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**Working Towards the Prevention of Brain Injury in Youth Sports, Brain Sentry is Developing Impact Sensor Technology on an Innovative Helmet-Mounted Device, Allowing Coaches and Parents to Identify Players who Need Concussion Evaluations**

**Healthcare  
Helmet Sensor**

**Brain Sentry  
630 Montgomery Ave, Suite 520  
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877-MY-SENSOR  
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**Greg Merrill  
CEO**

**BIO: Greg Merrill, CEO:** Has served as the founding CEO for three VC-backed fast growth wellness and medical product companies. His medical products have won BusinessWeek's "Best Product Design of the Year," and Popular Science's "Best of What's New" and his success story is now part of the National Museum of American History's permanent research collection on Innovation in Information Technology. He is an author on numerous peer reviewed technical papers and an inventor with seventeen issued patents. He served as invited guest editor for the Proceedings of the IEEE Special Issue on Virtual and

Augmented Reality in Medicine. He served as Principal Investigator on numerous federally funded research grants and as a referee/reviewer for government-sponsored and non-profit grants related to medical informatics and virtual reality technologies. As founding CEO of HT Medical Systems he led the Company through a \$42 million merger with Immersion Corp (NASDAQ: IMMR). He was recognized as Regional E&Y Entrepreneur of the Year ('07).



**About Brain Sentry**

Brain Sentry was founded by a team of award winning product developers with backgrounds in aerospace, medical products and sports.

It began out of a need in the market; lives are being destroyed by concussions. Sports are being ripped apart. In football, over 3,500 former pros sued the NFL over the debilitating effects of head impacts. Parents, understandably, are refusing to let their kids play. Players aren't disclosing their concus-

sion symptoms and lives are being devastated due to sports-related brain injuries, including second impact syndrome — caused by suffering a 2nd impact while playing with an undiagnosed concussion. That's unacceptable. It doesn't have to be this way.

The result of Brain Sentry's efforts is an innovative helmet-mounted device that alerts when an athlete suffers a potentially dangerous impact.

We help coaches, parents and safety monitors identify players that should be evaluated for a concussion.

Our goal is to help prevent further injury or even death.



**Interview conducted by:  
Lynn Fosse, Senior Editor  
CEOCFO Magazine**

**CEOCFO:** Mr. Merrill, would you explain the concept at Brain Sentry?

**Mr. Merrill:** Brain Sentry is currently developing an impact sensor technology, which helps teams- particularly youth sports teams- identify the players that need to be assessed for concussion.

**CEOCFO:** Would you please explain the science used in your product?

**Mr. Merrill:** The problem we are trying to address is that kids love to play football, hockey, and lacrosse, but in those sports there is often contact, and when a player gets hurt, such as with a concussion, they do not say anything because they don't want to be removed from the game. That is a problem, because those kids need to be off the playing field. Thirty-nine percent of catastrophic brain injuries happen to kids that were playing while still symptomatic with an unresolved concussion. The coaches are often volunteer parents who have trouble identifying which kids have concussions because the injury is not visible. We have developed a sensor, which measures the acceleration of the head. It mounts onto the helmet and it is very easy to use for both the kids and parents. They do not even have to turn it on or off, it just stay on the helmet for the entire year. The sensor detects when the head is accelerated at a rate that has been established to be statistically a high probability of concussion. The sensor then flashes a bright red light located on the helmet. When a coach or parent sees a flashing light on a player's helmet that player must report to the sideline for a standard concussion assessment. It's easy. It's quick. It doesn't disrupt the flow of the game and it has the potential to save lives.

**CEOCFO:** Could you explain what you mean by acceleration of the head?

**Mr. Merrill:** Acceleration is another way of saying an impact, or if the head moves rapidly. For example, if the athlete is a football player running down the sideline and another player hits him in the opposite direction, the players head may decelerate rapidly. Unfortunately, the brain inside of the skull will continue to move even though the skull has stopped and the brain will hit the inside of the skull, which could cause a concussion. We can detect when an event like that occurs and turn on a light so that the coaches know the player needs to be assessed for a concussion. This also addresses the concern that many of the players feel too embarrassed to identify themselves as being hurt.

**CEOCFO:** More specifically, how is your machine detecting this acceleration?

**Mr. Merrill:** We are leveraging a revolution in the miniaturization of sensor technology. Over the past 20 years or so, there has been a development of microelectronic mechanical devices, and one example of one of these types of sensors is in your iPhone or any smart phone. When you tilt the phone, the phone knows and can change its screen. We are using that same kind of technology, but we have developed technology around the sensor so that we can measure much higher forces than what you would experience with an iPhone.

**CEOCFO:** Where are you in the development process?

**Mr. Merrill:** We are two years into our development testing and are now in

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**- Greg Merrill**

large scale manufacturing ramp-up. We have products that deal with two clinical issues- one is that we are trying to help avoid second impact syndrome, which is when a player experiences a second hit when they are still suffering from a first concussion that was too often undiagnosed. We want to identify these players and get them off the field so they do not suffer second impact syndrome, which is unfortunately usually catastrophic. It kills several children every year that are playing football, hockey, or lacrosse. We want to avoid that. The other thing we are working toward is implementing a hit counter. We want to count the number of hits- even those at the average level- and we want to establish some standards saying if a player experiences too many hits in a short period of time that they should take a rest. We are doing that because we want to avoid the long-term effects of repeated head trauma.

**CEOCFO:** Assuming you have run

your product by potential users, what has been the response when you address the community you might ultimately be selling to?

**Mr. Merrill:** The community includes youth programs and even professional sports, and it has been extremely positive. We are now the official sensor for the professional Arena Football League- the AFL. The entire league is adopting our sensor technology. A number of colleges are adopting it as well, and there is a huge demand caused by the recent recognition of the dangers caused by head trauma in sports and the need to remedy that.

**CEOCFO:** Are you aware of competing technologies or generically similar products that are available or in production?

**Mr. Merrill:** There are a number of competitors entering the space, which we feel is positive in terms of validating the need. We feel that we are in the best position for the product because we address the specific needs of the youth market, in that our sensor does not require any battery charging and is effortless to use. It works for the entire year with no need to charge the battery.

**CEOCFO:** What is the cost of the product?

**Mr. Merrill:** Our NSRP is 60 dollars, and for teams with more than 20 players the product is being sold for 50 dollars per player, which is significantly less expensive than any of the competing products.

**CEOCFO:** Have you reached out to parents along with the youth programs?

**Mr. Merrill:** Youth sports are mainly comprised of parents, so we are finding that they are very much welcoming this technology.

**CEOCFO:** You stated previously that you are starting production. Where are you doing that, and can you gear up quickly if needed?

**Mr. Merrill:** We have chosen to do our manufacturing in the United States. US-based manufacturing makes sense

for us from a business standpoint. It benefits us in logistics in terms of just-in-time manufacturing capability and speed for fulfillment versus the need for shipping from Asia. We picked a contract manufacturer that has a competency in reverse logistics, which is recycling. Our product is a subscription product in that every year our teams get replacement sensors, and the old sensors are returned to us so that we can recycle them.

**CEO CFO:** Are you funded for the steps you need to move forward with development and commercialization?

**Mr. Merrill:** We have secured a round of capital this year, and we are funded well into the launch of the product. We will probably be raising additional capital in the future, but as of now we are funded through our product launch.

**CEO CFO:** What things are you on the

lookout for that may impede what you are working toward?

**Mr. Merrill:** There are some political challenges for the wide scale adoption of technologies such as this. We like to get the buy-in from organizations such as the NCAA to integrate the sensor into concussion protocols and allow the sensors to be worn on the helmets at all levels of sport. We need to collaborate with those organizations, which can be challenging.

**CEO CFO:** Is your team in place as you go into the major commercialization phase or will you need to bring in more people in order to fill certain roles?

**Mr. Merrill:** We are certainly expanding as we transition from research and development to large-scale manufacturing fulfillment and customer support, so we will be building our team in the areas of operation, customer sup-

port, and sales and marketing.

**CEO CFO:** Why should people pay attention to Brain Sentry, and why is it an important company?

**Mr. Merrill:** Brain Sentry is a leading company working on the issue of brain injury in sports. Sports are very important for everyone, and children in particular, because we need to keep them active and we need to combat obesity and life long health. We want kids to be physically active, but we do not want to put them at risk of brain injury. We have recently discovered that contact sports can put kids at risk of injury, so we need to make some changes. Brain Sentry is at the forefront of those changes, and is working toward making sports safer.



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