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## Breast cancer

### What is breast cancer?

Breast cancer forms in the tissues of the breast, usually the ducts (tubes that carry milk to the nipple) and lobules (glands that make milk). Early stage breast cancer refers to cancer that is confined to the fatty tissue of the breast. It may then spread to underlying tissues of the chest wall, when it is said to be locally advanced. When it spreads to other parts of the body it is called metastatic breast cancer. In breast cancer, approximately 15 -20% of tumours strongly over-express HER2 and this is known as HER2-positive breast cancer.<sup>i</sup> If untreated, HER2-positive breast cancer is associated with a relatively poor overall prognosis with faster time to relapse or progression than HER2-negative breast cancer.

### Prevalence

Breast cancer is the most common cancer among women worldwide. Each year about 1.4 million new cases of breast cancer are diagnosed worldwide, and over 450,000 people die of the disease annually.<sup>ii</sup> Although it is rare, men can also be diagnosed with breast cancer, accounting for less than 1% of all breast cancer diagnoses worldwide.<sup>iii</sup>

### Risk factors

#### There are a number of risk factors for breast cancer including:

- Age: The majority of breast cancer cases occur in women over the age of 50<sup>iv</sup>
- A personal or family history of breast cancer<sup>v</sup>
- A history of benign breast diseases<sup>v</sup>
- A late first pregnancy<sup>v</sup>
- Prolonged exposure to hormones, for example, a long menstrual life or use of hormone replacement therapy after the menopause<sup>v</sup>
- Lifestyle factors including being overweight or obese after the menopause, physical inactivity, a high fat diet<sup>vi</sup> and high alcohol consumption<sup>v</sup>

These risk factors have been identified through many epidemiological studies. Having a risk factor, or even several, does not mean that you will get the disease. Most women who have one or more breast cancer risk factors never develop the disease, while many women with breast cancer have no apparent risk factors. Even

when a woman with risk factors develops breast cancer, it is hard to know just how much these factors may have contributed to her cancer.

### **Symptoms**

Early stage breast cancer can often present without symptoms. However, symptoms of breast cancer may include:

- A hard lump developing in the breast or armpit; typically painless and occurring on one side only
- A change in the size or shape of the breast
- Changes in the skin such as dimpling, puckering or redness
- Changes in the nipple such as the secretion of unusual discharge or a rash around the nipple area

### **Management of breast cancer**

Current treatments for breast cancer include surgery, radiotherapy, chemotherapy, hormonal and biological therapies. These therapies may be used alone or in combination depending on the stage of the disease.

**Surgery (lumpectomy\* or mastectomy\*\*):** This is the main treatment option for patients whose breast cancer has not spread to other parts of the body (e.g. to the chest wall or lungs), and may be used in combination with radiotherapy or chemotherapy. In addition, surgery may be an option for patients with cancer that has spread to other parts of the body.

**Radiotherapy:** Therapy with radiation, or radiotherapy, is directed to the site of the tumour and may be used in addition to surgery and chemotherapy to reduce the chances of the cancer recurring. This type of treatment (i.e. after surgery) is often called adjuvant therapy. Radiotherapy may also be given in conjunction with chemotherapy prior to surgery (neo adjuvant therapy), to shrink the tumour, which can improve the outcome after surgery. Finally, radiotherapy can be used in patients with advanced metastatic breast cancer to help alleviate symptoms.

\* Lumpectomy refers to the surgical removal of a discrete lump in the breast with the aim of conserving as much of the surrounding breast tissue as possible.

\*\*Mastectomy refers to the surgical removal of one or both breasts.

**Chemotherapy:** Chemotherapy may be given prior to surgery with the aim of reducing tumour size, so that the surgery may not need to be as extensive. This is referred to as neoadjuvant chemotherapy. Chemotherapy is most often given after surgery, which is referred to as adjuvant chemotherapy, to reduce the chances of the cancer coming back. When the cancer has spread to other parts of the body, palliative chemotherapy may be used to reduce symptoms, improve quality of life and extend survival for as long as possible. Chemotherapy drugs can be given intravenously (directly into the blood), or orally.

**Hormonal therapy:** Medications that block or inhibit the actions of hormones (such as estrogen and progesterone) are often used in the treatment of patients with breast cancer who are suitable for this type of treatment.

**Biological therapy:** Biological therapies (also called targeted therapies or personalised healthcare) stimulate the body's immune system to inhibit the growth and spread of cancer by modulating specific molecular and cellular processes involved in tumour growth and progression. The personalised nature of these therapies means that treatment is tailored to specific patient sub-groups who share similar characteristics in their genetic makeup or in the molecular nature of their disease. Biological therapy can include monoclonal antibodies, vaccines and gene therapies. As biological therapies precisely target cancer-specific processes, they may potentially be more effective than other types of treatment (such as chemotherapy and radiotherapy) and less toxic to non-cancerous, healthy cells.<sup>vii</sup> Several types of biological therapy exist for the treatment of breast cancer. These are either given as monotherapy or in conjunction with other therapies at various stages of disease (in accordance with their approved label).

## References

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<sup>i</sup> Wolff A.C et al American Society of Clinical Oncology/ College of American Pathologists Guideline Recommendations for Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer. Arch Pathol Lab Med—Vol 131, January 2007

<sup>ii</sup> Ferlay J, et.al. GLOBOCAN 2008, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available from <http://globocan.iarc.fr/>

<sup>iii</sup> Korde LA et.al, *J Clin Oncol* 28:2114-2122

<sup>iv</sup> National Cancer Institute. Breast Cancer Fact Sheet. Last accessed 10 August 2011 at <http://www.cancer.gov/cancertopics/factsheet/Risk/estimating-breast-cancer-risk>

<sup>v</sup> American Cancer Society. Breast Cancer Fact Sheet. Last accessed 10 August 2011 at <http://www.cancer.org/Cancer/BreastCancer/DetailedGuide/breast-cancer-risk-factors>

<sup>vi</sup> Chlebowski RT et al. *J Natl Cancer Inst* 2006; 98:24: 1767–1776

<sup>vii</sup> National Cancer Institute. Targeted cancer therapies. Last accessed 10 August 2011 at <http://www.cancer.gov/cancertopics/factsheet/Therapy/targeted>