

HOW TO MANAGE CERTAIN SPECIFIC

side effects?

- 1. Diarrhoea** – This can usually be managed with loperamide. If this does not resolve, your treating oncologist might use stronger anti-diarrheal medications, put you on a treatment break or reduce the drug dose. Pembrolizumab can rarely cause inflammation of the bowel wall which can lead to severe diarrhoea or tummy pains. You should report this promptly to your treating oncologist so that investigations can be carried out quickly to rule out infections and you may be started on steroid medications if necessary.
- 2. Mouth sores** – This can be managed with good oral care including moistening mouthwashes, salt and bicarbonate washes, topical steroid treatment directly on the ulcer (triamcinolone ointment) and anaesthetic mouthwash – which needs to be prescribed.
- 3. Nausea** – This can usually be managed with anti-nausea medications.
- 4. Temporary heart muscle damage** – Trastuzumab, pertuzumab and trastuzumab emtansine can cause the risk of temporary heart muscle damage. This can be addressed by reducing risk factors for heart disease such as stopping smoking, treating diabetes or high blood pressure carefully and adopting healthy exercise. Heart scans would normally be requested before starting and during treatment to monitor heart function.
- 5. Heart rhythm disturbance** – Ribociclib can potentially affect your heart rhythm. Your treating doctor may request for baseline and ongoing heart tracings (ECG) to monitor this whilst you are on treatment.
- 6. Nail and skin changes** – If skin itching is present, oral antihistamines can be prescribed.

Depending on the severity, your treating doctor may prescribe topical steroid creams or moisturisers. In terms of nail care, you can focus on avoiding infections, particularly fungal infections, by using topical antiseptics or anti-fungal creams if required.

- 7. Low platelet count** – Trastuzumab emtansine can specifically cause low platelet count. Your treating oncologist will be monitoring your blood counts whilst on treatment. You may notice easy bruising or more frequent nose bleeds.
- 8. Low white cell count** – Palbociclib and ribociclib can both cause low white cell count, with abemaciclib causing this to a lesser degree. Your doctor will be monitoring your white cell counts on treatment. If the level is too low, you can either be put on treatment break or on a reduced drug dose by your treating oncologist.
- 9. Low red cell count (anaemia)** – The red cells that carry oxygen in your body can drop to lower levels whilst on Olaparib. Your doctor will determine if the levels are severe enough to hold treatment, reduce drug dose or prescribe blood transfusions.
- 10. Lung inflammation** – Abemaciclib, palbociclib, ribociclib, everolimus, alpelisib, trastuzumab emtansine and pembrolizumab can potentially cause lung inflammation and you might experience a new dry cough or shortness of breath that does not go away over weeks. Your treating doctor should be notified of these symptoms so that chest investigations can be carried out. If lung inflammation is confirmed, a camera test (bronchoscopy) may be introduced into the lungs to retrieve cellular samples for testing to exclude infectious causes. If the lung inflammation is confirmed to be a drug reaction, your treating doctor may hold the drug treatment and prescribe steroid medications.
- 11. Metabolic hormone disturbance** – Pembrolizumab can cause inflammation of the hormone glands, especially the thyroid. This can cause thyroid hormone imbalance which leads to either underactive or overactive metabolism. Your doctor will be monitoring these hormone levels whilst you are on treatment.



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TARGETED THERAPIES

in Breast Cancer

WHAT ARE

targeted therapies?

Targeted therapy is a type of cancer treatment that specifically targets certain proteins usually found on the surface of breast cancer cells or proteins inside breast cancer cells that are uniquely involved in breast cancer growth. These cancer proteins can be found in certain breast cancer subtypes and not in all types of breast cancer. Targeted therapies come in several forms – some of the therapies attach to the cancer cell surface and “block” or “turn off” signals from the surface telling the cancer to grow (an example of this is the antibody drug, trastuzumab for HER2 positive breast cancer). Other targeted therapies attach to specific external parts of cancer cells making the cancer cell a target for the body’s own immune cells to home in on the cancer cell and destroy it (an example of this is the drug pembrolizumab which is a form of immunotherapy). Still other targeted drugs are made in the laboratory, where a tiny amount of chemotherapy is tightly bound to a carrier molecule called a monoclonal antibody and then this combination molecule, when attached to the cancer cell, releases the tiny amount of chemotherapy into the cancer cell causing it to die (an example of this is sacituzumab govitecan).

Given its targeted effects on cancer cells, general side effects of targeted treatment are usually milder and more easily managed than most chemotherapy drugs. Side effects that can occur are due to some normal healthy cells being seen as the target of the treatment and thus can also be damaged. An example would be the monoclonal antibody trastuzumab, targeting the Her2 protein in Her2 positive breast cancer. However, some Her2 protein is also found in normal heart muscle cells and thus trastuzumab

can potentially cause temporary heart damage. This risk is higher if you already have pre-existing heart issues or heart risk factors such as older age, high blood pressure or poor heart pumping function. The heart function is always monitored before and during trastuzumab treatment.

HOW ARE

they used?

Some of the targeted drugs are designed to be taken in tablet form. Others still have to be infused in a vein or given as an injection under the skin. Depending on the patient’s diagnosis and condition, targeted treatments are more commonly used in combination with either hormonal treatments or chemotherapy. The table below shows the commonly used targeted therapies in breast cancer. Your treating oncologist will discuss with you the correct regimen and how to use these targeted therapies if they are suitable to treat your type of breast cancer. Like chemotherapy regimens, targeted therapies that are currently used and administered in specific ways were studied in drug trials involving hundreds of women and have been tested for safety and efficacy in specific breast cancers. Many new small-molecule drugs and antibody-drug conjugates are currently being studied with good promise and may add to future treatment options for breast cancer.



Breast cancer setting and subtype	Protein target	Drug	Delivery	Specific side effects
Metastatic, · ER positive · Her2 negative	CDK4/6 · stops the protein function · affects cancer cell division	Abemaciclib* Palbociclib Ribociclib · used in combination with hormonal treatment	Tablet	· Diarrhoea · Low white cell counts · Lung inflammation · Heart rhythm disturbance (Ribociclib)
Metastatic, · ER positive · Her2 negative	mTOR	Everolimus · used in combination with Exemestane (hormonal treatment)	Tablet	· Lung inflammation · Raise blood pressure or blood cholesterol levels · Mouth sores · Diarrhoea
Metastatic, · ER positive · Her2 negative	PIK3CA	Alpelisib* · used in combination with Fulvestrant (hormonal treatment)	Tablet	· Lung inflammation · Itchy skin rash · Raised blood sugars · Mouth sores · Diarrhoea
Early, · ER positive · Her2 positive	Her2	Neratinib* · used in combination with hormonal treatment	Tablet	· Diarrhoea
Metastatic, · ER positive or negative · Her2 positive	Her2	Lapatinib · used in combination with chemotherapy capecitabine	Tablet	· Diarrhoea
Early or Metastatic, · ER positive or negative · Her2 negative	PARP · specifically in women who carry the faulty BRCA1 or BRCA2 gene · affects the ability of cancer cells to self-repair	Olaparib* · used alone (in triple negative breast cancer) or · in combination with hormonal treatment (in ER positive breast cancer)	Tablet	· Nausea · Low white cell count · Low red cell count (anaemia)
Early or Metastatic, · ER positive or negative · Her2 positive	Her2	Trastuzumab · used alone or in combination with Pertuzumab and/ or Taxane chemotherapy	Vein or injection under skin	· Temporary heart muscle damage
Early or Metastatic, · ER positive or negative · Her2 positive	Her2	Pertuzumab* · used in combination with trastuzumab and chemotherapy	Vein	· Temporary heart muscle damage · Diarrhoea
Early or Metastatic, · Triple negative breast cancer	PD-1 · lifts the brake off the body’s immune cells in attacking cancer cells	Pembrolizumab* · used in combination with chemotherapy	Vein	· Inflammation in any organ is rare but possible (commonly bowel, liver, lung, skin and hormonal glands) · Metabolic hormone disturbance
Early or Metastatic, · ER positive or negative · Her2 positive	Her2	Trastuzumab Emtansine · used alone	Vein	· Low platelet count · Temporary heart muscle damage · Lung inflammation

*Abemaciclib is the only CDK4/6 inhibitor drug that can also be used in the early breast cancer setting at present.

*Neratinib, Alpelisib, Olaparib and Pembrolizumab are drugs not currently funded by the government.

*Pertuzumab is not currently funded by the government for early breast cancer treatment.