

# Kids and Concussions: ImPACT testing, an important tool used to evaluate the recovery from brain injuries

By Star-Ledger Staff

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By Matthew Stanmyre and Jackie Friedman/The Star-Ledger

*In the third of a 3-part series on concussions and their impact on youth sports, Star-Ledger staff writers Matthew Stanmyre and Jackie Friedman take a look at ImPACT testing.*

*Part 1: The effects of head injuries in young athletes, what New Jersey is doing and what more can be done to protect our kids.*

*Part 2: One of the most dangerous sports of all - Cheerleading.*



Jillian Schoer, 18, of Manalapan, takes a post-concussion test at Overlook Hospital Concussion Center. Schoer, who had a baseline test taken prior to her injury, suffered a concussion on November 15, 2009, in a cheerleading accident when two other cheerleaders fell on her during a basketball game. John Munson/The Star-Ledger Robert Rollo had to face an unwavering opponent before he could return to the playing field after suffering a concussion: the computer.

The Glen Ridge High School football player was asked to remember words, shapes and colors for 25 minutes, repeating a test he had taken just months earlier. The light from the flickering screen bothered his head and Rollo struggled to concentrate.

He failed the test; his return to the field would have to wait.

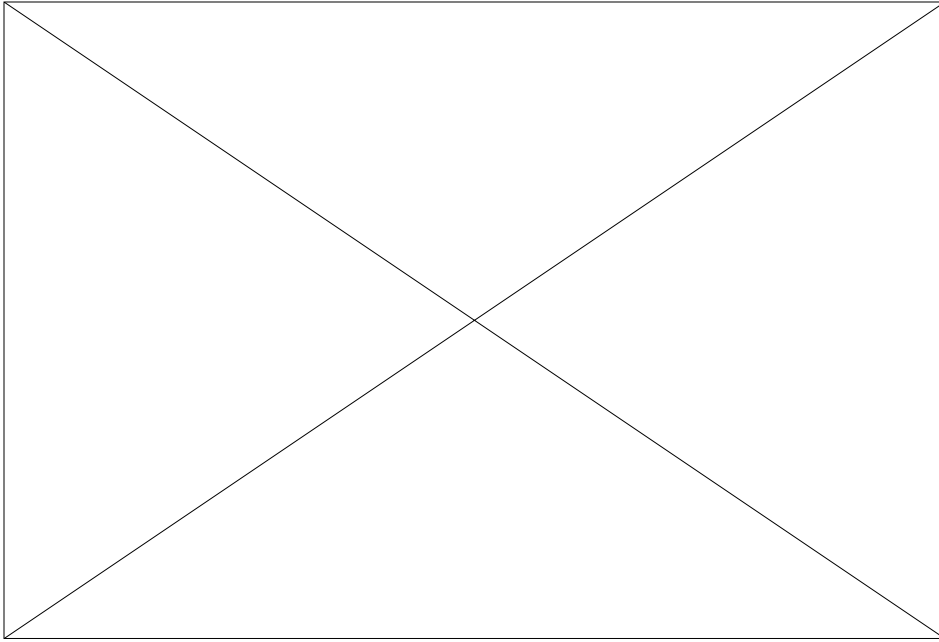
As doctors and athletic trainers learn more about the severity of concussions, precautionary steps to treat the injury are being taken by many New Jersey high schools and youth leagues. The most significant progress in high schools has been the addition of ImPACT testing, a neuro-psychological exam that is given to athletes and provides a baseline score available for comparison after an athlete sustains a concussion.

At the youth level, volunteer coaches are being instructed — and sometimes mandated — to take the Rutgers S.A.F.E.T.Y. course, which is designed to provide coaches with basic teaching and safety principals.

"These are still teenagers who have lives ahead of them and careers ahead of them," said Debbie Kusant, whose 13-year-old son suffered from severe brain injury in a youth soccer game. "You really have to take these things seriously."

In high school sports alone, more than 400,000 concussions occurred nationwide last year. It's impossible to know how many thousands more occurred in youth sports. What is known is a brain injury epidemic has prompted growing awareness across the sports landscape.

## High school athletes tackle sports concussions



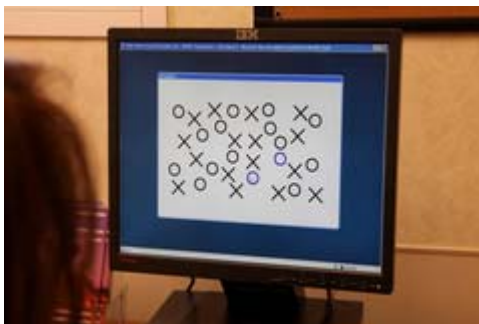
Rollo is taking the path many high school athletes in New Jersey must traverse as they try to return to athletics after suffering from a brain injury. At the 134 high schools in the state that use ImPACT testing, athletes who sustain brain injuries must "pass" a second test before being cleared to play.

Rollo took the ImPACT test prior to baseball season last spring and his baseline score was used for comparison after he took the test again a week after sustaining a concussion during a football game this fall.

"The first time I took the test, my memory was in the 99th percentile," he said. "The second time, it had dropped to 70-something. All my scores were down. After they told me my scores, I wanted to take it even more easy."

After a failed test, athletes are typically retested a minimum of a week later. Rollo will not be allowed to return to contact sports until his scores return to their baseline figures.

While the number of schools in New Jersey using the test has grown over the past five years, nearly 70 percent of the state's high schools still do not utilize it, according to the ImPACT website. There are approximately 430 schools with athletic programs accredited by the New Jersey State Interscholastic Athletic Association, the governing body of high school athletics in the state.



Jillian Schoer, 18, of Manalapan, takes a post-concussion test at Overlook Hospital Concussion Center. John Munson/The Star-Ledger **Baseline score is key**

The ImPACT test was created in the early 1990s to assist athletic trainers and medical personnel in the diagnosis and treatment of concussions.

The key to effective concussion management is having a baseline score for an athlete prior to an injury, doctors say. With the help of a baseline score, a medical professional can determine when a player has returned to the baseline cognitive levels.

"That's why an objective evaluation of these kids is so important — to have this data available to educate the parents as to what's going on, to educate the kid as to what's going on and to actually objectively help to determine the recovery," said Micky Collins, co-creator of the ImPACT test.

ImPACT testing can be purchased by a high school for \$500 for one year or \$1,300 for three years; all athletes in the school can be tested as many times as necessary. Grant money has been available for some schools in the past, though most of money comes out of the athletic department budget.

Youth organizations, and athletes whose schools don't offer the test, are normally directed to medical clinics that offer ImPACT testing, where the cost is about \$20 per athlete. The ImPACT website lists 23 clinics in New Jersey certified to offer the neuro-psychological testing.

U.S. Rep. Bill Pascrell Jr. (D-8th Dist.) and U.S. Sen. Robert Menendez (D-N.J.) are co-sponsoring a bill that would provide federal grants for ImPACT testing nationwide. The legislation will also require the Department of Health and Human Services to convene a conference of medical, athletic, and education professionals to establish concussion management guidelines for student athletes. It has been introduced in the Senate and in the House of Representatives.

If enacted, the measure would establish a five-year federal grant program that would assist the nearly 300 schools in New Jersey that do not use ImPACT testing.

"The only reason we don't have it is funding," said Mike Prybicien, the athletic trainer at Passaic High School. "I want every athlete to get tested. I want it to be that if you don't take your physical and do ImPACT (baseline testing), you won't be eligible for sports."

### **Test before playing**

Studies show the most severe concussions occur when an athlete returns to play while still experiencing symptoms from an earlier concussion. The worst of these injuries is called second impact syndrome, which has led to approximately 30 to 40 deaths nationwide in the past decade, according to the ImPACT test website.

Every other season, athletes at high schools that utilize ImPACT testing complete the 25-minute computerized test to establish a baseline score of cognitive ability. The athletes complete sections on word discrimination, design memory, visual memory, symbol matching, color matching and letter memory.

The athlete's total score is computed, along with scores for each of the six neurocognitive modules. These modules test verbal and visual recognition, memory, processing speed and reaction time.

Athletes also fill out a questionnaire in which they rate the severity of 22 symptoms — including fatigue, headaches and irritability — both prior to and after sustaining a concussion.

Obtaining pre-concussion numbers can be beneficial for determining recovery. Once an athlete's physical symptoms have been resolved, he or she is retested to determine if the athlete is healed cognitively. Most medical personnel will prevent athletes from returning to the field if their post-concussion score has not returned to baseline levels.

"ImPACT is a very helpful and very sensitive piece of information, but it has to be encompassed within a very good clinical evaluation," said Collins, the co-creator of the test. "This isn't a panacea — ImPACT is a tool to help get these kids back to play safely."

### **Availability lacking**

At the youth sports level, ImPACT testing is rarely available. Of the thousands of youth teams in the state, only a handful of football teams have hired athletic trainers to work on game days, taking injury decisions out of the hands of volunteer coaches, most of whom are parents.

For the teams without trainers, most of the adults making the critical decisions are youth coaches who receive their training from a one-time seminar: the Rutgers S.A.F.E.T.Y. Clinic (Sports Awareness for Educating Today's Youth).

The Rutgers course is designed to provide coaches with basic teaching and safety principals and to protect them from civil lawsuits, but it does not mean those coaches have achieved proficiency or competence in those areas. Coaches earn certification simply by attending the clinic, not by completing an exam.

"They (coaches) need to understand that this is just the beginning of their training as a volunteer," said Gregg Heinzmann, director of the Youth Sports Research Council at Rutgers University. "We don't attempt to train them to the level of an EMT or physician — that's not practical or appropriate. These first responders need to be able to contact medical assistance if needed. They need to know what to do to stabilize an injured victim, and what not to do."

When Tracy Schoenberg attended a clinic last month at Valley Hospital in Ridgewood, she hoped to learn about the symptoms of heat stroke, shock and concussion with roughly 100 other soon-to-be youth coaches.

For the nearly 2 1/2-hour class, the instructor discussed coaching philosophy, discipline techniques and legal aspects. But he skipped 13 slides that detailed specific youth injuries, including concussion.

"I'm a little concerned because we didn't do it all," said Schoenberg, who will coach youth softball in Oradell this spring. "If you don't have the training, you can't treat the injury."

Heinzmann said the curriculum is designed based on the minimum standards outlined by the Governor's Council on Physical Fitness and Sports. Each instructor is given flexibility but has been instructed to cover each bulletpoint, which includes the medical, legal and first aid aspects of coaching. During the clinic Schoenberg attended, some of her counterparts thumbed through newspapers, dozed off or punched away at their cell phones. The instructor ended the

course roughly 35 minutes early without discussing safety issues.

"We're going to fly through some of this because it's too specific for this group," he told the class.

The instructor, Bill Walsh, who is also the athletic trainer at Bergen Catholic High School, defended the presentation.

"At the end of the course I say this is sort of the tip of the iceberg. We're giving you guidelines and we're giving you some information here — what to do, what not to do," he said in an interview after the class. "I don't get too specific with specific injuries. That's not what the course is. It's more of a general overview of safety, recognizing certain things out there."

New Jersey is applauded for strongly encouraging youth coaches to attend these sessions, but athletic trainers stress additional knowledge about concussions and other injuries is imperative to achieve ideal safety.

"I don't think we're doing enough with that," said Nick Nicholaides, the athletic trainer at Ridgewood High and a former instructor of the Rutgers course. "I absolutely think we need to educate our coaches at (the youth) level."

Nicholaides suggests youth coaches take additional courses such as first aid and CPR. He urges coaches in his town to take a 20-minute brain injury course over the computer — found at [concussion.orcasinc.com](http://concussion.orcasinc.com).

Nicholaides was surprised to hear safety — and concussions — was not stressed or even broached at the clinic Schoenberg attended.

"They missed the whole boat with concussions, which is a sad thing," Nicholaides said. "That's definitely a problem."

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#### ***A detailed look at the ImPACT test.***

If you are interested in ImPACT testing, it is offered at these clinics:

Atlantic Neuroscience Institute  
99 Beauvoir Ave., Summit  
908-522-6146

Advocare Pediatric Neurology Associates  
25 Lindsley Drive, Morristown  
973-993-8777

The Center for Children's Neurology  
1000 White Horse Road, Voorhees  
856-435-0400

Advocare Marlton Pediatrics  
525 Route 73, South Marlton  
856-596-3434

Advocare Vernon Pediatrics  
249 Route 94, Vernon  
973-827-4550

All Sports Centers of New Jersey  
1747 Hooper Ave., Toms River  
732-255-3030

Chilton Occupational Health Center  
242 W. Parkway, Pompton Plains  
973-831-5179

Coastal Neurology  
1172 Beacon Ave. Manahawkin  
609-978-6336

Cooper Bone & Joint Institute  
3 Cooper Plaza, Camden  
856-325-6670

Joseph E. Conroy  
27 Beach Road, Monmouth Beach  
732-571-4799

Thomas Bottiglieri  
440 Old Hook Road, Emerson  
201-265-4400

Sports Concussion Center of NJ  
3131 Princeton Pike, Lawrenceville  
609-895-1070

A+ Athlete  
38A Robbinsville Allentown Road, Robbinsville  
609-223-2286

Advanced Neurobehavioral Diagnostics  
172 Broadway ,Woodcliff Lake  
201-476-0074

Cherry Hill Pediatric Group  
600 W. Marlton Pike, Cherry Hill  
856-428-5020

Dan McNeil  
2999 Princeton Pike, Lawrenceville  
609-771-3790

Head to Head Consultants  
205 Main St., Gladstone  
908-719-7555

Michael J. Colis  
408 S. White Horse Pike, Audubon  
856-310-9696

Neurobehavioral Institute of NJ  
626 North Thompson St., Raritan  
908-725-8877

Paul A. Ostergaard  
679 Newark Pompton Tpk, Pompton Plains  
973-839-8666

ProCare Medical Associates  
124 E Mount Pleasant Ave., Livingston  
973-535-8300

Sports Training Physical Therapy  
187 Millburn Ave., Millburn  
973-467-7976

St. Joseph's Regional Medical Center  
703 Main St., Paterson  
973-754-2416

Source: [impacttest.com](http://impacttest.com)