May 5, 2015
(uvpm: 27.7MM)

Latest Draftees Could Benefit From New-Age Concussion Test

By Larry Fine

File photo of NFL Senior Vice President of Health and Safety Policy Jeff Miller at a news conference discussing Health and Safety in football in Manhattan, New York January 30, 2014. REUTERS/ANDREW KELLY

(Reuters) - The 2015 NFL Draft class has now been welcomed into the league, one that could grow safer as their careers unfold through new-age research into identifying concussions.

Following a final settlement of a lawsuit brought by former players over concussions that could cost the league $1 billion, and a stunning retirement by a young player concerned about brain injury risks, there is high-tech hope for the future.

The GE/NFL Head Health Challenge has helped fund through grants 16 initiatives into diagnosing concussions from some 400 candidates, and is in the process of evaluating their progress before naming six "grand champions" for a next round of grants.

"We're excited by it," Jeff Miller, NFL senior vice president of health and safety policy, told Reuters.

The sweet 16 were selected by an outside group of experts on the potential impact of their concussion proposals.

"We asked, which ones are the 'wows'? Which ones really stand out, the ones that make you think this could really make a difference - a breakthrough protocol, a breakthrough idea, a breakthrough technology."

Head Health Challenge officials were visiting one such candidate on Tuesday, whose goal is to diagnose concussions and their severity from a blood sample.

"It's really quite magical technology," Kevin Hrusovsky, chief executive of Quanterix, a finalist in the GE/NFL Head Health Challenge, told Reuters in an interview.

Imagine a jarring tackle that dazes a player, who makes his way to the sideline, gives a blood sample through a prick of his finger and minutes later learns whether he has a sustained a concussion and to what degree.

Such is the ultimate aim through a technology dubbed Simoa (single molecule array) that can find minute proteins in blood to provide a window into the health of the brain.

"Nobody thought that many of the proteins or bio markers that affect the brain would even be in blood. It was thought, basically, that those proteins and those markers would only be in the brain in the spinal fluid," Hrusovsky said.

"But what we've learned is that a small amount of the spinal fluid, the cerebral spinal fluid, actually leaks into the blood through the blood brain barrier and because our technology can detect things that are so minute in blood, we can test what's going on in the brain."

'INCREDIBLY COMPELLING'

The release of certain proteins comes in response to injuries to the brain and the amount of the proteins found can show the severity of the trauma.

Researchers around the world are testing the technology and its potential applications, which could go beyond measuring brain trauma to other diseases as more proteins are found.

"We estimate the human body could have anywhere from 50,000 to a million different types of proteins, but today there's only about 170 of them that are tested routinely," said Hrusovsky.
Hrusovsky said watching his son get banged up playing football and hockey raised his concern, especially after the tragic effects of chronic traumatic encephalopathy (CTE) on some alumni of the NFL after years of repetitive blows to the head.

"Chris Borland, a 23 year old, decides to stop his NFL career based on what he has learned about CTE," said Hrusovsky, noting how former NFL players Junior Seau and Dave Duerson killed themselves with shots to the chest.

"I find that to be so incredibly compelling, how difficult their lives were with these conditions that they were willing to preserve their brains for science to try and figure this out."
Besides diagnosis of brain trauma, measuring the proteins can show when levels are returning to normal.

In the near future, blood samples would be sent to a lab, which would test for the amount of these proteins in blood.

"Initially, I think it will be used to determine when people are getting better," Hrusovsky said. "Eventually, tests will become more of a point of care. I think that will take more like two or three years, maybe even four years before it's offered on the side of a field."

For now, the device used for analysis is the size of a refrigerator, but he is confident of being able to miniaturize it to use hand-held, or on a desk top.

"We know that we can do it," said Hrusovsky. "Our technology is made for miniaturization."