Background Immune checkpoint inhibitors are a newer modality of systemic cancer-directed therapy that is often more tolerable and has broader eligibility criteria than traditional cytotoxic chemotherapy. Unfortunately, pneumonitis is a feared complication of these drugs in around 5% of all patients, including a rare risk of death. Per professional guidelines, there are no pathognomonic features in radiology, clinical history, or laboratory testing to confirm pneumonitis. The global COVID-19 pandemic and the widespread utilization of these drugs have complicated this diagnostic challenge. We sought to develop a systematic method to measure the incidence of different etiologies of acute respiratory failure in the current landscape.

Methods We developed a novel patient registry from a retrospective cohort of patients treated with an immune checkpoint inhibitor for cancer and then presented to the hospital after the onset of the COVID19 pandemic in this region. We created a novel case report template in REDCap that collected all relevant data from clinical documentation, imaging reports, and laboratory values during the hospitalization and follow-up. The template prompted the physician reviewer to attribute the respiratory failure based on diagnostic criteria from professional guidelines.

Results Our retrospective cohort was made up of 110 patients who had 304 separate hospitalizations between March 2020 and June 2022. Nearly half of these encounters (n = 138, 45%) had a respiratory complaint noted on admission, and an additional 36 encounters (11%) had respiratory testing at any point during their hospitalization. Respiratory complaints were most commonly due to bacterial pneumonia (n = 52, 30.2%), COPD exacerbations (n = 20, 11.6%), pleural effusions (n = 18, 10.5%), malignant obstruction (n = 18, 10.5%), multiple etiologies (n = 16, 9.3%), other etiologies (n = 16, 9.3%), checkpoint inhibitor pneumonitis (n = 3, 2%) and COVID19 pneumonia (n = 2, 1%).

Conclusions Our analysis found that respiratory evaluations occurred in most hospitalizations among patients receiving an immune checkpoint inhibitor for cancer. Although the current widespread use of these drugs and the COVID19 pandemic have altered the diagnosis and management of respiratory failure patients with cancer, most cases were still due to bacterial infections or malignant progression. Our study also provides proof-of-concept for a novel case report template form that can systematically collect and categorize data from these complicated hospitalizations.