

# Different Treatments and Side Effects of Immunotherapy

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## Perspective

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## DESCRIPTION

Immunotherapy or biological therapy is the treatment of disease through the stimulation or suppression of the immune system. Immunotherapies that lower or suppress the immune response are referred to as suppression immunotherapies, whereas immunotherapies that activate or amplify the immunological response are referred to as activation immunotherapies. The potential of immunotherapy to treat different types of cancer is the subject of preliminary investigation. The immune system of the body is used in immunotherapy to locate and eliminate malignant cells. There are various forms of immunotherapy, but they all function by strengthening the immune system so it can fight cancer more effectively. Some cancer patients may survive longer.

Very few cancers can be treated with cell-based immunotherapies. Lymphocytes, macrophages, dendritic cells, natural killer cells, and cytotoxic T lymphocytes work together to defend the body against cancer by targeting abnormal antigens expressed on the surface of tumour cells. COVID-19 vaccine-induced immunity is primarily based on an immunomodulatory T-cell response. Medical treatments include granulocyte colony-stimulating factor, interferons, imiquimod, and cellular membrane fractions from bacteria.

## Immunotherapy treatments include the following

- Immune system modulators.
- Monoclonal antibodies
- Checkpoint inhibitors.
- T-cell transfer therapy
- Cancer vaccines.

### Immune system modulators

Examples of Immunomodulators are substances that stimulate the immune system's response to cancer. Cytokines, BCG, and immunomodulatory drugs are of immune system modulators.

### Monoclonal antibodies

When the immune system detects an intruder, antibodies serve as the first line of defense. Antibodies are proteins that fight infection by identifying intruders and alerting the immune system to destroy them. Monoclonal antibody therapy for cancer involves the use of lab-created antibodies that can either supplement the existing antibodies or act as their own attack force.

### Checkpoint inhibitors

The immune system is a strong defense system that can be overpowering at times. Checkpoints in the body prevent the immune system from overreacting to invaders and damaging healthy cells.

### T-cell transfer therapy

This treatment strengthens the immune system's ability to kill cancerous cells. The immune cells are taken in and grown in a laboratory by healthcare providers. After the cells have grown, providers will reintroduce them into the body to kill cancerous cells. T-cell transfer therapy is categorized into two types: CAR T-cell therapy and tumor-infiltrating lymphocyte therapy.

### Cancer vaccines

**Cancer vaccines: Cell-based, protein- or peptide-based, or gene-based:** Tumor cells or tumor cell lysates are used in cell-based vaccines. Peptide-based vaccines are typically composed of cancer-specific epitopes and frequently require an adjuvant to stimulate the immune system and enhance antigenicity. Gene-based vaccines are made up of the nucleic acid (DNA/RNA) that encodes for the gene. The gene is then expressed in APCs, and the protein product is processed to form epitopes.

### Side effects of immunotherapy

Immunotherapy side effects may differ from those seen with traditional cancer treatments because they are the result of an overstimulated or misdirected immune response rather than the direct effect of a chemical or radiological therapy on cancer and healthy tissues. In theory, immune-related side effects can affect any tissue or organ in the body. These side effects can range from mild to moderate to severe, and in some cases, they can be life-threatening.

Immunotherapy side effects can vary depending on the type of treatment used, as well as the location and type of cancer, as well as the patient's overall health. Patients should consult their oncologist and care team before starting treatment to gain a better and more complete understanding of the potential side effects and risks associated with specific immunotherapies. Muscle pains, constipation, injection site pain, hypothyroidism, arthritis, loss of appetite, diarrhoea, fatigue, nausea, and vomiting are all possible side effects of immunotherapy.

Severe side effects are uncommon, but when they do occur, they can be fatal and necessitate immediate medical attention. Hepatitis, Pancreatitis, Paralysis, Colitis, Lung Inflammation, and Diabetes are the most common severe side effects.