OncoLink
Abramson Cancer Center of the University of Pennsylvania

Ifosfamide (Ifex®)

Pronounced: eye-FOSS-fuh-MIDE
Classification: Alkylating Agent

About Ifosfamide

Ifosfamide exerts its anti-cancer affect by a process called alkylation. Alkylation damages the DNA of cells, which prevents them from dividing and causes them to die. Since cancer cells, in general, divide faster and with less error correcting than healthy cells, cancer cells are more sensitive to this damage.

How to Take Ifosfamide

Ifosfamide is given by intravenous (into a vein) infusion. The dosage and schedule is determined by the person's size and type of cancer. It can be given alone or with other drugs.

Possible Side Effects of Ifosfamide

There are a number of things you can do to manage the side effects of Ifosfamide. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common side effects:

Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your WBC count can drop, putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4 F), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

Tips to preventing infection:

- Washing hands, both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bath daily and perform frequent mouth care.

- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your doctor or nurse before scheduling dental appointments or procedures.
- Ask your doctor or nurse before you, or someone you live with, has any vaccinations.

For more suggestions, read the Neutropenia Tip Sheet.

Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the red cell count is low, you may feel tired or weak. You should let your doctor or nurse know if you experience any shortness of breath, difficulty breathing or pain in your chest. If the count gets too low, you may receive a blood transfusion. Read the anemia tip sheet for more information.

Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the count is low you are at a higher risk of bleeding. Let your doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

Nausea and/or Vomiting

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy or acidic foods (lemons, tomatoes, oranges). Try antacids, (e.g. milk of magnesia, calcium tablets such as Tums), saltines, or ginger ale to lessen symptoms. Read the Nausea & Vomiting Tip Sheet for more suggestions.

Call your doctor or nurse if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

Decrease in Appetite

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.

- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

Loss or Thinning of Scalp and Body Hair (Alopecia)

Your hair may become thin, brittle, or may fall out. This typically begins two to three weeks after treatment starts. This hair loss can be all body hair, including pubic, underarm, legs/arms, eyelashes, and nose hairs. The use of scarves, wigs, hats and hairpieces may help. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun. Read more on alopecia.

Sexual and Reproductive Changes

This drug can affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and vaginal dryness - read more about coping with vaginal dryness. In addition, the desire for sex may decrease during treatment.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe your sperm is affected. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

Effect on Kidneys and Bladder

Ifosfamide can irritate the kidneys and damage the lining of the bladder, causing you to have blood in your urine. Intravenous fluids may be given with your treatment to flush the kidneys and bladder. A medication called Mesna may be given to protect the bladder. Drink 6-8 glasses of fluid a day. Urinate every 2-3 hours. Call your doctor or nurse if you have difficulty urinating or have blood in your urine.

Nervous System Toxicity

In rare cases, ifosfamide can be toxic to the nervous system. This can range from mild confusion, drowsiness, hallucinations and personality changes to seizure and coma. Toxicity can develop immediately after treatment up to several days later. Your caregiver should be aware of this rare side effect and know to report any changes in your behavior to your healthcare team right away.

Secondary Malignancies

There is a small risk of developing leukemia or other type of blood cancer due to treatment with this medication.

Etoposide (Toposar®, VePesid®, Etopophos®,VP-16)

Pronounced: e-TOE-poe-side
Classification: Antineoplastic Agent

About Etoposide

Etoposide works by inhibiting DNA synthesis in cancer cells. Because DNA is essential for cells to grow and reproduce, etoposide slows or stops the growth of cancer cells in your body.

How to Take Etoposide

Etoposide is given by intravenous (into a vein) infusion, over a short period (30-60 minutes) or in a continuous infusion over 24 hours. It can also be given my mouth in the form of a capsule. The dosage and schedule is determined by the person's size, type of cancer, and mode of administration. It can be given alone or with other drugs.

Even when carefully and correctly administered by trained personnel, this drug may cause feeling of burning and pain. There is a risk that this drug may leak out of the vein at the injection site, resulting in tissue damage. If the area of injection becomes red, swollen, or painful at anytime during or after the injection, notify your doctor or nurse immediately. Do not apply anything to the site unless instructed by your doctor or nurse.

Possible Side Effects of Etoposide

There are a number of things you can do to manage the side effects of Etoposide. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common side effects:

Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your WBC count can drop, putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4 F), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

Tips to preventing infection:

- Washing hands, both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever

or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bath daily and perform frequent mouth care.
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your doctor or nurse before scheduling dental appointments or procedures.
- Ask your doctor or nurse before you, or someone you live with, has any vaccinations.

For more suggestions, read the Neutropenia Tip Sheet.

Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the red cell count is low, you may feel tired or weak. You should let your doctor or nurse know if you experience any shortness of breath, difficulty breathing or pain in your chest. If the count gets too low, you may receive a blood transfusion. Read the anemia tip sheet for more information.

Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the count is low you are at a higher risk of bleeding. Let your doctor or nurse know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
    - Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin™, Aleve™, Advil™, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

Lowering of Blood Pressure

Blood pressure may drop while this medication is being infused. When receiving this medication through a vein, your nurse will be checking your blood pressure before and during the infusion. It may become necessary to stop the administration of this medication or slow down the infusion rate if your blood pressure drops.

Nausea and/or Vomiting

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. In addition, dietary changes may help. Avoid things that may worsen the symptoms, such

as heavy or greasy/fatty, spicy or acidic foods (lemons, tomatoes, oranges). Try antacids, (e.g. milk of magnesia, calcium tablets such as Tums), saltines, or ginger ale to lessen symptoms. Read the Nausea & Vomiting Tip Sheet for more suggestions.

Call your doctor or nurse if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

Sexual and Reproductive Changes

This drug can affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and vaginal dryness - read more about coping with vaginal dryness. In addition, the desire for sex may decrease during treatment.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe your sperm is affected. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

Loss or thinning of scalp and body hair (alopecia)

In rare cases hair may become thin, brittle, or fall out. The use of scarves, wigs, hats and hairpieces may help. You may want to use a soft hairbrush and a gentle or baby shampoo to avoid stress on your hair. Avoid hair dyes, perms, bleaches or hair spray. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun.

Decrease in Appetite

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.
- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

Other Side Effects

This medication can also cause a "radiation recall". This is redness, swelling or blistering of the skin in an area that was previously treated (even years ago) with

radiation. The goal of "treatment" for radiation recall is to manage the symptoms until it heals. Topical steroids or anti-inflammatory agents or cool compresses may help. Avoid sun exposure and tight fitting clothes that would rub on the area.

There is a slight risk of developing leukemia or other type of cancer due to treatment with this medication. This is most often associated with repeated treatments or high doses.

Some patients report a metallic taste during the infusion that may continue after treatment. Learn more about coping with taste changes on OncoLink.

Cytarabine (Cytosar-U®, Ara-C)

Pronounced: SITE-ah-rah-been
Classification: Antimetabolite

About Cytarabine

Cytarabine kills cells undergoing DNA synthesis. Although the mechanism of action is not clearly understood, it appears to act through inhibition of DNA polymerase (an important enzyme in DNA synthesis). Because cells cannot copy their DNA, they cannot properly divide, and thus die.

How to Take Cytarabine

Cytarabine is given through intravenous (into a vein) infusion or subcutaneous (under the skin) injection. The dosage and schedule is determined by the person's size, type of cancer, and mode of administration. It can be given alone or with other drugs.

Possible Side Effects of Cytarabine

There are a number of things you can do to manage the side effects of Cytarabine. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common side effects:

Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your WBC count can drop, putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4 F), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

Tips to preventing infection:

- Washing hands, both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever

or cough or live with someone with these symptoms).

- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bath daily and perform frequent mouth care.
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your doctor or nurse before scheduling dental appointments or procedures.
- Ask your doctor or nurse before you, or someone you live with, has any vaccinations.

For more suggestions, read the Neutropenia Tip Sheet.

Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the red cell count is low, you may feel tired or weak. You should let your doctor or nurse know if you experience any shortness of breath, difficulty breathing or pain in your chest. If the count gets too low, you may receive a blood transfusion. Read the anemia tip sheet for more information.

Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the count is low you are at a higher risk of bleeding. Let your doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

Nausea and/or Vomiting

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy or acidic foods (lemons, tomatoes, oranges). Try antacids, (e.g. milk of magnesia, calcium tablets such as Tums), saltines, or ginger ale to lessen symptoms. Read the Nausea & Vomiting Tip Sheet for more suggestions.

Call your doctor or nurse if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

Mouth Ulcers (Sores)

Certain cancer treatments can cause sores or soreness in your mouth and/or throat. Notify your doctor or nurse if your mouth, tongue, inside of your cheek or throat becomes white, ulcerated or painful. Performing regular mouth care can help prevent or manage mouth sores. If mouth sores become painful, your doctor or nurse can recommend a pain reliever.

- Brush with a soft-bristle toothbrush or cotton swab twice a day.
- Avoid mouthwashes that contain alcohol. A baking soda and/or salt warm water mouth rinse (2 level teaspoons of baking soda or 1 level teaspoon salt in an eight ounce glass of warm water) is recommended 4 times daily.
- If your mouth becomes dry, eat moist foods, drink plenty of fluids (6-8 glasses), and suck on sugarless hard candy.
- Avoid smoking and chewing tobacco, drinking alcoholic beverages and citrus juices.

Read the mouth ulcer tip sheet for more information.

Nail and Skin Changes

Your fingernails/toenails may become dark, brittle or fall off. You may notice dry skin or changes in the color or tone of your skin. Your skin will be more sensitive to the sun, which can result in severe sunburn or rash. Sun sensitivity can last even after chemotherapy is completed. Avoid the sun between 10-2pm, when it is strongest. Wear sunscreen (at least SPF 15) everyday; wear sunglasses and long sleeves/pants to protect your skin. Keep your fingernails and toenails clean and dry. You may use nail polish, but do not wear fake nails. Notify your doctor or nurse if any nails fall off. For more suggestions, read the Nail and Skin Care Tip Sheet.

Hand and Foot Syndrome (HFS)

HFS is a skin reaction that appears on the palms of the hands and/or the soles of the feet as a result of certain chemotherapy agents. It can start as a feeling of tingling or numbness in the palms and/or soles and progress to swelling, redness, peeling skin, and tenderness or pain. Notify your healthcare team right away if you notice any of these signs of HFS. Learn more about HFS on OncoLink.

Diarrhea

Your oncology team can recommend medications to relieve diarrhea. Also, try eating low-fiber, bland foods, such as white rice and boiled or baked chicken. Avoid raw fruits, vegetables, whole grain breads, cereals and seeds. Soluble fiber is found in some foods that absorbs fluid and can help relieve diarrhea. Foods high in soluble fiber include: applesauce, bananas (ripe), canned fruit, orange and grapefruit sections, boiled potatoes, white rice and products made with white flour, oatmeal, cream of rice, cream of wheat, and farina. Drink 8-10 glasses on non-alcoholic, un-caffeinated fluid a day to prevent dehydration. Read Low Fiber Diet for Diarrhea for more tips.

Liver Changes

Your doctor may order some blood tests to check your liver function. Call your doctor

or nurse immediately if you have abdominal pain, if you pass dark urine, or if your skin or the white of your eyes become jaundiced (yellow in color).

Loss or Thinning of Scalp and Body Hair (Alopecia)

Your hair may become thin, brittle, or may fall out. This typically begins two to three weeks after treatment starts. This hair loss can be all body hair, including pubic, underarm, legs/arms, eyelashes, and nose hairs. The use of scarves, wigs, hats and hairpieces may help. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun. Read more on alopecia.

Decrease in Appetite

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.
- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

Sexual and Reproductive Changes

This drug can affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and vaginal dryness – read more about coping with vaginal dryness. In addition, the desire for sex may decrease during treatment.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe your sperm is affected. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

Peripheral Neuropathy (Numbness or Tingling in the Hands and/or Feet)

Peripheral neuropathy is a toxicity that affects the nerves. It causes a numbness or tingling feeling in the hands and feet, often in the pattern of a stocking or glove. This can get progressively worse with additional doses of the drug. In some people, the symptoms slowly resolve after the drug is stopped, but for some it never goes away completely. You should let your healthcare provider know if you experience numbness or tingling in the hands and feet, as they may need to change the doses of

your medication. See OncoLink's section on peripheral neuropathy for tips on dealing with this side effect.

Taste and Smell Changes

You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months. Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell. Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can add flavor to vegetables. Ask your nurse nutritional counseling services.

Methotrexate (Mexate®, Folex®, Rheumatrex®, Amethopterin, MTX)

Pronounced: meth-oh-TREK-sate
Classification: Antimetabolite

About Methotrexate

Methotrexate competes with folic acid uptake in cells. This results in a folic acid deficiency in these cells and leads to cell death. By affecting the folic acid uptake, methotrexate also alters DNA replication and cell division. Cancer cells take up methotrexate faster than normal cells (because they are rapidly dividing and thus replicate their DNA more frequently) causing their cell death. Leucovorin is given starting 24 hours after methotrexate. Leucovorin is also known as folinic acid and is converted into a derivative of folic acid in the body. Therefore, Leucovorin is given in an attempt to prevent healthy cells from taking up too much methotrexate, but on the other hand, allowing time for the methotrexate to get into cancer cells to cause their death.

How to Take Methotrexate

Methotrexate is injected into a vein. In special situations, it may be injected into the spinal cord space (called intrathecal administration). It can also be given by mouth in the form of a tablet. The dosage is based on your body weight, medical condition and the regimen your physician is using. It can be given alone or with other drugs.

Possible Side Effects of Methotrexate

There are a number of things you can do to manage the side effects of Methotrexate. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common side effects:

Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your WBC count can drop, putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4°), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

Tips to preventing infection:

- Washing hands, both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bath daily and perform frequent mouth care.
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your doctor or nurse before scheduling dental appointments or procedures.
- Ask your doctor or nurse before you, or someone you live with, has any vaccinations.

For more suggestions, read the Neutropenia Tip Sheet.

Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the red cell count is low, you may feel tired or weak. You should let your doctor or nurse know if you experience any shortness of breath, difficulty breathing or pain in your chest. If the count gets too low, you may receive a blood transfusion. Read the anemia tip sheet for more information.

Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the count is low you are at a higher risk of bleeding. Let your doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

Nausea and/or Vomiting

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy or acidic foods (lemons, tomatoes, oranges). Try antacids, (e.g. milk of magnesia, calcium tablets such as Tums), saltines, or ginger ale to lessen symptoms. Read the Nausea & Vomiting Tip Sheet for more suggestions.

Call your doctor or nurse if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

Diarrhea

Your oncology team can recommend medications to relieve diarrhea. Also, try eating low-fiber, bland foods, such as white rice and boiled or baked chicken. Avoid raw fruits, vegetables, whole grain breads, cereals and seeds. Soluble fiber is found in some foods that absorbs fluid and can help relieve diarrhea. Foods high in soluble fiber include: applesauce, bananas (ripe), canned fruit, orange and grapefruit sections, boiled potatoes, white rice and products made with white flour, oatmeal, cream of rice, cream of wheat, and farina. Drink 8-10 glasses on non-alcoholic, un-caffeinated fluid a day to prevent dehydration. Read Low Fiber Diet for Diarrhea for more tips.

Decrease in Appetite

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.
- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

Mouth Ulcers (Sores)

Certain cancer treatments can cause sores or soreness in your mouth and/or throat. Notify your doctor or nurse if your mouth, tongue, inside of your cheek or throat becomes white, ulcerated or painful. Performing regular mouth care can help prevent or manage mouth sores. If mouth sores become painful, your doctor or nurse can recommend a pain reliever.

- Brush with a soft-bristle toothbrush or cotton swab twice a day.
- Avoid mouthwashes that contain alcohol. A baking soda and/or salt warm water mouth rinse (2 level teaspoons of baking soda or 1 level teaspoon salt in an eight ounce glass of warm water) is recommended 4 times daily.
- If your mouth becomes dry, eat moist foods, drink plenty of fluids (6-8 glasses),

and suck on sugarless hard candy.
- Avoid smoking and chewing tobacco, drinking alcoholic beverages and citrus juices.

Read the mouth ulcer tip sheet for more information.

Sexual and Reproductive Changes

This drug can affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and vaginal dryness – read more about coping with vaginal dryness. In addition, the desire for sex may decrease during treatment.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe your sperm is affected. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

Nail and Skin Changes

Your fingernails/toenails may become dark, brittle or fall off. You may notice dry skin or changes in the color or tone of your skin. Your skin will be more sensitive to the sun, which can result in severe sunburn or rash. Sun sensitivity can last even after chemotherapy is completed. Avoid the sun between 10-2pm, when it is strongest. Wear sunscreen (at least SPF 15) everyday; wear sunglasses and long sleeves/pants to protect your skin. Keep your fingernails and toenails clean and dry. You may use nail polish, but do not wear fake nails. Notify your doctor or nurse if any nails fall off. For more suggestions, read the Nail and Skin Care Tip Sheet.

Loss or Thinning of Scalp and Body Hair (Alopecia)

Your hair may become thin, brittle, or may fall out. This typically begins two to three weeks after treatment starts. This hair loss can be all body hair, including pubic, underarm, legs/arms, eyelashes, and nose hairs. The use of scarves, wigs, hats and hairpieces may help. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun. Read more on alopecia.

Other Side Effects

Methotrexate can affect the kidney. Your oncology team will make sure you are well hydrated before the medication is given to prevent this from occurring.

Some less common side effects that have been reported include: liver changes and eye irritation.

In rare cases, methotrexate can affect the nervous system or lungs. If you experience any dizziness, blurry vision, confusion, difficulty speaking, standing or walking, call

your doctor right away. If you have any shortness of breath, cough or difficulty breathing, call your doctor right away.

Intrathecal (Spinal) Administration

When injected into the spinal cord space, methotrexate can cause headache, vomiting, fever or stiff neck. In rare cases, intrathecal administration can cause neurotoxicity, which presents with paralysis, speak difficulty, seizures or coma. This can occur up to several days after the treatment and resolves in a few days.

***If you have been prescribed leucovorin with this chemotherapy and are unable to take it, keep it down or miss a dose, call your healthcare team immediately.**

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