

Block Party

Quantum Institute

One Chicago area man, and former hockey player, who bounced back from a dark, prolonged battle with post-concussion syndrome now hopes to revolutionize how sports-related traumatic brain injuries are diagnosed and treated.

"Concussions are a scary deal because they don't necessarily just go away, especially when you start piling them on top of each other," said Kelly Gee, CEO and founder of Quantum Institute, a new Vernon Hills-based startup company looking to assist sports organizations in treating athletes who suffer concussions or exhibit symptoms of chronic traumatic encephalopathy (CTE).

Gee's message comes from his own experience and his crusade is a personal one. The 31 year old former goaltender and coach in the amateur hockey ranks knows too well the seriousness and traumatic side effects that come along with severe concussions.

The Alaska-born Gee says he suffered his first concussion at the age of 10, in a non-sport related accident. He suffered more during his hockey career, but the worst didn't come until after his playing days were over.

It was on a Saturday evening, January 3, 2009, standing on the player's bench at the Edge Ice Arena in Bensenville, when Kelly Gee's life was shattered into pieces.

"My life took a rapid turn for the worse," explained Gee. "The next three years were a very slippery slope for me."

Gee was serving as assistant coach for the Chicago Steel, the United States Hockey League franchise whose head coach at the time was former Chicago Blackhawk Steve Poapst.

It was the 2nd period of a game between Chicago and the Fargo Force. The Steel were killing a penalty when one of their players intercepted the puck and tried to clear it down the ice off a pane of glass near the Steel bench. Gee never saw it coming.

"I don't remember any of this," Gee told me when we spoke last month. "But, apparently I was talking to a couple of the defensemen that had just come off as one of our players intercepted the puck and tried to clear it off the glass. The puck just missed the partition, split the (player's) helmets and hit me right between the eyes."

Gee's nose exploded on contact. "I bled all over Steve's suit." It was Poapst's 40th birthday.

"From when I took the puck to the face and suffered the concussion in early January, the first real memory, that I can recall, was Valentine's Day. There were a lot of destructive, whether it was self or socially destructive, occurrences that happened over the next three years for me. It led to isolation and horrible, horrible depression - and a general feeling of being lost."

Gee suffered through the aftereffects of his final and most devastating concussion for the next three and a half years. Then, in the summer of 2012, he took it upon himself to find hope, or solution.

"I was talking to any doctor I could, specialist or otherwise. They all had answers but nobody had a solution. Sitting in a dark room and waiting for things to get better is not a life choice for me," he avowed. "If a solution was not going to be presented to me then I had to get up and make one myself. And that's what I did."

"It got to a point where it was really do or die. My life was just completely in shambles."

It was at this point of desperation that Gee unwittingly began to pour the foundation for what would become his newest business venture.

"I started digging, looking for any piece of information." Gee said. "Quantum really started with Google."

Gee said he would spend hours surfing the internet, researching everything he could find in relating to brain functions, as well as treatments for depression.

"I found a doctor in Wheeling, Dr. Phillip Epstein, a brilliant neuropsychologist."

"I went through his therapy and it completely changed my life. I went from this silent, dark place to this bright world of possibilities. Through that whole process, I was just writing. I kept journals of everything, brain dumps of ideas and anything I

could. And it started formulating into a plan, and a system and a process.

"As soon as I realized this works for me, and thought about how many others like me were out there - I thought 'How can we get this into everybody's hands?'"

Soon after, with the help of Dr. Epstein and a private seed donation of \$1M, Kelly Gee founded Quantum Institute and its patent-pending multi-dimensional brain-mapping technology, Q-MAP.

Q-MAP is a QEEG (Quantitative Electroencephalograph) system that measures energy output from the different parts of the brain. Q-MAP is designed to provide a real-time visual confirmation that a brain injury has occurred. Q-MAP also pinpoints the actual location of the injury in the brain. The technology and software is designed to assist presiding physicians in the recovery process in the event of brain trauma, as well as return-to-play decisions.

"This is a huge step forward in the diagnostic process for physicians that oversee this epidemic," said Gee. "It's a first real look 'under the hood.'"

"So, now it's not just a symptomatic diagnosis. It's not just observation of an individual's function on the outside. We're tracing it back to the source."

Currently, in sports such as hockey, an aptitude, or cognitive evaluation exam is assessed to athletes suspected of suffering a brain injury. The observations made by the physician lead them to a hypothesis as to whether or not a concussion has occurred and what immediate course of action should be taken.

While Q-MAP could be a giant leap from the existing commonly-used methods, Gee is quick to point out that Q-MAP is not designed to eliminate aptitude tests from the process of diagnosing concussions.

"The observational data is important information," says Gee. "It's cognitive function. That cognitive function is as result of the affliction."

"We're showing the source of the affliction. So, our tests aren't comparable to theirs. We operate in the same space but we do not do the same thing."

Quantum's Q-MAP technology generates a functional 3-D model of an individual's brain function. This helps to 1.) Prove the existence of a concussion, 2.) Locate its area of affliction, 3.) Determine the severity, 4.) Show the surrounding areas and how the damaged area is affecting those related functions.

"An aptitude does give you some interesting data but it is not a measuring stick for a concussion. Our maps trace [the observational data] back and actually prove (or disprove) the hypothesis that a concussion has occurred and where it is."

Pinpointing an exact location of the afflicted area in some cases may just backup what a cognitive aptitude test suggests. Or, Q-Map may determine further damage before it shows up in cognitive testing and guide the doctor in predicting and treating potential future vision, mood control, balance or other functions based on what area of the brain is impacted.

Quantum's Q-MAP program is very straightforward, but if used, it could have a broad effect on the advancements in the area of post-concussion assistance.

The use of attention-deficit disorder drugs by athletes and doctors as a way of accelerating recovery, or passing a cognitive aptitude exam after a concussion is something very few people active in sports today will talk about, but has long-since been a regular practice.

Gee says that while his technology can't completely eliminate the dangerous misuse of these drugs on its own, Q-MAP does provide an extra layer of real data that can help a doctor decide how much, or if drug treatment would be useful.

"Pharmaceuticals are used commonly to mask the symptoms - the lack of activity, or hypo activity of the brain after a concussion," said Gee. "That's why you see a lot of Adderall or Dextroamphetamine type drugs used to heighten the function of the brain - because it's damaged."



Chris Block

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Quantum Institute Continued

"But that's like pouring fuel on the fire," he says. "There's a certain amount of pharmaceutical interaction that can be necessary as result of a concussion."

Gee continued, "A concussion not only physically changes the brain's structure, it also changes the chemical reactions as a result. So, regulated pharmaceutical use can help in the healing process. But it can't be used as a healing process. That's an important part of the message that we want to spread."

"It's all about clarity," Gee says of Q-MAP. "And that's what we're offering - a tool to give doctors that clarity they need to identify and diagnosis these brain injuries as accurately as possible."

Quantum's current focus is based at a grass-roots level. The company rolled out its Q-Map program modestly two months ago and its first client was the 200-plus player Team Illinois AAA youth hockey program in Crystal Lake, Illinois. The company plans to go national sometime in 2014. Still, it seems their model is to gain a foothold by sticking with similar sized youth and athletic programs.

"We've developed a unit and licensing package for these larger athletic programs where you can take them back to the locker room and inside twenty minutes know if the player is in the stage level to go back on the rink or not."

"Quite frankly, everybody is looking for a solution," Gee told us. "The hockey community has been incredibly receptive to us. Our roots lie in hockey. We want to make sure that we get these kids protected as soon as possible. We're not shy about sharing that. Because that's what we're all about. The reception has been amazing and we're grateful for it."

Yet, on a much more visible stage lies professional leagues such as the NHL. The National Hockey League was recently slapped with a multi-player lawsuit that alleges the league was negligent and acted fraudulently when it came to dealing with and informing players of the dangers of their head injuries.

The NHL steadfastly asserts its concussion protocol and on-ice discipline when it comes to headshots prove, in their estimation, that the league had been progressive in its handling of brain injuries. While those claims may be up for debate, one can't help but wonder how the NHL will react to the advancement in concussion analysis that Quantum is spearheading. How would the league, or the NHLPA, feel about this ability to take a deeper "under the hood" picture of the damage inflicted on the brain's of their players?

The NHL, after all, is big money entertainment business. The league sells a fast-paced, physical game in addition to star power. Likewise, the player's career lifespan is on a gradual decline anyhow. A window to the brain might be a hard sell at the pro-level - at least for owners and current athletes alike.

"Absolutely," Kelly Gee said when asked if he anticipates apprehension from those at the NHL. "This is one of our biggest concerns. It's one of the most difficult things for us to address."

"On the surface, it's easy to look at this and say 'Wow. This is going to keep players off the pond.' And that is not the case. Right now, with the current diagnostic process, if you show any sign (of a concussion) or symptom at all in the aptitude test, you're a minimum of a week out."

Gee says Quantum is about keeping the athlete on the rink or field, not off of it.

"But you also have to know how to make that decision. You have to have the data necessary to make responsible decisions. Because when you make those decisions, what that does is extend your career. It offers longevity in the sport. It also increases your quality of life."

He also says because of the threat of competition for lineup positions and roster spots, players are still afraid, under the current aptitude system, to approach trainers about potential issues.

"We know the difference between getting our bell rung and a headache. When you have a headache, you shouldn't be afraid to go and ask your trainer for some ibuprofen. But a lot of these guys won't because they say 'Well, they saw I got hit, and now I've got a headache. So [if I say something] now I'll be out for a week.'

Sometimes you get your bell rung and you feel better the next day. And the inflammatory response has resided. You're fine. But if you get your bell rung right now, we're talking an automatic week."

"It is important to have a standard of care for everybody so there's accountability through and through. That's good for the players. That's good for the medical staff. It's good for the coaches and owners. It's good for the economy of the NHL. Because everybody's held to the same standard and they're not going to be shell-shocked in twenty years when there are these lawsuits that do have an effect on the economy of this game. There has to be a bridge built between these different islands. Ultimately that is going to fall to the players in offering them a healthier, happier and longer career."

Quantum will launch phase two of its program early this year. Q-ZONE will bring specially designed programs to assist athletes in post-concussion recovery. Q-ZONE, though, will be aimed at non-concussed athletes as well.

"What Q-Zone is a brain strengthening platform," Gee explained. "You can look at the brain, especially if you look at it on a miniscule, on a quantum level."

"You wouldn't go into a season without stretching, hitting the bike, and running and squatting and training. You have to prepare your body (for the season). Well, you have to do the same thing for your brain. Our brain strengthening platform does just that. It improves on things like executive function, reaction time, working memory, hand-eye coordination and all these things - which is not only going to make you a better athlete but its going to make you less susceptible to these traumatic blows that cause these brain injuries."

"So after you've suffered (a concussion) we use the same brain monitoring software and technology. We can see those afflicted areas and then we can help stimulate those (areas). As opposed to sitting in a dark room and letting your brain heal itself."

"A brain will typically heal around the damaged area. But, just like a muscle, if you leave the damaged area unmoved it's going to develop scar tissue. It might function, but it is not going to function well and it is going to be weak. By stimulating those areas of the brain that have been damaged or afflicted, you get them moving. They rewire. And through the science and neural plasticity, they become strong again. And we can help recreate that balance in the brain, and bring it back to its normative function - not only quicker, but safer. And it's completely noninvasive."

The cost for Quantum's current individual baseline diagnostic testing is as low as \$87.50.

"We want to make sure that everybody has access to this and it won't break their bank. So, instead of going to the hospital and getting a diagnostic imaging test for up to \$5,000 - you can come to us and it's in the \$100 range. We'd like to try to work with programs. That way we're helping that program and we're working as the bridge between them and the players. We'll go to the programs. We'll take our mobile unit to them."

More information on Q-MAP, and contact info for the Quantum Institute is available at Go-Quantum.com

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