NHS
The Christie
NHS Foundation Trust

Hyper-CVAD

The possible benefits of treatment vary; for some people this chemotherapy may reduce the risk of the cancer coming back, for others it may control the cancer and its symptoms. Your doctor will explain to you whether you will receive chemotherapy or another type of treatment, or a combination of both.

Your doctor or nurse will be happy to answer any questions you have about your treatment. You will find it useful to refer to the booklet 'Chemotherapy, a guide' which gives general information on chemotherapy and side effects.

Your treatment

Your doctor or nurse clinician has prescribed for you a treatment called Hyper-CVAD which contains the drugs: cyclophosphamide, vincristine, doxorubicin (also known as Adriamycin®) and dexamethasone which is a steroid. Hyper-CVAD treatment also includes methotrexate and cytarabine which alternate with the above drugs.

Hyper is short for hyperfractionated. This means that more than one treatment of the same drug is given in a day.

Your treatment is usually given over 5 days as an inpatient and consists of:

- Cyclophosphamide is given as a drip over 2 hours
- Vincristine and doxorubicin are given as short infusions (10-15 minutes)
- Dexamethasone is given by mouth or by injection through your central line or PICC line
- Methotrexate is given as an infusion over 24 hours
- Cytarabine is given as an infusion over 2 hours.

Sometimes, methotrexate and cytarabine may also be given by injection into the fluid around the spinal cord (intrathecal) injection.

You will also be given lots of fluids as an infusion and a drug called mesna with your cyclophosphamide to help prevent irritation of the bladder. Sodium bicarbonate by infusion is usually given before and during your methotrexate treatment, to help protect your kidneys. Folinic acid (sometimes called leucovorin) is given, usually into the vein or as tablets, to reduce the side effects of methotrexate.

Immediate effects: Cyclophosphamide can cause a feeling of giddiness or dizziness, a metallic taste in the mouth, a feeling of numbness or pressure in the sinuses and a cold sensation along the course of the vein. This can last for an hour or so following treatment. Please tell your nurse if this happens.

Doxorubicin because of its red colour, may discolour your urine red for up to 24 hours following treatment. This is normal and nothing to worry about.

How often is treatment given?

You will have up to 8 cycles of Hyper-CVAD given every 21 days. This means you will have 4 cycles of schedule A alternating with schedule B.

If you are having Hyper-CVAD before a stem cell transplant, you will usually only have 4 sessions of chemotherapy (2 of schedule A and 2 of schedule B).

Schedule A (cycles 1, 3, 5 and 7)	
Days 1, 2, 3	Cyclophosphamide, via a drip over 2 hours which is given twice in 24 hours (6 times in 3 days)
Day 1 to 4	Dexamethasone tablets for 4 days.
Day 4	Doxorubicin and vincristine via an infusion.
Day 6-10	At home if you are well enough.
Day 11	Vincristine (as a day patient) and
Day 11-15	Dexamethasone tablets for another 4 days.
	After this you will have a rest period, with no treatment until your blood counts recover. This competes one cycle of Schedule A.
	After the rest period you will then go on to have Schedule B.

Schedule B (cycles 2, 4, 6, 8)	
Day 1	Methotrexate infusion over 24 hours.
Day 2	Finishing Methotrexate infusion over 24 hours. Cytarabine is given twice (12 hourly).
Day 3	Cytarabine is given twice (12 hourly).
Day 4-18	Rest period with no treatment.
	This completes one cycle of Schedule B.

After schedule B, you can usually go home once you are well enough and your methotrexate levels are satisfactory. This is checked with a blood test.

After the rest period you will then go on to have Hyper-CVAD (schedule A). You will continue to alternate between schedule A and B until your chemotherapy treatment is completed.

Going home

You will need to have your blood checked 2 to 3 times per week between chemotherapy treatments or cycles. Some people may need to be admitted to hospital if they develop an infection. A blood or platelet transfusion (to improve your blood count) can be given to you as a day patient.

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 37.5ºC or above, or below 36ºC contact The Christie Hotline straight away.

Possible side effects

Chemotherapy can cause many different side effects. Some are more likely to occur than others. Everyone is different and not everyone gets all the side effects. Most side effects are usually temporary, but in some rare cases they can be life-threatening. It is important to tell your hospital doctor or nurse about any side effects so they can be monitored and, where possible, treated.

Common side effects (more than 1 in 10)

- Lowered resistance to infection

This effect can begin about 7 days after treatment has been given. Your resistance to infection usually reaches its lowest point 10 to 14 days after chemotherapy. Your blood cells will then increase steadily and will usually have returned to normal levels before your next cycle of chemotherapy is due.

You may be given antibiotics to take as a preventative measure and you will need to have antibiotics if you develop a temperature.

You will have a blood test before having more chemotherapy to make sure that your number of white blood cells has returned to normal. Occasionally it may be necessary to delay treatment if your number of blood cells (blood count) is still low.

You may be given injections of a drug called G-CSF (granulocyte-colony stimulating factor), which is a protein that can help to boost the number of white blood cells that your bone marrow produces. It is given as an injection under the skin (subcutaneously).

- Bruising or bleeding

This treatment can reduce the production of platelets which help the blood clot. Let your doctor know 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.

- 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.

- Nausea and vomiting (sickness)

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

- 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 loss

Hair loss is usually total. The hair falls out gradually 10 to 14 days following your first course of treatment. The time scale varies from person to person. 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 centre offers a coping with hair loss service to all patients where support, information and advice will be given. Drop in, contact **0161 446 8100/8107** 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**.

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- **Diarrhoea**

If you develop severe diarrhoea it is important to contact The Christie straight away as this may be a sign of a serious infection. Don’t delay!

- Constipation and abdominal cramps

Vincristine can cause severe constipation. It is important that this is treated early if this occurs. Try to drink plenty of fluids and eat foods high in fibre. Tell your doctor who may prescribe a suitable laxative. Ask the staff for a copy of ‘Eating: help yourself’ which has useful ideas about diet when you are having treatment.

- Sore eyes

Cytarabine can commonly cause sticky or sore eyes. We will give you dexamethasone eye drops to help prevent this. Do not wear contact lenses while you are having this treatment. Please let your nurse or doctor know if your eyes feel uncomfortable.

- Steroid side effects

Your **dexamethasone tablets** should be taken with food as they may cause indigestion. They may also increase your appetite. It is better to take them earlier in the day, for example, with breakfast and lunch, since they can make you feel more alert and prevent sleep.

These dexamethasone tablets can alter your mood causing you to feel low, irritable or agitated. Please tell the doctor at your next clinic visit if this is a problem.

Dexamethasone can cause your blood sugar to rise. If you are diabetic then you may need to increase the dose of any diabetic medication you take (insulin or tablets). You should discuss this with your doctor before starting the chemotherapy. Dexamethasone can also induce diabetes in people not known to have this disease. This is normally reversible although you may need to take some diabetic medication while you are having chemotherapy.

Uncommon side effects (less than 1 in 10)

- Sore mouth and ulcers

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.

- Strange taste

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.

- Raised levels of uric acid in the blood

Cytarabine can affect the levels of uric acid in the blood. To stop this happening, we may give you a drug called allopurinol. It may also help to drink plenty of fluids. While you are taking cytarabine, we may check your uric acid levels using blood tests.

- Irritation of the bladder

Cyclophosphamide may irritate your bladder. It is important to drink as much fluid as you can (up to two litres a day) on the days you have the cyclophosphamide to help prevent this. Tell your doctor if you have any discomfort when you pass urine.

Doxorubicin because of its red colour, may discolour your urine red or pink for up to 24 hours following treatment. This is perfectly normal and nothing to worry about.

- 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 this hospital. Your eyes may also water. This will improve in time and needs no specific treatment.

- Flu-like symptoms

Some chemotherapy may cause flu-like symptoms such as fever, aches and pains and shivering about 3 to 5 hours after it is given. These symptoms should be temporary and should go within 12 to 24 hours. Paracetamol will help. If your symptoms are particularly severe, tell your doctor on your next visit.

Rare side effects (less than 1 in 100)

- **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 straightaway.

- Tingling and numbness in the fingers or toes

This is only usually mild and temporary but may last for some time or become permanent. Please report these symptoms to your doctor on your next hospital visit as your chemotherapy dose may need to be adjusted.

- Skin colouring

Sometimes as a result of the chemotherapy, your skin may appear darker in colour or lightly tanned, especially around the joints. This is known as hyperpigmentation. The skin will return to normal when the treatment is finished. Asian and African-Caribbean people may develop noticeable light patches on their skin.

- Sensitivity to the sun

Some chemotherapy can make your skin more sensitive to the sun than usual. Sit in the shade, avoid too much sun and use a sunblock cream.

- Sore hands and feet

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 given which can help. Your chemotherapy dose may need to change. Try to keep your hands and feet cool and if possible, uncovered.

- Nerve damage to the brain

Cytarabine in very high doses can cause some damage to the nerves inside and outside the brain. This may cause symptoms including seizures (fits) and mood changes.

- Kidney function

Methotrexate can affect your kidney function. To prevent this from happening, an alkaline medication called sodium bicarbonate is given as a drip or as tablets. Your kidney function will be closely monitored during and after your treatment.

- Liver function

Some of the drugs may cause changes in the way that your liver works, though it will return to normal when the treatment is finished. These changes are unlikely to cause you any harm but your doctor will monitor them carefully. Samples of your blood will be taken regularly to check your liver is working properly.

- Weakness of the heart:

Doxorubicin can affect your heart, weakening the heart muscle. This is uncommon and is associated with increasing the dose of the treatment. Your treatment will not exceed the maximum dose. If there is any concern about your heart, a scan of the heart will be done before the start of your treatment.

⚠ • **Chest pain and palpitations.** Doxorubicin can affect the heart muscle.

Go straight to A&E if you have chest pain during or in between treatments.

Serious and potentially life threatening side effects

In a small proportion of patients chemotherapy can result in very severe side effects which may rarely result in death. The team caring for you will discuss the risk of these side effects with you.

- Methotrexate rescue:

Before you are given methotrexate, we will test your urine to make sure that it is not acidic. This is to make sure that your body can remove the residues of the chemotherapy through the urine. We will continue to test your urine throughout the treatment and give you medication to prevent your urine from becoming acidic.

After your chemotherapy, we will routinely test your blood to see how much methotrexate is left in your blood. We will give you a medication called folinic acid as an injection or a tablet to help your body recover. This is called the folinic acid rescue. The dose of Folinic acid and the length of the time you need to have this depends on the results of your blood test.

- Medicines to be avoided on this regimen:

Do not take any medicines that contain aspirin, ibuprofen or co-trimoxazole. **Be careful!** Some cold remedies and painkillers contain aspirin and ibuprofen. Check with your pharmacist and tell them you are having treatment with methotrexate. Please ask your doctor at the Christie for advice about any other medication you are taking, including non-prescribed medicines, complementary therapies and herbal medicines.

Sex, contraception and fertility

Protecting your partner and contraception:

We recommend that you or your partner use a condom during sexual 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.

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 contact the Haematology and transplant unit.

Haematology nurse specialists	**0161 918 7962**
Haematology and transplant day unit	**0161 446 3924**
General enquiries	**0161 446 3000**
For urgent advice ring The Christie Hotline	**0161 446 3658** (24 hours)

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