



Defense Health Agency

Defense and Veterans Brain Injury Center “Clinical Updates in Brain Injury Science Today [CUBIST]” Podcast

“Concussion and Neurocognitive Assessment Tools”

Episode 102, Transcript

TRT: 8:43 min

Host: Inbal Eshel

Inbal Eshel: The views, opinions, and findings contained in this podcast are those of the host and subject matter experts. They should not be construed as official Department of Defense positions, policies, or decisions unless designated by other official documentation.

[music]

Inbal Eshel: Welcome to Clinical Updates in Brain Injury Science Today, or CUBIST, a biweekly podcast for health care providers about current research on traumatic brain injury, also known as TBI. This program is produced by the Defense and Veterans Brain Injury Center, otherwise known as DVBIC. And I'm your host, Inbal Eshel, a speech-language pathologist here at DVBIC. As a provider myself, I know how hard it is to stay on top of the literature while managing a full patient schedule. So we're doing the work for you, highlighting current TBI research that can help inform your practice in the time it takes you to walk from your clinic to the hospital. In today's episode, I'll be talking with Dr. Don Marion. Dr. Marion is a neurosurgeon and senior clinical consultant at DVBIC. In today's episode, Don and I will be discussing NCATs, or Neurocognitive Assessment Tests. Alright, welcome Don. So what are we going to learn about today?

Don Marion: Hi Inbal. So, yeah, today I'd like to talk about two recent studies, one that was done in 2013 and the second published last month about computerized neurocognitive assessment tools, or batteries. Both of these articles were authored by Dr. Wesley Cole and produced out of Fort Bragg in North Carolina.

Inbal Eshel: Excellent. Yeah. So tell us, what are NCATs actually, before we get into the meat of it?

Don Marion: Sure. Very simply, NCATs are computerized neurocognitive assessment tools. They're cognitive tests that are administered by a laptop computer. There are slight differences between the various commercially available tests. Four that we'll be talking about are the ANAM, the CNS Vital Signs, the Cog State, and the ImPACT. ImPACT being probably the most popular in the civilian world, and used at a lot of high schools, and in the NFL and NCAA. But basically these are, as I said, laptop administered tests, take approximately 10 to 15 minutes, Inbal. And really, a combination of some subtests, some memory tests, some math tests. But the most robust of those is reaction time tests.

Inbal Eshel: Excellent. That's really, really helpful, because I think that term gets thrown around a lot and we don't always know quite exactly what it's referring to. So before we get into the details, what is the bottom line up front? What are the findings of these two articles that you really want to highlight today?

Don Marion: Sure. So Dr. Cole looked at basically three things. He asked, "What's the likelihood that if I take the test today and I take it again 30 days from now, my results will be similar, assuming I haven't had a head injury in between? Are there any important differences that we should know about between those four tests or any of these commercially available tests? And finally, how do these tests perform compared to traditional pencil and paper tests, like the

Wechsler test, or Symbol Digit, or those kinds of things?" And so what he found was that test/retest reliability, or the likelihood that the results of your test will be the same today as they're going to be in 30 days from now, it's only fair. It's not in that high range that clinicians would like to see it in, in making clinical decisions. The second thing is, is one of these tests, like the ImPACT or ANAM, does one of them stand out as much better than the others? And the answer to that is no. They're all very similar. And finally, what about validity? What about how they perform compared to conventional pencil and paper tests? And performance wasn't great, Inbal. It was less, I think, than desired for clinical decision making again. Ultimately, what the investigators—what Dr. Cole and his team concluded—was that maybe the comparison wasn't a good comparison. Maybe we should take NCATs or neurocognitive assessment tools for what they are, which is basically a test of reaction time, mostly. And it's not a fair comparison with a pencil and paper test.

Inbal Eshel: Yeah. It certainly sounds that way, especially if the key measure is one of reaction time, and there are, of course, as we know, a whole host of other cognitive domains that are quite important to capture post-concussively. So I guess my next question is, do we trust these findings? Do these seem reasonable to you?

Don Marion: Yes, I think we do. And the reason I say that is because I think the test where these two studies that I referred to, Dr. Cole did, were very good studies. They were prospective studies with a relatively large number of service members enrolled in each of the studies. In the re-test reliability study, they started out with about 419 service members, and then 215 returned for the 30-day follow-up. So that was a pretty robust study. In the second study, the validity study that was just published last month, they enrolled 231 service members who were within seven days of a concussion and compared those results with 272 control service members who had not had a concussion. And just for example, to show how these tests were not as good as the traditional battery or pencil and paper test, they really didn't show any significant difference in outcomes for the group that had a concussion within the last seven days versus the group that didn't have a concussion, or the controls. The results of the NCATs were pretty similar, actually. Yes.

Inbal Eshel: So I feel like that's potentially a heavy implication for those providers out there who are getting these results oftentimes in their patients and trying to analyze them. So given on that, this whole discussion that we just had, what are the key implications for the providers out there?

Don Marion: Probably the first and most important is that the NCATs, in other words, ImPACT, or ANAM, or Cogstate Sport, or CNS Vital Signs, should never be used as the sole diagnosis or diagnostic for a concussion. In other words, you should never see an athlete, for example, in your office, give this test, and base your judgment on whether or not to diagnose concussion solely on the NCAT.

Inbal Eshel: Okay. So it's essentially potentially one piece of the puzzle that really focuses primarily on reaction time, but there are a whole host of other considerations to take into account when diagnosing a concussion?

Don Marion: Correct. And I don't want to downplay the utility in saying all these things. I mean, I will tell you in, Inbal, that in Afghanistan, the people or the physical therapists, occupational therapists, who staffed the concussion care centers found them pretty useful, actually, in following your recovery following a concussion. So they would get an initial ANAM and repeat it in two or three days, then maybe a third time after a week or so, and that would help them in following your reaction time in some of the other subtests that would help them decide when they were comfortable letting you return to duty.

Inbal Eshel: Excellent. So of course, this is not to say that there are not useful implications for NCATs, but just that we do need to be mindful of some of those results that we highlighted earlier. Alright, well, that is all we have time for today. We very much hope that you enjoyed this quick literature update. You can stay up to date on future episodes by subscribing to Cubist on iTunes Stitcher or wherever you listen to podcasts. If you have any questions about this podcast or about DVBIC products or programs, or if you have feedback for us, please feel free to email us at info@dvbic.org. That's info@dvbic.org.

[music]

CUBIST is produced and edited by Terry Welch and Deborah Bailin and is hosted by me, Inbal Eshel. It's a product of the Defense and Veterans Brain Injury Center, commanded by Army Colonel Geoffrey Grammer and the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, commanded by Navy Captain Mike Colston. Thanks for listening. We'll be back in two weeks with Dr. Anne Bunner to explore TBI research that's received significant media attention. Thanks again.

[music]