

Breast cancer risk

The facts

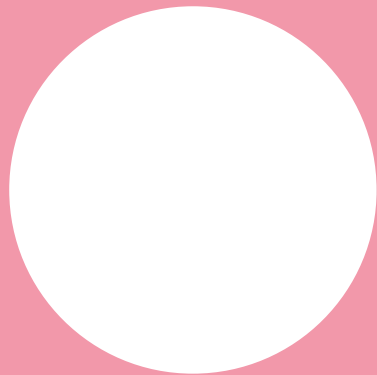


Contents

Introduction	4
What can affect risk?	12
Our genes and bodies	14
How the genes we inherit from our parents and the characteristics of our bodies might affect our risk of developing breast cancer	
Age	15
Being taller	16
Early puberty	16
Ethnicity	17
Genetics – breast cancer in the family	18
High breast density	20
Late menopause	21
Other breast conditions – proliferative	
benign breast disease	22
Bigger size at birth	23
Miscarriage	23
Our lifestyles and life choices	24
How the way we lead our day-to-day lives and our life choices might affect our risk of developing breast cancer	
Alcohol	25
Breastfeeding	27
Hormone replacement therapy	28
Physical activity	29
The pill	30
Pregnancy	32

Weight and weight gain	33
Healthy diet	34
Aspirin and ibuprofen	36
In vitro fertilisation treatment	37
Smoking	38
Abortion	39
Breast implants	39
Deodorants, antiperspirants and shaving	40
Underwired bras	41
Our environment	42
How what we are exposed to in our lives, including from the surrounding environment, might affect our risk of breast cancer	
Ionising radiation	43
Shiftwork – working at night	45
Stress	46
Bumping or bruising your breast	46
Chemicals in the environment	47
Non-ionising radiation	48
Further information	49
About the charity	50
Other useful contacts	51
Contact us	52

Introduction



What this booklet can tell you

This booklet aims to help women who have not had breast cancer to understand the things – or factors – that can affect their risk of developing the disease.

All the facts in this booklet are based on the latest scientific evidence. For each factor that affects risk, we explain how sure we are that it is linked to breast cancer and how much it changes your chances of developing the disease. Some of these factors increase your risk, while others decrease it or have differing effects in different women or at different times in their life. Some suggested factors actually do not affect risk at all – we explain these here too.

There are many stories in the media about the possible causes of breast cancer and how to prevent it. This booklet aims to help you separate the truth from the myths and to understand what the breast cancer risk factors are.

This booklet has three sections on factors affecting breast cancer risk:

- those related to our genes and bodies
- those related to our lifestyles and life choices
- those related to our surrounding environment

It will help you to identify the steps you can take to reduce your risk.

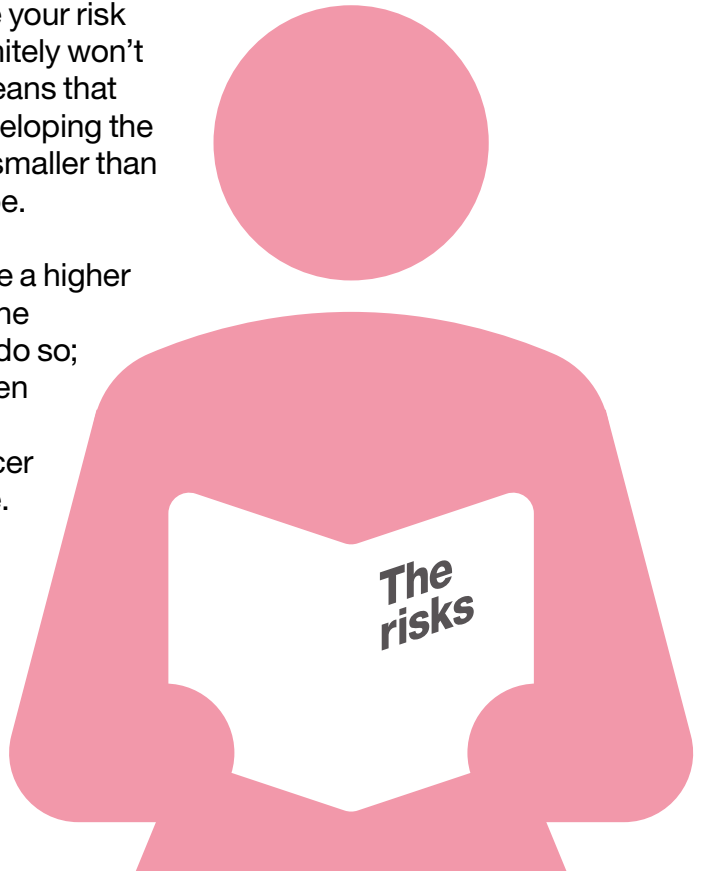
What this booklet cannot tell you

Will I get breast cancer?

It is not yet possible to predict who will get breast cancer, and for women who have been diagnosed with the disease, it is not possible to say what caused their breast cancer. This is because there is no one single cause of breast cancer – it results from a combination of our genes, the way we live our lives and our surrounding environment.

Being exposed to or having one or more factors that increase your risk does not necessarily mean you will get breast cancer. Equally, being exposed to or having some of the factors that can reduce your risk doesn't mean you definitely won't get breast cancer. It means that the chances of you developing the disease are greater or smaller than they would otherwise be.

Some women who have a higher chance of developing the disease never actually do so; in addition, some women with a lower chance of developing breast cancer do develop the disease.



What is my exact risk?

Getting older and being female are the biggest risk factors for breast cancer. Women are much more likely to get breast cancer than men, so simply being a woman means you are at higher risk of developing the disease.

Women have more breast cells than men and these cells are constantly exposed to greater levels of female hormones, which can promote the growth of breast cancer. Breast cancer is over 100 times more common in women than in men, but each year in the UK around 350 men are diagnosed with the disease. You can find out more about breast cancer in men at breastcancernow.org

We don't currently have a means to specifically predict each woman's individual risk. However, this booklet can help you to understand which things may affect your risk of the disease.

Often there is not a clear cut-off point as to whether something will affect your risk of developing breast cancer; instead, there is a gradual increase or decrease in risk. For example, a woman's risk of breast cancer increases with age and most cases of breast cancer occur in women over 50. This doesn't mean your risk of breast cancer will suddenly increase when you reach 50. There is a steady increase in breast cancer risk as you get older. This gradual change in risk applies to many other factors, such as drinking alcohol, time spent breastfeeding and the age of puberty and menopause.

Many of the factors mentioned in this booklet are linked with only a small increase or decrease in breast cancer risk. Some factors you cannot change, such as your height or when you started your periods. However, there are things you can change, such as your weight, how much alcohol you drink and the amount of physical activity you do.

How well proven are the risks?

Factors that may affect our risk of developing breast cancer can be categorised based on the strength of scientific evidence. In this booklet we sort the risk factors into three groups – established, possible or doubtful.

Established

For these factors, there is a large amount of scientific evidence that clearly shows they are linked to an increase or decrease in breast cancer risk. In this booklet, we describe these as things that increase, decrease or affect your risk. For some factors we say they ‘affect your risk’ rather than saying increase or decrease; this is because the effect of the factor on breast cancer risk differs between women or depends on the time in a woman’s life.

Possible

For these factors, there is some scientific evidence that suggests they may increase or decrease the chances of developing breast cancer. More research is needed before we can be sure whether or not they are definitely linked to the disease. In this booklet, we describe these as things that possibly increase, decrease or affect your risk.

Doubtful

For these factors, the overall scientific evidence suggests they are not linked to the disease. In some cases, there simply isn't any evidence of a link; in others, research has shown there is no link. Despite lack of evidence, these factors can still receive a lot of media attention, which can cause confusion about what has or hasn't been shown to be linked to breast cancer. In this booklet we describe these as things that do not affect risk.



Deciding whether to change your lifestyle to help prevent breast cancer

Hormones play a role in breast cancer development

It is thought the majority of the things that affect breast cancer risk are related to the female sex hormones oestrogen and progesterone. These are essential for normal sexual development and the functioning of female reproductive organs and also help to maintain healthy bones and heart.

Your lifetime exposure to these and other hormones is thought to influence your chance of developing breast cancer. For example, the number of periods you have affects your lifetime exposure to, or levels of, oestrogen and progesterone. Women who started their periods at a young age or who have a late menopause are exposed to these hormones for longer than women who started their periods later or who have an early menopause. As both oestrogen and progesterone can affect the growth of breast cancers, it is probably this greater exposure to these hormones that increases the risk of breast cancer.

However, breast cancer is caused by a combination of our genes, the way we live our lives, and our surrounding environment. Not all risk factors are linked to hormones.

Many things that affect your risk of breast cancer cannot be changed, such as your age or height. However, there are some factors you can choose to change, such as your weight, how much alcohol you drink, the amount of physical activity you do or whether or not to take the contraceptive pill or hormone replacement therapy (HRT) and for how long.

Changing your lifestyle can change your overall risk of developing breast cancer.

If you are considering making lifestyle changes, it is important to weigh up the pros and cons of making a change.

- The pros of making lifestyle changes are the helpful effects that happen as a result of these changes, such as potentially lowering your risk of breast cancer or other diseases.
- The cons of making changes are the chances that something unwanted or unexpected could happen to you because of the differences you have made.

For example, taking hormone replacement therapy may increase your risk of breast cancer and of other conditions, such as heart disease or stroke. However, HRT is very effective at reducing severe menopausal symptoms. So, if you are considering starting or stopping HRT, you and your doctor should think about the pros and cons to all aspects of your health and quality of life, not just your breast cancer risk.

The decision to make changes can be difficult. The best choice for you depends on your personal situation and may change over time. Every choice involves thinking through the helpful effects as well as the possible unwanted effects.

You should talk about any changes you decide to make with your doctor and decide together which pros and cons are most important to you.

For more information on factors you can change, see the 'Our lifestyles and life choices' section on page 24.

**What can
affect risk?**





Increase in risk

Established factors:

age, alcohol, being female, being taller, early puberty, genetics – breast cancer in the family, high breast density, hormone replacement therapy (HRT), ionising radiation, late menopause, other breast conditions – proliferative benign breast disease, the pill, weight and weight gain

Possible factors:

bigger size at birth, in vitro fertilisation treatment, shiftwork – working at night, smoking, stress



Decrease in risk

Established factors:

being shorter, breastfeeding, early menopause, late puberty, physical activity

Possible factors:

aspirin and ibuprofen, healthy diet, smaller size at birth



Affect risk in some instances

Established factors:

ethnicity, pregnancy

Possible factors:

miscarriage



No effect on risk

Doubtful factors:

abortion, breast implants, bumping or bruising the breast, chemicals in the environment, deodorants, antiperspirants and shaving, non-ionising radiation, underwired bras

Our genes and bodies

How the genes we inherit from our parents and the characteristics of our bodies might affect our risk of developing breast cancer





Age

As you get older, your risk of breast cancer increases – for most women, getting older is their biggest risk factor for breast cancer. At least four out of five of all breast cancer cases in the UK are in women over the age of 50. Breast cancer is uncommon in women under the age of 40. In summary:

- Breast cancer is most common in older women
- Breast cancer is generally uncommon in younger women
- The risk of developing breast cancer increases as you get older

There isn't anything we can do about getting older. But all women should be breast aware. Women aged 50 to 70 are eligible for breast screening on the NHS and should receive an appointment every three years. In England the programme is being extended to include women aged 47 to 73. Women over 70 can continue to access screening by making their own appointments through their doctor or local breast screening unit.

For more information about being breast aware, see our TLC resources or breastcancer.org/tlc



Being taller

For women, being taller slightly increases the risk of developing breast cancer, while being shorter slightly decreases the risk. The taller you are, the slightly higher your risk of breast cancer.

Height is determined by the combination of our genes, nutrition and hormone levels during our developing years, but we still don't know exactly how height influences breast cancer risk.



Early puberty

Women who started their periods at an early age have a slightly increased risk of breast cancer. The earlier you began your periods, the higher your risk, but this effect is small and gradual. Your risk of breast cancer will not be dramatically increased if you started your periods just before 13 (which is the average age).

The increase in risk of breast cancer seen with early puberty is probably because these women are exposed to the naturally occurring female hormone oestrogen for longer than women who started their periods later.





Ethnicity

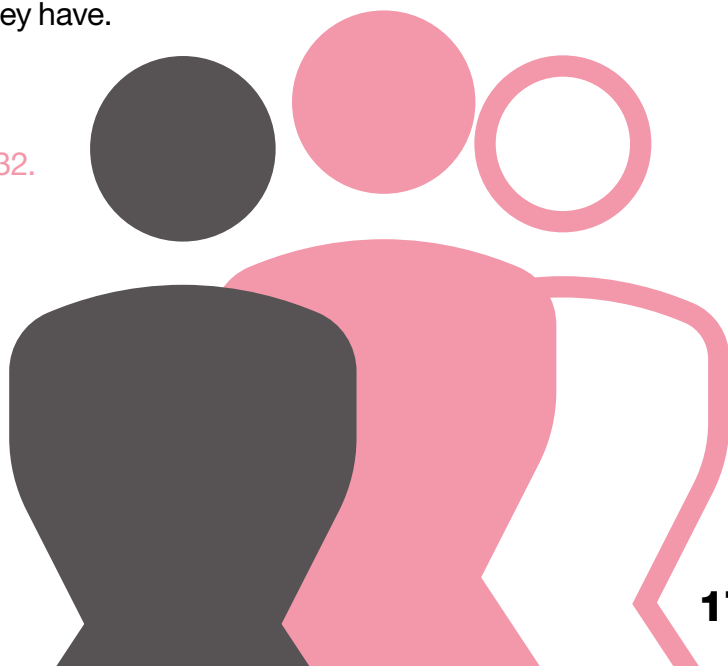
Your ethnic background affects your risk of developing breast cancer. Studies based in England show a white woman is more likely to develop breast cancer than a black, Asian, Chinese or mixed-race woman.

The difference in risk of breast cancer across different ethnic groups may be due to genes, although more research is needed to determine how much this plays a part. The difference could also be due to different cultures and lifestyle choices, such as the age women have their first child and the number of children they have.

For more on pregnancy, turn to page 32.

We know that people of certain ethnic groups have a higher risk of breast cancer because they are more likely to carry certain faults in their genes. For example, Ashkenazi Jewish and Icelandic women have a higher risk of carrying inherited faults in breast cancer genes, such as BRCA1 or BRCA2, which are known to increase the risk of developing breast cancer.

For more information about inherited faults in BRCA1 and BRCA2 genes, see the next page.



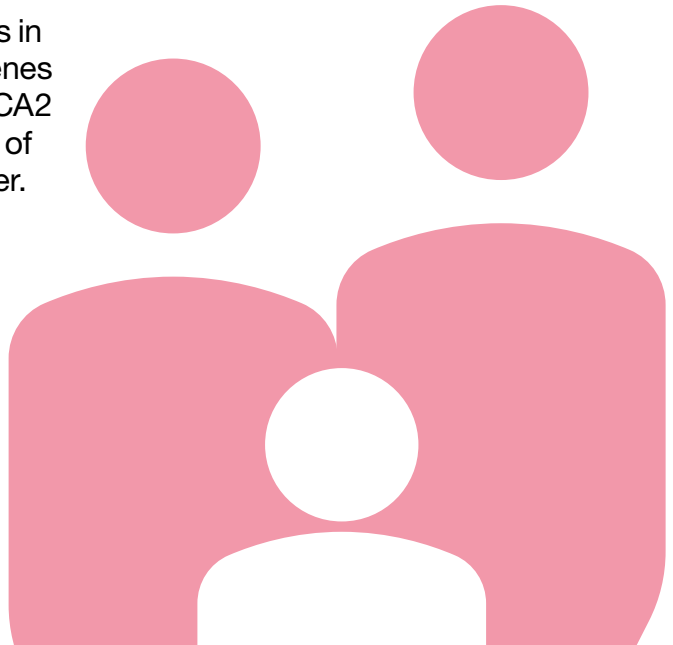


Genetics – breast cancer in the family

Most cases of breast cancer are not related to an increased risk due to family history. However, up to 15 in every 100 women with breast cancer have a family history which is likely to have contributed to why they developed the disease. Of all women who develop breast cancer, about one in 20 has inherited a fault in a gene linked to breast cancer.

The cells in our bodies each contain thousands of genes, which we inherit from our parents. These provide instructions to tell our cells how to function. People who have inherited faults in known breast cancer genes – such as BRCA1 or BRCA2 – have an increased risk of developing breast cancer.

People with a family history of breast cancer tend to have an unusually high number of close relatives (parents, siblings or children) on one side of the family who've experienced breast cancer and/or relatives who developed breast cancer at a young age. Other factors that are considered in determining a family history are cases of ovarian cancer, male breast cancer, cancer in both breasts or having an Ashkenazi Jewish ancestry. When thinking of family history, you should look at your mother's and father's side of the family separately.



The following are examples of a family history that may suggest breast cancer runs in the family:

- Your mother, sister or daughter was diagnosed with breast cancer before she was 40.
- Two of the following have been diagnosed with breast cancer: your mother, sister(s) and/or daughter(s).
- Your mother, sister or daughter has been diagnosed with breast cancer, as well as your grandmother, aunt or niece on the same side of the family.

There are also other patterns of family history.

If you have a family history of breast cancer, you may be at increased risk of developing the disease. Women with a particularly strong family history have a high risk of breast cancer and could have inherited BRCA1 or BRCA2 faults that run in the family.

If you have concerns about any cancers in your family then you should see your doctor. He or she will ask you about any cancers in your family to work out whether your family history suggests you have an increased risk of breast cancer and help you to consider the best options for you. If your doctor feels that your family history suggests you may be at increased risk, he or she may refer you to a genetics clinic or family history clinic for specialist care.

However, it is important to recognise that four out of five breast cancers are **not** related to a family history. Having one relative who was diagnosed with breast cancer over the age of 40 would usually not count as a family history strong enough to suggest you might be at increased risk of developing breast cancer.

For more information about services for people with a family history of breast cancer visit breastcancer.org



**Increases
your risk**

High breast density

The amount of fat and breast tissue women have in their breasts can differ greatly from woman to woman. The amount of breast tissue compared to breast fat is known as 'breast density'. Having high breast density is one of the biggest risk factors for breast cancer.

Women with breasts that have a comparatively high amount of breast tissue to fat (known as 'high breast density') have a greater risk of breast cancer than women with a comparatively lower amount of breast tissue to fat (less dense breasts).

Most women will not know the density of their breasts. Although there are some factors that affect breast density, there is not a straightforward link between our weight or overall body fat and our breast density, and there are no established ways for women to reduce their breast density.

The density of your breasts tends to gradually fall over time, but because age is also a risk factor for breast cancer, this does not mean that your risk of breast cancer reduces as your breasts change. In fact, your risk of breast cancer increases as you get older.

All women should be breast aware. If you notice any unusual changes to your breasts, check this with your doctor. Women aged from 50 to 70 are eligible for breast screening on the NHS and should receive an appointment every three years. In England the programme is being extended to include women aged 47 to 73. Women aged over 70 can continue to access screening by making their own appointments through their doctor or local screening unit.



Late menopause

Women who go through the menopause later than average have a slightly increased risk of breast cancer. The later you go through menopause, the higher your risk, but this effect is small and gradual. Your risk of breast cancer will not dramatically increase if you enter the menopause just after 52 (which is the average age in the UK).

The increase in risk of breast cancer seen in women who have a late menopause is probably because these women are exposed to the naturally occurring female hormone oestrogen for longer than women who go through the menopause earlier.

Some women undergoing the menopause choose to take hormone replacement therapy (HRT) to treat their symptoms. It is important to remember that HRT also affects breast cancer risk (see page 28).



**Increases
your risk**

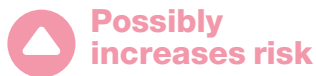
Other breast conditions – proliferative benign breast disease

A few – but not all – benign breast conditions have been linked to an increased risk of breast cancer. There are many different types of benign (non-cancerous) breast conditions and most do not have any effect on the risk of developing breast cancer.

If you have a benign breast condition where the breast cells are described as ‘proliferative’ (which means that the cells are growing too quickly) then your risk of breast cancer will be increased. The size of this increase will depend on the exact type of proliferative benign breast disease you have, as well as any other risk factors you have for breast cancer.

Benign breast conditions where the cells are proliferative are uncommon. Most benign breast conditions (for example, cysts and simple fibroadenomas) do not increase the risk of breast cancer.

If you have had a diagnosis of a benign breast condition and are unsure or worried about your breast cancer risk, you should speak to your doctor.

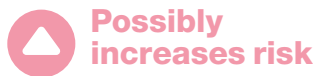


Bigger size at birth

It is possible that women who were longer when born have a slightly greater risk of developing breast cancer than women who were smaller or lighter at birth.

We don't know exactly why this might occur, but there are a number of possible explanations.

- Exposure to different levels of hormones in the womb may not only affect the size of a baby but also her risk of breast cancer in adult life.
- Women who were longer at birth tend to be taller adults, and being tall slightly increases a woman's risk of breast cancer.
- Being longer at birth is associated with early puberty, which is also associated with a slightly increased risk of breast cancer.



Miscarriage

Results of studies looking at a possible link between miscarriage and breast cancer do not all agree.

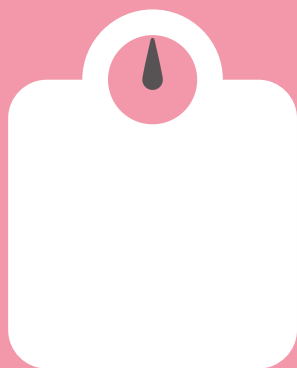
A few studies looking at whether or not there is a link between miscarriage and breast cancer have not found a link.

It is possible that there might be a link for women who have had more than one miscarriage, or that having a miscarriage increases a woman's risk of getting breast cancer later in life, when she has been through the menopause.

There are a few studies suggesting that having a miscarriage may reduce a woman's risk of breast cancer. However, the evidence is quite weak. More research is needed before we can be sure whether or not miscarriage affects breast cancer risk, and how.

Our lifestyles and life choices

How our lifestyle choices and the way we lead our day-to-day lives might affect our risk of developing breast cancer





Alcohol

Regularly drinking alcohol (even one drink a day) increases your risk of developing breast cancer. In the UK experts estimate 6 out of 100 breast cancers in women are linked to drinking too much alcohol.

For every 100 women who drink one typical drink a day (for example, a pint of lager or standard 175ml glass of wine) there will be an extra two women who develop breast cancer when compared with 100 women who don't drink alcohol at all.

The more drinks that you have each day, the greater your risk of breast cancer will be.

If you drink alcohol, the size, alcohol content and number of drinks you have regularly will affect your risk of breast cancer. All types of alcohol, including wine, beer and spirits, are associated with an increased risk of breast cancer.

Increasing risk of breast cancer with greater alcohol consumption:

Units per day	Example drinks	Women developing breast cancer, on average
None	Non-alcoholic	11 out of 100
Two	One standard (175ml) glass of wine / one pint of ordinary strength lager / a double measure of spirits	14 out of 100
Four	Two standard (175ml) glasses of wine / two pints of ordinary strength lager / two double measures of spirits	16 or 17 out of 100

It's not yet known whether binge drinking (having six or more units in one day) on just one or two days of the week leads to a higher risk of breast cancer than drinking an equivalent amount spread evenly throughout the week. Although there has been little research on the effects of binge drinking on breast cancer risk, we think all women should avoid binge drinking because it is associated with other health problems.

Unlike some other established risk factors for breast cancer, alcohol consumption is something you can change. If you want to reduce your risk of breast cancer, Breast Cancer Now recommends you limit your alcohol intake. National health guidelines recommend that women drink no more than two to three units of alcohol per day for general health.

For more information, see our fact sheet *Alcohol and breast cancer risk* available at breastcancer.org

If you are worried about your alcohol consumption or would like advice and support about cutting down your drinking, you should visit your doctor. Information and advice is also available from NHS Choices (www.nhs.uk).





Reduces
your risk

Breastfeeding

Breastfeeding your children slightly reduces your risk of breast cancer and the longer you breastfeed in total, the more your risk of breast cancer is reduced. For example, breastfeeding one child for one year would lower your risk of breast cancer as much as breastfeeding two children for six months each.

Breastfeeding may reduce breast cancer risk by altering the balance of hormones in the body and by delaying the return of a woman's periods.

There are many important benefits associated with breastfeeding for both mother and child, but the decision to breastfeed needs to be a personal one. While many women breastfeed, not all women choose to and others find it difficult or are unable to for a number of reasons.

National health guidelines recommend that women breastfeed exclusively for the first six months of an infant's life as it provides all the nutrients a baby needs. After that, giving your baby breast milk alongside other food will help them continue to grow and develop healthily.

If you are breastfeeding, you should examine your breasts for any unusual changes. It is common for breasts to be lumpy during breastfeeding, but if you notice anything unusual or have any concerns, talk to your doctor.



Hormone replacement therapy

Taking hormone replacement therapy (HRT) to treat menopausal symptoms increases your risk of breast cancer; this risk increases the longer you use HRT. The risk is greater with combined HRT (oestrogen and progesterone) than with oestrogen-only HRT. A steroid-based HRT called tibolone (also known as Livial) may also increase the risk of breast cancer.

The good news is that the increase in breast cancer risk begins to fall as soon as you stop taking HRT, no matter how many years you've taken it. Within five years of stopping HRT, your risk of developing breast cancer is about the same as if you had never taken it.

There are other ways you may be able to reduce menopausal symptoms other than by taking HRT. Some people find being physically active and cutting out caffeine and nicotine can help. If you are considering taking, or stopping taking, HRT you should speak to your doctor. Your decision should take into account the impact of menopausal symptoms on your life, your medical history, the pros and cons of HRT and your own preferences.

Experts recommend using the lowest effective dose of HRT necessary to relieve menopausal symptoms and for the shortest possible time.

If you are taking HRT, you should review your therapy and general health with your doctor at least once a year.

For more information, see our fact sheet *Hormone replacement therapy (HRT) and breast cancer risk* available at breastcancer.org





Reduces
your risk

Physical activity

Thirty minutes of daily physical activity (or 3.5 hours a week) can reduce your risk of breast cancer by at least 20 per cent. Physical activity doesn't only include structured exercise, but other every day activities, such as walking, housework, cycling at a casual pace, actively playing with children and gardening.

If every woman in the UK was physically active, one in six cases of breast cancer could be avoided – that's nearly 9,000 breast cancer cases each year.



We don't yet know how physical activity reduces breast cancer risk, but we do know that regular activity can help to prevent weight gain, which increases breast cancer risk (see page 33). A number of research studies show that it doesn't matter what sort of moderate activity you do, it is the total amount that makes a difference. The important thing is that the activity gets you warmer and breathing harder, and your heart beating faster. You should still be able to carry on a conversation.

Regular physical activity is good for your health in many other ways too. It reduces the risk of diseases such as heart disease, diabetes, stroke and osteoporosis, as well as other cancers such as bowel cancer.

It can also help improve energy levels and feelings of general wellbeing.



Some studies have looked at the effect of physical activity during childhood on breast cancer risk, but the results do not all agree. Just over half showed that being physically active in childhood or adolescence reduces the risk of breast cancer in adulthood, while others found no link. More research is needed before we can be sure whether or not there is a link.

However, physical activity in childhood has other benefits, and developing healthy habits in childhood may help people to follow a healthy lifestyle later in life.

For more information about being physically active, visit brisk.breastcancer.org

The pill

Taking the pill (combined contraceptive pill) slightly increases your risk of breast cancer. Ten years after stopping the pill this increased risk will have disappeared and your chance of developing breast cancer will be about the same as that of a woman who has never taken the pill.

It is important to keep in mind that breast cancer is rare in women under the age of 40, regardless of whether or not they use the pill.

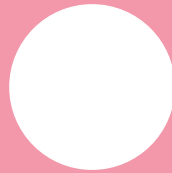
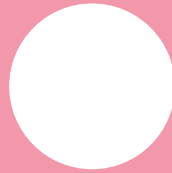
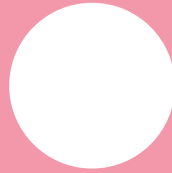
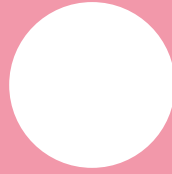
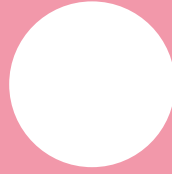
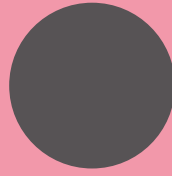
Over the past 30 years, the levels of the female hormone oestrogen in the combined pill have decreased. It is not yet clear whether the modern, low doses in the combined pill are associated with the same breast cancer risk as the older, higher dose pills.

While the combined pill is the most commonly used contraceptive pill, some women use the progestogen-only pill (or 'mini-pill'). Further research is needed before we can be sure

of the level of risk associated with taking this type of pill. There is currently not enough evidence to determine whether or not there is a link between other forms of hormone-based contraception and breast cancer, such as contraceptive implants and the hormone-containing coil (levonorgestrel intrauterine system [IUS]).

You should speak to your doctor if you are thinking of taking, or stopping taking, the pill. The decision to use the pill needs to be an informed choice, made by you, with the help of your doctor or family planning clinic. This decision should take into account the pros and cons of taking the pill, medical history, lifestyle, individual preferences and alternative methods of contraception.

For more information, see our fact sheet *The pill and breast cancer risk* available at breastcancernow.org

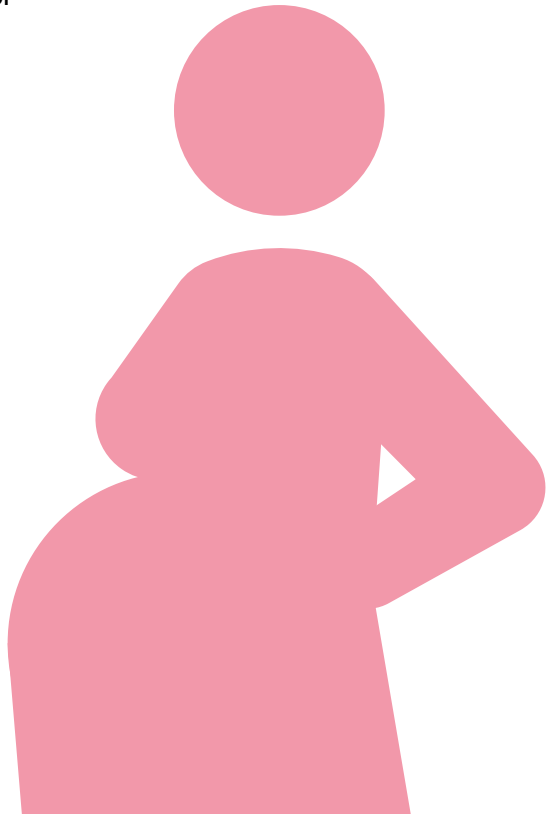


Pregnancy

Having children has a complex effect on breast cancer risk. Overall, in the long term, pregnancy reduces the risk of breast cancer.

Having children affects breast cancer risk in different ways:

- Women who have had children are at lower risk of breast cancer in the long term than women who have not had children. The more children you have, the greater the decrease in risk.
- The age at which you have children affects your risk of developing breast cancer. The earlier a woman begins her family, the lower her risk of breast cancer.
- In the short term, research studies suggest that your risk of breast cancer slightly increases after you give birth, regardless of your age. We don't know the reasons for this, but it may be caused by hormone changes. This increase in risk is temporary, lasting a number of years, and it is important to remember that breast cancer is rare in women under 50.





Weight and weight gain

Being overweight or obese generally increases your risk of breast cancer.

The main links between weight and an increased risk of breast cancer:

- Putting on weight in adulthood (after the age of 18) increases your risk of developing breast cancer after the menopause. The more weight a woman gains over the course of her adult life, the higher her risk of developing breast cancer will be after she has gone through the menopause.
- Being overweight or obese after the menopause increases your risk of breast cancer. This is likely to be because fat tissue becomes your main source of the female hormone oestrogen after you have been through the menopause. The more body fat you have, the higher your levels of oestrogen are likely to be and this, in turn, may increase your risk of breast cancer.

Regardless of whether or not you have been through the menopause, gaining weight and being overweight or obese are associated with a variety of health problems, including increased risks of heart disease, high blood pressure, diabetes, arthritis and several other types of cancer. Maintaining a healthy weight throughout life can help to reduce the risk of many diseases as well as promoting general good health. If you are concerned about your weight, you should visit your doctor for information on the best way to maintain a healthy weight.

For more information, see our fact sheet *Weight and breast cancer risk* available at breastcancer.org



**Possibly
reduces risk**

Healthy diet

Over the past few decades there have been many studies looking at whether or not there is a link between diet and breast cancer.

Despite this, the link between diet or individual foods and breast cancer is not clear.

What we do know is that diets high in fat or sugar can lead to weight gain and obesity. Being overweight after the menopause or gaining weight in adulthood can increase breast cancer risk (see page 33).

There have not been many studies looking at the effect of childhood diet on breast cancer risk. So far, there is not enough research evidence for us to know whether or not there is a link between what a girl eats in her childhood and her risk of breast cancer in the future.

Why are the facts on individual dietary factors unclear?

For some dietary factors there is not yet enough evidence for us to know whether or not they affect a woman's risk of developing breast cancer, and for other dietary factors the findings of different studies do not agree.

One of the reasons why the effect of diet on breast cancer is hard to research is that we all eat a variety of different foods. Our diet also changes over time and is very hard to measure throughout life. Separating out the individual effects of one part of our diet (such as dairy products or fruit and vegetables) on breast cancer risk is very difficult.

Diet is also closely related to other lifestyle factors. For example, someone who eats a balanced diet with lots of fruit and vegetables may be more likely to exercise regularly than someone who eats a diet high in fat and sugar with few fruit and vegetables. It is hard for researchers to untangle the separate effects of closely related lifestyle factors and be sure that it is the dietary factor and not something else that is changing the risk of breast cancer.

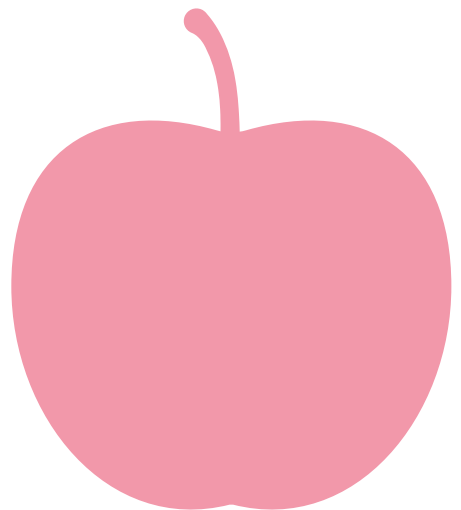
Maintaining a healthy diet

A healthy diet might help to reduce breast cancer risk by helping women maintain a healthy weight. We also know that there are many other good reasons for eating a healthier diet – it lowers the risk of many other diseases, including heart disease, type 2 diabetes and several other forms of cancer.

Breast Cancer Now recommends a varied, balanced diet for general health and wellbeing. A varied, balanced diet is rich in fruits, vegetables, pulses and whole grains and is limited in red meat, processed meat, animal fat, sugary or fatty processed food, salt and alcohol.

More information on alcohol and breast cancer is provided on page 25.

For more information on how to maintain a healthy, balanced diet, you may wish to speak to your doctor or visit the NHS Choices website (www.nhs.uk).





**Possibly
reduces risk**

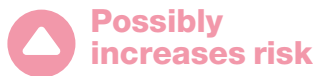
Aspirin and ibuprofen

Taking aspirin or ibuprofen might slightly reduce the risk of breast cancer, but we don't recommend that you take these drugs solely to lower their risk of breast cancer.

Aspirin and ibuprofen are types of non-steroidal anti-inflammatory drugs (NSAIDs). Taking these drugs might slightly reduce the risk of breast cancer, but not all studies agree. In addition, we do not know how different doses of these drugs affect breast cancer risk or for how long they would need to be taken to have an effect.

NSAIDs, including aspirin and ibuprofen, can have serious side effects when taken over a long period, including stomach ulcers, anaemia and, less commonly, heart problems. It is important that women who want to take these drugs regularly for any reason consult their doctor first. Because we don't know enough about how these drugs affect breast cancer risk, Breast Cancer Now does not recommend that women regularly take them in order to lower their risk of breast cancer.





In vitro fertilisation treatment

It is unclear whether in vitro fertilisation (IVF) treatment affects the risk of breast cancer because only a very small number of studies have looked into this. IVF treatment increases the levels of female hormones such as oestrogen in the body, which is why some people speculate it may increase the risk of breast cancer.

One study suggests that, overall, women who have received IVF treatment are no more likely to develop breast cancer than women who have not had IVF. Although women undergoing IVF may have a slightly higher risk of breast cancer in the first year after treatment, this risk disappears in the following years.

It may be that having IVF over the age of 30 or 40 slightly increases your risk of breast cancer, but until more research is available we will not know whether or not this is the case.

IVF is a relatively new procedure and we don't know its long-term health effects. If you are worried about IVF treatment and breast cancer risk you should discuss your concerns with your doctor or fertility specialist.





**Possibly
increases risk**

Smoking

Smoking may increase your risk of developing breast cancer, but there is not enough evidence for us to be sure.

Recently, some studies have shown that smoking increases the risk of breast cancer; however, some older studies did not find a link.

There is some evidence that the younger you started smoking, the greater your risk of breast cancer, particularly if you started smoking before you started having children. Also, it may be that the more heavily you smoke and the longer you smoke during your lifetime, the greater your risk of breast cancer.

Some researchers have looked at the effect of other people's smoke (passive smoking) on a woman's risk of developing breast cancer. The results of these studies do not agree and it isn't clear whether or not there is a link.

Regardless of any potential breast cancer risk, smoking is a major cause of lung cancer and other cancers, as well as heart disease – all women and men are strongly advised not to smoke by health professionals, the government and health charities.

For information and advice on stopping smoking, contact your doctor or visit the NHS Choices website (www.nhs.uk).





Abortion

It is unlikely that having an induced abortion (a planned termination out of choice or medical necessity) affects your risk of developing breast cancer.

Some people claim that having an abortion increases the risk of breast cancer because it disrupts the natural development of breast cells during pregnancy, making them susceptible to changing into cancerous cells. This claim is not supported by scientific or clinical evidence.

Some early, less well-designed studies suggested that abortion might increase the risk of breast cancer; however, over the past 20 years, several well-designed studies have shown this is not the case.



Breast implants

Breast implants (silicone, saline or PIP) do not increase your risk of breast cancer.

Women with implants should let their screening service know they have implants before attending breast screening appointments. Implants make it harder for the radiographer to see breast tissue during breast screening, so they may wish to take additional x-ray images from different angles to be sure that all of your breast tissue is completely examined. They may also want to check the images straight away to make sure they are suitable, which means your screening needs to take place at a unit with digital technology.

All women, whether or not they have implants, should be breast aware. If you notice any unusual changes to your breast, check this with your doctor. For more information on being breast aware see our TLC (Touch Look Check) resources or breastcancernow.org/tlc



**Does not
affect risk**

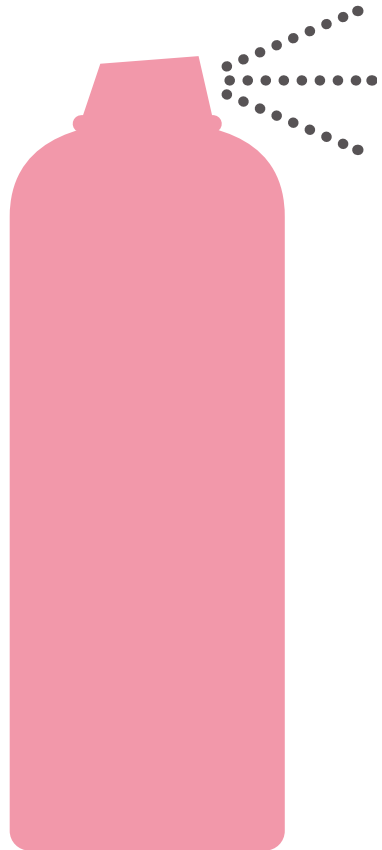
Deodorants, antiperspirants and shaving

Using deodorants or antiperspirants does not increase your risk of breast cancer.

Claims that deodorant or antiperspirant use increases the risk of breast cancer have been circulating since 1999. More recently, there have been claims that aluminium in antiperspirants can cause breast cancer. Aluminium salts are commonly used as an ingredient in antiperspirants as they block the sweat ducts and stop sweating.

There is no good evidence to support these claims.

Women are advised to avoid using a deodorant, antiperspirant or talc containing aluminium when they go for a mammogram only because the aluminium might show up on the x-ray image and give an inaccurate reading.





**Does not
affect risk**

Underwired bras

Wearing underwired bras does not increase your risk of breast cancer, despite some claims. Women need not be concerned about wearing any type of bra.

A good-fitting bra provides support. Women should be properly measured for their bras, which should be tried on to ensure a good fit. Bras that do not fit properly can cause discomfort and breast or back pain.



Our environment

How what we are exposed to in our lives, including from the surrounding environment, might affect our risk of breast cancer





Ionising radiation

While exposure to high levels of ionising radiation increases the risk of many cancers, the risks associated with mammograms and other x-rays are very small.

We can be exposed to ionising radiation through:

- Natural sources including the ground, food and cosmic rays (which come from outer space and are found in the earth's atmosphere).
- An atomic bomb explosion or radiation accident.
- Medical x-rays (including mammograms) and radiotherapy.

Non-ionising radiation is different and is not linked to an increased risk of breast cancer (see page 48).

Medical x-rays (including mammograms)

The amount of radiation you receive while undergoing a mammogram or other x-ray is very low. For example, the radiation exposure through a standard hospital x-ray is similar to the radiation you would be naturally exposed to over just a few days in your day-to-day life.

The health risks associated with this small exposure to ionising radiation are very small and are greatly outweighed by the benefits when x-rays are used appropriately.

If you have concerns about undergoing an x-ray or mammogram, we recommend that you talk this through with a healthcare professional.

Radiotherapy treatment

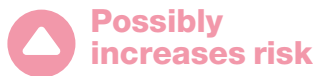
Radiotherapy in the chest area can be used to treat Hodgkin's lymphoma (also known as Hodgkin's disease) and conditions such as some cancers and respiratory diseases. Women who received this type of radiotherapy before 2000 and when they were younger than their early 30s have an increased risk of developing breast cancer later in life. This is particularly the case for women who received radiotherapy during their developmental (teenage) years.

Since the early 2000s, the standard method of chest radiotherapy has changed and the risk of developing breast cancer later in life should be lower than with previous methods; however, more research is needed before we can be sure of the long-term effects of this more recent treatment.

The individual risk for any woman will depend on many factors, including the age when you were treated, the dose and type of radiotherapy you received, your current age and the amount of time that has gone by since you had your treatment.

If you have been treated with radiotherapy for Hodgkin's lymphoma you should have been contacted by the lymphoma team or radiotherapy centre that treated you to discuss your breast cancer risk and options for breast cancer screening. If you have not been contacted but think you might be at risk, please contact the Lymphoma Association (contact details can be found on page 51).

If you received radiotherapy treatment for other conditions before the early 2000s and are concerned that this may affect your risk of developing breast cancer, we suggest that you discuss this with your doctor.



Shiftwork – working at night

Women who regularly work shifts, particularly women who work night shifts, may have a slightly increased chance of developing breast cancer than women who do not. Further studies are needed before we can know for sure whether shiftwork affects breast cancer risk, why this might happen and whether there are steps that women performing shiftwork can take to reduce their risk.

Shiftwork can include working during the night and other work patterns, including long shifts (such as 12 hours), early or late shifts, or working for more than the usual number of days before having days off. There is more evidence for a possible link between night shiftwork and breast cancer than for other patterns of shiftwork.

Experts believe that shiftwork might increase the risk of breast cancer because women are exposed to light at night, but we are not sure why. Some studies in the laboratory have shown a lack of darkness may reduce the

production of a hormone called melatonin, which might normally play a role in suppressing the growth of breast cancer. However, it has not yet been proven that reduced levels of melatonin in women working shifts are associated with breast cancer risk.

Another theory is that women working shifts have lower levels of vitamin D and that this affects their risk of breast cancer, but study results on this are not consistent.

Shiftwork might also lead to unhealthy behaviour that could independently increase the risk of cancer, such as being overweight and not being physically active. This makes the effects of shiftwork on breast cancer risk difficult to untangle from other lifestyle factors.



**Possibly
increases risk**

Stress

We do not yet know whether stress increases the risk of breast cancer.

A possible link between stress and cancer is sometimes reported in the news. However, a number of studies have looked at the direct and indirect links between stress and breast cancer, and so far the overall evidence is not conclusive.

Stress is a highly subjective state so it is difficult to measure – how one person determines their stress levels can be very different from how another person does. Stress can also lead to unhealthy behaviour that could independently increase your risk of cancer, such as not being active, putting on weight and drinking alcohol. This makes the effects of stress on breast cancer risk difficult to pinpoint.



**Does not
affect risk**

Bumping or bruising your breast

There is no good evidence that a bump or injury to the breast, including through sport, increases your risk of breast cancer. Sometimes a woman might just check her breasts more carefully after bumping or injuring her breast, and so may notice an unusual change in her breast, such as a lump.



Chemicals in the environment

Overall, there isn't clear evidence that exposure to environmental chemicals increases breast cancer risk, based on the levels you would normally be exposed to in the UK. In general, levels of chemical pollutants in the environment are now declining, due to stronger regulations on their use.

There has been some concern that chemicals in the environment might have a role in increasing breast cancer risk, particularly endocrine-disrupting chemicals (EDCs). EDCs have a similar structure to the female hormone oestrogen. This means they may act like oestrogen or impact how oestrogen behaves. However, the hormone-like effects of these chemicals are thought to be far smaller than the effects of natural oestrogen.

Women who work in certain jobs, such as the manufacturing industry, can be exposed to higher levels of chemical pollutants, so they may be at

higher risk of breast cancer. It is important to remember that in the UK most dangerous chemicals have been banned for decades, and employers are now legally required to limit exposure to chemicals that may cause cancer.

Lots of studies have looked at the link between chemicals in our environment and breast cancer. It takes many years for most breast cancers to develop and it is very difficult to work out what chemicals women with breast cancer have been exposed to over the 10, 20 or even 30 years before their breast cancer is detected. It is also hard to isolate the effects of individual chemicals on breast cancer risk when we are exposed to low levels of thousands of chemicals during our lifetime.

Breast cancer is likely to be caused by many factors, and we don't know how the complex interactions between a person's genes, lifestyle and surrounding environment contribute to breast cancer development.

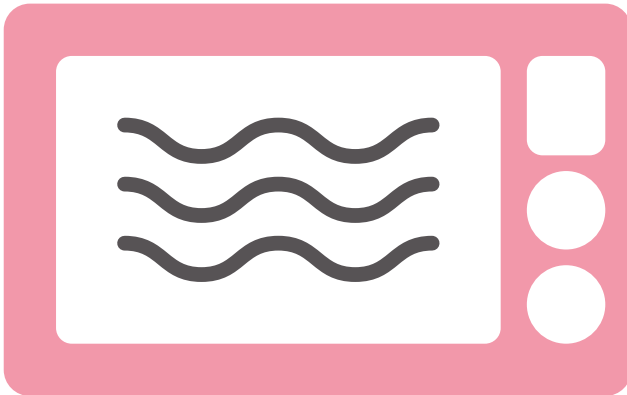


**Does not
affect risk**

Non-ionising radiation

There is no good evidence to suggest that exposure to non-ionising radiation – such as the radiation generated by mobile phone masts, TVs, microwave ovens and computers – has any effect on your risk of developing breast cancer.

Exposure to a different type of radiation (called ‘ionising radiation’) increases the risk of many cancers, including breast cancer (see page 43).



Further information

What should I do if I am worried about the risk factors mentioned in this booklet?

If you are worried about any of the breast cancer risk factors mentioned in this booklet you should discuss your concerns with your doctor.

Where can I get more information?

Breast Cancer Now has developed several free fact sheets that look in more detail at the effect of some factors on breast cancer risk.

For an up-to-date list of the fact sheets available visit breastcancernow.org/publications or contact the Breast Cancer Now Information Line on 0333 20 70 300.



About Breast Cancer Now

Breast Cancer Now is the UK's largest breast cancer charity, created by the merger of Breast Cancer Campaign and Breakthrough Breast Cancer.

Our cutting-edge research is focused entirely on breast cancer.

Right now, we're funding around £23 million worth of ground-breaking research projects, supporting nearly 450 of the world's brightest researchers at more than 30 institutions across the UK and Ireland. Together, they're working to discover how to prevent breast cancer, how to detect it earlier and how to treat it effectively at every stage so we can stop the disease taking lives.

Everything we do is rooted in the realities of women affected by breast cancer. We're the catalyst that connects the laboratory bench with the hospital bedside, the GP's office, the MP's surgery and the policies that govern our health service. And it's only by working together that we'll truly make an impact on this devastating disease.

If we all act now, we believe that by 2050 everyone who develops breast cancer will live. We need to invest at least £300 million in research over the next 10 years if we're to achieve these ambitious goals. Please join us and help support vital research into breast cancer now.



Other useful contacts

Breast Cancer Care

Provides support and information for people affected by breast cancer.

Freephone 0808 800 6000
(textphone 0808 800 6001)
(9am–5pm Mon–Fri,
or 9am–2pm Sat)

breastcancercare.org.uk

Cancer Research UK

Provides reliable, easy-to-understand patient information.

Freephone 0808 800 4040
(9am–5pm Mon–Fri)

[cancerresearchuk.org/
about-cancer](http://cancerresearchuk.org/about-cancer)

Lymphoma Association

Provides accurate medical information and support to lymphatic cancer patients, their families and friends.

Freephone 0808 808 5555
(9am–6pm Mon–Thu,
9am–5pm Fri)

lymphomas.org.uk

Macmillan Cancer Support

Provides practical, medical and financial support and pushes for better cancer care.

Freephone 0808 808 0000
(9am–8pm Mon–Fri)

macmillan.org.uk

NHS Direct

Provides health advice and information 24 hours a day.

Telephone 0845 46 47 (24 hrs)

nhsdirect.nhs.uk

NHS Choices

Provides online information from the NHS on conditions, treatments, local services and healthy living.

nhs.uk

WCRF

Provides information about cancer prevention.

wcrf.org

020 7343 4205

Contact us

Breast Cancer Now

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Ibex House
42–47 Minories
London
EC3N 1DY

38 Thistle Street
Edinburgh
EH2 1EN

We welcome feedback.
Please email comments to
info@breastcancernow.org
or call 0333 20 70 300.

breastcancernow.org

Where does the information in this booklet come from?

The information in this booklet is based on up-to-date research evidence and aims to give you the best information available. All information was reviewed by appropriate experts and people affected by breast cancer. We advise readers with concerns about breast cancer to discuss them with a healthcare professional.

If you would like more information about the sources of evidence on which this publication is based, please contact info@breastcancernow.org or call 0333 20 70 300.

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