

Whether or not therapy has been successful is something that has changed over time, and how we assess that. Replacement of thyroid hormone for patients with hypothyroidism started probably more than 100 years ago. And since 1880 until more or less the '70s-- so about 90 or 100 years-- the goal of the therapy was to eliminate symptoms. Physicians will provide thyroid hormone replacement therapy in different forms that we're going to discuss later. But the measurement was, how are you feeling? How are your symptoms? And the goal-- if you read those books, you will see that the goal was to progressively, but very gradually, increase the dose of thyroid hormone replacement therapy until the patient will tell you, "Oh, that's too much." Because you would identify fine tremor. Or sometimes the patient will have palpitations, the tightness of the chest, sweating. So those are all signs of hypothyroidism, thyrotoxicosis. So when that happens, physicians will step back and say, well let's reduce the dose and go back to your previous dose, which you were feeling OK and you didn't have any symptoms, any adverse reactions. That's how it happened for 100 years.

Now, as we developed the methods to measure TSH in the serum, in the blood, TSH transitioned to be the gold standard to adjust thyroid hormone replacement therapy. So, since the TSH is an invaluable tool for the diagnosis of hypothyroidism-- TSH levels are up-- physicians reasoned that we should provide thyroid hormone replacement until TSH levels have returned to within the normal range. And that makes a lot of sense. And that's how we do it today. So if you read any guidelines, patients will be treated with sufficient levothyroxine, or whatever thyroid hormone replacement therapy they decide, until TSH levels return to within the normal range.

Now, why are we not addressing symptoms or clinical signs? Because, number one, they are not very dramatic to start with. Since we are screening patients with TSH, T3/T4 on a yearly basis when they come for a checkup, we will catch patients with hypothyroidism very early in the disease. It's very rare to see a patient with overt hypothyroidism. You will see those. Usually we see those patients in the hospital, as they were brought in comatose states or low level of conscious. Because either they were hypothyroid and they stopped taking the medication and then they developed overt signs of hypothyroidism. So those are rare patients. Today, we're talking patients that have a slightly elevated TSH, minimal symptoms. And for those patients, what we do is we follow the levels of TSH. And of course, we have to measure T3/T4 as well. We are giving thyroxine to a patient. If that's the case, we should see what's going on with the T3/T4 levels as well.