



BODY WORK 04.15

Head Case

HOW ONE TEAM IS LEADING CYCLING OUT OF THE BRAIN INJURY DARK AGES—AND PROVIDING A POTENTIAL ROAD MAP FOR THE NFL
by Aaron Gulley

IF YOU want a snapshot of the way head injuries were treated in professional cycling until very recently, start with the viral images of Chris Horner at the 2011 Tour de France. After the American cyclist crashed toward the end of Stage 7 and was knocked out cold, he climbed back onto his bicycle, despite displaying clear signs of the disorientation caused by a severe concussion. At the finish line 15 miles later, television cameras captured Horner's bewilderment. "I don't understand," he stammered as he rolled in. "Where am I? When did I crash? I don't remember." Horner, who was forced to drop out of the race, suffered from dizziness and confusion for months. To this day he has no memory

of how things changed? In 2014, the UnitedHealthcare pro cycling team developed a new cognitive analysis that utilizes baseline testing done on its athletes throughout the season. (See "How Many Fingers Am I Holding Up?" below.) The team's post-crash practice changed after team doctors pulled UHC star sprinter Kiel Reijnen from a race following a crash. The ad hoc nature of the assessment left Reijnen angry and the doctors searching for a less subjective procedure.

The new protocol replaces the laborious SCAT3's sideline exam used in other sports, which largely results in a judgment call by an on-site health professional. The theory is that the new test eliminates most of the guesswork of whether or not a rider should be removed from competition. Had Horner been put through the UHC protocol, he'd likely never have ridden the final 15 miles.

"Nobody wants to take out your star quarterback," says Michael Roshon, UHC team physician. "But given everything we're



starting to learn about traumatic brain injuries, this has to be a medical decision, not a business one."

In the past few years, a national spotlight has been turned on traumatic brain injuries, focused largely on the lawsuit brought by retired professional football players against the NFL for concealing the dangers. Less known are the incidence rates of serious head injuries in adventure sports, including ones that took the life of freeskier Sarah Burke in 2012 and nearly killed snowboarder Kevin Pearce. Dangerous crashes are also a routine part of road cycling and mountain biking. UHC's program is just one example of a growing desire in many of these sports to take serious steps to mitigate the damage.

"Everyone is looking at ways to diagnose injuries quicker and more accurately," says Rob Wesson, senior director of research and design at Giro, which has built cycling and ski helmets for 30 years. This year, Giro, along with more than a dozen other helmet brands, invested in a technology called MIPS (multidirectional impact protection system) that is designed to reduce rotational forces on the brain, thereby minimizing the risk of concussion. Still, helmets will likely never prevent concussions entirely, which makes the decision over how to handle injured athletes the more critical ongoing issue.

Currently, the U.S. Ski and Snowboard Association, along with the NFL, NHL, and MLB, use a computerized neuropsychological test called IMPACT, which was developed by Dr. Mark Lovell, the former director of the Sports Medicine Concussion Program at the University of Pittsburgh Medical Center. IMPACT gauges memory and reaction time and is considered the gold standard in the industry, but it takes 30 minutes and must be administered in a quiet room. "It measures fine gradations of cognitive functioning," says Lovell, who has been studying concussions since his work with the Pittsburgh Steelers in the mid-'80s. "It's not appropriate for return-to-play decisions." That means a sideline diagnosis is typically made with the slightly less time-consuming, pencil-and-paper SCAT3 test. "It's the best we have," says Dr. Julian Bailes, chairman and neurosurgeon at Chicago's North Shore

Neurological Institute, who has consulted with the NFL Players Association.

"In professional cycling, if you can't make a decision in under five minutes, your day is over," says Roshon. That's why UHC made its protocol quick and simple enough to administer in the press of a race. "It always comes down to a judgment," he says, "but these tests, and especially the comparisons to an individual's normal results, help us make the decision less subjective."

Of course, no one sees the new program as a cure-all. "It's a good start. But remember that these tests aren't official," says Anna Abramson, an internal-medicine physician at University of California San Francisco and cochair of Medicine of Cycling, which is pushing for higher care standards in professional road racing. "There is some evidence behind them, but there's still tin" a lot of data. Many questions remain about how the brain reacts when it is injured?"

Lovell underscores the point: "It's a very tricky injury to diagnose. Chemical changes in the brain from an impact can take up to 12 hours to manifest. Our advice is always, When in doubt, sit them out."

Roshon is undeterred. He hopes that someday UHC's diagnostic test, or something like it, could become a standard procedure everywhere from the Tour de France to the NFL sidelines. But for now, he's just happy to have a tool that he feels can protect his riders. "The priority," says Roshon, "must always be the athlete's health." **D**

How Many Fingers Am I Holding Up?

An in-depth look at how UHC's protocol helps identify traumatic brain injuries in the field—A.G.

BEFORE AN INJURY

Team physicians conduct the following tests three times during the preseason to establish a baseline.

Step 1: Balance

The athlete stands with both feet on the ground, with eyes closed, for 20 seconds. Each balance correction is noted.
The test is repeated on a single, dominant foot.
A final, one-legged test

is run on a soft surface like grass, carpet, or a foam pad.

Step 2: Cognition

The physician tells the athlete a list of five words: banana, golf ball, pillow, coffee, feather. After the next two tests, the athlete attempts to recall the list. Accuracy is measured.
The athlete is given a series of five or six numbers. The physician then records how long it takes to repeat the series backwards.
An iPad app like Mind-Metrics (\$3; proactiveif.org) or BestTime! (free; natonaloms.com) is used to calculate reaction speed.

WHEN AN INJURY IS SUSPECTED

The physician asks a series of orienting questions—name, birth date, home address. If the athlete doesn't know the answers, or recalling them is difficult, the test is over; they've failed. Next, doctors ask if they feel tired, dizzy, agitated, or sensitive to bright light. Finally, the balance and cognition tests are run and the results compared with the baseline. A decrease in performance in one or more of the tests could indicate a brain injury, resulting in the athlete's removal from the competition.