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Athletic trainer's heart is in the game

(by Karen F. Mmnavic - December 23, 2008)

It's a modern suit of armor that takes the form of a lowly t-shirt, and it was conceived and created by a local high school athletics trainer. Frank Armstrong has been working for Westwood Regional High School for almost 15 years. But while he is a familiar face to all who have passed through the school's athletics department, few know that what Armstrong has been up to in his spare time – inventing a device that protects pacemakers during athletic activity. It is called the PaceGuard.

Armstrong, incidentally, is currently a senior at NJIT, working toward his degree in civil engineering. "I always was interested in engineering, since I was 9 years old," he says. "I wanted to build buildings and work on computers." But, as many adults find, life had a different plan for him. While he has set his sights on becoming a professional engineer, he has found that his background in children's athletics, and related expertise in treating sports injuries, has actually led him toward his greatest engineering feat so far.

When Armstrong and his wife moved into their Waldwick home in 1996, they became fast friends with another young couple who lived across the street. The Armstrongs and their friends, the Spinnlers, ended up having their first-born children, both girls, just three months apart. But when Zoie Spinnler was just 3 years old, she passed out and collapsed. Doctors told the Spinnlers that Zoie had a heart condition and needed a pacemaker.

The installation of the pacemaker saved Zoie's life, but it also introduced a new set of difficulties. When she was about 5 years old, her mother, Sharon, wanted to enroll her in school sports programs, but was told by doctors that impact to the child's chest could damage the pacemaker, jeopardizing her safety. They advised that Zoie should not participate in athletic activities. "[Sharon] came to me and said, 'Is there anything on the market to protect a pacemaker site?'" Armstrong remembers. "So my wheels started to turn."

As a trainer, Armstrong was well versed in the most effective ways to pad and tape children's injuries to protect them from further impact injuries. "I made a mock-up [of a pad for a pacemaker site], and my mother-in-law is a seamstress and she sewed it together," says Armstrong. The result was the first prototype of the PaceGuard, a washable t-shirt with a pocket sewn in to accommodate a plate resistant to high-velocity impact. Armstrong's wife encouraged him to perfect the product and market it.

Armstrong gave a prototype to Zoie, and shortly thereafter, the girl began to play sports. Armstrong then went into partnership with Sharon Spinnler to develop a saleable version of the PaceGuard and get the design patented. They call their company "Z-Ray," after Zoie and Raven, Armstrong's own daughter, who coincidentally also has a heart defect. "We showed the design to a manufacturer, and tested it to withstand an 80 mph fastball," he says triumphantly. Currently, the PaceGuard is patent-pending and Z-Ray is working on a Web-site where the product will be sold online.

Z-Ray even contacted an electrophysiologist to conduct tests of the resilience of the PaceGuard. "We had to test it four different ways," says Armstrong, including a computer simulation, an impact test and a weight test. "We dropped a three-pound steel ball on it, and it worked really well. Then we set up a pitching machine and we



Photo Courtesy of Frank Armstrong

Frank Armstrong, inventor of the PaceGuard is pictured with business partner Sharon Spinnler, her daughter Zoie, and Frank's daughter Raven.

blasted baseballs at it. And it was still intact," he says. "We definitely hit our target on how we wanted to protect [a pacemaker]."

Armstrong has already received e-mails and phone calls from adults and children interested in buying the PaceGuard, which is not yet for sale, and has not yet been priced. He says that making money was never his primary motivation for developing the product. "I want to put my head on my pillow at night and know that I made a safe product," he says. "I want to leave this earth knowing I did something good. If kids can play sports because of my device that makes my job worthwhile."

For more information about the PaceGuard, visit www.paceguard.com. The site is still under construction, but provides background information and contact information.

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