

2018 Public Reporting of Outcomes

Nivulomab and Pembrolizumab Outcomes

A new drug was introduced approximately 4 years ago that captured the attention of the world as a novel treatment for certain types of cancers, particularly late stage diseases such as melanoma or non-small cell lung cancer. This new drug was nivulomab or what is more commonly referred to in the media as Opdivo. Following close behind were other new drugs delivering a new kind of therapy to treat cancer called immunotherapy. This report will focus on two immunotherapy drugs, nivulomab (Opdivo) and pembrolizumab (Keytruda) utilized in our cancer centers since FDA approval. This report will focus on the previous two years, 2016 and 2017, and the outcomes experienced by our patients who were administered nivulomab and pembrolizumab.

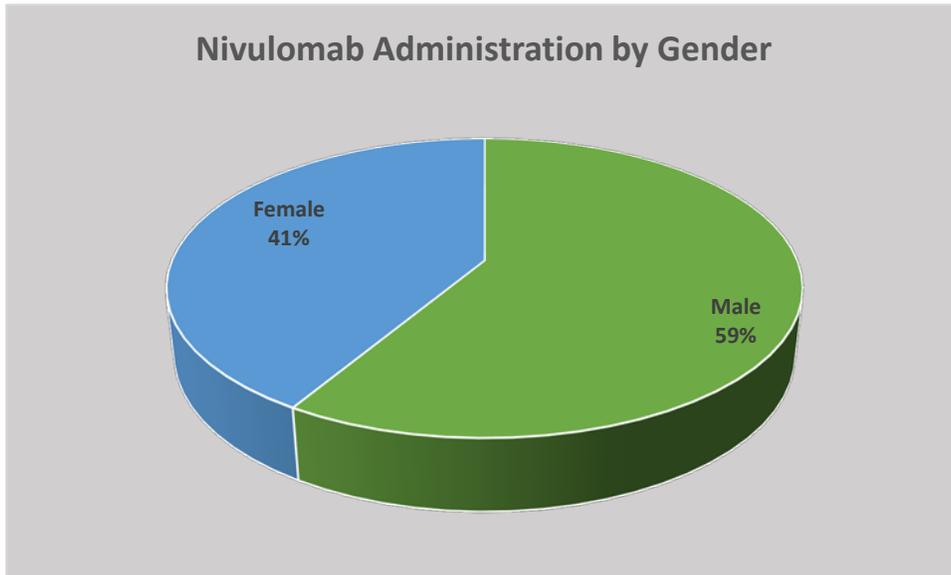
Immunotherapy is a type of cancer treatment that helps your body's immune system fight cancer cells. William B. Coley, M. D., known as the father of immunotherapy, first attempted to harness the power of the body's immune system to fight cancer in the late nineteenth century with some success. However, the known mechanism for success was not clearly identified, leaving oncologists to adopt surgery and radiotherapy as standard treatments for cancer in the early twentieth century.

One reason cancer cells can thrive is their ability to "hide" from the immune system utilizing what is known as the PD-1 pathway. When the body detects a "foreign" substance, it sends out "T" cells to detect and fight infections and diseases, including cancer. Cancer cells may use the PD-1 pathway to hide from the "T" cells thereby prohibiting attack from the "T" cells and growing and thriving. Drugs such nivulomab and pembrolizumab are called "checkpoint inhibitors" and block the PD-1 pathways and prevent the cancer cells from hiding.

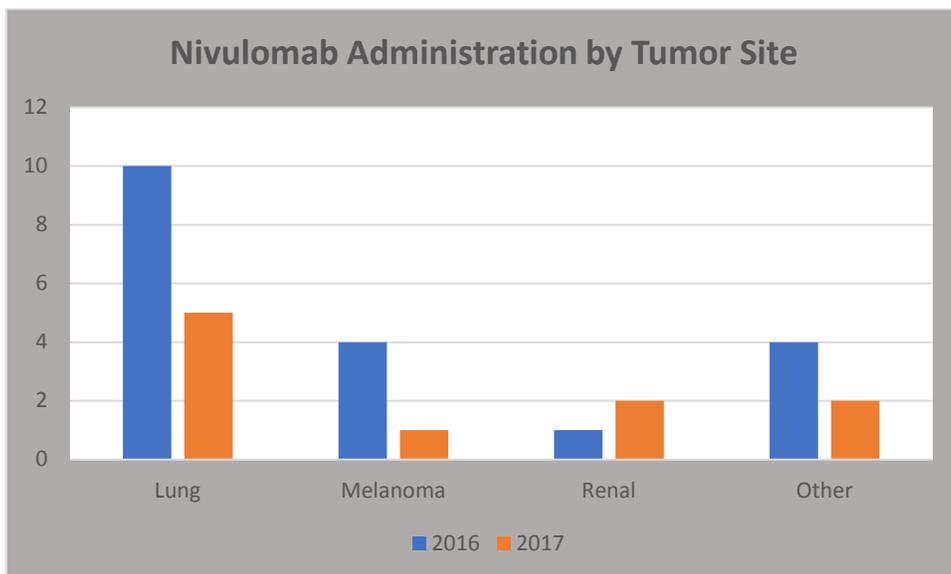
This outcome report consists of data from 29 patients receiving nivulomab and 16 patients receiving pembrolizumab during the years of 2016 and 2017.

Nivulomab (Opdivo) outcomes:

29 patients received nivulomab during the timeframe described above. Age range of patients receiving nivulomab was 48 years to 82 years of age. 58% of the patients receiving nivulomab during the described time frame were male and 41% were female.

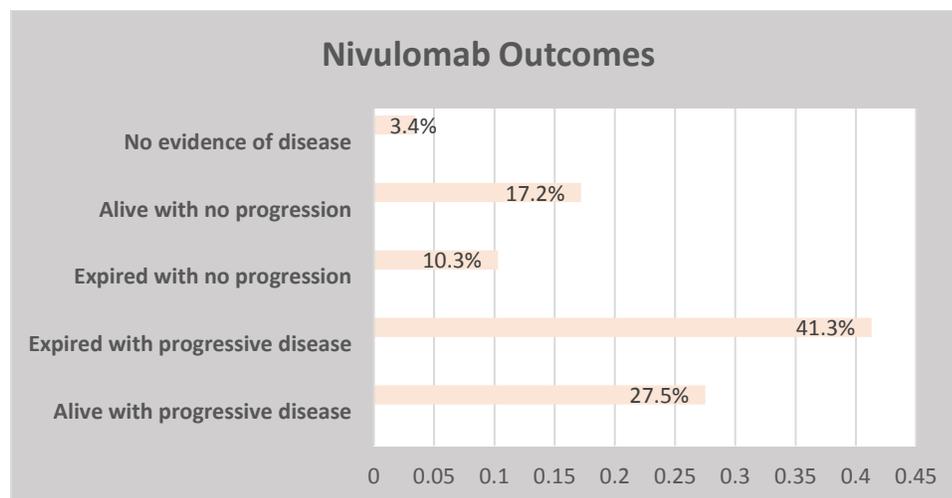


- 52% or 15 of the 29 total patients presented with lung cancer.
- 17% or 5 of the 29 total patients presented with melanoma.
- 10.3% or 3 of the 29 patients presented with renal cell carcinoma.
- 21% or 6 patients of the total 29 patients presented with other types of cancer including head and neck cancer, endometrium, liver, malignant neoplasm, and connective tissue neoplasm.



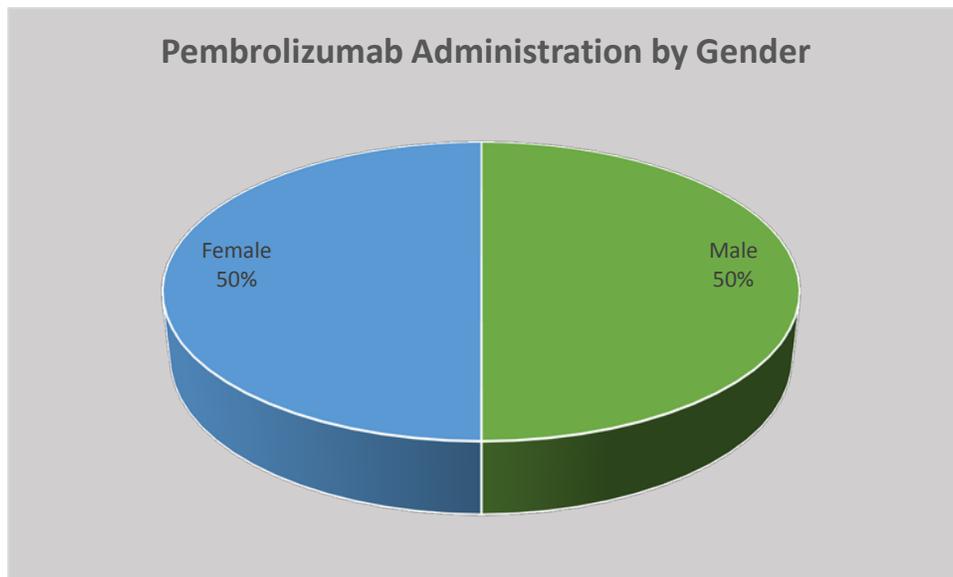
Nivulomab is typically administered intravenously every two weeks and can be given until the cancer progresses or toxicity from the immunotherapy is unacceptable. CT scans are typically performed approximately eight weeks after nivulomab is initiated. The following data indicates patient outcomes:

- 27.5% or 8 patients are currently alive having experienced progressive disease after receiving nivulomab. Five patients displayed progression of their disease after two months, two patients progressed after eleven months; and one patient showed progression of disease after 23 months of nivulomab.
- 41.3% or 12 patients expired after progression of disease with nivulomab.
- 10.3% or 3 patients expired after no progression of disease with nivulomab, death attributed to comorbid conditions.
- 17.2% or 5 patients are currently receiving nivulomab with no progression of their cancers. One patient has had progression free cancer for five months; two patients are progression free at 6 months; one patient is progression free at 7 months and one patient is progression free at 20 months.
- 3.4% or 1 patient has completed treatment with nivulomab and has no evidence of cancer and is 33 months progression free, from initiation of Treatment.



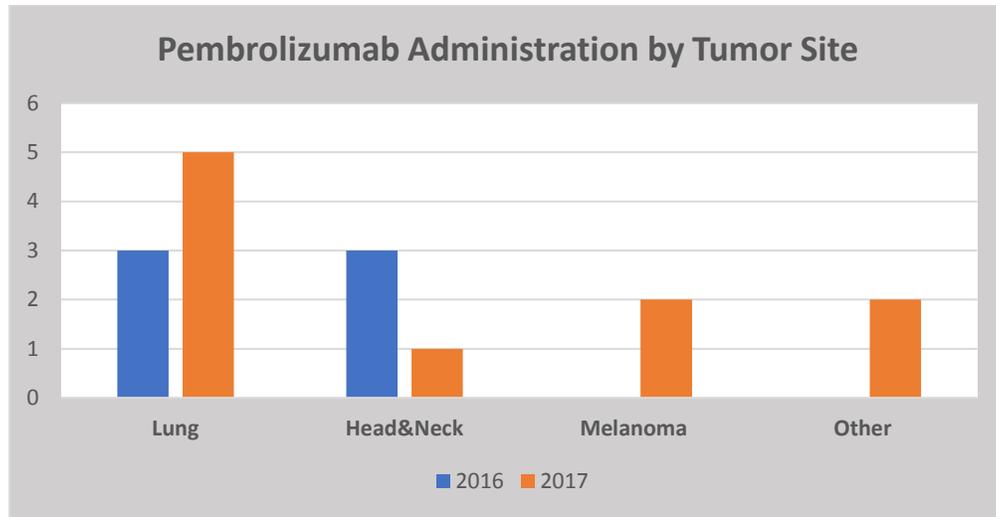
Pembrolizumab (Keytruda) outcomes:

16 patients received Pembrolizumab during the timeframe described above. Age range of patients receiving pembrolizumab ranged in ages of 47 to 85 years of age. 50% of the recipients of pembrolizumab were male and 50% female.



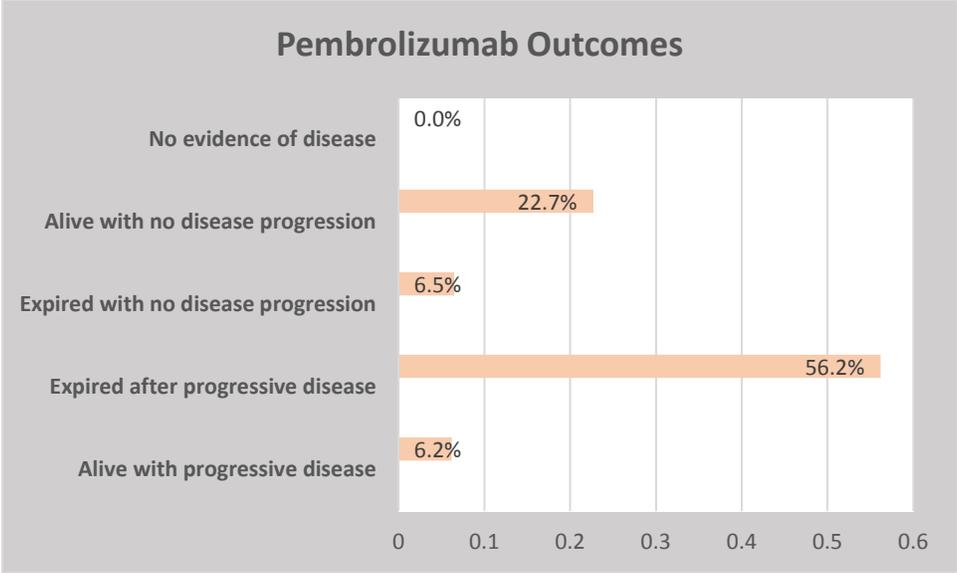
16 patients received pembrolizumab during 2016 and 2017.

- 50% or 8 patients presented with lung cancer.
- 25% or 4 patients presented with Head and Neck Cancer.
- 12.5% or 2 patients presented with melanoma
- 12.5% or 2 patients presented with other cancers.



Pembrolizumab is typically administered intravenously every 3 weeks and as nivulomab, can be administered until the cancer progresses or toxicity from the immunotherapy is unacceptable. As with nivulomab, CT scans are typically performed approximately eight weeks after pembrolizumab is initiated. The following data indicates patient outcomes:

- 6.2% or 1 patient is alive and has experienced progression of disease with pembrolizumab. The patient showed progression of disease after four months receiving pembrolizumab.
- 56.2% or 9 patients expired after progression of disease with pembrolizumab.
- 6.5% or 1 patient expired after no progression of disease with pembrolizumab with death attributed to comorbid conditions.
- 22.7% or 5 patients are currently receiving pembrolizumab with no progression of their cancers. One patient is progression free at 15 months; one at 10 months; one at 9 months and two patients at 5 months.
- 0% disease free



Early data nationwide is indicating improved survival rates in non-small cell lung cancer after the use of nivulomab. The five-year survival rate for patients experiencing highly advanced metastatic lung cancers are estimated at 2%. Early results from survival studies after the use of nivulomab is indicated at 16% survival rate for lung cancers. Early survival data for pembrolizumab is also indicating improved survival rates for late stage disease.