



Health Reporting on Breast Cancer in the Philippines

Advancing Innovations in Breast Cancer

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June 21, 2023

What is survivorship in cancer treatment?

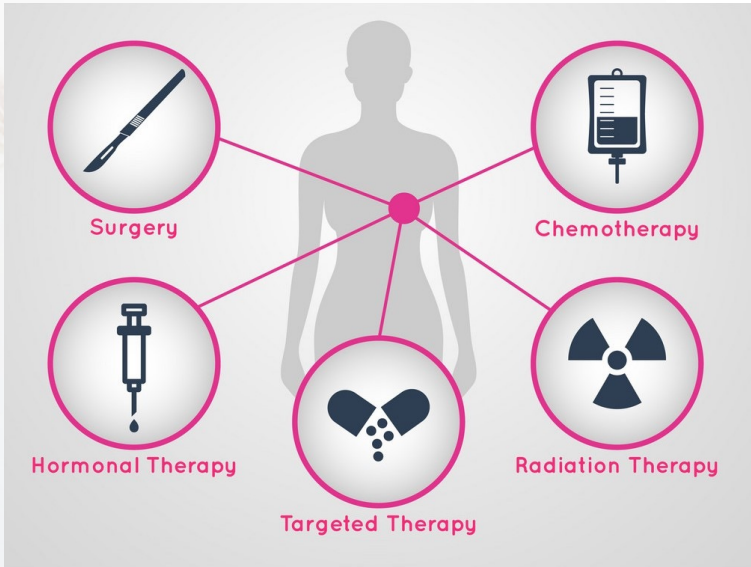


In cancer, survivorship focuses on the health and well-being of a person with cancer from the time of diagnosis until the end of life. This includes the physical, mental, emotional, social, and financial effects of cancer that begin at diagnosis and continue through treatment and beyond.

Due to improvements in survival that have occurred over the past 20 years, leading to disease chronicization in advanced stages and cure in early stages, breast cancer survivorship represents one of the most challenging aspects to be approached in dedicated clinical follow-up settings.

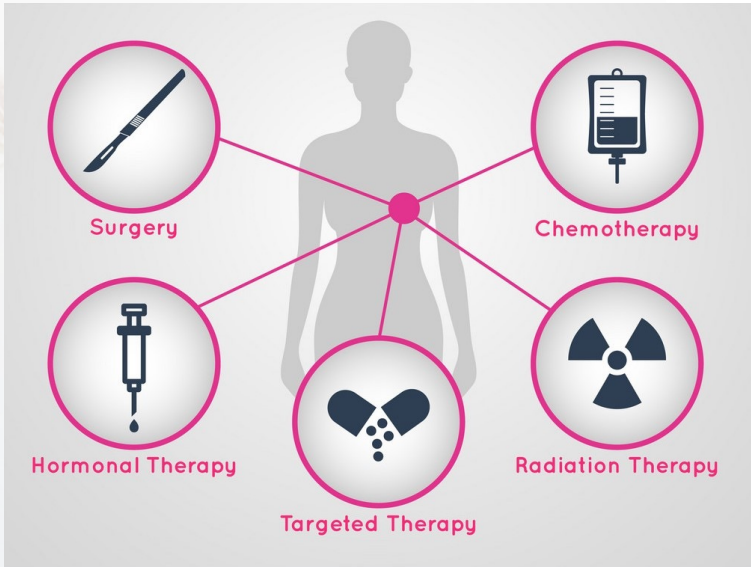
Breast Cancer Treatment

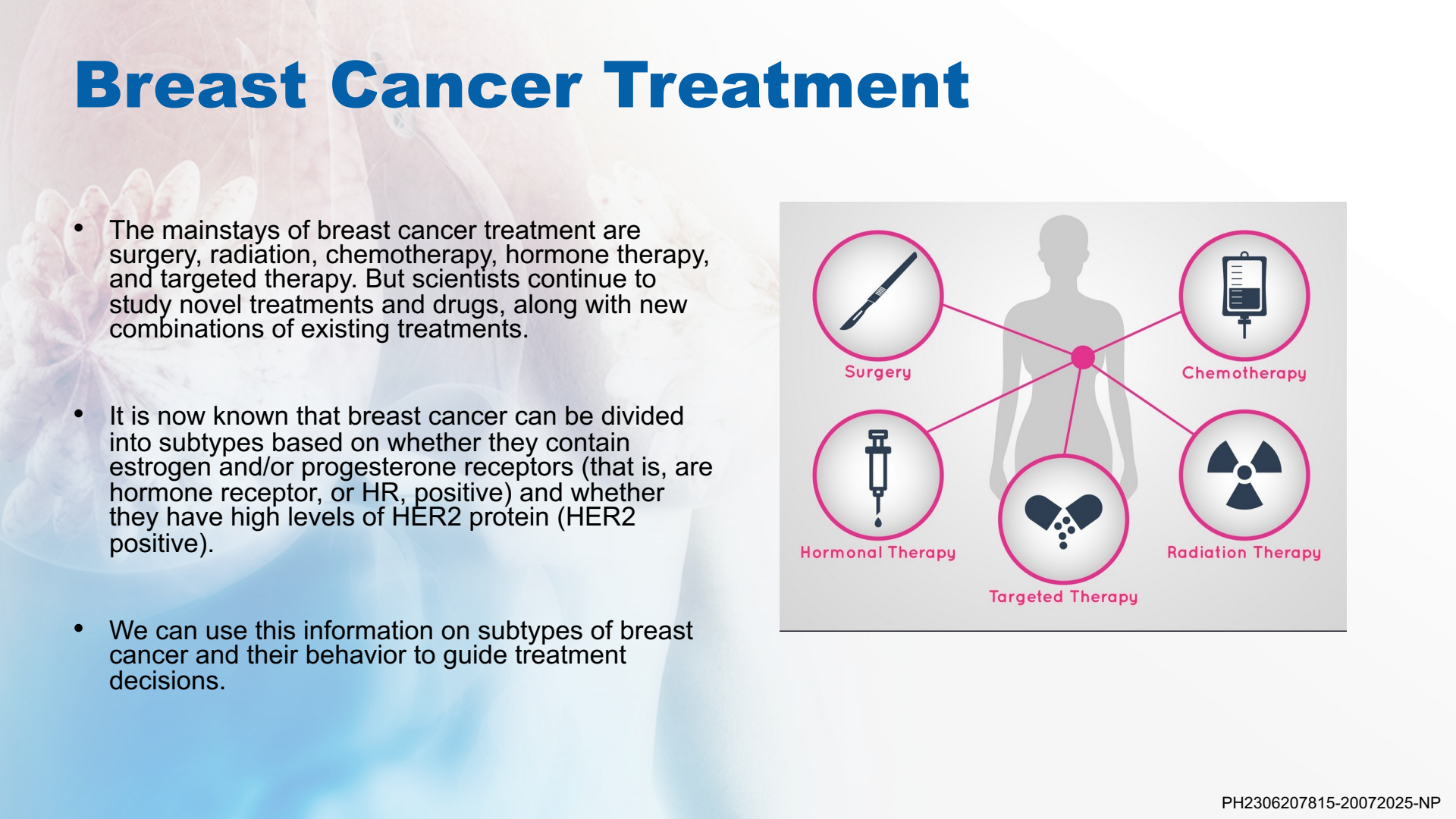
- The mainstays of breast cancer treatment are surgery, radiation, chemotherapy, hormone therapy, and targeted therapy. But scientists continue to study novel treatments and drugs, along with new combinations of existing treatments.
- It is now known that breast cancer can be divided into subtypes based on whether they contain estrogen and/or progesterone receptors (that is, are hormone receptor, or HR, positive) and whether they have high levels of HER2 protein (HER2 positive).
- We can use this information on subtypes of breast cancer and their behavior to guide treatment decisions.



The diagram illustrates the five mainstays of breast cancer treatment. At the center is a grey silhouette of a human torso. Five pink circles are arranged around the torso, each containing a black icon representing a treatment: a scalpel for Surgery, a syringe for Chemotherapy, a radiation symbol for Radiation Therapy, a pill for Targeted Therapy, and a hormone gland for Hormonal Therapy. Pink lines connect each circle to a central pink dot on the torso, indicating that these treatments are all applicable to breast cancer.

PH2306207815-20072025-NP

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Local Treatments

Treatment that is directed to a specific organ or limited area of the body.



Surgey



Radiation Therapy

How Surgery Is Used for Cancer

- **Diagnose** – surgical biopsies.
- **Stage** - during surgery, the area around the cancer including lymph nodes and nearby organs are examined.
- **Curative** - done when cancer is found in only one part of the body, and it's likely that all of the cancer can be removed. May be used along with other treatments like chemotherapy or radiation therapy.
- **Debulk** -done when taking out the entire tumor would cause too much damage to nearby organs or tissues.
- **Palliative** - can be used with other treatments to correct a problem that's causing pain, discomfort, or disability.
- **Supportive** - done to help make it easier for people to get other types of treatment. For example, a vascular access device such as a Port-A-Cath.
- **Reconstructive** - used to improve the way a person looks after major cancer surgery or used to restore the function of an organ or body part after surgery. Examples include breast reconstruction after mastectomy.
- **Preventive** - done to remove body tissue that's likely to become cancer – even though there are no signs of cancer at the time of the surgery. For example, some women with a strong family history of breast cancer have an inherited change in a breast cancer gene (called BRCA1 or BRCA2).

Radiation Therapy

- Radiation therapy is one of the most common treatments for cancer. Radiation may be used alone or with other treatments, such as surgery, chemotherapy, hormones, or targeted therapy.
- Radiation therapy uses high-energy particles or waves, such as x-rays, gamma rays, electron beams, or protons, to destroy or damage cancer cells.
- Cells normally grow and divide to form new cells. But cancer cells grow and divide faster than most normal cells. Radiation works by making small breaks in the DNA inside cells. These breaks keep cancer cells from growing and dividing and cause them to die. Nearby normal cells can also be affected by radiation, but most recover and go back to working the way they should.

What are the goals of radiation therapy

- Cure or shrink early-stage cancer
- Stop cancer from recurring somewhere else
- Treat symptoms caused by advanced cancer - palliative radiation
- Treat cancer that has recurred

External radiation (or external beam radiation) is the most common type of radiation therapy used for cancer treatment. A machine is used to aim high-energy rays or particles from outside the body at the tumor. The machines focus the radiation beam on the exact location in such a way to maximize the radiation reaching the cancer, but also to affect normal tissues as little as possible.

Systemic Treatments

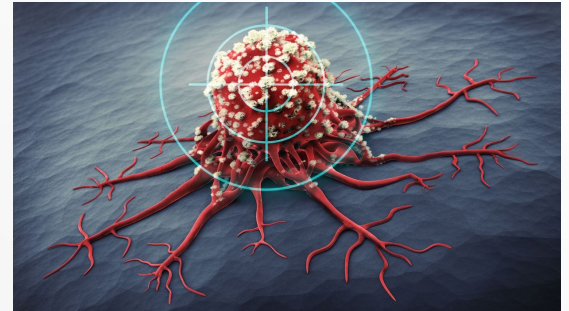
Systemic therapies for breast cancer are administered to the patient as medicines. They can be given through an IV, taken as a pill, and sometimes received as an injection.



Chemotherapy



Hormonal Therapy



Targeted Therapy

Timeline of Drugs Approved for HR+, HER2– ABC

US FDA approval dates for products used in the treatment of hormone receptor positive (HR+), human epidermal growth factor-2 negative (HER2–) advanced breast cancer (ABC)



Prior to the approval of tamoxifen, the **primary treatment** for ABC was **chemotherapy**. Since then, several **endocrine** and **targeted therapies** have been approved.¹³

Chemotherapy

- The word "chemotherapy" ("chemo") is often used when referring to medicines or drugs that treat cancer. But, not all drugs used to treat cancer work in the same way. Traditional or standard chemotherapy uses drugs that are cytotoxic, meaning they can kill tumor cells.
- Chemo is considered a systemic treatment because the drugs travels throughout the body, and can kill cancer cells that have spread (metastasized) to parts of the body far away from the original (primary) tumor.
- There are three main goals for chemotherapy in cancer treatment:
 - Cure
 - Control
 - Palliation

Factors a cancer care team considers when recommending treatment options include:

- The type and subtype of cancer
- The stage of the cancer (how far it has spread)
- Results of other tests on the tumor, such as biomarkers
- The patient's age
- The patient's overall health and current medications
- Other serious health problems (such as heart, liver, or kidney diseases)
- Types of cancer treatments given in the past

The team takes all these factors into account, along with information from research studies published in medical journals and textbooks describing the outcomes of similar patients treated with chemo.

Hormone (Endocrine) Therapy

- Hormones are proteins or substances made by the body that help to control how certain types of cells work. For example, some parts of the body rely on sex hormones, such as estrogen, to function properly.
- Some cancers depend on hormones to grow. Because of this, treatments that block or alter hormones can sometimes help slow or stop the growth of these cancers. Treating cancer with hormones is called hormone therapy, hormonal therapy, or endocrine therapy. Hormone therapy is mostly used to treat certain kinds of breast cancer that depend on estrogen.

How hormone therapy works

- Hormone therapy travels throughout the body to find and target hormones. Different types of hormone therapy work in different ways. They can:
 - Stop the body from making the hormone
 - Block the hormone from attaching to cancer cells
 - Alter the hormone so it doesn't work like it should
- Hormone therapy can be used to:
 - Treat a certain kind of cancer by stopping or slowing its growth
 - Lessen symptoms related to a certain type of cancer

Types of hormone therapy

Breast cancer

- Aromatase inhibitors (AIs), such as anastrozole, exemestane, and letrozole
- Selective estrogen receptor modulators (SERMs), such as tamoxifen and raloxifene
- Estrogen receptor antagonists, such as fulvestrant and toremifene
- Luteinizing hormone-releasing hormone (LHRH) agonists, such as goserelin, leuprolide, and triptorelin
- Surgery to remove the ovaries (known as an oophorectomy)

Targeted therapy for HER2-positive Breast Cancer

- In about 15% to 20% of breast cancers, the cancer cells make too much of a growth-promoting protein known as HER2. These cancers, known as HER2-positive breast cancers, tend to grow and spread more aggressively than HER2-negative breast cancers. Different types of drugs have been developed that target the HER2 protein.
 - **Monoclonal antibodies** are man-made versions of immune system proteins (antibodies) that are designed to attach to a specific target. In this case, they attach to the HER2 protein on cancer cells, which can help stop the cells from growing. An example of this drug is **trastuzumab**.
 - **An antibody-drug conjugate (ADC)** is a monoclonal antibody linked to a chemotherapy drug. In this case, the anti-HER2 antibody acts like a homing signal by attaching to the HER2 protein on cancer cells, bringing the chemo directly to them. An example of this drug is **Ado-trastuzumab emtansine**.
 - **Kinase inhibitors**. HER2 is a type of protein known as a kinase. Kinases are proteins in cells that normally relay signals (such as telling the cell to grow). An example of this drug is **lapatinib**.

Targeted therapy for women with BRCA gene mutations

- Olaparib is a drug known as PARP inhibitors. PARP proteins normally help repair damaged DNA inside cells. The BRCA genes (BRCA1 and BRCA2) also help repair DNA (in a slightly different way), but mutations in one of those genes can stop this from happening. PARP inhibitors work by blocking the PARP proteins. Because tumor cells with a mutated BRCA gene already have trouble repairing damaged DNA, blocking the PARP proteins often leads to the death of these cells.
- This can be used in different ways to treat breast cancer.
 - Olaparib can be given to women with a BRCA mutation with early-stage HER2-negative breast cancer after surgery who have been treated with chemotherapy (before or after surgery) and are at high risk of the cancer recurring. It is typically given for one year. When given in this way, it can help some women live longer.
 - Olaparib can be used to treat advanced or metastatic, HER2-negative breast cancer in women with a BRCA mutation who have already had chemotherapy. If the cancer is hormone receptor-positive, olaparib can also be used in women who have already received hormone therapy.

Targeted therapy for HR+ Breast Cancer

About 3 of 4 breast cancers are hormone (estrogen or progesterone) receptor-positive. For women with these cancers, treatment with hormone therapy is often helpful. Certain targeted therapy drugs can make hormone therapy even more effective.

- CDK4/6 inhibitors – ribociclib, abemaciclib, palbociclib
- mTOR inhibitor - everolimus
- PI3K inhibitor - alpelisib

HR+ Breast Cancer Treatment

Hormone therapies have been a mainstay of treatment for HR-positive cancer. However, there is a new focus on adding targeted therapies to hormone therapy for advanced or metastatic HR-positive cancers. These treatments could prolong the time until chemotherapy is needed and ideally, extend survival.

- Ribociclib, palbociclib, and everolimus have all been approved by the FDA for use with hormone therapy for treatment of advanced or metastatic breast cancer. Ribociclib has been shown to increase the survival of patients with metastatic breast cancer.
- Abemaciclib can be used with or after hormone therapy to treat advanced or metastatic HR-positive, HER2-negative breast cancer. In October 2021, the US Food and Drug Administration (FDA) approved abemaciclib in combination with hormone therapy to treat some people who have had surgery for early-stage HR-positive, HER2-negative breast cancer.
- Alpelisib is approved to be used in combination with hormone therapy to treat advanced or metastatic HR-positive, HER2-negative breast cancers that have a mutation in the PIK3CA gene.

CDK4/6 inhibitors

- CDK4/6 inhibitors are drugs that block proteins in the cell called cyclin-dependent kinases (CDKs), particularly CDK4 and CDK6. Blocking these proteins in hormone receptor-positive breast cancer cells helps stop the cells from dividing. This can slow cancer growth.
- These drugs are approved for women with hormone receptor-positive, HER2-negative breast cancer and are taken as pills, typically once or twice a day.
- Any of these drugs can be given along with an aromatase inhibitor (AI) or fulvestrant to women with advanced breast cancer who have gone through menopause.
- Any of these drugs can be given with fulvestrant or an aromatase inhibitor to women with advanced breast cancer who are still having regular periods (premenopausal) or are almost in menopause (perimenopausal). These women, however, must also be on medicines, such as luteinizing hormone-releasing hormone (LHRH) analogs, that stop the ovaries from making estrogen or have their ovaries removed with surgery.

mTOR inhibitor

- Everolimus blocks mTOR, a protein in cells that normally helps them grow and divide. Everolimus may also stop tumors from developing new blood vessels, which can help limit their growth. In treating breast cancer It seems to help hormone therapy drugs work better. Everolimus is a pill that is taken once a day.
- This drug is used for women who have gone through menopause and have advanced hormone receptor-positive, HER2-negative breast cancer. It is used with the aromatase inhibitor exemestane for women whose cancers have grown while being treated with either letrozole or anastrozole (or if the cancer started growing shortly after treatment with these drugs was stopped). It might also be used with fulvestrant, a hormone therapy drug.

PI3K inhibitor

- Alpelisib (Piqray) blocks a form of the PI3K protein in cancer cells, which can help them stop growing. This drug is a pill taken once a day.
- It can be used along with fulvestrant to treat postmenopausal women with advanced hormone receptor-positive, HER2-negative breast cancer with a PIK3CA gene mutation that has grown during or after treatment with an aromatase inhibitor.
- About 30% to 40% of breast cancers have a mutated PIK3CA gene. Oncologists will test for this mutation before starting treatment with this drug.

Immunotherapy for Breast Cancer

- Immunotherapy is the use of medicines to boost a person's own immune system to recognize and destroy cancer cells more effectively. Immunotherapy typically works on specific proteins involved in the immune system to enhance the immune response. These drugs have side effects different from those of chemotherapy.
- Some immunotherapy drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered targeted therapy because they block a specific protein on the cancer cell to keep it from growing.

PD-1 inhibitor

- Pembrolizumab is a drug that targets PD-1 (a protein on immune system T cells that normally helps keep them from attacking other cells in the body). By blocking PD-1, these drugs boost the immune response against breast cancer cells. This can often shrink tumors.
- It can be used with chemotherapy to treat triple-negative breast cancer:
 - Before and after surgery for stage 2 or 3 cancers
 - That has come back (recurred) locally but can't be removed by surgery
 - That has spread to other parts of the body.
- This drug is given as an intravenous (IV) infusion, typically every 3 or 6 weeks. In certain situations, oncologists might test for the PD-L1 protein to show that the cancer is more likely to respond to treatment with pembrolizumab.

Survivorship

Choosing a treatment option that improves overall survival and quality of life will have an impact on a breast cancer patients' journey.



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Questions to ask your medical oncologist

- What do the results of these tests mean?
- What are my treatment options?
- How will each treatment option benefit me? What are the risks?
- What is the expected timeline for each treatment option?
- What treatment plan do you recommend for me? Why?
- What is my prognosis?
- What can I do to get ready for this treatment?
- What are the potential long-term or late side effects of each treatment?
- How will this treatment affect my daily life? Will I be able to work, exercise, and perform my usual activities?
- What lifestyle changes should I consider making during my treatment?

A person wearing a blue shirt is holding a large, translucent, pinkish-red object that resembles a flower or a cluster of small, rounded items. The object is held in front of their chest. The background is a soft, out-of-focus light blue and white.

Thank you!

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