

# Immunotherapy for Esophageal Cancer

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## Introduction

Immunotherapy is the use of medicine that helps a person's immune system to detect and destroy cancer cells. It can be used in treating esophageal cancer. Esophagus is a muscular tube like structure that connects from mouth to stomach. Esophageal cancer is disease where malignant cancer cells form in the esophagus tissues. Esophagus wall is made up to multiple layers of tissues like mucous membrane, muscle tissue and connective tissue. Esophageal cancer begins in the inner lining of esophagus wall and spreads through other layers. There are two types of esophageal cancers named for the type of malignant cells they become. They are Squamous cell carcinoma and Adenocarcinoma.

## Signs and Symptoms

Symptoms are mostly found in the later stages of cancer. They are pain or difficulty in swallowing, weight loss, chest pain, cough, hoarseness, indigestion and heartburn, lump formed under the skin.

## Risk Factors

There are many factors that can increase the risk of esophagus cancer. They are use of tobacco, heavy alcohol consumption, gastro esophageal reflux disease, barrett's esophagus.

## Diagnosis of Esophageal Cancer

Esophageal can be diagnosed by performing physical examination and health history, barium swallow x-ray, esophagoscopy, thoracoscopy, laparoscopy

## Factors Effecting Prognosis and Treatment Options

The prognosis and treatment options of esophageal cancer depend on the stage of cancer and patient's general health. Usually esophageal cancer is diagnosed at the advanced stages where cancer can be treated but rarely cured. Esophageal cancer can recur after treatment.

## Tests

Staging is a process used to examine whether the cancer has spread within the esophagus or to any other parts

of the body. The staging process helps in planning the treatment. The tests used in staging process are Endoscopic ultrasound (EUS), CT scan, PET scan, MRI, thoracoscopy, laparoscopy.

## Metastasis

Cancer spreading to other parts of body it is called as metastasis. Cancer can spread through tissues (primary tumor), lymph vessels and blood (metastatic tumor).

## Grades of Cancer

Biopsy is done to determine the plan of treatment. They elaborate on how abnormal the cancer cells looks under microscope. Esophageal cancer is described in 3 stages:

Stage I: the cancer cells appear as normal cells.

Stage II: abnormal growth of the cancer cells.

Stage III: cancer cells are multiplied abnormally.

## Immunotherapy for Treatment of Esophageal Cancer

Immunotherapy is a treatment that uses the patient's own immune system to stimulate its response to fight cancer.

## Monoclonal antibodies (mAB)

Are synthetic proteins which act as human antibodies in immune system. They are called as targeted antibodies used in cancer immunotherapy. They detect and disrupt the cancer activity and helps immune system to destroy cancer cells.

## Ramucirumab (Cyramza)

these drugs block another protein of the T-cells (immune cells) named as CTLA-4 and enhances the immune response. Ipilimumab (Yervoy) is a CTLA-4 inhibitor that can be used in combination with Nivolumab (Opdivo) in treatment of liver cancer.

## Transtuzumab (Herceptin)

Is the antibody targets HER2 pathway. This treatment option is approved as first line therapy in HER2 positive GEJ cancer. Immunomodulators are also called as

checkpoint inhibitors. The checkpoint proteins on immune system are like switch which is turned on or off as required to stimulate an immune response.

### **Nivolumab (Opdivo)**

Is a checkpoint inhibitor approved as a second line treatment in treating esophageal squamous cell carcinoma and GEJ cancer that can't be removed surgically? This checkpoint inhibitor targets PD-1/PD-L1 pathway. It can also be used with chemotherapy to treat advanced squamous cell carcinoma or advanced GEJ cancer. The drug is administered through intravenous (IV) infusion once every 2, 3 or 4 weeks.

### **Pembrolizumab (Keytruda)**

Is a checkpoint inhibitor used in treating locally advanced or metastatic esophageal cancer called esophageal squamous cell carcinoma (ESCC) and GEJ cancer as a second line treatment.

### **Common side effects of PD-1 inhibitors**

Tiredness, muscle or joint pain, loss of appetite,

constipation or diarrhea, shortness of breath, skin rash, itching, nausea, cough, fever

### **Conclusion**

Immunotherapy plays a major role in esophageal cancer treatment. Even though the trials are ongoing, the results from the trial of combination therapy of surgery and immunotherapy are promising.

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