Guidelines for the early detection and screening of breast cancer

Quick reference guide

Breast cancer is a common and frequently fatal disease, and the second ranking cause of cancer death in the Eastern Mediterranean Region. Worldwide, breast cancer represents 10% of all cancers diagnosed annually and constituted 22% of all new cancers in women in 2000, making it by far the most common cancer in women.

Studies have shown that most patients with breast cancer in the Eastern Mediterranean Region present for the first time at stages two and three, indicating the need for increased community awareness and early detection of the disease. This quick reference guide aims to assist primary health care workers in raising community awareness and detecting breast cancer in its early stages.

World Health Organization
Regional Office for the Eastern Mediterranean

Community education about breast cancer

It is the right of all women to be educated about breast cancer. The points that should be stressed are:

- breast cancer can kill
- breast cancer can be effectively treated if detected early and need not kill
- the signs and symptoms of breast cancer
- most breast lumps are not cancer
- breast cancer is diagnosed by biopsy rather than mastectomy.

The risk factors for breast cancer

The etiology of breast cancer is not fully understood. A variety of interrelated factors can influence its development. These include:

- *Genetic predisposition*. A positive family history increases the risk of breast cancer in first-line relatives (mother, sister, or daughter). The risk is dependant upon whether the cancer is bilateral and whether it has occurred in the pre- or postmenopausal period.
- *Hormonal factors.* Hormone regulation is important in the development of breast cancer. Early pregnancy and early oophorectomy lower the incidence of breast neoplasm. In contrast, late menopause is associated with an increase in the incidence of breast cancer.
- *Oral contraceptives.* A small increase in the risk of breast cancer has been noted in users of oral contraceptives. This risk, however, drops following the cessation of contraceptive use so that, at ten years post-use, there is no significant increase in the risk of developing breast cancer. Use of oral contraceptives at an older age has also been linked to an increase in the number of breast cancer cases diagnosed.
- *Hormone therapy for menopause.* Current and recent users of hormone replacement therapy are at a higher risk of developing breast cancer than women who have never used hormone therapy. The risk increases with duration of hormone use, while it decreases significantly following cessation of the therapy.
- *Environmental factors*. The primary environmental factor that has been shown to have a direct link with breast cancer is ionizing radiation.
- *Sociobiological factors*. Age and gender, diet and weight are risk factors for developing breast cancer.
  - Worldwide, 75% of new cases and 84% of breast cancer deaths occur in women aged 50 and older.
  - Consumption of fruits and vegetables may reduce the risk of developing breast cancer, while dietary intake of fat seems to increase the risk.
  - In postmenopausal women, obesity increases the risk of breast cancer. This association is not observed in premenopausal women.
- *Physiological factors*. Physical activity levels can have an impact on the risk of breast cancer. Although data in this area is not entirely consistent, moderate physical activity is associated with a lower risk of breast cancer. Studies have shown a 30% reduction in risk level associated with a few hours per week of vigorous activity compared to no exercise at all.
- *Other risk factors.* These include proliferative breast disorders, which are also associated with breast cancer development, especially if the biopsy shows a typical hyperplasia.

  However, in 70% of breast cancer patients no risk factors can be identified.

The pathology of the breast

Clinically, among 100 female patients aged 40–65 years presenting with breast complaints:

- 30% have no breast lesion
- 40% have fibrocystic changes
- 7% have a benign tumour diagnosis
- 10% have carcinoma.

Breast cancer can be divided into two main groups: non-invasive or carcinoma in situ, and invasive carcinoma. The following table presents the incidence of various breast pathology.

Breast malignant tumours

Type	Incidence
In situ carcinoma	15%–30%
Ductal carcinoma in situ	80%
Lobular carcinoma in situ	20%
Invasive carcinoma	70%–85%
Ductal carcinoma (no special type)	79%
Lobular carcinoma	10%
Tubular/cribiform carcinoma	6%
Mucinous carcinoma	2%
Medullary carcinoma	2%
Papillary carcinoma	1%

Sources: Tabar L et al. Tumour development, histology and grade of breast cancers: prognosis and progression. *International Journal of Cancer*, 1996, 66(4):413–419; Sobin LH, Wittekind CH. *TNM classification of malignant tumours*, 4th ed. Paris, Springer Verlag, 1988:100.

Breast cancer staging

Breast cancer can be grouped into different subtypes, as shown below, to characterize and compare therapeutic mortalities.

Breast cancer stages

Stage	Type	Five-year survival rate
0	Ductal carcinoma in situ or lobular carcinoma in situ	92%
I	Invasive carcinoma 2 cm in size (including carcinoma in situ with micro invasion) without nodal involvement and no distance metastasis	87%
II	Invasive carcinoma <5 cm in size without nodal involvement but with movable axillary nodes and no distance metastasis	75%
III	Invasive carcinoma <5 cm in size with nodal involvement and fixed axillary nodes	46%
IV	Any form of breast cancer with distance metastasis	13%

Source: Sobin LH, Wittekind CH. *TNM classification of malignant tumours*, 4th ed. Paris, Springer Verlag, 1988:100.

Clinical course of breast cancer

Characteristics that have important prognostic significance which need to be considered when designing an optimum treatment strategy for the patient include, but are not limited to, the following:

- Age of the patient (less than or equal to, or more than, 35 years).
- Tumour size (less than or equal to, or more than, 2 cm).
- Axillary lymph node status. This is the most important predictor of disease recurrence and survival. Nearly 70%–80% of patients with negative node status survive 10 years; prognosis worsens as the number of positive nodes increase.
- Histological grade and nuclear grade
- Estrogen and progesterone receptor status. Patients with receptor-positive primary tumours have a lower rate of recurrence and longer survival, and a higher response to hormonal manipulation.
- Other biological markers including HER2/neu (c-erbB2), p53 and bcl-2.

Protection from breast cancer

Although breast cancer cannot be prevented, the risks of developing breast cancer can be minimized through specific preventive activities. These include changes in lifestyle, diet, overall physical characteristics and obesity, and interventions for women at high risk of developing breast cancer using tamoxifen and estrogen-like compounds.

The most important and beneficial protection activity is the early detection of breast cancer (screening). Breast cancer is most easily and effectively treated in its early stages. Survival rates drop dramatically when women present with advanced cases regardless of the setting; therefore, a primary strategy for reducing breast cancer mortality is increasing the proportion of cases that are detected during the early stages of the disease.

Unfortunately, women in resource-poor countries generally present at a later stage of disease than women elsewhere, in part due to the lack of mass screening programmes. Regular screening of all women over a certain age has the potential to sharply increase the proportion of cancer cases that are diagnosed in their earliest stages.

There are a number of approaches to the screening of breast cancer.

- **Breast self-examination** has been endorsed and widely promoted by cancer organizations and authorities around the world. Its effectiveness, however, is dependent on education and outreach among women, and upon conscientious and regular self-examination. Breast self-examination should be used in combination with mammography and clinical breast examination, and not as a substitute for either method. In fact, whether breast self-examination alone can reduce the number of deaths from cancer is currently a source of controversy.
- **Clinical breast examination** is one of the primary modes of screening for breast cancer. Its effectiveness is dependent upon the skills of the health worker and the facilities available. It is therefore important that health workers are fully and appropriately trained. Clinical breast examination combined with mammography is considered essential to reducing mortality from breast cancer.
- **Mammography** is known to reduce breast cancer mortality among women, but its benefits are dependent upon several factors such as the equipment used, the skills of the technician taking the mammography and the expertise of the radiologist reading the mammogram. Other breast imaging techniques include ultrasonography, computed tomography (CT) and magnetic resonance imaging (MRI).

Breast self-examination

The purpose of breast self-examination is for a woman to learn the topography of her breast, know how her breasts normally feel and be able to identify changes in the breast should they occur in the future. Breast self-examination consists of two basic steps: visual and tactile examination of the breast.

Visual examination

No woman has two breasts that are exactly identical. Once a woman knows what her breasts look like, she is able to identify any changes in the shape, form, colouring or structure of the breast more quickly and can discuss these with the appropriate health care provider.

In preparing for the visual examination, the woman should:

- stand in front of a mirror with her upper body unclothed
- place a good light to the side, rather than above, to better differentiate any irregularities

The woman should examine the breast with her:

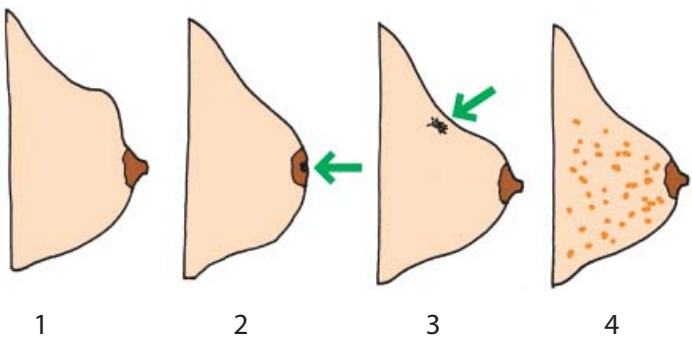
- arms relaxed and to the side
- with her arms raised
- and with her palms flat on the sides of her hips and pressing down

Two additional positions include:

- clasping the hands in front of the forehead, palms squeezed together, to tighten the chest pectoral muscles
- bending forward to examine the breasts

When looking in the mirror, the woman must look for:

- changes in contour or placement of the breasts, such as swelling
- changes in colour and shape
- discharge from the nipples
- redness, irritation or prominent veins in the breast that can signal an increased supply of blood to the breast, a sign that often accompanies tumour growth
- whitish scale on the nipples, and ulcers and sores that do not heal properly
- "orange peel" skin (swollen and shiny with large deep pores) associated with blocked lymph ducts
- a nipple that is flat, inverted or retracted, especially if this is new development, or one that is not inverted when the woman is upright but inverts when she leans forward



What to look for

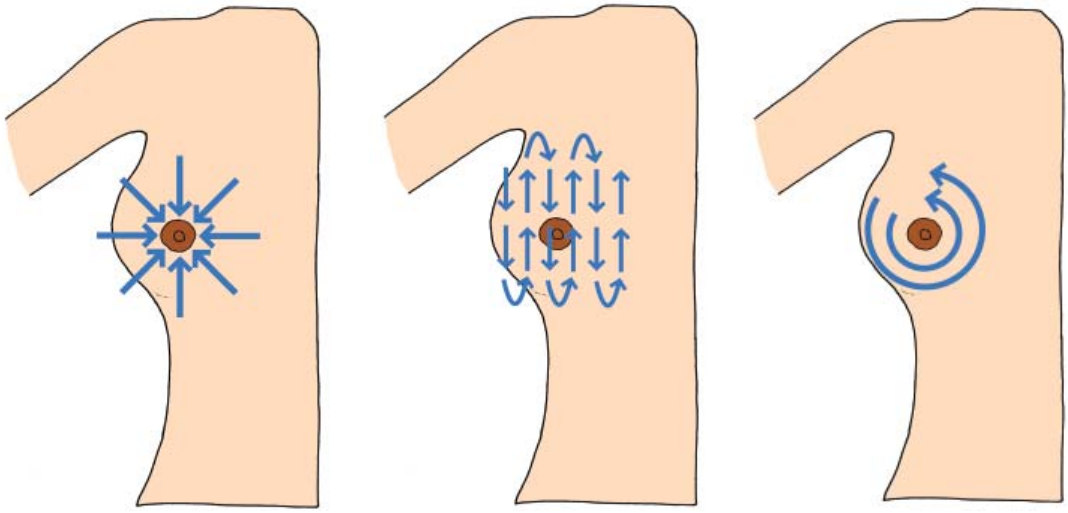
1. Change in breast contour, such as swelling
2. Change in direction of the nipple
3. Dimpling or puckering of the skin
4. "Orange peel" appearance of the breast skin

Changes in breast surface

Tactile examination

Tactile examination of the breast can be done lying down or standing up in the shower, depending on the preference of the woman. The breast self-examination should:

- be conducted at the same time each month
- use the techniques appropriately
- cover the whole area of each breast, including the lymph nodes, underarms and upper chest, from the collarbone to below the breasts and from the armpits to the breastbone
- cover each area of examination three times, using light, medium and firm pressure.



Breast self-examination palpation techniques

The breast self-examination can be done using vertical strip, wedge section, and/or concentric circle detection methods.

- *Wedge section.* The wedge section technique was developed as some women find the circular movement of the hand easier to use during the breast self-examination. In this method, the breast is divided into wedges, moving the palmar pads of the fingers towards the centre of the breast or the nipple. Both breasts are examined wedge by wedge in this manner until completely covered.
- *Vertical strip.* With the vertical strip method the woman should start in the underarm area of the breast, moving the fingers downward slowly until she reaches the area below the breast. The fingers are then moved slightly towards the middle and the process begins again, this time moving the hand upwards over the breast. This process continues up and down until the whole surface of the breast and underarms is examined. Both breasts should be examined.
- *Concentric circle.* In this method, the woman uses a circular motion starting with a small circle around the nipple area to feel the breast. The circle is widened as the woman moves over the surface of the breast. The breast, upper chest and underarm area are fully examined through this circular motion. As with other methods, both breasts should be fully examined.

In all three methods, the woman should:

- make a systematic and careful feel of the breast using two or three fingers, thumb extended
- use the sensitive palmar pads on the flat, inner surfaces of the fingers because the fingertips are less sensitive and long nails can impede the movement of the hand
- be careful not to compress the breast between fingers as it may result in feeling a lump that does not really exist

The woman should feel for changes in the texture and feel of the breast, reporting to a physician:

- any new lump or hard knot found in the breast or armpit
- any lump or thickening of the tissue that does not shrink or lessen after her next period
- any change in the size, shape or symmetry of her breast
- a thickening or swelling of the breast
- any dimpling, puckering or indention in the breast
- dimpling, skin irritation or other change in the breast skin or nipple
- redness or scaliness of the nipple or breast skin
- discharge from the nipple (fluid other than breast milk), particularly if it is clear and sticky, dark or occurs without squeezing the nipple
- nipple tenderness or pain
- nipple retraction (turning or drawing inward or pointing in a new direction)
- any breast changes that may cause concern.

Clinical breast examination

A clinical breast examination is an examination of the breast by a health care professional, such as a physician, nurse, or physician's assistant. It includes both inspection (looking) of the breast and palpation (feeling). The areas examined include the entire breast/chest area (including the lymph nodes), above and below the collarbone, and under each arm.

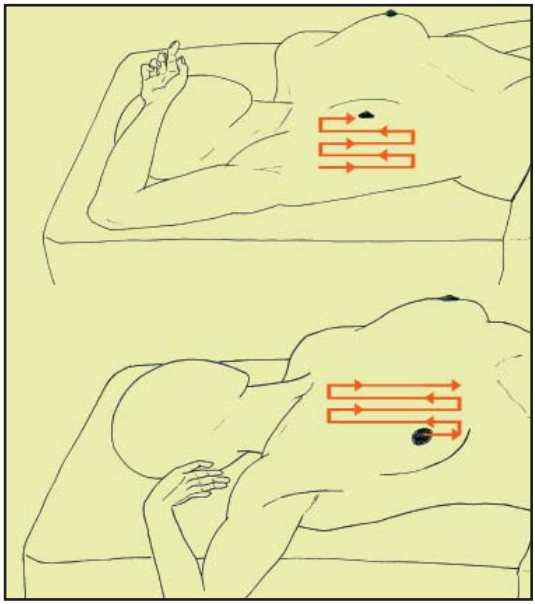
The first component of the clinical breast examination is a visual examination of the breasts in three different standing positions:

- arms relaxed at the sides
- hands pressed firmly on the waist and leaning forward
- arms over the head.

During this process, subtle asymmetries and changes in the appearance of the breasts should be identified. The entire area of the breast, including the area from the clavicle to the inframammary fold, and from the midaxillary line to the sternum, should be examined in both the seated and supine positions. The application of three levels of pressure (superficial, medium and deep) at each palpation site is essential.

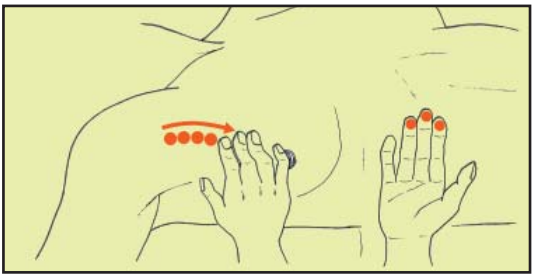
Palpation should be done with the finger pads of the three middle fingers, and pressure applied with circular motions at each site. For the lateral half of the breast, the torso is rotated in the medial direction; for the medial half of the breast, the torso is rotated laterally in order to spread out the breast tissue. When an abnormality is detected, the corresponding area of the other breast should be examined. If the finding is not bilateral, further investigation is required.

From the age of 20, women should have a clinical breast examination as part of her routine check-up every two or three years, increasing to once a year from the age of 40.



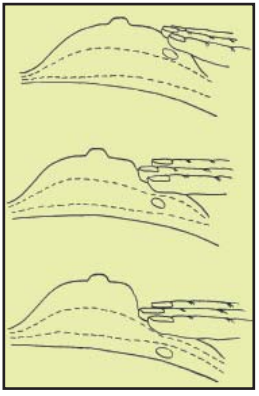
Position of patient and direction of palpation for clinical breast examination

The top shows the lateral portion of the breast and the bottom shows the medial portion of the breast. Arrows indicate vertical strip pattern of examination.



Palpation technique

Pads of the index, third and fourth fingers (inset) make small circular motions.



Levels of pressure for palpation of breast tissue shown in a cross-sectional view of the right breast.

Clinical breast examination techniques

Screening mammography

A screening mammography is a standard two-view mammogram obtained from either a symptomatic or asymptomatic woman with the purpose of early detection of breast cancer. Two views of each breast are obtained: a view from the top and a view from the side (a). To obtain accurate images, it is important that the breast is compressed to an even thickness, thus minimizing the radiation exposure while allowing for accurate visualization of possible abnormalities.

The ability to detect breast cancer is dependent upon being able to distinguish a mass or abnormality from normal breast tissue. Generally, the more fat there is in the breast, the easier it is to distinguish a mass or abnormality. When the breast is dense, the abnormality may be hidden in the tissue and additional investigations may be needed, such as ultrasound if it is suspected to be a cystic mass or fine needle aspirate for cytologic examination. Figure (a) shows a benign-looking mass with low density with a hollow sign surrounding the mass. Most probably it is a fibro-adenoma.

In general, when there are macrocalcifications they are usually not associated with cancer. Figure (b) shows benign-looking macrocalcifications overlying a low density, benign-looking, well defined mass with a hollow sign surrounding it. However, when there are microcalcifications, additional examination and investigations of the mass are required to differentiate between benign and malignant microcalcifications.

Figure (c) shows a highly suspicious malignant mass with a lobulated margin, high density, microcalcifications and nipple retraction.

In Figure (d), three masses of different sizes raise suspicion of malignancy as they are of high density, irregular speculated margin while the large one shows microcalcifications.

A few points to remember regarding mammographic density are that:

- breast parenchymal density as seen on a mammogram is a determinant of the sensitivity of mammography
- breast parenchymal density decreases with age
- hormone replacement therapy of the combination type may result in increased breast density
- tamoxifen may reduce breast density.

(a)

(b)

(c)

(d)

Follow-up

Physical health follow-up

Follow-up services include those coping with the direct physical side-effects and problems associated with breast cancer treatment. Follow-up of patients after conservative treatment includes a periodic physical examination and mammography every six months during the first two years and every year thereafter. Local recurrences occur for approximately 1% of the target population per year. Therefore, continued screening for the early detection of local relapses improves long-term survival after breast cancer treatment, especially mastectomies.

Physical health follow-up is most successful when the patient has been clearly educated about the stages of treatment, the services offered and available, and the course of treatment and recuperation expected. Equally as important, is educating the woman and her family in the early detection of any signs of recurrence or possible metastasis of the cancer to other areas of the body. Symptoms such as bone pain, shortness of breath, excessive tiredness and unexpected bleeding, should be pointed out as possible signs of concern. An educated woman is a better patient with a higher chance of survival.

Mental health follow-up

For women diagnosed with breast cancer, follow-up services should also include interventions to deal with the emotional and psychological issues that are raised as a result of a diagnosis. The word cancer still brings with it a magnitude of fear and anxiety not associated with many other diseases. Breast cancer is an illness where most women, especially those in developing countries, understand that their survival rate may not be strong. Women also continue to be the focal point of family life and an illness that threatens their life and ability to function significantly impacts the emotional well-being of the family unit.

It is therefore of utmost importance that any treatment and follow-up programme for women with breast cancer include a strong psychosocial component that builds upon the strengths of the family, offers community and other normal forms of support during the most difficult stages of the illness, and assists the family in making the journey in a productive and positive manner.

Further information

For further information, consult Khatib OMN, Modjtabai A (eds.) *Guidelines for the early detection and screening of breast cancer*, Cairo, World Health Organization Regional Office for the Eastern Mediterranean, 2006 (EMRO Technical Publications Series No. 30) on which this card is based, or contact:

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