

Immunotherapy: Side Effects of Checkpoint Inhibitors (ICI)

Checkpoint inhibitor drugs block proteins (checkpoints) made by some types of immune system cells and some cancer cells. When these proteins/checkpoints are blocked by an ICI drug, T cells can kill cancer cells better. An unintended consequence of more effective T cell function is that the T-cells may attack the person's own healthy tissues and organs (See back for more information on *immune-mediated responses*).

Common side effects

- Dry Mouth, mouth sores
- Low thyroid hormones: sensitivity to cold, constipation, weight gain, dry skin, muscle/joint aches
- Lungs: changes in breathing, cough
- Liver: changes in liver function
- Kidney: (in back, flank): infection
- Intestines: diarrhea
- Skin: rash, itching
- Muscle, joint, bone pain

About Side Effects




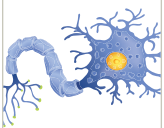



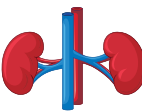



- May occur during or after treatment
- May occur anywhere in the body
- Must be reported! Many side effects are treatable and some rare side effects can cause death if not treated.

ICI Drugs

Generic Name	Brand Name
atezolizumab	Tecentriq®
avelumab	Bavencia®
cemiplimab	Libtayo®
durvalumab	Imfinzi®
ipilimumab	Yervoy®
nivolumab	Opdivo®
pembrolizumab	Keytruda®

Immune-mediated Reactions

Sometimes ICIs overstimulate your immune system, causing an immune-mediated reaction. Normal organs and tissue are attacked, causing symptoms. Mild inflammatory conditions occur in 30-50% of patients taking ICIs, but serious reactions occur in about 5% of patients. Symptoms depend on the organs/tissues that become inflamed. **Report any of these symptoms to your doctor, right away.**

	Intestines (colitis): Black or sticky stools or stools with blood or mucus, diarrhea or more bowel movements than usual, change in bowel habits, unexpected weight changes; or stomach pain or tenderness
	Liver (hepatitis): Yellowing of the skin or eyes, nausea, vomiting, feeling less hungry than usual, pain on the right side of your stomach area, dark urine, and easy bruising or bleeding
	Hormone glands (thyroid, pituitary, and adrenal glands): Fast heartbeat, weight loss, increase in sweating, weight gain, hair loss, feeling cold, constipation, deeper voice than usual, muscle aches, dizziness or fainting, headaches that will not go away or unusual headache
	Nervous system (neuropathy, meningoencephalitis): Severe muscle weakness, changes in mood or behavior, numbness or tingling in hands or feet, extreme sensitivity to light, fever, neck stiffness, or confusion
	Skin: Rashes covering more than 25% of your body or rashes that blister, peel, or open
	Eye problems: Blurry vision, double vision, eye pain or redness, or other vision problems
	Lungs (pneumonitis): New or changing shortness of breath, new or worse cough, and chest pain
	Kidneys: Changes in the urine amount/color, blood in your urine, swelling in arms and legs
	Heart: Irregular heartbeat, myocarditis (inflammation of the heart muscle)
	Brain (encephalitis): Sensitivity to light, headache, confusion, mood or behavior changes, neck stiffness, seizures
	General/Full body: Severe muscle or joint pains, severe muscle weakness, high blood sugar, high cholesterol