Let's talk about adjuvant therapy. Here's a great example of a very positive adjuvant therapy trial. The patients on this trial had Stage III melanoma, meaning it was in the lymph nodes, and they were randomized to the pembrolizumab treatment for one year in blue — anti-PD-1 single agent — or placebo in red.

What did we learn? We learned that the blue group did much better: 63.7% are still alive and disease-free here compared to 44% of the placebo patients — almost a 50% relative improvement, highly statistically significant.

But still, we have to recognize that when we use adjuvant treatment when we do surgery first, and then give these drugs for a year, still, about a third of the patients recurred despite getting the drug and about half of the patients got drug who never would have needed it. So, only about 20% of the people actually benefited from getting the drug right away after surgery. That's a big deal for that 20%.

But it was at a cost. The cost was all 100 people had to get treated for those 20 to benefit; all had to have the risk of side effects of the treatment, even though it was only one drug, some people had significant toxicity; everybody had to pay the cost, even if it didn't come out of their pocket if it came from insurance or medicare, somebody somewhere had to pay the cost for that treatment. And all those people had to come into the clinic for regular visits and infusions for up to a year's worth.

So, we know that even though some people benefit when we give treatment after surgery, we don't know who those people are, and we never really know whether we did any good.