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Dear Reader,

In this third issue of our NCAA Sport Science Institute Newsletter, we are taking a more detailed look into the world of strength and conditioning. Athletic success is no longer about technique alone, but has become deeply interwoven with strength and conditioning programs that should be overseen by nationally certified strength and conditioning coaches. We hope you appreciate the articles on this subject. Even with a great strength and conditioning program, an athlete will perform at a sub-par level if he or she practices or competes while dehydrated; thus, we discuss the importance of maintaining euhydration. As part of our continuing discussion on concussion, we provide an overview of post-concussion syndrome, which is a condition that is too often underdiagnosed and mismanaged. We hope you enjoy.

Sincerely,

Brian Hainline, M.D.
NCAA Chief Medical Officer

Women's Volleyball Injuries

In 2008-09, there were 1,015 NCAA member institution teams and 14,827 student-athletes. The average squad size was 15 players.*

- The overall injury rate in NCAA women's volleyball

Understanding Post-concussion Syndrome

Post-concussion syndrome is not truly a "syndrome" because there is no core of consistent symptoms. Post-concussion syndrome refers to a constellation of symptoms that develop or persist following concussion, but the cause is not clear. There is no direct relationship between the development of post-concussion syndrome and the type or severity of concussion. It is best considered a neuro-psychiatric condition that results from a combination of factors. [Read more ...](#)

CSCCa Promotes Focus on Effective Strength and Conditioning Programs

One of the greatest factors to have affected competitive athletics has been the incorporation of organized strength and conditioning programs into high school, collegiate and professional athletic programs across the country. Strength and conditioning programs have made competitive athletics more explosive and more exciting, as athletes have made great improvements in strength, power, speed, speed endurance and motor control. Since the early 1970s, strength and conditioning programs have become an integral part of athletic programs across the country. Founded in 2000, the Collegiate Strength and Conditioning Coaches association (CSCCa) was designed to represent and promote the collegiate strength and conditioning coach. [Read more ...](#)

Proper Hydration: How much water is enough?

is 4.3 per 1,000 athlete exposures (games and practices combined).

- There were more than 26,000 injuries and 6.1 million athlete exposures from 2004 to 2009.
- Volleyball players are just as likely to be injured in a game (4.2 injuries per 1,000 athlete exposures) as in practice (4.4 injuries per 1,000 athlete exposures).
- Preseason has the highest overall injury rate (6.5 per 1,000 athlete exposures) as compared to the in-season injury rate of 3.6 injuries per 1,000 athlete exposures.
- Ligament sprains (28.2 percent), followed by muscle strains (21.7 percent), tendinitis (7.5 percent) and contusions (4.6 percent), are the most common types of injuries.
- Ligament sprains of the lateral ankle (15.6 percent), concussions (4.1 percent), quadriceps (thigh) muscle strains (4.0 percent), and abdominal strains (3.0 percent) are the most common types of injury in women's volleyball.
- The outside hitter suffered the most injuries (38.7 percent) for all positions, followed by middle blocker (27.4 percent), libero (12.0 percent), setter (10.9 percent) and opposite/diagonal player (7.5 percent).
- The most common activity at the time of injury during competition was general play (26.4 percent), followed by digging (19.9 percent), spiking (18.9 percent), blocking (18.8 percent) and passing (5.8 percent).

Click [here](#) to view the Women's Volleyball Injuries Fact sheet and other sports injuries fact sheets.

*Data from the 2004/05 - 2008/09 seasons.



Just like training and proper fueling, maintaining hydration is an essential part of a student-athlete's performance plan. In general, student-athletes know they need to hydrate during activity, but truly personalizing the recommendations for what, when and how much to drink is key for success. [Read more ...](#)

The Training Process: Strength & Conditioning

A comprehensive training program is the cornerstone of developing the NCAA student-athlete. As each year passes from incoming freshman to senior year, student-athletes should develop and refine their skills, both technically and tactically. Training in the weight room will condition the athlete as well as lay the foundation for sport-specific training on the practice field. [Read more ...](#)



APPLE Conference Registration Opens August 19th

The NCAA-sponsored APPLE Conferences, conducted by the Gordie Center for Substance Abuse Prevention at the University of Virginia, promotes substance abuse prevention and health promotion for student athletes and athletics department administrators. The goal of the APPLE conference is to assist colleges in promoting student-athlete health and wellness by empowering teams of student-athletes and administrators to create an institution-specific action plan. Prevention teams from over 70 campuses attend each year. Participating schools pay for travel to the conference and a team registration fee. All other expenses are covered by the NCAA. For more information and to register, go to <http://apple.studenthealth.virginia.edu/>



Performance Hydration

Performance declines with as little as 2 to 3 percent decrease in body weight from water (sweat) loss. Click the image to learn more about the consequences of dehydration and tips to avoiding it.



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