Chris Rhea’s research will let military check for concussions in the field, using smartphone

Up to 320,000 service members in the past decade’s military operations in Afghanistan and Iraq have sustained some form of traumatic brain injury (TBI). The lack of an objective measurement tool for evaluating a suspected mild traumatic brain injury (mTBI) is of great concern to the military.

That’s why the U.S. Department of Defense is particularly eager to invest in UNCG research that may be the solution.

Dr. Christopher Rhea (Kinesiology) has received new funding of nearly one million dollars from the Department of Defense for the project “TBI Assessment of Readiness using a Gait Evaluation Test (TARGET).”

Many at UNCG are well aware of Rhea’s VEAR Lab in the Coleman (HHP) Building. There, he and students assess the gait, balance and walking techniques of study participants through the use of 3D motion capture, virtual reality immersion capabilities, a treadmill that simulates slips and trips, and more.

This grant is, however, for something quite unique.

“This is about a smartphone app,” Rhea says. “About smartphone technology.”

It’s not about studying movement in a lab. It’s about assessing a person’s movement wherever they may be. Even if they’re in the desert in a war zone. Or if there’s no medic nearby. They and their comrades can pull out a smartphone and do a quick assessment.

If the soldier moves abnormally, their balance is off, or if something in their stride is amiss, that suggests a concussion or worse.

He points out that in the past 10-15 years, improved armor has prevented many soldiers’ deaths. But explosions that they may now survive can result in varying levels of concussions and brain injury. After a blast of any sort, the question is: Can they return to duty, or should they be assessed more thoroughly and treated?

“The Department of Defense wants quantitative ways to measure dysfunction after concussion,” he notes. In combat, such assessments can be a matter of life and death.

Almost all smartphones have accelerometers, which orient the smartphone up or down and track acceleration. His research team has developed an app at UNCG to collect data as you walk for a few minutes, tracking your gait and balance.