



understanding chemotherapy

From the JASCAP booklet series

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**** JASCAP has factsheets on each of the above drugs and procedures.**

General information on chemotherapy

Chemotherapy is a treatment used for some types of cancer. This booklet gives information about chemotherapy. We hope that it answers some of the questions you may have about the treatment and helps you to cope with any side effects it may cause. Where cancer is mentioned, this refers to cancer, leukaemia and lymphoma.

Sometimes chemotherapy is used to treat non-cancerous conditions but often the doses are lower and the side effects may be reduced. This booklet does not cover the use of chemotherapy for conditions other than cancer.

The booklet is divided into sections about how the treatment works, how it is given and how to deal with some of the more common side effects. You are likely to have questions and concerns about your own treatment that this information does not cover, as there are over 200 different types of cancer and over 50 chemotherapy drugs, which can be given in various ways. It is best to discuss the details of your own treatment with your doctor, who will be familiar with your particular situation and type of cancer.

If you think that this information has helped you, you can show it to any of your family and friends who may find it useful. They too may want to be informed so they can help you cope with any problems you may have.

What chemotherapy is

Chemotherapy is the use of anti-cancer (**cytotoxic**) drugs to destroy cancer cells (including leukaemia and lymphoma).

There are over 50 different chemotherapy drugs. Some are given on their own but often several drugs are given together. This is known as combination chemotherapy.

The type of chemotherapy treatment you are given depends on many things, but particularly:

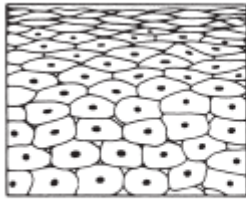
- the type of cancer you have
- where the cancer started in your body
- what the cancer cells look like under the microscope
- whether the cancer has spread to other parts of your body.

Chemotherapy may be used alone to treat some types of cancer. It may also be used with other types of treatment such as surgery, radiotherapy, hormonal therapy, biological therapies, or a combination of these.

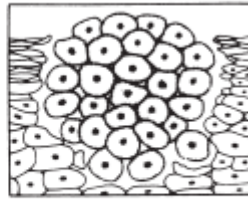
What is cancer?

The organs and tissues of the body are made up of tiny building blocks called cells. Cancer is a disease of these cells.

Cells in different parts of the body may look and work differently but most reproduce themselves in the same way. Cells are constantly becoming old and dying, and new cells are produced to replace them. Normally, cells divide in an orderly and controlled manner. If for some reason the process gets out of control, the cells carry on dividing, developing into a lump which is called a **tumour**.



Normal cells



Cells forming a tumour

Tumours can be either **benign** or **malignant**. Cancer is the name given to a malignant tumour. Doctors can tell if a tumour is benign or malignant by examining a small sample of cells under a microscope. This is called a **biopsy**.

In a benign tumour the cells do not spread to other parts of the body and so are not cancerous. However, if they continue to grow at the original site, they may cause a problem by pressing on the surrounding organs.

A malignant tumour consists of cancer cells that have the ability to spread beyond the original area. If the tumour is left untreated, it may spread into and destroy surrounding tissue. Sometimes cells break away from the original (primary) cancer. They may spread to other organs in the body through the bloodstream or lymphatic system.

The lymphatic system is part of the immune system - the body's natural defence against infection and disease. It is a complex system made up of organs, such as bone marrow, the thymus, the spleen, and lymph nodes. The lymph nodes (or glands) throughout the body are connected by a network of tiny lymphatic ducts.

When the cancer cells reach a new area they may go on dividing and form a new tumour. This is known as a **secondary cancer** or **metastasis**.

It is important to realise that cancer is not a single disease with a single type of treatment. There are more than 200 different kinds of cancer, each with its own name and treatment.

Types of cancer

Carcinomas

The majority of cancers, about 85% (85 in a 100), are carcinomas. They start in the epithelium, which is the covering (or lining) of organs and of the body (the skin). The common forms of breast, lung, prostate and bowel cancer are all carcinomas.

Carcinomas are named after the type of epithelial cell that they started in and the part of the body that is affected. There are four different types of epithelial cells:

squamous cells - that line different parts of the body, such as the mouth, gullet (oesophagus), and the airways

adeno cells - form the lining of all the glands in the body and can be found in organs such as the stomach, ovaries, kidneys and prostate

transitional cells - are only found in the lining of the bladder and parts of the urinary system

basal cells - that are found in one of the layers of the skin.

A cancer that starts in squamous cells is called a squamous cell carcinoma. A cancer that starts in glandular cells is called an adenocarcinoma. Cancers that start in transitional cells are transitional cell carcinomas, and those that start in basal cells are basal cell carcinomas.

Leukaemias and lymphomas

These occur in the tissues where white blood cells (which fight infection in the body) are formed, i.e. the bone marrow and lymphatic system. Leukaemia and lymphoma are quite rare and make up about 6.5% (6.5 in 100) of all cancers.

Sarcomas

Sarcomas are very rare. They are a group of cancers that form in the connective or supportive tissues of the body such as muscle, bone and fatty tissue. They account for less than 1% (1 in 100) of cancers.

Sarcomas are split into two main types:

- bone sarcomas - that are found in the bones
- soft tissue sarcomas - that develop in the other supportive tissues of the body.

Others forms of cancer

Brain tumours and other very rare forms of cancer make up the remainder of cancers.

How chemotherapy drugs work

Chemotherapy drugs can stop cancer cells dividing and reproducing themselves. As the drugs are carried in the blood, they can reach cancer cells anywhere in the body. They are also taken up by some healthy cells. Healthy cells can repair the damage caused by chemotherapy, but cancer cells cannot and so they eventually die.

Different chemotherapy drugs damage cancer cells in different ways. If a combination of drugs is used, each drug is chosen because of its different effects.

Unfortunately, as the chemotherapy drugs can also affect some of the healthy cells in your body, they can cause unpleasant side effects. However, damage to the healthy cells is usually temporary and most side effects will disappear once the treatment is over.

Healthy cells in certain parts of the body are especially sensitive to chemotherapy drugs; these parts of the body include:

- the bone marrow (which makes blood cells)
- the hair follicles
- the lining of the mouth
- the digestive system.

Chemotherapy is usually given as a series of sessions of treatment. Each session is followed by a rest period. The session of chemotherapy and the rest period is known as a **cycle** of treatment. A series of cycles makes up a **course** of treatment.

Each session of chemotherapy destroys more of the cancer cells, and the rest period allows the normal cells and tissues to recover.

Why chemotherapy is given

With some types of cancer, chemotherapy is likely to destroy all the cancer cells and **cure the disease**.

Chemotherapy may also be given after surgery or radiotherapy to **destroy any cancer cells that remain**.

Chemotherapy may be given to **shrink a cancer** before another treatment such as surgery.

It can also be given to shrink and control a cancer to help **reduce symptoms and prolong life**. This is known as **palliative chemotherapy**.

When chemotherapy is used

Before an operation

Chemotherapy can be used before an operation (this is known as **neo-adjuvant or primary chemotherapy**) to shrink a cancer that is too large – or too attached to surrounding healthy tissue – to be removed easily during an operation. This can make removing the cancer easier during a later operation.

After an operation

Chemotherapy can be given after an operation (this is known as **adjuvant chemotherapy**) when all the visible cancer has been removed but there is a risk that some cancer cells, which are too small to be seen, may have been left behind. The aim is to destroy these cancer cells.

Chemotherapy may also be given if a cancer cannot be completely removed during an operation. In this situation chemotherapy may not be able to cure the cancer but may shrink it and so reduce symptoms.

During radiotherapy

Sometimes chemotherapy is given at the same time as radiotherapy. This is known as **chemoradiotherapy** or **chemo-radiation**.

In advanced cancer

Where cancer has spread into surrounding tissue or other parts of the body (advanced cancer), chemotherapy can sometimes be given with the aim of getting rid of all the cancer and curing it. More commonly however, chemotherapy is given to people in this situation to shrink and control the cancer, to try to extend life and control any symptoms that may occur.

High-dose chemotherapy with bone marrow transplant or stem cell support

For some types of cancer, high-dose chemotherapy is given. This is usually done after initial chemotherapy has got rid of the cancer cells but there is a high risk of the cancer coming back. High doses of chemotherapy would normally destroy the bone marrow – which makes the blood cells – so the bone marrow has to be replaced after the chemotherapy has been given. This is done using stem cells which have been collected from the bone marrow or blood. The stem cells are collected before the high-dose treatment, either from the patient, or from someone else (a donor) whose cells are a good match. They settle in the bone marrow and develop into the different blood cells. This type of treatment is only used in a few types of cancer.

Our booklet on stem cell and bone marrow transplants discusses this treatment in detail.

Giving chemotherapy

How chemotherapy drugs are given
 Intravenous chemotherapy
 Oral chemotherapy
 Intramuscular injection
 Subcutaneous injection
 Intrathecal chemotherapy
 Intracavity chemotherapy
 Chemotherapy creams

How chemotherapy drugs are given

Chemotherapy may be given in different ways, depending on the type of cancer you have and the chemotherapy drugs used.

Most often chemotherapy is given by injection into a vein (intravenously). This is known as **intravenous chemotherapy**.

Some drugs are given as tablets or capsules (**oral chemotherapy**).

Some are injected into a muscle (**intramuscular injection**).

Others may be injected just under the skin (**subcutaneous injection**).

Drugs given in the above ways are absorbed into the blood and carried around the body so they can reach all the cancer cells.

For some types of cancer, chemotherapy may be injected into the fluid around the spine. This is known as **intrathecal chemotherapy**.

Sometimes the chemotherapy may be injected into particular body cavities such as the pelvic cavity or bladder: this is known as **intracavity chemotherapy**.

Drugs given in this way tend to stay in the area in which they are given and do not affect cells in other parts of the body.

Chemotherapy creams may be used for some cancers of the skin: they only affect the cells in the area of skin to which the cream is applied.

Sometimes, two or more types of chemotherapy may be used together; for example, intravenous and oral chemotherapy.

Intravenous chemotherapy

There are four ways of giving chemotherapy drugs directly into the vein. These are through a:

Cannula – a small tube inserted into a vein in your arm or the back of your hand.

Central line – a thin, flexible tube inserted through the skin of the chest into a vein near the heart.

PICC line (a **peripherally inserted central catheter**) – a thin flexible tube passed into a vein in the bend or upper part of the arm and threaded through until the end of the tube lies in a vein near the heart.

Implantable port (also called a portacath) – a thin, soft plastic tube that is put into a vein. It has an opening (port) just under the skin on your chest or arm.

Cannula

The nurse or doctor will put a short, thin tube (cannula) into a vein in the back of your hand or your forearm. You may find this a bit uncomfortable or painful, but it should not take long and the pain soon wears off. If you find it painful to have the cannula put in, an anaesthetic cream can be used on the skin to numb the area beforehand. The cream takes 10–20 minutes to work.

Once the cannula has been put in, it will be taped securely to keep it in place. A clear bag of fluid (a drip) is then attached to the cannula by a tube. Some chemotherapy drugs are given by injection into a rubber bung in the tubing of the drip. This can take from a few minutes to about 20 minutes.



Chemotherapy being given through a cannula

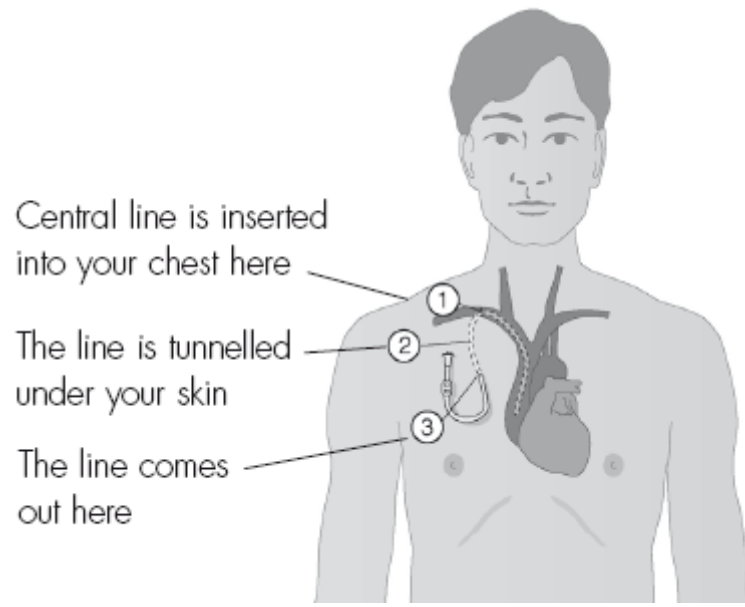
Some drugs will be given directly in the drip bag (by infusion). This can take from 20 minutes to several hours, or sometimes days. If you feel any discomfort or notice a change in sensation, redness or swelling around the area of the cannula (or along your arm) while the drug is being given, let your nurse or doctor know immediately.

Central lines (tunnelled central venous catheters)

A central line is a long, thin plastic tube put into a vein in your chest. Hickman®* or Groshong®* lines are common types. The doctor or chemotherapy nurse will explain the procedure to you. You will be given a general or local anaesthetic before the central line is put in.

Once it is in place, the central line is either stitched or taped firmly to your chest to prevent it being pulled out of the vein.

There is a small 'cuff' around the line which can be felt just under the skin. The cuff holds the line safely in place. A central line can stay in the vein for many months and means that you do not have to have cannulas put in when you have your intravenous chemotherapy. Blood can also be taken from it for testing. You will be able to bathe or shower; although you should prevent water from getting to the area where the tube enters the skin – a plastic dressing can be used for this. Before you go home, make sure you are confident about looking after your central line. If you have any problems, contact the staff in the chemotherapy clinic or on the ward for advice.



Central line is inserted into your chest here

The line is tunnelled under your skin

The line comes out here

A central line

Possible problems with central lines Two potential problems with central lines are blockage and infection. Once or twice a week the line has to be flushed with saline (salt water), or heparin – a drug which prevents clotting. The nurses on the ward can teach you how to do this, or can arrange for a district nurse to visit your home and do it for you. Your doctor may also prescribe a low dose of warfarin, a drug to help prevent blood clots forming and blocking your line.

If you notice any swelling in your arm or neck, contact the hospital staff as your line may be blocked. If you notice any reddening, darkening or soreness of the skin around the central line, or if you have a high temperature, let your doctor know, as it could be a sign that you have an infection in the line. If this happens you will need to have antibiotics through the line to clear the infection.

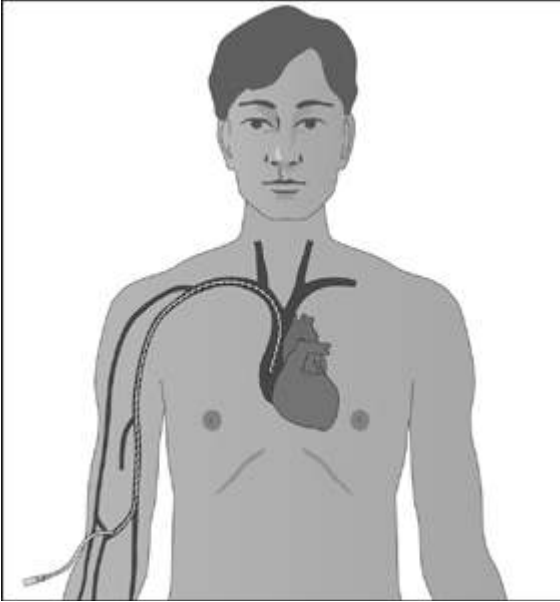
Most hospitals consider a temperature above 38°C (100.5°F) to be high, but some hospitals use a lower or higher temperature. The doctors and nurses at your hospital will tell you which temperature they use.

Removing your central line When you no longer need the central line, it will be taken out. A doctor or nurse will do this for you, usually in the outpatients department. Your chest will be cleaned with antiseptic, and the line will be gently but firmly pulled until it loosens and comes free. This does not usually take more than a few minutes, but can be uncomfortable. Sometimes a small cut in the skin is needed so that the cuff can be loosened. This is done under a local anaesthetic. A dressing will be put over the area where the line has been removed, and you will be asked to remain lying down until it is certain that there is no bleeding.

PICC lines

Your doctor may suggest that you have a long, thin tube put into a vein in the crook of your arm. This is called a **peripherally inserted central venous catheter (PICC)**. Your doctor or chemotherapy nurse will explain the procedure to you. You will be given a local anaesthetic before the line is put in.

Once it is in place, the PICC line is taped firmly to your arm to prevent it being pulled out of the vein. It can stay in the vein for many months. As with the central line, it means that you do not have to have cannulas put in when you have your intravenous chemotherapy. Blood can also be taken through the line for testing.



The tube is threaded through the vein until the end is near your heart



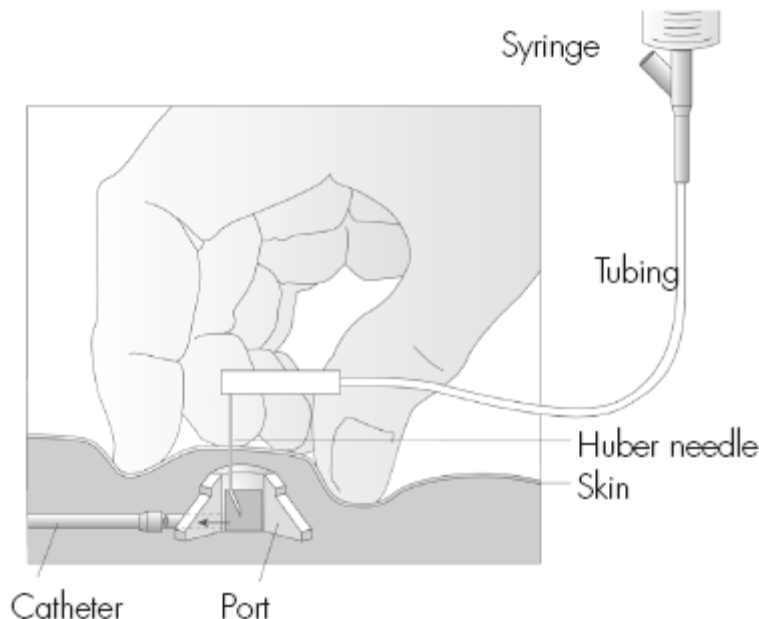
The end of the tube comes out just below the crook of your elbow

You will be able to bend your arm, bathe and shower, although you should avoid getting water on the area around the tube – a plastic dressing can be used for this. Before you go home, make sure that you are confident about looking after your line. A district nurse can flush your line and change the dressing, or a friend or relative can be taught to do this for you. If you have any problems, contact the staff in the chemotherapy clinic or on the ward for advice.

The possible problems are the same as for central lines: blockage and infection.

Implantable ports (portacaths)

An implantable port is a thin, soft plastic tube that is put into a vein and ends in an opening (port) just under the skin on your chest or arm. The port has a thin rubber disc through which special needles can be passed to give medicines into the vein or take blood.



The tube is a long, thin hollow tube known as a catheter and the port is a disc about 2.5 to 4 cm in diameter. The catheter is usually inserted (tunnelled) under the skin of your chest. The tip of the catheter lies in a large vein just above your heart and the other end connects with the port which sits under the skin on your upper chest. A small bump can be seen and felt underneath the skin, but nothing shows on the outside of your body.

The possible problems are the same as for central lines: blockage and infection.

Infusion pumps

Infusion pumps may be used to give some types of chemotherapy. There are various types of portable pump. These give a controlled amount of chemotherapy into the bloodstream over a period of time (from a few days to a few weeks). The pump is connected to a central line or a PICC line. This means that you can go home with the pump and so you need fewer visits to hospital. The pumps are small enough to fit into a pocket and can be carried in a bag or belt holster.

The chemotherapy drugs are prepared at the hospital. You, and perhaps a family member or friend, will be taught how to look after the pump. Some pumps are battery-operated and care has to be taken not to get them wet when you are washing. Your nurses or pharmacy staff will give you full instructions and should also tell you who to contact if you have any problems or questions. Some pumps are disposable and are operated by a balloon mechanism or spring control.

Extravasation

Drugs given intravenously can occasionally leak into the tissues. This is called extravasation. It usually happens when a cannula dislodges and so is not positioned in the vein correctly. It very rarely happens with a central line.

If you notice any swelling, pain, stinging or redness when you are having your chemotherapy treatment, or after you get home, it is important to contact the hospital straight away. Some chemotherapy drugs can damage the tissues, so the sooner any extravasation is dealt with, the better.

Oral chemotherapy

You may be given chemotherapy tablets or capsules to take at home as all or part of your treatment. You will be told when to take them and will be given other instructions such as whether or not to take them with food. If you cannot take your medicines for any reason you should contact your doctor immediately for advice.

The drugs that you have been given by the hospital make up a complete course of treatment, and it is important to take them exactly as they have been prescribed. Always read the labels on the boxes before you leave the hospital – if the instructions are unclear, ask your nurse, doctor or pharmacist.

If you need to have further supplies of the chemotherapy or other medicines, it is important to get these from your hospital specialist and not from your GP or local pharmacist.

Oral chemotherapy can cause side effects and it is important to be aware of these when taking your medicine.

Intramuscular injection

Some chemotherapy drugs are given by injection into a muscle. The doctor or nurse will explain the procedure to you. The drug is injected into the muscle of the leg or buttock. You may feel some pain or discomfort for a short time.

Subcutaneous injection

Some drugs can be given by injection just under the skin. A very fine needle is used and this may be uncomfortable for a short time.

Intrathecal chemotherapy

In some conditions such as leukaemia or lymphoma (cancer which starts in the lymph system) cancer cells can pass into the fluid which surrounds the brain and spinal cord. This fluid is called cerebrospinal fluid. To prevent this from happening, or to treat it if it occurs, chemotherapy may be given into the cerebrospinal fluid. For this treatment you will usually need to lie on your side with your legs drawn up. The doctor will then use local anaesthetic to numb an area of skin over your spine. A needle is inserted into the space between two of the spinal bones and into the cerebrospinal fluid and the chemotherapy is injected. This procedure is called a lumbar puncture.

It takes from 15 to 30 minutes and you may need to lie flat afterwards for a few hours. It is important to drink plenty of fluids to reduce the chance of getting a headache. If you get a headache, it may last for a few hours. Painkillers can be given to help. Chemotherapy given in this way does not usually cause any other side effects.

Intracavity chemotherapy

To give chemotherapy drugs in this way, a tube is inserted into the affected body cavity, for example the bladder (intravesical treatment) or the abdominal area (intraperitoneal treatment). The chemotherapy is put in through the tube. It may then be drained out again after a set period of time. Drugs given in this way may cause some irritation or inflammation in the area they are given, but they do not tend to cause side effects in other parts of the body.

Chemotherapy creams

Chemotherapy creams are used for some types of skin cancer. They are put onto the affected area of skin in a thin layer and may need to be used regularly for a few weeks. They may cause some soreness or irritation of the skin in the affected area but do not cause side effects in other parts of the body. While you are using chemotherapy creams you may need to wear a dressing over the affected area of skin.

Giving consent for chemotherapy treatment

Before you have any chemotherapy, your doctor will explain the aims of the treatment to you. They will usually ask you to sign a form saying that you give your permission (consent) for the hospital staff to give you the chemotherapy.

No medical treatment can be given without your consent, and before you are asked to sign the form, you should have been given full information about:

- the type and extent of the treatment you are advised to have
- the advantages and disadvantages of the treatment
- any other treatments that may be available
- any significant risks or side effects of the treatment (both short and long term)
- what the treatment aims to achieve.

If you do not understand what you have been told, let the staff know straight away so that they can explain again. Some cancer treatments are complex, so it is not unusual for people to need things explained more than once.

It is often a good idea to have a friend or relative with you when the treatment is explained, to help you remember the discussion more fully. You may also find it useful to write down a list of questions before you go for your appointment.

Patients often feel that the hospital staff are too busy to answer their questions, but it is important for you to be aware of how the treatment is likely to affect you. The staff should be willing to make time for you to ask questions.

You can always ask for more time to decide about the treatment, if you feel that you can't make a decision when it is first explained to you.

You are also free to choose not to have the treatment. The staff can explain what may happen if you do not have it. It is essential to tell a doctor, or the nurse in charge, so that they can record your decision in your medical notes. You do not have to give a reason for not wanting to have treatment, but it can be helpful to let the staff know your concerns so that they can give you the best advice.

Benefits and disadvantages of chemotherapy

Many people are concerned about having chemotherapy, because of the side effects that can occur. However, side effects can often be well controlled with medicines, and some people have only a few side effects.

Some people ask what would happen if they did not have the treatment. Treatment can be given for different reasons and the potential benefits will vary depending upon the individual situation.

In people with early cancer, surgery is often done with the aim of curing the cancer and chemotherapy may be given to reduce the risks of it coming back. It is helpful to discuss with your cancer specialist how much the chemotherapy may reduce the chance of the cancer coming back in your particular situation.

If the cancer is at a more advanced stage, the aim of treatment may be to control the cancer. This can lead to a reduction in symptoms, a better quality of life, and it can possibly prolong life. However, for some people the treatment will have no effect upon the cancer and they will get the side effects without any of the benefit. If you choose not to have treatment in this situation, you can still be given supportive (palliative) care, with medicines to control any symptoms.

The decision about whether to have chemotherapy treatment can be a difficult one and you may need to discuss it in detail with your doctor.

Where chemotherapy treatment is given

Chemotherapy units are very specialised and not all hospitals have them, so you may need to travel for treatment. Chemotherapy drugs are usually prepared in a special area of the hospital pharmacy. All the drugs are carefully checked by the pharmacy staff to ensure that they are the right ones for you. Chemotherapy tablets, capsules or creams can be given to you to take home.

Most intravenous chemotherapy drugs can be given to you as a day patient at the hospital. This may take from half an hour to a few hours. However, some treatments, such as having chemotherapy into the abdominal cavity, will mean a short stay in hospital – perhaps overnight or for a couple of days. For some chemotherapy treatments – for example, high-dose chemotherapy – you will need to stay in hospital longer, perhaps for a few weeks. Your doctor or nurse will explain exactly what your treatment will involve before it starts.

If you are having chemotherapy by intramuscular injection, subcutaneous injection, intrathecal injection, or intracavity injection into the bladder, it is usually given in the outpatients department or the chemotherapy day unit at the hospital. It may also be given on certain wards within the hospital.

Sometimes, specialist chemotherapy nurses can visit you at home to give intravenous chemotherapy. This sort of service is only available in some parts of the UK and with some types of chemotherapy treatment. You can ask your doctor whether it is possible to have your treatment at home.

Points to remember when having chemotherapy at home

Chemotherapy tablets, capsules or injections may need to be stored in a particular way, such as in the fridge. Always follow the instructions given by your pharmacist.

It is important not to touch some chemotherapy drugs with your fingers. You can check this with your pharmacist.

All drugs must be stored out of the reach of children as they could cause serious harm if taken by accident.

If you are having intravenous chemotherapy by pump and you notice any leakage of the drug from the pump or tube it is essential to let the nurse or doctor at the hospital know immediately.

If you feel unwell at any time, phone the nurse or doctor at the hospital for advice.

Planning your chemotherapy treatment

Your treatment will depend on a number of factors including:

the type of cancer you have

where in the body the cancer is
 how far it has spread (if at all)
 your general health.

How often you have your treatment and how long the whole course of treatment takes will depend on:

the type of cancer you have
 the particular chemotherapy drugs you are having
 how well the cancer responds to the drugs
 any side effects the drugs may cause.

Before starting chemotherapy, you will have your height and weight checked. This is used to work out the right dose of chemotherapy for you.

Intravenous chemotherapy is usually given as several sessions of treatment, unless you are having continuous treatment by infusion pump. Depending on the drug, or drugs, each treatment can last from a few hours to a few days. Each treatment is generally followed by a rest period of a few weeks to allow your body to recover from any side effects and so that the number of cells in your blood can go back to normal. The treatment and the rest period together make up a cycle of treatment. The number of cycles you have will depend on how well your cancer is responding to the chemotherapy.

Your doctor or chemotherapy nurse will explain your treatment plan to you. If you have any questions, don't be afraid to ask. It often helps to make a list of questions and to take a close relative or friend with you to remind you of things you want to know but may easily forget. You may need some tests before starting your course of treatment. These will include blood tests and perhaps urine tests or heart tests.

Before each cycle of chemotherapy, you will normally have blood tests and see the doctor or specialist chemotherapy nurse. This can take some time. Your GP, practice nurse or the staff at a hospital close to your home may be able to test your blood a day or two before your treatment, so that you do not have to wait so long on the day of your treatment. If your blood is tested at your GP surgery, or at another hospital, the results can be sent to the hospital where you are having your treatment. Sometimes, you may need to have x-rays or scans.

All chemotherapy drugs are prepared specially for you and you may have to wait while the hospital pharmacy department gets them ready. To help pass the time, it can be helpful to take a book, personal stereo, iPod, newspaper, crosswords or perhaps some letters to write.

It may take several months to have all the chemotherapy needed to treat your cancer. When chemotherapy is given by an infusion pump it can be given continuously over a time varying from several days to several weeks.

Some people having their chemotherapy as tablets or capsules take them daily for several weeks or months, before they have a rest period.

Changes in the treatment plan

Your doctors will use blood tests and sometimes urine tests to monitor the effect that the chemotherapy is having on your body.

If you have a tumour that can be seen on a scan or felt by the doctor, the hospital staff will regularly check the effects of the chemotherapy on the cancer. The results from your blood tests and any scans or x-rays can show how much the cancer is responding to the treatment.

Depending on the results of the tests, your treatment plan may sometimes need to be changed. There can be many reasons for this and your doctor will tell you why your treatment needs to be changed if this is necessary. It may be because the drugs you are having are starting to cause damage to particular parts of the body, such as the bone marrow, kidneys, liver or nerves in the hands or feet.

Sometimes it can be because the chemotherapy is not shrinking the cancer enough. If this is the case, then changing to different drugs may be more effective.

Sometimes, your treatment may need to be delayed because the chemotherapy drugs are stopping your bone marrow from working properly. Delaying the chemotherapy gives your bone marrow a chance to recover before the next session of drugs is given.

If there is a special occasion coming up, or you want to go on holiday, it may be possible to arrange the timing of your treatment to fit in with this. Your doctor can tell you whether this is possible.

Research - clinical trials for chemotherapy treatments

You may be asked to have your chemotherapy as part of a treatment research trial. Cancer research trials are carried out to try to find new and better treatments for cancer. Trials that are carried out on patients are known as clinical trials.

Clinical trials may be carried out to:

- Test new treatments, such as new chemotherapy drugs, gene therapy or cancer vaccines.
- Look at new combinations of existing treatments, or change the way they are given, in order to make them more effective or to reduce side effects.
- Compare the effectiveness of drugs used for symptom control.
- See which treatments are the most cost-effective.
- Find out how cancer treatments work.

Trials are the only reliable way to find out if a different type of chemotherapy is better than what is already available.

Taking part in a trial

There can be many benefits in taking part in a trial. Trials help to improve knowledge about cancer and the development of new treatments. You will also be carefully monitored during and after the study. Usually, several hospitals around the country take part in these trials.

Blood and tumour samples

Many blood samples and bone marrow or tumour biopsies may be taken to help make the right diagnosis. You may be asked for your permission to use some of your samples for research into cancer. If you are taking part in a trial you may also be asked to give other samples which may be frozen and stored for future use, when new research techniques become available. These samples will have your name removed from them (anonymised) so you can't be identified.

The research may be carried out at the hospital where you are treated, or it may be at another hospital. This type of research takes a long time, so you are unlikely to hear the results. The samples will, however, be used to increase knowledge about the causes of cancer and its treatment. This research will, hopefully, improve the outlook for future patients.

After your chemotherapy has finished

After your chemotherapy has finished, you will have regular check-ups and possibly scans or x-rays. These will probably continue for several years. If you have any problems, or notice any new symptoms in between your appointments, let your doctor know as soon as possible. Many people find that they get very anxious before their appointment. This is natural and it may help to get support from family, friends or an organisation during this time.

When their treatment is finished, people often feel it is time to get back to normal. However, this can sometimes be one of the hardest times to cope with. Recovery times vary and no one can say for sure how long you should take to get over the treatment and its effects.

The end of the visits to hospital for treatment can leave you feeling alone and neglected. Many people find that they feel very low and emotional at this time, when they had expected to be able to put the cancer and the treatment behind them. This may be the time when you need most support. Support is available to you if you would like it.

For people whose treatment is over apart from regular check-ups, our booklet on adjusting to life after cancer gives useful advice.

An overview of the side effects of chemotherapy

Different chemotherapy drugs cause different side effects. Everyone is different and will react to chemotherapy treatment in a different way. Some people may have very few side effects while others will have a lot. Almost all side effects are only short-term and will gradually disappear once the treatment has stopped.

The main areas of your body that may be affected by chemotherapy are those where normal cells rapidly divide and grow, such as the lining of your mouth, the digestive system, your skin, hair and bone marrow (the spongy material that fills the bones and produces new blood cells).

If you want to know more about the side effects that may be caused by your chemotherapy treatment, ask your doctor or chemotherapy nurse, as they will know the exact drugs you are taking. Although the side effects of chemotherapy can be unpleasant, they need to be weighed against the benefits of the treatment. It is important to tell your doctor or chemotherapy nurse if the treatment is making you feel unwell. You may be able to have medicines to help you, or changes can be made to your treatment to lessen any side effects.

Our information on the individual chemotherapy drugs gives specific details on their side effects.

Possible side effects of some chemotherapy drugs

- Bone marrow and blood
- Anaemia
- Increased bleeding and bruising
- Your hair
- Your digestive system
- Changes to your sense of taste
- Your mouth
- Tiredness
- Skin and nail changes
- Other possible side effects

Bone marrow and blood

Chemotherapy can reduce the number of blood cells produced by the bone marrow. Bone marrow is a spongy material that fills the bones and produces the cells (called **stem cells**) which develop into the three different types of blood cells:

- red blood cells**, which carry oxygen to all parts of the body.
- white blood cells**, which are essential for fighting infection.

platelets, which help the blood to clot and control bleeding.

All these cells normally stay inside the bone marrow until they are mature enough to perform their functions properly. They are then released into the bloodstream so that they can circulate around the body.

Increased chance of infection

If the number of white cells in your blood is low you are more likely to get infections as there are fewer white cells to fight off bacteria.

If your temperature goes up, or you suddenly feel unwell, even with a normal temperature, contact your doctor or the hospital straight away. Most hospitals consider a temperature above 38°C (100.5°F) to be high, although some hospitals use a lower or higher temperature. The doctors and nurses will advise you when you need to contact the hospital.

Your regular blood tests will show the number of white cells in your blood. If you get an infection when your white blood cell level is low, you will need to have antibiotics. These may be given as an injection at hospital or you may be given antibiotic capsules or tablets to take at home. You may need to be admitted to hospital for the antibiotic treatment.

Blood cells are usually at their lowest level from 7–14 days after the chemotherapy treatment, although this will vary depending on the type of chemotherapy.

Helpful hints - infection

Tell your doctor at once if you develop a temperature as you may need to have antibiotics.
Keep clean. Always wash your hands thoroughly before preparing your food.
Stay away from crowded places and from people who you know to have an infection such as a cold.
Read our information on avoiding infection when your immunity is low

Sometimes, after chemotherapy, a drug called G-CSF will be used to help your bone marrow make white blood cells more quickly and so reduce the risk of infection. G-CSF is a protein made naturally in the body that can now be produced in the laboratory.

Anaemia

Red blood cells contain haemoglobin, which carries oxygen round the body. If there are fewer red blood cells in your bloodstream because of the chemotherapy, the level of haemoglobin in your blood will be low (anaemia).

This means you may feel very tired and lethargic, and may also feel breathless as there is less oxygen being carried around your body. People with anaemia can also feel dizzy and light-headed, and have aching muscles and joints.

The blood tests will measure your haemoglobin. If it is low you may be offered a blood transfusion. The extra red cells in the transfusion will pick up oxygen from your lungs and take it around the body. You will feel more energetic and any breathlessness will be eased.

Increased bleeding and bruising

Platelets are cells which are important in blood clotting. If you have a low number of platelets in your blood you may bruise very easily, and may have nosebleeds or bleed more heavily than usual from minor cuts or grazes. If you develop any unexplained bruising or bleeding, such as nosebleeds, blood

spots or rashes on the skin (petechiae) or bleeding gums, you should contact your doctor or the hospital straight away. You may have to be admitted to hospital for a platelet transfusion. This is given by drip into your blood. The platelets will start to work immediately, to prevent bruising and bleeding.

Your regular blood tests will count the number of platelets in your blood. If your platelets are low, take care to avoid injury; for example, if you are gardening, wear thick gloves. You can use a soft toothbrush to clean your teeth to reduce the risk of scratching your gums and making them bleed.

Your hair

Some drugs do not make your hair fall out, or the amount of hair lost is so slight it is hardly noticeable. Some chemotherapy can damage the hair and make it brittle. If this happens, the hair may break off near the scalp a week or two after the chemotherapy has started. Some chemotherapy drugs can make all of your hair fall out and this can be very upsetting.

The amount of hair that falls out, if any, depends on the type of drug or combination of drugs used, the dose given and how the drug affects you personally.

If your hair falls out, it usually starts within a few weeks of beginning treatment, although very occasionally it can start within a few days. Underarm, body and pubic hair may be lost as well. Some drugs also make the eyelashes and eyebrows fall out. If your hair does fall out due to the chemotherapy, it will grow back over a few months once you have finished your treatment.

Helpful hints – your hair

If your drugs are likely to make your hair fall out, it can help to have your hair cut quite short before treatment. The weight of long hair pulls on the scalp and may make your hair fall out earlier.

Use gentle hair products.

Avoid perming or colouring your hair if it is brittle or if your scalp is dry and itchy.

If you colour your hair, use a mild vegetable-based colourant and ask your hairdresser or chemotherapy nurse for advice.

Try not to brush or comb your hair too roughly – use a soft or baby's brush.

Avoid using hair dryers, and other items like tongs and straighteners. Pat your hair dry gently after washing it.

If it is likely that your hair will fall out, ask your doctor or nurse about wigs early on, so that the wig can be as close a match as possible to your normal hair.

You may like to wear a hat or scarf when you go out. There are also turbans which can be worn in the house.

See our booklet on coping with hair loss.

Scalp cooling

Some people having certain types of chemotherapy may be able to prevent hair loss by using a 'cold cap'. This works by temporarily reducing the blood flow and the amount of the drug reaching the scalp. Unfortunately, the cold cap only works with certain drugs and does not always prevent hair loss. You can ask your doctor or chemotherapy nurse whether one would be useful for you. See our booklet on scalp cooling.

Your digestive system

Your digestive system can be affected in a number of ways by chemotherapy.

Nausea and vomiting

Some chemotherapy drugs can make you feel sick (nausea), or actually be sick (vomit). Not all chemotherapy drugs cause sickness and many people have no sickness at all, as there are now very effective treatments to prevent and control it. Nausea and vomiting is much less of a problem than it was in the past.

If you do feel sick, it may start from a few minutes to several hours after the chemotherapy is given, depending on the drugs you are having. How long the sickness lasts varies.

Helpful hints – eating and digestion

If you feel sick or are sick, tell your doctor as soon as possible. Anti-sickness drugs can be prescribed which usually work well.

Avoid eating or preparing food when you feel sick.

Avoid fried foods, fatty foods or foods with a strong smell.

Eat cold or warm food if the smell of hot food makes you feel sick.

Eat several small snacks and meals each day and chew the food well.

Peppermints or peppermint tea may help.

Have a small meal a few hours before treatment, but not just before it.

Drink plenty of liquid slowly, taking lots of small sips.

Ginger, either as ginger biscuits, ginger tea or ginger beer can reduce feelings of sickness.

Avoid filling your stomach with fluid before you eat.

Some complementary therapies (such as homeopathy, acupuncture or sea-bands) may help.

Your doctor will prescribe anti-sickness drugs (anti-emetics) to help. If your chemotherapy is known to cause sickness, you will be given anti-sickness drugs by injection or tablets before your chemotherapy. You will also be given tablets to take at home afterwards. It is important to take the anti-sickness medicines as advised by your doctor or chemotherapy nurse as it is easier to stop sickness from coming on than treating it once it has already started.

Steroids are often given to reduce nausea and vomiting. They often give a sense of well-being, as well as helping to reduce feelings of sickness and loss of appetite.

If the chemotherapy you are having does not usually cause sickness, you will be given anti-sickness medicine that you can take if you need to.

Diarrhoea and constipation

Some chemotherapy drugs can affect the lining of the digestive system and this may cause diarrhoea for a few days. Some chemotherapy drugs (or anti-sickness drugs) can cause constipation.

If you have any diarrhoea or constipation, or are worried about the effects of chemotherapy on your digestive system, you can talk to your doctor or chemotherapy nurse, or ask them to arrange for you to see a dietitian. If you have severe diarrhoea (eg more than 4–6 times a day), contact your nurse or doctor at the hospital.

Helpful hints – diarrhoea and constipation

If you have diarrhoea, eat less fibre, and avoid cereals, raw fruits and vegetables.

Drink plenty of liquid (up to two litres a day) to replace the fluid lost with diarrhoea.

If you are constipated, eat more fibre, raw fruits, cereals, and vegetables. Fruit juice and warm drinks can help.

Try to take gentle exercise, if possible.

Loss of appetite

Some chemotherapy drugs can affect your appetite. Our booklet on eating well has information to help if your appetite is low.

Changes to your sense of taste

Chemotherapy can affect your sense of taste; food may taste more salty, bitter or metallic. Your normal sense of taste will come back after the chemotherapy treatment finishes.

Helpful hints – changes to sense of taste

Eat only the foods that you like and ignore those that do not appeal to you.
 Use seasonings and herbs to flavour your cooking.
 Try marinating food, or using strongly flavoured sauces to go with food.
 Sharp-tasting foods such as fresh fruit can be refreshing and leave a pleasant taste in the mouth.
 Some people find that cold foods taste better than hot foods.

Your mouth

Some drugs can cause a sore mouth, which may lead to mouth ulcers. If this happens it is usually about 5–10 days after the drugs are given and will clear up within three to four weeks. You can be given mouthwashes to help.

Mouth ulcers can become infected. Your doctor or specialist nurse can give you treatment to help prevent or clear any infection. Cleaning your teeth regularly and gently with a soft toothbrush will help to keep your mouth clean. It may be helpful to see your dentist before you start your treatment. Dental treatment sometimes needs to be delayed when you are on chemotherapy because of the risk of infection and a sore mouth.

If your mouth is very sore, gels, creams or pastes can be used to reduce the soreness. Your cancer specialist can tell you about these.

Helpful hints – your mouth

You might find eating fresh pineapple helps keep your mouth fresh and moist.
 Clean your teeth or dentures gently every morning, evening and after each meal.
 Use a soft-bristled or child's toothbrush.
 If your toothpaste stings or brushing your teeth makes you feel sick, try using a mouthwash of one teaspoon of bicarbonate of soda dissolved in a mug of warm water.
 If your doctor prescribes a mouthwash for you, use it regularly as prescribed to prevent soreness.
 Rinse your mouth regularly with salt water.
 Gently use dental tape or floss each day.
 Keep your lips moist by using Vaseline, or a flavoured lip balm.
 Avoid neat spirits, tobacco, hot spices, garlic, onion, vinegar and salty food. These may irritate your mouth.
 Keep your mouth and food moist. Add gravies and sauces to your food to make swallowing easier.
 Try to drink at least 1.5 litres (3 pints) of fluid a day (water, tea, weak coffee, and soft drinks).
 Avoid acidic drinks such as orange and grapefruit juice. Warm herbal teas may be more soothing.
 Let your doctor know if you have mouth ulcers, as you may need medicines to help heal the ulcers and clear any infection.
 Sucking crushed ice while the chemotherapy drugs are being given may help to prevent a sore mouth.
 Read our booklet on mouth care during chemotherapy.

Tiredness

Some people feel very tired during chemotherapy. This is quite normal. For someone who normally has a lot of energy, feeling tired all the time can be very frustrating and difficult to cope with. The hardest time may be towards the end of the course of chemotherapy.

Try to cut down on any unnecessary activities and ask your family or friends to help you with jobs such as shopping and housework. It is important not to fight your tiredness. Give yourself time to rest and, if you are still working, see if it is possible to reduce your hours while you are having treatment. If you are having problems with sleeping, your GP may be able to prescribe sleeping tablets for you.

The tiredness will ease off gradually once the chemotherapy has ended, but it can often be three or four months until you feel back to normal. Some people find that they still feel tired a year or so afterwards.

Our booklet on coping with fatigue gives helpful tips on dealing with tiredness during chemotherapy treatment.

Skin and nail changes

Some drugs can affect your skin. Your skin may become dry or slightly discoloured, which may be made worse by swimming, especially if there is chlorine in the water. Any rashes should be reported to your doctor.

Your skin may also be more sensitive to sunlight, during and after the treatment. Protect your skin from the sun by wearing a hat, sunglasses, and loose clothing that covers your skin. Use sunscreen cream (at least factor 15) on any exposed areas.

Helpful hints – skin changes

Avoid wet shaving – an electric razor is less likely to cause cuts.

If your skin becomes dry or itchy, you can use some moisturising cream. If you are also having radiotherapy, check with your doctor before using any moisturisers.

Wear a hat, loose clothing and high-factor suncream if you are going out in the sun, to prevent your skin burning.

Your nails

Chemotherapy may make your nails grow more slowly, or become brittle or flaky. You may notice white lines appearing across them. False nails or nail varnish may disguise these. Sometimes the shape or colour of your nails may change.

Other possible side effects

Effects on the nerves

Some chemotherapy drugs can affect the nerves in your hands or feet. This can cause tingling or numbness, or a sensation of pins and needles. This is called peripheral neuropathy. It is important to let your doctor know if this occurs. They may need to change the chemotherapy drug if it gets worse. Usually, it gradually gets better when the chemotherapy treatment ends. Very occasionally it can damage the nerves permanently.

Effects on the nervous system

Some drugs can make you feel anxious, restless, dizzy, sleepy or have headaches. Some people also find it hard to concentrate. If you have any of these effects let your doctor know, as medicines can often be given to help. Cancerbackup nurses can give you advice on how to cope with these effects.

Change in kidney function

Some chemotherapy drugs can affect how well your kidneys work (kidney function). In order to prevent this, fluids may be given by drip into your vein for several hours before you have the treatment. Your kidney function will be carefully checked by blood tests before each treatment. The nurses may ask you to drink plenty of fluid and it is important to do this. They may also ask you to measure the amount of urine you pass.

Changes in hearing

Some chemotherapy drugs can affect your hearing. You may lose the ability to hear some high-pitched sounds. Some people find they have a continuous noise in the ears known as **tinnitus**, which can be very distressing. Let your doctor know if you notice any change in your hearing. They can arrange a hearing test for you.

Second cancer

Some chemotherapy drugs can increase the risk of developing particular types of cancer or leukaemia later in life. This is extremely rare and your doctors will weigh up the small increase in risk of cancer or leukaemia, against the benefit of the chemotherapy in treating your current cancer. If the chemotherapy you are having may cause a second cancer, your doctors will discuss this with you.

How chemotherapy might affect your everyday life

Even though chemotherapy treatment can cause unpleasant side effects, some people still manage to lead an almost normal life during their treatment. Chemotherapy can make you feel better by relieving the symptoms of the cancer. Even if you feel unwell during your course of treatment, you may find that you recover quickly between each cycle and can take up your usual activities again as you begin to feel better.

You may be able to go to work and carry on with your social activities as usual, but may need to take rests during the day or shorten your working hours.

Social life

While you are having chemotherapy you may find that you can't do some of the things you used to take for granted. Depending on how well you feel, there is no reason to stop going out or visiting friends, especially if you can plan ahead for social occasions. For example, if you are going out for the evening, you could make sure that you get plenty of rest during the day so you have more energy for the evening. If you are planning to go out for a meal, you may find it helpful to take anti-sickness tablets before you go.

If you have an important social event (such as a wedding) coming up, discuss with your doctor whether the time of your treatment can be changed so that you can feel as well as possible for the occasion.

Alcohol

For most people, having the occasional alcoholic drink will not affect the chemotherapy treatment, but it is best to check with your doctor beforehand.

Holidays and vaccinations

If you are going abroad on holiday, it is important to remember that you should not have any 'live' vaccines while you are having chemotherapy. These include polio, measles, rubella (German

measles), MMR (the triple vaccine for measles, mumps and rubella), BCG (tuberculosis), yellow fever and typhoid vaccine. There are, however, vaccines that you can have if necessary. If you are travelling abroad, ask your doctor if you need any vaccines and whether it is safe for you to have them.

Sometimes people who have, or have had, cancer can find it difficult to get travel insurance to travel abroad.

How chemotherapy might affect your sex life

Some people go through chemotherapy without it having any effect their sex lives. Others find that their sex lives are temporarily or permanently changed in some way due to their chemotherapy.

- Changes due to chemotherapy
- Contraception
- Protecting your partner
- Talking about sex
- Early menopause

Changes due to chemotherapy

Most changes that occur are temporary, and should not have a long-term effect on your sex life. There may be times when you just feel too tired, or perhaps not strong enough for the level of physical activity you are used to during sex. If your treatment is making you feel sick, you may not want to have sex at all for a while. Remember that most side effects from chemotherapy that may affect your sex life, such as tiredness or sickness, will gradually wear off once your treatment is finished.

Anxiety may also play a part in putting you off sex. The anxiety may not be directly related to sex; you may be worried about your chances of surviving your cancer, or how your family is coping with the illness, or about your finances. Stresses like these can easily push everything else, including sex, to the back of your mind.

There is no medical reason to stop having sex at any time during your course of chemotherapy. It is perfectly safe, and the chemotherapy drugs themselves will have no long-term physical effects on your ability to have and enjoy sexual activity. Cancer cannot be passed on to your partner during sex and it won't make the cancer worse.

Contraception

It is very important to take effective contraceptive precautions when having chemotherapy, as the chemotherapy drugs might harm the baby if pregnancy occurs. For this reason, your doctor will advise you to use a reliable method of contraception (usually 'barrier' methods – such as condoms or the cap) throughout your treatment and for a few months afterwards.

If you are taking the contraceptive pill, you need to check with your doctor if it is all right for you to continue using it. The side effects of chemotherapy, such as sickness and diarrhoea, can make the pill less effective.

Protecting your partner

It is thought that chemotherapy drugs cannot pass into semen or vaginal fluids. However, just in case, most hospitals advise that people having chemotherapy use condoms for up to a few days after the treatment has been given.

Talking about sex

It is not always easy to talk about sex, but it can help to know what effects the chemotherapy treatment may have on your sex life. Your doctor or nurse at the hospital who should be able to tell you about this. If the idea of talking to them about these things is too embarrassing, you could contact our nurses. They will talk through any concerns you may have in complete confidence.

It may also help to discuss your feelings and worries with your partner. Perhaps your partner could join you if you decide you want to talk to your doctor or nurse.

Early menopause

In some women, chemotherapy brings on an early menopause (see below for more about infertility). This may cause symptoms such as dryness of the vagina and a decreased interest in sex.

Hormone replacement therapy (HRT) can be used by women with most types of cancer to prevent or reduce menopausal symptoms. However, doctors have concerns about using it for women who have had breast cancer or cancer of the womb (uterus). Some doctors feel that HRT may increase the risk of these cancers coming back, but others do not.

If vaginal dryness is making sex uncomfortable, your doctor may be able to prescribe a cream or ointment to help. You can also use KY Jelly® or other creams such as Replens® to moisten the vagina. These are available from your chemist without a prescription.

How chemotherapy might affect your fertility

Unfortunately, some chemotherapy treatments may cause infertility. Infertility is the inability to become pregnant or to father a child. This may be temporary or permanent, depending on the drugs that you have. It is strongly advised that you discuss the risk of infertility fully with your doctor before you start treatment. If you have a partner, they will probably wish to join you at this discussion. Then you can both be aware of all the facts and have a chance to talk over your feelings and options for the future.

Although chemotherapy can reduce fertility, it is quite possible for a woman having chemotherapy to become pregnant during the treatment. Female partners of a man having chemotherapy may also become pregnant. Pregnancy should be avoided during chemotherapy in case the drugs harm the baby.

- Female fertility
- Male fertility
- Feelings about infertility
- Pregnancy and cancer

Female fertility

Some drugs will have no effect on your fertility, but others may temporarily or permanently stop your ovaries producing eggs. If this happens, it means that you can no longer become pregnant and it will also bring on the symptoms of the menopause. During chemotherapy your periods may become irregular or stop. You may also have hot flushes, dry skin and vaginal dryness.

In about a third of women, once the treatment ends, the ovaries start producing eggs again and their periods return to normal. It may be a few months before this happens. In this case, the infertility will have been short-term.

Usually, the younger you are, the more likely you are to have normal periods again and still be able to have children once the chemotherapy has ended.

Depending on the type of cancer you have, your doctor may be able to prescribe hormone replacement therapy (HRT) to help relieve the menopausal symptoms. However, HRT cannot prevent infertility.

Male fertility

Some chemotherapy drugs will have no effect at all on fertility, but others may reduce the number of sperm produced or affect their ability to reach and fertilise a woman's egg during sex. Unfortunately, this means you may no longer be able to father children. However, you will still be able to get an erection and have an orgasm.

You should use a reliable barrier method of contraception throughout your treatment

If you want to have children after your treatment you may be able to 'bank' some of your sperm for later use, before you need to start chemotherapy. If this is possible in your case, you will be asked to produce several sperm samples over one or two weeks. These will then be frozen and stored so that they can be used later to try to fertilise an egg and make your partner pregnant. You may be charged a fee for sperm storage. You should be entitled to one course of infertility treatment on the NHS.

Some men will remain permanently infertile after their treatment has stopped, while others will find their sperm count returns to normal levels and their fertility comes back. Sometimes it may take a few years for fertility to return. Your doctor will be able to do a sperm count to check your fertility when your treatment is over.

Teenage boys should also be aware of the infertility risk so that, if possible, their sperm can be stored for later years.

Feelings about infertility

It can be devastating to learn that the treatment you need for your cancer may also mean you can no longer have any children. If you had been planning to have children in the future or to have more children to add to your family, infertility may be very hard to come to terms with. The sense of loss can be very painful and distressing for people of all ages. Sometimes it can feel as though you have actually lost a part of yourself. You may feel less masculine or less feminine because you can't have children. Women may be especially distressed that the drugs may bring on the menopause, which can further undermine their self-confidence.

People vary in their reactions to the risk of infertility. Some people may shrug it off and feel that dealing with the cancer is more important. Others seem to accept the news calmly when they start treatment, and find that the impact doesn't hit them until the treatment is over and they are sorting out their lives again.

There is no right or wrong way to react. You may want to discuss the risks and all your options with your doctor before you start treatment. You may also find it helpful to talk to a trained counsellor about any strong emotions which threaten to become too much for you.

Your partner will also need consideration in any discussions about fertility and future plans. You may both need to speak to a professional counsellor or therapist specialising in fertility problems. They can help you to come to terms with your situation.

Your doctor may be able to refer you to a specialist.

Pregnancy and cancer

If you are pregnant before your cancer is diagnosed and your chemotherapy starts, it is important to discuss with your doctor the pros and cons of continuing with your pregnancy. It is sometimes possible to delay starting chemotherapy until after the baby is born, or, sometimes, chemotherapy can be given in the later stages of pregnancy. It will all depend on the type of cancer you have, the extent of the disease, how advanced the pregnancy is and the particular chemotherapy you will be having.

You will need to talk to your doctor about your pregnancy and be sure you are fully aware of all the risks and alternatives before making any decisions.

Feelings and emotions about having chemotherapy

Many people find that having cancer, needing chemotherapy treatment, and the effect that this has on their lives can sometimes make them feel anxious, afraid or depressed. Often these feelings can be triggered by something seemingly trivial, such as having to change your usual daily routine to fit in with the treatments. It may also be caused by something more obvious, such as particular side effects of the treatment, or the risk of infertility.

It is important to know that you are not alone. It is natural to have these feelings from time to time during your treatment.

Some people may feel low or depressed due to side effects such as hair loss and tiredness. Certainly it can be discouraging if the cancer is taking time to respond to the drugs.

Your emotional well-being is as important as your physical health. Everyone needs some support during difficult times and having cancer is one of the most stressful situations you are likely to face. You might find it helps to talk over your feelings with someone you feel close to who is a good listener. Some people find it helpful to discuss their feelings with a professional counsellor, a spiritual leader or member of their religious faith, or a social worker. If you feel comfortable discussing your worries with your doctor or nurse, they can be good at helping you to bring your feelings out into the open and can find you further help if necessary.

Sometimes a doctor may suggest some medicine to help with depression or anxiety, such as a course of anti-depressant drugs. These drugs can be useful to help you cope with what is going on.

Our booklet on the emotional effects of cancer may help you cope with your feelings and emotions.

Helping yourself when you're having chemotherapy

There are things you can do which may make your course of chemotherapy treatment easier to cope with.

People often talk about having a positive attitude. This does not mean being cheerful and happy all the time. Everyone feels down and worried now and again, and accepting that you will have these feelings is part of being positive.

It can help to know what your treatment involves; what side effects to expect; what can be done about them; and what should be reported to your doctor or chemotherapy nurse.

Finding information

Keeping a journal
Planning

Finding information

Knowing more about your disease and its treatment can often help you to feel more in control of your life.

You may have questions about the effect the chemotherapy is having both on the cancer and your life in general. Getting information and answers to these questions can help to reduce anxiety.

If you don't understand the explanation, then keep asking until you do. Most doctors and nurses are very willing to answer any questions and to keep you up-to-date on your progress. You may find you have different questions each time you visit the hospital.

Keeping a journal

Some people find it helpful to keep a diary, journal or blog (online journal) of their treatment. This can have a practical use, as well as letting you express your feelings. If you record any side effects you have, you can see how things change if a different medicine is used to help. Changes to reduce side effects can often be made by using information of this kind.

As your journal develops, you may find it encouraging to look back at how you coped during previous difficult times. A private diary also allows you to put in writing anything that may be difficult for you to talk about. Sometimes it can be used to help you prepare to speak to someone about a problem, or it can be used to describe anger or sadness that you feel you cannot express in any other way.

Planning

Try to plan your time so that you can still do the things that are important to you. Although it is helpful to try to keep up with your social life, don't be afraid to rest if you need to. Taking some gentle exercise can raise your spirits and help get rid of tension.

How others can help you when you're having chemotherapy

There may be times when you want to be alone with your thoughts. However, at other times being able to share your feelings can be a relief.

Support groups
Family and friends
Counselling

Support groups

Patient support groups can put you in touch with other people having similar treatment. Talking with other people can be a good way of discussing feelings, and you can also pick up some useful coping tips.

Our booklet on talking about your cancer may also help you to find ways of discussing your cancer.

Family and friends

Family and friends often want to help you. However, they may find it difficult to grasp exactly what you are going through. Good communication is really important. Just at a time when you feel your friends and family should be helping, they may stand back and wait for you to make the first move. This is often because they are worried they may say the wrong thing, or they think you may want to cope alone. They may also be feeling quite emotional themselves.

Be open and honest about how your treatment is going and how you feel about it. In that way, misunderstandings can be avoided and others are given the chance to show their love and support.

Our booklet on talking to someone with cancer looks at the difficulties people may have when talking about cancer.

Counselling

Many people find that counselling can help them to face the problems of living with cancer. Counsellors help people talk through and sort out problems and confusion. Emotional difficulties linked to cancer are not always easy to talk about and are often hardest to share with the people you are closest to. Talking with a trained counsellor who is not personally involved in your situation can help to untangle thoughts, feelings and ideas.

Chemotherapy and complementary therapies

Complementary therapies can help to people's improve quality of life and well-being and can sometimes help to reduce the side effects of chemotherapy. Many people find that complementary therapies or practices can help them to feel stronger and more confident in dealing with chemotherapy. Many of these therapies can be used safely alongside conventional treatments and medicines, but it is important to check the particular treatment with your doctor.

Our booklet on complementary therapies includes descriptions of some relaxation and visualisation exercises, and information on how to contact registered practitioners.

Some complementary therapies, such as meditation or visualisation, can be done by the person with cancer themselves and can reduce anxiety. Other therapies, such as gentle massage, can be carried out by relatives or carers and can help them to support the person.

Some hospitals offer complementary therapies alongside conventional care. These may include:

- aromatherapy
- massage
- relaxation
- visualisation
- guided imagery techniques
- acupuncture

Relaxation

Deep relaxation is a skill that can be learned. It can be used to help relieve muscle tension, relieve stress, reduce tiredness and pain, improve sleep and peace of mind, and regain control of your emotions.

There are several different relaxation techniques that can be learnt from books or tapes. You can get these from your local library, bookshop and some chemists. Therapists and groups throughout the country also teach particular relaxation methods.

■ Work for people having chemotherapy

Work

You may need to take time off work during your treatment and for a while afterwards. It can be hard to judge the best time to go back to work and your decision if and when to go back is likely to depend mainly on the type of work you do and how much your income is affected. It is important to do what is right for you.

Getting back into your normal routine can be very helpful and you may want to go back to work as soon as possible. Many people find that going back to work as soon as they feel strong enough gives them a chance to forget their worries, as they become involved with their job and colleagues again. It can be helpful to talk to your employer about the situation – you may be able to work part-time or job share.

On the other hand it can take a long time to recover fully from treatment for cancer, and it may be many months before you feel ready to return to work. It is important not to feel pressurised into taking on too much, too soon.

Your consultant, GP or specialist nurse can help you decide when and if you should go back to work. If you have a disability caused by the cancer, your employer can get specialist help to enable you to work.

■ Individual chemotherapy drugs

This section contains information about individual chemotherapy drugs. It includes information about how each drug is given and possible side effects that may be experienced with each drug.

A chemotherapy drug can be either given on its own or in combination with other drugs. When more than one drug is given it is known as a combination chemotherapy regimen.

Drugs are listed in alphabetical order; select the one that you are interested in for further information.

If you can't see the drug that you are looking for, it's possible that it might be better known by a brand name.

Individual drugs

Amsacrine, Bleomycin, Busulfan, Capecitabine, Carboplatin, Carmustine, Chlorambucil, Cisplatin, Cladribine, Clofarabine, Crisantaspase, Cyclophosphamide, Cytarabine, Dacarbazine, Dactinomycin, Daunorubicin, Docetaxel, Doxorubicin, Epirubicin, Etoposide, Fludarabine, Fluorouracil, Gemcitabine, Gliadel implants, Hydroxycarbamide, Idarubicin, Ifosfamide, Irinotecan, Leucovorin, Liposomal daunorubicin, Liposomal doxorubicin, Lomustine, Melphalan, Mercaptopurine, Mesna, Methotrexate,

Mitomycin, Mitoxantrone, Oxaliplatin, Paclitaxel, Pemetrexed, Pentostatin, Procarbazine, Raltitrexed, Satraplatin, Streptozocin, Tegafur-uracil, Temozolomide, Teniposide, Thiotepa, Tioguanine, Topotecan, Treosulfan, Vinblastine, Vincristine, Vindesine, Vinorelbine

By brand name

Individual chemotherapy drugs by brand name

On the Cancerbackup website, drugs are referred to by their generic names. Sometimes, however, they are more commonly called by a brand name. This is an alphabetical list of brand names for chemotherapy drugs with links to the relevant information.

2'DCF®, 2'-deoxycoformycin®, 5FU, Alimta®, Alkeran®, Amsidine®, BiCNU®, Busilvex®, Caelyx®, Campto®, Cosmegen Lyovac®, DaunoXome®, DTIC®, Eldisine®, Eloxatin®, Etopophos®, Erwinase®, Evoltra®, Fludara®, Gemzar®, Hycamtin®, Hydrea®, Isovorin®, Lanvis®, Leukeran®, Leustat®, Matrex®, Mitoxana®, Myleran®, Myocet®, Navelbine®, Nipent®, Oncovin®, Pharmorubicin®, Puri-Nethol®, Sodiofolin®, Taxol, Taxotere®, Temodal®, Tomudex®, Uftoral®, Uromitexan®, Velbe®, Vepesid®, VM-26®, Vumon®, Xeloda®, Zanosar®, Zavedos®

Combination chemotherapy regimen

This section contains information about combination chemotherapy regimen. It includes information about how each regimen is given and possible side effects that may be experienced with that regimen.

A chemotherapy drug can be either given on its own or in combination with other drugs. This is when more than one chemotherapy drug is given. If you cannot find information about a particular regimen there is further information about chemotherapy in the individual chemotherapy drug section.

The list of regimen is in alphabetical order, select the one you are interested in for further information.

ABVD, AC, BEAM, BEP, CAF, Capecitabine & docetaxel, Carbo MV, Carboplatin & etoposide, CAV, ChIVPP, CHOP, Cisplatin & fluorouracil, CMF, C-VAMP, CVP, de Gramont, DHAP & R-DHAP, Docetaxel & carboplatin, Docetaxel & cisplatin, Doxorubicin & ifosfamide, EC, ECF, E-CMF, ECX, EEX, ELF, ESHAP & R-ESHAP, Etoposide & cisplatin, FEC, FEC-T, GemCap, GemCarbo, Gemcitabine & cisplatin, GemTaxol, Hyper-CVAD, ICE & R-ICE, Irinotecan & cetuximab, Irinotecan with 5FU & folinic acid, Mayo, MIC, MM, MMM, MVAC, MVP, Oxaliplatin & 5FU, Paclitaxel & carboplatin, Pemetrexed & cisplatin, PCV, PMitCEBO, R-CHOP, R-CVP, TAC, VAD, VAPEC-B, Vinorelbine & carboplatin, Vinorelbine & cisplatin