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# Head Games

Thursday, Nov. 29, 2007 By SEAN GREGORY

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A hit on the field caused goalkeeper and honor student Anson to read at a third-grade level.  
Bill Cramer for TIME

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The word concussion tends to evoke macho images when you're talking about sports: hulking football players flying across the field, crushing their heads into one another's helmets, lucky if they can count their fingers by the end of the game. But brain pain doesn't affect just boys. Ask Christin Anson, a high school junior from Lancaster, Ohio. During a soccer game her freshman year, an opposing player kicked her square in the back of the head. She shook it off and even finished the game. "I just thought I'd have a headache for a day or two," Anson, now 17, says. Instead, she started showing symptoms of a concussion: lack of concentration, bad balance, delayed reactions. Soon the onetime honor student could read at only a third-grade level. After a year of intensive neurological therapy, she finally recovered.

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In the post-Title IX era, female sports are more competitive than they have ever been. And with higher stakes have come more hazardous consequences. Boys who play football are still more likely to suffer concussions than any other athletes, but in some sports played by both sexes, girls actually run a higher risk of getting hurt. According to a new study in the *Journal of Athletic Training*, U.S. female high school soccer athletes

suffered almost 40% more concussions than males did (overall, the study estimates that female players suffer some 29,000 concussions annually, compared with 21,000 for boys). In high school basketball, female concussions were nearly 240% higher (overall, girls got 13,000 concussions playing basketball, boys 4,000). Female college athletes who play soccer, basketball, softball and hockey also bear higher concussion risks than their male counterparts.

Some experts believe boys are less likely to report the harmful side effects of a collision--headaches, dizziness--than girls are and that could account for the gender discrepancy. "Culturally, we teach boys that they have to be tough," says Dawn Comstock, an Ohio State University pediatrics professor and an author of the Athletic Training study. "They have to play through the pain."

Of course, many girls suck it up too, but there are anatomical reasons that explain why they are more likely to have a concussion diagnosed. For starters, look to the neck. Bigger, stronger neck muscles can balance the head during impact and lower the chances of the brain's being jolted in a collision. According to a study that will be published in the *Journal of Biomechanics*, the circumference of men's necks is 20% larger than that of women's necks. Further, resistance tests showed that men's necks are 50% stronger than those of women. Another new biomechanical study shows that during adolescence, boys develop significantly stronger necks than girls do. "More-developed necks allow boys to better absorb a blow to the head," says Dr. Joseph Maroon, a neurosurgeon and consultant to the Sports Concussion Program at the University of Pittsburgh Medical Center.

The way girls play may also make a difference. Kevin Guskiewicz, director of the Sports Medicine Research Laboratory at the University of North Carolina, has found that female athletes are more likely than male athletes to land on the floor or field with their knees locked. The less flexible their knees, the worse their balance. The worse their balance, the more likely they'll hit the ground or another player.

How can young female athletes protect themselves? Many sports-medicine pros recommend that girls work with coaches to strengthen their neck muscles. Another solution, especially for soccer players, is to wear protective headgear. Since its inception in 2002, a San Diego-based company, Full 90, has sold some 200,000 soft, padded headbands to soccer players. A recent study in the *British Journal of Sports Medicine* found that the band reduced concussion risk among a group of Canadian adolescent soccer players. But some experts worry that the bands may spur more reckless on-field behavior. "I fear that kids will put these things

on their heads and feel invincible," says Guskiewicz.

Indeed, even if better equipment can help reduce the likelihood of head injuries, female concussion rates are unlikely to fall significantly until girls alter their playing styles. Olivia Kirby, a high school sophomore from Seattle, suffered her second concussion while playing soccer this fall. A goalkeeper, she promises to tone down her aggression. "Don't be the goalie who takes out another person just 'because,'" she says. "Be the goalie who takes out the person strategically." In other words, use your head. Or else you might damage it for good.

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