

The Good, the Bad, and the Ugly... the Wild, Wild West of Supplements

By Josh S. Hellums MD, David G. Liddle MD, FACP

Whether watching television, perusing the Internet or thumbing through a magazine, advertisements for supplements are ubiquitous. Similarly, there are entire stores and websites devoted to these products, and there is an aisle at the local grocery and even options at the corner convenience store. We all know an "expert" too. How is an athlete-consumer to know which products have real benefit and which are just modern day "snake oil"?

The supplement industry has grown to over \$60 billion annually. With the popularity of health and fitness, it is not just elite athletes that are trying to get a boost. There are many reasons people take supplements. Motivations include trying to gain muscle mass, lose weight, improve performance or appearance, prevent injuries, increase healing or decrease recovery time. And there's at least one product for every motivation.

Because supplements are classified as "foods" and are intentionally not regulated like medications, a product's purity and contents can vary wildly. This fact not only adds confusion, but also may change the supplement's effectiveness and decrease its safety.

The labels of many products can leave one feeling as though they need a PhD in "Supplement Science." Being label literate is of the utmost importance. Beware of the "proprietary blend"

that does not fully disclose the type or amount of each ingredient. As with any supplement, the risk is that these "blends" can contain banned substances, stimulants or other products that can actually negatively impact performance or can be harmful.

The number, type and combinations of supplements are dizzying. Let's look at 5 readily available and widely used supplements.

Vitamins and Minerals

Vitamin and mineral supplementation is as old as the Flintstone's themselves. In general, vitamin and mineral supplements are not necessary unless there is a known deficiency. That is, if you are eating a well-balanced diet with a variety of fruits and vegetables, it is unlikely you need supplementation. However, there is evidence that supports their use to treat or prevent disease. For example, if you have deficiencies in Vitamin B12, Calcium or Vitamin D, using supplements can improve energy levels, immunity or bone health. Those that are exercising intensely, particularly in the heat, have increased use/demand for minerals like sodium chloride that are lost in sweat. These losses contribute to muscle cramping and heat illness and can be mitigated by using salt tablets or electrolyte drinks. Lastly, those that must eat a highly refined diet and or have had gastric reduction surgeries benefit from vitamin and mineral supplementation.

Protein Supplements

Protein is the building block of muscle and maintaining sufficient intake is important. While athletes, dieters, vegetarians, vegans and pregnant/breastfeeding women can be at risk of protein deficiency, the majority of people get more than enough protein. Depending on your goals and access to high quality food, protein supplements can certainly provide specific amounts



of higher quality calories and nutrients than a vending machine or fast food. Supplements can add needed protein to an athlete's diet, especially during times of intense or prolonged exertion or during recovery from such periods. They also help insure the dieting individual does not lose lean muscle as they try to shed pounds. Vegetarians and vegans can utilize supplements when complete protein ingestion is impractical. Generally, protein supplements are well-tolerated, but constipation or increased gas could be experienced.

Energy Aids

Caffeine is one of the most commonly used supplements worldwide. While most consider their morning cup of joe as not just a supplement, but a necessity, research has found that caffeine can improve focus and performance. Readily available, caffeine [as well as other common stimulants like Xenadrine or Bitter Orange (Synephrine)] is found in pre-workout supplements as well as energy drinks. Caffeine takes 45-60 minutes to reach peak levels in the blood. Its benefit in sports can delay fatigue and increase exercise capacity. While there are certainly benefits to *continued on next page...*

IN THIS ISSUE

- **The Good, the Bad, and the Ugly... the Wild, Wild West of Supplements**
- **Five things to ask your doctor about ITB Syndrome**
- **Athletic Footwear**
- **Choosing Wisely®: Deep Vein Thrombosis (DTV)**

CONTINUED FROM PAGE 1

consumption, side effects can include an increase in heart rate and blood pressure, shakiness, nausea, insomnia and increased urination and sweating leading to dehydration. The amount needed to boost performance is around 3 mg/ kg (or 200mg for a 70kg/150-pound person)... or about an 8-12 ounce cup of brewed coffee. Research suggests that there is a plateau effect at this level and taking in more just increases side effects without benefit. Tolerance and/or withdrawal occur after prolonged use.

Creatine

Creatine is one of the most common sports-related supplements used today. A naturally occurring compound, the average person ingests about 2 grams of creatine for every pound of fish or meat they eat. It serves as a rapidly available source of energy during short bouts of intense exercise. While the “how it works” part of creatine is interesting, suffice it to say — “It works!” It improves

tolerance for increased exercise intensity, peak power, total work until fatigued and strength. The response is more robust in those with lower natural baseline creatine stores. It also increases lean body mass and total body mass. It improves performance, but not in endurance sports.

Long-term studies have not been performed, and no studies have been done in children or adolescents. Caution should be used if you have kidney or heart conditions. Overall, when appropriate doses are taken, there are no demonstrated significant adverse effects, and creatine is generally considered safe.

Glucosamine & Chondroitin

For people with joint pains related to osteoarthritis, glucosamine and chondroitin sulfate are both generally safe, but their effectiveness has not been well-established. At the right dose (glucosamine 1500mg and chondroitin 1200mg daily), and taken for at least 2 months, they mildly decrease pain in

about 60% of people.

You should not take these supplements if you are allergic to shellfish, have a bleeding disorder or take medications (other than 81mg Aspirin) that thin your blood (i.e. Plavix, Coumadin, Eliquis, etc.). People with diabetes should use these with caution, as they may increase blood sugar levels.

Talk To Your Doctor and Do Your Homework

As you continue to do your research on what supplements are desired or required, talk to your doctor. Make sure there are no concerns for medication interactions or other contraindications. Always remember that supplements are not well-regulated and may contain harmful contaminants, as well as more or none of the product listed on the bottle.

Use good, neutral resources to help educate yourself on products and their truth-in-labeling include: <https://www.opss.org> and <https://labdoor.com>.

Be safe, be smart and happy training!

Five things to ask your doctor about ITB Syndrome

By Caitlyn Mooney MD, FAAP

Iliotibial Band (ITB) Syndrome is one of the most common causes of knee pain. It is very common in runners, but it is an overuse injury that can be seen in many other types of athletes, as well as sedentary individuals. The IT band (or iliotibial band) is a thick, connective tissue which extends from the pelvis and hip to the outside of the knee. With IT band syndrome, pain will occur on the outside of the knee. There are several things that can cause IT band syndrome including:

- A tight IT band
- Weak hip and pelvis muscles
- Poor running form
- Poor athletic equipment (like inappropriate footwear or poor bike fit)
- Training error, which includes things increasing hill workouts or running mileage too quickly.

When diagnosed with ITB, there are several questions I recommend you discussing with your physician.

What activities can I do while I'm recovering from the injury? Resting from painful activities may be necessary to

fully recover from ITB syndrome. Often, there are other activities that can be done during this recovery time, including swimming, biking, elliptical trainers, lifting and physical therapy.

Is physical therapy necessary and what exercises can help my recovery?

In the majority of cases in active individuals, physical therapy can be helpful. During the exam, your physician will identify factors that may have influenced you getting ITB syndrome, and these factors should be addressed with your physical therapy. Physical therapy for ITB syndrome often includes stretching, strengthening and some modalities such as ice, massage or tissue work.

When returning to running, how fast can I advance my mileage to prevent the pain from recurring?

If doing activities other than running, how quickly can I advance those? ITB syndrome is prone to return if advancing too fast. You will not be able to return immediately to previous activity level once your ITB syndrome is better. There are many online running programs that start out

slow and advance gradually to prevent the pain from recurring. Also, you do not want to advance your activity level, running distance or intensity by more than 10% a week.

continued on next page...



CONTINUED FROM PAGE 2

What can I do to prevent this pain from coming back? One of the most important things to do to prevent ITB pain from coming back is to not advance activity too quickly. Another important thing is to keep doing the exercises recommended to you in physical therapy. If hip, core strength or inflexibility was thought to contribute to your ITB syndrome, you will have to continue strengthening or stretching to prevent the pain from coming back. You likely won't have to do your exercises as frequently,

but a maintenance program of 2-3 days a week commonly can help prevent recurrence.

Is there any other treatments that can be helpful? While physical therapy, activity modification and gradual increasing of activity are probably the most important thing for treatment of ITB pain, there are other treatments that can help. For some, it is as simple as changing the way you sit and cross your legs. Others really feel that foam rollers, massage, applying ice or even deep tissue

work such as graston help. It is important to not overdue deep tissue work nor massage, however, as that can increase the inflammation. Finally, biologic injection therapy and very rarely surgery is utilized for ITB syndrome.

Overall, IT Band syndrome usually stems from weakness or training errors and can be treated with strengthening and activity medication without serious incident. Most people may return to their activity with a short rehabilitation program and gradual progression back to full activity.

COACH'S CORNER

Athletic Footwear

By Ryan Freedman, MD

Athletes always look for the latest gear to give them an edge in competition and training. This can include wearable tech, moisture-wicking fabrics or footwear. As sports and exercise have taken a more prominent place in our society, athletic footwear has developed to meet the demand. There are specialized shoes for running, basketball, tennis and many other sports. Choosing the right footwear for your specific sport is crucial for comfort, stability and performance.

Throughout history, most athletic activity was performed barefoot. The athletic shoe did not become popular until the latter half of the nineteenth century when a sandal was designed for people playing croquet. This shoe was known as the sneaker and was made with a rubber sole and laces. This led to the development of customized shoes for each sport. Shoes evolved for different playing surfaces as well as athletes' varying needs.

Why It Matters

Poor fitting and improper shoes are the principal causes of injuries associated with athletic footwear. It is important that the shoes fit appropriately and are designed for the athlete's purpose to avoid blisters, callouses, bunions and other foot injuries. For example, a

running shoe is designed for forward foot movement and a high-force heel impact, while basketball shoes focus on foot support during quick, lateral movement. Aerobic shoes, or cross-trainers, are designed for lateral movement but provide more cushioning for impact on the ball of the foot.

Know Your Foot

It is important that you and your athlete determine what type of foot he or she has so you can prescribe the best shoe. Athletes with a flat and low-arched foot require shoes that provide stability (motion control) to prevent the foot from rolling in with each step. The opposite is true of athletes with high-arched feet, who require a shoe that is more flexible (cushioning). The width of the athlete's foot is important and is addressed with picking a shoe with an adequate size and shape of the toe box. It is imperative that there be enough room to prevent toes rubbing on the shoe, which may cause blisters or ulcers. Shoes are also made of different materials that are breathable and are desirable for activities that may produce significant perspiration.

Know Your Sport

Regarding sport-specific shoes, it is important that an athlete know the specific requirements of their sport. For example, a tennis player may want

different shoes depending on the type of court surface he or she may play on, such as clay, grass or another synthetic surface. Tennis players require quick side-to-side movements, which would require good lateral support and lighter in weight for ease of movement. Tennis players may also choose different shoes based upon their style of play.

Another example would be someone running an obstacle race would need excellent traction, but also with good ventilation to drain water and mud from inside the shoe. The shoe would also need to fit tightly, so as not to slip on an obstacle or get stuck in the mud.

While understanding shoe design and picking the best shoes may seem like a daunting task, it is important to educate yourself and your athlete about different types of footwear. This may confer advantages, such as improved performance, decreased injury and improved comfort. In addition to using reputable internet resources and books to educate yourself about the topic, use local experts such as orthotists and medical providers to your advantage. It is also useful to know basic terminology for different components of a shoe. Understanding the terminology makes it easier to communicate your preferences to find the shoe that best fits your needs.

The athletic shoe has gone through many changes since its humble beginnings. Given the number of athletic shoes on the market and the singular composition of each athlete, it is important to understand the specific needs of each athlete and sport to match them with the best shoe possible.



Choosing Wisely®: Deep Vein Thrombosis (DVT)

By Anne Marie C. Zeller, DO, MSc



An initiative of the ABLM Foundation

With a known cause of deep vein thrombosis (DVT), do not work up for clotting disorder for patients who develop first episode, and do not reimagine DVT in the absence of clinical change.

Being diagnosed with a deep vein thrombosis (DVT), or blood clot, as a healthy active athlete with no medical conditions can be confusing and scary. Athletes in general are very low-risk for DVT, but there are unique risk factors to be considered. In the general population, the rate of DVT is approximately 1 in 1,000 people. Being a healthy active individual does not exclude this population from the possibility of developing DVT. This issue will highlight symptoms of DVT, risk factors, treatment options and return to activity in the athletic population.

Deep vein thrombosis is a blood clot that can develop in the arms or most commonly in the legs. Clots in the legs are especially dangerous due to the fact that they can travel to the lungs and cause severe damage or death. A DVT usually presents with significant pain, redness and swelling in the extremity (usually one side involved) and can be commonly misdiagnosed as a lower leg strain in athletes. Diagnosis can be made through ultrasound of the involved extremity.

There are many risk factors that are specific to athletes and the general public. Most of the time, a DVT is caused by any of the following: trauma, immobilization, long-distance travel, dehydration, high altitude training/sport, greater than 60 year old, obesity, cancer, surgery, pregnancy and oral contraceptive use. If these risk factors are present, we do not recommend a laboratory work-up for genetic causes, if it is the first episode. Some athletes that develop a DVT have an underlying, genetically inherited issue that causes them to develop clots more easily, but this is rare.



After diagnosis is made, treatment is started using blood thinners. They work by reducing the formation of blood clots in arteries or veins. Blood thinners do not dissolve existing clots, but they can help prevent clots from becoming larger and causing more serious problems. Repeat ultrasound is not recommended if athlete is doing well with no new symptoms on medication. Duration of treatment for a first episode of DVT with known cause is approximately 3-6 months.

Return to activity research is limited while on blood thinners, but there are basic guidelines that should be guided by a physician that understands DVTs and athletes. Athletes can immediately return to activities of daily living (bathing, working, dressing and walking) with no physical activity for three weeks. By week four, the athlete can increase walking

program and then resume running at six weeks for noncontact sport participation. If at any time pain, swelling or redness returns, the athlete is advised to limit activity and see physician. Any athlete that wants to return to a collision or contact sports should not participate while on blood thinners.

Blood thinners are not recommended for prevention of DVTs in an athlete that has no history of prior blood clots. If an athlete is at high altitude for an extended stay, it is advised to use aspirin as prevention. Hydration during exercises is also important for reducing risk of DVT.

Athletes are exposed to many of the risks listed in this article, but they are have an overall lower risk of DVT than the general population. It is important to be aware of the signs and symptoms of a DVT and seek appropriate medical treatment.

Editor-in-Chief: Jeffrey Bytowski, DO AMSSM is a multi-disciplinary organization of 3,000+ sports medicine physicians dedicated to education, research, advocacy and the care of athletes of all ages. The majority of AMSSM members are primary care physicians with fellowship training and added qualification in sports medicine who then combine their practice of sports medicine with their primary specialty. AMSSM includes members who specialize solely in non-surgical sports medicine and serve as team physicians at the youth level, NCAA, NFL, MLB, NBA, WNBA, MLS and NHL, as well as with Olympic teams. By nature of their training and experience, sports medicine physicians are ideally suited to provide comprehensive medical care for athletes, sports teams or active individuals who are simply looking to maintain a healthy lifestyle. Find a sports medicine physician in your area at www.amssm.org.