

What is Immunotherapy?

Immunotherapy is a type of cancer treatment aimed at enhancing the body's natural ability to fight cancer by improving the functions of the immune system.


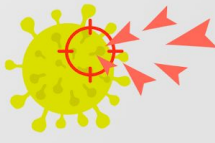
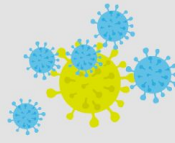
How does Immunotherapy work?

The immune system protects the body against illness and infection, and it naturally defends the body against cancer cells. However, some cancer cells are able to grow and hide from the immune system allowing the growth and spread of cancer to continue. For example, some cancer cells may have genetic changes that make them less visible to the immune system. Others may have proteins on their surface that turn off immune cells.

Immunotherapy works by helping the immune system fight against cancer cells more effectively. It can do this in a variety of ways including:

- Correcting the immunological abnormalities that facilitate the growth of cancer cells.
- Enhancing the immune mediated destruction of cancer cells.
- Weakening the cancer cells' ability to evade the immune system.
- Targeting markers on cancer cells specifically to destroy them.

What is the difference between Chemotherapy, Targeted Therapy and Immunotherapy?

| Difference between Chemotherapy, Targeted Therapy and Immunotherapy | | Centre for Clinical Haematology | |
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| |  |  |  |
| | Chemotherapy | Targeted Therapy | Immunotherapy |
| How does it work? | Targets rapidly dividing cells (mostly cancer cells) | Targets Proteins required for cancer growth | Uses our immune system against cancer |
| Side Effects | Hair loss, intestinal damage, nausea | Liver problems, diarrhea, skin rash | Autoimmune effects |
| Limitations | Cancer cells develop resistance to chemotherapy, not specific | Cancer cells develop resistance | Tailored and expensive |

What are the types of Immunotherapy?

These are several types of immunotherapy based on the specific strategies used in fighting cancer cells:

Immune checkpoint inhibitor

The immune checkpoint is a key component of the immune system that controls or regulates the functions of the immune system and prevents the immune response from becoming too strong. By blocking these immune checkpoints, these checkpoint inhibitors allow the immune cells to respond stronger to cancer cells.

Nivolumab is an immune checkpoint inhibitor commonly used in the treatment of Hodgkin lymphoma.

Monoclonal antibody

All cells have different receptors or proteins on their surface. Monoclonal antibodies are made so they can only connect to one type of receptor. Most monoclonal antibodies are made to connect to

receptors on the surface of specific cancer cells. By connecting to cancer cells, they help the body's immune system find the cancer cells and attack them.

Rituximab and Daratumumab are types of monoclonal antibodies used for the management of CD20 positive **lymphoma** and CD38 positive **myeloma** respectively.

Drug-conjugated monoclonal antibody

In this form of immunotherapy, a cytotoxic agent is attached to a monoclonal antibody, which then attacks the cancer cells. The use of drug-conjugated monoclonal antibodies such as Brentuximab can be useful in the management of Hodgkin lymphoma.

Bispecific monoclonal antibody

T-cells are white blood cells in the body that help to fight infection and cancer cells. Bispecific monoclonal antibody is a type of monoclonal antibody that binds to both the normal T-cells of the immune system and the cancer cells so that the T-cells destroy the cancer cells. Blinatumomab is a bispecific monoclonal antibody used for treating acute lymphoblastic leukaemia.

CAR-T (Chimeric antigen receptor-T) cells

CAR-T cells are the genetically modified T-cells harvested from the patient or a healthy third party donor. These modified T-cells have receptors which allow it to link to proteins on cancer cells so that they can directly attack and eradicate specific cancer cells.

Immune moderating agents

Immune moderating agents help the immune system work better so that it can recognise and fight cancer cells. Examples of such medication are lenalidomide and interferon.

Which blood cancers can be treated with Immunotherapy?

Immunotherapy can be effective in the management of many blood cancers including:

- B-ALL (B-Cell Acute Lymphoblastic Leukaemia)
- AML (Acute Myeloid Leukaemia)
- B-cell lymphoma
- Multiple myeloma
- Hodgkin lymphoma

How is Immunotherapy administered?

Some immunotherapy medications are available in the form of pills and capsules that can be consumed orally. Others can be given in our clinic by injection intravenously (through the vein) or subcutaneously (injection under the skin).

Our haematologists will determine the best immunotherapy drug and its dosage suitable for you. Immunotherapy may be administered alone or in combination with other forms of therapy such as chemotherapy.

You may receive immunotherapy daily or once a week or once a month. Some forms of immunotherapy are given in cycles with alternate periods of treatment and rest. The period of rest serves to provide the body adequate time to recover and build healthy cells.

What are the side effects of Immunotherapy?

Immunotherapy may cause side effects, many of which occur when the stimulated immune system acts not just against the cancer cells, but also against healthy cells and tissues in your body. These side effects vary according to the types of immunotherapy.

The following are some of the common side effects encountered in immunotherapy:

- Infusional reactions resulting in a fever, chills and sometimes hypotension (low blood pressure) following the administration of monoclonal antibodies and checkpoint inhibitors.
- Flu-like symptoms such as body aches, mild fever, and muscle pains may occur in patients receiving monoclonal antibodies.
- Autoimmune complications could result from the treatment with checkpoint inhibitors and monoclonal antibodies.

Other possible side effects you may experience include:

- Shortness of breath (difficulty breathing)
- Swelling of legs (oedema)
- Sinus congestion
- Headaches
- Weight gain from retaining fluid
- Diarrhoea
- Hormone changes such as an underactive thyroid leads to fatigue and weight gain
- Cough

This is not an extensive list of side effects. It is advised that you talk to your haematologist about the expected side effects of particular medications, and what to do if you have unexpected side effects.

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