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HOW ARM ACTION AIDS SPRINTING PERFORMANCE

In this modern era of sports, it is interesting that some controversy still exists among sprint coaches over the role of the arm swing during the act of sprinting. One side of the issue emphasizes the arm swing as a key factor contributing to horizontal propulsive force, while the other side suggests that arm movement is less significant and actually performs a different function than what has been voiced in the past. Before presenting the arguments on both sides, it may be helpful to review what is considered proper sprint-arm mechanics for team sport athletes:

Most coaches and specialists in biomechanics feel that coordinated arm and leg movement results in efficient sprinting. The arms work in opposition to the legs, with the right arm and left leg coming forward as the left arm and right leg go backward and vice versa. The shoulders stay square (perpendicular) to the direction of the run. The swing is strong but relaxed. The hands are also relaxed and positioned about shoulder-high, not exceeding the chin, slightly in front of the chest. On the upswing, the hand rises naturally to a point just in front of the chin and just inside the shoulder. During the upswing, the arm angle is about 90 degrees or less, coordinating with the quick recovery of the forward swing of the leg. During the downswing, a natural straightening of the elbow corresponds with the longer leverage of the driving leg on the opposite side of the body to allow horizontal drive. As the arm swings down, the elbow extends slightly. At the bottom of the swing, the hand is next to the thigh. However, toward the end of its backward movement, the arm bends and speeds up again to match the final fast stage of the leg drive. The elbows stay close to the body. Attempts to keep the elbows away from the body prevent relaxation of the shoulders and limit efficient running mechanics. Arm action is never forced or tense.

The shoulder is the axis of arm rotation and the elbow acts to shorten the lever when needed. Closing the elbow angle reduces the movement of arm inertia and increases angular velocity to create quicker turnover. Arm movement without the elbow joint results in a straight-arm, pendulum-like swing that moves too slow for leg coordination. Although this advice is occasionally given to sprinters, no athlete keeps the same angle throughout a sprinting cycle. As stated previously, when the arm is lowered, a straightening at the elbow occurs. The exact angles vary from sprinter-to-sprinter depending on the length of the stride and the phase of a sprinting cycle. The key is to maintain relaxed shoulders, arms and hands with the swing coming from the shoulder joint.

The above analysis of sprinting arm action is not fully supported by research. A study by Hinrichs (1987) indicates that the arms to *do not* contribute directly to forward (horizontal) movement. The horizontal force production of the arms is said to be limited due to the simultaneous forward-backward action of contralateral arms (opposite side). Although the forward swing of the arm produces some horizontal

propulsive force, the effect is cancelled by the opposite action of the other arm as it moves backward.

According to Michael Young, United States Military Academy (Maximal Velocity Sprint Mechanics), research indicates that the arm swing serves two roles. *First*, to counterbalance the rotary movement of the legs and control the rotation of the trunk caused by the unilateral action of the legs; and second, to enhance vertically directed ground contact forces (Hinrichs, et. al., 1987, Mann and Hermann, 1985). A study by Hinrichs found that arm action may contribute as much as 10 percent to vertically directed ground contact force. Young states that this occurs “because unlike the spatial phase difference of the arm swing in the forward-backward direction, both arms are synchronized in their upward and downward movement. As a result, there is no cancellation of their affect in the vertical direction and the synchronized upward movement of both arms is able to vertically direct ground contact force.

An additional area adding to the confusion is the concept: “the faster the arm movement, the faster the leg movement (stride rate or steps per second).” The verbal cue to “overly pump the arms” is incorrect. Elite sprinters and athletes in other sports use their arms in a natural, relaxed manner and avoid any suggestion of “muscling” through the movement at any stage of sprinting. In addition, athletes can move their arms at a faster rate than their legs. Researcher and Sprint Biomechanics expert, Ralph Mann (2011) clarifies the issue:

“Contrary to popular belief, superior arm action does not produce a superior sprint performance. In fact, regardless of the quality of the sprinter, there is no significant difference in the arm action. If a sprinter could improve the horizontal velocity simply by moving the arms faster, then even old, out of shape coaches could run faster than the elite sprinter since virtually everyone has the ability to move their arms fast enough to easily produce an elite stride rate of five steps per second. What the coaches and most other people cannot do, is produce the leg action required to produce an elite sprint performance. It is the legs that must not only move their own considerable bulk, but also contend with the large ground forces during each consecutive ground contact. In comparison, the arms must only move their own rather meager bulk, without any other external hindrance. It is true from the start of a sprint that as the arms increase their rate, the legs follow and leg speed also increases until the athlete reaches the point where no additional leg speed (stride rate) is possible. This maximum threshold of the legs is not the maximum for the arms.”

In summary, it can be said that the issue has not involved questions about the mechanics of arm movement or whether proper arm movement is needed during each phase of a short sprint. The discussion involves the exact role played by the arms and whether or not and how proper arm action increases horizontal propulsive force and sprinting performance.

References

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FROM CHUMP TO CHAMP: The Making of Sports Champions

This column covers all aspects of speed training. Send your question to NASE, P .O. Box 1784, Kill Devil Hills, NC 27948 or e-mail naseinc@earthlink.net,

Improving Horizontal Acceleration

Q - What are the best exercises for team sport athletes to improve horizontal acceleration?

A - In the not too distant past, coaches relied heavily on the front and back squat, a staple of speed-strength training, to improve all four phases of a short sprint: Start, Acceleration, Maximum Speed, and Deceleration. The majority of strength training has also involved exercises that mainly improve vertical force production. During a short sprint, an athlete is moving both upward and forward, which requires both vertical and horizontal force production. According to Newton's Third Law, this force must be equal and opposite to the ground contact force exerted in each direction. It is clear that specific exercises must be used that simulate both the horizontal and vertical directed forces as closely as possible during the four phases of a short sprint.

As discussed in the NASE publication, *Sports Speed Digest* (November, 2013 Vol. 9, Issue 49), athletes improve speed by applying more force to the ground, providing this force application occurs at the right time (using correct form) and in the right direction (horizontal,

vertical). During the start (first two steps), the force direction is slightly more vertical than horizontal to propel the body up into the proper sprinting position. During the acceleration phase, athletes make the transition from backside mechanics (touch down occurs behind the body's center of gravity (COG) to frontside mechanics (touch down occurs almost dead center to the COG). Ground contact force demands are high during all four phases of a short sprint and, during front side mechanics after the start and early acceleration, must overcome the braking effect occurring at the first half of touch down, stop downward velocity, overcome the force of gravity and wind, and propel the body back up into the air each step.

V-force demands peak after 50-60 meters then remain relatively unchanged in elite sprinters, whereas H-force demands increase in a linear fashion throughout the sprint. If strength training is to transfer to improved sprinting speed, exercises must be used that simulate the correct H- and V-direction of a short sprint in sports. A review of the literature suggests that horizontal forces are more important during the maximum speed phase of a sprint and appear to be the limiting factor preventing athletes from going faster.

The squat exercise is not the answer (*Sports Speed Digest*, Vol. 9, Issue 47; and *Sports Speed Digest*, March, 2013 Vol. 9, Issue 45) although it plays a role during the first two steps (the Start) when 100% of available force can be applied to the ground and considerable vertical force is needed. Squats are not neuromuscularly compatible with the act of sprinting, which requires maximum ground contact force in the shortest possible time. Squats also fail to meet most of the key criteria mentioned above and involves vertically directed force and muscle groups that are more important during the start and very early acceleration phase, and of less assistance during front-side mechanics (acceleration and maximum speed phase). The squat is also a knee-dominant exercise, while top-end speed is determined by cross-sectional area and strength in the psoas, hamstrings and glutes (hip dominant musculature).

Choosing the single best speed-strength exercise from those identified in Table 1 below is difficult in the absence of studies that specifically analyze the effect of each on horizontal ground contact force during the four phases of a short sprint.

The Lunge with Sled Resistance, a sport-loading exercise, and the Lunge with Weight Resistance, a free weight exercise, are two key effective exercises that should be included in any program to improve horizontal ground contact force. The Austin Leg Drive Machine allows athletes to exert force at adjustable directions and is capable of improving horizontal ground contact force at the correct angle during all phases of a short sprint. Additional research is also needed on this device to determine the most effective angles.

Summary of Speed-strength Exercises to Increase Horizontal and Vertical Force

STRENGTH TRAINING PROGRAM	HORIZONTAL DIRECTION	VERTICAL DIRECTION
Free Weights and Weight Machines	Lunge with weight resistance Walking lunge Reverse lunge Barbell hip thrust Single reverse leg press Horizontal back extensions	Olympic Lifts: clean, jerk, snatch Dead lift Front and back squat Barbell step up Kick back Squats Walking dead lift
Plyometrics	Speed hops Standing broad jump Standing triple jump	Box jumps Running bound Squat jump, dumbbell squat jump Single leg stride hop
Sport Loading: Resistance Training	Lunge with Sled Resistance Austin leg drive machine Harness and release Kettleball swings Rubber band sprint movements Weighted sled pull Wall sprint (isometric)	Staircase sprinting Uphill sprinting Weighted vests Rubber band sprint movements



WHAT RESEARCH TELLS THE COACH ABOUT SPRINTING

Muscle Power Patterns in the Mid-acceleration Phase of Sprinting

Mark D. Johnson and John G. Buckley, Muscle Power Patterns in the Mid-acceleration Phase of Sprinting, *Journal of Sports Sciences*, Vol. 19, Issue 4, pgs. 263-272. 2001

Abstract

To assess the role of the lower limb joints in generating velocity in the mid-acceleration phase of sprinting, muscle power patterns of the hip, knee and ankle were determined. Six male

sprinters with a mean 100 m time of 10.75 s performed repeated maximal sprints along a 35 m indoor track. A complete stride across a force platform, positioned at approximately 14 m into the sprint, was video-recorded for analysis. Smoothed coordinate data were obtained from manual digitization of (50 Hz) video images and were then interpolated to match the sampling rate of the recorded ground reaction force (1000 Hz). The moment at each joint was then calculated using inverse dynamics and multiplied by the angular velocity to determine the muscle power. The results showed a proximal-to-distal timing in the generation of peak extensor power during stance at the hip, the knee and then the ankle, with the plantar flexors producing the greatest peak power. Apart from a moderate power generation peak towards toe-off, knee power was negligible despite a large extensor moment throughout stance. The role of the knee thus appears to be one of maintaining the centre of mass height and enabling the power generated at the hip to be transferred to the ankle.

Stretching and Sprint Performance

Wallmann HW, Scott Christensen, SD, Perry C and Hoover DL. The Acute Effects of Various Types of Stretching (Static, Dynamic, Ballistic, and No-stretch) of the Iliopsoas on 40-yard Sprint Times in recreational runners. *Int J Sports Phys Ther.* 2012 Oct;7(5):540-7.

Abstract

BACKGROUND AND PURPOSE: The potential adverse effects of static stretching on athletic performance are well documented, but still appears to be controversial, especially as they relate to sprinting. The prevalence of this practice is demonstrated by the number of competitive and recreational athletes who regularly engage in stretching immediately prior to sprinting with the mindset of optimizing their performance. The purpose of this study was to examine the effects of acute static, dynamic, and ballistic stretching, and no stretching of the iliopsoas muscle on 40-yard sprint times in 18-37 year-old non-competitive, recreational runners.

METHODS: Twenty-five healthy recreational runners (16 male and 9 female) between the ages of 24 and 35 (Mean = 26.76 yrs., SD = 2.42 yrs.) completed this study. A repeated measures design was used, which consisted of running a 40-yard sprint trial immediately following each of 4 different stretching conditions aimed at the iliopsoas muscle and lasting 1 minute each. The 4 conditions were completed in a randomized order within a 2-week time period, allowing 48-72 hours between each condition. Prior to each 40-yard sprint trial, a 5-minute walking warm-up was performed at 3.5 mph on a treadmill. The subject then ran a baseline 40-yard sprint. After a 10-minute self-paced walk, each subject performed one of the 4 stretching conditions (ballistic, dynamic, static, and no stretch) and then immediately ran a timed 40-yard sprint.

RESULTS: There was a significant interaction between stretching conditions and their effects on sprint times, $F(3,72) = 9.422$, $p < .0005$. To break down this interaction, simple

main effects were performed with 2 repeated measures ANOVAs and 4 paired t-tests using a Bonferroni corrected alpha ($\alpha = .0083$). There were no significant differences between the 4 pre-condition times, $p = 0.103$ (Greenhouse-Geisser) or the post-condition times, $p = 0.029$. In the no stretch condition, subjects improved significantly from pre- to post- sprint times ($p < 0.0005$). There were no statistically significant differences in pre- and post-stretch condition sprint times among the static ($p = 0.804$), ballistic ($p = 0.217$), and dynamic ($p = 0.022$) stretching conditions.

CONCLUSIONS: Sprint performance may show greatest improvement without stretching and through the use of a walking generalized warmup on a treadmill. These findings have clinically meaningful implications for runners who include iliopsoas muscle stretching as a component of the warm-up.

Optimal Control of Human Running

Abstract

Ross Herbert Miller, Optimal Control of Human Running, *Dissertation*, University of Massachusetts, May, 2011

Humans generally use two modes of locomotion as adults. At slow speeds we walk, and at fast speeds we run. To perform either gait, we use our muscles. The central questions in this dissertation were: (1) Why do humans run the way they do, and (2) How do the mechanical properties of muscle influence running performance? Optimal control simulations of running were generated using a bipedal forward dynamics model of the human musculoskeletal system. Simulations of running and sprinting were posed as two-point boundary value problems where the muscle excitation signals were optimized to maximize an optimality criterion. In the first study, minimizing the dimensionless muscle activations rather than the cost of transport generated the simulation that most closely agreed without experimental kinetic, kinematic, and electromyographic data from human runners. In the second study, sprinting simulations were generated by maximizing the model's horizontal speed. Adjustments in the parameters of the muscle force-velocity relationship, in particular the shape parameter, increased the maximum speed, and provided support for previous theories on limitations to maximum human sprinting speed. In the third study, virtual aging of the model's muscles induced changes in the running biomechanics characteristic of older adults, and increased the stresses and strains of muscles where older runners are more frequently injured than young runners. Strengthening these muscles reduced their loading while still maintaining an economical gait with a relatively low joint contact force at the knee. The studies provide a framework for testing hypotheses on human movement without a strong dependency on experimental data, and provided new evidence on the validity of the simulation approach for studying human running, and on optimality criteria in human running, limitations to maximum

sprinting speed, and relationships between aging, muscular properties, and running injuries.

Sprinting Patterns in Youth

Abstract

Ana Delalija, Sprinting Patterns in Youth Initiating from Two Different Types of Starts, *Master of Science Thesis*, Appalachian State University, Department of Health, Leisure and Exercise Science, May, 2011.

The sprint start is a specialized movement skill. Proficiently performed start action may be evident in specific movements, such as the “drive,” as well as in the acceleration time. Different constraints can influence the performance of the sprint start, one of which is instructions. Therefore, the purpose of this study was to determine if the sprint start movements and acceleration time of a 30m sprint is altered using different instructions in youth. Eight boys and one girl ($11.7 \pm .35$ years) participated in this study. Participants were recruited from the local after school program. Height, weight, and sitting height were measured and sitting height to height ratio was calculated. Predicted adult height and current height to predicted height ratio were calculated. A survey on sports’ experiences was also administered. The sprint testing procedures included a randomized design utilizing three groups: a control (C), verbal (VE), and video (V). Each group was assigned to one intervention per day or testing session. Participants performed four 30m (2 pre, 2 post) sprints for all testing protocols. The better performance was selected for analysis. The intervention consisted of either participants watching video instructions on a falling start and subsequent acceleration (V), listening to scripted verbal instructions and practicing a falling start and subsequent acceleration (VE), or having no instructions at all regarding a sprint start but still practicing (C).

Following the intervention, a 30m sprint post-test was administered. The sprint start was video recorded and sprint times at each 5m of the 30m sprint were obtained for all measurements. From the interval sprinting times, velocity (m/s) and acceleration (m/s^2) were calculated. The distance of the acceleration for each condition was obtained from acceleration-time curves. Qualitative observations of three main features of the sprint start were performed. A repeated measures ANOVA ($p < 0.05$) revealed no significant differences in acceleration time. However, general tendencies of the body movements related to improving the start and thus acceleration phase, changed, although not significantly. Although the altered movements did not influence the acceleration time, the effectiveness of instructions on start movements cannot be neglected. Future studies should use larger sample size and quantitative approach in investigation of this matter.



FOOTBALL SPEED FUNDAMENTAL DRILLS

Series by Mike Srock, Speed and Strength Coach, Byrnes H. S., Duncan, SC

Source: Srock, Mike and Johnson, Zach, (2012) *101 Fundamentals for Developing Football Speed*, Coaches Choice, Box 1828 www.coacheschoice.com

Drill #3: Walking Lunge

Objective: To warm up the body's core, reinforce running techniques, and improve rhythm and balance

Equipment: None, however, a lined field is recommended.

Description: The athlete assumes a tall upright position, then quickly shoots his feet into a shoulder-width distance on the coach's command. At the whistle, with the arms in a running position, the athlete takes a big step back, keeping the chest, back, and shin straight, and gently lowers the back leg's foot/knee to the ground. The athlete then returns to a standing position before, immediately, repeating the first step, but with the opposite leg.

Coaching Points:

- The athlete completes this drill at a distance of 10 yards.
- The athlete's arms must move quickly and tightly on every step.
- The athlete must implement the "opposite arm" technique to maintain proper balance.



Drill #4: Reverse Lunge

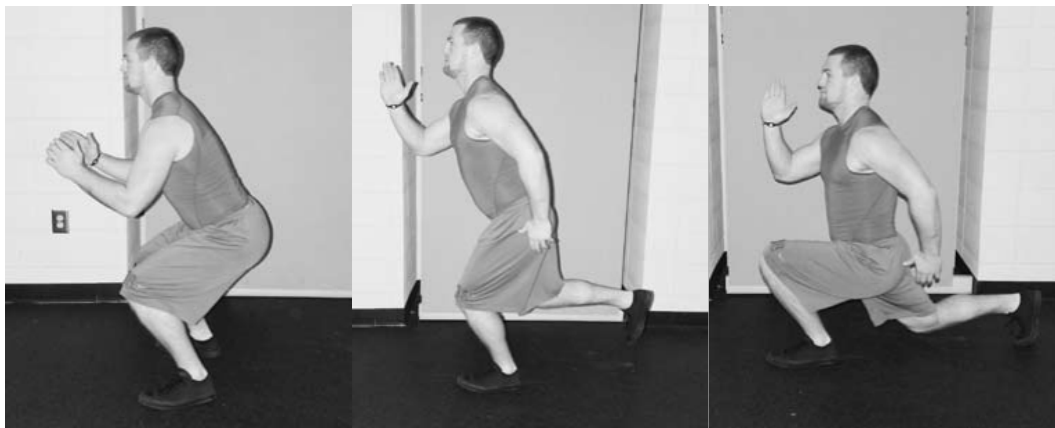
Objective: To warm up the body's core, reinforce running techniques, and improve rhythm, coordination, and balance

Equipment: None, however, a lined field is recommended.

Description: On the coach's command, from a tall upright position, the athlete quickly shoots the feet into a hip-width position. On the whistle, a long step backward is taken until the right knee touches the ground. Pushing hard against the ground, the athlete lifts the left knee waist high and extends the left leg backward until the left knee touches the ground. The athlete then alternates steps for the desired number of repetitions.

Coaching Points:

- Stays tall, with the knees behind the toes, while keeping the chest and shoulders behind the knees.
- Perform this drill for 10 yards.



Drill #99: Alternate Reverse Lunge—Intermediate

Objective: To strengthen the muscle groups involved with ground force contact and improve core strength and stability

Equipment: A barbell with weights

Description: With the feet hip-width apart, arms extended slightly wider than shoulder width, and a barbell across the shoulders, the athlete steps backward, taking a long step with his right leg until the right knee lightly touches the ground, then returning to the starting position and repeating the sequence by alternating steps.

Coaching Points:

- A good jump stance must be assumed with the feet hip-width apart.
- Once the exercise is mastered, quicker steps are encouraged while maintaining proper technique.

- Variation - Make the exercise more challenging by instructing the the athlete to extend the arms out completely overhead with the elbows locked during the movements.



Drill #100: Overhead Double Lunge Reverse—Advanced

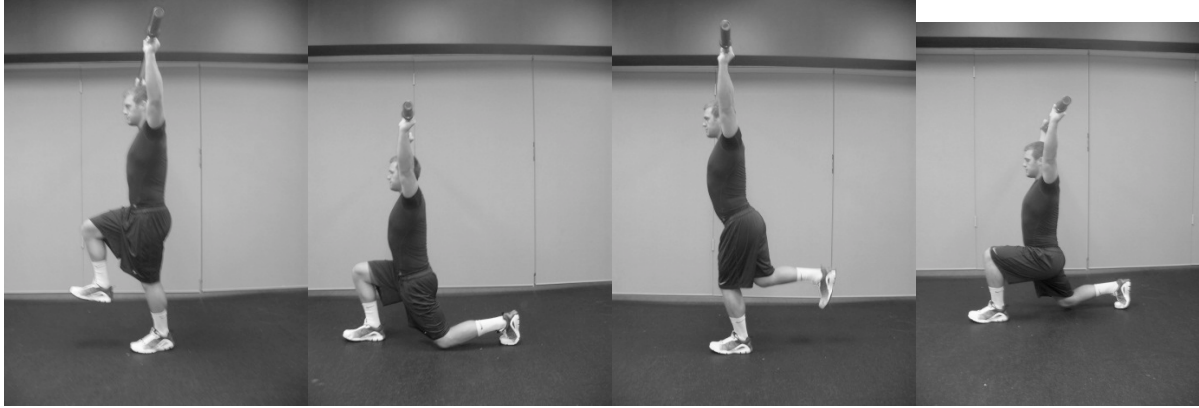
Objective: To strengthen the muscle groups involved with ground force contact and improve core strength and stability.

Equipment: A barbell with weights

Description: The athlete begins with the feet hip-width apart in a good athletic jump stance with the weight extended above the head and elbows locked. The athlete now steps out with the right leg and touches the left knee lightly to the ground. The exercise continues by applying force into the ground with the right foot and driving the right knee to a waist high position. The right leg is now extended backward with a big step until the right knee lightly touches the ground. The athlete now returns to the starting position and then alternates the legs for the desired number of repetitions.

Coaching Points:

- Be sure to starts in a good jump stance with the feet hip-width apart.
- Once the exercise is mastered, coach the athlete to take quicker steps while maintaining proper technique.



Drill #37: Wall Sprint—Advanced

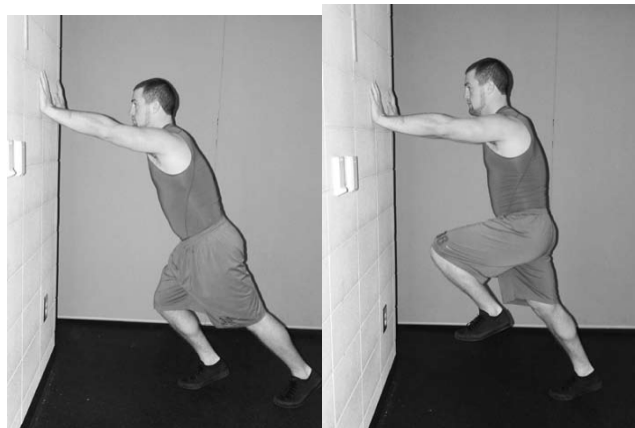
Objective: To teach the correct foot placement for maximum ground contact force.

Equipment: A wall

Description: With straight arms at shoulder height, the athlete leans into a wall at a 45-degree angle, arches his back and spreads his chest with the head up. The drill begins with the right knee at waist level and the toes up. On cue, the athlete switches leg positions and repeats for timed repetitions as quickly as possible with proper technique. It is recommended that a repetition not exceed five seconds with a 20-second rest period.

Coaching Points:

- The athlete's toes must be kept up during the drill and the ball of the foot must strike the ground under the hip on each step.
- The athlete attempts to “push the wall” forward.
- Maintain a high impact “run” without “jogging.”





COACH AND ATHLETE HEALTH

Osteoarthritis: Keeping the Joints Health

Osteoarthritis occurs from a breakdown of cartilage in the knees, hips, and other joints and should not be confused with rheumatoid arthritis, an autoimmune disease causing the body to attack the lining of joints. Cartilages act as a cushion between bones. When cartilage breaks down due to the wear and tear of age, activity, and injury, bone rubs against bone resulting in pain and stiffness.

The knee is particularly vulnerable to osteoarthritis after years of overuse, injury, and aging. Although the hyaline cartilage lining the patellar surface is the thickest in the human body, it must sustain forces in excess of 500 pounds per square inch during activities such as sprinting and lifting heavy weight. These forces are much higher in overweight and obese individuals. Years of micro-trauma wears the cartilage down and cause degeneration of the underside of the patella. In the early *Stage I*, softening occurs, creating a condition termed chondromalacia. *Stage II* results in loss of water and resilience of the cartilage and blistering of the normally smooth surface. In *Stage III*, blisters develop into fissures and in *Stage IV* the cartilage on the undersurface of the patella are worn away or dead causing *patelofemoral arthritis*.

Osteoarthritis is a common pain management problem for millions of people, including most coaches who were former athletes exposed to years of vigorous joint stress and soft tissue injuries. The condition is so widespread and potentially debilitating that it is important to take a closer look at its causes, prevention, and management for coaches and current and former athletes.

Contributing Factors

Body Weight. The leading risk factor for osteoarthritis is obesity. Adding extra pounds and being overweight also increase the risk. In addition to injury to the joints, fat cells release inflammatory chemicals that have been shown to break down cartilage tissue.

According to Dr. Felson, professor, Boston School of Medicine, the heavier you are, the more likely you are to suffer from osteoarthritis. Studies indicate that overweight individuals are 2-3 times more likely to develop knee osteoarthritis than those of normal weight (reported in *Nutrition Action Health Letter*, January, 2013). Coaches are aware that each added pound of body weight requires an athlete to exert over two additional pounds of force against the ground each step to maintain their present speed during the four phases of a short sprint. Surprisingly, studies show that each additional pound of body weight increases the *stress across the knee joint* fivefold.

Being overweight also increases the risk of joint injury which, as athletes are well aware, leads to osteoarthritic pain. An analysis of individuals undergoing repair of a torn meniscus

revealed that these subjects were three times more likely to be overweight; and any tear increased the chance of osteoarthritis later in life.

Recommendation. Shed the extra pounds at any age and develop a lifelong pattern of proper nutrition and regular exercise. Even the loss of 5-10 pounds can improve knee function and reduce pain.

Strength and Flexibility. Strong muscles help absorb weight, provide stability and assist bones in tracking properly. Weak supporting muscles of the knee, thigh, calf, and hip increase the incidence of injury and cartilage loss. Overuse due to repetitive motion in some sports such as tennis, golf, and team sport speciality areas can cause continual irritation and also increase the risk. An imbalance in the strength of the quadriceps muscles generally involving atrophy of the *vastus medialis oblique* is a common cause in adolescents. When this occurs, the stronger portion of the quadriceps muscle pull outward on the patella and alter the balanced tracking across the femoral head. This causes excessive wear on the inner facet and leads to chondromalacia (David C. Saidoff and Stuart Apfel, *The Healthy Body Handbook*, Demos Medical Publishing, ©2004). Tight hamstrings force the quadriceps to work harder when straightening the knee, which can also contribute to chondromalacia.

Recommendation. The entire quadriceps muscle group should be strengthened and individuals need to maintain an adequate level of core strength and flexibility as they age. Aerobic exercise in the form of walking (> 4 mph), jogging, cycling (road and stationary), and swimming improve blood flow to cartilage and supply the nutrients needed to remain healthy. Studies also show that aerobic activity reduces one's sensitivity to the pain or osteoarthritis and actually relieves knee pain.

Gender. After middle age, women are more likely to develop osteoarthritis. One explanation advanced by the *Arthritis Foundation* is that the wider hips of women place more long term stress on the knees. The widespread use of weight training and other strength training programs among female athletes in all sports provides considerable protection.

Heredity and Age. Studies indicate that arthritis of the hip and hand account for as much as 50 percent of the risk. The condition becomes more prevalent as one gets older after many years of use, injury, disease, and inactivity. For former athletes in sports where joint injuries are common such as football, basketball, baseball, soccer, rugby, lacrosse, it will be difficult to escape some form of osteoarthritis in the later years.

Supplements

Since glucosamine and chondroitin are found in healthy cartilage, most supplements contain a mixture of both.

Research findings on the benefits of *glucosamine* varies from "glucosamine doesn't work" to "there are reasons to think it is helpful." Results of the *National Institute of Health's GAIT trial* concluded that glucosamine does NOT work. Randomized clinical trials have compared both

supplements, alone and in combination with one another, against placebo pills in subjects with osteoarthritis of the hip and knee. An analysis of 10 studies of 4,000 patients found little evidence of reduced pain from either supplement. Some other studies did find a temporary benefit. The only good news is that no evidence of side effects were revealed.

There is an abundance of unscientific, testimonial support for glucosamine. If you are not convinced from the scientific data, it is considered reasonable to try glucosamine-chondroitin for 2-3 months to see if it reduces your pain. Most physicians will not discourage you from trying the product since it is not dangerous if you think it will be of benefit. Some products use shellfish as a source of glucosamine and you should be aware if you are allergic to this food source. Keep in mind also that there are two forms of glucosamine: glucosamine hydrochloride (used in the GAIT Trial) and glucosamine sulfate. According to the Cochrane Collaboration (scientists who review evidence for medical therapies), glucosamine sulfur **seems** to relieve pain and improve function. The concern of this recommendation is that all of the studies reviewed that found a benefit were funded and run by the Italian manufacturer of a glucosamine sulfate formulation. In three studies conducted by independent investigators, glucosamine sulfate was no more effective than a placebo.

The effects of *Chondroitin* on pain relief and joint function was found to be no better than a placebo.

NSAID (non-steroid anti-inflammatory drug) medication remains as the most commonly used approach for those suffering from osteoarthritis to reduce pain, stiffness, and improve function. Numerous arthritis supplements sold over-the-counter make wild claims but do not hold up to the scrutiny of researchers. Osteo Bi-Flex, for example, promising relief in seven days, failed to demonstrate the statement in two company-funded studies. Other similar products making such claims appear to produce the most relief by reducing the weight of your wallet.

Source: Some of the material appearing above are a summary from the article, 'Osteoarthritis: Keeping the Joints Rockin,' October 2013 issue of the *Nutrition Action Newsletter*, October, 2013, pgs. 9-11. This is an excellent source for coaches and athletes who want to stay current on the latest research on nutrition.



NASE NEWS

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If your membership expired, you must join as a NEW member for the system to issue a password. Register online at naseinc.com or mail the application to NASE, Box 1784, Kill Devil Hills, NC 27948. You can Renew you online anytime before the expiration date.

NASE Team “Go Fund Me” for Shelly Stone

The NASE has formed a team to provide needed help for the daughter of Stephen Stone, Lock Haven University athlete, and close friend and colleague of Dr. Dintiman, who suffered a spinal cord injury and is fighting to stand and walk by the end of 2014. Shelly is a lifetime athlete, horse jockey, and trainer who injured her spinal cord after being thrown over the rail of a fence. Her prognosis to improve the function of the bruised spinal cord, stand, and walk again, is good if funds can be raised to provide the needed treatment and medical support.

The [Go Fund Me](#) secure donation system, featured in *Forbes Magazine*, is a safe way to contribute, and your support in 2014, of as little as \$10.00 per month, can make a huge difference in Shelly’s outcome. NASE members who donate will receive monthly updates on Shelly’s progress and be a part of an exciting 2014 team endeavor. We hope you will consider this as one of your “acts of kindness” in 2014, to greatly improve the life of another individual.

For more information, a video of Shelly’s efforts to stand and walk again, and to donate in anyway, go to:

<http://www.gofundme.com/ShellyStoneJourneyToWalk>

or, Click on the GoFund me icon on the Home page of the NASE web site.



“A Leg up for Shelly”



NATIONAL ASSOCIATION OF SPEED AND EXPLOSION

HEADQUARTERS: P.O. Box 1784, Kill Devil Hills, NC 27948
Tel. 252.441.1185 Web Site: naseinc.com e-mail: naseinc@earthlink.net

2014 MEMBERSHIP APPLICATION

NASE Member Benefits

- AN ASSOCIATION DEVOTED ENTIRELY TO IMPROVING PLAYING SPEED - The NASE is the only national association with this main focus.
- CERTIFICATION AND PROFESSIONAL ADVANCEMENT - Become a recognized expert as a speed coach by becoming certified in Speed and Explosion and completing the Prestigious NASE Online Course (Level I or II), or the Self-study Program.
- ACCESS TO AN ACTIVE WEB SITE and NASE ARCHIVES - Stay current through the NASE Web Site containing the latest articles, videos, and other information on speed improvement for team and individual sports.
- SPORTS SPEED DIGEST - Receive the NASE 12-16 page bimonthly *Sports Speed Digest* in January, March, May, July, September, and November with articles on the improvement of playing speed for sports competition and access 50+ issues in the NASE Archives containing several hundred key articles on speed improvement.
- ON-LINE FORUM - Exchange ideas with NASE Coach Andrew Flatt and other coaches throughout the world.
- DISCOUNTS - Reduced fees for clinics, symposiums, and conferences.

ANNUAL MEMBERSHIP FEES (All Members) \$29.95

***Note:** If your membership expired, you must register online or by mail as a NEW member for the system to grant you a Password and Access. You can also Renew your membership anytime prior to the expiration date.

Name _____ Title _____

Address _____ State _____ Zip _____

Tel _____ e-mail _____

Return this form with a check or money order to **NASE, Box 1784, Kill Devil Hills, NC 27948, OR** join or renew online at **naseinc.com**