Fluorouracil (Adrucil®, 5-FU)

Pronounced: FLURE-oh-UE-ra-sil

Classification: Antimetabolite

About Fluorouracil (Adrucil®, 5-FU)

An antimetabolite drug interferes with DNA production. This stops cell growth and division, resulting in the slowing or stopping of cancer growth. Since cancer cells, in general, divide faster and with less error-correcting than healthy cells, cancer cells are more sensitive to this damage.

Fluorouracil exerts its anti-cancer effect by preventing synthesis of DNA and RNA in the cell by significantly decreasing thymine (a nucleotide that is one of the building blocks of DNA). Lack of functional DNA and RNA prevent the cancer cell from reproducing and making vital proteins, which results in death of the cell. In this way, fluorouracil slows or stops the growth of cancer cells in your body.

How to Take Fluorouracil

Fluorouracil is given as an intravenous (IV, into a vein) infusion. How long the infusion takes is dependent on the treatment regimen. The dose will be determined by your care team. It can be given alone or with other medications.

If you take warfarin, your INR and PT levels will be closely monitored to adjust your warfarin dose as needed. Please make sure your healthcare team is aware of all the medicines you take before you begin treatment.

Possible Side Effects of Fluorouracil

There are a number of things you can do to manage the side effects of fluorouracil. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common or important 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 or 38°C), 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 oncology care team before scheduling dental appointments or procedures.
- Ask your oncology care team before you, or someone you live with, has any vaccinations.
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 oncology care team 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.

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 oncology care team know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums or blood in your urine or stool. If the platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor (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/Advil (ibuprofen), Aleve (naproxen), Celebrex (celecoxib) etc. as these can all increase the risk of bleeding. Please consult with your healthcare team regarding use of these agents and all over the counter medications/supplements while on therapy.
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Diarrhea
Your oncology care 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 and absorbs fluid, which can help relieve diarrhea. Foods high in soluble fiber include: applesauce, bananas (ripe), canned fruit, orange sections, boiled potatoes, white rice, products made with white flour, oatmeal, cream of rice, cream of wheat, and farina. Drink 8-10 glasses of non-alcoholic, un-caffeinated fluid a day to prevent dehydration.

Mouth Ulcers (Mucositis)
Certain cancer treatments can cause sores or soreness in your mouth and/or throat. Notify your oncology care team 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 with warm water mouth rinse (2 level teaspoons of baking soda or 1 level teaspoon of 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.

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.

Nail and Skin Changes
Your fingernails/toenails may become dark, brittle or fall off. Keep your fingernails and toenails clean and dry. You may use nail polish, but do not wear fake nails (gels, acrylics, overlay). If any nails fall off, clean the nail bed well with soap and water and cover with a band aid.

You may notice dry skin or changes in the color or tone of your skin. Your skin may 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 30 with UVA/UVB protection) everyday and reapply when in the sun for extended periods of time); wear sunglasses with UVA/UVB protection, a hat and long sleeves/pants to protect your skin and seek out shade whenever possible.

Hand Foot Syndrome
Hand foot syndrome (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 being absorbed by the skin cells. HFS can begin as a mild tingling, numbness, pins-and-needles feeling, redness or pain or swelling of the hands and/or feet. This can then progress to painful swelling, blistering or peeling skin that can interfere with your ability to do normal activities. Be sure to let your oncology team know right away if you notice these symptoms, as they may need to adjust the chemotherapy dose or take a break to allow the skin to heal. Some tips to help prevent HFS include:

- Keep hands and feet clean and dry.
- Avoid tight shoes or socks.
- Avoid activities that put pressure on the palms or soles for 1 week after treatment.
- Apply an alcohol-free moisturizer liberally and often. (Avoid moisturizers with perfumes or scents)
- Avoid very hot water for baths and showers.

**Nausea and/or Vomiting**

Talk to your oncology care team so they can prescribe medications to help you manage nausea and vomiting. 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 saltines, or ginger ale to lessen symptoms.

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

**Less common, but important side effects can include:**

- **Heart Problems:** In some cases this medication can cause or worsen pre-existing heart problems including congestive heart failure, decreased heart function and heart attack. Notify your healthcare provider if you have sudden weight gain or swelling in the ankles or legs. If you develop chest pain or pressure, pain in the left arm, back, or jaw, sweating, shortness of breath, clammy skin, nausea, dizziness or lightheadedness, call 911 or go to the nearest emergency room.
- **Neurotoxicity:** This medication can cause neurological issues such as confusion, disorientation, ataxia (trouble walking), and visual disturbances. Call your provider immediately if you are having any symptoms of a neurological issue.
- **Elevated Ammonia Level:** This medication can cause the level of ammonia in your blood to become too high, which can then affect how your brain is functioning. You will have your labs checked to monitor your ammonia level. Symptoms include ataxia (trouble walking), intellectual impairment, and changes in behavior. Call your provider immediately if you notice any of these symptoms.
- **DPD Gene Mutation:** There is a very rare genetic mutation in the DPD gene that can cause very serious side effects to this medication. Report any worsening or unusual symptoms to your health care team immediately.

**Sexual & Reproductive Concerns**

This medication may 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. In addition, the desire for sex may decrease during treatment. 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.

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 and for at least 3 months after treatment, even if your menstrual cycle stops or you believe you are not producing sperm. You should not breastfeed while receiving this medication.

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