



# REVIEW ON PREVENTION AND RISK FACTORS OF BREAST CANCER

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## ABSTRACT:

Breast cancer (BC) is the most frequently diagnosed cancer in women . In 2023, 1,958,310 new cancer cases and 609,820 cancer deaths are projected to occur in the United States. Its incidence and death rates have increased over the last three decades due to the change in risk factor profiles, better cancer registration, and cancer detection. Based on mRNA gene exhibits, Breast cancer can be divided into molecular subtypes (Luminal A, Luminal B, HER2[Human Epidermal Growth Factor Receptor-2]-enriched, and basal). Treatment of breast cancer is complex and involves a combination of different modalities including surgery, radiotherapy, chemotherapy, hormonal therapy, or biological therapies delivered in diverse sequences.

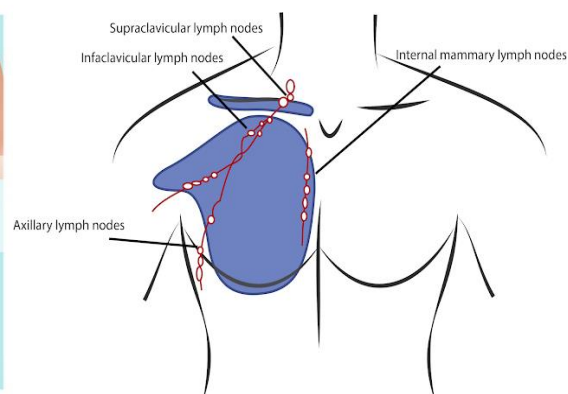
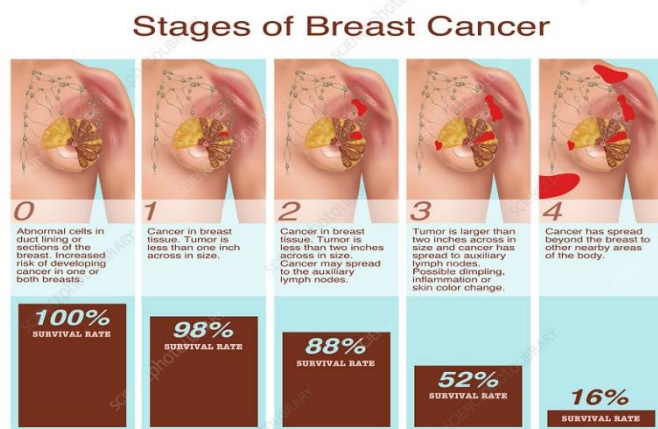
**KEY WORDS:** Breast cancer, Lymphoma, Chemotherapy , Epidemiology, Diagnosis,Treatment.

## INTRODUCTION:

Increased incidence of cancer in recent years and its impact on different physical, mental, and social dimensions of human life have turned it to a major problem of the century [1]. The incidence of this disease in developed countries varies from 1 to 2 percent, with almost 5% yearly increase in less developed countries [2]. According to estimates, more than 7 million people globally die from cancer. It is predicted that the number of

new cancerous cases rises from 10 to 15 million by 2020 [3,4]. Breast cancer forms in the tissues of the breast. It spreads mainly through the lymphatic system. The lymphatic system which leads to breast cancer are Lymph nodes under the arm [Auxiliary nodes], supraclavicular and infraclavicular lymph nodes and internal mammary lymph nodes. The risk of an individual dying from breast cancer is 1-in-35 [5]. At present, the chance of developing breast cancer over lifespan is 13.5% and 10.6% of all deaths. Regarding the importance of this issue, this study sought to investigate breast cancer and its associated factors.

## ANATOMY:



One To understand breast cancer, it will be helpful to share some basic about the normal information structure of the breast. A woman's breast includes the following parts:

- Lobes and lobules (milk producing glands),
- Milk ducts (small ducts that bring milk to the nipple, breast duct);
- Stroma consists of fat and connective tissue around milk ducts, lobules, blood vessels and lymphatic vessels .Most breast cancers start in the cells of the milk ducts. Some occur in the lobules and a very small number of breast cancers occur in other tissues.

## BREAST CANCER AND LYMPHATIC SYSTEM:

Since one of the ways breast cancer spreads is through the lymphatic system, it is important to understand its overall structure. This system has different parts. Bean-shaped lymph nodes are small cells of the immune system that are connected to lymphatic vessels. Lymphatic vessels are like small veins, except that they carry a clear fluid (instead of blood) called lymph from the breast and contain fluid from

lymph tissue, waste materials, and immune system cells. Breast cancer cells may enter the lymphatic vessels and begin to grow in the lymph nodes. Most breast lymph vessels connect to axillary lymph nodes, while some

lymph vessels connect to the chest (internal mammary lymph nodes) and above or below the collarbone. If cancer cells have spread to the lymph nodes, it is likely that these cells have spread to other parts of the body through the bloodstream. The more breast cancer is in the lymph nodes, the more it has spread to other organs. Therefore, the presence of one or more cancerous lymph nodes affects the treatment plan. However, not all women with cancer cells metastasize to their lymph nodes. In some women, there are no cancer cells in the lymph nodes, but metastases develop later.

#### TYPES OF BREAST CANCER:

##### ➤ Ductal cancer

In this type of breast cancer, cancer cells grow only inside the breast duct. By touching your breast, if you feel that there is a lump in the breast or if a liquid other than milk comes out of the nipple, be sure to see a doctor. 80 to 90 percent of those who get breast cancer are of this type.

##### ➤ Lobular cancer

With the accumulation of breast milk in these lobules and where there is a hard mass and swelling, the change in the appearance of the breast is one of the symptoms of this cancer, and the diagnosis of this type of cancer is through sampling of the breast tissue.

##### ➤ Inflammatory cancer

In this type of breast cancer, the appearance of the breast becomes inflamed, causing redness and swelling of the breast.

#### STAGES OF BREAST CANCER:

Breast cancer has different stages, which include stages 0 to 4 in total, and its stage is determined by a doctor with sampling and tests such as mastectomy and lumpectomy (removal of a part of the breast) and sampling of armpit lymph nodes.

#### STAGE 0:

This period is also called the pre-cancer period, which is considered the first stage of breast cancer, and the most common one is abnormal cell growth in the milk ducts of the breast. This stage of breast cancer is not aggressive and will not spread to other breast tissues, but it can spread to other parts of the breast if not treated in the future. In this type of cancer, the cancer cells have not yet spread to the lymph nodes and other organs of the body. This type of cancer is usually only treated with surgery or radiation therapy.

**STAGE 1:**

breast cancer is aggressive, meaning that the cancer cells have invaded healthy breast tissue. In type 1, usually the tumor will be less than two centimeters long. In this type, the cancer has not spread outside the breast and no lymph nodes have been involved. In stage 1, there is no tumor or its length is less than 2 cm and thin strands of cancer cells are found in the lymph nodes. In stage 1 breast cancer, lobectomy is usually used to save the breast followed by radiation therapy. Chemotherapy may also be considered for tumors larger than one centimeter. A lumpectomy will usually be prescribed to detect cancer in the lymph nodes near the breast.

**STAGE 2:**

In stage 2 breast cancer, the cancer has grown but is still in the early stages. This stage itself has two categories. In step 2, there is one of the following.

- There were no tumors and less than 4 cancerous lymph nodes under the arm.
- Small tumor (smaller than 2 cm) and cancer in less than 4 lymph nodes under the arm.
- A tumor between 2 and 5 centimeters without involvement of lymph nodes.
- Stage 2B breast cancer can include one of the following stages:
  - A tumor measuring 2 to 5 cm and small strands of cancer cells in the lymph nodes.
  - A tumor between 2 and 5 cm and cancer in less than 4 lymph nodes under the arm.
  - Tumor larger than 5 cm and without lymph node involvement.

Although stage 2 breast cancer is larger than stage 1 and can involve the lymphatic system as well, the possibility of treatment and recovery is still very high. In this case, the methods of mastectomy or lobectomy plus radiation therapy and chemotherapy can be used. If it is effective, the doctor can also use hormonal treatment and targeted treatment methods. In some cases, the lymph nodes will be removed or completely removed.

**STAGE 3:**

In some cases, the patient's entire breast is removed, which is called a mastectomy. In other cases, the method of saving the breast or lumpectomy (lumpectomy) or radiation therapy and in some cases chemotherapy and removal of the involved lymph node are used. Some patients will also receive hormone therapy and targeted cancer treatment. In some cases, the patient will first undergo chemotherapy to reduce the size of the tumor,

and then mastectomy and radiation therapy will take place. Hormone therapy and targeted cancer therapy may also be used if necessary and deemed beneficial. People whose breast cancer is in stage 3 usually undergo surgery to remove at least some of the involved lymph nodes under of the advanced cases of cancer. This stage itself is divided into three categories based on the size of the tumor and the degree of involvement of the lymph nodes.

- Any of the following can be classified as type 3 breast cancer.
- Absence of tumor or presence of tumor of any size and cancer in 4 to 9 cases of adjacent lymph nodes.
- A tumor larger than 4 cm in length and small strands of breast cancer cells in the lymph nodes.
- A tumor larger than 5 cm and cancer in one to three lymph nodes near the breast bone.

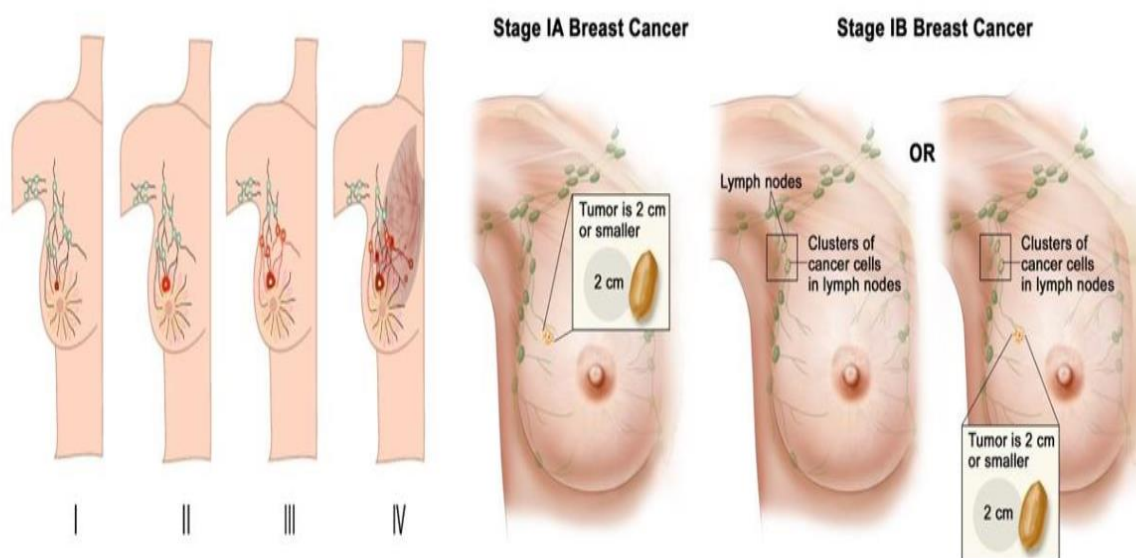


FIGURE :A tumor larger than 5cm breast cancer

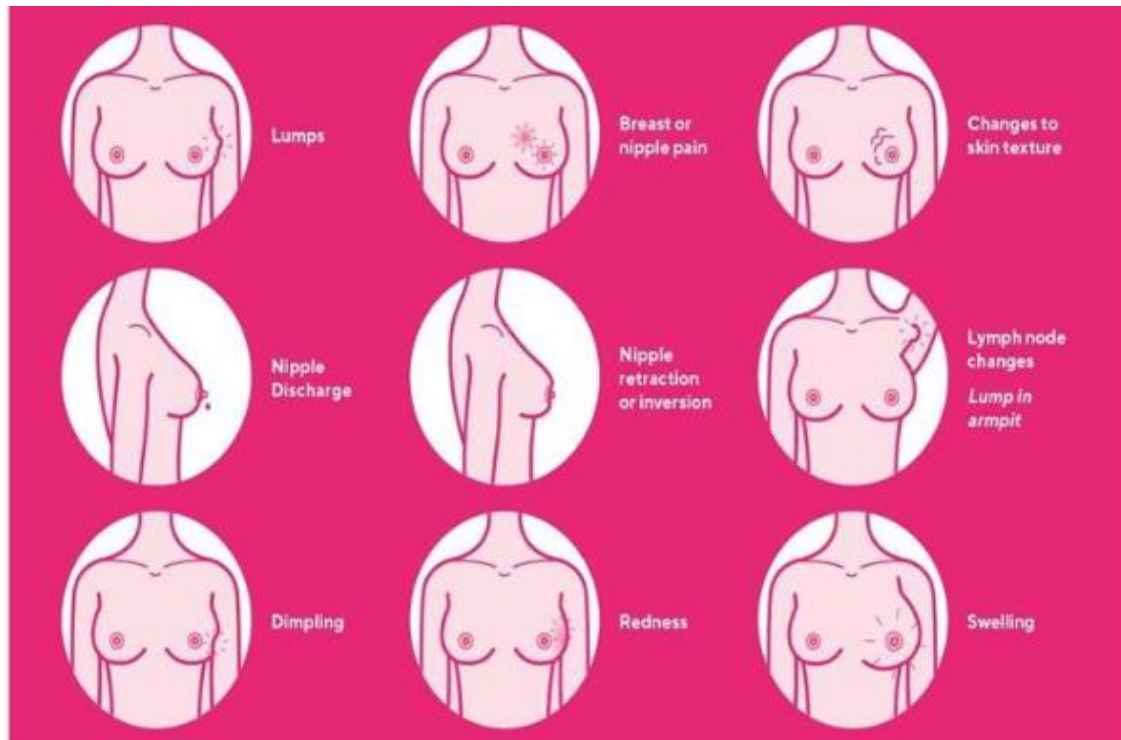
#### STAGE 4:

In the 4th stage of breast cancer, breast cancer has found its way to other parts of the body and usually considered incurable, new treatment methods help patients to survive for a few more years even when their disease has entered advanced stages. The main treatment method, which actually only delays death, is the use of drugs, and in some cases, chemotherapy is also recommended. In women whose breast cancer is fed using female hormones, hormone therapy methods such as tamoxifen or aromatase inhibitors are used to prevent cancer growth. Drugs that target specific characteristics of cancer cells and are used in a method known as targeted therapy can reduce the effects of enzymes and proteins that cause cancer cells to grow. In less cases,

surgery and radiation therapy are used to reduce symptoms and complications that reduce the effects of breast cancer such as severe pain.

### The importance of early detection of breast cancer :

Although breast cancer does not usually cause any symptoms in the early stages, early detection can transform a person with breast cancer from a victim to a survivor. In societies where women take monthly breast self-exams seriously and don't waste time visiting a doctor when faced with symptoms, cancer is diagnosed in the early stages, which makes treatment easier.



### Prevention of breast cancer:

Exercise (research has shown that physical activities and doing half to an hour of exercise daily can reduce the risk of infection by 20%. Because exercise balances the amount of estrogen and testosterone hormones in the blood). Consumption of dairy products (dairy products are rich in calcium; Research has shown that the use of calcium plays a role in preventing cancer). Fruit consumption (fruits play a significant role in reducing cancer due to their fiber and antioxidants. Antioxidants prevent the creation of cancer cells by preventing oxidation reactions and preventing the release of free radicals. Antioxidants include vitamin E, A, C and selenium, which are found in fruits. In addition to preventing cancer, fiber also plays an effective role in keeping body weight balanced . Having children (according to researchers, women who have children have less cancer). Breastfeeding (breastfeeding has been the focus of oncologist researchers for many years and it seems that

breastfeeding prevents the occurrence of cancer by certain mechanisms, and the more times and duration of breastfeeding, the lower the incidence). Low-fat diet (consumption of high-fat foods and high-fat and high-calorie desserts can cause cancer, and it is better for women to use cholesterol-free and low-fat foods such as soybeans in their diet. Soybeans can be a good substitute for high-fat meats).

### Breast cancer symptoms:

Often, in the early stage, the tumor in the mammary gland does not show itself in any way, but in most cases, cancer can be detected in the early stages. About 70% of all breast tumors are found by women themselves. Therefore, the correct examination of the mammary glands is of great importance. The right time to do the examination is 5-7 days after the end of menstruation.

For example,

Nipple discharge can be caused by an infection.

Early stage	Later stage
<ul style="list-style-type: none"> <li>➤ Changes in the shape of the nipple.</li> <li>➤ Pain that has not disappeared until after the next menstrual period.</li> <li>➤ A new mass that does not disappear until after the next menstrual period.</li> <li>➤ Clear, red, brown or yellow discharge from the tip of one breast.</li> <li>➤ Redness, swelling, itching of the skin, skin sensitivity or pimples for which there is no reason.</li> <li>➤ Swelling or lump around the collarbone or under the arms.</li> <li>➤ A firm lump with irregular corners is more likely to be cancerous.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Indentation or turning of the nipple inside.</li> <li>➤ Enlargement of one of the breasts;</li> <li>➤ Indentation in the surface of the breasts.</li> <li>➤ An old mass that has become larger;</li> <li>➤ The texture of the skin is in the shape of an orange pee.</li> <li>➤ Unreasonable weight loss.</li> <li>➤ Enlargement of the lymph nodes under the armpit.</li> <li>➤ Visible vein on the chest</li> </ul>

Common procedures include:

**Fine needle aspiration:** This is for tumors that are easy to access or cysts that may be filled with fluid.

**Brain needle biopsy:** (Core) Tru-cut (Core) In this type, a larger telescopic needle is used to remove a piece of tissue.

**Open surgical biopsy:** With surgical intervention, the entire tumor is removed along with the adjacent breast tissue.

**Lymph node biopsy:** A needle biopsy or removal of some of the lymph nodes in the armpit to see if the cancer has spread.

**Image-guided biopsy:** Imaging is used to guide the biopsy needle.

- Ultrasound
- Mammography

## MANAGEMENT OF BREAST CANCER:

Breast cancer treatment can be done by local and general methods. Local treatments include surgery and radiation therapy, and general treatments include hormone therapy, chemotherapy, and biological therapy. In some cases, both methods are used. One of the most common methods of treatment is surgery, in which either the cancerous lump or the entire breast tissue is removed. In radiation therapy (radiotherapy), high-energy waves are used to destroy cancer cells. This procedure can usually be done before or after surgery. Also, radiation therapy is used when the mass is large and cannot be removed by surgery. In the chemotherapy method, anti-cancer drugs are used, which are usually used as a combination of several drugs. These drugs are used in injectable or oral form, in which both chemicals enter the bloodstream and go to the whole body. In hormone therapy, two hormones, estrogen and progesterone, are usually used, which do not allow cancer cells to receive the hormones they need and are destroyed. Biological therapy helps the body's immune system to fight the cancerous mass. In this way, Herceptin (Herception), which is a type of antibody and is made in the laboratory, is usually used and injected into the vein. This method is done either alone or with chemotherapy.

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