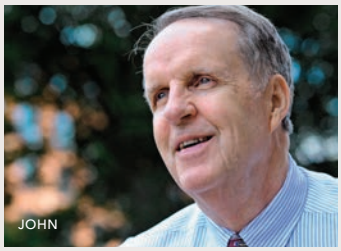
"I gained 100 months of quality life..."

One Patient's Journey in this History-Making Clinical Trial


JOHN

John was one of the lung cancer patients who benefitted from the historic clinical trials of anti-PD1 immunotherapy in lung cancer.

In 2015, John, then 68, began coughing up a small amount of blood. The husband and father of eight thought it was strange, but with no pain or other symptoms he was stunned to learn he had the most advanced stage of a common form of lung cancer, known as non-small cell lung cancer. The cancer had already spread to a rib.

There are few diagnoses worse than late-stage lung cancer. The cancer kills more people than any other type of cancer, and few patients survive once it has spread.

"One of my sons was graduating from college, and my daughter was about to leave for a study abroad. I wondered if I would live long enough to see my son graduate or to welcome my daughter back home," John recalls.

The first treatment he received was chemotherapy, and for a time, it worked, but the treatment came at great physical cost, and these side effects were worsening. The simplest tasks became difficult. His body was weakening, and worse, he learned his cancer was no longer responding. He thought he might be out of options.

It was then that his doctor suggested he go meet with **Julie Brahmer**, who was one of the lead investigators on an experimental clinical study of anti-PD-1 immunotherapy in a variety of advanced cancers. John's form of lung cancer was among the cancers that showed unprecedented responses.

The anti-PD-1 drug, called nivolumab, interfered with cancer cell's ability to shut down the immune response to cancer, unharnessing the immune response against cancer.

"I had struggled to sit at my kitchen table. After just four treatments, the tumor shrunk by 65%, and I felt like a human being again," says John. A few more treatments and his rapidly growing lung cancer was nearly gone, and the cancer that spread to his rib was eliminated.

About one-quarter of the lung cancer patients in the study responded to the treatment. The numbers were even higher for melanoma and kidney cancer patients, but it was the lung cancer responses that garnered the most attention.

Anti-PD-1 was the first checkpoint inhibitor to work against lung cancer—and as many as 14 other cancer types —and that's the pivotal difference that excited the cancer world.

Despite the great success, Brahmer and her Kimmel Cancer Center colleagues began to observe that, in some patients, the immune response did not stop at the cancer but rather continued to attack and inflame the lung, skin, gut or other organs. John was among them.

In March 2022, he began having trouble breathing. The immunotherapy, that kept his advanced lung cancer in check for more than eight years was now triggering his immune system to attack his lungs. The persistent inflammation, called pneumonitis, caused scarring in the lungs, leading to significant shortness of breath.

John was not the only patient to experience this side effect. The Kimmel Cancer Center and its Bloomberg-Kimmel Institute for Cancer Immunotherapy (BKI) led the way in research and addressing the challenge, launching a new dedicated initiative for managing side effects of immunotherapy, led by **Jaruska Naidoo**.


NAIDOO

BKI researchers and clinicians are setting the standard of care for how to recognize and treat these types of immunotherapy toxicities.

These side effects can present with a wide range of symptoms, so their management requires the cooperation of many experts. Naidoo and colleagues assembled a group of specialists in every part of the body that has the potential for adverse reactions to immunotherapy and they are on call for the BKI 24/7.

Naidoo attended national cancer meetings with a research nurse to educate other doctors and worked with organizations, like the National Comprehensive Cancer Network, to share what they have learned and to establish standards for managing immunotherapy side effects. They are also assembling a web-based course for doctors.

Despite the limiting toxicities, John continues to battle. He still believes he was in the right place at the right time. He feels fortunate that his diagnosis coincided with advances in immunotherapy. Without it, he points out, he had, at best, nine to 18-months to live.

"Having just passed the 10-year survival milestone in April 2023, I am humbled and grateful to the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins and Dr. Julie Brahmer, and the team of doctors and nurses who have provided unparalleled expert medical care to me throughout this journey. I am comforted in knowing that I am with the best team of experts in the world," says John. "I gained 100 months of quality life extension. I have been there for college graduations, weddings, and the births of grandbabies. If I had to do it over again, even with the pneumonitis, I would make the same choice. The alternative would be not to be here. Immunotherapy saved my life."