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EC

EC is the name of a chemotherapy combination. It is made up of the following drugs. The pronunciation is in brackets.

- epirubicin (eh-pee-roo-bih-sin)
- cyclophosphamide (sike-low-foss-fa-mide)

EC is a treatment for breast cancer.

You might have EC on its own or before or after other cancer drug treatments.

[Find out about breast cancer](#)

How does EC work?

These chemotherapy drugs destroy quickly dividing cells, such as cancer cells.

[Find out more about how chemotherapy works](#)

How do you have EC?

You might have treatment through a long plastic tube that goes into a large vein in your chest. The tube stays in place throughout the course of treatment. This can be a:

- central line
 - PICC line
 - portacath
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How often do you have EC?

You usually have EC chemotherapy as a course of several cycles of treatment. This means that you have the drugs and then a rest to allow your body to recover.

You have both drugs every 2 or 3 weeks and then a break with no treatment. Each 2 or 3 weeks is a cycle of treatment 🗨️. You have between 3 and 6 cycles, taking 3 to 4 months in total.

The treatment usually takes just over an hour each time however you may be at the hospital for longer.

You usually also have a drug called granulocyte colony stimulating factor (G-CSF). This makes your bone marrow 🗨️ produce white blood cells 🗨️ more quickly after the chemotherapy. It helps lower your risk of getting an infection after having this treatment.

Your healthcare team will let you know what day to start your G-CSF injections.

Find out about G-CSF

Tests

You have blood tests before and during your treatment. They check your levels of blood cells and other substances in the blood. They also check how well your liver and kidneys are working.

What are the side effects of EC?

Side effects can vary from person to person. They also depend on what other treatments you're having.

When to contact your team

Your doctor, nurse or pharmacist will go through the possible side effects. They will monitor you during treatment and check how you are at your appointments. Contact your advice line as soon as possible if:

- you have severe side effects
- your side effects aren't getting any better
- your side effects are getting worse

Early treatment can help manage side effects better.

Contact your advice line immediately if you have signs of infection, including a temperature above 37.5C or below 36C.

We haven't listed all the side effects here. Remember it is very unlikely that you will have all of these side effects. But you might have some of them at the same time.

Common side effects

These side effects happen in more than 10 in 100 people (more than 10%). You might have one or more of them. They include:

Increased risk of getting an infection

Increased risk of getting an infection is due to a drop in white blood cells. Symptoms include a change in temperature, aching muscles, headaches, feeling cold and shivery and generally unwell. You might have other symptoms depending on where the infection is.

Infections can sometimes be life threatening. You should contact your advice line urgently if you think you have an infection.

A much less common side effect you might have is a severe reaction to an infection. Signs can include feeling very unwell, not passing urine, being sick, a very high or very low temperature or shivering. Contact your advice line straight away if you have any of these symptoms.

Breathlessness and looking pale

You might be breathless and look pale due to a drop in red blood cells. This is called anaemia.

Bruising, bleeding gums or nosebleeds

This is due to a drop in the number of platelets in your blood. These blood cells help the blood to clot when we cut ourselves. You may have nosebleeds or bleeding gums after brushing your teeth. Or you may have lots of tiny red spots or bruises on your arms or legs (known as petechiae).

Tiredness and weakness (fatigue)

Tiredness and weakness (fatigue) can happen during and after treatment. Doing gentle exercises each day can keep your energy up. Don't push yourself, rest when you start to feel tired and ask others for help.

Feeling or being sick

Feeling or being sick is usually well controlled with anti sickness medicines. It might help to avoid fatty or fried foods, eat small meals and snacks and take regular sips of water. Relaxation techniques might also help.

It is important to take anti sickness medicines as prescribed even if you don't feel sick. It is easier to prevent sickness rather than treat it once it has started.

Hair loss

You could lose all your hair. This includes your eyelashes, eyebrows, underarms, legs and sometimes pubic hair. Your hair will usually grow back once treatment has finished but it is likely to be softer. It may grow back a different colour or be curlier than before.

Pink or red urine

This won't harm you. It's due to the colour of the chemotherapy and lasts for one or two days.

Tummy (abdominal) cramps

Tell your treatment team if you have this. They can check the cause and give you medicine to help.

Inflammation of the bladder

Inflammation of the bladder (cystitis) can cause pain and occasionally blood when passing urine.

Contact your advice line straight away if you see blood in your urine.

You should drink 8 to 12 cups of fluid a day to try to prevent this.

Feeling generally unwell

Speak to your doctor or nurse if you feel generally unwell after taking this drug.

High temperature (fever)

If you get a high temperature, let your treatment team know straight away. Ask them if you can take paracetamol to help lower your temperature.

Hot flushes

We have some tips for coping with [hot flushes in women](#) and [hot flushes in men](#). This information also includes some of the possible treatments. Talk to your doctor if your hot flushes are hard to cope with. They might be able to prescribe some medicines to help.

Skin problems

[Skin problems](#) include a skin rash, dry skin and itching. This usually goes back to normal when your treatment finishes. Your healthcare team can tell you what products you can use on your skin to help.

Sore mouth

[Mouth sores and ulcers](#) can be painful. Keep your mouth and teeth clean; drink plenty of fluids; avoid acidic foods such as oranges and lemons; chew gum to keep the mouth moist and tell your doctor or nurse if you have ulcers.

Eye problems

This might include inflammation of the conjunctiva (conjunctivitis) or inflammation of the cornea (keratitis).

Liver changes


You will have regular blood tests to check for this.

Swelling of the veins (phlebitis)

This might start during your infusion or afterwards. Symptoms include pain, tenderness, swelling, warm itchy skin, colour and texture changes where the chemotherapy is going in.

During the infusion if you have these symptoms tell your nurse straight away as the drug could be leaking into the tissue and causing damage to the tissue.

Diarrhoea

Contact your advice line if you have [diarrhoea](#). For example, in one day you have 2 or more loose bowel movements than usual. If you have a [stoma](#) , you might have more output than normal. Your doctor may give you anti diarrhoea medicine to take home with you after treatment.

Try to eat small meals and snacks regularly. It's best to try to have a healthy balanced diet if you can. You don't necessarily need to stop eating foods that contain fibre. But if your diet is normally very high in fibre, it might help to cut back on high fibre foods such as beans, nuts, seeds, dried fruit, bran and raw vegetables.

Drink plenty to try and replace the fluid lost. Aim for 8 to 10 glasses per day.

Occasional side effects

These side effects happen in between 1 and 10 out of every 100 people (between 1 and 10%). You might have one or more of them. They include:

- heart problems such as change in heart rhythm, heart rate and heart failure
- chills
- reddening of the skin where the drip or injection goes in
- inflammation and bleeding of the lining of the food pipe (oesophagus), stomach, intestines and bowels
- not enough fluid in the body (dehydration)

Rare side effects

These side effects happen in fewer than 1 in 100 people (fewer than 1%). You might have one or more of them. They include:

- an increased risk of developing another cancer. Talk to your doctor if you are concerned about this.
- an allergic reaction that can cause a rash, shortness of breath, redness or swelling of the face and dizziness. Some allergic reactions can be life threatening, alert your nurse or doctor if notice any of these symptoms.
- blood clots that are life threatening. Signs are pain, swelling and redness where the clot is. Feeling breathless can be a sign of a blood clot on the lung. Contact your advice line or doctor straight away if you have any of these symptoms.
- tingling or nerve damage on both sides of the body (polyneuropathy)
- loss of hearing (deafness)
- nerve pain (neuralgia)

Other side effects

There isn't enough information to work out how often these side effects might happen. You might have one or more of them. They include:

- headaches
- inflammation and sensitivity of the skin where you have had radiotherapy
- skin sensitivity to sunlight. Don't use sunbeds or sit in the sun. Cover up or use sunscreen if you go out in the sun. Remember to put sun cream on your head or wear a hat if you have lost hair there.
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lung changes that can cause a cough or shortness of breath

Coping with side effects

We have more information about side effects and tips on how to cope with them.

[Read more about how to cope with side effects](#)

What else do you need to know?

Other medicines, foods and drink

Cancer drugs can interact with medicines, herbal products, and some food and drinks. We are unable to list all the possible interactions that may happen. An example is grapefruit or grapefruit juice which can increase the side effects of certain drugs.

Tell your healthcare team about any medicines you are taking. This includes vitamins, herbal supplements and over the counter remedies. Also let them know about any other medical conditions or allergies you may have.

Pregnancy and contraception

This treatment might harm a baby developing in the womb. It is important not to become pregnant or father a child while you're having treatment and for 12 months afterwards. Talk to your doctor or nurse about effective contraception before starting treatment.

Loss of fertility

You may not be able to become pregnant or father a child after treatment with these drugs. Talk to your doctor before starting treatment if you think you may want to have a baby in the future.

Men might be able to store sperm before starting treatment. And women might be able to store eggs or ovarian tissue. But these services are not available in every hospital, so you would need to ask your doctor about this.

Breastfeeding

Don't breastfeed during this treatment. This is because the drugs may come through in your breast milk.

Treatment for other conditions

If you are having tests or treatment for anything else, always mention your cancer treatment. For example, if you are visiting your dentist.

Immunisations

Don't have immunisations with live vaccines while you're having treatment and for up to 12 months afterwards. The length of time depends on the treatment you are having. Ask your doctor or pharmacist how long you should avoid live vaccinations.

In the UK, live vaccines include rubella, mumps, measles, BCG, yellow fever and one of the shingles vaccines called Zostavax.

You can have:

- other vaccines, but they might not give you as much protection as usual
- the flu vaccine (as an injection)
- the coronavirus (COVID-19) vaccine - talk to your doctor or pharmacist about the best time to have it in relation to your cancer treatment

Members of your household who are aged 5 years or over are also able to have the COVID-19 vaccine. This is to help lower your risk of getting COVID-19 while having cancer treatment and until your [immune system](#) recovers from treatment.

Find out more about the COVID-19 vaccine and cancer

Contact with others who have had immunisations - You can be in contact with other people who have had live vaccines as injections. Avoid close contact with people who have recently had live vaccines taken by mouth (oral vaccines) such as the oral typhoid vaccine. Sometimes people who have had the live shingles vaccine can get a shingles type rash. If this happens they should keep the area covered.

If your immune system is severely weakened, you should avoid contact with children who have had the flu vaccine as a nasal spray as this is a live vaccine. This is for 2 weeks following their vaccination.

Babies have the live rotavirus vaccine. The virus is in the baby's poo for about 2 weeks and could make you ill if your immunity is low. Get someone else to change their nappies during this time if you can. If this isn't possible, wash your hands well after changing their nappy.

More information about this treatment

For further information about this treatment and possible side effects go to the electronic Medicines Compendium (eMC) website. You can find the patient information leaflet on this website.

eMC website

You can report any side effect you have to the Medicines Health and Regulatory Authority (MHRA) as part of their Yellow Card Scheme.

Report a side effect to the MHRA

+ References

Electronic Medicines Compendium

Accessed August 2023



Immunisation against infectious disease: Chapter 6: General contraindications to vaccination

Public Health England

First published: March 2013 and regularly updated on the Gov.UK website

Systemic Anti-Cancer Therapy (SACT)

Accessed August 2023

Related links

Breast cancer

Find out about breast cancer, including symptoms, diagnosis, treatment, survival, and how to cope with the effects on your life and relationships.

Chemotherapy

Chemotherapy is a standard treatment for some types of cancer. It uses anti cancer drugs to destroy cancer cells.

Coping with cancer

Coping with cancer can be difficult. There is help and support available. Find out about the emotional, physical and practical effects of cancer and how to manage them.



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