NHS
The Christie
NHS Foundation Trust

FOLFOXIRI

Includes Oxaliplatin, Irinotecan, Folinic Acid and Fluorouracil

The possible benefits of treatment vary; for some people chemotherapy may be used in an attempt to shrink cancer prior to possible surgery, for others it may control the cancer and its symptoms. Your doctor or nurse can answer any questions you have about your treatment. It is useful to refer to the booklet 'Chemotherapy - a guide' which gives general information on chemotherapy and side effects.

Your treatment

Your doctor has prescribed a course of treatment with irinotecan, oxaliplatin, folinic acid and fluorouracil. The treatment consists of the following:

Day 1	Oxaliplatin and Folinic acid infusion (by drip) over 2 hours, followed by Irinotecan infusion over 90 minutes. If the initial infusion is tolerated, the infusion time may be reduced to 60 minutes from Cycle 2 onwards. This is followed by Fluorouracil as a slow infusion over 46 hours (at home) via a pump through a central venous catheter.
Day 3	District nurse home visit to take pump off and flush line.
Days 4 - 8	Once daily injections of G-CSF which helps your body's immune system to start recovering from the chemotherapy.

Day 15 Repeat of day 1 and start of next cycle of treatment

This treatment is repeated every 2 weeks for a total of 6 to 12 cycles.
You will also have a one-off blood test to check for DPD deficiency and that it is safe for you to have this treatment. See page 2.

This treatment can have serious or possibly life-threatening side effects. It is very important that you report side effects straight away. Don't delay, if you feel unwell, please ring The Christie Hotline on **0161 446 3658**. The lines are open 24 hours a day.

Increased risk of serious infection

You are vulnerable to infection while you are having chemotherapy. Minor infections can become life-threatening in a matter of hours if left untreated. Symptoms of infection include fever, shivering, sweats, sore throat, diarrhoea, discomfort when you pass urine, cough or breathlessness. We recommend that you use a digital thermometer so you can check your temperature. You can buy one from your local chemist.

If you feel unwell, you have symptoms of an infection or your temperature is 37.5°C or above, or below 36°C, contact The Christie Hotline straight away.

After Cycle 2 of treatment, if clinically possible you will have your treatment at a location closer to home. The Christie is committed to providing treatment closer to home as part of the Outreach and Christie at Home service.

• Testing for DPD deficiency

The body makes enzymes which break down chemotherapy drugs so that chemotherapy doesn't build up in the body and cause severe side effects. A very small percentage of the population (approximately 1 in 20), either do not produce or produce less of an enzyme called DPD which would normally break down the chemotherapy drugs 5-FU and capecitabine. This is called DPD deficiency. Reduced production of DPD is not an issue in day-to-day life, but it might mean that some patients experience severe and sometimes life-threatening side effects after 5-FU or capecitabine chemotherapy is given. Patients with DPD deficiency are more likely to develop severe mouth ulcers and diarrhoea, and very low blood counts increasing vulnerability to life-threatening infections.

In order to check that it is safe for you to have this treatment, your team will be arranging a one off blood test. This test checks for some of the commonest abnormalities which can cause DPD deficiency. Your medical team will discuss the test results with you and can confirm whether you will be able to go ahead with your planned chemotherapy, or whether any changes need to be discussed.

Although DPD testing identifies many patients who are at risk of severe side effects from 5-FU and capecitabine, it does not identify all at risk patients. Severe and sometimes life-threatening side effects can occur in patients who have had a normal test result. Therefore it is important that patients receiving chemotherapy monitor their symptoms carefully and contact The Christie Hotline on **0161 446 3658** if they become unwell.

Herbal medicines:

Some herbal medicine including St John's Wort can affect the chemotherapy. You should let your doctor or nurse know if you are taking any herbal medication, complementary or alternative medicines, including vitamins, minerals and medicines purchased over-the-counter.

Other medicines:

Some medicines can be harmful to take when you are having chemotherapy. Let your doctor know you are having chemotherapy. Let your doctor know about any medications you are taking, including non-prescribed medicines such as complementary therapies and herbal remedies.

Flu vaccinations

Is it alright for me to have a flu jab during the time I’m having chemotherapy?

It’s safe to have a flu jab, but depending on the sort of chemotherapy you have had, it may not give quite as much protection against infection as usual. Some patients may need two vaccinations. However, if you’re thinking of having any other vaccinations, do check with your Christie doctor first, because some vaccines should be avoided.

COVID-19 vaccinations

We advise that all patients receive a COVID-19 vaccination when this is offered. Your doctor will discuss this with you the best time to have this.

Common side effects (more than 1 in 10)

• Anaemia (low number of red blood cells)

While having this treatment you may become anaemic. This may make you feel tired and breathless. Let your doctor or nurse know if these symptoms are a problem. You may need a blood transfusion.

• Bruising or bleeding

This treatment can reduce the production of platelets which help the blood to clot. Tell your doctor if you have any unexplained bruising or bleeding, such as nosebleeds, bloodspots or rashes on the skin, and bleeding gums. You may need a platelet transfusion.

• Increased risk of severe infection

All patients on this chemotherapy treatment will receive a 5 day course of once daily injections (G-CSF) under the skin of your abdomen to stimulate the bone marrow to make white blood cells. White blood cells normally help to fight off infection and we know that chemotherapy affects how many white blood cells the bone marrow makes. The injections reduce the risk of the white blood cell count becoming very low, but do not remove the risk of infection entirely. The injections can either be administered by the district nurse, or patients may self-administer after training. The commonest side effect of this treatment are flu-like symptoms such as bone and joint pains.

All patients therefore need to remain aware of the guidance regarding the increased risk of infection (see page 1) and the need to contact The Christie Hotline on **0161 446 3658** straightaway if there is any concern about possible infection.

• Delayed or persistent diarrhoea (Warning!)

If the diarrhoea starts more than 24 hours after your chemotherapy, you should immediately take the anti-diarrhoea treatment that the doctor has prescribed for you. This is the loperamide dispensed by The Christie Pharmacy.

Follow the instructions **EXACTLY:**
Take 2 loperamide capsules/tablets as soon as the first liquid stool occurs. If you continue to have episodes of liquid stools, then take 1 capsule/tablet, with each episode (allow at least 2 hours between doses). The maximum number of capsules/tablets you can take is 8 in a 24 hour period.

If the diarrhoea persists for more than 24 hours despite taking the loperamide, please contact The Christie Hotline on **0161 446 3658.**

You must tell your doctor if:
- you have a temperature/fever as well as diarrhoea
- you have nausea/vomiting as well as diarrhoea
- you still have diarrhoea 48 hours after starting the diarrhoea treatment.

• Numbness in fingers and toes

Oxaliplatin can increase the sensitivity of the nerve endings. You may develop pins and needles, tingling or numbness, or pains like small 'electric shocks' and may have difficulty in carrying out delicate tasks such as buttoning clothes (this may sometimes occur in association with cramps). These symptoms are often triggered by exposure to cold. Take care with extreme drops of temperature, e.g. opening fridge/freezers. Avoid drinking iced drinks and eating very cold food for 24 hours before treatment and for 24 hours afterwards. The chance of these symptoms occurring increases as you receive more oxaliplatin and will improve over time once you stop treatment. Rarely, the numbness can be permanent. Please see the Appendix at the back of this leaflet for further information.

• Nausea and vomiting (sickness)

The severity of this varies from person to person. Anti-sickness medication will be given along with your chemotherapy to prevent this. You will also be given anti-sickness tablets to take at home. If you continue to feel or be sick, contact your GP or The Christie, because your anti-sickness medication may need to be changed or increased.

- Sore mouth

Your mouth may become sore or dry, or you may notice small mouth ulcers during this treatment. Drinking plenty of fluids and cleaning your teeth regularly and gently with a soft toothbrush can help to reduce the risk of this happening. We can prescribe a mouthwash for you to use during treatment. You can dilute this with water if your mouth is sore. Ask your doctor or nurse for further advice. There is also general mouth care information in the chemotherapy booklet. If you continue to have a sore mouth, please contact The Christie Hotline.

Occasionally during treatment you may experience a strange taste sometimes described as metallic or bitter. A strongly flavoured sweet or mint will help to disguise this.

- Cholinergic reaction

Sometimes during the infusion or within 24 hours of the infusion of irinotecan you may get some of these symptoms: abdominal cramps, diarrhoea, sweats, dizziness, excess saliva, watery eyes, tiredness and occasionally problems with your vision. These side effects can easily be managed with an injection under the skin. Tell your chemotherapy nurse or doctor if you have any of these symptoms. If you have this reaction, you will normally need an injection before each treatment.

- Skin and nail changes

PPE (palmar-plantar erythema): The skin on your hands and feet may become very dry, red and sore with some cracking. Tell your doctor. Cream and tablets can be prescribed to help. Your chemotherapy dose may need to change. Try to keep your hands and feet cool and if possible, uncovered.

Hyperpigmentation: Less commonly, your skin may appear darker in colour or lightly tanned, especially around the joints. This is known as hyper pigmentation. Asian and African-Caribbean people may develop noticeable light patches on their skin. The skin will return to normal when treatment is finished.

Increased sensitivity to the sun: Your skin will tan or burn in the sun more easily. Sit in the shade, avoid too much sun and use a high factor sunblock cream and wear a hat.

Nail changes: You may have a blue tinge or darkening of the nails, flaking of the nails and thickening of the area where the nail starts growing.

- Lethargy

Some chemotherapy may make you feel tired and lacking in energy. It can be frustrating when you feel unable to cope with routine tasks. If you do feel tired, take rest and get help with household chores. If necessary, take time off work. Gentle exercise such as walking can be beneficial.

- Hair thinning

Some hair loss/thinning may occur during treatment. It is advisable to avoid perms, colours, the use of hot brushes and vigorous, frequent washing that could increase hair loss. Please remember that this is a temporary side effect and your hair will grow back when your treatment is completed. Very rarely, hair loss can be permanent.

The cancer information service offers a coping with hair loss service to all patients where support, information and advice will be given. Drop in, contact **0161 446 8100** or **8107** or email **the-christie.informationcentre@nhs.net.** Information about the wig service can also be found here and vouchers for wigs can also be obtained for eligible patients. The wig room provides a drop-in service, please see The Christie leaflet 'the wig fitting service' for further information.

The Maggie's Centre runs a Talking Heads hair loss support workshop for anyone who is anticipating or experiencing hair loss (both men and women). These sessions cover the practicalities of hair loss as well as offering support with its emotional impact. Contact Maggie's on **0161 641 4848** or email **manchester@maggies.org.**

Uncommon side effects (less than 1 in 10)

• Sore eyes

You may get a dry, gritty feeling in your eyes following treatment. If this happens, using Hypromellose eye drops will help to ease the discomfort. If the problem persists, contact The Christie. Your eyes may also water. Often this will improve in time and needs no specific treatment.

• Infusion reactions

Sometimes you may experience unpleasant feeling in the throat, particularly when swallowing which can give the sensation of shortness of breath. However, you will still be able to breathe normally. These sensations usually occur while you are receiving oxaliplatin and may be dealt with by slowing down the infusion of oxaliplatin from 2 to 6 hours. Also, taking a warm (not hot) drink can help if cold air is causing you swallowing difficulties.

• Extravasation

Extravasation is when chemotherapy leaks outside the vein. If you develop redness, soreness or pain at the injection site at any time, please let us know straight away.

Rare side effects (less than 1 in 100)

• Allergic reactions

Whilst receiving the oxaliplatin patients rarely can feel hot, faint, breathless, sick or develop an itchy rash. These can be symptoms of an allergic reaction. If an allergic reaction is suspected, the oxaliplatin drip will be stopped and medications can be given to settle the allergic reaction.

• Chest pain or stroke (Warning!)

A small number of patients receiving 5-Fluorouracil (5FU) or capecitabine can experience chest pain (angina) or rarely have a heart attack. Extremely rarely this may lead to death. Other complications such as a stroke or mini-stroke can happen but are exceptionally rare. If you develop any of these symptoms you should contact your hospital doctor for advice. **In an emergency you should go immediately to your nearest Accident and Emergency department.**

• Blood clots (Warning!)

During chemotherapy you are more at risk of blood clots in the legs (DVT) or lungs (PE). Occasionally these clots can be life-threatening. To help prevent clots, keep mobile and drink plenty of non-alcoholic fluids (around 2 to 3 litres per day). Symptoms of a blood clot include breathlessness; chest pain; fainting; coughing up blood or pain; redness; swelling or warmth in an arm of leg. If you develop any of these symptoms, you should ring **999** or go immediately to your nearest accident or emergency department.

Sex, contraception and fertility

Protecting your partner and contraception: We recommend that you or your partner use a condom during intercourse while you are having the course of chemotherapy. Chemotherapy is dangerous to unborn babies and this will also protect you and your partner from any chemotherapy drugs that may be present in semen and in the vagina. **If you suspect that you may be pregnant please tell your doctor immediately.**

Fertility: This chemotherapy may affect your ability to have children. Your doctor or nurse should have discussed this with you. If not, please ask them before you start treatment.

• For female patients only

Loss of periods

Due to the effect of chemotherapy on the ovaries, you may find that your periods become irregular or stop. This is more likely in women over the age of 40 when most women will notice some change in their periods. It is less common in women under the age of 40 but does still happen and can result in significant menopausal symptoms (see section below). Even if your periods stop completely during chemotherapy your periods may come back several years later. This means that you may be able to become pregnant even many years after chemotherapy. It is very important to use contraception if you don't want to get pregnant.

Menopausal symptoms

When the ovaries stop working due to chemotherapy or during a natural menopause most women experience symptoms such as hot flushes, sweats (night and day) and vaginal dryness. These hormonal changes can make the vagina feel as though it has shrunk and become less easy to stretch. This is called vaginal atrophy and can result in discomfort, pain on sexual intercourse, itching and recurrent urine infections. If your ovaries don't start to work again the vaginal symptoms can be permanent, although the flushes and sweats tend to reduce and stop over a small number of years. Some women who have already gone through menopause may notice their symptoms worsening for a time after chemotherapy.

The vaginal symptoms can start early and the longer they are left the harder they can be to treat. Contact your specialist nurse either in clinic or by phone when the symptoms first develop if you would like help. Symptoms can be managed in several ways including gels, essential oil pessaries and sometimes local oestrogen replacement. It is also helpful to request the booklet 'Menopausal symptoms and breast cancer' by Breast Cancer Now (either from your breast care nurse, the cancer information centre at The Christie or online).

Late side effects

Some side effects may become evident only after a number of years. In reaching any decision with you about treatment, the potential benefit you receive from treatment will be weighed against the risks of serious long term side effects to the heart, lungs, kidneys and bone marrow. With some drugs there is also a small but definite risk of developing another cancer. If any of these problems specifically applies to you, the doctor will discuss these with you and note this on your consent form.

Contacts

If you have any general questions or concerns about your treatment, please ring the area where you are having treatment:

Administration enquiries - **0161 918 7606/7610**
Chemotherapy nurse - **0161 918 7171**
Clinical trials unit - **0161 918 7663**

For advice ring The Christie Hotline on **0161 446 3658** (24 hours)

Your consultant is: ....

Your hospital number is: ....

Your key worker is: ....

Appendix

Oxaliplatin-induced peripheral neuropathy

Oxaliplatin is a commonly prescribed drug used in the treatment of cancer. It has been used for many years, and the safety profile and side-effects are well known. **Peripheral neuropathy** (nerve damage) is a common side effect due to the effects of oxaliplatin on the nerves. Almost all patients experience temporary symptoms of pins and needles exacerbated by exposure to the cold. However, repeated treatment can cause persistent numbness to develop in more than 30% of patients treated with oxaliplatin, which can be long lasting, troublesome and permanent in up to 10% of patients.

It is important that patients and their carers are alert to the signs and symptoms of peripheral neuropathy. The symptoms should improve slowly after the treatment has finished, but in some people they may never go away and have potential to affect their quality of life forever. Sometimes the effects of the nerve damage become apparent, or even worsen **after** the discontinuation of the chemotherapy.

Please do not worry if you are advised to stop oxaliplatin if you develop signs and symptoms of peripheral neuropathy. It is much safer to stop sooner rather than later, and you can still continue to receive and benefit from your fluorouracil-based chemotherapy.

Signs and symptoms of peripheral neuropathy

For most individuals, tingling in hands will be triggered by anything cold, such as iced drinks and cold air. If you notice that your symptoms are related to the cold, you should avoid cold food and drinks and wrap up warmly (wear gloves, socks and a scarf to cover your nose and mouth) in the cold weather. Use gloves when taking things out of the freezer or fridge. These symptoms are generally short lived and expected with the use of oxaliplatin. If however you have these symptoms all the time, you do need to inform the cancer specialist and the nurse treating you.

The symptoms of peripheral neuropathy are known to worsen in terms of severity and duration with successive treatments. This is known as a cumulative effect. These symptoms can include numbness, tingling and cramping of the hands and feet. You may also find it hard to fasten buttons or to do other fiddly tasks such as tying shoelaces. In more severe or established cases you can experience difficulties writing, using a computer keyboard or difficulties in day to day walking (unable to feel the ground). In severe cases, these symptoms can mean that it is no longer safe for a patient to drive. This is why we want to emphasise the need to stop the drug in a timely manner, rather than carry on too long, causing more difficulties.

The medical team would want to review and adjust the dose of the oxaliplatin drug to account for this and reduce the risk of more severe permanent nerve damage. Therefore every time you attend for a chemotherapy review you should be asked whether you have had any numbness, cramping or tingling of the hands or feet and whether they are worsening.

If persistent symptoms are present, the oxaliplatin drug will be stopped. There is no proven treatment to help reverse existing nerve damage, although symptoms often improve slowly over time. If you have pain associated with the numbness additional medications may be suggested to try to help reduce the pain. If a clinical trial is available your medical team will discuss this with you.

Self-care advice:

- Whilst receiving and after treatment with oxaliplatin, avoid cold temperatures and objects. For example, cold drinks, ice cream, washing in cold water. Many patients wear gloves when using the fridge or freezer.

- Cover yourself with a blanket while you are receiving your oxaliplatin infusion.

- In winter, after receiving your treatment, take care when leaving the chemotherapy unit as the cold air outdoors can cause you to feel like you can't get your breath. Put on a scarf, gloves and warm coat before going outdoors.

- During the summer, avoid direct contact with air conditioning.

- If persistent symptoms occur mention this at your next hospital visit to the medical or nursing teams so that we can discuss what to do next.

If your tingling or numbness symptoms are persisting or worsening all the time (i.e. no full recovery before next dose), you should certainly inform your cancer specialist and chemotherapy nurse when you attend for a review.

The EARLIER the medical and nursing team are made aware of any signs of nerve damage, the sooner your treatment plan can be adjusted to reduce the risk of you developing any long-term nerve damage.

If you need information in a different format, such as easy read, large print, BSL, braille, email, SMS text or other communication support, please tell your ward or clinic nurse.

The Christie is committed to producing high quality, evidence based information for patients. Our patient information adheres to the principles and quality statements of the Information Standard. If you would like to have details about the sources used please contact **the-christie.patient.information@nhs.net**

For information and advice visit the cancer information centres at Withington, Oldham, Salford or Macclesfield. Opening times can vary, please check before making a special journey.

Contact The Christie Hotline for
urgent support and specialist advice
The Christie Hotline: 0161 446 3658
Open 24 hours a day, 7 days a week

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The Christie Patient Information Service
Tel: 0161 446 3000 www.christie.nhs.uk