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Myth: Computerized psychological testing, for example, the ImPACT or ANAM tests, can give definite answers about whether athletes have returned to their baseline, pre-concussion level of cognitive ability and are safe to return to play. I'm afraid this isn't true yet.

Fact: We would all like a magic crystal ball that would tell us when everything is safe, but the current computerized cognitive tests cannot tell you when someone is 100% safe to play again.

The companies selling such computerized testing certainly make the marketing claim that comparing these tests baseline and post-injury can help track recovery for a safe return to play, but like all marketing claims, take these with a grain of salt. Why don't these tests give definitive answers? Well, to be useful, a test has to have a stable, reliable value at the baseline. You need to know that if you get a score to summarize someone's cognitive abilities in, say, June, that the score you would get on the test in July or September would be the same, if no damage to the brain has occurred. This kind of stability over time is true of IQ tests, for example - your IQ in June will be the same as your IQ in July or September. So, to get a useful baseline score, you have to test a person twice, to know how much they vary over time normally.

Unfortunately, these computerized tests, such as ImPACT (or, a different company sells one called ANAM), do not show the kind of stability over time that IQ tests do. If you measure someone at a particular point in time, and then measure them again 2 weeks later or 10 weeks later, that person's scores might be very different the second time, even for perfectly healthy people with no head injuries whatsoever. What does that mean? That means that you could test a perfectly healthy athlete in June and he might score highly, say an 82/100. Test him again 10 weeks later in September, and even though he hasn't been playing and hasn't had any blows to the head, he might have a much lower score, say 60/100. Maybe he didn't sleep well before the September test, or maybe he has a new crush on some girl at school, and can't think about anything else. Lots of things can affect these test scores besides head injuries. So that high score in June and that low score in September together make up your baseline. Let's say this athlete goes into the season, has a concussion, and a week after the concussion, he has a low score, 62/100. But, because he had a low score right before the season, do you know whether that low score of 62 is related to the concussion? No, you don't know that. Without a baseline score that's stable and reliable over time, you don't know anything.

Let's imagine the reverse situation. You could test a perfectly healthy athlete in June, and she scores 70/100. Test again 10 weeks later in September, when she hasn't been playing and hasn't had any blows to the head, and most people will score higher just because of having more experience with the test -- let's say this gal's score is 85/100 in September. In October, she gets a concussion, and a week after the concussion, she scores 68/100. Do you know whether that score of 68 is related to the concussion? No, you don't. To re-iterate: without a baseline score that's stable and reliable over time, you don't know anything. So that is the major problem with these tests. What they claim to provide and what they actually provide, in terms of assurances of safety, are two different things.

If you are trying a case about sports concussion, this means your case will be vulnerable if your arguments depend on asserting that an athlete did not reach his/her baseline score or a normative baseline score before being allowed to return to play. If the other side has expert witnesses who are well-versed in the research literature about these tests, they could convince a jury that the test results were questionable. ***Bolster your case*** by bringing in evidence other than results of computerized cognitive testing.