

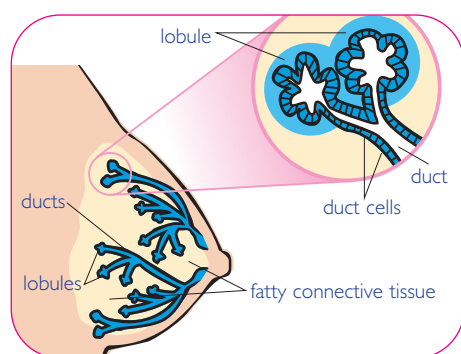
# briefsheets: Breast cancer

August 2006

Breast cancer is the most common cancer in the UK and accounts for more than a quarter of all cancers in women. Each year over 42,000 cases of breast cancer are diagnosed in the UK and the disease claims over 12,000 lives.\*

## About breast cancer

- More than 100 women in the UK are diagnosed with breast cancer every day.
- It is the second most common cause of cancer death in UK women, after lung cancer.
- The good news is that more women than ever are surviving the disease as a result of earlier detection and improved treatment.
- Men can also develop breast cancer, but this is rare. There are around 300 cases in the UK each year.\*



## What is breast cancer?

The breast is made up of millions of cells. Breast cancer develops when a single cell begins to multiply out of control and form a tumour. Some cells may break away and travel to other parts of the body starting new tumours. The breast consists of fatty tissue and lobules that are connected to the nipples by ducts. Breast cancer usually starts in a cell lining a duct or a lobule.

## Progress and future developments

- Breast cancer death rates have fallen by a fifth over the last ten years.
- Thanks to ongoing research into improved treatments, survival rates for breast cancer should continue to rise in the future.
- Clinical trials like IBIS-II are testing the effectiveness of drugs for preventing breast cancer in women at increased risk.
- Research into the genetic variations between breast tumours, and between patients, holds future promise in helping doctors tailor treatment to the individual.

## What affects your risk?

### Age

Breast cancer risk increases with age. Four out of five women diagnosed with the disease are over 50 years old.

### Family history

A woman's risk is higher if one or more close relatives (for example, her mother or sister) have been diagnosed with breast cancer. But most women with one or two affected relatives will still not develop the disease and most women with breast cancer do not have a family history.

### Menstruation and menopause

Women who start their periods at a younger age or have a late menopause have an increased risk of breast cancer.

### Hormone replacement therapy (HRT)

Women taking HRT are more likely to develop breast cancer, especially those taking combined oestrogen-progestogen HRT. This risk increases the longer a woman takes HRT, but falls back to normal within 5 years of stopping the treatment.

### The pill

The contraceptive pill causes a slight increase in breast cancer risk, but this gradually returns to normal once a woman stops taking it.

### Obesity

Being overweight after the menopause increases the risk of breast cancer because body fat affects levels of the female hormone oestrogen. Combining a balanced diet with regular exercise helps to maintain a healthy body weight.

### Alcohol

Drinking alcohol can increase the risk of breast cancer. The more a woman drinks every day, the greater her risk.

### Having children

The more children a woman has, and the younger she is when she has them, the lower her risk of breast cancer.

### Breastfeeding

Breastfeeding reduces the chances of developing the disease. The longer a woman breastfeeds her children for, the more she lowers her risk.

## Breast screening

The NHS breast screening programme was set up in 1988 with the aim of reducing the death toll from breast cancer. It now screens over one and a half million women each year. All women between the ages of 50 and 70 are invited for a free breast examination, using mammography, every three years. Thanks to screening and improved treatment, deaths from breast cancer have fallen dramatically.

## What is Cancer Research UK doing about breast cancer?

Cancer Research UK is the major funder of breast cancer research in the UK, with an annual spend of over £25 million. Our work covers all aspects of the disease, from understanding its molecular causes through to improving the lives of people with the disease. Across the UK, our research is revealing new ways for preventing, diagnosing and treating breast cancer – advances that will help save many lives in the future.

CANCER RESEARCH UK



\* latest available figure

# Breast cancer: our research

## *Understanding the causes*

Breast cancer is caused by damage to important genes, including those involved in the growth and survival of cells. This damage usually occurs during a woman's lifetime but, in rare cases, a faulty high-risk gene is inherited from the mother or father. Other factors like hormones and body weight, can influence the development of breast cancer. So a person's risk of the disease is determined by a complex interplay between their genes, their lifestyle and other factors.

### **Inherited susceptibility**

In the early-1990s, Cancer Research UK-funded scientists helped identify high-risk breast cancer susceptibility genes and led the world in discovering BRCA2. People who inherit faults in these genes have a high chance of developing breast cancer. But these faults are rare, causing just 2-5 per cent of cases. In Cambridge and London our scientists are making progress in understanding how faults in the genes BRCA1 and BRCA2 cause cancer. We are also looking for other inherited genes and subtle DNA variations that carry a more moderate risk of breast cancer but which may be more common in the population. Scientists in Cambridge have shown that a faulty version of CHEK2, a 'low-risk' breast cancer gene, doubles a woman's risk of the disease.

### **Breast cancer in the general population**

Most cases of breast cancer are 'sporadic', caused by a series of chance events that lead to DNA damage during a woman's lifetime. In Cambridge we fund a research team that established the first link between sporadic and inherited breast cancers. They found that, in some sporadic cases, cancer cells contained extra copies of a gene called EMSY. This is thought to turn off the BRCA2 gene, stopping it from working properly and allowing cancer to develop. Ground-breaking discoveries like this provide new leads for diagnosing and treating breast cancer.

### **Hormones and HRT**

Levels of the hormone oestrogen vary during a woman's lifetime and will influence her breast cancer risk. Oestrogen levels change dramatically during puberty, pregnancy and the menopause, and are affected by HRT and the oral contraceptive pill. Our scientists in Oxford are co-ordinating the Million Women Study – the largest study of its kind – to

investigate the effect of HRT on breast cancer risk. They showed that current or recent use of HRT can increase a woman's risk of breast cancer, especially in those who have taken the combined form of HRT for several years.

### **Diet**

The food we eat affects our breast cancer risk, but we don't fully understand which dietary factors are important. We are helping to fund the UK arm of a major study called EPIC (The European Prospective Investigation into Cancer and Nutrition). EPIC is investigating the eating habits of more than 500,000 people across Europe to unravel the role of diet in the development of cancer risk. The study has already confirmed that being overweight or obese increases the risk of breast cancer in post-menopausal women.

## *Improving treatment*

Cancer Research UK is committed to improving survival and quality of life for breast cancer patients. To this end, we are identifying new and better combinations of chemotherapy, radiotherapy and hormone treatments.

Cancer Research UK-funded scientists in Sutton are co-ordinating a number of national breast cancer trials. One trial is investigating a new and more specific method of delivering radiotherapy to women with early breast cancer. The technique, called IMRT (intensity modulated radiotherapy), will be tested in 3,000 women to see if it can reduce possible side effects such as swelling of the arm, known as lymphoedema.

We are also funding research throughout the UK to develop new approaches to treatment. These include targeting and shutting down a cancer's blood supply and blocking the spread of breast cancer cells to other parts of the body. Identifying protein patterns that distinguish between different subtypes of breast cancer will help doctors tailor and target treatment to individual patients in the future. And in Scotland and Northern Ireland we're working on drug resistance, a major hurdle in breast cancer treatment.

Chemotherapy can sometimes damage the ovaries in women who have not been through the menopause. Cancer Research UK is funding a national trial, co-ordinated by researchers in Wales, to find out if pre-treatment with a specific type of hormone

therapy can prevent this damage. This could help younger women with breast cancer maintain their fertility after treatment.

## *Prevention and early detection*

Early detection of breast cancer is crucial. The sooner the disease is detected, the easier it is to treat successfully. Routine screening of the general population can pick up breast cancers at an early stage. And identifying the genes that cause breast cancer in families and developing of genetic testing will help those at highest risk. Our work on the impact of reproductive and lifestyle factors on breast cancer risk is highlighting potential new strategies for preventing the disease.

### **Prevention**

Many breast cancer patients are treated with anti-oestrogen drugs, like tamoxifen, that are designed to stop the growth of cancer cells and help prevent the disease from returning. Our scientists in London co-ordinated an international study, which showed that tamoxifen could also be used to prevent breast cancer in women at increased risk. They are now leading a follow-up study to investigate if the drug anastrozole could be more effective at preventing breast cancer and have fewer side effects.

### **Screening**

Cancer Research UK-funded scientists in London are helping to evaluate the NHS breast screening programme and ensure that the service continues to improve. And researchers in Sutton are investigating alternatives to mammography for women at greater risk.

## *Improving quality of life*

Cancer Research UK is committed to improving the quality of life for cancer patients and supporting them and their families.

Our researchers in London have shown why some older women delay in going to the doctors with breast cancer symptoms. Strategies to combat this problem are now being developed. Another team in London is studying why some women experience extreme tiredness after breast cancer treatment. And in Edinburgh our researchers are devising new ways to help women with breast cancer cope with depression, using specially trained nurses who work alongside patients.