

**DAVID DODICK:** I'm David Dodick. I'm a professor of neurology at the Mayo Clinic in Arizona and director of the Mayo Clinic Concussion Program. Concussion, as many of you know, is a major public health concern and a major scientific and clinical priority in the United States right now. Sports-related concussion affects upwards of 3.8 million athletes per year, and youth, adolescent, amateur, and professional athletes are all at risk for concussion.

As many of you know, there are at least now 39 states that have passed concussion legislation, and the concussion legislation specifically centers around, amongst other things, the need for the athlete to be cleared by a licensed health care provider before being allowed to return to play. So that is the "what" we're talking about. The "why" about this, of course, is in regards to the consequences of premature return to play.

So what are the consequences of premature return to play? We know that if an athlete returns to play prematurely, he or she is at risk of one of three things essentially. One, the risk of a rare but obviously serious and potentially fatal complication known as second impact syndrome which, when an athlete's brain has not recovered from a prior concussion, incurring a second concussion may lead to fatal brain swelling. The second issue is that they are at an increased risk for a second concussion, which takes them longer to recover from and has the potential to lead to a post-concussion syndrome, which are symptoms that may be disabling that persist for weeks, months, or years. And third, they are at risk for a subsequent concussion which can lead to progressive neurodegenerative changes in the brain that have been identified in athletes as young as teenagers, 17, 18 years of age. So that's why this concussion legislation has been passed.

So the question is, who should be returning these athletes to play, since this return to play legislation is so important? What's so important about it is that we need to be sure that the athlete's brain is back to normal before they return to play, not when the athlete feels that he or she is back to normal. So who should be evaluating these athletes? I think the individual who's evaluating these athletes should be someone experienced in the evaluation of patients with brain injury, because a concussion is, indeed, a brain injury. That may or may not be a neurologist, but it should be someone who's experienced in the evaluation of concussion.

Why is that important? Because he or she, whoever is evaluating these athletes, are not only experienced in evaluating concussion, but know how to examine the brain to ensure that both the metabolic and structural integrity of the brain is back to its baseline before returning that athlete to return to play. That's important because symptoms, by and large, resolve within several days, whereas more objective measures of brain function we know don't return to normal until about seven days in older athletes and even longer in youth athletes. As we get more sophisticated with the diagnostic testing-- for example, there are certain sophisticated imaging procedures that we can do that show that even though objective measures have returned to baseline within a week or two, sometimes the brain metabolism and the structural integrity of the brain has not recovered from a concussion maybe up to four six weeks or even longer. So whoever evaluates these athletes needs to be sure that there is some objective measure of brain function, so that we know when the athlete's brain has truly returned to baseline so that we can be sure that these athletes are returning to play when it's safe.

One of the initiatives that we launched here at Mayo Clinic was to baseline test with a computerized cognitive assessment tool every middle and high school athlete in the state of Arizona. We felt that was important because, if health care providers are going to be asked to clear these athletes to play, we felt that we needed to put into their hands one measure that was objective whereby they could see what the athlete looked like before the concussion and now what the athlete's brain function looks like after the concussion. And so they at least have one objective tool to use to make more informed return to play decisions.

So we think that while baseline testing is extremely important. Obviously, it's only part of the overall diagnostic evaluation of an athlete. It at least does provide health care providers with an objective tool to use to make safe return to play decisions.