

Immune Checkpoint Inhibitors: A Guide for Cancer Patients

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Table of Contents

What Does My Immune System Do?	2
Cancer And Your Immune System	3
What Are Immune Checkpoint Inhibitors?	5
Types Of Immune Checkpoint Inhibitors	6
Drugs That Target PD-1 Or PD-L1	6
Drugs That Target CTLA-4	6
Are Immune Checkpoint Inhibitors The Same As Chemotherapy?	6
Immune Checkpoint Inhibitors Side Effects	7
What Can I Expect When I Am Having Immune Checkpoint Inhibitor Treatment?	8
What Precautions Do I Have To Take?	8
What Can I Expect After Immune Checkpoint Inhibitor Treatment?	8
Where Can I Learn More?	8

**What are your questions? Please ask.
We are here to help you.**

What does My Immune System Do?

To understand how Immune Checkpoint Inhibitors (CPIs) work, it is important to first understand how your immune system works. Your immune system is known as your body's "defense system". It is made up of cells, tissues and organs that help defend the body from foreign things like infections (bacteria, viruses) and diseases, including cancer.

Many different types of cells make up the immune system but a very important type of cells are the lymphocytes (a type of white blood cell). They help recognize when there is an "invader" and try to fight against it.

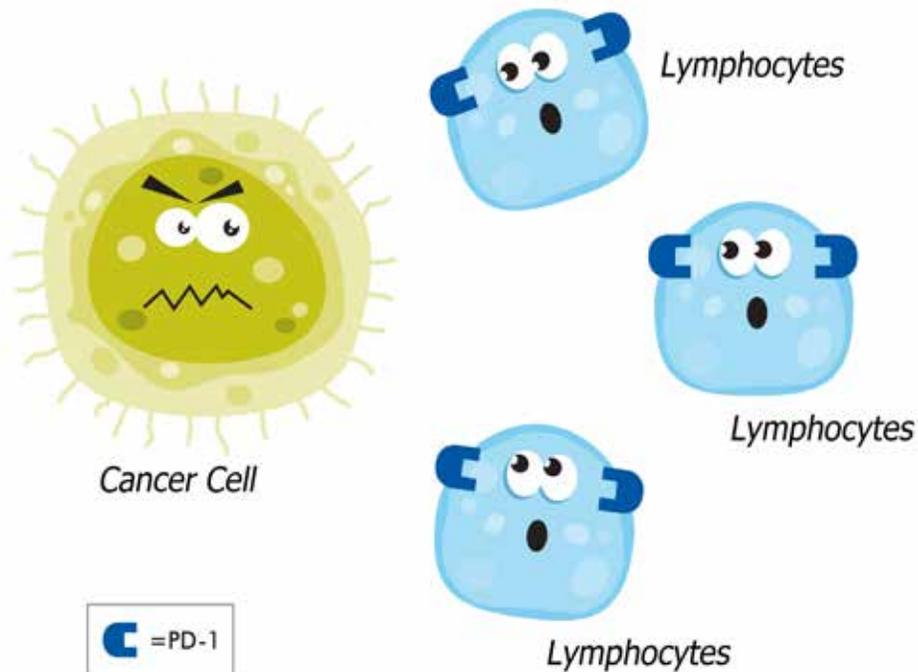


Image courtesy of LCRF

The lymphocytes recognize the cancer cell as something that should not be there and...

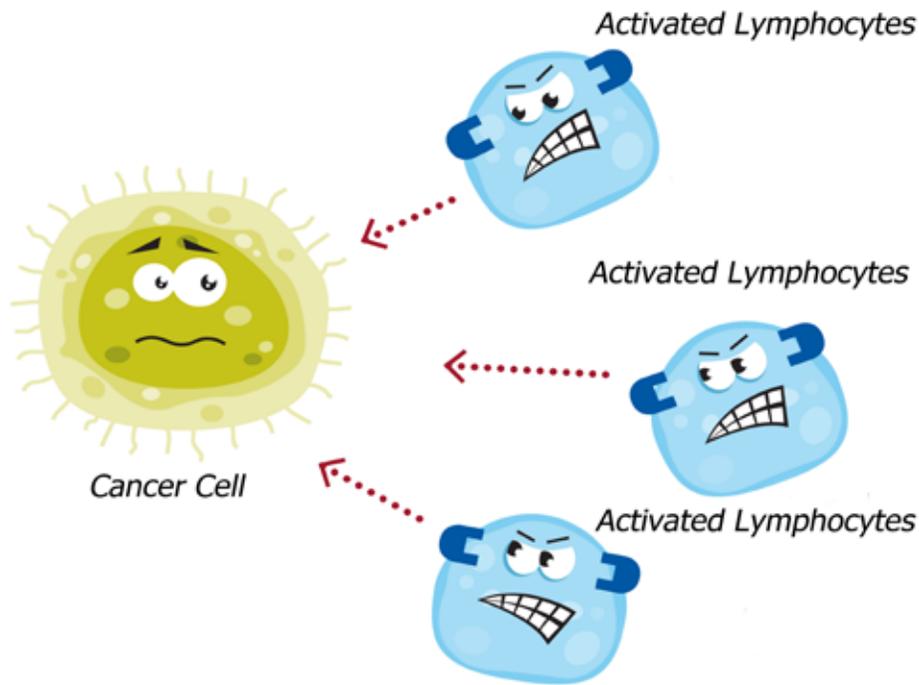


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...they become activated and try to destroy the cancer cell.

Cancer and Your Immune System

There are limits on the immune system's ability to fight cancer, because many people with healthy immune systems still get cancer. Sometimes the immune system does not see the cancer cells as different enough from normal cells. Or, the immune system sees the cancer cells, but the response is too weak to destroy the cancer. Cancer cells can also produce things that fool the immune system.

For example:

- There are "off switches" located on cancer cells that can "blind" the immune system and allows the cancer cells to grow and spread
- These "off" switches are also called checkpoints

Cancer cells sometimes find ways to use these checkpoints to avoid being attacked by the immune system.

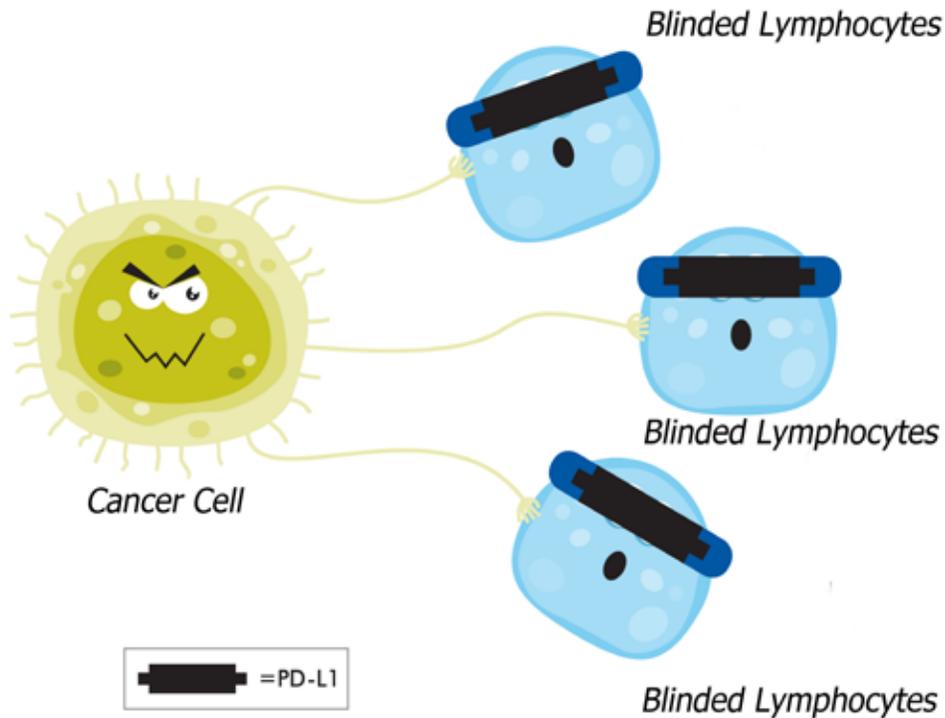


Image courtesy of LCRF

Cancer cells can be smart and hide..

To overcome this “blinding” of the lymphocytes, researchers have found ways to alter these “off” switches in the immune system so it can recognize cancer cells and strengthen its response so they can be destroyed. To do this, these “checkpoints” are targeted.

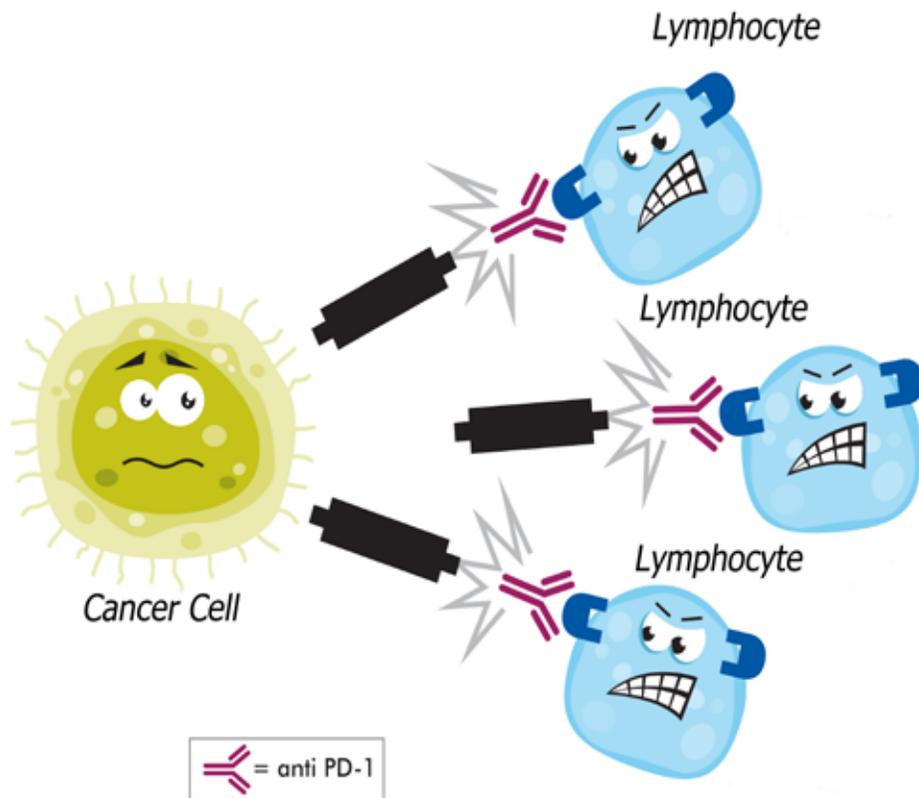


Image courtesy of LCRF

...but this is how they fight back! Checkpoint inhibitors bind to the “off” switch so the immune system can attack the cancer cells.

What are Immune Checkpoint Inhibitors?

Immune checkpoint inhibitors (CPIs) (also called immunotherapy) are an important part of treating some types of cancer, but not all cancers. CPIs work by causing your own immune system to work harder or smarter to attack cancer cells. CPIs are based on the concept that if you block one of the checkpoints that is inhibiting the immune system, you can turn the immune system back on. These drugs help the immune system to recognize and attack cancer cells. They may improve your immune system’s ability to fight cancer cells.

For some cancers an CPI is used by itself, for others it works better when used in combination with other CPIs or with other treatments like chemotherapy or oral targeted therapy.

Types of Immune Checkpoint Inhibitors

Several types of immune checkpoint inhibitors are either approved for use by Health Canada or are being used in clinical trials to test their effectiveness. The current checkpoints that are being targeted the most right now are CTLA-4 and PD-1 or PD-L1. There are many more under study.

These drugs have shown a great deal of promise in treating certain cancers including melanoma, non-small cell lung cancer, kidney cancer, bladder cancer, head and neck cancers and Hodgkins lymphoma as well as other cancers.

Drugs that Target PD-1 or PD-L1

PD-1 is a checkpoint on a specific lymphocyte called T cells. When PD-1 (on the T lymphocyte) binds to PD-L1 (on the cancer cell), it tells the T cells to leave everything alone and not destroy it. Some cancer cells have large amounts of PD-L1, which helps them avoid immune attack.

Drugs that target either PD-1 or PD-L1 can block this binding, turn the “off” switch back “on”, and boost the immune response against cancer cells.

Drugs that target the PD-1 and PD-L1 include Pembrolizumab, Nivolumab, Atezolizumab, Avelumab and Durvalumab.

Drugs that Target CTLA-4

CTLA-4 is another checkpoint on some T lymphocytes and again acts as an off switch to keep the immune system in check. Drugs that attach to CTLA-4 stop the “off” switch. This can boost the body’s immune response against cancer cells. A drug that targets CTLA-4 would be Ipilimumab.

Are Immune Checkpoint Inhibitors the Same as Chemotherapy?

No, CPIs are not the same as chemotherapy. Unlike chemotherapy, CPIs are not cytotoxic, meaning they do not directly kill the cancer cells. Chemotherapy causes side effects by also harming your healthy cells. CPIs cause most of their side effects by activating the immune system which then may fight your normal healthy cells. Because of this different mechanism, the side effects are quite different than chemotherapy and are managed differently than the side effects of chemotherapy.

Immune Checkpoint Inhibitors Side Effects

One concern with all of these CPIs is that they may allow the immune system to attack your normal cells as well which can lead to mild to severe side effects in some people.

Your Cancer Care Team will give you a Medication Information Sheet(s) and other materials that highlight information to help you understand about your specific type of CPI. Your Cancer Care Team will assess you for side effects before every treatment. In between treatments, please notify your Cancer Care Team if you have any of the potential side-effects you have been told about or if you have any other concerns.

If you have any serious symptoms:

- During business hours-call your cancer doctor/nurse, see your contact card.
- After hours- go to the closest Emergency Department right away and give your orange alert card to the Emergency Department Staff.
- This card alerts Emergency Staff that you are a cancer patient on an immune checkpoint inhibitor for cancer, and need treatment urgently.

Although your care is a priority, you may still have to wait while other patients with more urgent concerns are treated.

These serious side effects may include:

- Shortness of breath
- Severe diarrhea
- Yellowing of the skin/eyes
- Severe nausea/vomiting
- Blood in urine, painful urination
- Very weak or dizzy
- Confusion
- Changes in vision
- Headache that will not go away
- Numbness/tingling in your face, arms, legs
- Painful rash that keeps you awake at night

The side effects can happen right away but often 1-3 months after you start treatment. They can be delayed and last even up to one year after stopping treatment. Side effects are sometimes managed with supportive care (e.g. creams for rashes) but if serious they require treatment with steroids (e.g. Prednisone).

What Can I Expect When I am Having Immune Checkpoint Inhibitor Treatment?

Immune checkpoint inhibitors are given by an IV infusion, each CPI drug usually takes 30-90 minutes to infuse but sometimes the nursing staff will observe you for a period afterwards. Patients are usually treated as outpatients in a chemotherapy treatment unit.

Like any drug, patients can have an allergic reaction to the CPI infusion. If you do, you will be treated appropriately for that reaction. As well, prior to your next treatments, you will be given medications to decrease the risk of an allergic reaction happening again.

What Precautions Do I Have To Take?

If a caregiver/family member is helping you and will be handling your body fluids, it is important that they wash their hands well.

Because we are unsure of the effect of CPIs on unborn babies:

- It is important that you do not get pregnant or father a child while on CPIs
- Birth control must be used by men and women of child bearing age taking CPIs

If you have any questions or concerns about this, please discuss them with your cancer doctor/nurse.

What Can I Expect After Completing Immune Checkpoint Inhibitor Treatment?

Side effects from CPI's can occur weeks to months following completion of your treatment. Continue to carry your alert card for up to one year after you finish treatment in case you present to the Emergency Department with new symptoms/side effects. It is also important to inform your cancer team if you have any new symptoms/side effects.

Where Can I Learn More?

Learning more about cancer and treatment and getting support for the emotional and practical issues related to cancer can help you cope with your diagnosis.

The Nova Scotia Cancer Care Program's website provides reliable information and links to support services for cancer patients and their families, visit www.nshealth.ca/cancer-care for more. The video "Immune checkpoint inhibitors for Cancer Treatment" can also be found on this site.

You may wish to view the video How is Immunotherapy Used to Fight Cancer? by visiting [youtube.com/watch?v=AbmEt_E8kfo&feature=youtu.be](https://www.youtube.com/watch?v=AbmEt_E8kfo&feature=youtu.be) or watch the video Immune Checkpoint Therapy by visiting [youtube.com/watch?v=l26xM3336lo](https://www.youtube.com/watch?v=l26xM3336lo)

You can find reliable information on this topic on the Nova Scotia Cancer Care Library Guide page for patients and families, library.nshealth.ca/Cancer/Home for more information.

The Nova Scotia Cancer Care Program has partnered with the Nova Scotia Provincial Library System, to ensure Nova Scotians can access helpful books about cancer at their local library, including:

- After You Ring the Bell... Ten Key Challenges for the Cancer Survivor
- Beyond Survivorship – Cancer and Your Spiritual Journey
- Man, Cancer, Sex
- The Essential Cancer Treatment Nutrition Guide and Cookbook
- The Healing Journey – Overcoming the Crisis of Cancer
- When a Parent is Sick – Helping Parents Explain Serious Illness to Children
- Woman, Cancer, Sex

See their website, library.novascotia.ca for more information.

Looking for more health information?

Find this brochure and all our patient resources here: <http://library.nshealth.ca/PatientGuides>
Contact your local public library for books, videos, magazines, and other resources.
For more information, go to <http://library.novascotia.ca>

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The information is not intended to be and does not constitute health care or medical advice.
If you have any questions, please ask your health care provider. The information in this pamphlet is to be updated every 3 years or as needed.

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