

### Breast Lymphatics

Fellow therapists, clients, family or friends! These days we are all affected in one way or another and as October is breast cancer awareness month poignantly in this study room I want to draw your attention to the breast, breast cancer, axillary lymph nodes, lymphatic pathways and some related information we should be aware of.

Firstly, all cells in our bodies replace themselves 50 to 60 times and then die. Breast cells are the fastest cells to be replaced and renewed and therefore have a higher risk of mutation. Your lymphatic system naturally fights cancer cells within the hundreds of lymph nodes every day, possibly more times than you could ever realise, but because of the rapid death of cells in and around the breast it means the axillary lymphatics are already overloaded on a regular basis.

### Breast Cancer

The term 'breast cancer' refers to a malignant tumour that has developed from cells in the breast. Occurring when genes that are responsible for regulating the normal growth of cells and keeping them healthy, mutate, causing abnormal changes to occur. This uncontrolled growth of breast cells results in breast cancer. Breast cancer is found in the cells of the lobules, the milk-producing glands or the ducts, the passages that drain milk from the lobules to the nipple. **Fig 1.**

Invasive Ductal Carcinoma (IDC), sometimes called infiltrating ductal carcinoma, is the most common type of breast cancer. About 80% of all breast cancers are invasive ductal carcinomas. Invasive means that the cancer has "invaded" or spread to the surrounding breast tissues from the ducts. Less commonly, breast cancer can begin in the stromal tissues, which include the fatty and fibrous connective tissues of the breast.

Over time, cancer cells can invade nearby healthy breast tissue and make their way into the underarm (axillary) lymph nodes. If cancer cells get into the lymph nodes they then have a pathway into other parts of the body. The breast cancer stage refers to how far the cancer cells have spread beyond the original tumour.

### The Breast

The breasts are mammary glands, organs in mammals producing milk to feed young offspring. Positioned anteriorly from the clavicle to the middle of the sternum and laterally, into the axilla armpit and as far as the latissimus dorsi. The breasts are affected by several factors, including fat deposits, hormonal changes and genetic factors. They are not always exactly the same size or shape and you should become very familiar with the normal shape, size and feel of your own breasts and/or chest to alert you to any change.

Made up of both fatty tissue and glandular milk-producing tissues the ratio of fatty tissue to glandular tissue varies. Basic components of a mature mammary gland are the

## **Breast Lymphatics**

alveoli (hollow cavities, a few millimeters in size) lined with milk-secreting cuboidal cells and surrounded by myoepithelial cells, which contract to aid the ejection of milk. **Fig 2.**

There is increasing evidence that the myoepithelial cells also play a key role in the organisational development of the mammary gland and that the loss and/or change of myoepithelial cell function is a key step in the development of breast cancer.

## **Breast Lymphatics**

The smallest lymph capillaries lie directly underneath the skin and connect with larger vessels and a network of lymph nodes that are located around the lateral edges of the breast or in nearby tissues of the armpits, collarbone and décolleté area. The breasts' lymph nodes are not linked in a straight line. They are staggered, fixed within fat pads that complicate lymph node removal in breast cancer surgery. Lymph nodes play a central role in the spread of breast cancer and the axillary lymph nodes are particularly important as they are among the first places that cancer is likely to be found if it metastasizes (moves) from the breast. Therefore, it is imperative we should always keep healthy lymph nodes clean and free flowing, particularly after menstruation or during the change and continually as we age through the menopause. **Fig 3.**

Axillary lymph nodes: Levels III    Above medially to pectoralis minor

Axillary lymph nodes: Levels II    Deep to pectoralis minor

Axillary lymph nodes: Levels I    Below and lateral to pectoralis minor

**Sentinel Lymph Node Biopsy (SLNB)** A sentinel lymph node is the first lymph node(s) to which cancer cells are most likely to spread from a primary tumour. An SLNB can be used to help determine the extent, or stage, of cancer in the body. Because SLNBs involve less extensive surgery and the removal of fewer lymph nodes than standard lymph node surgery, the potential for adverse effects, or harm, is lower. In the context of breast cancer, the usual location for the SLN is under the arm, although for cancers on the inner or medial aspect of the breast, the SLN may be inaccessible in nodes beneath the breastbone or sternum.

During SLNB or more extensive lymph node surgery, lymph vessels leading to and from the sentinel node or group of nodes are cut, thereby disrupting the normal flow of lymph through the affected area. This disruption may lead to an abnormal build-up of lymph fluid. Complications or side effects can happen at any time after surgery, years afterwards, or because of lifestyle change, and/or the ageing process and some of the most common complications are:

**Infection (Cellulitis)** This occurs in 2–4% of patients and is usually from bacteria that normally live on the skin. Patients must be always mindful of this condition as their

## Breast Lymphatics

lymphatic system has been impaired. It causes swelling and can be severe if not treated quickly. Symptoms of infection include: pain, redness, swelling and fever.

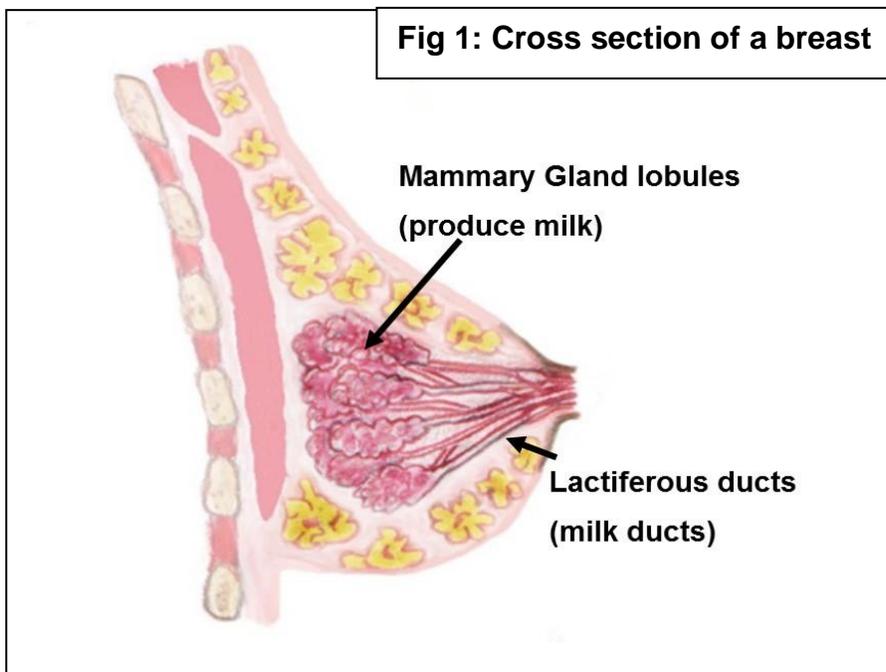
**Lymphoedema.** Statistically, one in five women will develop lymphoedema. It can occur any time after lymph node removal and/or breast cancer surgery. The chance of developing lymphoedema increases with the number of lymph nodes removed.

Lymph nodes are needed to pump lymph fluid away from the upper thoracic cavity and the upper arm. Some women experience severe lymphoedema. Chronic pain can be caused by lymphoedema, and damage to the nerves in the armpit can impair muscle movement and shoulder mobility.

**Axillary Web Syndrome (AWS)** Developing in the lymph vessels from the armpit to the elbow, AWS is when fibrotic lymph fluid becomes trapped inside lymph vessels and impairs lymphangioactivity and muscular movement. It is also called lymphatic 'cording'. It impairs movement but must not be stretched and pulled. Symptoms can be felt as pain and tightness in the arm with difficulty moving the shoulder on the affected side. Beneath the skin it may feel like a small hard string of pearls.

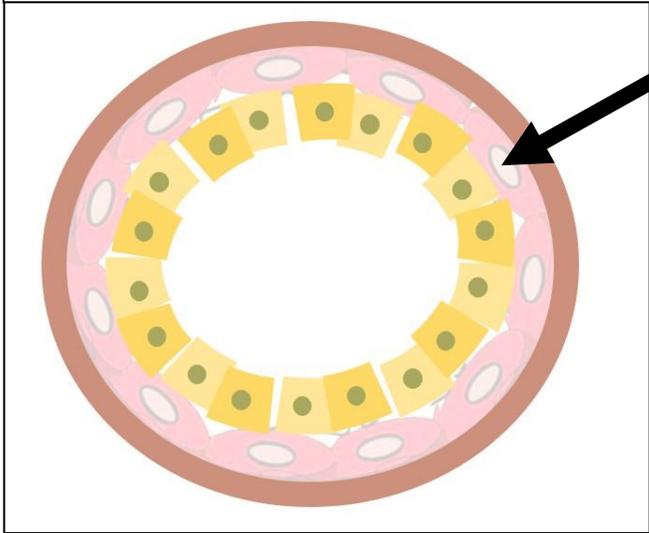
Statistically the increase of breast cancer is alarming; however, aftercare is also essential to get the lymphatic system moving again to assist it's disrupted pathways reconnect.

Unfortunately, nothing can replace the lymph nodes which facilitate the directional flow of lymph, but early movement of post-operative waste fluid and improved musculoskeletal activity can dramatically increase recovery outcomes and the healing process.



Breast Lymphatics

Fig 2: Inside of a milk duct



Myoepithelial cells shown in pink

Fig 3: Lymph Node Levels

