

# Your CODOX-M / IVAC treatment

 **Information for patients**  
Specialised Medicine



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## What is CODOX-M / IVAC?

CODOX-M / IVAC is a form of chemotherapy which is used at the Royal Hallamshire Hospital to treat some forms of non-Hodgkin's lymphoma. It is particularly effective in treating Burkitt lymphoma.

CODOX-M / IVAC is named after the chemotherapy drugs used in this form of treatment. In CODOX-M the drugs are **C**yclophosphamide, Vincristine (known as **O**ncovin), **D**oxorubicin and **M**ethotrexate. In the IVAC regimen the drugs used are **I**fosfamide, Etoposide (known as **V**epesid) and Cytarabine (known as **A**ra-**C**).

This combination of drugs has been found to be more successful than using any of the drugs alone. It is a particularly complex form of treatment but we will try to use this factsheet to explain what will happen over the course of your treatment and the possible side effects which you may experience.

This type of chemotherapy may also be given with Rituximab with each course of CODOX-M and IVAC. Your medical team will inform you if this is required.

## Preparing you for treatment

Before starting your treatment there are a number of tests and procedures we need to undertake first. These include:

- A biopsy to determine which type of lymphoma you have
- A bone marrow biopsy
- Insertion of a Central Venous Access Device (CVAD) into your chest or arm (please see our leaflet "Hickman Line insertion" or "About your PICC").

You may also require further scans, imaging and blood tests before treatment can begin. We have additional information on these procedures if you would like to read more.

## What does treatment involve?

CODOX-M / IVAC can be given partly as a day case treatment and partly on an in-patient basis. The drugs are delivered through your CVAD. You will have to stay in hospital to receive the Methotrexate treatment, and for a few days following this. The length of time in hospital will depend on any side effects you may have.

After each course of chemotherapy you will need some time for your blood count to recover. If/when you are well you will have a brief break at home. You will be seen regularly on our Day Case Unit to monitor your blood counts and to see how you are. Once your blood counts have recovered the next course of treatment will be planned.

The schedule of treatment will be:

Course / Cycle	Treatment
1	CODOX-M
1	IVAC
2	CODOX-M
2	IVAC

## Your fluid intake

It is very important that you drink plenty of fluids before your treatment starts and while you are having it. We will also give you some additional medication which will help you cope with the chemotherapy. We will ask you to measure how much you drink and how much urine you pass at certain points in the treatment.

## What is intrathecal injection?

Some of the medicines used in this type of treatment are given by 'intrathecal injection'. This involves passing a tiny needle between the sections of the spinal column at the lower part of your back, below the spinal cord.

The brain and spinal cord are bathed in fluid called cerebrospinal fluid (CSF). A few drops of this fluid are collected to analyse for cancer cells and then a small volume of chemotherapy is given down a needle in order to destroy any cancer cells in the CSF or prevent them spreading to the CSF.

This procedure is carried out under local anaesthetic either whilst you are an inpatient or as a daycase procedure.

## What does a course / cycle of chemotherapy involve?

### CODOX-M treatment

You will first receive CODOX-M treatment. This may be started as a day case treatment.

Day	Treatment	Time taken
1	You will be given 3 drugs (Doxorubicin, Vincristine and Cyclophosphamide) directly into your CVAD	2 hours
2 to 5	You will just be given Cyclophosphamide as a drip	15 minutes
6 and 7	Rest days	
8	You will be given a Vincristine infusion	5 minutes

<b>Day</b>	<b>Treatment</b>	<b>Time taken</b>
11	<p>You will be admitted to the ward to start a drip containing sodium bicarbonate.</p> <p>We will also need to test your urine each time you go to the toilet as your urine needs to be alkaline before you are given Methotrexate.</p>	Continuous for 3/4 days
12 to 17	<p>You will receive Methotrexate as a continuous infusion into your Hickman line.</p> <p>Twelve hours after the Methotrexate has been completed you will start to receive a drug through your CVAD called Folinic Acid. Sometimes termed 'Folinic Acid rescue', this drug is given to reduce the risk of the side effects on your bone marrow and gastrointestinal tract. If you are able to take tablets this drug will be given intravenously for the first 24 hours and then given as a tablet.</p> <p>Following this you will have some blood tests. These check whether your immune system (white cell) counts have returned to normal and also whether we can stop giving you the sodium bicarbonate drip.</p>	<p>Continuous for 24 hours</p> <p>Every 3 hours for first 24 hours.</p> <p>Tablets thereafter</p>
1 to 17	<p>You will receive in total 3 intrathecal injections on 3 separate occasions. Two intrathecal injections of Cytarabine and one intrathecal injection of Methotrexate.</p>	

This ends the first cycle of CODOX-M treatment.

## How will I feel after the first cycle of CODOX-M treatment?

After you finish the CODOX-M, you may feel very 'washed out' and take several days to recover. It is extremely important to let your nurses and doctors know how you are feeling and if you are experiencing any problems. There is a great deal we can do to manage these side effects. The time it takes to get through this stage is very individual.

## IVAC treatment

After the first cycle of CODOX-M you will receive IVAC treatment. This is usually given around one week after the CODOX-M is completed though will depend upon whether your blood cell count is within normal levels. IVAC treatment is currently given as an inpatient.

Day	Treatment	Time taken
1 and 2	You will be given Etoposide, Ifosfamide and a drug called Mesna (not a chemotherapy but a drug given to protect your bladder). You will receive 2 doses of Cytarabine 12 hours apart. These infusions last for 3 hours each so you will spend a lot of time hooked up to a drip.	2 doses each day for 3 hours
3 and 4	You will have infusions of Etoposide, Ifosfamide and Mesna but no Cytarabine on these days	
5	You will again have the Etoposide, Ifosfamide and Mesna infusions and also an intrathecal dose of Methotrexate at some point	

We will need to test your urine each time you go to the toilet whilst on IVAC. This is to make sure that your bladder has not become irritated by the chemotherapy.

This completes one full cycle of CODOX-M / IVAC. Generally patients have two of these cycles although for limited stage Burkitts lymphoma 3 cycles of CODOX-M may be given.

## What side effects am I likely to experience?

It is important to point out that not everybody experiences side effects and those that do vary in how much they are affected. We have broken down the following list into those which are likely to happen versus those which may or may not occur.

### Likely side effects:

- **Lowered resistance to infection:** This type of treatment will affect your immune system. You will be more susceptible to infection so you will need to monitor your temperature closely. Please let your nurse know if you have a raised temperature over 37°C or if you begin to feel unwell. If you do become unwell due to lowered immunity, you will need to be admitted to hospital between your treatments. **If you are at home when your temperature rises, it is particularly important you contact the hospital for immediate advice.** We can be contacted via the following numbers:

Between 8.00am and 4.00pm

- Haematology Triage line: **0114 271 1749**

Outside of these hours, on weekends and Bank Holidays

- O2 Day Unit: **0114 271 3607**
- Ward P3: **0114 271 3626**

When your immune system is low it is important that any visitors who are unwell, have a cough or cold do not visit. One of the most important things you can do to prevent infection is to wash your

hands often and visitors to the hospital can use the alcohol rub provided on the wards before and after visiting you.

- **Anaemia:** Chemotherapy can reduce the number of red blood cells in your blood. These cells carry oxygen around the body. If your cells become low you can become breathless and tired. If you are very anaemic a blood transfusion may be given to increase the number of red blood cells and improve your symptoms.
- **Bruising/Bleeding:** CODOX-M/IVAC can reduce the number of platelets in your blood. These are cells which help the blood to clot. Inform your medical team if you notice bruising or any bleeding you can't explain. This might be in the form of nosebleeds, blood spots/rashes on your arms or legs or bleeding gums. You may need a platelet transfusion to increase your platelet levels.
- **Nausea & Vomiting:** It is likely that you will feel sick during this treatment. However, we will give you regular anti-sickness medication which is very effective. If you find the medication is not working for you there are a number of different drugs we can try.
- **Sore mouth and ulcers:** Your mouth may become sore, or you may notice small ulcers during this treatment. Drinking plenty of fluids and cleaning your teeth regularly with a soft toothbrush can help reduce the risk of these effects. We will provide you with an antibacterial mouthwash for you to use regularly from the start of your treatment. If your mouth becomes sore, we will give you pain killers to reduce the pain and assess it regularly. Unfortunately your other mucosal surfaces including your gut and rectum can become sore too.
- **Hair loss:** Hair may be lost completely or can thin significantly. This usually starts 2-4 weeks after the first dose of CODOX-M chemotherapy, although it can occur earlier. You may also have thinning and loss of eyelashes, eyebrows and other body hair. This is temporary and your hair will start to re-grow within a few weeks of the end of treatment. We can arrange a hairdresser to cut your

hair short if you would like. You will also be entitled to a free wig which you can speak to your nurse about.

- **Problems with fertility:** CODOX-M/IVAC treatment affects both male and female fertility. Your doctor or nurse can give you further information on this. We would also advise you to use barrier contraception until at least 6 months after all your treatment has finished.
- **Fatigue:** This treatment can make you feel extremely tired and the tiredness can be long-lasting and persistent. Different individuals experience fatigue to different degrees but it is important to note that it can be several months to a year after chemotherapy before you start to feel 'normal' again and your energy fully returns.

### **Possible side effects:**

- **Peripheral neuropathy:** Numbness or tingling in the hands and feet. These are symptoms caused by the effect of Vincristine and Methotrexate on nerves. It is called peripheral neuropathy. You may find it difficult to fasten buttons or do fiddly tasks. Tell your medical team if you have these symptoms. The symptoms usually improve slowly after treatment finishes but in some people they may never go away.
- **Constipation:** The chemotherapy treatment can make you constipated and cause tummy discomfort. Drinking at least 2 litres of fluids every day will help. Try to increase your dietary fibre and some regular exercise. If you haven't had a bowel motion for 2 days contact the hospital for advice. Laxatives will be prescribed. Always contact the hospital straight away if you are constipated and have tummy pain or are being sick.
- **Irritated bladder:** Some of the chemotherapy can cause irritation to your bladder which may result in inflammation and some bleeding. The nurses on the ward will ask to check your urine continuously for any traces of blood. The Mesna drug helps to

protect your bladder. Drinking plenty of fluids and emptying your bladder regularly can help to prevent this.

- **Headaches:** Some patients experience headaches following intrathecal chemotherapy. To help prevent this, we will advise you to lie flat for a few hours afterwards and to drink plenty of fluids. A caffeine based drink often helps with these sorts of headaches.
- **Loss of appetite:** You will probably not feel like eating around the time of your treatment and this may be due to lack of appetite or taste changes. Our dietitian can give you advice and tips on boosting appetite, coping with eating difficulties and maintaining weight.
- **Irritated bladder:** Some chemotherapy can cause irritation to your bladder which may result in inflammation and some bleeding. The nurses on the ward will ask to check your urine continuously for any traces of blood. The Mesna drug helps to protect your bladder. Drinking plenty of fluids and emptying your bladder regularly can also help to prevent this.
- **Boredom:** It can be very boring having to stay in hospital for long periods, especially whilst you are hooked up to a drip. However, we will ask you not to leave the ward for safety reasons if your chemotherapy is running, so anything you can bring with you that can help to pass the time is useful.
- **Skin and nail changes:** Your skin may become dry and nails become brittle. Try using an unperfumed moisturising cream everyday. During treatment and for several months afterwards your skin will be more sensitive to the sun. For your future protection you should use a high factor protection cream (at least SPF30) and cover up in the sun. Any changes in discolouration or ridge marks on your nails should grow out once treatment is completed.
- **Changes to the way your heart and lungs work:** CODOX-M/IVAC chemotherapy may affect how the heart works and changes to the lungs. Inform your medical team if you develop

a cough, wheezing, breathlessness or fever or let them know if any existing problems get worse. If necessary they will arrange tests to check your lungs and heart function.

- **Blood clots:** Having a cancer and chemotherapy increases your risk of developing a blood clot. A clot can cause symptoms such as pain, redness and swelling in a limb, breathlessness and chest pain. Contact the hospital straight away if you have any of these symptoms. A blood clot is serious but it can be treated with drugs that thin the blood.



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