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## USMAPS

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# Sports Medicine Newsletter



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## Introduction

As the cooler weather begins to invade our campus this time of year, I would like to remind everyone that it is still imperative to hydrate yourself, especially those who are involved in competitive athletics in the winter season. In this issue, we discuss topics such as energy drinks, smoking cessation, and back rehabilitation. Please let us know if you have any questions or suggestions. Tim Hansen

## Current News

### Petition calls for FDA to Regulate Energy Drinks By Elizabeth Weise, USA Today (Oct 2008)

One hundred scientists and physicians have written a letter to the Food and Drug Administration asking for more regulation of increasingly popular energy drinks because their high caffeine content puts young drinkers at possible risk for caffeine intoxication and higher rates of alcohol-related injuries.

The letter was written by Roland Griffiths, a neuroscientist at Johns Hopkins School of Medicine in Baltimore. It asked the FDA to require the drinks' caffeine content be listed on the can, to set a limit on the amount of stimulant allowed in the drinks and to require warning labels. The U.S. market for the drinks is estimated at \$5.4 billion in 2006, according to Packaged Facts, growing at an annual rate of 55% per year.

The United States is the world's largest consumer by volume of energy drinks, roughly 290 million gallons in 2007, according to Zenith International, a British consulting group. Americans drink 3.8 quarts per person per year.

Griffiths was also senior author on a September paper on caffeinated energy drinks in the journal *Drug and Alcohol De-*

*pendence.*

Red Bull, the best-selling energy drink in the USA, contains 80 milligrams of caffeine per 8.3-ounce can, says spokeswoman Patrice Radden, about the equivalent of a cup of coffee. She says that's well below the 400-milligram-per-day caffeine limit at which "the general population is not at risk from potential adverse effects from caffeine," according to health authorities worldwide.

The drinks are aggressively marketed to young men as performance enhancers, with ads and promotions often linked to extreme sports. The market in the USA began with the introduction of Red Bull in 1997 and has expanded rapidly. The drinks are advertised as able to increase endurance, reaction time and concentration, with names such as Full Throttle, Amp Energy and No Fear.

It's the wide variations between brands that are a danger, Griffiths says.

"You can pick up a can and drink it and get 50 milligrams, which is the amount in a Mountain Dew, or pick one up and get 500 milligrams, and that's enough to put someone who hasn't built up a tolerance to caffeine into caffeine intoxication, resulting in nervousness, anxiety, restlessness, insomnia, nausea,

vomiting, tremors and rapid heart rate," Griffiths says.

In a statement, the American Beverage Association says lumping mainstream energy drinks with moderate amounts of caffeine with "companies seeking attention and increased sales based solely on extreme names and caffeine content" was unhelpful.

As for caffeine content, "consumers can easily find out how much caffeine is in a beverage by calling the company's 1-800 number or visiting its website" for those drinks that don't list content on their labels, the association says.

Energy drinks are also frequently used as a mixer with alcohol, Griffiths says.

"There's good evidence that when you do that, people are less able to discriminate how intoxicated they are, so they're more likely to get into alcohol-related accidents," he says.

The FDA does not comment on petitions, says spokesman Michael Herndon.

## Smoking: Kick the habit!

In the United States, tobacco is responsible for 1 in 5 deaths, costing \$68 billion per year in health care costs and loss of productivity. Tobacco is related to over 419,000 deaths per year in the United States and over 3 million per year world wide. Smoking is a major cause of coronary heart disease and cancer.

There are many forms of tobacco, including cigarettes, cigars, and smokeless tobacco. Each of these preparations contains nicotine, a highly addictive drug. In fact, the probability of becoming addicted to nicotine after any exposure is higher than that for alcohol, heroin, or cocaine. Tobacco products contain over 4,000 other compounds, including known carcinogens such as benzopyrene and vinyl chloride. Environmental tobacco smoke (second hand smoke) is classified as a Group A carcinogen by the Environmental Protection Agency, along with asbestos, benzene, and arsenic. While filter cigarettes have reduced smoker's exposure to high levels of tar and nicotine, they are still associated with a lung cancer risk that is four

times that of a nonsmoker. Smokers of low-tar and low-nicotine cigarettes have a death rate that is 30 to 75 % higher than the death rate of nonsmokers.

Of current smokers, 9 out of 10 report that they would like to quit smoking. When smokers fail to completely quit smoking, they may still benefit from reducing the number of cigarettes they smoke. The more a person smokes, the higher his risk of developing lung cancer and other smoking-related cancers. Therefore, using medications or other means to smoke less may reduce smoking-related harms. Studies show that smokers who cut back are more likely to stop smoking in the future. However, smoking less should not be seen as a substitute for quitting smoking altogether, and is harmful if the smoker inhales more deeply or smokes more of each cigarette to try to control nicotine cravings. Nicotine replacement products have been shown to help smokers reduce the number of cigarettes smoked, but this effect does not appear to last over a period of years.

For more information or for assistance in "kicking the habit", please visit the following websites:

**Government site:**  
[www.smokefree.org](http://www.smokefree.org)  
**American Cancer Society**  
[www.cancer.org](http://www.cancer.org)  
**Quit Smoking Support**  
**Hotline:**  
**(800) 784-8669**

*Please note:*  
*The Patterson Army Health Clinic @ Fort Monmouth can also offer assistance with quitting. Call 732-532-1244 to set up an appointment.*



## Medline Report—Active, Young Women Need Calcium, Vitamin D Supplementation

FRIDAY, Nov. 9 (HealthDay News) -- Calcium and vitamin D supplements may do more than strengthen bones in older women. These vital nutrients may also help younger, active women reduce their risk of stress fractures.

To illustrate that point, many bone health experts refer to a recent study of more than 5,200 female U.S. Navy recruits that found that women who didn't take additional calcium and vitamin D were about 25 percent more likely to suffer a stress fracture than women who took the vitamin and mineral combination.

"The most common time for a stress fracture is when you're increasing your exercise levels -- when you're going from doing nothing to doing a whole lot. It's too much, too fast, and the bone can't handle it," explained Dr. Sabrina Strickland, an orthopedic surgeon who specializes in sports medicine at the Hospital for Special Surgery in New York City.

"*Before* you embark on any sort of exercise regimen, take calcium and vitamin D supplements to reduce your chances of a stress fracture," she advised.

Stress fractures occur when muscles become tired and can't absorb shock properly. That force is then transferred to the bone instead. After time, that added shock can cause a tiny crack in the bone. More than half of all stress fractures occur in the lower leg, according to the American Academy of Orthopaedic Surgeons.

Women are more likely to suffer stress fractures, particularly women involved in just one particular sport, such as running, tennis, gymnastics or basketball. "Stress fractures are seen in people who do the same activity over and over again," said Dr. Elton Strauss, an associate professor of orthopedic surgery at the Mount Sinai Medical School in New York City.

In the Navy recruit study, the women were undergoing eight weeks of basic training. All were between the ages of 17 and 35. The women were randomly divided into two groups. One group was given daily supplements containing 2,000 milligrams of calcium and 800 international units of vitamin D, while the other group took a placebo.

More than 300 women developed a stress fracture. About 170 women who took a placebo experienced a stress fracture. That means about 25 percent more of the placebo group had a stress fracture compared to those taking the supplements. Results of the study were presented at a recent meeting of the Orthopaedic Research Society.

"I recommend that all of my female patients take 1,200 to 1,500 milligrams of calcium citrate and 800 international units of vitamin D3 daily," said Strickland. Strickland also advised that athletes should cross-train to avoid stress fractures. If you're a runner, she suggests lifting weights. "Don't just participate in impact activities," she cautioned.

Strauss agreed that cross-training is crucial for strengthening muscles and ligaments, which will help prevent stress fractures. "You shouldn't do the same sport seven days a week," he said.

Strauss also suggested making sure you get plenty of sleep. And, if you're participating in a lot of exercise, you should "push for at least 12 to 15 grams of protein at each meal." Protein is important for the metabolism of muscles and bones, he said. Strauss also recommended getting adequate levels of calcium, because it's "good for the entire musculoskeletal system." He said he thought most runners and other athletes spend enough time outdoors that they might not need a vitamin D supplement, because the body makes vitamin D when exposed to sunlight. However, athletes who are vigilant about applying sunscreen may need the additional vitamin D.

Finally, when you begin a new activity, take it slow, Strickland advised. "Don't do too much too fast. The typical rule for runners, and one almost nobody follows, is to increase the amount of running by 10 percent each week," she said.



**"Women are more likely to suffer stress fractures..."**



## Core Stability Training in Low Back Rehabilitation By Tim Hansen

The occurrence of low back pain in intercollegiate athletes is a fairly common condition. Typically, the sources of pain experienced by these high-caliber athletes are due to injuries to the soft tissue structures that include the muscles, fascia and ligaments. Most of these cases resolve within 2-4 weeks. However, many of these individuals will have a recurrence of symptoms at some point in their collegiate or professional careers. The causes of these injuries can be linked to lack of flexibility, lack of strength, poor technique, and improper body mechanics. In recent years, one of the key developments in treating low back injuries has been understanding that the deep trunk muscles, or "core" muscles, play an important role in supporting the spine. Core stability training, also known as lumbar stabilization, is an active form of rehabilitation designed to strengthen the muscles that support the spine in an effort to treat and to help prevent low back pain. Through a series of exercises, and with the instruction of an athletic trainer or therapist, the athlete is trained to find and maintain their "neutral" spine position. The back and trunk muscles are then exercised to teach the spine how to stay in that position.

### The components of the "core":

The lumbar spine is inherently unstable. Therefore it relies upon the muscles that support the area for dynamic stability. Your core consists of more than just your abdominal muscles. It includes the deep trunk muscles that attach to your spine and pelvis. They include:

- *Transverse Abdominus and Internal / External Obliques* – Act to transmit compressive forces that increase the intra-abdominal pressure to help to stabilize the spine. The transverse abdominus is found to be in a weakened state in patients with chronic back pain.
- *Multifidus* – A vital postural muscle of the spine. When co-contracting with the transverse abdominus, it acts to increase spinal stabilization by forming a deep internal "corset". Has been shown to be active in all ranges of motion.
- *Interspinalis / Intertransversari* – Deep muscles that stabilize each adjacent vertebrae.
- *Thoracolumbar fascia* – Provides tensile support to the lumbar spine and is used to transfer loads through the lumbar region.

### Implementing core training in a rehabilitation program

With any lower back rehabilitation program, flexibility plays a vital role in allowing the pelvis to move correctly. Stretching of the hamstrings, glutes, hip flexors, and hip rotators will assist the athlete in their rehabilitation program. Before beginning a program, the athlete must first learn the most pain-free and balanced "neutral" position and how to maintain it. To accomplish this, you need to co-contract both the transverse abdominus and the multifidus muscles effectively – a key to spinal stabilization. Have the athlete lay on their back with their knees bent. The lumbar spine should be neither arched up nor flattened against the table, but aligned normally with a small gap between the table and their back. Instruct them to draw their belly button toward the spine. The trunk muscles should contract in unison. Applying your fingers over the transverse abdominus will provide tactile feedback. This is considered to be the neutral position that they need to learn to maintain. Since the core muscles act as stabilizers that involve static or isometric contractions, they must be trained in that manner to build endurance of the muscle fibers. Have the athlete hold this contraction for 10-15 seconds or to fatigue and repeat 5-10 times. **(Picture 1)** Once the athlete has good control bracing their abdomen, they can be progressed to the following exercises.

*(Continued on next page)*



## Core Stability Training (Continued)

### Basic Level Exercises:

*Supine Hip Bridging* – Have the athlete place their feet flat on the table. Have them perform the abdominal brace then lift their hips to the ceiling. **(Picture 2)**

*Sidelying Hip Lift* – Sidelying position, knees extended. Have them lift their hips to the ceiling. **(Picture 3)**

*Neutral Spine with leg extension* – Have the athlete attain the neutral spine position on an exercise ball, then extend the leg. **(Picture 4)**

### Intermediate Level Exercises:

*Bridging with exercise ball* – Have the athlete place their shoulders on the ball with their knees flexed, then extend the hips to be parallel to the floor.

Make sure to have them keep their pelvis level. **(Picture 5)**

*Kneeling on exercise ball* – Have the athlete begin by kneeling and placing their forearms on the ball. Then have them lean forward, rolling onto their elbows. **(Picture 6)**

*Back extensions on ball* – Have the athlete place their abdomen on the ball, and then extend the trunk off the ball. **(Picture 7)**

### Advanced Level Exercises:

*Human arrow position* – Have the athlete roll their body straight out until their feet are the only body part on the ball. Have them keep their body straight while maintaining their neutral position. **(Picture 8)**

*Sidelying on Ball* – Place athletes elbow on the ball, then lift hips to the ceiling **(Picture 9)**

*Advanced Bridging* – For increased difficulty, have the athlete extend their leg while the other leg has an unstable surface underneath. **(Picture 10)**

*Lunges* – More functional. Have the athlete perform a lunge while maintaining their neutral spine.

As you can see, there are many variations of the same exercise. Always try to challenge yourself and be creative with your progressions. I typically will start out by having athletes hold each position for 10 seconds with 10 repetitions, progressing to a 30 second hold with 20 repetitions. However, you must emphasize meticulous technique in order to develop true stability through core strengthening. The whole essence of core stability is to teach the body to control lumbar function during their sport or activity in an effort to reduce the chance of re-injury.



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**Mission Statement:**

**The mission of the United States Military Academy Preparatory School Athletic Training Staff is to provide quality medical care to the cadet candidate battalion. This will encompass timely injury evaluation and assessment, injury prevention through education and risk management, and rehabilitation services with the goal of physically preparing the cadet candidates for acceptance to the United States Military Academy at West Point.**



**Go ARMY!**