National Association of Speed and Explosion

SPORTS SPEED DIGEST QUARTERLY

The authoritative source on speed improvement for sports

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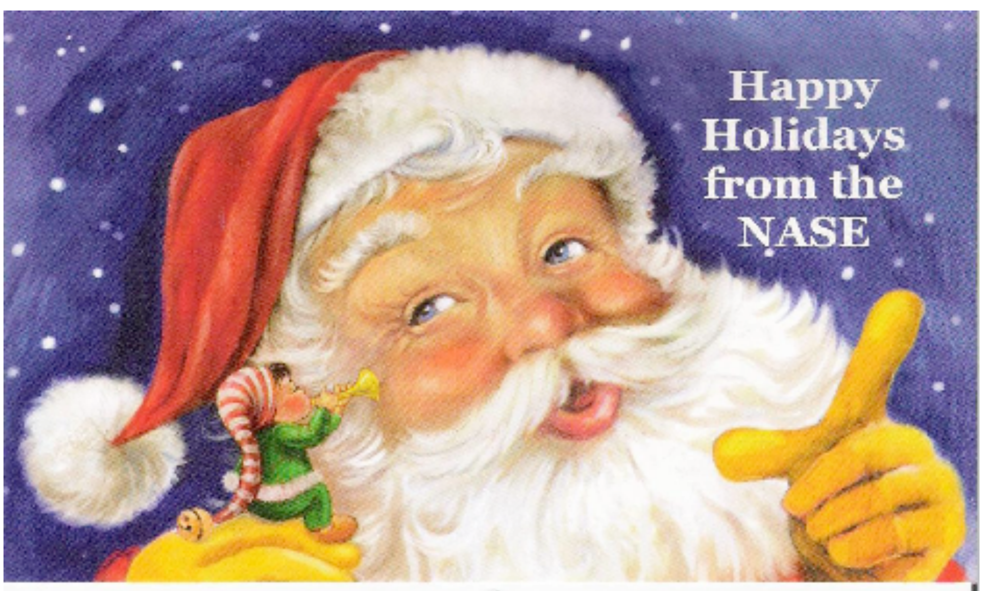

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THE MAXIMUM SPEED PHASE OF A LONG SPRINT IN TEAM SPORTS

Newton's First Law of Motion states that *an object in motion will remain in motion and an object at rest will remain at rest unless acted upon by an external force.* Objects continue in their present state (stationary or moving) until force changes that state. A sprinter will continue to move with constant velocity until an external force is made to change its speed or direction. After approximately 60-meters for elite sprinters, less for athletes with a lower top end speed, the body has reached "zero" acceleration or maximum speed. This is readily identifiable also by the more upright posture of a sprinter, showing little or no forward lean. This "tall," stance with the head upright, pelvis in a neutral position, and shoulders completely relaxed is observed in every elite sprinter. At that point, the main factor preventing increased velocity is the inability to apply additional vertically-directed force to the ground to counteract the braking effect and downward force at foot touch down, overcome body weight and the force of gravity, and rapidly propel the body back up into the air. Proper sprint mechanics optimizes the amount of vertical GRF, the speed with which it is applied, and sprint performance.

Flight (air time and distance covered)

"Flight" refers to the time spent in the air and the distance covered in this non-support phase of each stride when both feet are off the ground. It is determined by the angle of impulse, the velocity at take-off produced from the pushing action against the ground, relative height of the center of gravity (COG) at takeoff, air resistance, and acceleration due to gravity (natural body lean). Landing distance is the distance the COG is away from the landing foot. This distance must be relatively short to reduce braking forces which decelerate the body. The correct landing spot is slightly in front of the COG before the body moves directly under the COG for push off.

Landing behind the COG may cause stumbling, and placing the foot too far in front of the COG forces a reaching step, increases ground contact time, utilizes too much force, and results in loss of momentum as the body regains proper position to push off for the next stride.

The foot strikes the ground directly under the center of gravity.

The High kick-up of the Back Leg (butt kick).

A high kick up of the rear leg should occur naturally during the recovery and support phase. Immediately after ground contact and toe-off, the heel of the foot that pushed off the ground is recovered up toward the buttocks. This occurs from the hip flexion after the athlete enters the flight phase. The hamstring muscle is not involved. In general, the harder the push-off the ground, the greater the fold up and closer to the buttocks the heel reaches. This is a natural reaction to the drive phase of sprinting that allows the leg to come through as a short lever and, in the time available, permits a greater range of movement. As athletes learn to execute a powerful drive phase, the height of the back leg kick up will increase and actually come closer to the buttocks.

Although butt kicking drills are designed to mimic form during the recovery and support phase, coaches should avoid overuse of the “kick the butt” cue. Observation of an elite sprinter or fast running back as they pass at full speed, from a side view, reveals a natural high kick up of the rear leg.

Relaxation

Coaches and athletes are well aware that the presence of tension-free muscular movement produces more rapid fatigue, poor performance, and increases the incidence of injuries. Executing short sprints in team sports also requires very efficient muscular coordination and relaxed movement patterns. Less pliant, tense muscles restrict range of motion and keep athletes from reaching their maximum mph speed. In addition, muscle involvement may occur that does not efficiently contribute to forward movement. Although the degree of “slowing” that occurs in all athletes at the end of a long sprint, or after repeated short sprints, is mainly determined by anaerobic fitness (Repeated Sprint Ability and Long Speed Endurance) and exhausted energy sources, it is also affected by muscular tension and an inhibiting processes that occurs in the central nervous system. According to Kehakultuur (1988), these inhibiting factors are not only caused by the reduced strength of nerve impulses but also by the frequency (sprinting) and duration (speed endurance) of the impulses. Successful sprinting that allows athletes to excel at their maximum potential speed will not occur without a relaxed running style free from tension.

To produce a relaxed style of sprinting, athletes must first develop the correct movement patterns. The object is to sprint fast, but effortlessly (relaxed) with a loose jaw, loose hands, and relaxed arm, shoulder and neck muscles. Renowned sprint coach, Charlie Francis (2012) points out that elevated shoulders are the most obvious indicator of inappropriate tension that directly affects performance.

Relaxation techniques should be a regular part of the workout schedule until tension-free sprinting is automatic in all phases of a short sprint. The key is to avoid becoming too aware of the actual movement details of sprinting. As sprinting mechanics become automatic, emphasis is placed on relaxed movement patterns. Athletes are taught to relax their hands and eliminate tension from the shoulders to the finger tips. Those who tend to make a tight fist as they accelerate and try to sprint faster, should make contact with the thumb and index finger on both hands as the remaining fingers stay relaxed (Dintiman, 2009).

Mike Smith (2005), one of Britain's most successful sprint coaches, offers some key advice to improve relaxation during the maximum speed phase. He points out that tension most often occurs when athletes “try too hard” and tighten the muscles of the hands, arms, shoulders, neck and jaw. The object is to avoid overdoing things and concentrate on remaining relaxed.

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WHAT RESEARCH TELLS THE COACH ABOUT SPRINTING

Increasing Speed Beyond Zero Acceleration

Steffi L. Colyer, Ryu Nagahara, and Yohei Takai. 2018. How sprinters accelerate beyond the velocity plateau of soccer players: Waveform analysis of ground reaction forces. *Scandinavian Journal of Medicine & Science in Sports* 19 September

Abstract

Forces applied to the ground during sprinting are vital to performance. This study aimed to understand how specific aspects of ground reaction force waveforms allow some individuals to continue to accelerate beyond the velocity plateau of others. Twenty-eight male sprint specialists and 24 male soccer players performed maximal-effort 60-m sprints. A 54-force-plate system captured ground reaction forces, which were used to calculate horizontal velocity profiles. Touchdown velocities of steps were matched (8.00, 8.25, and 8.50 m/s), and the subsequent ground contact forces were analyzed. Mean forces were compared across groups and statistical parametric mapping (t-tests) assessed for differences between entire force waveforms. When individuals contacted the ground with matched horizontal velocity, ground contact durations were similar. Despite this, sprinters produced higher average horizontal power (15.7-17.9 W/kg) than the soccer players (7.9-11.9 W/kg). Force waveforms did not differ in the initial braking phase (0%-~20% of stance). However, sprinters attenuated eccentric force more in the late braking phase and produced a higher anterior-posterior component of force across the majority of the propulsive phase, for example, from 31%-82% and 92%-100% of stance at 8.5 m/s. At this velocity, resultant forces were also higher (33%-83% and 86%-100% of stance) and the force vector was more horizontally orientated (30%-60% and 95%-98% of stance) in the sprinters. These findings illustrate the mechanisms which allowed the sprinters to continue accelerating beyond the soccer players' velocity plateau. Moreover, these force production demands provide new insight regarding athletes' strength and technique training requirements to improve acceleration at high velocity.

Coaching Implication

The study sheds some light on how correct training can allow athletes to continue accelerating and attain a higher maximum speed.

Role of the Hamstring Muscles in the Acceleration Phase of a Short Sprint

Lassee Ishol, Per Aagaard, Mathias F. Nielsen, Kasper B. Thorton. 2018. The Influence of Hamstring Muscle Peak Torque and Rate Of Torque Development for Sprinting Performance in Football Players: A Cross-Sectional Study. *Human Kinetics*, Pages:1-27 doi: 10.1123/ijspp.2018-0464

Abstract

This cross-sectional study aimed to investigate the association between hamstring muscle peak torque and rapid force capacity (rate of torque development: RTD) versus sprint performance in elite youth football players.

Methods:

Thirty elite academy youth football players (16.75 ± 1.1 years, 176.9 ± 6.7 cm, 67.1 ± 6.9 kg) were included. Isometric peak torque (Nm/kg) and early (0-100 ms) and late (0-200 ms) phase RTD (RTD_{100}, RTD_{200}) (Nm/s/kg) of the hamstring muscles were obtained as independent predictor variables. Sprint performance was assessed during a 30-m sprint trial. Mechanical sprint variables (maximal horizontal force production (F_{H0}) (N/kg); maximal theoretical velocity (V_0) (m/s); maximal horizontal power output (Pmax) (W/kg)) and sprint split times (0-5 m; 0-15 m; 0-30 m; 15-30 m) (s) were derived as dependent variables. Subsequently, linear regression analysis was conducted for each pair of dependent and independent variables.

Results:

Positive associations were observed between hamstring RTD_{100} and F_{H0} (r^2=0.241, p=0.006) and Pmax (r^2=0.227, p=0.008). Furthermore, negative associations were observed between hamstring RTD_{100} and 0-5 m (r^2=0.206, p=0.012), 0-15 m (r^2=0.217, p=0.009) and 0-30 m sprint time (r^2=0.169, p=0.024). No other associations were observed.

Conclusion:

The present data indicate that early-phase (0-100 ms) rapid force capacity of the hamstring muscles plays an important role for the acceleration capacity in elite youth football players. In contrast, no associations were observed between hamstring muscle function and maximal sprint velocity. This indicates that strength training focusing on improving early-phase hamstring rate of force development may contribute to enhance sprint acceleration performance in this athlete population.

Coaching Application

Speed training should involve both specific movement patterns and exercises that activate the hamstrings muscle groups in a similar fashion as the acceleration phase of a short sprint, as well as general strengthening of the hamstrings muscle group using various resistance training techniques such as weight training, plyometrics and sprint loading.

Ground Reaction Force Requirements During a Drop Vertical Jump

Jeffrey D. Simpson, Brandon L. Miller, Erik K. O"Neal, Harish Chandler and Adam C. Knight. 2018. Ground reaction forces during a drop vertical jump: Impact of external load training. *Human Movement Science* Volume 59, June 2018, Pages 12-19.

Abstract

External load training (ELT) is a supplemental training method used to potentially improve high intensity task performance. However, biomechanical parameters such as ground reaction forces (GRF), ground contact time, and time to peak GRF during a drop vertical jump (DVJ) following an ELT intervention have yet to be examined. Therefore, this study investigated the impact of ELT on certain biomechanical parameters of a DVJ task. Well-trained females stratified into two groups (ELT = 9, Control = 10) completed a DVJ from a 45.72 cm box onto a force platform at baseline, post-ELT, and post-detraining (DET). ELT consisted of wearing weight vests (WV) with 8% body mass for 32 h/week during daily living and 3 training sessions/week for 3 weeks. After ELT, a 3 week DET phase was completed. The control group replicated procedures without ELT intervention. The vertical, medial/lateral, and anterior/posterior components of the GRF were assessed during the initial contact, minimum force following initial contact, push-off, and second landing periods. Dependent variables were analyzed using a 2 (group) × 3 (time) mixed model ANOVA (p < .05). Significantly greater peak vertical GRF during the initial contact period was identified for the ELT group. Significant increases in the minimum vertical GRF following the initial contact period from baseline to post-ELT were observed for the ELT group, while significant increases in peak vertical GRF during the second landing period at post-ELT and post-DET in comparison to baseline was observed for both groups. The combination of greater vertical GRF during the initial contact period and the period following initial contact suggests that ELT may increase GRFs during a DVJ in comparison to routine training without a weighted vest.

Coaching Application

The inability to provide additional vertically-directed force to the ground is the key limiting factor in preventing an athlete from attaining a higher mph or maximum speed. Studies that identify specific speed-strength and other exercises that significantly increase vertically-directed ground reaction force, such as the drop vertical jump utilized in this study, provide valuable information for coaches in training for this phase of a short sprint in their sport.

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,

A COMPARISON OF THE SPEED OF HUMANS AND ANIMALS

Q - How do humans compare to the speed of wild animals?

A - Not very well as you can see in Table 1 below. Although the *endurance* of humans is superior to some animals, humans are no match for animals in a short sprinting contest. The best advice for escaping a dangerous, faster predator is to "freeze" and play dead, hide with protection unavailable to the animal, or make certain your can outrun at least one of the companions in your group (according to stand-up comedians).

The fastest human, Usain Bolt, holds the 100-m world record at 9.58 seconds. His absolute fastest recorded speeds during that sprint were 12.27 meters per second, or 27.44 miles per hour. Bolt could outrun an elephant, hippo, mule, and polar bear, but would be not match for other animals.

According to Wikipedia, the fastest land animal is the cheetah, with a recorded speed of 109.4–120.7 km/h (68.0–75.0 mph). The peregrine falcon is the fastest bird and the fastest member of the animal kingdom with a diving speed of 389 km/h (242 mph). The fastest animal in the sea is the black marlin, which has a recorded speed of 129 km/h (80 mph). No human being will ever approach these speeds.

Animals have the obvious advantage of the use of four legs to propel their body forward with excellent balance. In general, humans have poor musculature and muscle density compared to the average animal. The attachment points, articulation and skeletal arrangement of running animals is also quite different from humans even though most of the same bones and muscles are present. Most four-legged animals are also narrower across the shoulder and hips and have deeper chests, while humans tend to be wider across the shoulders and hips, which is not as efficient for sprinting. The fastest sprinting animals also have a flexible spine allowing them to nearly overlap the front and back legs for increased stride length and a ‘catapult' effect that pushes them forward with each push from the back legs as shown in Figure 1 (Wikipedia). A key factor that has not been determined is the ground reaction force (GRF)/Body Weight ratio of animals who are pushing away from the ground with two limbs each stride instead of one. One would suspect that animals have a much more favorable ratio. In addition, form and technique problems may be nonexistent in most animals which means all forces to the ground are applied at the right time, in the right direction, and with maximum force.

Table I: SPRINTING SPEED OF ANIMALS

Animal Species	Resting Heart Rate	Maximum Heart Rate	Sprinting Speed
Antelope (Prolong)	__	__	60
Ass	40	56	30
Bear (Black)	__	__	37
Bear (Polar)	__	__	25
Bear (Grizzly)	__	__	40
Bear (Brown)	__	__	30
Beaver	140	—	Approx. 40
Buck (Black)	__	__	50
Camel	25	32	9.7
Cat	120	140	30
Cattle (bos cavus)	35-40	45-50	__
Cattle (dairy)	60	70	__
Cheetah	55	65	75
Chipmunk	684	600-702	Approx 40-50
Coyote	__	__	40
Dog (canis familiaris)	70	120	__
Dog (Greyhound)	80	90	40
Dog (St. Bernard)	74	80	Approx 25-30
Elephant	25-35	50	25
Fox (grey)	122	150	40
Giraffe	66	__	Approx 50-60
Gazelle			60
Hare (Brown)	__	__	48
Hippo	__	__	19-25
Horse (nag)	37	32-44	15
Horse (thoroughbred)	38	45	45
Hyena	__	__	37
Lion	40	__	50
Kangaroo	__	__	44
Man	40-90	220 minus age	27.4
Mule	46	50	10-20
Panther	60	__	60
Rabbit (Lepus)	251	__	45
Rabbit (I. cunniculus)	120	160	145
Rhesus monkey	160	330	34
Skunk (striped)	166	144-192	40
Squirrel (ground)	140	400	40-50
Tiger	64	__	50-60

Source: Adapted from Dintiman, George B. 1970. Sprinting Speed: Its Improvement for Major Sports Competition (Illinois: Charles C. Thomas).

Figure 1. Shows the overlap of the front and back legs that increases stride length and provides a 'catapult' effect to propels an animal forward with each push from the back legs.

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Dintiman, George B. 1970. *Sprinting Speed: Its Improvement for Major Sports Competition* .Illinois: Charles C. Thomas.

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FRONT AND BACKSIDE MECHANICS - REVISITED

Q - I'm still confused. Can you explain the action of Front Side Mechanics and the importance of mastering this technique for maximum sprint performance.

A - This topic was also briefly discussed briefly in a May, 2014 article of *Sports Speed Digest.* Traditionally, the Start, consisting of the first two steps, has been described as occurring during *Back Side Mechanics* with ground reaction force (GRF) applied behind the body's center of gravity (COG). However, using the "trunk" as the reference point, even the first two steps involve front side dominance and play a key role in setting up *Front Side Mechanics* (ground contact that occurs slightly in front of the runner's COG) for the remainder of a short sprint. The only difference during the start is body lean, which occurs in a straight line from the center of the ankle through the ear.

A review of the findings of world-renowned Sprint Mechanics researcher, Dr. Ralph V. Mann (2011) best clarify both the correct action and importance of Front Side Mechanics:

Concepts

Sprinters should focus their attention on the action of the legs that takes place in front of the body's center of gravity. Backside mechanics is an action that coaches try to get their athlete's to avoid.

The entire sprint from gun to finish should be front side oriented.

Front Side mechanics must be set up during the first two steps (the Start) and then continued during the entire acceleration phase into the maximum speed phase.

If front side dominance is not achieved at the very beginning of a short sprint, it is difficult to shift later in the race.

Importance: Effects on Sprint Performance

The more and sooner an athlete can make the shift, the faster the sprint performance. GRF (ground reaction force) is twice as high during the first half of foot touchdown during Front Side mechanics than the last half (Back Side mechanics). Obviously, athletes who spend more time in Front Side Sprinting will be more successful. In addition, GRF during the final 15 percent of ground contact is very low; so completing this phase as quickly as possible allows a fast return to the productive front side of sprinting.

During the start and acceleration phase, front side mechanics must also dominate in order for athletes to be able to apply as much of their maximum available ground contact force as possible. The objective is to maximize *Front Side Mechanics* and actually avoid *Back Side Mechanics*. The force during the first half of touchdown (ground contact) with Front Side Mechanics is about twice as much as the force exerted in the 2nd half (Back Side). In addition, the force applied in the final 15% of ground contact is very low (approximately 5% of that applied in the first half). The sooner an athlete vacates this 15% limited, unproductive ground contact phase and returns to front side activity, the better the sprint performance.

Mastering Front Side Mechanics

Dr. Mann points out that mastering Front Side Mechanics is no easy task for most team sport athletes who are accustomed to merely allowing Back Side mechanics to occur and are used to driving the leg backward throughout the ground contact phase. The task is for athletes to learn to sense the beginning of an active upper leg recovery during ground contact. Mann states that Carl Lewis eliminated Upper Leg Back Side mechanics by never allowing his upper leg to pass behind a vertical line dropped down from his hip. "The most critical component of sprint mechanics lies in the management of upper leg mechanics." For a detailed, technical discussion of every aspect of Front Side Mechanics, see Mann, Ralph, *The Mechanics of Sprinting and Hurdling.* 2011 Edition.

In a long sprint, rare in team sports, fatigue can become a factor and cause some athletes to fall out of front side mechanics, making it very difficult to recover and regain front side dominance. As a result, speed declines. This may also occur in team sports where repeated short sprints are required with very little rest interval between each. Without a high level of speed endurance (RSA-repeated sprint ability) permitting near complete recovery between repetitive short distance sprints, form and technique can be compromised, causing athletes to fall into backside dominance.

COACHES HEALTH

Keeping Your Aging Liver Healthy

The liver is the most varied and metabolically complex organ in the human body. It is also the largest and heaviest (average of 1.6 kilograms, 3.5 pounds) internal organ (skin is the largest external organ) and performs over 500 essential tasks that keep the body healthy. A general list of some of these functions include:

- Receiving the end products of digestion and storing or resynthesizing them into other forms, or transporting end products to other parts of the body
- Storing energy in the form of glycogen
- Storing iron, copper, fat-soluble vitamins, appreciable amounts of ascorbic acid and B-complex vitamins
- Storing and releasing glucose as needed to control blood sugar levels
- . Synthesizing triglycerides, phospholipids, and cholesterol
- Cleaning toxins from the blood
- Producing bile to digest food and fluids
- Converting food and drink into nutrients
- Controlling the blood clotting function
- Providing physical energy
- Detoxifying chemicals and metabolizing drugs

- Secreting bile that ends up back in the intestines
- . Making proteins important for blood clotting and other functions
- Producing certain proteins for blood plasma
- Producing cholesterol and special proteins to help carry fats through the body
- Processing of hemoglobin for use of its iron content (the liver stores iron)
- Converting harmful ammonia to urea (urea is one of the end products of protein metabolism that is excreted in the urine)
- Regulating blood clotting
- Resisting infections by producing immune factors and removing bacteria from the bloodstream
- Clearing bilirubin (if there is a buildup of bilirubin, the skin and eyes turn yellow)

Common Liver Conditions

In spite of the tremendous importance of proper liver function to general health and life, the liver is often compromised due to genetic conditions and, more commonly, our health choices.

Fatty liver (fat buildup in the cells), Bile duct disease (prevents movement of bile to the small intestine), Hepatitis C (virus transmitted by blood or through sexual activity), Cirrhosis (scarring of the liver as a result of untreated liver disease), and Hemochromatosis and Wilson disease (genetic condition causing a buildup of iron and copper in the liver) all reduce liver function and can lead to serious problems and death.

Alcoholic Liver Cirrhosis. With heavy alcohol consumption over long periods of time, the body replaces healthy liver tissue with scar tissue leading to a condition termed *alcoholic liver cirrhosis*. Eventually, with more and more loss of healthy tissue, the liver cannot function properly. The disease begins with fatty liver disease, progresses to alcoholic hepatitis, and to alcoholic cirrhosis. Alcoholic liver cirrhosis can also occur without ever having alcoholic hepatitis. It is estimated that 10-20 percent of heavy drinkers eventually develop alcoholic liver disease (*American Liver Foundation*). Some of the symptoms that appear between ages 30 and 40 include jaundice (yellowing of the skin and eyes), portal hypertension (increased blood pressure in the vein that passes through the liver), and skin itching (pruritus, uncontrollable sensation to scratch the skin).

Physicians diagnose cirrhosis by reviewing a patient's medical history of drinking and use various tests to identify the presence of portal hypertension, low blood levels of anemia, magnesium, potassium, and sodium, and high levels of glucose, leukocytosis (white blood cells), and liver enzymes. A number of Liver Function Tests may also be prescribed by your physician. Blood analysis analyzes protein and liver enzyme levels for possible presence of liver disease:

ALT (alanine transaminase)
AST (aspartate transaminase)
ALP (alkaline phosphatase)
GGT (gamma-glutamyl)

A bilirubin test - checks for presence of orange-yellow fluid that may leak with liver damage
Liver biopsy - detects cancer and infections.

Protecting the Liver

Liver function depends upon the wellness of individual cells. As we age, some cells die and are not replaced and older cells are not as efficient. If enough cells are lost, normal function is not possible. The liver also becomes smaller since the number of cells decrease and receives less blood flow. In addition, some enzymes produced in the liver become less efficient and less effective in eliminating drugs and other substances.

The good news is that loss of function is more likely to occur from factors other than aging, such as poor health habits. The liver is also an organ that can easily be "trashed" if you do not take care of it properly. You can protect your liver throughout life by following the 9 key suggestions below:

1. Always take the lowest possible dose of OTC drugs.

2. Avoid excessive use of acetaminophen, the active ingredient in Tylenol, in any form (may be present in allergy and cold medications). This OTC drug can damage the liver, and even result in death.

3. Limit the use of Protein-pump inhibitors to reduce acid reflux since studies show it may increase gut bacteria enterococcus and cause inflammation that can lead to chronic liver disease.

4. Practice sound nutrition (variation, moderation, and balance). Proper care is mostly about avoiding what is bad for the liver, rather than consuming foods that supposedly provide liver nourishment.

Some vitamins may need to be supplemented to repair damage and fortify the liver against stress. Malabsorption and eating disorders interfere with the absorption of nutrients in the digestive tract and can lead to liver failure. A dietitian can analyze each individual and prepare a proper diet based upon specific liver conditions.

5. Limit processed foods (packaged) with sugar and saturated fat that increase the risk of diabetes, which adversely affect liver function.

6. Limit alcohol intake to no more than one (women) to two (men) drinks daily to protect both your liver and general health.

7. Exercise 4-5 times weekly to keep your weight under control, which helps prevent nonalcoholic fatty liver disease (NAFLD) that leads to cirrhosis. Aerobic and resistance exercise also improves insulin resistance and helps oxidate the fatty acids in the system.

6. Drink coffee - 3 cups daily can prevent hardening of the liver and assist in halting the progression of liver disease due to coffee's antioxidants.

9. Take the time to learn how to prevent viral hepatitis. Hepatitis A can be acquired from eating or drinking water that contains the virus. A vaccine is available for those who are traveling to parts of the world experiencing outbreaks. Hepatitis B and C are spread through blood and body fluids. You can reduce your risk by avoiding the sharing of tooth brushes, razors, or needles, taking extreme caution with tattoos, limiting the number of sexual partners and always using latex condoms. A vaccine is available for hepatitis B, but not for hepatitis C. Since Hepatitis does not cause early symptoms, one can be unknowingly affected for years while liver damage is occurring. A blood test is recommended for those at risk.

2019

NASE - CSS CERTIFICATION RENEWAL

(Maintaining Certification as an NASE Certified Speed Specialist)

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PAYMENT ($39.00; add $39.95 to renew your membership if it has expired)
____ Make check/money order payable to NASEINC !
____ My NASE Membership is: ___ Current ___ Not Current ($39.95 added) If membership has expired, add $39.95 to the Renewal fee and submit $78.95 to NASEINC

Criteria Since Last Certification

In recognition of the extreme dedication and time constraints placed on certified members, the NASE uses a practical approach to ensure growth and development as the main means of maintaining NASE-CSS certification The purpose of the 36-month renewal program is to encourage members to remain current and aware of new concepts, principles, theories and techniques in the area of speed improvement.

Every 3 years, applicants complete and return this *Renewal Application Form* listing activities that occurred since their previous certification date. Criteria are met when certified members accumulate a total of **25 points** from the choices listed below. Applicants may also request credit for other activities. Continued employment in the area of strength, speed, and fitness during this three year period (based on the number of years your NASE membership was current) + 5 points from other categories meets the standard. Any combination of areas listed below can be used.

	Points
1. Current membership in NASE is required.	
2. Continued employment in area of speed, strength, conditioning (If membership continued for 3 years - 20 pts., 2 years, 15 points, 1-year, 10 points	10,15,20
3. Attendance at an NASE or other National Symposium	10
4. CEU'S (up to 10)	0 - 10
5. Article(s) submitted for publication in the *Sports Speed Digest*	*5*
6. Article(s) published in the Sports Speed Digest, other journals, or book Chapters	10
7. College/University Course*	5
8. Program/Course development (attach Syllabus)	3
9. Presentation at a national conference	5
Other: TOTAL (25 or more circled)	____

* Course-related fields: Anatomy, Physiology, Athletic Training, Physical Therapy, Exercise Physiology, Strength and Conditioning, Performance Enhancement, Fitness, and others.

INSTRUCTIONS: Circle the points above. Include support data if available, return the form to: NASE, P.O. BOX 1784, KILL DEVIL HILLS, NC 27948 with your fee. Make check/money Payable to NASEINC. You can also pay online and submit the form by mail or e-mail. Provide supportable data when possible. The NASE staff will contact you if more information is needed.

NATIONAL ASSOCIATION OF SPEED AND EXPLOSION
HEADQUARTERS: P.O. Box 1784, Kill Devil Hills, NC 27948
Tel. 252.441.1185 Website: naseinc.com e-mail: naseinc@earthlink.net

NASE MEMBERSHIP: **$39.95 Per Year**

NASE MEMBER BENEFITS

Increase Knowledge & Learn New Techniques

Learn from the only national association devoted entirely to the improvement of speed in short sprints for sports competition.

Obtain Access to a dynamic website

Stay current through the Naseinc.com website containing articles, videos, and other information on speed improvement for team and individual sports updated regularly. Access over 55 back issues of *Sports Speed Digest* with hundreds of articles by leading experts.

Begin Key Networking

Utilize an on-line forum with directed topics for the exchange of ideas and networking with other team sport coach (age group, high school, University, and Pro), Strength and Conditioning coaches, Personal Trainers, Athletes and Parents, and Physical Therapists involved in training athletes throughout the world.

Receive the Quarterly Publication of Sports Speed Digest

The 12-16 page *Sports Speed Digest Quarterly, published in January, April, July, and October.* contains articles by leading experts on speed improvement for football, basketball, baseball, field hockey, rugby, softball, soccer, tennis, and other sports.

- Lead articles on speed improvement techniques
- Q & A and other Columns: Chump to Champ, Speed Improvement for Young Athletes, Coaches Health
- What Research Tells the Coach about Speed Improvement
- Analysis and practical application of the latest research findings

Discounts

Receive discounts on Registration Fees for selected symposiums and clinics.

Certification (Certified Speed Specialists - NASE CSS) and Professional Advancement

Become a recognized expert as a speed coach by completing the NASE prestigious Certification Program in Speed and Explosion for school, university, pro and age-group coaches in all sports, strength and conditioning coaches, personal trainers, athletic trainers, and undergraduate and graduate students. Experienced coaches begin with the NASE advanced Level II certification.

Level I Certification (online course) for inexperienced coaches and undergraduate students,

Level II Certification (online course) for experienced coaches and graduate students,

Self-study Level II certification for experienced coaches who prefer to avoid taking an online course on the computer and prefer to prepare on their own after receiving materials and other resources.

Name ________________________________Title______________________________

Address ______________________________ State ____________Zip _____________

Tel ______________________ e-mail ____

______ $39.95 (NASE ANNUAL MEMBERSHIP ONLY)

You can pay online OR return this form with a check or money order for $39.95 to NASEINC, Box 1784, Kill Devil Hills, NC 27948.