foods such as ice cream, sherbet, popsicles, or milk shakes
- Control pain - ask for pain medication and let the doctor or nurse know if medication is not controlling the mouth pain

What to report

- Gums or mouth bleeding
- Temperature 100.5 or higher
- If white patches appear on tongue or inside of the mouth report within 24 hours
- If pain medication does not control the mouth pain
- If mouth pain worsens or interferes with eating, swallowing, or talking

Nausea and Vomiting

What are the facts?

- Nausea is a sick or uncomfortable feeling in the stomach that often comes before vomiting
- Nausea or vomiting can occur from chemotherapy drugs, or radiation therapy to specific areas such as the chest, stomach, or back
- Severity can depend on the chemotherapy and drug used
- Contributing factors that may worsen nausea and vomiting include: certain types of cancer, infection, constipation, high blood sugar levels, low salt levels, high calcium levels, and certain medications

What to expect

- Medications given for nausea may be a pill or given by IV
- Medication given may cause constipation or make you feel sleepy, jittery, or restless
- Decreased appetite and possible weight loss

What you can do

- Take medication for nausea 30 minutes before meals
- Try 5-6 small meals a day rather than 3 big meals
- Avoid greasy or spicy foods
- To improve nutritional status try Ensure, Boost, or Carnation Instant Breakfast
- Inform doctor or nurse of nausea or vomiting not controlled by medications or if unable to keep medications down
Try cold foods rather than warm/hot foods. Cold foods do not create aromas which might trigger nausea.

Nutrition

Appetite:

LIQUIDS\SOFT FOODS		HEAVIER FOODS
Soups	Bread\Crackers	Meats
Puddings	Cooked Vegetables	Raw fruits\vegetables
Ice Cream	Canned Fruits	Fried, greasy foods
Liquid supplements	Baked chicken or fish	Potato chips
	Oatmeal	

Chemotherapy or radiation therapy may change the taste of digestion of food as well as your tolerance or desire for food. Poor or no appetite (anorexia) is common and is only temporary, but can still persist for several weeks. Difficulty swallowing, nausea, vomiting, changed sense of smell, depression, feeling full, or pain may also cause poor appetite.

Plan Ahead:

These changes in eating habits are to be expected. Your body is able to sustain itself for many days without food following chemotherapy or radiation therapy. Prior to chemotherapy, plan ahead and bring a light meal or snack. Make sure you eat something before getting your treatment. Don't be too hard on yourself if side effects make it hard to eat. Don't be afraid to ask family and friends for help with grocery shopping and fixing meals.

Suggestions for Increasing Calories and Protein:

Eat every few hours; don't wait until you feel hungry. Try some light exercise or take a walk before meals to increase your appetite. Drink high-calorie, high-protein beverages, such as milk shakes and Ensure. Drink most of your fluids between meals instead of with meals. Drinking fluid with meals can make you feel full.

Hints for Eating:

As mouth sores or nausea/vomiting resolves, increase the types and amount of food that you eat slowly. Some patients have suggested cereals as good "starter" foods. In general, start with liquid and soft foods, and then advance to heavier foods as you feel you can tolerate them. Try cold foods rather than warm/hot foods. Cold foods do not create aromas which might trigger nausea. Everyone has different "comfort foods", so use your own judgment when choosing foods.

Hints for eating

DO:

Eat as much as you want
 Prepare small, frequent meals
 Drink oral nutritional supplements

DO NOT:

Force yourself to eat
 Allow appetite to become the focus of
 relationship between you and your family

II. Labs

Bleeding and Thrombocytopenia

What are the facts?

- Thrombocytopenia is a low platelet count
- Platelets are cells made in your bone marrow that help to clot your blood should bleeding occur
- Cancer and cancer treatments (chemotherapy and radiation therapy) can cause Thrombocytopenia which stops the production of platelets by the bone marrow
- A normal platelet count is between 140,000 and 400,000; Thrombocytopenia is defined as a platelet count below 100,000
- Bleeding problem can occur during cancer treatment due to low platelet counts and your bloods inability to clot normally.

What to expect

- Invasive Procedures are generally avoided if your platelets count is below 50,000
- If you need to have invasive procedure you may have to receive platelets before or during the procedure
- Nosebleeds may occur when your platelet count is low
- Blood in the stool can occur because of irritation of the bowel after chemotherapy, an infection, or straining hard during bowel movement
- Blood in urine is seen when bleeding occurs in some part of the urinary system and blood is flushed out with the urine causing it to be red or pink tinged
- Pre-Menopausal women may experience breakthrough or abnormal menstrual bleeding because of the chemotherapy or low platelet count
- You may notice a tiny red or purple rash on your skin, it is called petechiae which is a sign of a low platelet count

What you can do

- Avoid activities in which you might bruise or hurt yourself-use help when walking if you are unsteady on your feet
- Wash peri-rectal area with warm soapy water and rinse well - do not wipe this area vigorously after bowel movement
- Do not use tampons for menstrual bleeding
- Do not use enemas, rectal thermometers, rectal suppositories, or laxatives
- Use an electric razor for shaving to reduce the risk of cuts
- Check your skin everyday for cuts, bruises or petechiae
- To protect the inside of your mouth: eat soft foods, use a soft toothbrush, and check your mouth every day for bleeding gums
- Do not use dental floss, toothpicks, or an electric toothbrush when your platelet count is low
- Do not blow your nose hard and watch for nose bleeds if you sneeze
- If you have nosebleeds, sit up, tilt your head forward, apply pressure and ice to nose and back of the neck, call the DR. if bleeding persists more than 10 minuets
- Do not strain when having bowel movements; ask for a stool softener or laxative IF you need them; exercise to prevent constipation
- Women should not resume sexual intercourse if they have experienced breakthrough bleeding within the last two weeks

- If injured, hold direct pressure to a bleeding site for a full five minutes before checking to see if the bleeding has stopped

What to report

- Nosebleeds despite the use of pressure and cold compress
- Blood on the toilet paper, underwear, sheets, or under pads
- Streaks of blood in feces, or darkened or black feces
- Red or pink urine, or if urine is foul-smelling
- Pain or burning upon urination or pain in your lower back
- Vaginal bleeding or breakthrough bleeding that is heavier than usual
- A bruise that has gotten bigger or bleeding that does not stop

Complete Blood Cell Count (CBC)

What are the facts?

- Complete blood count (CBC) is a blood test that measures the amount of red blood cells, white blood cells & platelets in the body
- White blood cells (WBC) fight infection by destroying bacteria, fungi and viruses; normal range for a WBC is 4,000 to 11,000
- Red blood cells (RBC) transport oxygen to all parts of the body; hemoglobin (Hgb) measures the erythrocyte's (RBC) capacity to carry oxygen to all parts of the body; the normal range for hemoglobin is 12 to 15
- Platelets assist in blood clotting; the normal range is 140,000 to 400,000

What to expect

- A low WBC count (Neutropenia) results in an increased risk of infection; the chance of infection increases the longer you are neutropenic
- Treating neutropenia focuses on minimizing any types of exposures to germs;
- To minimize your chance of infection you may be placed on antifungal, antiviral, & antibiotic medication; you may also be placed on a WBC growth factor used to shorten the duration of neutropenia
- Anemia is a shortage of RBCs and may cause weakness, dizziness, shortness of breath, headache, pale skin, fatigue, or a rapid heartbeat; red blood cells are generally given when your hemoglobin is low or when symptoms of anemia are present
- Platelets are given to help prevent or stop bleeding; platelets are usually ordered if your platelet count is less than or equal to 20,000, you have active bleeding, or before or after a procedure
- Signs of low platelets include: nose bleeds, bleeding that is difficult to stop, bruising, little purple spots on the skin or tongue (petechiae): when platelets are very low spontaneous bleeding can occur

What you can do

- When you are neutropenic you should wear your protective mask when outside of hospital room or when in public places
- Continue to take your prescribed antibiotics even if you are feeling well, until your physician tells you to discontinue them
- To decrease your exposure to germs, follow the low microbial diet, good hand washing
- No visitors while you are sick or not feeling well
- Practice good hygiene: bathe daily and practice proper mouth care by using salt water rinses before and after meals and before bed

- To keep your lungs healthy: stay as active as possible and out of the bed at least half of the day, exercise, and walk around a minimum of three times a day; if you're in the hospital use your incentive spirometer 10 times every two hours while awake
- When your hemoglobin is low (anemia) you need to conserve your energy, pace yourself, ambulate and do self care in-between rest periods
- Avoid sudden changes from lying to sitting, and sitting to standing; if you are dizzy let others know so they can help you so you will not fall
- A nutritionally balanced diet is essential
- When your platelets are low (thrombocytopenia) there are some medications such as aspirin, Motrin, Advil, or Nuprin that you should not take because the medications can alter the platelet development or increase the risk of bleeding
- When Platelets are low it is essential to protect yourself from causing harm to your body that may cause bleeding, therefore:
 1. No blade razors, use electric razors
 2. No anal sex or intercourse until platelets are greater than 20,000, use water base lubricants to decrease friction or irritation
 3. No dental floss, use soft bristle tooth brush
 4. No enemas, tampons or suppositories

What to report

- When you are neutropenic, a fever may be the only response to an infection that you have therefore it is very important to you report any fever 100.5 or greater to your nurse or doctor; other things to report
 1. Chills with or without a temperature
 2. Productive cough, wheezing, or shortness of breath
 3. Sinus pressure, drainage or pain
 4. Redness or pain at or around the venous access line
 5. Sore throat, mouth sores, difficulty swallowing
 6. Dizziness, headache
 7. Racing heart beat
 8. Increased fatigue

When your platelets are low (thrombocytopenia) report:

1. Bleeding or increased bruising
2. Nose bleeds that will not stop
3. Reduced levels of alertness or confusion
4. Falls or injuries

Neutropenia

What are the facts?

- Neutrophils are one of the five types of white blood cells circulating in blood; their job is to provide the primary protection against infections
- Neutropenia is a blood disorder where the number of circulating neutrophils in the blood is too low to defend the body against infections and putting you at risk for getting an infection
- Neutropenia is often due to chemotherapy, radiation treatments or cancers affecting the bone marrow; duration can be a few days to several months
- The absolute neutrophil count (called ANC) is one way to measure the severity of neutropenia is classified:
 1. Mild neutropenia: absolute neutrophil: ANC falls below 1500 but remains above 1000 - minimal risk of infection
 2. Moderate neutropenia: ANC falls between 500 and 1000 - moderate risk of infection
 3. Severe neutrophil: ANC falls below 500 - severe risk of infection

What to expect

- Each time you receive a cycle of chemotherapy or radiation, it will often increase the duration of neutropenia
- Some medications such as antibiotics and steroids can cause bone marrow suppression causing your white blood cell count to decrease
- Advanced age and malnutrition can cause prolonged neutropenia
- Symptoms you may experience depend on the degree of neutropenia; severe neutropenia with an ANC of less than 500 places you at greatest risk, especially if the neutropenia is prolonged, lasting days to weeks
- Types of infections include:
 1. Bacteremia (bacterial infections in the blood)
 2. Viral infection of the blood
 3. Fungal infections in the blood as well as the mouth, esophagus, groin or lungs
 4. One or more of these infections can occur at the same time, most often manifesting itself with fevers
- Anti-infective medications may be given to prevent infections or started when there are possible signs of an infection (such as fever)
- Neutropenia can be shortened significantly if your doctor decides to order a WBC growth factor, which are used to stimulate the bone marrow to speed up WBC production and neutrophils to reduce the risk of infection from severe neutropenia

What you can do

- Frequent, vigorous hand washing is vital for you and anyone coming in contact with you; **this is the most important way to prevent infection**
 - Remind family and friends to stay away if they are coughing, sneezing or have a runny nose
- Do meticulous mouth care while getting chemotherapy and/or radiation, use a soft bristle toothbrush to cleanse teeth and rinse out your mouth with saline water and other mouthwashes as prescribed by your physician

III. Radiology

Common Procedures

X-Ray: X-ray imaging is perhaps the most familiar type of imaging. Images produced by X-rays are due to the different absorption rates of different tissues. Calcium in bones absorbs X-rays the most, so bones look white on a film recording of the X-ray image called a radiograph. Fat and other soft tissues absorb less, and look gray. Air absorbs least, so lungs look black on a radiograph. The most familiar use of X-rays is checking for broken bones, but X-rays are also used in cancer diagnosis. For example chest X-rays and mammograms are often used for early cancer detection or to see if cancer has spread to the lungs or other areas in the chest.

CT scan: A computed tomography scan (CT scan, also called a CAT scan) uses computer-controlled X-rays to create images of the body. However a radiograph and a CT scan show different types of information. An arm or chest radiograph looks all the way through a body without being able to tell how deep anything is. A CT Scan is three-dimensional. By imaging and looking at several three-dimensional slices of a body (like slices of bread) a doctor could not only tell if a tumor is present. but roughly how deep it is in the body. The data from a CT scan can be enhanced to be more vivid than a plain X-ray. You may be given a contrast agent to drink and/or by injection to more clearly show the boundaries between organs or between organs and tumors.

Ultrasound: Ultrasound uses sound waves with frequencies above those that humans can hear. A transducer sends sound waves traveling into the body which are reflected back from organs and tissues, allowing a picture to be made of the internal organs. Ultrasound can show tumors, and can also guide doctors doing biopsies or treating tumors.

Magnetic Resonance Imaging (MRI): MRI uses radio waves in the presence of a strong magnetic field that surrounds the opening of the MRI machine where the patient lies to get tissues to emit radio waves of their own. Different tissues (including tumors) emit a more or less intense signal based on their chemical makeup, so a picture of the body organs can be displayed on a computer screen. Much like CT scans, MRI can produce three-dimensional images of sections of the body, but MRI is sometimes more sensitive than CT scans for distinguishing soft tissues.

MUGA Scan: A MUGA (multigated blood-pool imaging) scan takes about an hour. In this test, a tiny amount of radioactive material is injected into a vein in your arm. This material temporarily hooks onto your red blood cells. You lie still while a special camera that can detect the radioactive material takes pictures of the blood flow through your heart as it beats. From this image, the health of the heart's major pumping chamber (the left ventricle) can be assessed. The left ventricular ejection fraction (LVEF) is an excellent measure of overall heart function.

PET Scan: A PET (positron emission tomography) scan is a nuclear medicine imaging technique that produces a three-dimensional image or picture of functional processes in the body and shows how organs and tissues are working. A small amount of a radioactive material is injected into one of your veins. The substance travels through the blood and collects in organs and tissues. Then, you will lie down on a table that slides into a tunnel-shaped hole in the center of the PET scanner. The PET machine detects energy given off by the radioactive substance and changes it into 3-dimensional pictures. You must lie still during the PET scan so that the machine can produce clear images. How long the test takes depends on what part of the body is being scanned.

IV. PREVENTATIVE LINE CARE

Catheters and Ports in Cancer Treatment *Patient Central Venous Line Care Guide*

A. GENERAL INFORMATION

During cancer treatment, your health care team often needs access to your veins to give you treatments such as chemotherapy, blood transfusions, antibiotics, or intravenous (IV) fluids. They may also need to take samples of your blood for testing. To make these procedures easier, your doctor may recommend inserting a special medical device called a central venous catheter or port.

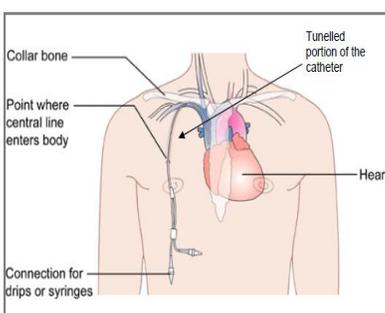
These catheters may be placed completely under the skin and connected to a small plastic or metal disc called a port (known as a port-a-cath), or they may be tunneled under the skin with the tip exiting outside the body so they can be used to give treatments. When not being used, the catheter tip will either be clamped to keep the line closed or sealed with a special cap. Some of these catheters have two (double-lumen) or three (triple-lumen) tips that allow more than one treatment to be given at a time.

There are several types of catheters. The one you receive depends on many factors, including how long you need to receive cancer treatment, the type of treatment you will be receiving, how easy it will be to care for, and cost. Most types of catheters are inserted and work in a similar way. Where and how they are placed depends on the type of catheter being used.

TYPES OF CATHETERS

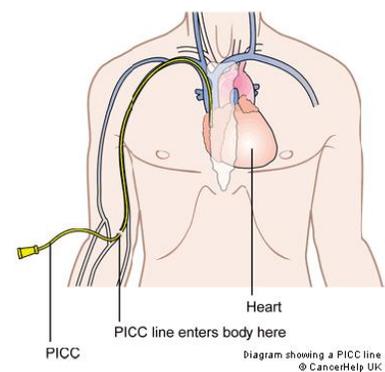
PERIPHERALLY INSERTED CENTRAL CATHETERS (PICC).

A PICC line is inserted into one of the large veins in the arm near where the elbow bends. The tip of the catheter will end in an even larger vein in your chest. There may be one or two access ports at the exit site.



CENTRAL LINE, TUNNELED VENOUS CATHETERS (Hickman, Groshung).

This type of catheter is inserted into a large vein under the clavicle (collarbone) or in the neck and then tunneled under the skin. The exit site on your skin is usually on the chest. The catheter is accessed from this exit site.



IMPLANTABLE PORTS (port-a-cath).

A catheter connected to a port is surgically inserted (tunneled) under the skin of the chest. Unlike the other two types of catheters above, the access port sits entirely underneath the skin. You may be able to feel a small bump in your chest or arm. A special needle is inserted through the skin into the rubber seal to access the port.

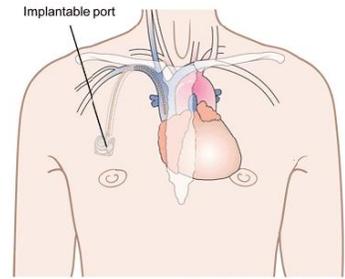


Diagram showing an implantable port
© CancerHelp UK

BENEFITS

Catheters in the upper arm or inserted into the veins in the neck can remain in place for several weeks or months and can be used to:

- Reduce the number of times a patient has to have a needle stick to draw blood (particularly helpful if a patient has small veins, has veins that have been damaged by previous treatments, or is anxious about needles)
- Give blood transfusions or more than one type of cancer treatment or medication at a time
- Decrease the risk of tissue and muscle damage that can occur if some types of chemotherapy leak outside a vein, which is more likely to occur with a regular IV
- Allow for frequent blood tests for monitoring treatment without needle sticks in the arm
- Avoid excessive bruising or bleeding in patients who may have bleeding problems, including low platelet counts
- Allow some chemotherapy treatments, such as those given by continuous infusion, to be given at home instead of requiring a long stay in the hospital

Ports can remain in place for several weeks, months, or even years, and can be used to:

- Reduce the number of needle sticks in the vein
- Provide chemotherapy or other treatments that last longer than one day (the needle used to access the port can be left in for several days)
- Give more than one type of chemotherapy or other treatment at a time (a double port is used rather than a single port)
- Allow blood testing and treatment on the same day with only one needle stick through the skin in the chest

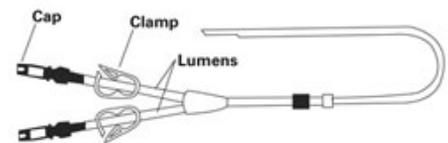
CARING FOR CATHETERS AND PORTS

There are special instructions for catheters or ports that reduce the risk of these problems (see below for specific directions). For catheters that have tips that remain outside the body, you must take special care of the tube and the skin surrounding the area where the tube exits in the arm or chest. These catheters may need to be flushed with sterile fluid each day to prevent blockage. If you will require home chemotherapy - this care may be provided by a special IV service in your home until you are comfortable taking care of this on your own.

Catheters:

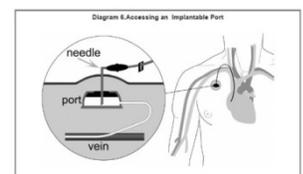
Typical instructions, which your doctor or nurse will explain in detail, include:

- Wash your hands before you touch the catheter or exit/insertion site to help prevent infection
- Never touch the tip of the catheter when the cap is off
- Clean the area around the tube and change any bandages as directed
- Prevent air from getting inside the catheter by making sure the top or clamps are on tightly when the tube is not being used
- Avoid any breaks or cuts in the catheter
- Flush a small amount of fluid into the catheter so it doesn't get blocked, as directed
- Protect the catheter area from being submerged underwater
- While you have a line with external ports:
 - Avoid any contact sports.
 - Avoid activities that use that arm. Such as weight lifting, vacuuming, bowling, golf, or tennis.
 - Limit activities that may cause excessive sweating. This may loosen your dressing.
 - Do not swim or soak in a tub.
 - keep your line and dressing dry (protect it when needed)



Implanted Ports:

Because ports are completely under the skin, there is a lot less to care for. Many of the instructions above still apply. If you require home chemotherapy. You may also need to use fluid to flush out the port so it does not get blocked - this care may be provided by a special IV service in your home until you are comfortable taking care of this on your own.



Warning signs

Contact your doctor immediately if:

- The area around the catheter or port becomes red, swollen, painful, bruised, or warm
- There is excess bleeding from the insertion area
- You develop a fever
- Any fluid leaks
- You have shortness of breath or dizziness
- The catheter tube outside of your body gets longer
- The catheter or port cannot be flushed out with liquid; it seems blocked. Fluid should never be forced into the catheter

B. CARE OF YOUR CENTRAL VENOUS ACCESS (CVC)

A home healthcare agency hired by your insurance will often provide instruction and line care. They will instruct you in detail how to care for your line, how to flush it, what to flush it with and how often, how to change the dressing and/or caps. The instructions below are just a guide to orient you general line care, the home agency will override any instruction provided below. The nurse will be instrumental in showing you how to do this. He or she will allow time for you to become familiar with catheter care and will answer your questions. For most patients, the home care nurse will help the patient and caregiver to become independent in caring for the catheter.

Signs of Catheter Problems

The signs of catheter infection and problems are similar for all types of central venous catheters.

If you have any sign of infection or catheter problem, call your doctor immediately.

Signs of infection, clotting, or other problems include:

- ☞ Redness, tenderness, drainage, warmth, or odor around the catheter site
- ☞ Fever of 100.5F (38 C) or greater, or chills
- ☞ Swelling of the face, neck, chest, or arm on the side where your catheter is inserted
- ☞ Leakage of blood or fluid at the catheter site or the cap
- ☞ Inability to flush the catheter, or resistance to flushing the catheter
- ☞ Displacement or lengthening of the catheter (your catheter appears to be coming out)

Preparing for catheter care

You must always wash your hands carefully for 15 seconds before and after working with the line.

Anyone who helps you with line care must do the same. This is necessary to protect you from infection.

Use liquid antibacterial soap and paper towels to dry your hands. DON'T forget to disinfect the table top area that you will lay out your supplies onto.



To prevent infection, anything that touches the exit site of the line and anything that goes into the line must be sterile. Your nurse will show you how to care for the line properly. The following guidelines are helpful in preventing infection:

- ☞ **Do not** let the CVC exit site get wet until it is well healed. You may shower 72 hours after the catheter has been inserted. When you bathe or shower, you must cover the site with waterproof material, such as household plastic wrap, taped over the dressing and injection caps.
- ☞ **Do not** submerge the CVC site or caps below the level of water in a bathtub, hot tub, or swimming pool.
- ☞ Store CVC supplies in a clean, dry place such as a shelf in a closet or a drawer.
- ☞ Always clean your work area with alcohol and let it to dry completely before setting up your supplies. Or you can cover the area with clean paper towels.
- ☞ Use only sterile supplies. Open all packages carefully without touching the contents. Handle dressings only at the edges.

- 📄 **Never** touch the open end of the CVC when the cap has been removed.
- 📄 **Never** touch the end of the needleless cannula or the end of the open syringe. If this happens accidentally, use a new cannula or syringe.
- 📄 **Never** use scissors, pins, or sharp objects near the CVC or other tubing. The catheter could be damaged easily.
- 📄 If your catheter has a clamp, keep it clamped when not in use. Some CVCs show where the clamp must be placed. If your CVC does not show the clamp location, ask your nurse to show you where to clamp.
- 📄 **Remember to wash your hands thoroughly before and after touching the CVC.**

Changing the Line Dressing

Check your dressing several times daily to make sure it is not loose. DO NOT use sharp objects, like scissors, knives, or safety pins around your catheter. These can damage your catheter.

If you have a catheter with lines, dressing changes are required. The CVC dressing is changed every 7 days if you are using a transparent dressing. Change it every 48 hours if you are using gauze or Telfa island dressing and tape. If the dressing becomes wet or loose, change it even if it is not the normal time to change it. A nurse will give specific instructions to you and your caregiver about your type of dressing.

If you have a port there are no dressing changes. Once the incision over the port has healed it is not necessary to wear a dressing anymore. Once healed there is no real maintenance involved - treat as normal skin. After it is accessed for treatment we recommend a band-aid or temporary cover till the puncture site heals. Always wash hands when near your port.

Supplies

- 📄 A roll of medical tape (silk, paper, or transparent)
- 📄 A central line dressing change kit that includes:
 - 📄 sterile gloves
 - 📄 ChloroPrep® applicator
 - 📄 a transparent dressing
 - 📄 skin protectant swab
 - 📄 Other supplies as needed:

Steps

1. Set up a big enough clean work surface
2. Gather supplies and arrange them in the order to be used
3. Disinfect the table top surface you will lay out your supplies on.
4. **Wash your hands** for 15 seconds with liquid antibacterial soap. Dry your hands thoroughly using paper towels.
5. If someone else changes your dressing, he or she should put on sterile gloves.
6. Carefully loosen and remove the old dressing. Peel the dressing toward the site without pulling on the CVC. Never use scissors or sharp objects near the CVC. Tape can pull on your line and dislodge or pull it out !
7. Inspect the area around the site for any sign of infection (redness, swelling, drainage, tenderness, warmth, or odor). Call the doctor if you see any sign of infection. Also report dry skin, rash, or irritation from the dressing.
Note: You may notice some oozing of blood from the site for several days after CVC placement. If there is a lot of blood, or if the site keeps bleeding, call the doctor right away.
8. Check the entire chest area for new or prominent veins, rash, change in color, or swelling.
9. **Wash your hands** again for 15 seconds with liquid antibacterial soap after removing dressing and inspecting the site. Dry your hands thoroughly with paper towels.
10. Open the dressing change kit.



11. Put on sterile gloves.
12. Activate the ChloroPrep® applicator by pinching the plastic wings.
13. Using the ChloroPrep® applicator, vigorously cleanse an area 4 x 5 inches in size around the catheter site. Cleanse for 30 seconds using an up-and-down or side-to-side motion.
14. Allow this area to dry for about 30 seconds.
15. Swab the edges of the cleaned area with the skin protectant swab. Allow to dry.
16. Remove backing from the transparent dressing, center dressing and place the dressing over the site. If possible, alternate skin areas where the dressing is placed to avoid skin irritation.
17. Loop and tape the catheter to skin to prevent the catheter from dangling and catching on things.

Flushing a line

If your line requires flushing at home that most likely means you are receiving some type of treatment at home thru your line. For example: TPN, antibiotics, or hydration. A home healthcare agency hired by your insurance will be providing you care at home. They will instruct you in detail how to care for your line, how to flush it, what to flush it with and how often. The instructions below are just a guide the home agency will override any instruction provided below.

If you have a catheter and it is being used for treatment at home. Some CVCs have separate tubes. Each tube is called a lumen. Each lumen of the CVC needs to be flushed regularly to keep it clear of backed-up blood. If you have more than 1 lumen, it is helpful to have a routine for flushing lumens in the same order each time. For instance, you might always flush the red one first, then the white, then blue. You will flush each lumen of the CVC as instructed by home health care.

If you have an implanted port and it is being used for treatment at home. It will require flushing in between treatments. You will flush each lumen of the CVC as instructed by home health.

Supplies (Exact supplies may vary.)

- ☞ 1 vial of flush and/or a 10 cc syringe for each catheter lumen OR pre-filled flush syringe
- ☞ Needleless injection cannula (unless your needleless system does not need this) for each catheter lumen
- ☞ Alcohol swabs
- ☞ Needle/syringe disposal box

Steps

1. Wash hands for 15 seconds with liquid antibacterial soap. Dry hands thoroughly with paper towels or use an alcohol-based hand rub, like Purell.
2. Gather all the supplies.
3. Wipe the rubber stopper of the medicine vial with an alcohol swab for 5 seconds.
4. Remove the syringe cover. Twist on the needleless injection cannula or needle, if it is not already attached. Remove the cover from the needleless cannula or needle.

If heparin flushes used:

5. Draw 3 cc of air into the syringe by pulling back on the plunger.
6. Push the cannula or needle through the rubber stopper of the vial.
7. Push the syringe plunger to discharge air into the vial.
8. Turn the vial upside down. Be sure the tip of the cannula or needle is in the solution. Draw back on the plunger to draw up 3 cc of _____ into the syringe.
9. Before removing the cannula or needle from the vial, check for air bubbles. To remove air bubbles, gently push the _____ back into the vial and re-measure your dose.
10. Remove the cannula or needle from the vial and replace the cap loosely. Fill other syringes at this time if more than 1 lumen will be flushed.
11. Replace the needle with needleless cannula, if that is what you are using.

If saline flushes:

12. You should have prefilled saline syringes ready to go, Attach either a needle or needles cannula to access port needle or line cap
13. Use the alcohol swab to clean the injection cap/ port needle cap of the lumen/port to be flushed. Rub the cap with an alcohol swab, rubbing vigorously for 15 seconds, and then allow it to dry. Hold the end of the catheter so it does not touch anything. Open the clamp on the lumen.
14. Remove the cap from the cannula or needle and insert into injection cap.
15. Slowly inject the entire amount of flush into the lumen of catheter. If you meet resistance, check to see if the clamp is closed. If there is still resistance, do not flush that lumen. Call the doctor.
16. If you are using a standard cap, clamp the catheter as you are finishing the injection. If you are using a positive pressure cap, remove the syringe and then clamp the catheter. Then remove the syringe. Place it into the needle disposal box.
17. Repeat all of the above steps for each lumen to be flushed, using a clean syringe to flush each catheter.
18. Close the syringe disposal box lid and place the container out of reach of children and pets.
19. Wash hands for 15 seconds with liquid antibacterial soap.
20. When the syringe box is full, return it to your home care program or doctor's office.

Flushing of Groshong Catheter

Groshong catheters are flushed once _____ or when the catheter is used. The lumens are flushed using 10 cc of saline solution on the same day of each _____. Heparin is not used because of the special construction of the Groshong catheter.

Supplies (Exact supplies may vary.)

-  Normal saline solution
-  10 cc syringe for each catheter lumen
-  Needleless injection cannula (unless your needleless system does not need this) for each catheter lumen
-  Alcohol swabs
-  Needle/syringe disposal box

Steps

1. Wash hands for 15 seconds with liquid antibacterial soap. Dry hands thoroughly with paper towels.
2. Gather all the supplies.
3. Wipe the rubber stopper of the saline vial with an alcohol swab for 5 seconds.
4. Remove the syringe cover. Twist on the needleless injection cannula or needle if it is not already attached. Remove the cover from the needleless cannula or needle.
5. Draw 10 cc of air into the syringe by pulling back on the syringe.
6. Push the cannula/needle through the rubber stopper of the vial.
7. Push the syringe plunger to discharge air into the vial.
8. Turn the vial upside down. Be sure the tip of the cannula is in the solution. Draw back on the plunger to draw up 10 cc saline into the syringe.
9. Before removing the cannula or needle from the vial, check for air bubbles. To remove air bubbles, gently push the saline back into the vial and re-measure your dose.
10. Remove the cannula or needle from the vial and replace the cap loosely. Fill other syringes at this time if more than one lumen will be flushed.
11. Replace the needle with the needleless cannula, if that is what you are using.
12. Use an alcohol swab to clean the injection cap to be flushed. Rub the cap vigorously for 15 seconds, and allow it to dry. Hold the end of the catheter so it does not touch anything.
13. Remove the cap from the cannula/needle and insert it into injection cap.

14. Briskly inject the entire amount of saline into the lumen of the catheter. If you meet resistance, do not flush that lumen. Call the doctor.
15. Remove the syringe and place it into the syringe disposal box.
16. Repeat all the above steps for each lumen to be flushed, using a clean syringe to flush each catheter.
17. Close the syringe disposal box lid, and place container out of reach of children and pets.
18. Wash hands for 15 seconds with liquid antibacterial soap.
19. When syringe box is full, return it to your home care program or doctor's office.

Central venous catheter cap changes

The home health care nurse will usually perform this. If your use is more chronic the agency may teach you to do this yourself. The injection cap on each lumen of your CVC is changed every _____ days. Change a cap any time it is leaking.

Supplies

-  1 injection cap for each CVC lumen

Steps

1. Set up a clean work surface.
2. Gather all the supplies.
3. Wash your hands for 15 seconds with liquid antibacterial soap. Dry your hands thoroughly using paper towels.
4. Make sure that the CVC lumens are clamped.
5. Remove the new cap from its package. Loosen, but do not remove, the cover on the end of the new cap.
6. While holding onto the lumen of the CVC with one hand, use the other hand to:
 1. remove the old cap and set it aside
 2. remove the cover from the new cap
 3. screw the new cap onto the open end of the lumen
7. Repeat these steps for each of the caps and lumens. Follow your routine to change caps in the same order as flushing.

This requires doing a lot with only one hand, but it is important to hold onto the lumen of the CVC to keep it from hanging free and touching anything. The patient and caregiver may need to work together to have enough hands for this procedure.

Problem-solving for central venous catheters

See the table on the next page for some potential CVC problems and what to do about them. It is a good idea to carry a few CVC supplies with you at all times.

Emergency	Response
Sudden chest, neck, or shoulder pain, coughing, or difficulty breathing	Make sure the CVC is clamped. Lie on your left side with your head down. Stay in this position while your caregiver calls 911. Then call the number written below immediately.
Accidental removal of the CVC from the chest	Apply pressure to the exit site and chest area above it with a gauze dressing or clean washcloth. Call the doctor's office or number written below immediately.
Accidental removal of injection	Make sure that the CVC is clamped. Clean the outside threaded area of the lumen with an alcohol wipe for at least 30 seconds. Place a new cap securely into the open end. If you do

cap	not have a new cap, wrap the end of the lumen with sterile gauze until you can get a cap. Flush catheter following the usual steps.
Swelling of face, neck, chest, or arm. New or prominent chest veins.	Call the doctor's office or number written below immediately.
Drainage, redness, swelling, or bleeding at the exit site	Call the doctor's office or number written below immediately.
Fever of 100.5F. (38C) or greater and/or chills	Call the doctor's office or number written below immediately.
Damage to the CVC, such as a hole or crack in the tubing	Immediately clamp the CVC between the hole and your chest. If necessary, pinch or fold it over to clamp it. Cover the hole or crack with sterile gauze. Call the number written below immediately.
Difficulty flushing the catheter	Make sure the CVC is unclamped. Change your position by raising your arms, lying down, sitting up more straight, coughing, or taking a deep breath. If you still cannot flush it, stop using the catheter and call the doctor's office or number written below immediately.
Loose suture at exit site	Tape the CVC to your skin. If you do not need to flush or use the CVC, notify your doctor or nurse during routine business hours. If you need to flush or use the CVC, do not use it until you speak with your doctor or nurse. Call the doctor's office or number written below if you need to use the CVC.
CVC is displaced, CVC is longer, a "cuff" is visible at exit site, or CVC is not working.	Do not use the CVC. Tape the CVC to your skin if it seems loose. Call the doctor's office or number written below immediately.

Remember

- Keep your Line dry.
- Flush yours as instructed
- Always wash hands before and after handling your line/port.

Call Right Away

- If your catheter appears to be coming out
- If your catheter becomes kinked or hard to flush
- If you have redness or warmth around your catheter
- If you have chills or a fever of 100.5° F or higher
- If you have bleeding, swelling, or drainage around your catheter
- If your arm becomes swollen

The above information contains some, but not necessarily all, of the information that you may need to care for your central line. Please speak with your doctor or nurse if you have questions or issues you may experience. This document should not take the place of conversations with members of your health care team about your treatment and effects you may experience during and after the use of a central line.

If you experience any significant change in your health during or after treatment, contact a member of your health care team right away.



MISH

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