

Mitoxantrone-based chemotherapy

Mitoxantrone can be used to treat some people with acute myeloid leukaemia (AML). It is an intensive treatment. Treatment for AML can be divided into three stages:

- Induction (to get AML under control)
- Consolidation (to keep AML under control)
- Maintenance (to reduce the risk of AML coming back)

Mitoxantrone is sometimes used during the induction and consolidation stages. We cover what mitoxantrone is, who might have it, and how to have it. We also cover its main side effects and any special precautions you may need to take while you're on it.

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Throughout this leaflet, you will see QR codes and URLs that link to webpages for further support. If you are not able to access the webpages, please email information@leukaemiacare.org.uk or call **01905 755977**.

Summary

- Mitoxantrone is a chemotherapy medicine used to treat some adults with acute myeloid leukaemia (AML).
- You have mitoxantrone as a drip (infusion) into a vein, usually via a central line.
- You will have regular blood tests to check how well the treatment is working and how your body is coping with it.
- You may get some side effects while you are having mitoxantrone. Some people have very few side effects, whereas other people experience more serious side effects.
- Some side effects can be serious if not treated promptly. Contact your haematology team straight away if:
 - You have chest pain, shortness of breath, or a fast and irregular heartbeat
 - You have swelling, due to a build-up of fluid, in your legs, ankles and feet
 - You feel tired, dizzy and short of breath
 - You have unexpected bruising or bleeding
 - You are getting frequent infections

About mitoxantrone

Mitoxantrone is a chemotherapy medicine that stops your cancer cells from making and repairing DNA. This can stop cancer cells from growing and dividing.

The brand name for mitoxantrone is Onkotrone.

Your haematology team might recommend mitoxantrone for you if:

- You have newly-diagnosed AML and intensive treatment is suitable for you
- You have AML that did not respond to your first treatment or came back after treatment, and intensive treatment is suitable for you

You might have it on its own or combined with other chemotherapy medicines.

Your haematology team might recommend mitoxantrone in other circumstances. If they do, they will let you know exactly what treatment they recommend, and what you can expect from it.



Before having mitoxantrone

Before starting mitoxantrone, your haematology team will carry out checks to make sure it's suitable for you. These might include:

- Blood tests to measure your blood counts
- Blood tests to check your liver and kidney function
- Bone marrow tests
- Tests and scans to check your heart function



Before starting treatment, you should let your haematology team know if you:

- Have liver or kidney problems
- Have heart problems or your heart isn't working well
- Have had mitoxantrone before
- Have previously had radiotherapy to your chest
- Have previously had other chemotherapy, especially daunorubicin or doxorubicin
- Have an infection or feel unwell
- Are due to have any vaccines
- Are or think you may be pregnant, want to have children, or are breastfeeding

Some medicines or drugs may interact with mitoxantrone. It is important to tell your haematology team about any medicines or supplements you are taking. This includes prescribed medicines and medicines you have bought yourself without a prescription. Examples include:

- Some medicines that affect your heart
- Some medicines that help prevent blood clots
- Some medicines that affect your immune system

Having mitoxantrone

You can have mitoxantrone on its own or in combination with other medicines. Your haematology team will let you know exactly what medicines you are having.

You have mitoxantrone through a drip into a vein (or a central line, if you have one). You have treatment in cycles, with time in between for your bone marrow to recover. You will have blood tests, and sometimes other tests, to see how you have responded and to decide if you need further treatment.

How often you have mitoxantrone and how many cycles you have depends on the type of leukaemia you have, where you are in your treatment, and what other medicines you are having.

Newly-diagnosed AML

Treatment for AML can be divided into three stages: induction (to get AML under control), consolidation (to keep AML under control) and maintenance (to reduce the risk of AML coming back). You might have mitoxantrone during the induction and consolidation stages. You usually have it alongside another chemotherapy medicine called cytarabine.

First induction

You have treatment in cycles, with different treatment on different days. Your haematology team will tell you exactly what treatments you'll have and when. Here we give an example of a cycle you might have as your first treatment.

- Day 1: Mitoxantrone + cytarabine
- Day 2: Mitoxantrone + cytarabine
- Day 3: Mitoxantrone + cytarabine
- Day 4: Cytarabine
- Day 5: Cytarabine
- Day 6: Cytarabine
- Day 7: Cytarabine
- After this you have blood tests to see if your blood counts have improved



It takes up to 30 minutes to have mitoxantrone. You have cytarabine as a continuous drip over 7 days.

Second induction

If your leukaemia does not respond completely to your first induction treatment, you might need another cycle. In this case, you might have a cycle similar to the one we show here:

- Day 1: Mitoxantrone + cytarabine
- Day 2: Mitoxantrone + cytarabine
- Day 3: Cytarabine
- Day 4: Cytarabine
- Day 5: Cytarabine
- After this you have blood tests to see if your blood counts have improved



It takes up to 30 minutes to have mitoxantrone. You have cytarabine as a continuous drip over 5 days.

Consolidation

If you respond to mitoxantrone and cytarabine induction, you have consolidation treatment to keep your AML under control. You might have the following treatment on the following days:

- Day 1: Mitoxantrone + cytarabine
- Day 2: Mitoxantrone + cytarabine
- Day 3: Cytarabine
- Day 4: Cytarabine
- Day 5: Cytarabine
- After this you have blood tests to see how your body has responded to treatment



It takes up to 30 minutes to have mitoxantrone. You have cytarabine as a continuous drip over 5 days.

AML that did not respond to treatment or came back after treatment

If your AML did not respond to treatment or came back after treatment, there are several different treatment options. Your haematology team will let you know what they recommend for you, and what to expect from treatment.

Mitoxantrone-based treatment options include:

- Mitoxantrone with another chemotherapy medicine called cytarabine (mitoxantrone + cytarabine)
- Mitoxantrone with other chemotherapy medicines called etoposide and cytarabine (MEC)
- Mitoxantrone with other chemotherapy medicines called cytarabine and cladribine, as well as a growth factor to help your bone marrow recover (CLAG-M)
- Mitoxantrone on its own

Your haematology team might suggest mitoxantrone combined with other medicines. They will let you know what dosing schedule you are on, how often you will have treatment, and if you need to stay in hospital.

Mitoxantrone and cytarabine

If you are having mitoxantrone + cytarabine, you have the following treatment on the following days:

- Day 1: Mitoxantrone + cytarabine
- Day 2: Mitoxantrone + cytarabine
- Day 3: Mitoxantrone + cytarabine
- After this you have blood tests to see how your body has responded to treatment



It takes up to 30 minutes to have mitoxantrone. You have cytarabine as a drip over 3 hours, every 12 hours.

Mitoxantrone, etoposide and cytarabine (MEC)

If you are having MEC, you have the following treatment on the following days:

- Day 1: Mitoxantrone + etoposide + cytarabine
- Day 2: Mitoxantrone + etoposide + cytarabine
- Day 3: Mitoxantrone + etoposide + cytarabine
- Day 4: Mitoxantrone + etoposide + cytarabine
- Day 5: Mitoxantrone + etoposide + cytarabine
- After this you have blood tests to see how your body has responded to treatment



It takes up to 30 minutes to have mitoxantrone. You have etoposide as a drip over 30 to 60 minutes. You have cytarabine as a drip which can take up to 4 to 6 hours.

Cladribine, cytarabine, growth factor and mitoxantrone (CLAG-M)

If you are having CLAG-M, you have the following treatment on the following days:

- Day 1: G-CSF (This stands for granulocyte colony-stimulating factor. It's a growth factor that encourages your bone marrow to make white blood cells.)
- Day 2: Mitoxantrone + cladribine + cytarabine + G-CSF
- Day 3: Mitoxantrone + cladribine + cytarabine + G-CSF
- Day 4: Mitoxantrone + cladribine + cytarabine + G-CSF
- Day 5: Cladribine + cytarabine + G-CSF
- Day 6: Cladribine + cytarabine + G-CSF
- After this you have blood tests to see how your body has responded to treatment



It takes up to 30 minutes to have mitoxantrone. You have cytarabine as a drip which can take up to 4 to 6 hours. You have cladribine as a drip over 2 hours. You have G-CSF as an injection under your skin, usually in your tummy or leg.

Mitoxantrone on its own

If you are having mitoxantrone on its own, you have it for 5 days. After this you have blood tests to see how your body has responded to treatment. It takes up to 30 minutes to have mitoxantrone.

Dose

Your haematology team will work out the best dose of mitoxantrone, and any other medicine you may have with it, based on your height, weight and how well you respond to treatment. They will tell you what dose they recommend for you.

Precautions when having mitoxantrone

There are several precautions to be aware of when you are having mitoxantrone.

- Mitoxantrone can make you feel confused or very tired. Take care if you are driving or using tools or machinery.
- You should not have live vaccines whilst having treatment and for 3 months after you stop. Tell your haematology team if you are due to have any vaccines, and they can let you know whether or not it is safe to have.

Pregnancy, breastfeeding and fertility

Mitoxantrone may harm unborn babies.

- If you could get pregnant, it is important to use effective contraception. You need to do this while you are having mitoxantrone and for 4 months after you stop.
- If you could make someone pregnant, it is important to use effective contraception. You need to do this while you are having mitoxantrone and for 6 months after you stop.
- If you think you might be pregnant, tell your haematology team as soon as possible. They may recommend stopping mitoxantrone for a while. They could also recommend switching to a different treatment.
- If you are planning to get pregnant, or make someone pregnant, tell your haematology team. They can discuss your treatment options with you.

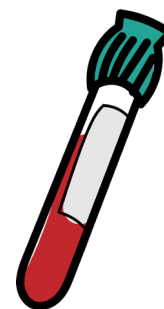
Mitoxantrone can pass into breast milk during treatment and for up to a month after stopping. This can be a risk for breastfed babies or children. You should not breastfeed when having mitoxantrone and for at least a month after you stop.

Monitoring during mitoxantrone treatment

During your treatment with mitoxantrone you will have regular blood tests. You will also have bone marrow tests and may have heart tracings and heart scans. Your haematology team will let you know what tests you need and how often.

Your haematology team will use the results of these tests to:

- Check how well mitoxantrone is working for you
- Make sure your blood counts have not dropped too low
- Check how well your liver and kidneys are working
- Check how well your heart is working



Other cancers

Having mitoxantrone can increase your chance of getting a different leukaemia or blood cancer. It may also increase your chance of getting some other types of cancer.

Your haematology team will monitor your blood counts to check for any signs of leukaemia or blood cancers. If you have any worrying symptoms, tell them. These include fatigue, unexpected bruising or bleeding and frequent or long-lasting infections.

Cancer Research UK have [more information about the signs and symptoms of cancer](https://www.cancerresearchuk.org). If you have any of these symptoms, tell your haematology team. Follow the link, scan the QR code, or search 'signs and symptoms of cancer' at www.cancerresearchuk.org



Bone marrow not making new blood cells

Treatment with mitoxantrone can affect your bone marrow. This can stop or slow down how quickly your bone marrow is able to make new blood cells.

Your haematology team will do regular blood tests to check your blood cell counts.

Heart problems

Treatment with mitoxantrone can affect your heart, during treatment, and sometimes months or years after treatment.

Your haematology team will carry out regular checks and scans of your heart during treatment.

Tumour lysis syndrome

Chemotherapy kills cancer cells. When lots of cancer cells breakdown quickly, they can release a large amount of chemicals into your blood. This is known as tumour lysis syndrome. It can affect how well your kidneys work, as well as causing changes to your heartbeat and sometimes fits (seizures). Your haematology team will monitor you closely so they can treat it quickly if it happens.

How long to have mitoxantrone

The number of cycles you have depends on how you respond to treatment and how well your body is coping with it.

- If you are newly-diagnosed and you're having mitoxantrone, you usually have a maximum of two induction and two consolidation cycles.
- If you are having mitoxantrone for AML that has come back or not responded to treatment your haematology team will let you know how many cycles of treatment you will have, based on your individual situation.

Side effects of mitoxantrone

Like all medicines, mitoxantrone can cause side effects. Some of these may be serious. Side effects are different for everyone, and we cannot predict what side effects you may or may not get.

Tell your haematology team about any side effects you have. They may be able to suggest things you can do or give you medicines to help.

Serious side effects of mitoxantrone

The following side effects may be serious and require urgent treatment. Contact your doctor or nurse straight away if you have any of these side effects.

Your medical team will closely monitor you for serious side effects so that they can treat them promptly if they happen. The most important serious side effects for people having mitoxantrone are:

- Your heart not functioning properly. You may get symptoms like:
 - Chest pain
 - Shortness of breath
 - Swelling, due to a build up of fluid, in your legs, ankles and feet
 - A fast, irregular heartbeat

Mitoxantrone can lower your blood cell counts. This can mean you may be more likely to get infections, fever, bruising, bleeding, shortness of breath or feeling very tired. If you get any of these symptoms, tell your doctor or nurse straight away.

Other side effects of mitoxantrone

You may experience some of the following side effects when having mitoxantrone. Tell your medical team if you get any side effects. They may be able to suggest things to help.

If you are getting side effects that are difficult to cope with, your medical team might suggest:

- Changing how often you have mitoxantrone
- Stopping mitoxantrone treatment

Very common side effects

Very common side effects affect more than 10 in every 100 people who are having mitoxantrone. They include:

- Infections. Signs of infection include:
 - A high temperature (38°C or higher)
 - Sore throat, sneezing, blocked or runny nose, earache
 - Coughing or shortness of breath
 - Burning or stinging when you pee, or peeing more often than usual
 - Sickness or diarrhoea
 - Pain or redness around any drips or central lines you have
- Feeling tired, dizzy or short of breath due to a low red blood cell count (anaemia)
- Frequent or long-lasting infections due to a low white blood cell count
- Feeling sick or being sick
- Hair loss



Hair loss

Hair loss is usually temporary. It happens gradually. Some people prefer to shave their hair or cut it short. This can give you a feeling of control and reduce the emotional impact of it falling out. You could also cover your hair loss, if you choose to. There are lots of options like hats, headscarves, wraps, turbans or wigs.

Cancer Hair Care UK has [more information on hair loss](#), including how to care for Afro-textured hair during chemotherapy. Follow the link, scan the QR code or search for 'hair loss' on cancerhaircare.co.uk



Common side effects

Common side effects affect more than 1 but less than 10 out of every 100 people who are having mitoxantrone. Common side effects include:

- Unexpected bruising or bleeding, like nosebleeds, bleeding gums, blood spots or rashes due to a low platelet count
- Loss of appetite
- Lack of energy, fatigue, feeling tired, weak or exhausted
- Shortness of breath
- A fast, irregular heartbeat
- Swelling of your legs, feet and ankles
- Chest pain, you may also get pain in your arms, jaw, neck, back and tummy
- Feeling lightheaded or dizzy
- Sweating
- Constipation or diarrhoea
- Sore mouth or lips
- Fever



Changes to the colour of your pee

Mitoxantrone may cause your pee to become a blue-green colour 24 hours after having it. The whites of your eyes, skin and nails may also have a blueish colour (this may look different on black or brown skin).

This is normal, and not anything to worry about, but if you are concerned, talk to your haematology team.

What to do if you get side effects

Tell your haematology team if you get any side effects. They may be able to suggest things to help. This could include:

- Asking a heart doctor (cardiologist) to see you if you have problems with your heart
- Giving you medicines like antibiotics, antifungals or antivirals to treat and prevent infections
- Giving you blood or platelet transfusions if you have low levels of blood cells
- Giving you mouthwashes, rinses and gels to help with sore mouth
- Giving you medicines to prevent and treat sickness and diarrhoea

You may need to stay in hospital to manage some of these side effects.

[Blood Cancer UK](#) and [Macmillan](#) have more information on coping with side effects and treatment. Follow the links, scan the QR codes, or search 'blood cancer side effects' at bloodcancer.org.uk or 'coping with treatment' at macmillan.org.uk



Further information

We have more [information about AML](#) including booklets and factsheets to download. Follow the link, scan the QR code or search 'AML' at leukaemiacare.org.uk



We also have [booklets you can order in print free of charge](#). Follow the link or search 'AML' at shop.leukaemiacare.org.uk or scan the QR code.



We are grateful to Jonathan Kell, haematologist, and Catherine Langton, clinical nurse specialist, and Sue Yates, patient reviewer, for reviewing this information.

If you have any feedback on this information, or you'd like a list of the references we used to develop it:

- Email information@leukaemiacare.org.uk
- Complete our [short survey](#) to help us improve our information
- Call **01905 755 977**
- Write to **Leukaemia Care, One Birch Court, Blackpole East, Worcester, WR3 8SG**

If you need support

[We're here for you if you need support](#). Follow the link or search 'support for you' at leukaemiacare.org.uk to find out how we can help you.

If you'd like to talk to someone who understands what you're going through:

- Call our freephone helpline on **08088 010 444**
- Message us through WhatsApp on **07500 068065**

