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Wednesday  
Oct. 7, 2015

# Newsday

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THE LONG ISLAND NEWSPAPER

  
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NEWSDAY | NEWS 12  
SPECIAL REPORT

# HARD KNOCKS

Helmets,  
concussions  
and Long Island  
high school  
football

A2-5, 10-13

ONLINE

Interactive report with video, databases  
[newsday.com/helmets](http://newsday.com/helmets)



## TOP STORIES

**NEWSDAY  
NEWS 12**

**SPECIAL  
REPORT**



Rocky Point players bring down a Harborfields running back last year.  
■ Watch a Virginia Tech researcher explain helmet ratings: [newsday.com/helmets](http://newsday.com/helmets)

A high school football player takes **650 hits** to the head per season, on average

At Long Island high schools, there were **364 concussions** reported during practices or games last season

At LI high schools, **9.3% of 9,502 helmets** are rated 'low performers' in reducing concussion risks by Virginia Tech researchers



# TACKLING HELMET SAFETY



**Riddell VSR4**  
Safety rating: ★



**Schutt Vengeance VTD II**  
Safety rating: ★★★★★

HUNDREDS OF 'LOW PERFORMERS'  
AT REDUCING CONCUSSION RISK  
REMAIN IN LI HIGH SCHOOL INVENTORIES

BY JIM BAUMBACH  
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**F**ootball helmets, the iconic piece of equipment in America's most popular sport, are at the center of the debate over concussions that is roiling the way the game is played at all levels.

On Long Island, there are nearly 10,000 student-athletes playing football on 239 varsity, junior varsity and freshman teams at 116 high schools.

Experts say the helmet is the last line of defense against head injuries. But how well a helmet can help prevent a concussion is a source of controversy among neurologists, medical researchers, helmet manufacturers and football coaches.

A typical high school football player receives about 650 hits to the head per season, according to researchers at Purdue University and the University of Michigan. The impacts of those hits are the equivalent of what a seat-belted passenger experiences in car accidents ranging from 15-to-35 mph, according to University of Nebraska Professor Timothy Gay, author of "The Physics of Football."

There are many factors that contribute to concussions: speed, acceleration, the angle of a tackle and a player's physical size among them. Players are bigger and stronger than

ever before, which presents enormous challenges to the efforts to protect them from head injuries. Neurologists also don't know why some hits cause concussions in certain players and not in others.

A seven-month Newsday examination into head safety in high school football on Long Island — which included analyzing concussion reports from 104 of the 116 schools and helmet inventories from 108 schools, and interviews with more than 80 neurologists, researchers, helmet manufacturers, state athletic officials, superintendents, athletic directors, coaches, players and parents — found:

- Entering this football season there were 885 football helmets in circulation that are classified as "low performers" at reducing the risk of concussion, according to safety ratings that Virginia Tech researchers have been publishing since 2011. The testing grades helmets on their ability to reduce head acceleration within the helmet on impact. A five-star helmet is the best at reducing the risk of concussion. A one-star helmet is the least effective. The study's lead author, Stefan Duma, is surprised these 885 one- and two-star helmets remain in circulation. "Four years later these should have definitely been phased out," he said.
- There are 60 schools with

one- or two-star helmets in inventories obtained by Newsday. In response to Newsday's inquiries, 18 schools said they either removed those helmets from their inventories or did not issue them to athletes this season.

- New Hyde Park, in the Sewanhaka school district, has the most, with 71 one-star helmets in its inventory. District Superintendent Ralph Ferrie said in July he was comfortable with players still wearing one-star helmets because they meet the safety standards set by the National Operating Committee on Standards for Athletic Equipment (NOCSE), which oversees helmet use in football on all levels. Despite Ferrie's previous comments, the district purchased 160 five-star helmets on Tuesday for \$38,400 and said it plans to swap out all of the one- and two-star helmets currently being worn when the helmets arrive Friday, a district spokeswoman said.

- Of the 9,502 helmets in circulation at 108 of the 116 high schools that responded to Newsday's request, there were 2,898 five-star (30.5 percent) and 4,576 four-star (48.2 percent) helmets. Another 408 (4.3 percent) have no rating because they are more than 5 years old and were no longer being made when Virginia Tech released its first ratings in 2011.

- There were 364 reported concussions during practices or games last season at districts covering 88 public high schools and two private schools.

- There were 14 high schools that said they had no football players suffer concussions on any of their teams, including varsity, junior varsity and freshman.

- Six players on Long Island were not cleared to return to athletic activities for more than four months because of lingering concussion symptoms. The longest time missed was 202 days.

## 'Brain was rebooting'

Yusuf Young doesn't remember much about the final plays of his high school football career.

The former Roosevelt High School linebacker was playing in last year's Long Island championship game against Shoreham-Wading River when a swarm of blockers came his way during a third-quarter running play. He stepped into the path of the oncoming bodies and took the brunt of a blocker's helmet-to-helmet hit.

On the next play, Young was knocked to the ground, and, according to the school's concussion incident report, hit his head on the ground.

"At first I didn't think I was hurt that bad," Young said. "I

See **HELMETS** on A4

**MORE ON:**  
**NEWS 12**  
LONG ISLAND

- A three-part series by News 12 Long Island sports director Kevin Maher and reporter Jamie Stuart will air daily starting at 8 a.m.

## TODAY

- A look at concussion rates among high school football players and what is being done to prevent them.

## TOMORROW

- How helmets are rated, which schools do and don't believe in the ratings, and how helmets are tested for safety.

## FRIDAY

- Oyster Bay's new helmet inventory with sensors that record the impact of a big hit on a player.



# It felt like my brain was rebooting.

— Yusuf Young, former Roosevelt linebacker, on his concussion

## HELMETS from A3

tried to stay in the game, but it was like I kept falling, I was so weak. . . . It felt like my brain was rebooting.”

Young stayed in the game for two more plays. When he returned to the sideline, he dropped to his knees and tumbled to the ground. As he was being checked by a physician on the sideline, he said his mom rushed to his side and, through tears, implored him to go to the hospital. Young was taken by ambulance to an emergency room at Stony Brook University Hospital, where doctors told him he had suffered a concussion.

Young, now 18, graduated from Roosevelt in June and is attending Nassau Community College this fall.

Young was the only Roosevelt player removed from play last season on either the JV or varsity because of a concussion, according to documents obtained by Newsday.

The school's incident report said Young was confused, dizzy and was sensitive to noise in the aftermath of the hits to the head.

According to a doctor's note, Young returned to school the next day following the concussion but “was sent home because he was feeling drowsy.” Young said the school's athletic director, Michael Jones, drove him home.

“I know I wouldn't want my kid walking home after something like that,” Jones said.

Paperwork provided by the school indicates that Young began the school's return-to-play protocol that Thursday, five days after the concussion.

The protocol, part of New York's concussion management act of 2012, includes gradually increasing a player's activity level for a series of days. He was cleared to return to sports by the school physician Dec. 10, nearly two weeks after the concussion.

Duma, a biomedical engineering professor, said he modeled Virginia Tech's independently funded helmet rating system after the National Highway Traffic Safety Administration's five-star car safety rating system.

Some neurologists say Virginia Tech's ratings overinflate

Yusuf Young shows image of the hit that caused his concussion during the 2014 LI championship game. ■ Watch his story: [newsday.com/helmets](http://newsday.com/helmets)



a helmet's role in preventing concussions and oversimplify the complexities behind the science of concussions. However, just as safety testing changed the way the automobile industry made cars, Virginia Tech's ratings changed the way football helmets are made.

The number of five-star helmet models being manufactured has risen to eight from one since the ratings were first made public in 2011.

Riddell makes the most helmets in use on Long Island, followed by Schutt, Xenith and Rawlings, which announced

in June it will no longer produce football helmets because it was not profitable enough.

### Ratings credited

Riddell credited the Virginia Tech ratings for encouraging schools to accelerate their helmet replacement plans.

“We think kids should be in the best available technology,” said Thad Ide, Riddell's senior vice president for research and product development.

Xenith chief executive Joe Esposito called the ratings “the de facto industry standard” and said Xenith wouldn't put a new

helmet on the market that wasn't five stars.

On Long Island, two schools — Oyster Bay and Port Jefferson — replaced their inventories with all new five-star helmets after the death of Shoreham-Wading River junior Thomas Cutinella following a helmet-to-helmet hit last year. Port Jefferson spent \$14,749 on 50 new five-star helmets. Oyster Bay spent \$33,915 on 85 five-star helmets equipped with a sensor system that alerts a handheld device when a hit registers above a certain threshold of force.

Northport is the only other school with all five-star helmets. Typically, schools buy about 10 helmets per year, according to purchase orders obtained by Newsday.

Helmets worn by high school players are the same makes and models as those worn in the NFL. The league says it's “mandatory” that teams make the Virginia Tech ratings available to players, a spokesman said.

Schutt chief executive Robert Erb, who lives in Manhasset, described the ratings as “one piece of information with all sorts of caveats.”

“There are simply too many variables taking place on a football field for such testing to be predictive of risk reduction,” Erb said.

But Dr. Michael Egnor, a professor of neurosurgery at the Stony Brook University School of Medicine, said Duma's team has done “the best and most rigorous work” studying which helmets decrease head acceleration the best.

“And if it were my kid, I would want him to be wearing one of the higher-rated helmets,” Egnor said.

Other experts agree.

“I would not put my kid in one of those one-star helmets,” said Kevin Guskiewicz, co-director of the University of North Carolina's Sport-Related Traumatic Brain Injury Research Center and a member of the NFL's Head, Neck and Spine Committee.

Virginia Tech tests helmets in a laboratory by dropping them 120 times from predetermined heights to simulate the different forces of impacts that its research says a football player would expect to experience during a season.

A separate six-year study by researchers from eight universities, including Virginia Tech, tracked the force of impacts and concussions suffered by college football players from 2005 to 2010 wearing a one-star helmet and a four-star helmet. The researchers determined there was a 54 percent reduction in concussions among players in the four-star helmet compared with the one-star.

But just as injuries and deaths can happen to people

## MORE COVERAGE PAGES A12-13

### ANOTHER PLAYER TELLS HIS STORY

Mike O'Donnell doesn't remember much about the devastating hits that caused his concussion — or even the game itself.

### TRAGEDY SPURS CHANGE

Oyster Bay and Port Jefferson districts bought new helmets after the death of Tom Cutinella

See **HELMETS** on A10

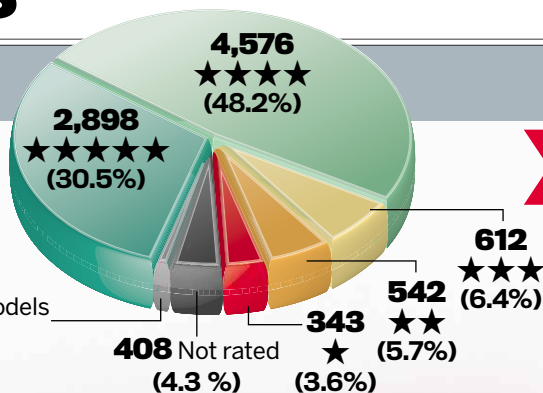


## NOW ONLINE [newsday.com/helmets](http://newsday.com/helmets)

Researchers at Virginia Tech test football helmets' ability to reduce head acceleration and the risk of concussion. **A 5-star helmet is deemed best at reducing risk**, and all manufacturers now sell models that earn 4 or 5 stars. On Long Island, there are 9,502 helmets at the 108 high schools that responded to Newsday's request for the most current inventory.

### HELMETS IN LI SCHOOLS

123 helmet models in dispute (1.3%)



**SCHOOL BY SCHOOL**  
Search and compare safety ratings online for all helmets at 108 LI high schools.

### THE RATINGS (Sample helmets)

Front view



★

#### Riddell VSR4

Riddell says this helmet, introduced in 1992, "was the most advanced helmet in the marketplace for many years." Riddell discontinued sales in May 2011. There are 343 in circulation on Long Island.

★★

#### Schutt Air Advantage

Introduced in 2001, it was designed to be lighter and had a smaller outer shell. Schutt says it discontinued this helmet in 2011. There are 542 in circulation on Long Island.

★★★

#### Schutt DNA Pro+

Shell is slightly smaller and does not manage energy on low-impact hits as well as others in testing, Schutt says. Schutt stopped manufacturing this model last month. There are 93 in circulation on LI.

★★★★

#### Riddell Revolution

Riddell says this is the first helmet designed to reduce concussions. Introduced in 2002, Riddell said last month it will no longer manufacture this helmet. There are 3,028 in circulation on LI.

★★★★★

#### Riddell Speedflex

Introduced last year, it features flexibility in certain portions of the shell and face mask, which, Riddell says absorbs more impact. There are 154 in circulation on Long Island.



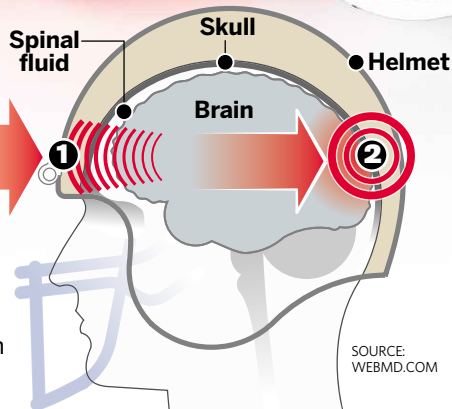
Liner and underside

### WHAT IS A CONCUSSION?

**AT REST** The brain is protected by a cushion of spinal fluid in the skull.

**1 IMPACT** A violent jolt, such as a tackle, causes the brain to shift and strike the skull.

**2 EFFECT** Bruising of the brain, tearing of blood vessels and nerve damage can occur. Symptoms include headaches, dizziness, blurred vision and memory loss.



### YOUR HELMET'S RATING

Enter a brand name to see Virginia Tech ratings for specific models.

### PLUS: SPECIAL VIDEO FEATURES

- Watch the "Hard Knocks" mini-documentary.
- See interviews with former Long Island high school players Yusuf Young and Michael O'Donnell.
- Go behind the scenes with Virginia Tech researchers.
- Watch Schutt's CEO discuss the ratings' effect on industry, sport.



## HELMETS from A4

in a car with a five-star safety rating, Duma says that a five-star helmet by no means guarantees someone won't get a concussion.

"There's always going to be a risk," Duma said. "It's about risk reduction. ... At the end of the day, I ask people this simple question: Do you want to wear a helmet that lowers head acceleration or not? We tell you which ones lower head acceleration better than others, and you can pick."

NFL players choose which helmet to wear. The Giants' Odell Beckham Jr. wears a five-star helmet, the Jets' Darrelle Revis wears a four-star helmet and New England Patriots quarterback Tom Brady wears a one-star.

In July the NFL and the NFL Players Association released the results of their own helmet rating system. The NFL's testing focused on high-impact hits more typical of the professional game. Virginia Tech's testing is designed to replicate both high- and low-impact hits.

The NFL/NFLPA listed helmets from best to worst and separated them into two groupings: top performers and low performers. The poster that ranks the helmets says "there was no statistically significant difference in performance" among helmets in the top grouping.

The league's grouping of helmets was consistent with Virginia Tech's, aside from a

few outliers. But the league says "it is important to emphasize that these results were based on testing intended to represent NFL impacts and thus, the conclusions on helmet performance cannot be extrapolated to collegiate, high school or youth football."

High school players have little say as to what's available to them. Either the coach or athletic director purchases the helmets, which range from \$150 to \$400 each. Some schools said they will allow an athlete to purchase his own helmet if asked. Other schools do not allow it for liability reasons.

NOCSE recommends but does not require that helmets be reconditioned every year.

Reconditioning is a process in which the padding in the helmets is cleaned and, if needed, replaced, and the helmets are recertified for use by NOCSAE standards. This costs schools about \$35 per helmet. Helmets can be reconditioned only up to their original specifications, so a three-star helmet cannot be upgraded to a five-star, Duma said.

## Concussion management

New York State's concussion management act was passed by the legislature in July 2011 and went into effect for the 2012-13 school year. The result of a nationwide push for better standards, the act mandates that any public school athlete suspected of suffering a concussion must be removed from play and cannot return until he

or she has written authorization by a licensed physician.

Experts say concussion reporting relies on players speaking up, coaches noticing a violent hit or the athletic trainer recognizing a difference in a player's behavior. Sometimes there are no immediate symptoms.

Dawn Comstock, an epidemiology professor at the University of Colorado in Denver, has been tracking high school sports injuries, including concussions, on the national level since 2006. She said concussions are the most challenging injury to track.

The incident reports obtained by Newsday offer firsthand accounts of how difficult these injuries are to recognize if the athlete doesn't speak up.

One player "made a tackle and hit his helmet" in practice and "experienced a headache during and after practice" but did not say anything until the next afternoon. He sat out 21 days before he was cleared to return to play.

One high school reported 11 concussions last season. But in seven of those the incident report notes that the student did not report any symptoms at the time of the injury. Instead, the athlete spoke up either after the game, to his parents at home or to the school's health office at a later time.

Another player "did not report [injury] at game. Three days later complained of head injury." Records show he was diagnosed with a concussion and missed 44 days before he was cleared by a physician to play.

Other reports offer a glimpse into the symptoms that occur after a concussion.

One high school player was unable to compete for 38 days. The injury report states, "Coach reports no known hit. Teammates reported athlete appeared confused last 5 minutes of play. Student had no recall of game."

A report says a player lost consciousness during a game for approximately 15-20 seconds. "When regained consciousness, could not answer questions except 'yes/no' squeezing my hand." The stu-



The Floral Park High School football team practices in August.

dent was cleared to return to athletics 39 days later.

## Safety guidelines

A high school football player in a Seattle suburb died of an undisclosed injury on Monday, three days after getting hurt while making a tackle. He is the fourth high school football player to die this season. A player in Louisiana suffered a neck injury, a player in New Jersey died of a lacerated spleen, and a player in Oklahoma had a head injury, according to news reports.

At football games, a doctor or medical personnel such as an athletic trainer is recommended to be on hand to assist with injuries, according to the New York State Public High School Athletic Association, the state's governing body that oversees all aspects of interscholastic sports. But medical presence is not required, NYSPHSAA assistant director Todd Nelson said.

Nassau's Section VIII, the county's governing body for interscholastic sports, requires schools to have medical representation "of their choice" on

the sideline at all football games. Examples Nassau provides are a doctor, physician assistant, a certified emergency medical technician, a certified advanced medical technician or an athletic trainer certified by the National Athletic Trainers Association.

Suffolk's Section XI, the county's governing body for interscholastic sports, follows the state athletic association's guidelines.

An athletic trainer's job at a football game is to be on constant lookout for player injuries and be prepared to put the emergency action plan in place in the event of a serious injury, said Larry Cooper, chair of the National Athletic Trainers Association's high school athletic trainers committee.

"We're looking at the game with an eye on the health and safety of the players," Cooper said.

At football practices — or any other high school sport practices — there are no state requirements that an athletic trainer be present, Nelson said.

Thomas Dompier, lead epide-

## SAFETY WARNING



**A 5-star Schutt Vengeance VTD II helmet. ■ See Schutt CEO speak on pros, cons of ratings: newsday.com/helmets**

## WARNING

Keep your head up. Do not butt, ram, spear, or strike an opponent with any part of this helmet or facemask. This is a violation of football rules and may cause you to suffer severe brain or neck injury, including paralysis or death and possible injury to your opponent. Contact in football may result in Concussion/Brain injury which no helmet can prevent. Symptoms include: loss of consciousness or memory, dizziness, headache, nausea, or confusion. If you have symptoms, immediately stop and report them to your coach, trainer, and parents. Do not return to a game or contact until all symptoms are gone and you receive medical clearance. Ignoring this warning may lead to another and more serious or fatal brain injury. **NO HELMET SYSTEM CAN PROTECT YOU FROM SERIOUS BRAIN AND/OR NECK INJURIES INCLUDING PARALYSIS OR DEATH. TO AVOID THESE RISKS, DO NOT ENGAGE IN THE SPORT OF FOOTBALL. TO ACHIEVE THE MOST EFFECTIVE PERFORMANCE OF A SCHUTT HELMET, USE ONLY SCHUTT SPORTS REPLACEMENT COMPONENTS.**

## CONCUSSION PROTOCOL

The Concussion Management and Awareness Act, which went into effect in July 2012, requires that public school athletes "suspected of having

a concussion" must be removed from the practice or game. Before they can return, they must be symptom-free for 24 hours and have written

authorization from a physician. Athletes must then gradually return to play. The concussion act recommends a five-step protocol.

**DAY 1** Low impact activity such as riding a stationary bike.

**DAY 2** Higher impact activity such as running or jumping rope.