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CATS NEWSLETTER

The Bi-annual Publication of the
College Athletic Trainers' Society

IN THE SPOTLIGHT: Featuring Christine Volk, Head Athletic Trainer at The University of Alaska Anchorage

By: Kristen Mostrom, MPA, LAT, NREMT, North Carolina State University

Current Position/Job Title:
Head Athletic Trainer, The University of Alaska Anchorage (UAA)

Years Worked in Alaska: 32

Years as an Athletic Trainer: 29

Years Worked at UAA: 24.5

Native of Alaska: No – born & raised in Cincinnati, Ohio

Education History:
University of Dayton, Bachelor of Science 1979 & Master of Science 1986

How does your Sports Medicine Department differ from other programs throughout the NCAA?

The UAA Sports Medicine Program is within the UAA Department of Athletics and includes a medical team that consists of a head team physician (Director of Medical Services); four certified & licensed athletic trainers; the Student Health & Counseling Center; one dietitian; two neuropsychologists and a group of local affiliate physicians in various specialties. UAA does not have a curriculum athletic training program for its students but is an internship site location for student athletic trainers.

What have you enjoyed most about working at a university that is quite secluded in comparison to other schools throughout the country?

I think what I have enjoyed most about working in Alaska is how unique it is as a state. It is called the "Last Frontier" because of its vast wilderness and abundance of wildlife. It never grows old to witness the excitement of seeing a moose on campus, a few feet of snow on the ground and possibly the northern lights.

Due to UAA's location and type of sports, it draws a diverse student-athlete population. We have approximately 180 student-athletes and over 1/3 of them are international students (i.e. Germany, Austria, Norway, Australia, France and Kenya) along with students from all over the United States.

Have you come across any challenges while working at UAA? How have you handled these?

Yes, there have been a variety of challenges in relation to sports medicine:

- For the first 21.5 years at UAA, I managed a sports medicine facility/ATR that was approximately 200 square feet in size. Although small, my staff and I utilized every possible inch for 160 student-athletes.

In This Issue

- In Alaska, shorter days and lack of sunlight in the winter can lead to forms of clinical depression or seasonal affective disorder. Since most of our student-athletes are not from Alaska, we are sensitive to the potential for this to occur. The Sports Medicine program has formulated a Mental Health Plan to assist in the screening, referral and management of mental health issues.
- For my first 19 years, the Sports Medicine program only had two ATs. After recognizing some Title IX deficiencies and submitting the "Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics" for a review, our administration found the funds for additional Athletic Training staff.
- UAA and its counterpart in Fairbanks (UAF) may be the only universities that must travel by airplane to all away competitions. All flights are at least 3.5 hours, plus a bus ride. Due to teams' extended travel schedules, frequent flying and increased risk for illness, the Sports Medicine program requires a series of immunizations for all student-athletes.
- All of our medical supplies are shipped from the Lower 48 and have to be flown or barged in to Anchorage and the shipping fees are extremely expensive.
- Applicant pools for AT jobs in Alaska are scarcer than in the Lower 48. Not everyone wants to move to Alaska so it is sometimes more difficult to find good candidates. It has helped to network with other ATs in our conference, district meetings and at conferences, like CATS.
- There are not as many hands-on CEU opportunities in Anchorage. Most athletic trainers seek online CEU opportunities. At UAA, we have sponsored hands-on classes (Graston & Mulligan) for our AT staff and those in the community to help remedy the shortage.

What information would you give to future athletic trainers visiting your institution?

Check the weather! We recommend visitors check the forecast before they come and make sure that they and their team/staff dress appropriately for the weather.

What would you say is the best part about working at the University of Alaska Anchorage?

There isn't just one thing.

- The school: It's in a beautiful setting with spectacular scenery and incredible wildlife that still amazes me.
- Success: We have very good coaches and very successful teams both athletically and academically.
- Relationships: It is just the right size program where you can identify every student-athlete.
- Sports Medicine Team: I have always had a fantastic group of community physicians that are extremely supportive of the program, and most importantly, have been blessed with a first-class athletic training staff for my entire tenure.

Congratulations are in order! What are your plans after retirement from athletic training & UAA?

I plan on doing all those things that you never have time for when you are working! Mostly, I hope to travel more for pleasure and travel less for business. In addition to vacationing, my husband and I are looking forward to visiting family members and friends out-of-state, as well as working on home improvement projects. In terms of business, I hope to continue to support athletic training in the state of Alaska and within the local community and possibly at the state association level.

Any further comments:

I have been attending CATS Symposiums since they started in the early nineties. Since I became the head athletic trainer at the University of Alaska Anchorage in January of 1993, the CATS Symposiums have been a valuable asset to my success. It is an excellent professional organization that focuses on current issues that are extremely relevant to the needs of the college athletic trainer. Knowledge and discussions disseminated from CATS Symposiums have helped me improve the quality of care to my student-athletes, improve my workplace, improve my relationships with my athletic directors, be a better administrator and most importantly, played a role in helping me be the best athletic trainer that I could be.

CATS not only wants to help all athletic trainers be better at their occupations, but it also cares about each of us as individuals and advocates topics to improve our physical and mental well-being.

That caring is extended even to our families in the creation of the CATS Family Scholarship for the college-age children of CATS members. My daughter was a recipient of one of the first CATS Family Scholarships and it was very helpful in relieving some of our financial burden in her pursuit of an advanced degree in occupational therapy.

"So many positive things can be said about Chris: Her passion for sports, athletes and their care. Her tireless work ethic. How she has grown sports medicine at UAA. Her personal strength of character. The way she leads with knowledge and a gentle strength while fostering cooperation and a sense of community in our department. Her sense of humor and infectious laugh. She may have, once, even helped rescue a new athletic trainer employee out in the woods, in the dead of winter, in the middle of the night, on a weekend. So many things can be said about Chris, but ultimately I want to say I am most grateful for her mentorship and friendship."

-Rachel Butler, Assistant Athletic Trainer, UAA

The University of Alaska Anchorage campus

INTERNSHIP INQUISITION: HOW CAN WE BETTER PREPARE FUTURE LEADERS IN ATHLETIC TRAINING?

By: Adam J. Thompson, PhD, LAT, ATC, Indiana Wesleyan University

It's an exciting time to be in the athletic training profession. Employment growth for certified athletic trainers (ATs) continues to outpace many other professions.[1] Professional development options have never been more robust with the Board of Certification boasting numerous onsite and online continuing education opportunities. Post-professional education options and practical experiences continue to evolve. While obtaining a master's degree has been and still is a viable option to advance education and clinical skills, doctoral programs continue to diversify education, complemented by the recently released focused content areas of residencies in athletic training.[2]

With the positive strides we are making as a profession, we still have challenges to address. The expansion of opportunities for athletic trainers to gain employment and advance their educational and clinical experience necessitates the responsibility of our professionals to scrutinize these options to ensure quality. To that end, there is a growing concern on the topic of internships in athletic training – especially at the post-professional level. With increasing frequency, advertisements from professional organizations and institutions announce "internship" positions for ATs. Many of these positions prefer advanced degrees and experience from candidates. Low salaries while requiring full-time employment responsibilities is common.

There are specific U.S. Department of Labor criteria that must be met to identify a position as an internship.[3] A true internship has never been designed to replace full-time qualified staff at a discounted pay rate. There should be education and training that benefit the intern and not necessarily work provided that benefits the supervisor/employer.

Many athletic training positions labeled as internships are problematic as the supervisor/employer directly benefits from the work of the intern and is largely dependent on the work of the intern. The primary beneficiary of the activity occurring is a key component in the designation of a position.

It is imperative that an institution/organization's human resource department articulates U.S. labor law requirements to athletic departments to qualify a position as an internship. This practice can avoid confusion and maintain Fair Labor Standards Act (FLSA) compliance.[3]

"In general, the more an internship program is structured around a classroom or academic experience as opposed to the employer's actual operations, the more likely the internship will be viewed as an extension of the individual's educational experience (this often occurs where a college or university exercises oversight over the internship program and provides educational credit). The more the internship provides the individual with skills that can be used in multiple employment settings, as opposed to skills particular to one employer's operation, the more likely the intern would be viewed as receiving training. Under these circumstances the intern does not perform the routine work of the business on a regular and recurring basis, and the business is not dependent upon the work of the intern. On the other hand, if the interns are engaged in the operations of the employer or are performing productive work (for example, filing, performing other clerical work or assisting customers), then the fact that they may be receiving some benefits in the form of a new skill or improved work habits will not exclude them from the FLSA's minimum wage and overtime requirements because the employer benefits from the interns' work."[3]

This information calls into question the job responsibilities that most athletic training internships identify as required. These job functions strongly promote the expectation that those positions should not be excluded from the FLSA's minimum wage and overtime requirements.

The most recent National Athletic Trainers' Association (NATA) salary survey identifies the average salary in 2016 for an athletic trainer with a bachelor's degree as $48,498 or $54,695 with a master's degree.[4] Recent graduates with minimal experience are averaging $40,000. These numbers are in stark contrast to the alarmingly low salaries offered for most "internship" positions currently advertised for potential post-professional AT candidates. This is not problematic if the position is structured as an internship under FLSA law. However, this is arguably not the standard within the athletic training profession, with the exception of a few. Most of the "internships" offered to ATs are residencies that are poorly funded. This begs the question as to why employers of ATs would offer such inadequately funded positions and furthermore, why our peer professionals agree to take such positions?

Incentives can be provided as part of an athletic training internship. Health care coverage, housing options, apparel and meal plans can be offered and could help offset a low salary. This may provide enough enticement to allow young professionals to accommodate their needs for a short period of time. However, these options are not offered universally or consistently and in most cases are unique to only the best internships offered.

Internships should not be viewed in a negative light and overshadowed by poor current practice. They can be incredibly beneficial and develop our future leaders in athletic training with unique and valuable experiences. However, change is needed and could be implemented relatively quickly with the right approach. Identifying the available funding, performing a needs assessment and involving the human resource department to ensure that labor law is understood is critical. Many of the current approaches to internships in athletic training cannot continue legally but could be improved with a residency approach. Future professionals should be educated on labor law standards to ensure they are equipped to recognize a detrimental situation to their professional development before they accept such a position.

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2017 CATS Family Scholarship Recipients

CATS is proud to announce the 2017-18 CATS Family Scholarship recipients.

The 2017-18 scholarship recipients have shown great success academically. They possess leadership qualities and have become actively involved with their communities. Many of the winners even assist their parents with the financial responsibilities of college education. We wish the new recipients great success this year and hope each recipient continues to work hard in their respective studies, achieves their goals and makes their parents proud.

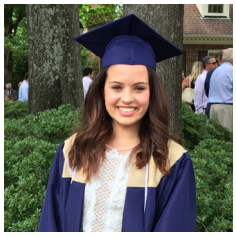
Moose Detty Scholarship sponsored by PRO Orthopedics

Rachel Schmidt will be a sophomore at Butler University and is the daughter of Paul Schmidt, University of Michigan

Otho Davis Scholarship sponsored by Bill & Tracey Buzzeo and Bob & Marsha Mangine

Ryan Pike will be a senior at Syracuse University and is the son of Brad Pike, Syracuse University

Dan Gorman Scholarship sponsored by Johnson & Johnson



Julia Colello will be a freshman at University of Colorado, Boulder and is the daughter of Mike Colello, Aegis Sciences

Hydroworx CATS Family Scholarship

William Hardin will be a sophomore at University of Virginia and is the son of Allen Hardin, University of Texas, Austin

CDM Sport CATS Family Scholarship

Kathryn Hazen will be a freshman at Marian University and is the daughter of Neal Hazen, Ball State University

CDM Sport CATS Family Scholarship

Hannah Sunderland will be a freshman at Illinois State University and is the daughter of Scott Sunderland, Knox College

Is your child college bound? Does he or she qualify for our scholarship? To find out if your child qualifies for the CATS Family Scholarship visit https://www.collegeathletictrainer.org/CATS-Family-Scholarships.html

Follow CATS on Twitter for the latest updates: @college_ATs

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Provide an insider's view of the life and work of CATS members and facilitate the sharing of knowledge to help ensure high-quality care of student-athletes

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POTENTIAL MISUSE OF PRESCRIPTION PAIN MEDICATION IN ATHLETES

By: Yvette Rooks, MD, CAQ, FAAFP, CMO
Sports Medicine, RWJBarnabas Health and Rutgers University

For many athletes, pain is a normal everyday experience and success is often achieved in spite of pain.

Many studies have confirmed that people respond differently to similar levels of painful stimulation. Differences exist not just in people's individual sensitivity to a painful stimulus, but also in their perception of pain and how we display it. Pain is individual.

The use of pain medication is also individual, but it is important that athletes – who are often prescribed painkillers to deal with injury or recover from procedures – take special care to ensure they are using the prescriptions correctly. It is paramount that the clinician providers of such medications are educating the athlete about the usage of pain medications.

Pain medication abuse has skyrocketed in all aspects of society, across the nation. Pain control is one of the biggest issues sports medicine doctors face when treating injured players.

Opioid pain medication prescription sales in the U.S. nearly quadrupled from 1999 to 2014.[1] With the arduous physical demands of training and competition, college athletes are at particularly high risk for acute pain injuries. In a recent NCAA survey (2014), 23% of college athletes reported receiving a prescription for pain medication and 6% reported using an opioid without a prescription in the prior year.[2]

The risks of misuse of opioid pain medication can lead to addiction and physical dependence, accidental overdose/poisonings and death.

Prescription drug misuse can be defined in several ways:

1. Taking a medication not prescribed to you;
2. Purposely taking the wrong dosage of a prescribed medication and/or taking it longer than prescribed; and
3. Taking a prescribed medication for something other than its intended purpose.

In addition to the overprescribing of prescription pain medications, possible reasons for the upsurge could be new norms when it comes to injury and pain management, new or increased pressure for an athlete to quickly return to play, a player's fear of losing a starting position or a fear of missing out on a potential scholarship opportunity. Risk assessment tools can be used to identify patients that may be at risk of misuse.

Clinicians must attempt to identify patients at risk of misusing prescribed opioids to prescribe and monitor opioid safety. Clinicians should keep in mind that there are screening tools used to identify high-risk patients appropriate for close monitoring and further assessment, but are not diagnostic tools to diagnose substance use disorders. The more common screening tools are the SOAPP-Screener and Opioid Assessment for Pain Patients and the ORT-Opioid Risk Tool.

Fortunately, the vast majority of Americans will never have a problem with opioids prescribed or administered for their acute pain. However, a systematic approach to the management of acute pain with a treatment plan determined by the diagnosis and mechanisms underlying the pain, patient education and realistic goal setting are required to avoid the unwanted consequences.

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PERSONALIZED BLOOD FLOW RESTRICTION: THE FUTURE OF REHABILITATION

By: Ben Weatherford, PT, DPT, Clinical Education Coordinator, Owens Recovery Science

Over the last few years, there has been a shift in the approach to minimizing muscle loss and maximizing strength in athletes after injury. Traditional strengthening guidelines recommend resistance training between 65-85% of a one repetition maximum to achieve adaptive muscle strength and hypertrophy changes. However, after acute injury, post-operatively or with overuse injuries, this heavy mechanical tension model is not typically tolerated by patients. Personalized blood flow restriction (PBFR) rehabilitation is a novel technique that utilizes a surgical-grade tourniquet and Doppler system with light resistance training loads to achieve muscle strength and hypertrophy changes with very low loads.

Anabolic Resistance

Anabolic resistance is defined as the condition in which a limb reduces protein synthesis during a period of disuse, such as after surgery or injury.[1] The reduction in local protein synthesis is linked to atrophy and decreased strength. Light load exercises have little to no effect on increasing protein synthesis, but studies show light load combined with blood flow restriction (BFR) consistently increases protein synthetic responses. For instance, Fujita et al. demonstrated a 46% rise in protein synthesis 3 hours post training with BFR at low loads. A work matched control group without occlusion demonstrated no change.[2]

How Does BFR Work?

PBFR uses a specialized tourniquet system to limit arterial inflow and occlude venous outflow of an exercising limb. The hypoxic environment created stimulates strength and hypertrophy gains. Although the exact mechanism behind BFR training is still not fully understood, several potential mechanisms are being considered.

One prevailing hypothesis is the recruitment of larger, fast twitch motor units secondary to the hypoxic state created by the tourniquet. To support this, several papers have demonstrated higher integrated electromyography (iEMG) signal output when performing exercise under vascular occlusion compared to low load training.[3,4] As the muscle utilizes the anaerobic pathway during resistance training, the metabolic accumulation within the muscle may be a trigger for hypertrophic changes.[5] This can be seen when comparing the accumulation of substances such as lactate in BFR vs. low load training. In the BFR group, there is a significant rise in lactate which is a byproduct of anaerobic metabolism, and the levels of metabolic stress measured via lactate are similar between BFR and HIT training.[6] The systemic response from this metabolite accumulation with BFR training includes significant increases in substances such as growth hormone,[7,8] insulin like growth factor,[9] myogenic stem cells[10] and down regulation of substances such as myostatin.[11] Although the accumulation of muscle metabolites and the ensuing systemic response may not be the only or primary factor behind the effects of PBFR, the ability to recruit more fast twitch fibers and take a muscle to fatigue rapidly with light weight does appear to be an important determinant of these adaptive changes.

Published clinical trials have demonstrated improved results with BFR after ACL injury, knee arthroscopy, limb salvage and anterior knee pain. Many ongoing clinical trials are actively being conducted to assess the effects of BFR in post-surgical populations, tendinopathy, long-bone fractures and joint arthroplasty.

Why PBFR?

Personalized BFR refers to BFR exercise applied at a target percentage of an individual's limb occlusion pressure (LOP). Individual pressures vary based on a cluster of factors including race, gender, limb circumference, tissue density, systolic blood pressure, cuff width and cuff location. Measurement of vascular inflow using Doppler technology is the current gold standard to determine an individual's LOP. Capillary refill, blood pressure and subjective ratings of pressure are not valid means to determine LOP and should not be used in the clinical setting. Additionally, the pressure used for BFR may significantly affect the outcome of the exercise. Fatela et al. demonstrated significantly higher iEMG for the rectus femoris and vastus medialis with 80% occlusion compared to 40% or 60%.[12] PBFR is intended to maximize the effects of BFR exercise while using the least amount of pressure necessary, thus increasing safety for soft tissue structures under the tourniquet cuff.

The Leader in PBFR Education

Johnny Owens, MPT, founded Owens Recovery Science after utilizing the application of personalized BFR within a military setting. Owens is former Chief of Human Performance Optimization at the Center for the Intrepid (CFI), which is part of the SAMMC Department of Orthopedics and Rehabilitation (DOR). Johnny was at SAMMC for 10 years, treating service members suffering

severe musculoskeletal trauma. These traumatic injuries required a new approach to strengthening since lifting heavy weight was not available. Johnny has been applying personalized BFR clinically since 2012 and developed an educational program centered on best practices for clinicians looking to add personalized BFR to their repertoire. The course is EBP-approved and addresses history, safety, cellular physiology and practical application for the rehab professional.

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COMPLEMENTARY AND ALTERNATIVE THERAPIES AS ATHLETIC TRAINERS

By: Sue Falsone, PT, MS, SCS, ATC, L-AT, CSCS, COMT, RYT, Owner, Structure & Function Education

According to the National Institutes of Health, results from a 2007 survey showed 38.3% of U.S. adults use some form of complementary and alternative medicine in their health and illness management plan.[1] Complementary and Alternative Medicine (CAM) are practices that are not typically considered part of conventional medicine. The National Center for Complementary and Alternative Medicine is categorized as energy medicine, mind-body medicine, biologically based practices and whole medical systems practice.

Energy Medicine

Energy medicine is defined as anything that can positively affect the energy of a person, such as Chakra therapy, Traditional Chinese Medicine and other manual therapies.

For athletic trainers, manual therapies are part of everyday practice to assess and treat athletes.

Cupping

Cupping is one form of manual therapy that has become popular over the last year, partially thanks to the 2016 Summer Olympics when the world saw Michael Phelps sporting round bruises on his shoulders.

Cupping involves the use of glass, plastic or silicon cups and either fire or a hand pump to create negative pressure inside the cup.[2] This negative pressure lifts the tissue under the cup, causing a decompression of the tissue in the center and compression under the rim.[3] There are two types of cupping: wet and dry. Wet cupping lances the skin first, and then places the cup over this area, pulling blood out of the body. Dry cupping does not lance the skin and bleeding is discouraged.

The benefits may be related to the tissue decompression, while other manual therapy techniques cause compression. How this therapeutic benefit differs from compressive techniques is unknown. The second theory is the decompression/compression interface seen in biomedical modeling[3] which may be of some benefit for scar tissue remodeling; however, this research is inconclusive.

Finally, cupping is thought to have an impact on microcirculation. Poor microcirculation has been shown to cause many chronic disease states.[4, 5] Cupping is thought to force the body to go through angiogenesis by using an external stimulus to bring excess blood to an area. The body would then be forced to produce new blood vessels to dissipate the blood.

Microcirculation would be improved, and chronic disease could potentially be treated or even prevented.

Acupuncture and Dry Needling

Dry needling has had a recent spike in popularity, despite it being an old intervention.[6] Dry needling is a skilled intervention by a health care professional using a fine filiform needle to penetrate the skin, creating a healing response in the tissue being lesioned. Tissues contributing to neuromusculoskeletal dysfunction can be needled, including muscle, fascia, tendon, capsule, ligament, perineural tissue and microvascular structures. Like many health care interventions, there is significant overlap between health care professionals,[7] and the reasons why they are used. Traditional Chinese Medicine (TCM) acupuncture is the major umbrella all dry needling falls under; however, concepts of qi, the five elements and meridians are not discussed in western dry needling practices, which are based on anatomical and physiological principles.[8] The mechanism of how dry needling works remains under study; however, answers regarding its use for pain control, inflammation, swelling, muscle activation and relaxation and movement are beginning to be uncovered.[9, 10]

Mind-body Medicine

Mind-body medicine practices surround the concepts of relaxation and meditation. Given that pain is an individual experience based on someone's memories, culture and social interactions, and that pain can have a significant impact on the mental health of a patient,[11] a mind-body connection as part of a comprehensive treatment plan should be considered.

Yoga

Yoga has been around for 5,000 years. It became popular in the U.S. in the 1960s as people were seeking alternatives to health and stress management. There are many types of yoga, ranging from being relaxing to physical. Yoga has been shown to decrease stress, improve balance, decrease pain, improve flexibility, improve strength, improve energy levels and improve functional and social outcomes.[12]

Meditation

Meditation can be defined in many ways, making it sometimes difficult to implement in a treatment paradigm.[13] However, breath-based meditation has been shown to have positive physiological and psychological changes.[14] It can have a significant impact on balancing the autonomic nervous system, decreasing the "fight or flight" response associated with stress and pain.[15]

Biologically Based and Whole Medical Systems Practices

Biologically based practices typically involve the use of herbal and dietary supplementations that go beyond the scope of western medicine nutrition. Whole medicine systems typically include the use of homeopathy for the prevention and treatment of disease. Homeopathy typically uses minute amounts of natural substances to treat a disease that in a healthy person, would produce symptoms of that disease.[16]

Many of these interventions and supplements are not FDA approved or NSF certified for sport, making further discussion of these two categories beyond the scope of this text. Honest discussions between the athlete and the athletic trainer regarding supplementation are necessary in order for the athletic trainer to counsel an athlete on risks and rewards of supplementation and the potential consequences of using such supplements.

In summary, the use of alternative therapies in the athletic training room is becoming more common. Athletic trainers should be aware of the indications, contraindications, benefits and risks for using such interventions and seek education to better understand these therapies.

Seeking appropriate education on these topics can be difficult. Be sure to seek education from reputable educators with qualified instructors. Certifications from private companies do not trump your state board's practice act. The overseeing state board rules and regulations will determine what is appropriate to use in the state you practice in. Be sure to contact your state board directly for further information if you are unclear about being able to perform any of these techniques.

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INFLAMMATION AND THE "FIRE WITHIN" – DIETARY STRATEGIES TO REDUCE EXERCISE-INDUCED INFLAMMATION

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Bumps and bruises are a normal part of sports for athletes and whether or not you realize it, athletic trainers are experts in treating inflammation and injuries. Most people know nonsteroidal anti-inflammatory drugs (NSAIDs), like aspirin, can help control inflammation in the body – but what if the same results could be achieved through nutrition? This article sheds light on the benefits of an anti-inflammatory diet to reduce the inflammation associated with exercise.

Traditional treatments to reduce inflammation include rest, ice compression and elevation. NSAIDs are also commonly used to manage pain associated with injury. There is a modest reduction of pain and swelling with the use of NSAIDs, especially in the early repair period, which is generally within the first three days of the injury. While helpful in the short-term, long-term use of NSAIDs may actually be counterproductive. In the case of a contusion injury, the use of NSAIDs may impede muscle repair and regeneration.[1]

While most injuries heal on their own, the ones that linger ultimately result in chronic inflammation. Fortunately, chronic inflammation can be decreased through improvements in dietary patterns.

Phytonutrients

Plants contain phytonutrients, which are the pigments that provide a variety of antioxidant and anti-inflammatory compounds. To reduce chronic inflammation, an initial intervention is to encourage all players – but especially the recovering athlete – to include more fruits and vegetables at each meal. There are simple strategies to promote increased intake of fruits and vegetables for those athletes who don't enjoy eating them raw, such as drinking 100% fruit/vegetable juice and smoothies. Berries, tart cherries, pomegranate and beet juice all have powerful effects on the inflammatory process.[2] Plant-based spices such as turmeric, curcumin and ginger also have anti-inflammatory properties.[3,4]

Omega-3 Fatty Acids

Fish oil is a dietary source of the anti-inflammatory long-chain omega-3 fatty acids, EPA and DHA, which are known to reduce inflammation and prevent cancer. Cold-water fish such as Alaskan salmon, mackerel, black cod and sardines are good sources of these long-chain fats.[5] Eating two to three cold-water fish meals per week can provide a consistent intake of EPA and DHA to reduce inflammation. Athletes who do not like cold-water fish should consider taking a fish oil supplement containing about 2,000 mg of EPA and DHA, which is the same dose found in fish.

Vitamin D

Vitamin D has a unique role in the anti-inflammatory process. Although vitamin D's role in bone health is well known, adequate amounts of vitamin D can also influence the inflammatory process through gene expression and protein synthesis. If vitamin D levels in the blood are adequate, it will down regulate inflammatory cytokines and up regulate the compounds that reduce inflammation. The key is that the blood levels must be greater than 30 ng/ml – with some research suggesting blood levels need to be 50 ng/ml.[6]

While most athletes do not know their vitamin D blood levels, some athletes are naturally at greater risk of deficiency. Melanin, the natural pigment in skin, acts as a sunscreen blocking the synthesis of vitamin D in the skin. Therefore, dark-skinned individuals such as African Americans often have lower vitamin D blood levels. Vitamin D toxicity is rare and supplements of 2,000 IU is a conservative dose.

Branched-chain Amino Acids

Branched-chain amino acids (BCAAs), isoleucine, leucine and valine, are critical components of inflammation recovery. Exercise, injury and inflammation are catabolic processes that can cause lean body mass loss. Evidence suggests BCAAs can reduce the rate of protein breakdown – most specifically leucine, which is considered an anti-catabolic amino acid. Chronic inflammation can cause loss of lean body mass and consuming a high-quality source of protein at each meal and at bedtime is essential in preventing muscle protein breakdown, and ultimately a restoration of lost muscle mass.[7]

Putting It Into Practice

In summary, athletes should strive to increase fruits, vegetables, cold-water fish and vitamin D intake. Protein should be consumed at all three meals and at bedtime. In addition, diets high in sugar and saturated fat can contribute to the inflammatory process. Controlling inflammation mandates a focus on improved dietary quality, and athletic trainers can educate and reinforce these principles to help athletes return to competition.

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