

EC-T CHEMOTHERAPY

The background is a solid pink color. Overlaid on this are two large, overlapping, organic shapes. The larger shape on the left is a vibrant orange, and the smaller shape on the right is a bright yellow. The shapes overlap in the center, creating a darker pink area where they meet.

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ABOUT THIS BOOKLET

This booklet explains what the chemotherapy combination EC-T is, how and when it may be given, and the side effects it can cause. You may like to read it alongside our **Chemotherapy for breast cancer** booklet.

WHAT IS EC-T CHEMOTHERAPY?

EC-T is a combination of three chemotherapy drugs.

It takes its name from the initials of the three drugs:

- E – epirubicin
- C – cyclophosphamide
- T – docetaxel (Taxotere) or paclitaxel (Taxol), which belong to a group of drugs called taxanes

Chemotherapy is a treatment that uses anti-cancer drugs to destroy cancer cells.

HOW DOES EC-T WORK?

EC-T works by stopping the cancer cells from dividing and multiplying, which blocks the growth of the cancer.

Normal cells in the body divide and grow all the time in an ordered and controlled way. Cancer cells divide and grow in a disordered and uncontrolled way.

Different chemotherapy drugs work in different ways and interfere with cancer cells at different times in their growth. This is why a combination of drugs is often used.

Chemotherapy also affects healthy cells throughout the body and because of this can cause a number of side effects.

WHO MIGHT BE OFFERED EC-T?

Primary breast cancer

EC-T chemotherapy can be used to treat primary breast cancer. This is breast cancer that has not spread beyond the breast or lymph nodes (glands) under the arm.

Chemotherapy is given to reduce the risk of breast cancer returning or spreading.

EC-T chemotherapy may be given before surgery, known as neo-adjuvant treatment (sometimes called primary chemotherapy). Or it may be given after surgery, known as adjuvant treatment.

If breast cancer has come back

EC-T chemotherapy may be given to people whose breast cancer has:

- Come back in the chest/breast area or in the skin near the original site or scar (local recurrence)
- Spread to the tissues and lymph nodes around the chest, neck and under the breastbone (locally advanced breast cancer)

BEFORE YOU START EC-T

Before starting your treatment a member of the treatment team will discuss how and when you'll have chemotherapy and how side effects can be managed.

You will have blood tests and your height and weight will be measured.

You may also have tests to check your heart function, such as:

- An ECG (electrocardiogram), a simple test that checks your heart rhythm
- An echocardiogram (an ultrasound scan of the heart)
- A MUGA scan (an injection and heart scan)

You'll be given contact numbers so you know who to phone if you have any questions or concerns.

HOW IS EC-T GIVEN?

EC-T is given into a vein (intravenously). This will usually be as a drip, also called an infusion, into your hand or arm.

Other intravenous methods may be used depending on how easy it is for the chemotherapy team to find suitable veins, and your preferences.

For more information about the different ways chemotherapy can be given, see our **Chemotherapy for breast cancer** booklet.

How long does treatment take?

It normally takes:

- About an hour for the EC drugs to be given
- One to three hours to have the T part of the treatment

However, you are likely to be at the hospital for longer than this.

Having EC-T

EC-T chemotherapy is given in two parts.

1. EC (epirubicin and cyclophosphamide)

You will usually start by having the EC.

This is given every two or three weeks.

If you have EC every two weeks, you'll be given injections to boost your immune system and protect against infection.

You'll have three or four sessions (cycles) of EC.

2. T (docetaxel or paclitaxel)

After you have finished all the EC sessions, you will then have docetaxel or paclitaxel.

Docetaxel is usually given every three weeks. Again, you'll have either three or four sessions (cycles).

Paclitaxel can be given once every two weeks, over two to three hours (known as accelerated or dose dense). Or it may be given weekly in lower doses over one hour.

Why is there a break between each treatment?

The break between each treatment gives your body time to recover from any short-term side effects. The exact timing of your treatments may vary depending on whether the number of blood cells has returned to within a normal range (see page 7).

Reducing the risk of an allergic reaction

Some people have an allergic reaction to some chemotherapy drugs.

Before each treatment of docetaxel or paclitaxel, you will be given drugs called steroids to reduce the risk of an allergic reaction. These are usually given as tablets to take for three days, starting the day before each cycle.

Take these as directed by your treatment team and don't stop taking them without talking to the team first.

If you have an allergic reaction to EC-T, it will probably happen within the first few minutes of your treatment and is most likely the first or second time you have the drug.

Reactions can vary from mild to severe, but severe reactions are uncommon.

You'll be monitored closely during your treatment so that any reaction can be dealt with immediately.

Let your chemotherapy nurse know if you start to feel unwell during the treatment.

Symptoms of an allergic reaction include flushing, skin rash, itching, back pain, shortness of breath, faintness, fever or chills.

If you have a severe reaction, treatment will be stopped straight away. Your treatment team will decide when it's safe to continue your treatment.

SIDE EFFECTS OF EC-T

Like any treatment, EC-T can cause side effects. Everyone reacts differently to drugs and some people have more side effects than others. These can usually be controlled and those described here will not affect everyone.

Before starting chemotherapy you should be given a 24-hour contact number or told who to contact if you feel unwell at any time during your treatment, including at night or at the weekends.

If you're worried about any side effects, regardless of whether they are listed here, talk to your chemotherapy nurse or treatment team.

For more information about the side effects of chemotherapy, see our **Chemotherapy for breast cancer** booklet.

Common side effects

Effects on the blood

EC-T chemotherapy can temporarily affect the number of blood cells in the body.

Blood cells (white blood cells, red blood cells and platelets) are released by the bone marrow (the spongy material found in the hollow part of bones) to replace those which are naturally used up in the body. Chemotherapy reduces the ability of the bone marrow to make these cells.

You will have regular blood tests throughout your treatment to check your blood count.

If the number of blood cells is too low:

- You may be given injections to improve this
- Your next course of treatment may be delayed
- The dose of the chemotherapy may be reduced

Risk of infection

When the white blood cells fall below a certain level, it's known as neutropenia.

Not having enough white blood cells can increase the risk of getting an infection.

Your resistance to infection is usually at its lowest point around 7–14 days after the chemotherapy has been given, if you're having treatment every two to three weeks.

The number of white blood cells usually returns to normal before your next course of chemotherapy is due.

Your treatment team may give you guidelines to follow for reporting signs of an infection, but generally you should contact your hospital immediately if you experience any of the following:

- **A high temperature (over 37.5°C) or low temperature (under 36°C), or whatever your chemotherapy team has advised**
- **Suddenly feeling unwell, even with a normal temperature**
- **Symptoms of an infection, for example a sore throat, a cough, a need to pass urine frequently or feeling cold or shivery**

Before starting chemotherapy your treatment team should give you a 24-hour contact number or tell you how to get emergency care. You may need antibiotics.

Sometimes your doctor may recommend injections of drugs called growth factors. This helps the body produce more white blood cells to reduce your risk of infection.

Anaemia

Having too few red blood cells is called anaemia. If you feel particularly tired, breathless or dizzy, let your treatment team know.

Bruising and bleeding

EC-T can reduce the number of platelets, which help the blood to clot. You may bruise more easily, have nosebleeds or your gums may bleed when you brush your teeth. Tell your treatment team if you have any of these symptoms.

Nausea and vomiting

You may feel sick (nausea) or be sick (vomit), but this can usually be controlled.

You'll be given anti-sickness medication, by mouth or into a vein, before each cycle of chemotherapy is given, as well as some anti-sickness drugs to take home. Take these as prescribed by your treatment team.

If nausea or sickness are still affecting you, tell someone in your treatment team as they may be able to change your anti-sickness drugs.

Diarrhoea or constipation

You may have diarrhoea or constipation. Your chemotherapy team can prescribe medicine to help control it and can give you information about diet.

Contact your chemotherapy team if:

- You have four or more episodes of diarrhoea within 24 hours
- You have constipation for more than 48 hours

Hair loss or thinning

Most people having EC-T will lose all their hair, including eyebrows, eyelashes and body hair.

You may begin to lose your hair about two weeks after the first treatment, but it can happen earlier. Although hair loss is usually gradual, for some people it's much quicker, possibly happening over a couple of days.

Cooling the scalp can sometimes help minimise hair loss. This involves wearing a 'cold cap' before, during and for one to two hours after your treatment with chemotherapy drugs. How well the cold cap works depends on the drugs and doses used, but it doesn't work for everyone. You can discuss scalp cooling with your chemotherapy nurse before starting treatment.

Hair loss should be temporary and in most cases your hair will begin to grow back a few weeks after your treatment has ended.

There's some evidence that docetaxel treatment may result in prolonged or permanent hair loss.

For more information about hair loss, see our **Breast cancer and hair loss** booklet.

Fatigue (extreme tiredness)

Fatigue is extreme tiredness and exhaustion that doesn't go away with rest or sleep. It can affect you physically and emotionally. It's a very common side effect of EC-T and may last for weeks or months after your treatment has finished. Occasionally fatigue is a long-term effect.

Fatigue can also be caused by conditions such as anaemia (low number of red blood cells). It's important to let your team know if you're affected by fatigue to rule out other conditions.

Fatigue affects people in different ways and there are a number of ways of coping with and managing it – your treatment team may be able to help you with this. You can find lots more information on our website or by calling our Helpline on 0808 800 6000. Macmillan Cancer Support produces a booklet called Coping with fatigue.

Numbness and tingling in hands and feet

Some people having paclitaxel or docetaxel experience numbness or tingling in their hands and feet. This is due to the effect of docetaxel or paclitaxel on the nerves and is called peripheral neuropathy.

For some people the symptoms are mild and go away soon after treatment stops. However, for most people the symptoms gradually improve over the weeks and months after treatment has finished.

Some symptoms may not disappear completely and, occasionally, the symptoms can get worse after stopping the treatment.

If you have numbness or tingling mention this to your treatment team so that the symptoms can be monitored. For more information about peripheral neuropathy see our **Chemotherapy for breast cancer** booklet.

Pain in the injection site

Tell the nurse giving the chemotherapy immediately if you have pain, stinging or a burning sensation around the cannula (small plastic tube) while the drug is being given.

If epirubicin leaks out of the vein it's being given in (called extravasation), it can damage the surrounding tissue.

After treatment, you may have pain where the needle was inserted, or along the vein. After a few weeks you may notice tenderness, darkening and hardening around where the needle was inserted. This should fade over time.

Change in the colour of urine

You may notice your urine is red or pink when you go to the toilet. This is because epirubicin is red and it's being passed through your kidneys and bladder. This can last for one to two days after treatment.

Bladder irritation

Chemotherapy drugs and cyclophosphamide in particular can irritate the lining of the bladder.

It's important to drink plenty of fluids around the time you have your treatment and to empty your bladder regularly and as soon as you feel the need to.

Tell your treatment team if you notice any irritation, or a burning or stinging sensation when passing urine.

Sore mouth and dental problems

Looking after your mouth, including your teeth and gums, is very important during treatment.

You'll be given mouthwash to try to reduce soreness and stop mouth ulcers developing.

It's advisable to see your dentist for a dental check-up before chemotherapy begins and to avoid dental treatment during chemotherapy if possible. If you do need to have dental treatment during chemotherapy, talk with your treatment team about the best time to have this.

Taste changes

While you're having EC-T your taste may change. Some food may taste different, for example more salty, bitter or metallic. You may no longer enjoy some foods you used to enjoy.

Your taste should return to normal once your treatment has finished, although for some people taste changes can last after treatment.

See our booklet **Diet and breast cancer** for more information on dealing with changes to your taste and appetite during treatment.

Loss of appetite

You may lose your appetite while having EC-T. Talk to your specialist or breast care nurse about this. They will give you advice and information to help deal with loss of appetite and may refer you to a dietitian if needed.

Effects on your concentration

Some people find treatment affects their ability to concentrate and makes them more forgetful. This is sometimes referred to as 'chemo brain' or 'chemo fog', but your treatment team may call it cognitive impairment. It usually improves over time after treatment has finished.

We have more information about this on our website **breastcancer.org**

Menopausal symptoms

Some women have menopausal symptoms. This is because EC-T chemotherapy affects the ovaries, which produce oestrogen.

If you have not yet reached the menopause, your periods may stop or become irregular during chemotherapy. Whether your periods return will depend on the type of drugs used, the dose given and your age.

Other common menopausal symptoms can include:

- Hot flushes
- Night sweats
- Mood changes
- Joint aches and pains
- Vaginal dryness
- Reduced sex drive

You can talk to your breast care nurse or treatment team about ways of coping with any of these symptoms.

For information on how to cope with these side effects, see our **Menopausal symptoms and breast cancer** booklet.

Effects on fertility

EC-T chemotherapy causes changes in the ovaries, which can affect your ability to become pregnant. The likelihood of you becoming infertile also depends on whether you have had chemotherapy in the past and your age.

Many women stop having periods (amenorrhoea) during chemotherapy, but this may be temporary.

Women aged around 40 and above are less likely to have their periods return after completing chemotherapy than women under this age.

In men, EC-T chemotherapy can affect sperm production which can lead to temporary or permanent infertility.

If you're concerned about your fertility, talk to your treatment team before you begin your treatment. Your treatment team should offer you a referral to a fertility specialist to discuss the possibility of preserving your fertility.

For more information, see our **Fertility, pregnancy and breast cancer treatment** booklet.

Painful muscles and joints

Your muscles or joints may ache or become painful two to three days after you have your treatment, particularly when having docetaxel or paclitaxel.

This usually wears off after a few days. However, it can be very painful and you may need to take mild pain relief such as paracetamol or anti-inflammatory drugs such as ibuprofen. It's a good idea to have some of these available before starting your treatment just in case you need them.

Fluid retention and weight gain

You may develop a build-up of fluid in the body (oedema), particularly when having docetaxel or paclitaxel. This can take a few weeks to get better. It may cause swollen ankles and legs and shortness of breath.

You'll be given steroid drugs to prevent an allergic reaction to docetaxel, which will also help reduce the chance of fluid building up.

You may put on weight, but will usually lose it again once the treatment has finished. However, this can vary from person to person and may take up to several months. Physical activity and eating a healthy diet may help with this.

Less common side effects

Heart changes

Epirubicin can affect the heart and blood pressure. This is usually temporary but for a small number of people it may be permanent.

You may have tests to check how well your heart is working before, during and after your treatment.

Heart problems as a result of epirubicin are not common. However, because of the potential risk, before you start chemotherapy treatment your specialist may arrange a heart (cardiac) function test. This could be an electrocardiogram (ECG), which takes an electrical recording of your heart, or an echocardiogram (echo) to make sure your heart is working normally.

You may also be offered a multiple-gated acquisition (MUGA) scan to check how well the heart is pumping. You will also be carefully monitored during your treatment.

If you have pain or tightness in your chest, feel breathless or notice changes to your heartbeat at any time during or after treatment, tell a doctor straight away. These symptoms can be caused by other conditions but it's important to get them checked by a doctor.

Sore eyes and runny nose

EC-T can cause a runny nose. It can also cause soreness and a gritty feeling in your eyes, or your eyes may water. Eye drops may be prescribed to relieve the soreness.

Headaches

EC-T can cause headaches. These are usually mild and can be relieved with simple pain relief such as paracetamol.

If your headache is severe, speak to a member of your treatment team.

Skin changes

EC-T can make your skin dry, more sensitive or prone to reactions.

If you develop a rash tell your treatment team as soon as possible.

Your skin may be more sensitive to the sun, so use a high factor sun cream.

Hand-foot syndrome (Palmar-plantar syndrome)

You may develop soreness or redness on the palms of your hands and soles of your feet. This is called Palmar-Plantar or hand-foot syndrome. Your doctor may prescribe creams to try to help with this.

Nail changes

Chemotherapy may cause changes to the appearance of your nails. This can be a change in the nail colour or texture, such as ridges forming. Nails can become more brittle and cracked.

Occasionally the nail may lift off the nail bed and fall off.

As you're more at risk of infection while having chemotherapy, it's important to report any signs of infection such as redness, heat, swelling or pain in or under your fingernails and toenails.

Rare side effects

Breathlessness or a dry cough

Docetaxel and paclitaxel can affect the lungs, which can cause breathlessness or a dry cough. Let your treatment team know if you have either of these symptoms.

Liver or kidney changes

EC-T can cause changes to the way the kidneys or liver work. Changes are usually minimal and go back to normal when treatment is finished. You'll have regular blood tests to monitor your liver and kidneys throughout your chemotherapy.

Another cancer in the future

There's a small risk of developing a rare type of blood cancer in the future. However, the risk is very low.

BLOOD CLOTS

People with breast cancer have a higher risk of blood clots. Their risk is higher because of the cancer itself and some treatments for breast cancer. If the cancer has spread to other parts of the body (secondary breast cancer), this also increases the risk.

Having EC-T chemotherapy increases the risk of blood clots such as a deep vein thrombosis (DVT).

People with a DVT are at risk of developing a pulmonary embolism. This is when part of the blood clot breaks away and travels to the lung.

Blood clots can be life-threatening but are treatable so it's important to report symptoms as soon as possible.

If you experience any of the following symptoms contact your treatment team or go to your local A&E department straight away:

- Pain, redness/discolouration, heat and swelling of the arm or leg
- Swelling, redness or tenderness where a central line is inserted to give chemotherapy, for example in the arm, chest area or up into the neck
- New or increased shortness of breath
- Pain or tightness in the chest
- Unexplained cough or coughing up blood

SEX, CONTRACEPTION AND PREGNANCY

You're advised not to become pregnant while having treatment because EC-T can harm a developing baby.

EC-T can be safely given to pregnant women with breast cancer if necessary, after the first 12 weeks of pregnancy.

If you haven't been through the menopause, talk to your team about the most suitable method of contraception for you. It's still possible to become pregnant even if your periods become irregular or stop.

You can still have sex during treatment. It's thought that chemotherapy drugs can't pass into vaginal fluids or semen, but this can't be completely ruled out as chemotherapy drugs can pass into the blood and some other body fluids. Most hospital specialists will advise using barrier methods of contraception, such as condoms, for a few days after chemotherapy is given.

Chemotherapy will almost certainly affect how you feel about sex and intimacy. You may not feel like being intimate when you're dealing with treatment, or you may find intimacy helps you feel more normal. Everyone's reaction will be different. There's more information about how breast cancer and treatment can affect intimacy on our website.

TRAVEL AND VACCINATIONS

If you're planning a holiday or need to travel overseas, check with your treatment team first.

You shouldn't have any live vaccines while you're having chemotherapy. Live vaccines include mumps, measles, rubella (German measles), polio, BCG (tuberculosis), shingles and yellow fever.

Live vaccines contain a small amount of live virus or bacteria. If you have a weakened immune system, which you may do during chemotherapy, they could be harmful.

It's safe to have these vaccinations six months after your treatment finishes.

Talk to your GP or treatment team before having any vaccinations.

If someone you live with needs to have a live vaccine speak to your treatment team or GP. They can advise what precautions you may need to take depending on the vaccination.

Coronavirus (Covid-19) vaccination

People having chemotherapy are advised to speak to their treatment team about the best time to have a Covid-19 vaccine.

Flu vaccination

Anyone at risk of a weakened immune system, and therefore more prone to infection, should have the flu vaccine. This includes people due to have or already having chemotherapy. The flu vaccine is not a live vaccine so doesn't contain any active viruses. Talk to your chemotherapy team or breast care nurse about the best time to have your flu jab.

ABOUT THIS BOOKLET

EC-T chemotherapy was written by Breast Cancer Now's clinical specialists, and reviewed by healthcare professionals and people affected by breast cancer.



For a full list of the sources we used to research it:
Email health-info@breastcancer.org



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At Breast Cancer Now we're powered by our life-changing care. Our breast care nurses, expertly trained staff and volunteers, and award-winning information make sure anyone diagnosed with breast cancer can get the support they need to help them to live well with the physical and emotional impact of the disease.

We're here for anyone affected by breast cancer. And we always will be.

For breast cancer care, support and information, call us free on **0808 800 6000** or visit **breastcancernow.org**

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