techniques

for Track & Field and Cross Country

VOLUME 6, NUMBER 1 AUGUST 2012

KEEPING IRON STRONG

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OFFICIAL PUBLICATION OF THE U.S. TRACK & FIELD AND CROSS COUNTRY COACHES ASSOCIATION

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CORRECTING PELVIC ROTATIONS

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Cover photograph of Rebecca Gusmer
by Christopher Mitchell, University of Minnesota

A Letter From the President

Hopefully you are enjoying the summer months. I am sure that there is much diversity among us in what exactly our summer activities involve. Camps, teaching, recruiting, coaching athletes in summer meets, working on next year's budget, travel, scheduling and equipment needs are all professional activities that I am sure most of deal with to some degree. I hope that, what ver your personal responsibilities call for, you find some time to relax and rejuvenate before we get started again this fall.

This past May those of us in NCAA Division III had our national championship in California. John Goldhammer and the folks at Claremont Mudd-Scripps did a fantastic job in hosting the championship. Student-athletes and coaches alike were appreciative of the rare Division III Championship held outside of the Midwest. I suspect travel costs were a bit higher, but kudos to the NCAA for accepting the bid from CMS. It was a very positive experience for our student-athletes, coaches and fans.

I write this as the United States Olympic Track & Field trials are wrapping up. Regardless of whether you are in Eugene, Oregon coaching athletes, supporting former athletes, just there as fans or watching on television, I am sure that you share my excitement in following the competition. It is gratifying to know that virtually every member of the US Olympic team is a product of our college system. While I don't see developing athletes for future Olympic teams as the major purpose of college programs, there is no doubt that the skill and expertise of our USTFCCCA membership has a significant impact on the development of the most powerful track team on the planet, the United States Olympic Track & Field team.

Our association board of directors will be having our annual summer meeting via conference call on Aug. 16. We will receive reports from each standing committee, deal with old business, new business and receive the CEO report from Sam Seemes.

It is not too early for each of us to be thinking about the 2012 USTFCCCA convention. After two successful years in San Antonio, Texas we are headed to Orlando, Florida in December. Having been to every USTFCCCA convention except one, I have witnessed the incredible growth and relevance of this event. The convention today gives us the framework to debate, discuss and make decisions and recommendations concerning our sport as well as take part in fantastic professional growth opportunities through seminars and clinics. Let's all get the convention on our calendars right now!

I wish everyone a great finish to the summer and look forward to seeing many of you this fall and many more in Orlando. As always, I look forward to working with each of you in making the greatest sport in the world even better!

Ted Bulling

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NCAA REPORT Division I Track & Field and Cross Country

RON MANN
PRESIDENT, NCAA DIVISION I TRACK AND FIELD COACHES

The Indoor Championships in Boise was a great competition. The 2012 Outdoor Track & Field Finals at Des Moines produced numerous records and the best weather conditions in recent years. The US Olympic Trials in Eugene were spectacular! London and the 2012 Olympics will be beyond amazing! Wow ... what a year! But the best is yet to come.

I hope you have taken a "time out" to go on a vacation as we approach 2012-2013.

Congratulations to all of you coaches for showing your great leadership, demonstrating skills and dedication to your teams, universities and our sport! Congratulations to each of the student athletes who trained and studied tirelessly to represent themselves and their coaches, universities and families. Thank you to the USTFCCCA national office that does such a great job recognizing the coaches and athletes. The sheer volume of awards given by the USTFCCCA is outstanding each season.

Serving as the Division I President has given me unique insight into all the issues that surround our sport and reaffirms what a great profession we have. Working with the Executive Committee, which represents each of you, has been a true blessing to me personally. The Executive Committee, along with each of you, has shown me what a powerful group of professionals we are and how we can address difficult issues and come together as a coaching body with passion and resolve.

Throughout this next fall our agenda will have us working to improve our future Outdoor and Indoor NCAA Championships. We will press forward on the Division I Strategic Plan that we passed at the 2009 National Convention. This plan will direct us toward a long-term vision that will ultimately demonstrate improvements in and the preservation of our great sport.

This summer and fall we will work diligently with our Championship Advisory Committee. We will continue to work with the NCAA Division I Track & Field Committee to improve the NCAA Preliminary Round experience for the athletes and coaches at both locations. We will also revisit our awards program to make it even more meaningful into the future.

I want to thank our USTFCCCA National Office staff and the leadership of Sam Seemes. These people truly are committed to each of us and to our profession. They truly have our best interests at heart. Once again, I would like to express my appreciation to all of you; it continues to be an honor to serve as your president. As we move into 2012-2013, keep focused on the tasks and goals that lie ahead to keep Track & Field the world's greatest sport! Lastly, mark your calendars for our National Convention in Orlando, Fla., Dec. 17-20.

Ron Mann is the Head Men's & Women's Track & Field Coach at the University of Louisville. Ron can be reached at ron.mann@louisville.edu

BARRY HARWICK
PRESIDENT, NCAA DIVISION I CROSS COUNTRY COACHES

As I write this report I am literally sitting in front of my laptop on a desk covered with papers. Recruiting folders, bus schedules for 2013 team trips, my running camp brochures, team GPAs and a host of other items all need to be dealt with in one way or another. I am going to hazard a guess that most other coaches find themselves in a similar situation. With that in mind I do need to remind you that there are a few other things that needed to be added to the summer "to-do list."

• We will do our preseason cross country poll at the end of August. Our First Vice President, Sean Cleary of West Virginia, has his poll committee working on some new guidelines for our voters. We will share those with you at the end of the summer. In the meantime, you can help your region rep plan for their votes. It is very helpful if you can send them a copy of your roster, your meet schedule, and a few notes about how you expect your team to do. I would characterize this as a 15-minute project once you sit down to do it.

• The summer is when a lot of Sports Information staff get their work done for all of the fall teams. Don't let cross-country get stuck behind all the releases for football, soccer, field hockey etc. Take time to sit with someone from your SID's staff and make sure your website has up-to-date information on your team. Having an accurate roster, schedule and bio for each athlete is incredibly important for your program.

• If you are hosting an event this fall take the time to be sure that your local media know about it. If you don't already know someone from your local paper make it your job to remedy that situation. Ask someone from your team to touch base with your school paper. A lot of college papers are looking for things to write about. Help them out and give them a story idea about someone on your team.

• Once your season gets rolling in September there is not a lot of time left for any long-range planning. Take a few minutes to look at the calendar for the fall and note that our annual convention will be in Orlando this December. This is a great site and airfares are usually reasonable if you book in advance. Please think about this now and make a concerted effort to attend.

• Our executive committee continues to hold conference calls in the spring and summer. If you have an issue that you would like to see addressed please contact your regional representative or me.

Let me close by advising you to close your office door for an hour, deal with at least a big chunk of that paperwork, and find some time to enjoy the summer.

Barry Harwick is the Head Men's Track & Field and Cross Country Coach at Dartmouth College. Barry can be reached at Barry.Harwick@Dartmouth.EDU

NCAA REPORT Division II Track & Field and Cross Country

STEVE GUYMON
PRESIDENT, NCAA DIVISION II TRACK & FIELD COACHES

I would like to thank CSU-Pueblo and their staff for all the hard work in making the 2012 NCAA Outdoor Track & Field Championships a success. Congratulations to all the athletes that made the National Championship and to all the athletes and coaches that were named Regional "Athlete of the Year" and "Coach of the Year".

The USTFCCCA staff as well as the Track & Field Executive Committee would like to encourage coaches to send in proposals for the upcoming convention. Please review the past season while it is still fresh in your mind and, if you feel you would like to see some things change, please email your proposal to myself and the national office by Nov. 1. Please visit with your representatives from your conference and feel free to voice your concerns or ideas so they can bring it back to our committee to discuss. Our job is to represent our athletes and coaches and to strive to make our sport better. We had some discussion at our coaches meetings in Pueblo and many ideas were shared in the room. I would also encourage you to send me an email if you have some concerns you would like me to pass along to the NCAA Track & Field Committee about the Indoor or Outdoor Championships.

I would like to congratulate our Hall of Fame Inductees: Dick Booth, Dick Hill, Vin Lananna, Bob Pollock, Fran Welsh and John Zupanc, all are very worthy of the honor and I look forward to witnessing their induction in Orlando.

Just a reminder, we add the 3k Indoors next year and the numbers have been increased. Provided that the NCAA Committee accepts our proposal from last Convention that we voted on as a body, the minimum accepted in Indoor will be 16 in each individual event, 14 multis and 12 relays with any extra numbers to be assigned by the committee. Outdoor was 20-16-14. As a body, we recommended that the 5k be moved to Friday right before the DMR during Indoor Championships and the 3k added to Saturday's events in the 5k slot.

It has been announced that the NCAA Sports Festival for the 2013 Indoor Track & Field Championships will be held at the SPIRE Institute in Geneva, Ohio. Additional details will be coming soon via the NCAA and the USTFCCCA website.

Finally, a reminder to mark your calendar for the USTFCCCA annual convention to be held Dec. 17–20 in Orlando. In addition to the convention, there will be a number of Track & Field Academy programs held at the same site, so make sure to log onto the USTFCCCA website for all of the details. Best wishes for a productive fall semester.

Steve Guymon is the Head Men's and Women's Track & Field Coach at Harding University. Steve can be reached at sguymon@harding.edu

MARLON BRINK
PRESIDENT, NCAA DIVISION II CROSS COUNTRY COACHES

Citius, Altius, Fortius! With the conclusion of the Olympics just wrapping up, it is always an inspirational time that we celebrate every four years with the masses that often miss the greatness of track & field and cross country. Although most of us will never get the chance to coach an Olympic athlete, it is great to have athletes realize that they can set their goals higher than they ever imagined before because they saw that someone else achieved something that once seemed impossible! I hope that both you and your athletes have experienced the inspiration of seeing the greatness of the Olympic athletes and can use that as motivation for your athletes in the upcoming season.

You should have received or will be soon receiving information regarding the 2012 Division II Cross Country Preseason Polls. You should have the formal request and team outlook form sent to you by your regional poll rater, which you should return by August 15. I can tell you that these are very helpful in creating the initial polls as teams can change significantly from year to year. Please take the time to submit your information to your region rater with as much information as possible. Your coordinators are Ray Hoffman (women's poll), T.J. Garlatz (men's poll) and Michael Freiss (poll committee chair).

The Joplin Initiative has been mentioned several times in both this column and emails sent out by the National Office. I hope that your teams will support this with an event(s) to help raise funds for the city of Joplin, Mo. I believe that the student-athletes will get a new feeling of satisfaction in knowing that they are helping a fellow Division II city and institution that will greatly appreciate our efforts.

This year the National Championships in Joplin will see the increased field sizes that we have been working for several years to bring about. Each region will now have three automatic qualifiers as well as three individual qualifiers. I believe the increased field size will only add to the excitement of the National Championships.

Finally, it is not too early to start thinking about booking your room and flight to the 2012 USTFCCCA Convention, Dec. 17 – 20 in Orlando. There will be a number of Track & Field Academy programs held prior to the start of the convention as well. If you have a proposal that you would like to submit, it must be submitted by Nov. 1 to either myself or Sylvia Kamp at the National Office. Information is posted on the USTFCCCA website. The convention is a great time to reunite with fellow coaches to generate ideas and take care of our annual business. Your attendance and participation are crucial to the betterment of our sport!

Good luck in the upcoming cross country season!

Marlon Brink is Head Men's and Women's Track & Field and Cross Country coach at Wayne State College. Marlon can be reached at mabrink1@wsc.edu

NCAA REPORT Division III Track & Field and Cross Country

CHRIS HALL
PRESIDENT, NCAA DIVISION III TRACK & FIELD COACHES

The past two years that I have served as president of the coaches association seem to have gone by pretty quickly. It has however been a time in which a number of issues have been resolved. The most notable change has come with the new qualifying procedure for the NCAA Championships and the retirement of national standards. While I feel this was a change that many members of our association were not in favor of originally, the feedback I have gotten while at national meets has been overwhelmingly positive. From my standpoint I felt it was much more transparent as to how athletes qualified and the even field sizes seemed to be much more fair in the eyes of the athletes and spectators. I also believe it is very important to note that we actually had more athletes competing in the outdoor national meet this year than last under the new qualifying procedure.

As we look ahead to the future I feel the biggest change coming our way is going to be the implementation of the new track indexing. A committee with representation of all divisions has been working very hard at coming up with a solution for converting times from banked, oversized and undersized tracks. The new conversions will be based upon a conversion formula instead of a flat conversion used over the past several years. My understanding is the committee has put together a final recommendations, and this will be voted on this summer with possible implementation in the 2013 track season.

I would like to take a moment to thank Sam Seemes and the national office for the work they have put into developing what has become one of the strongest coaches associations in all of college sport. It has been a very rewarding experience for me personally to have worked side-by-side with coaches from Divisions I, II and III along with the NAIA. I have gained from them as they have from us but, more than anything, have enjoyed the fact that we are all working together to make track & field at the college level the best it can possibly be. I want to encourage those of you that have an interest in getting more involved to do so. There are many opportunities and we need good people to take on these responsibilities. Come to Convention in Orlando this December and consider taking on a greater role if you have the time. At the very least, please come to have a voice in the future of our sport.

Chris Hall is the Head Men's & Women's Cross Country and Track & Field coach at the University of Chicago. He can be reached at hallc@uchicago.edu

KATHY LANESE
PRESIDENT, NCAA DIVISION III CROSS COUNTRY COACHES

A term has come to the close and I will be stepping into the ranks as Division III Cross Country president this fall. First, I would like to thank Greg Huffaker for his conscientious service and leadership as president. Congratulations to Greg as he was the recipient of the National Assistant Coach of the Year for the NCAA Outdoor Track & Field Championships and to his women and their all-American performances on the track. Additional thanks is extended to Sam Seemes who has been a great advocate for our group and has provided thoughtful suggestions and positive reinforcement for some of the big decisions we have made during this past year. Final kudos are my appreciation to the National Office Staff that continually provides support, communication and innovation to this organization.

The new group of officers will include Robert Shankman (Rhodes College) as First Vice President, Dara Ford (John Carroll University) as Second Vice President and Dustin Dimit (Buffalo State College) as Secretary. I am eager to have for the opportunity to lead and serve this group in the fall and in the years ahead.

This past spring and early summer have functioned as a busy and productive stretch as the executive committee evaluated our existing regions and worked towards presenting a regional realignment plan. This plan was in the infancy stage at Convention last December but, with the input and support of the Division III body, the process of realignment has continued to develop. Numerous individuals researched the history of our present alignment, implemented some recommendations from the NCAA for guidance, considerately presented some well-thought-out ideas and have developed a balanced and equitable map consisting of eight regions. We believe this is an excellent model for the future of our sport and have received positive feedback about the proposed plan from the NCAA.

Aside but equally important, the NCAA approved the elimination of the five-team cap for each region. Two teams from each region will still receive an automatic bid to the NCAA and the no-cap ruling will take effect in 2013. As with any change, there will be some resistance, but as the regional realignment is considered and with the cap removed, we as a body have moved forward to accomplishing some of our goals set forth at Convention. One of those goals is getting the best teams to the national championships!

Much success to all this fall!

Kathy Lanese is the Head Men's & Women's Cross Country Coach at Case Western Reserve University. Kathy can be reached at krl3@case.edu

HIGH SCHOOL REPORT

WAYNE CLARK

Olympic Fever: That period every four years during which the aficionados of every sport glue themselves to the television or radio to follow their event and the athletes they know and admire. This is usually followed by a period of coaches dreaming about upcoming seasons and athletes becoming a little more devoted to their summer running schedules. Enthusiasm runs high. Everyone hopes. Everyone dreams.

Athletes of all ages dream of one day winning a gold medal, but for adapted sport athletes, hoping and dreaming was about all they could do - until now. Presently Alabama, Georgia, Florida, Idaho, Iowa, Louisiana, Maine, Maryland, Minnesota, New Jersey, North Carolina, Oregon, Washington, and Wisconsin include wheelchair events as parts of State Championships.

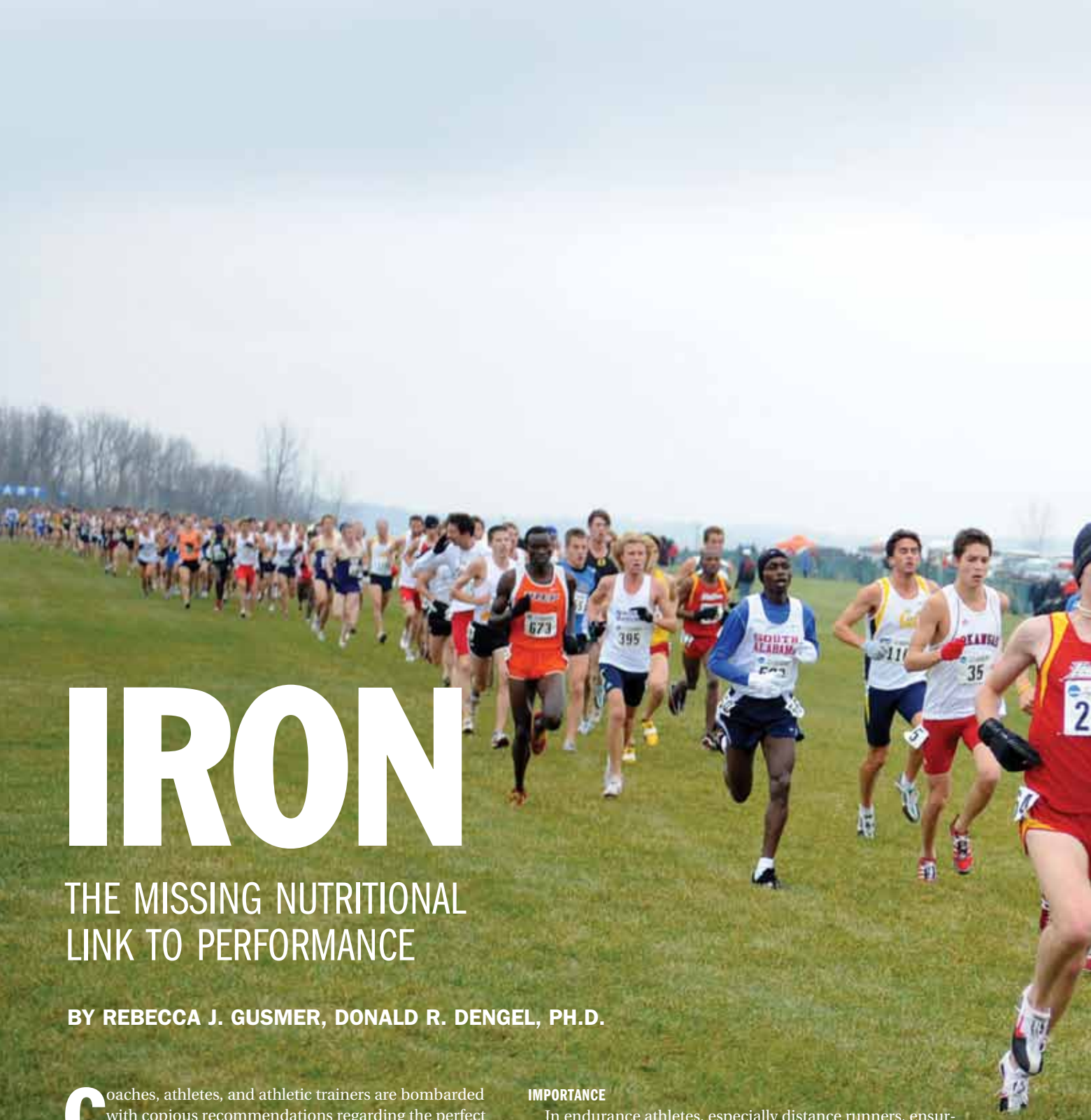
In June of this year, The Ohio High School Athletic Association approved a resolution to include the 100m, 400m, 800m and shot put as part of the 2013 State Championship with boys and girls competing for individual championship titles and All-Ohio recognition. What makes this announcement so unique was not so much the proposal itself, but the process undertaken to make it a reality. "We did not write a proposal," said Dave Kirk, the District 2 representative and adapted sport liaison to the Ohio Association of Track and Cross Country Coaches. "We assembled it." Taking the best practices from each state, the OATCCC Executive Committee put together a presentation of how an adapted sports program could be integrated into the current championship format.

What has caught people's attention, however, is the coalition-building process undertaken by the OATCCC. Beginning in December of 2010, the OATCCC allocated personnel and finances to begin researching the adapted sport movement association and USA Paralympics followed over the next year and half. "We are excited that the OHSAA will have the opportunity to make a positive impact on this group of outstanding student-athletes and create lifetime memories for the participants," said OHSAA Commissioner Dan Ross, Ph.D. "The impact on the young athletes with physical disabilities will be incredible," said Charlie Huebner, United States Olympic Committee Chief of Paralympics. "They will be representing their schools and communities in ways that have never been seen in Ohio."

The Olympic and Paralympic Fever of the London Games will pass and the four-year process of hoping and dreaming will begin anew as we look to Rio in 2016. The next generation of athletes who will represent this country are in the halls of our high schools. As we seek them out, let us not forget that some of them may be on wheels.

This report was prepared for techniques by Dave Kirk.

Wayne Clark is the Clinic Chair of the Ohio Association of Track and Cross Country Coaches. He can be reached at wclark002@columbus.rr.com.



IRON

THE MISSING NUTRITIONAL LINK TO PERFORMANCE

BY REBECCA J. GUSMER, DONALD R. DENGEL, PH.D.

Coaches, athletes, and athletic trainers are bombarded with copious recommendations regarding the perfect formula and factors that will be conducive to optimal performance. Some of these contain fallacies that can stump the individual as to which factors should be implemented while others are simply overlooked. One commonly misunderstood and overlooked nutritional component related to endurance performance is iron. Does iron actually have a role in athletic performance of endurance athletes? How come low hemoglobin values are not conducive to diagnosing iron deficiency among athletes? Is iron toxicity an inherent risk when taking iron supplements? Understanding the real role iron plays in the body and simply monitoring iron status can debunk the myths and lead to an improvement in an athlete's overall health and performance.

IMPORTANCE

In endurance athletes, especially distance runners, ensuring that adequate amounts of oxygen are delivered to the working muscles is pertinent for successful performance. Iron plays a vital role in oxygen delivery such that a deficiency in iron can lead to a reduction in oxygen delivery and ultimately impair performance (Fallon, 2004). Additionally, iron depletion can result in fatigue, weakness, dizziness and sensitivity to cold (Chatard et al., 1999). An initial symptom of iron deficiency is a drop or plateau in performance that is typically proportional to the loss of hemoglobin such that a 1-2 g decrease of hemoglobin per 100 mL of blood can result in a 20-percent decrease in performance (Gardner et al., 1977).

→

KIRBY LEE PHOTO

The prevalence of low iron levels is greater among athletes than the general population (Koehler et al., 2011). For instance, in a study of 193 elite athletes (96 males, 97 females) with a mean age of 16.2 +/- 2.7, iron depletion occurred among 31 percent of the males and 57 percent of the females (Koehler et al., 2011). Although iron deficiency occurs in both male and females, it most frequently occurs in female athletes, affecting about 60 percent of female athletes (Cowell et al., 2003).

IRON PHYSIOLOGY

Iron is a chemical element that affords the binding of oxygen to hemoglobin molecules found within erythrocytes and is essential for ensuring adequate oxygen delivery to the body (Widmaier, Raff, & Strang, 2008). Blood is the main medium in which oxygen is transported and is composed of approximately 60 percent plasma and 40 percent formed elements, which are made up of 99 percent erythrocytes (Kenny, Wilmore & Costill, 2011). The erythrocytes are mature red blood cells that are unable to reproduce independently. As a result, erythrocytes are consistently destroyed and reproduced and persist in the body for about four months (Kenny, Wilmore & Costill, 2011). When erythrocyte numbers decrease from a loss of blood or when they are destroyed, oxygen delivery and subsequent athletic performance is hindered.

The percentage of the blood volume that is made up of formed elements is termed hematocrit and reflects erythrocyte concentrations. Normal ranges of hematocrit are 42-52 percent in males and 37-47 percent in females (Pagana & Pagana, 2010). Optimal facilitation of oxygen transport requires having low to normal levels of hematocrit and slightly increased numbers of erythrocytes (Kenny, Wilmore & Costill, 2011). A low hematocrit is often seen in endurance runners but is due more to an increase in plasma volume rather than low erythrocyte production (e.g, hemodilation) and is a reason why making an accurate diagnosis of iron deficiency difficult when solely using hemoglobin levels in athletes (Kenny, Wilmore & Costill, 2011).

Under normal conditions, dietary intake provides the necessary amount of iron which is absorbed in the intestines (Papanikolaou & Pantopoullos, 2004). Once iron is absorbed, about 95 percent of it is bound to transferrin which transports iron to the bone marrow for production of erythrocytes or to the liver for storage as ferritin (Chatared et al., 1999). Healthy individuals store 3-5 g of iron within hemoglobin, myoglobin (a protein similar to hemoglobin that transports oxygen in the muscles) and enzymes in the liver, spleen, and bone marrow (Papanikolaou & Pantopoullos, 2004).

Anemia is precipitated by iron deficiency and occurs when there are too few red blood cells or hemoglobin; its hallmark sign is exhaustion (Eichner, 2001). The three stages of anemia are iron depletion (marked by depleted iron stores), iron-deficient erythropoiesis (marked by diminished erythrocyte production) and reduced marrow supply and iron-deficient anemia (characterized by falling hemoglobin levels) (Table 1) (Peeling et al., 2007).

Table 1 – Stages of Anemia

Stages of Anemia			
Stage	**Serum Ferritin**	**Hemoglobin**	**Transferrin Saturation**
Iron Depletion	< 35 µg/L	> 11.5 g/dL	> 16%
Iron-deficient Erythropoiesis	< 20 µg/L	> 11.5 g/dL	< 16%
Iron-deficient Anemia	< 20 µg/L	< 11.5 g/dL	< 16%

Based upon Peeling et al., 2007

CAUSES

Iron deficiency develops due to various factors. One of the main causes of iron deficiency, especially among females, is inadequate dietary intake (Chatard et al., 1999). Additional contributing causes are strenuous training regimens, blood loss, and menstruation. The vigorous training results in iron loss through sweat and internal bleeding as well as from the mechanical destruction of red blood cells and decreased intestinal absorption.

Diet. Inadequate intake of iron is considered the most common cause among female athletes and non-athletes (Cowell et al., 2003). The recommended dietary allowances (RDA) for women ages 19-50 is 18 mg/day, and for men ages 19-50 is 8 mg/day (Trumbo et al., 2001). Low caloric diets that are high in carbohydrates and low in animal protein and fat account for the greatest risk for developing iron deficiency (Ryan, 2004). Female athletes are at greater risk for iron deficiency since they commonly have lower energy intakes but have a higher iron requirement than males (Chatard et al., 1999).

Strenuous Training. Training accelerates hemolysis, or destruction of red blood cells, as a result of the mechanical trauma associated with repeated foot strikes. This hemolysis is responsible for decreased hemoglobin levels since hemoglobin is lost in the urine when significant hemolysis occurs (Chatard et al, 1999). Furthermore, when training is too frequent, the low hemoglobin levels become permanent.

The physiological effect of training on iron stores involves saturation in transferrin, the carrier that transports iron (Chatard et al., 1999). This saturation halts iron release from intestinal mucosal cells. Therefore, when transferrin saturation is high, intestinal absorption of dietary iron is decreased. This effect indicates why rest is recommended as treatment for individuals experiencing sports anemia (Chatard et al., 1999).

Sweating. Sweat contains about 300 to 400 µg of iron per liter of sweat (Chatard et al., 1999). A sweat rate of 2 to 3 L per hour can result in a loss of 1 to 2 mg of iron (Chatard et al., 1999). These losses are highly individualistic and vary between body sites. Additionally, during a long distance run, sweat rates are higher at the beginning than at the end (Kenny, Wilmore & Costill, 2011).

Blood Loss. Blood loss is another contributor of decreased iron levels. A negative iron balance can occur with a daily blood loss of 7 to 10 mL (Chatard et al., 1999). Gastrointestinal bleeding (GI) from vigorous training typically goes unnoticed and does not have pathological consequences. Factors that affect GI bleeding include exercise intensity and distance, dehydration level and ingestion of pharmacological agents.

Blood loss can also be detected microscopically in the stool or urine, with the latter being termed hematuria. About 1 to 2 percent of runners are affected

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by blood in the stool (Chatard et al., 1999). This unnoticed blood loss can result in a loss of 1-7 mL of blood/day, which is equivalent to about 0.5-2 mg of iron/day (Chatard et al., 1999). The causes of red blood cells found in the urine include foot-strike hemolysis, kidney damage, anti-inflammatory drug use, dehydration, and muscle tissue damage (Chatard et al., 1999). As a means to minimize internal bleeding, recommendations include maintaining adequate hydration prior to, during and after training.

Menstruation. Females are at an increased risk for iron deficiency because of menstruation, which can result in a loss of 30 mL of blood per menstrual cycle (Chatard et al., 1999). This loss is equivalent to 0.5-0.6 mg of iron per day during the menstrual cycle (Chatard et al., 1999). The menstrual flow is inversely associated with serum ferritin levels. An increased flow results in a decrease in serum ferritin levels.

All of these factors can result in suboptimal iron levels in athletes who engage in intense physical training. The result of this suboptimal iron level would be a reduction in performance. For this reason alone maintaining healthy iron levels is desired in athletes.

IRON TESTING

Identifying and diagnosing athletes who are iron-deficient can help prevent an athlete's season from plummeting while promoting optimal performance. A survey sent to NCAA Division I-A Institutions found that 43 percent of the 55 institutions that responded regularly screen for iron deficiency (Cowell et al., 2003). Additionally, high variability in the frequency of screening, diagnostic parameters and treatment occurred. This variability indicates that screening is not a common procedure and there currently are not standardized protocols to assess and treat iron deficiency (Cowell et al., 2003). This situation reinforces the idea that iron is often overlooked in collegiate training programs.

To determine an athlete's iron status, a blood sample must be drawn. A blood-testing battery including serum ferritin, serum iron, hemoglobin, transferrin, and percent transferrin saturation is desired (Fallon, 2004). However, if resources are limited, the recommendation is to check serum ferritin levels (Worwood, 1996). These levels are directly proportional to total iron stores such that every 1 µg of ferritin is equivalent to 8 mg of iron storage (Walters, 1973). Using only hemoglobin saturation levels is not recommended because they can be affected by plasma volume expansion, which frequently occurs in endurance athletes (Chatard et al., 1999). Additionally, serum iron levels have hour-to-hour variations, displaying a peak in the morning and lull in the evening, so using serum iron levels alone is not recommended for diagnosis (Worwood, 1997; Chatard et al., 1999). Standardizing testing by conducting tests at the same time of the day, without prior workouts, and without recent ingestion of iron is important for accurate results (Pagana & Pagana, 2009).

DIAGNOSTIC LEVELS

Diagnostic levels determining supplementation need and deficiency vary greatly by institutions and health professionals, which make a straightforward diagnosis difficult (Cowell et al., 2003). Each individual should be treated with a case-by-case analysis because individual considerations – including an athlete's body mass index, gender and sport – play roles in normal iron levels (Telford, & Cunningham, 1991). Therefore, using diagnostic levels as guidelines, not absolutes, is recommended.

Athletes in training also make the interpretation of diagnostic levels difficult because training affects the iron parameters. For instance, hematocrits between 40-42 percent can occur without a decrease in circulating hemoglobin in endurance athletes (Chatard et al., 1999). Additionally, hemoglobin levels in endurance-trained athletes are commonly below the average population's hemoglobin ranges (i.e., 13-14 g/dL in males and 12 g/dL in females) (Chatard et al., 1999).

The general diagnostic levels that indicate supplementation are serum ferritin levels between 30-35 µg/L, with levels greater than 40 µg/L requiring no action (Chatard et al., 1999; Fallon, 2004; Nielsen & Nachtigall, 1998). Supplementation is recommended when transferrin saturation levels fall below 16 percent because red cell production needs cannot be met (Chatard et al., 1999). Hemoglobin values below 12 g/dL, combined with low serum ferritin levels, are additional indicators for supplementation (Pagana & Paganan, 2009; Fallon, 2004).

PREVENTION

The goal is to prevent iron deficiency before it occurs. Implementing and promoting prevention strategies is recommended for programs with athletes who do not have the means to be tested. Since one of the most common causes of iron deficiency is inadequate dietary intake of iron, the primary

Table 2 – Heme and Non-Heme Dietary Sources of Iron

Heme and Non-Heme Dietary Sources of Iron		
Heme Source	**Portion**	**Iron Content**
Liver, pan fried	3 oz	5.24 mg
Beef, ground, extra lean, boiled	3 oz	2.35 mg
Shrimp, cooked, moist heat	3 oz	2.63 mg
Turkey, dark, cooked	3 oz	1.98 mg
Tuna, canned, drained	3 oz	1.30 mg
Chicken, breast, broiler	3 oz	0.97 mg
Non-heme Source	**Portion**	**Iron Content**
Total Whole Grain	1 cup	23.94 mg
Cheerios	1 cup	8.10 mg
Potato, baked, flesh & skin	1 item (202 g)	2.75 mg
Black beans, boiled	½ cup	1.81 mg
Peanuts, raw	¼ cup	1.67 mg
Almonds, dry roasted, no salt	¼ cup	1.56 mg
Bread, whole wheat	1 slice (46 g)	1.43 mg
Raisins, seeded, packed	¼ cup	1.07 mg
Spaghetti, al dente, cooked	½ cup	1.00 mg
Spinach, raw, chopped	1 cup	0.81 mg
Egg, hard boiled	1 item, (50 g)	0.60 mg

Based upon Whitney & Rolfes, 2008

preventative procedure should be focused on adequate iron intake (Cowell et al., 2003). This can be done by providing nutritional counseling and monitoring dietary intake.

Dietary sources of iron are classified into heme and non-heme sources (Table 2, Page 14). Foods with heme iron are more desired since 10-30 percent of the iron is absorbed in contrast to non-heme sources of which only 2-10 percent of iron is absorbed (Ryan, 2004). Heme iron is found in animal sources including lean red meat, dark poultry, and liver. Shiraki et al. found that consuming 2 g of animal protein per kg of bodyweight is recommended to prevent an iron deficit (as cited in Charatard et al., 1999). For a 150-pound person this is equivalent to about five ounces of meat per day. Non-heme sources of iron are found in plants such as dark green leafy vegetables, nuts, dried fruit, beans, and iron fortified cereals (Chartard et al., 1999).

To optimize dietary intake of iron, one should consume small amounts of iron rich meat multiple times a week. Heme and non-heme sources should be consumed together. To ensure maximal absorption, iron should be consumed with Vitamin C sources such as tomatoes, citrus fruits, bell peppers and spinach (Ryan, 2004).

Iron absorption can be inhibited by various sources. These include calcium, phosphates, phytates (cereal grains), bran, polyphenols (tea and coffee) and antacids (Ryan, 2004). Medications such as antibiotics as well as magnesium, aluminum, calcium salts, copper, zinc and oxides can interfere with iron absorption (Chatard et al., 1999). Subsequently, intake of these sources should be avoided at the same time of consumption of iron rich foods.

TREATMENT

Once an individual has been diagnosed with iron deficiency, treatment involves iron supplementation. This treatment is used to restore lost iron stores, prevent additional iron loss, and to maintain adequate iron levels (Chatard et al., 1999). Iron supplementation has been shown to improve aerobic capacity and endurance performance in athletes displaying low iron levels (Fallon, 2004).

Iron supplementation is provided as oral treatment through a pill (most common), as a liquid and by intramuscular injections (Chatard et al., 1999). The most common oral forms include ferrous fumarate, ferrous gluconate and ferrous sulfate which contain 33, 12 and 20 percent of elemental iron (iron available for absorption) respectively and ferric iron (Skidmore-Roth, 2010). According to Nielsen et al. (Nielsen & Nachtigall, 1998), ferrous iron salts are recommended over ferric iron because ferric iron has lower bioavailability.

Among NCAA Division I institutions that provide iron supplements, the most prevalent supplemental dose is >300 mg (>60 mg elemental) of ferrous sulfate/day (Cowell et al., 2003). However, Beard and Tobin (2000) noted that 125 mg ferrous sulfate/day is sufficient to maintain serum ferritin levels in competitive athletes. Eichner (2001) recommends 325 mg ferrous sulfate/day for individuals with serum ferritin values <20 µg/L. Conclusively, the recommendation for individuals indicated for iron supplementation (serum ferritin <35 µg/L) is ferrous sulfate with total doses between 125-325 mg/day for supplementation (Table 3).

Individuals taking iron supplementation should be educated on the proper way to optimize absorption. This includes consuming iron with Vitamin C, taking the supplement at the same time daily (and two hours apart from other medications) and avoiding taking iron with foods that inhibit absorption (calcium, caffeine). Additionally, the individual should be encouraged to eat red meat and be provided with information on iron-rich foods and foods that inhibit iron absorption.

Clinical and laboratory criteria are used to determine the effectiveness of iron supplementation. For instance, decreased fatigue, increased physical performance, ferritin levels, hemoglobin levels, transferrin saturation and appearance of reticulocytes are all indicative of effective treatment (Chatard et al., 1999). Hemoglobin should increase about 1 g/dL per week as hemoglobin levels typically increase proportionally to increases in iron supplementation (Ryan, 2004). Caution should be taken when analyzing an athlete's hemoglobin and hematocrit levels because of the hemodilution that occurs in athletes due to training resulting in significant variation.

Typically, full iron repletion requires three months of oral supplementation but the length of supplementation is dependent on the individual (Peeling et al., 2007; Cowell, 2003). Consequently, follow-up testing is strongly encouraged every six months (Nielson & Nachitgall, 1998). Gary Wilson, the Head Women's Cross Country Coach at the University of Minnesota, has integrated iron testing into his coaching program for 25 years. He notes that at least three or four tests per year are necessary to get a normal level for each individual, because what might be normal for one person may be detrimentally low for another. One athlete's normal serum ferritin levels may fluctuate between 80-85 µg/L but another's may fluctuate between 40-45 µg/L even though both athletes may be at their optimal levels.

HEALTH CONCERNS

Health concerns and precautions with iron supplementation are attributed to the dose and the conditions under which iron is taken. Health concerns involve unwanted side effects when iron is not tolerated well. These include nausea, constipation, intestinal cramps and black stools which may decrease

Table 3 – Recommended Diagnostic Levels for Supplementation

Recommended Diagnostic Levels for Supplementation				
Supplement	**Serum Ferritin**	**Transferrin Saturation**	**Hemoglobin**	**Dose/Day**
No	> 40 µg/L	> 16%	> 12 g/dL	N/A
Yes	30-35 µg/L	< 16%	< 12 g/dL	125-325 mg ferrous sulfate
Yes	< 20 µg/L	< 16%	< 12 g/dL	325 mg ferrous sulfate

Based upon (Nielsen & Nachtigall, 1998; Cowell et al., 2003; Eichner, 2001)

compliance (Skidmore-Roth, 2010). Typically these effects occur when iron is taken on an empty stomach and when the dose is above 200 mg/day (Chatard et al., 1999). If gastrointestinal symptoms occur, the individual should be advised to take iron after a meal, preferably with Vitamin C (Skidmore-Roth, 2010). Gradually increasing the dose and splitting the dose into smaller doses consumed multiple times a day can decrease gastrointestinal distress and promote absorption (Ryan, 2004). Additionally, due to the interference of iron supplements with medications, iron should be taken two hours apart from other medications. Anaphylactic shock is a risk when taking iron via intramuscular injections (Chatard et al., 1999). Therefore, only proper personnel should administer injections.

Increased risk of effects from iron toxicity occurs when serum ferritin levels are greater than 200 µg/L, which is considerably higher than individuals indicated for iron supplementation with serum ferritin levels less 35 µg/L (Chatared et al., 1999; Nielsen & Nachiticall, 1998). To safeguard against any risks, iron supplementation should not be initiated without first determining one's iron levels, and a physician should be consulted when therapeutic doses are provided (Akabas & Dolins, 2005; Ryan, 2004). The excess iron has a potential to cause dysfunction in the brain, liver and heart (Pagana & Pagana, 2009). A rare condition termed hemochromatosis occurs when an individual absorbs two to three times more iron from their diet than individuals without hemochromatosis (Ryan, 2004). These individuals are at risk for liver and intestinal damage if they receive iron supplementation. This situation is a rare phenomenon because individuals with hemochromatosis are rarely iron deficient.

KIRBY LEE PHOTO

CONCLUSION

Iron is a commonly overlooked and misunderstood nutritional element that plays a vital role in an athlete's performance. Coaches can identify athletes who are iron-deficient through symptoms such as exhaustion and decreased work capacity by blood testing serum ferritin levels. Of highest importance is prevention of iron deficiency, which focuses on educating athletes to consume adequate dietary iron sources and supplementation when indicated. Practical recommendations include:

- Serum ferritin levels below 35 µg/L are suggested to be supplemented with 125-325 mg ferrous sulfate/day (Nielsen & Nachigall, 1998; Cowell et al., 2003; Eichner, 2001)
- Iron should be consumed with Vitamin C and apart from calcium and caffeine (Ryan, 2004)
- Iron testing should be done 3-4 times/year to determine the normal iron levels for each athlete and monitored consistently though seasons
- Hemoglobin saturation levels used solely for diagnosis are not recommend due to hemodilution (Chatard et al., 1999)
- Serum iron levels used solely are not recommended due to hourly variations (Worwood, 1997; Chatard et al., 1999)
- Effects from iron toxicity can occur when serum ferritin >200 µg/L and is uncommon for individuals indicated for iron deficiency (serum ferritin <35 µg/L) (Ryan, 2004; Nielsen & Nachtigall, 1998)

Conclusively, monitoring the iron status of athletes may be the missing nutritional link for optimal performance.

DISCLAIMER

The information provided in this article should not take the place of medical advice. Any specific questions should be directed toward appropriate health care provides (medical →

doctors, pharmacists, registered dieticians, etc.).

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Strength Training

Preventing Hamstring Injuries in the Sprinter

BY JOHN M. CISSIK

For sprinters to be able to perform, they have to be healthy. One of the most common and devastating injuries for sprinters is a hamstring injury. Not only can these impact performance and training, but they can also continue to plague athletes long after the initial injury occurs. This article is going to take a brief look at the anatomy of the hamstrings and their function during sprinting, and then present exercises to help prevent hamstring injuries.

The hamstrings are a group of three muscles located on the back of the upper leg. The first is the biceps femoris, which is the outermost hamstring muscle. The second is the semitendinosus, which lies in between the biceps femoris and the third hamstring muscle. The third is the semimembranosus, which is the innermost of the hamstring muscles. While it has the largest cross-section of the three hamstring muscles, the semimembranosus is difficult to see and feel as it is covered by the semitendinosus as well as one of the adductor muscles (Smith et al 1996). Collectively, the hamstrings function to flex the knee (i.e. bring the heel to the hip) and to extend the hip (i.e. lower the leg).

During the sprinting motion, the hamstrings are active throughout all phases. As the foot is lifted off the ground, the hamstrings shorten to bring the heel to the hip. As the leg is then swung forward, the hamstrings resist extension in order to decelerate the lower leg. The hamstrings then extend the hip as the foot is drives back towards the ground.

→


Photo 1: Stability Ball Hip Raise


Photo 2: Back Raises


Photo 3: Marching


Photo 4: Inchworms

So what causes hamstring injuries in sprinters? The biceps femoris is the hamstring muscle that is most frequently injured during sprinting (Petersen and Holmich 2005, Schache et al 2012). According to a study by Schache et al (2012), the biceps femoris seems to be the muscle most important for decelerating the lower leg during the swing phase of the sprint. In fact, this muscle experiences the greatest strain (i.e. change in length) during the entire sprinting motion (Scache et al 2012). It appears that the combination of the resistance to lengthening that occurs during the swing phase, combined with an attempt to quickly switch to driving the leg towards the ground, is the culprit for many of the hamstring injuries seen in sprinting.

To prevent hamstring injuries in sprinters, it is important to strengthen the hamstrings in a particular manner that requires them to be lengthened and function eccentrically. The rest of this article is going to present a continuum of exercises to help achieve this in sprinters.

LEVEL ONE

These exercises represent the first level of hamstring exercises for the sprinter. These are important for the athlete that is unaccustomed to focused training of the hamstrings or that

Photo 5: Romanian Deadlifts

Photo 6: Good Mornings (Standing)

Photo 7: One-Legged Back Raises

Photo 8: Good Mornings (Seated)

is recovering from an injury. In the case of athletes that are unaccustomed to this type of training, these exercises should be performed for several weeks, two to three times a week. A more advanced athlete can use these as part of his or her sprinting warm-up. Note that sprinters also need to be squatting, performing lunges, and performing variations of the Olympic lifts as part of their training. The exercises described here all emphasize a stretching of the hamstrings and focus on the hip extension role of the muscles:

Stability Ball Hip Raise: Lie on your back with your legs straight. Your heels should be on the stability ball. Keeping your legs straight, lift your hips up while pressing your heels into the stability ball (see photo 1). Lower and repeat for the desired number of repetitions.

Back Raises: Lie in the back raise bench so that the backs of your ankles are supported by the ankle pads and so that the thigh pads are under your thighs. Your hips and upper body should be clear of the pads. Place your hands where they are comfortable. Keeping your trunk straight and moving from your hips, lower your upper body as far as is comfortable (see photo 2); reverse directions until your upper body is parallel to the floor. Repeat for the desired number of repetitions.

Table One: Recommendations for hamstring exercises.

	Sessions/Week	Sets x Repetitions
Level One:		
Stability Ball Hip Raises	2-3	3x10-20
Back Raises	2-3	3x10-20
Marching	2-3	3x10-20 meters
Inchworms	2-3	3x10-20 meters
Level Two:		
Romanian Deadlifts	1-2	3-5x8-15
Good Mornings (Standing)	1-2	3x6-10
One-Legged Back Raises	1-2	3x6-10
Level Three:		
Eccentric Romanian Deadlifts	1	3x2-6
Eccentric Back Raises	1	3x2-6
Good Mornings (Seated)	1	3x4-8

Marching: Stand up tall and face the course. Keeping your left leg straight, lift it straight out in front of you. As you lift your left leg, reach across your body with your right arm – attempting to touch your left foot (see photo 3). Step forward, repeat with the right leg and left arm. Continue alternating until the desired distance has been covered.

Inchworms: Assume the push-up position. Keeping your hands on the floor and your legs straight, walk your feet up towards your hands (see photo 4). When your feet get as close to your hands as is comfortable, walk your hands back out until you are again in the push-up position. Continue until the desired distance has been covered.

LEVEL TWO

As sprinters develop strength and increase the range of motion of the hamstrings, they are able to progress to the next level of hamstring exercises. These exercises all emphasize a stretching of the hamstrings followed by a contraction, emphasizing the hip extension role of the muscles. Note that these exercises need to be part of a well-rounded strength training program that includes variations of the squat, lunge, and Olympic lifts. The exercises described here should be performed one to two times a week, depending upon where the sprinter is in the year:

Romanian Deadlifts: Stand up with the barbell in your hands. Take a shoulder-width grip on the bar with your palms facing you. Your feet should be hip-width apart, with your weight on your heels. Pull your shoulders back and stick your chest out. From this position, unlock your knees. Push your hips back and lower your upper body; as you do this slide the barbell down your thighs (see photo 5). When you have lowered the bar as far as is comfortable, reverse directions. Repeat until the desired number of repetitions has been performed. It is important to maintain the chest out/shoulders back position throughout this exercise!

Good Mornings (Standing): Stand up with the barbell on the backs of your shoulders. Your feet should be hip-width apart, with your weight on your heels. Pull your shoulders back and stick your chest out. From this position, unlock your knees. Push your hips back and bend forward, lowering your upper body (see photo 6). When you have lowered your upper body as far as you are comfortable, reverse directions. Repeat until the desired number of repetitions have been performed. It is important to maintain the chest out/shoulder back position throughout this exercise!

One-Legged Back Raises: This exercise is performed exactly like the back raises described earlier, except only one leg is being supported by the ankle pads (see photo 7). Note that this exercise should only be attempted by athletes with strong hamstrings that are properly warmed up.

LEVEL THREE

These exercises represent advanced variations of the exercises in level two and should only be attempted by advanced sprinters with a long training history. Athletes performing these exercises need to be very carefully monitored to ensure that their lifting technique is sound. A high volume on these exercises (generally no more than six repetitions per set) is not recommended due to the fact that the combination of the loads that can be lifted, fatigue and poor technique could injure the athlete. These are appropriate exercises for a special preparation phase of training as well as a competition phase and should be part of a well-rounded strength training program. Due to their specialized

nature, there is no need for the advanced sprinter to perform these variations more than once a week. For the advanced athlete, the level-two exercises can still be used one to two times per week, with the level one exercises being used as warm-up:

Eccentric Romanian Deadlifts: This exercise is performed exactly like the Romanian deadlift described earlier with one important difference: Exaggerate the lowering phase of the lift, taking 10 slow seconds to descend.

Eccentric Back Raises: This exercise is performed like the back raises described earlier, but like the eccentric Romanian deadlifts you should exaggerate the lowering phase by taking 10 slow seconds to descend.

Good Mornings (Seated): This exercise is performed while sitting on a bench with the barbell on the back of your shoulders. Your legs should straddle the bench, with your feet flat on the floor. Stick your chest out and pull your shoulders back. From here, moving from the hips, lean forward as far as is comfortable, attempting to touch your chest to the bench (see photo 8). Reverse directions and repeat.

Table 1 provides recommendations on sets and repetitions for each of the exercises described in this article. Those exercises that involve a great deal of technique, place the body in an awkward position or are especially fatiguing will involve a smaller training volume than other exercises. In exercises such as back raises, Romanian deadlifts and good mornings, athletes can work up to a great deal of weight.

The hamstrings are critical muscles for a sprinter. They help to lift the foot off the ground, they help to slow down the lower limb during the swing phase and they help to drive the foot towards the ground. Not only are they important to train to improve performance, they are also important to train because they are frequently injured and this can have both immediate and long-term effects on the sprinter. Incorporating their focus into the training of sprinters can help to improve performance and prevent injuries.

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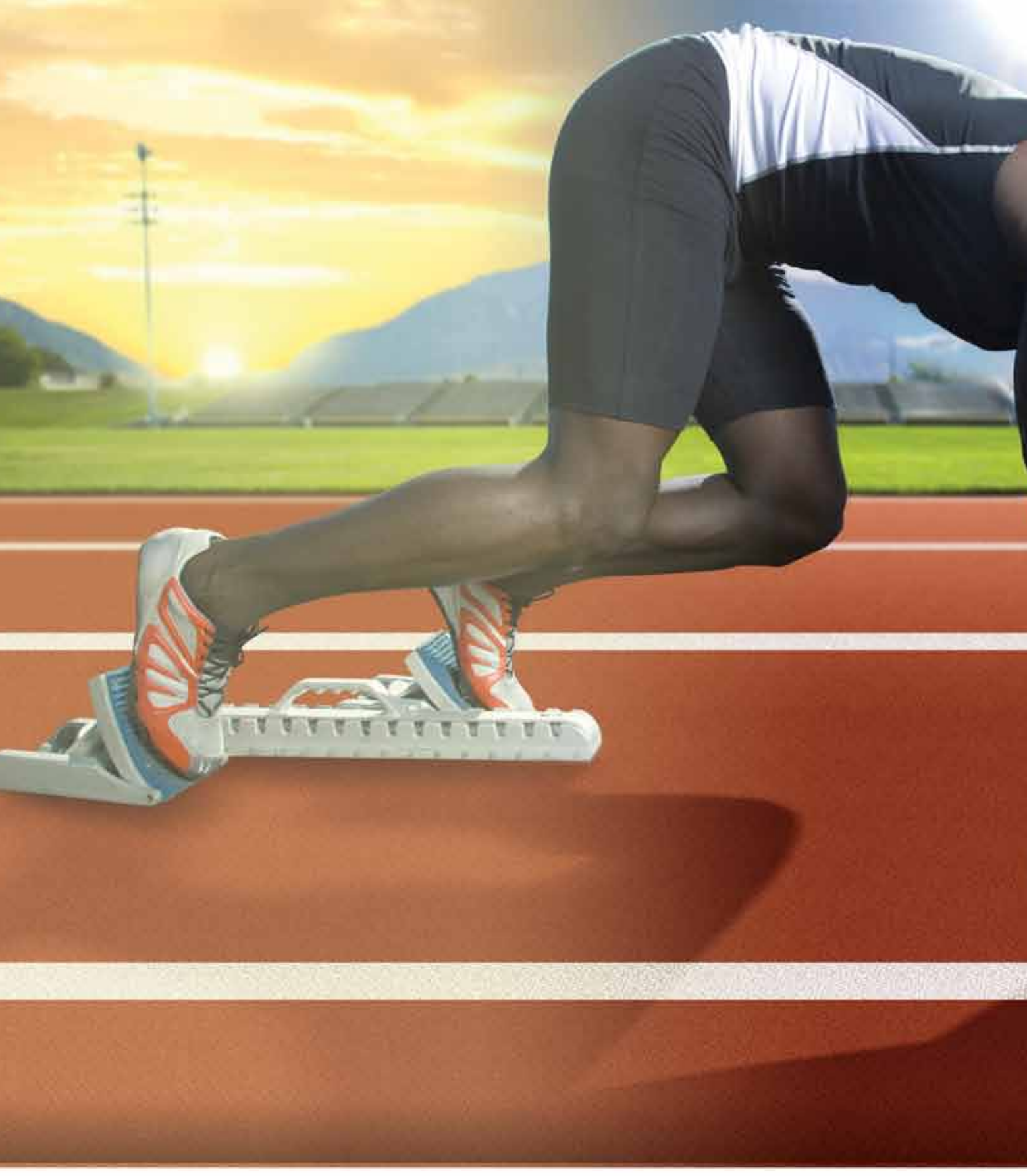

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THE TRIPLE JUMP STEP PHASE REPAIR FLOWCHART

By Boo Schexnayder
Sacspeed.com

The second (step) phase of the triple jump has been a source of frustration for generations of jump coaches. Many coaches have sought advice on improving this phase, and I have been personally asked this question hundreds of times. So many coaches are looking for the simple answer or the magic drill.

In spite of the fact that this problem has dogged jumps coaches for ages, I have never seen an article or heard a clinic presentation that was based solely on the topic of fixing the step phase. I think the reason this topic has been avoided is, to be simple, it's complicated.

The step phase is a point of collection for all triple jump problems. It effectively serves the same purpose as the "Check Engine" light on your car, signaling a need for a deep, dark and mysterious search through unpleasant countryside for problems. There are probably at least 20 triple jump faults that result in destroyed step phases. Take an athlete who makes two or three mistakes and you are looking for the proverbial needle in the haystack when repairing technique.

Combine these issues with the fact that executing the step phase requires the ability to produce huge forces in a fraction of a second. Asking athletes who are not sufficiently trained to do this is a practice doomed to failure, even if technical coaching is sound.

The chart provided is designed to work as a roadmap on this search. It provides the coach with a system of analysis and diagnosis for step phase problems, beginning at the step phase take-off and working back with cause-and-effect methodology. The chart uses a flowchart approach to this diagnostic procedure, requiring certain evaluations to be made and video checkpoints to be analyzed as the roots of these problems are unearthed.

This chart might serve as little more than a poor flashlight on this diagnostic journey, but perhaps it can play a small role in the coaching of this event. Great coaches have many such charts in their heads whether they realize it or not. Therefore, more importantly, perhaps it can serve a much larger role by demonstrating the need for and effectiveness of systematic, logic-based coaching and diagnosis in all track & field events.

Triple Jump Step Phase Repair Flow Chart

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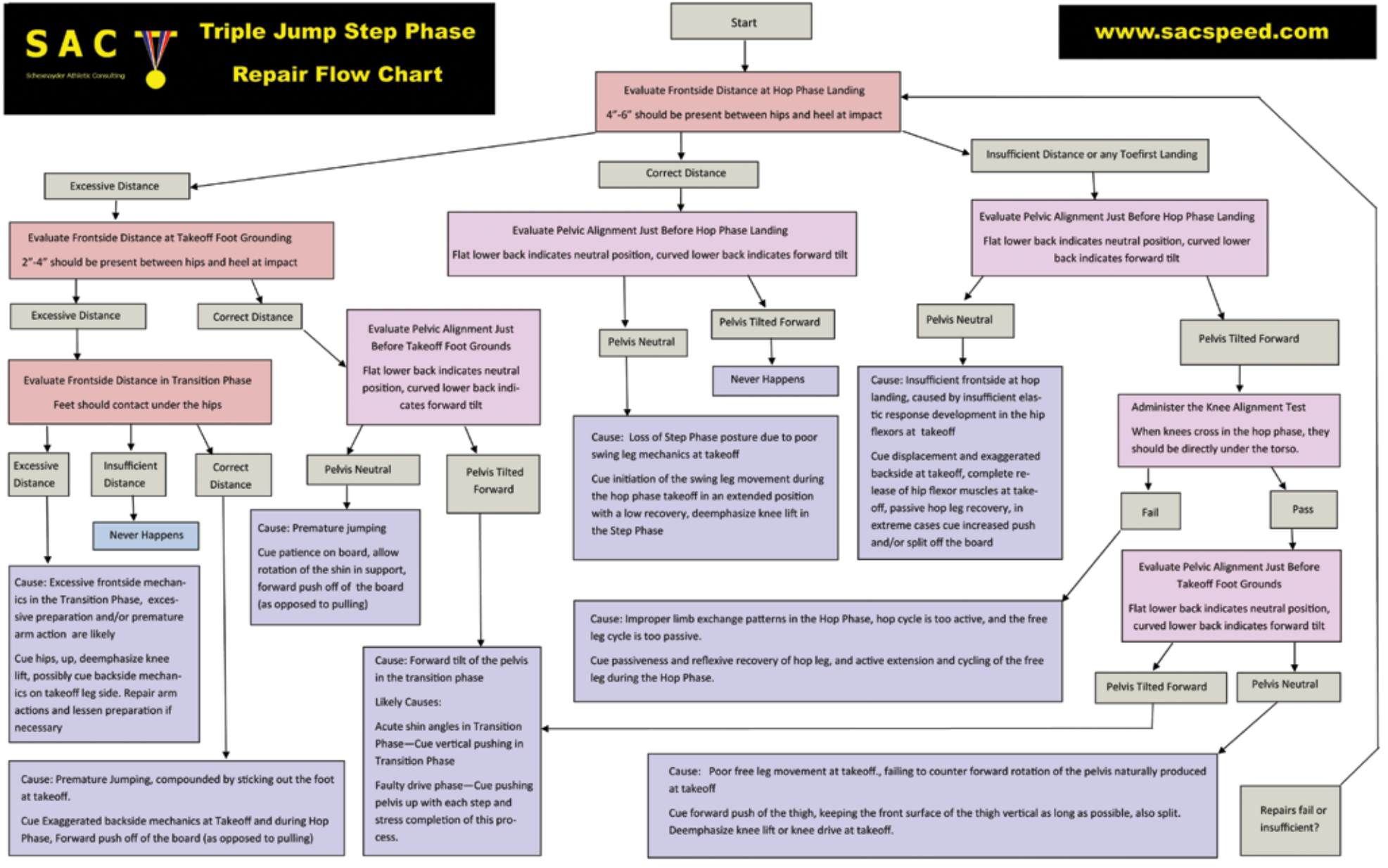

KIRBY LEE PHOTO

THE DELIVERY

TEACHING TRACK AND FIELD ATHLETES THE SKILL OF FOCUS

BY DR. RICK MCGUIRE

PART 2

In the previous issue of *techniques* (Volume 5, Number 4, May 2012) we provided "Teaching Track and Field Athletes the Skill of Focus: Part 1- The Plan." In that article we laid the foundational understanding that focus is a fundamental sport skill. And, like all skills, the skill of focus can be both taught and learned. We identified that, in fact, there are five specific individual skills that comprise the skill set of focus. These five skills include:

Time Orientation – Be in the present! Right here! Right now!
Positive Self Talk – Positive affirmations
Composure – Attain optimal arousal- not too high, not too low, just right
Concentration – Find what matters! Stay focused on it!
Confidence – It's a choice!

We also provided the cornerstone understanding that we all understand that wrong thoughts hurt an athlete's sport performance. Conversely, if wrong thoughts hurt performance, right thoughts help the athlete's performance. And, to recognize that when there is a wrong thought, all you have to do is pick a right thought, and the wrong thought is gone. Thinking right is a skill. We must teach and learn the sill of thinking right!

Being focused is the perfect example of thinking right. In fact, it is the ultimate in thinking right! Every coach wants their athletes to show up on the day of competition totally focused and intending to deliver their very best performance! Focus is just another skill! Track & field coaches are great teachers of skills! That's what we do!

So now, let's outline a plan for how coaches can teach their track & field athletes the skill of focus! If you have not already read the previous article, I encourage you to do so. In this discussion, I will be sharing how to apply the models and ideas which were provided there, but I will not be repeating them here.

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THE COACH AS AN ARTIST

We often hear reference made to the "art and science" of coaching, and I believe that it provides the absolute perfect description, or metaphor, for our role as the Coach. Great coaches are well-educated and have developed significant foundational expertise in the scientific principles representing the physiological, biomechanical, psychological, motor-neural and nutritional components that support and allow them to lead their athletes to develop and deliver high-performance excellence! To be highly effective, it is essential that coaches possess this strong scientific foundation.

But coaches don't have to teach "science class" to each athletes! In fact, that would probably become highly ineffective in achieving high performance excellence. The coach's role is to glean the key concepts from each of the sciences, integrate them into a working model, interpret and translate this information into a great teaching plan, and then articulate all of this through instructions and experiences so that the athlete understands, learns and grows in their required capabilities and skills!

This is the "coaching!" This is the creative genius of the coach putting it all together in a way that works for each athlete! This is the "artistry" that is on display in brilliant coaches! I believe in the "coach as an artist!" I respect the artistic brilliance that it takes to be an effective and successful coach!

And so, I am not going to be disrespectful of any coaches by providing you here with step-by-step cookbook recipes for teaching focus! I do not believe that coaches want or need to be taught how to color by the numbers. But I do want to help you put some new paints on your palette, then point you in some right directions, and encourage you to apply your own creative artistic genius in weaving these new ideas into your already developed coaching model.

And that leads to the essence of coaches teaching the skill of focus to their athletes. Focus should be "living" in practice everyday! Focus should, and can, be taught, learned, reinforced and strengthened throughout every practice, every team meeting, every coach-athlete conversation, every relationship, everyday, every season, all the time! It just becomes woven into all of the workouts, drills, team activities and experiences that you are already defining and providing.

But now you have some new ideas, new paints on your coach's palette, with which you can add even more beauty and brilliance to the masterpiece your are creating with your athletes! This is the art of coaching!

THE COACH AS THE ENVIRONMENTAL ENGINEER

As the coach, you are the creator, definer, shaper and provider of your total team experience. You are the primary influence of anyone, anything and everything that makes up your track & field team environment and culture. You do this through what you value, what you believe, what you do, what you don't do, what you say and what you don't say each day, every day! You are doing this patiently, consistently, persistently, insistently and relentlessly. You place your stamp, your signature, on everything that is your program!

How do you do all of this? Randomly? No! Do you make it up as you go along? No! Do you engage in this with a purposeful plan? Yes! You are the coach!!

What are the key elements in that plan? I believe that these are the keys to all great teaching, coaching and environmental engineering. And these absolutely are the keys to teaching and building the skill of focus with your team and with each athlete.

Modeling – You live it! You show them what it looks like! You talk the talk, and you walk your talk! You are the model. And, you expect the same from the entire coaching staff.

Instruction – You teach! You are the master of positive, constructive instruction.

Routine - Your athletes are very comfortable with using routines. A routine is when you do something using the same steps, the same way, and in the same order every time. Athletes learn most of their sport skills by repeating the same routine literally thousands of times. A sense of security and trust is built by following the same routine, and ultimately the routine seems nearly natural, almost autonomic. Focus is a sport skill just like their physical skills. Help them build a short three- to five-step focus routine.

Experiences – You don't just talk in your instruction. You give them specifically designed experiences and drills, which allow the athletes to learn new skills and understandings, and then grow and develop in their competency with them. You do this when you teach the physical skills. Now do the same with focus, the mental sport skill.

Repetition – You don't teach and experience important things just once. No, you teach and experience important things repeatedly! Repetition … repetition … repetition … and more repetition!

Have an Anchor! – Your program needs an anchor, a cornerstone, a source of strength that everyone can go to, or hold onto, when things are really hard, or even on the verge of falling apart! The anchor provides that sense of security, that "we can do this" The anchor can provide the cue and the trigger to initiate the athlete's choosing to take control and focus! As a sport that has a particularly individual nature to it, it may be appropriate to have one general team focus anchor, and then, in addition, an individually specific anchor for each athlete.

THE PLAN –TAKING FOCUS TO PRACTICE EVERYDAY!

This is great! Now, how do you do it? How do you teach docus? How do you get the athletes to learn focus? How do you infuse focus into your team culture? How do you get to have focus live in and throughout your team environment?

I think that you already know the answers to these questions. Or at least you are more than beginning to see the connections to a whole lot of other things you already are doing as the coach. This is what you do. You coach, you teach and you create and shape environments (McGuire, 2012).

Just like in the development of all of the other skills of track & field, the building of the skills of thinking right and focus with your team must be seen as a part of every day's normal routine. You literally must take focus to practice everyday, and with time, focus will come to live in your environment and just become a regular part of what you and your athletes do, just like warm up, or pre-jump routines, or a team circle!

I will share here some examples of applications for each of the key concepts. These are just ideas to help jump-start your own creative genius. Remember, these are intended to serve as a catalyst and not as a cookbook!

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MODELING

• Coaches must model focus.
• Coaches must model being in the present.
• Coaches must model positive self talk.
• Coaches must model maintaining composure.
• Coaches must model concentration.
• Coaches must model confidence as a choice.
• Same expectations for all staff members, including anyone and everyone with a role with the team. Everyone must teach and model focus! This cannot be emphasized enough! Every coach on the staff must buy into the importance of focus! And then they must be accountable in delivering their role in modeling, instructing and nurturing the development of focus with and for every athlete!
• Modeling must happen on and off the field, in practice and during competitions.
• Make staff T-shirts that carry the key focus messaging. Boldly portrayed messages could include such affirmations as: "Bring Your Best Focus Today;" "Where Are You? Right Here! Right Now!;" "Be Positive! Think Right!;" "Concentrate"; "Get in Your Zone!;" "Trust;" "See It! Feel It! Trust It!;" "S-F-T."
• Team T-shirts, with these same messages, give the players a vehicle to both affirm themselves and to display the model for their teammates and others.

INSTRUCTION

• Provide initial instruction in a controlled classroom setting, free from distractions.
• Use positive constructive instruction. Positive – modeling positive self talk. Constructive – demonstrating "building" skills and behaviors, rather than destructive, negative and tearing down.
• Engage athletes in this verbal dialogue; question: "Where Are You?" Answer: "Right Here, Right Now!" Being consistent and persistent are key. You could begin every practice with this, or just prior to every drill or interval, or when sensing athletes being distracted, etc.
• Engage athletes in writing their own personal affirmations, including a personal affirmation about their team and the team's mission. Encourage athletes to read their affirmations regularly and repeatedly, both out loud and to themselves, until they know them! Until they are in their minds to stay! You can't have the habit of positive self talk unless you have positive affirmative thoughts in your mind.
• Teach athletes the critical importance of optimal arousal, and engage them in finding what is optimal for each of them, and in the skills of regulating and controlling their arousal.
• Teach Cook's Model of Concentration. Teach in a manner that allows the athlete to identify with specificity "the information that matters" for them to be successful, and where to look for it and how to find it.
• Emphasize the "feel it" aspect of the "see it! Feel it! Trust it!" concentration mantra, and its impacting connection to the athlete's kinesthetic Genius.
• Instruct specifically and model emphatically that confidence is a choice! Never deviate from this message! Confidence is just a thought, and just a choice!

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• Have athletes keep and utilize logs of their focus skills development, or create Individualized focus notebooks or workbooks.

ROUTINE

• Observe – Strategy – Image – Trust
• See it! Feel it! Trust it!
• Between jumps, throws, starts, repeats, etc.

Step #1 DEACTIVATE – Take control. Take a deep cleansing breath. Blow that breath out. Park any bad stuff.

Step #2 AFFIRM YOUR SELF - "I am great!" "I am ready!" "I will deliver!"

Step #3 REFOCUS - What matters? What are my keys? Cues?

Step #4 REACTIVATE - Get in your zone! See it! Feel it! Trust it! Where are you? Right here! Right now!

Step #5 DELIVER YOUR BEST!

EXPERIENCES

Your athletes will become receptive, learn, utilize and gain competence with these mental skills at different rates. Have the players who buy into it, and get good at it early, share with their teammates, and teach them how and why it works for them. Model similarity provides a powerful model.

Get all coaches involved in the instruction. Within your event groups, when the event coaches are reviewing the previous weekend's performances and outlining the plans for practice and training for the week ahead, have them also include reviewing, scripting and verbalizing the routine that the athlete should be using between attempts in the jumps or throws, or prior to each block start in the sprints/hurdles, or between each effort in an interval workout. This is to both emphasize the legitimacy of this as a critical sport skill, and to give specific direction, instruction and experience as to how and when it is to be implemented.

During the event group meetings, encourage and empower those who get it to share with their teammates how they do it.

In practice, while doing drills, or a series of jumps, throws, starts or repeats , instruct the athletes to speak loudly the thought routine that they are thinking in preparation for the next practice performance. Yes, to literally think out loud! Even very loudly! And, yes, this necessarily means that there will be an everybody-talking-at-once cacophony happening. But the coach on the field will get to hear firsthand what the athletes are thinking, and identify those who are thinking wrong. It will give the athletes both the message and the experience that they are really supposed to be actively doing this focus thing right now, and the experience of having to have the discipline to think clearly when there is a lot of other stuff going on around them. This experience may sound silly at first. Think about it. Work with it. This literally has focus living on the track and the field!

Apply focus routines and drills during strength and conditioning settings, challenging athletes to be able to control their thoughts, control their arousal, control their concentration, to use personal affirmations, and to choose to think confidently prior to every performance!

Using the same messaging as described in Modeling #9, create signage to blast the focus throughout the track & field facility, your locker room, weight room, practice area, team bus, the dining area, the athletes' bedrooms. Wherever you are able to be providing an important message to your athletes, send your message! Brand your team culture and environment with the importance of focus!

Be creative!

REPETITION

• Repeat … repeat … repeat … repeat!!!!
• One day at a time! Day after day! Every day!
• Season after season … year-round!
• Regular … consistent … and thorough!
• Consistent, persistent, insistent … and, relentless!

THE ANCHOR

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• The anchor is the place to look to remind you to take control, to use your mental skills, to be right here! Right now! To Have positive self talk, to stay composed, to concentrate and to choose to be confident! To be a good anchor, we need to find something that will always be there in every track & field setting! You can effectively use anything that works for you, or the athletes can have their own personal anchor.

• For high jumpers or pole vaulters, the anchor could be the right standard. Or for the throwers, the anchor could be the right sector line. For hurdlers, it could be the right post in the hurdle. These each make great anchors!

• Why the standard, sector line, or post? Because they will always be there! Every track & field facility has standards, sector lines and hurdle posts!

• Why the right standard, sector line or post! Because it is the right, not the left! Because it is right, not wrong! Because we want to always be thinking "Right here! Right now!" Because we want to always think positive thoughts, right thoughts! We need to have the right optimal arousal. We want to find the

right information, and stay focused on it! We want to think confident! All of this is thinking right!

• Looking at the right standard, right sector, or right post reminds us, and demands us, to think right!

• When you look to the right anchor, it says back to you … "When you are on the track, be on the track! When you are in the circle, be in the circle! When you are on the runway, be on the runway! Right here! Right now! Think right! Take control! Be confident! Trust yourself! Deliver your best!

• There will always be challenges in a track meet! And there will always be jump standards, sector lines and hurdle posts at a track meet! To help you stay focused, just look to the right standard, the right sector line, or the right hurdle post! Take the right from the right anchor! Now, think right! Focused! Deliver your best performance!

• So what about middle-distance and distance runners? They don't have standards, sector lines or posts to use as their anchor. Obviously! But there is surely something that is always there, in your environment and where ever you go to compete! Be creative! And, know for sure that you can always take a red Sharpie marker and write the anchor on the athlete's right hand! You could write "Trust" or "Believe" or "Right Now" or whatever works! But just be sure to write it on the right hand, because you want it to be the right anchor!

• The anchor – It's not a trick. It's an aid, to encourage you to use your skills. It's an aid to play your best. This is the ultimate in taking it to the field!

• Coach, teach your athletes to use their anchor!

THE "A" WORD – ACCOUNTABILITY

The challenge is to defeat the enemy! But the enemy is not another athlete! The enemy is not an opposing competitor! The enemy is not the event! Never can we let the opportunity to run, to jump, to throw, or to do all of them, become our enemy!

The enemy is distraction! From whatever the source, internal or external, distraction is the enemy of high performance excellence! Distraction is thinking wrong! And thinking wrong hurts our performance! We can never perform at our very best if we are distracted!

Focus is thinking right! When there is focus there is no distraction!

This is not about magic tricks, good-luck charms or superstitions! This is all about learning and applying new skills!

To the players – you, the players, are learning these skills! You are developing these skills! You have these skills!

Now it is about one thing: accountability!

Accountability is making the decision, making the choice to do what is expected and what is needed! We need you to be accountable to learn these skills, practice these skills and use these skills to deliver your very best!

Don't try to fake it just because nobody can see how you think! You can't fake it, because we can see how you perform! And, you can only perform great if you are thinking right and are focused!

We are not learning these skills in preparation for the "easy" competitions! We are learning these skills to prepare us to be able to deliver our very best performance in our championship season, when delivering our very best is necessary!

And, when we compete in those championship meets, and we will compete in those championship mmets, if you haven't already learned your focus skills, practiced your focus skills, used your focus skills in competitive situations, if you don't already have your focus skills, it will be too late to get them in the middle of the championship meet, when the challenge comes right at you!

No, you can't buy collision insurance for your car after you hit the tree! No, you can't decide you need these skills after the first heat of the 1500 meters in the championship meet, when you are in the third heat!

We need every athlete on this team to be accountable to learn, to practice and to use these skills, every day, every drill, every competition, every time!"

Accountability is making the decision, making the choice to do what is expected and what is needed!

Demand accountability from yourself! Demand accountability from your teammate! Be accountable to yourself! Be accountable to your teammate!

KEY SUMMARY POINT FOR COACHES

• The head coach and staff must be accountable! If you believe in this and you want it to live in your team and in your team culture and environment, then it will! But it all starts with the coach, and then the coaching staff! You must be accountable! You must choose to meet the expectations that you have for the team! If you do, then they will too!

• Model!

• Teach! Positive constructive instruction!

• Provide great experiences!

• Repetition!

• Use your anchor!

• Wrong thoughts hurt performance! Right thoughts help performance! Choose to think right! Be focused!

• Give your team the opportunity to perform their very best!

• Where are you? Right here! Right now! Focused!

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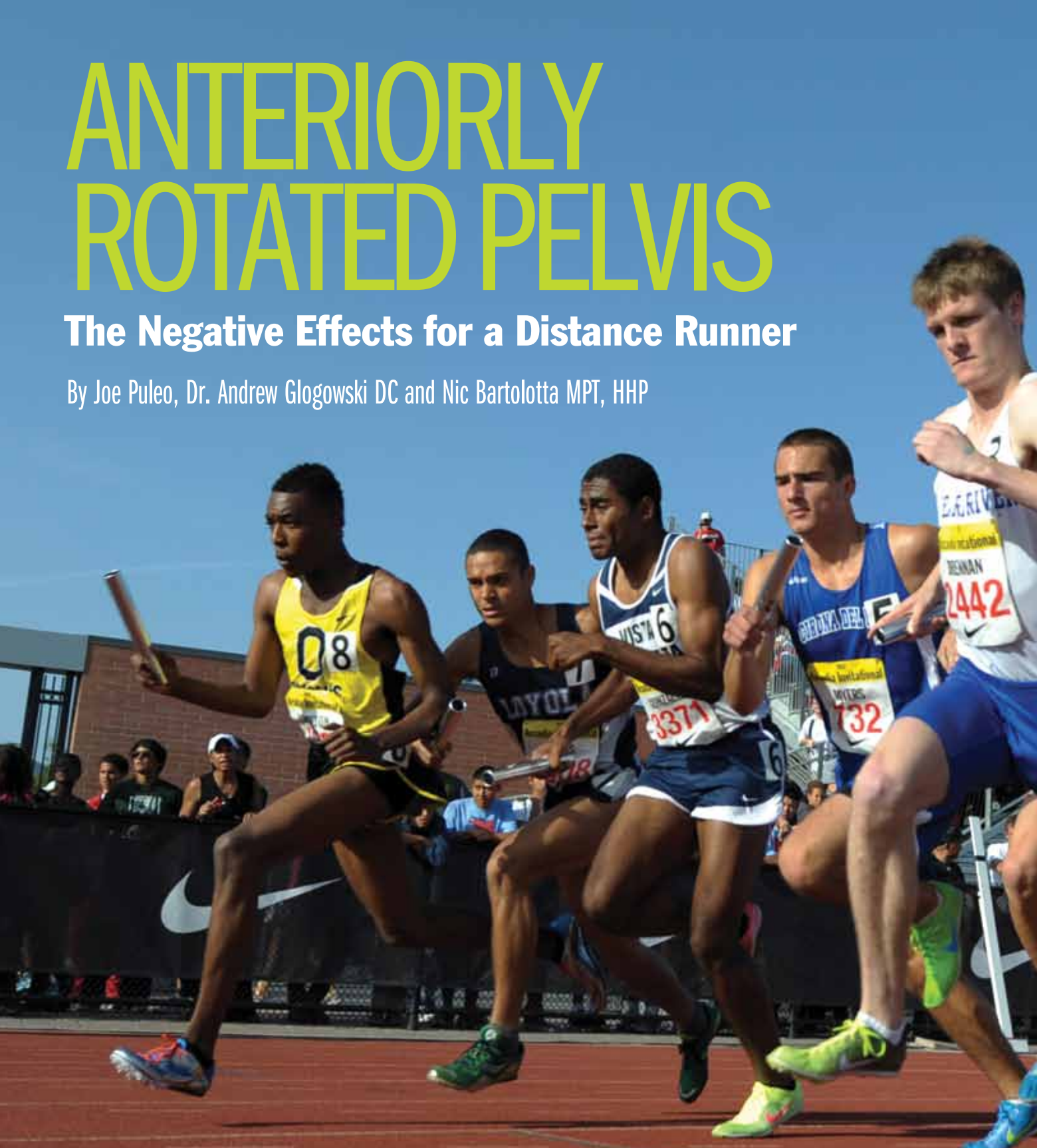
ANTERIORLY ROTATED PELVIS

The Negative Effects for a Distance Runner

By Joe Puleo, Dr. Andrew Glogowski DC and Nic Bartolotta MPT, HHP



Thirty years ago, running-related injuries such as shin splints and tibial stress fractures, chondromalacia, and Achilles tendonitis were evaluated by analyzing the biomechanics of the foot. After this analysis, and this analysis only, an injury treatment plan was developed. Approximately 10 years ago, discussions of common running injuries began to include the possibility of anterior pelvic rotation as a major culprit in patella-femoral syndrome, ITB syndrome and piriformis pain. Over the past five years, core exercises have become the backbone of many runners' strength training programs, specifically those exercises targeting the gluteus muscles as well as the psoas and the other hip flexor muscles. This shift in focus represents a significant paradigm shift, moving away from the traditional "bottom-up" podiatric model of injury causation, towards a more "top-down" pelvic tilt-related understanding of running injuries, specifically those from the knee to the hip.

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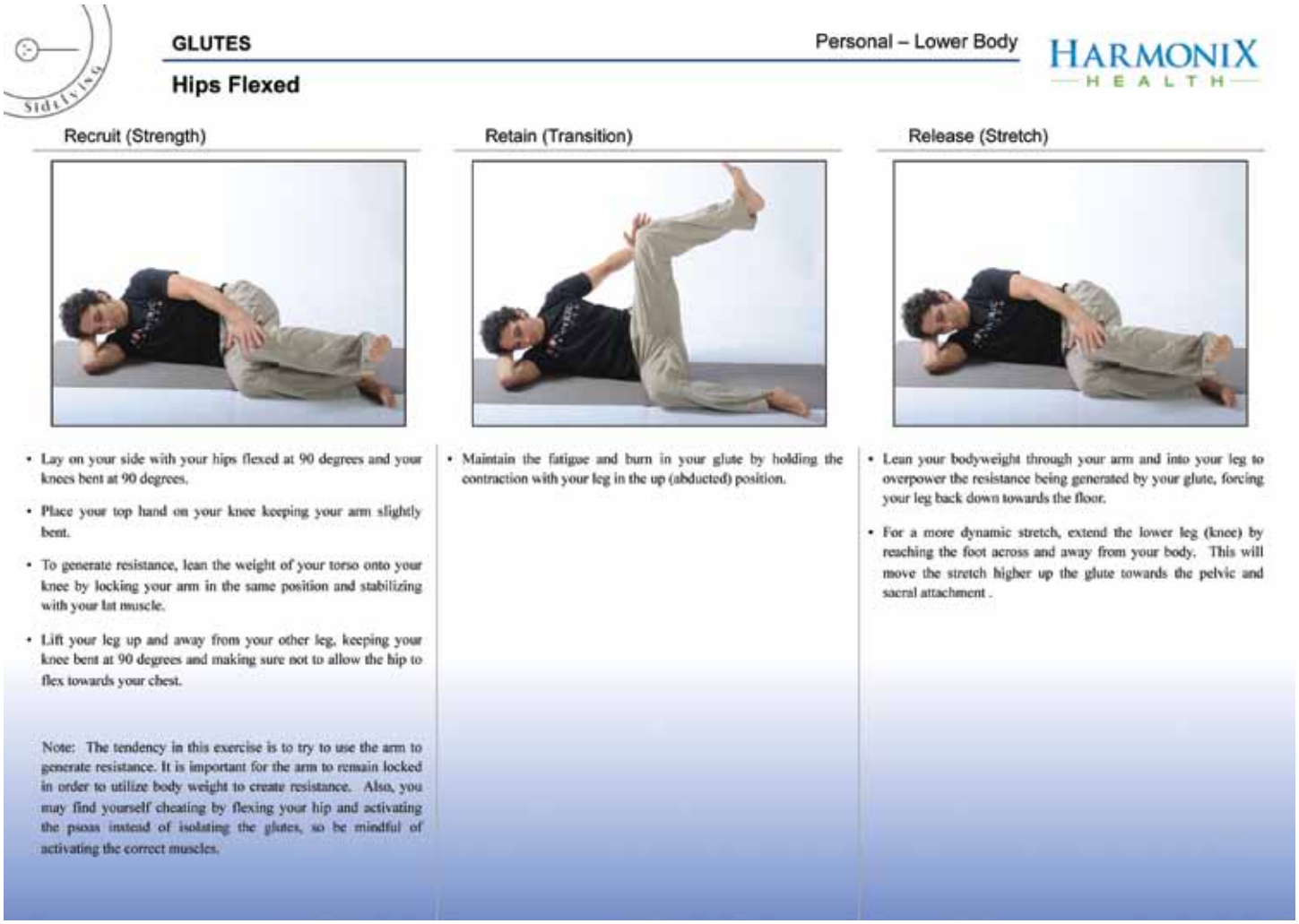

The goal of this article is to examine the shift in the methodology involved in examining running injuries from a traditional foot-based, podiatric model to a pelvic tilt (specifically an anterior tilt) model. Also, this article proposes to thoroughly explain this new model of injury causation and offer a treatment strategy which combines ART® (Active Release Techniques) and DCT (Dynamic Contraction Technique) specific strength/stretching exercises which can function as both prehab and rehab for runners.

ORIGIN OF THE "BOTTOM-UP" MODEL

The basis of the podiatric model for treating running injuries was established in the mid 1960s by Dr. Merton Root, a California podiatrist who coined the term "podiatric biomechanics." Simply put (and this is no easy task because the foot and ankle are a very complex network of soft-tissue, bones, and nerves), the foot, upon landing, pronates via movement of the subtalar joint. This pronation is significant (over-pronation), normal, or minimal/under-pronation). Although pronation happens in three planes, the emphasis, in this model, is on the sagittal plane. Once the foot achieves mid-stance the foot accelerates through a supination phase, ensuring push-off. The pronation or lack thereof and the subsequent position and movement of the foot determines what happens "up" the kinetic chain all the away to the hip. Hence, faulty biomechanics of the feet cause all chronic running-related injuries.

This is a straightforward concept (given the publication of Dr. Root's *Biomechanical Examination of the Foot* Vol. I and *Abnormal Function of the Foot: Clinical biomechanics* Vol. II), and makes a lot of common sense. The foot is the initial point of contact for the runner's body and the surface he/she is running on. Given the amount of impact force (on average, three to five times the runner's body weight) on a relatively small structure (although ingeniously designed as a cantilever), any breakdown (over- or significant under-pronation) of the foot/ankle complex's movements will need to be compensated for by the muscles and soft tissue above the foot/ankle in order to ensure proper motion for the runner. Once these compensatory structures become overloaded, they, in turn, break down, and an injury occurs. The injury is treated as a symptom of the foot pathology (normally over-pronation) and a course of treatment (usually custom orthotics or over-the-counter inserts) are prescribed.

ESTABLISHING A NEW PARADIGM- "TOP-DOWN"

The obvious question is: "Are all chronic running-related injuries caused by improper foot motion?" If the answer is "no", or "maybe not," this leads to more questions.

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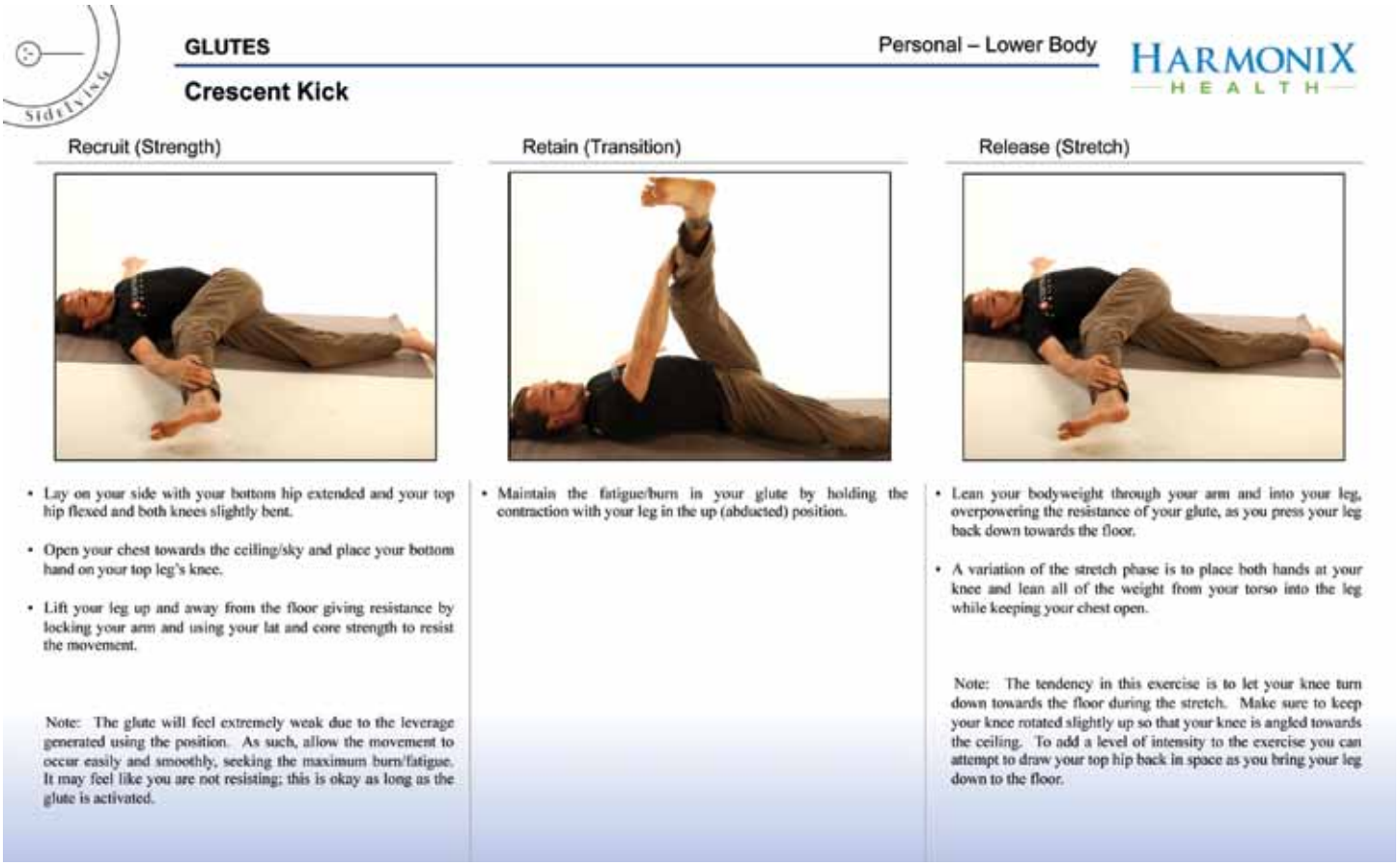

Specifically, the next question could be, "If the foot is not the culprit for all running-related injuries, what part of a runner's anatomy could be a culprit?" The knee is not the answer, because it is a "dumb" joint. Although it functions, like the foot, in three dimensions, it is essentially a hinge. It is the nexus of the lower and upper leg; however, its movements are dictated to it, it does not do the dictating.

Runners often suffer hip injuries, but the ball and socket joint is not the culprit in chronic injuries, so chronic running injuries of the hip are not the hip itself, but usually the soft tissue surrounding the hip. Since the soft tissue (muscles/tendons/ligaments) surrounding the hip attach or insert in the pelvis, a new model for understanding running injuries begins to emerge. Specifically, due to shortening of the psoas muscle and hamstring muscles (normally the biceps femoris short-head), the glutes, specifically the gluteus medius, become very tight, and thus functionally shorter than normal. This shortening requires compensatory movements through the recruiting of other soft tissue structures and joints that can lead to muscle imbalances, tendonitis and fascial damage.

The majority of running problems arise from an imbalance in the gluteal muscles that result in an anterior pelvic tilt. The gluteus medius is responsible for adducting, extending and laterally and medially rotating the hip. Simply, it is the most important muscle in the runner's body, and how well it functions dramatically affects your quadriceps, psoas, smaller hip flexors, adductors and overall pelvic stabilization. Since running involves a relatively small, fixed range of forward motion, there is constant tension between the front and back of the leg muscles, placing the gluteus medius in constant contraction. Without proper strength and proper health of this muscle, running injuries will arise. Specifically, an inhibited/weak gluteus medius recruits the psoas to stabilize the lumbo-pelvic region, thus anteriorly rotating the ilium. It is not simply that the psoas is strong and the hamstrings are weak (although it could be case), but more that one muscle group/system "won out" over the other.

Many runners also experience IT Band Syndrome, which can be both a symptom and a cause of an anterior pelvic tilt. An anterior pelvic tilt can be a major causative factor in IT Band Syndrome because the gluteus maximus, tensor fascia lata (TFL) and gluteus medius all have fibers that run into the IT band and consequently are responsible for its proper function. Since the origin of the IT Band attaches to the superior gluteal muscles, its middle portion lies on top of the vastus lateralis, and it ultimately inserts on the lateral aspect of the tibia any change in pelvic tilt can directly impact the IT band. Similarly, weakness, fibrosis and fascial contraction of the proximal aspect of the IT band and its affect on surrounding anatomical structures are some of the reasons pelvic tilt can occur and is not easily corrected. So, iliotibial band tightness can be both a symptom and a cause of an anterior pelvic tilt.

If the pelvis is not stabilized due to weakness or fibrosis (scar tissue), risk of injury increases to the local joint complexes, which are the low back (SI joint) and knees. Patella-femoral syndrome's etiology is anterior loading on the soft tissue struc-

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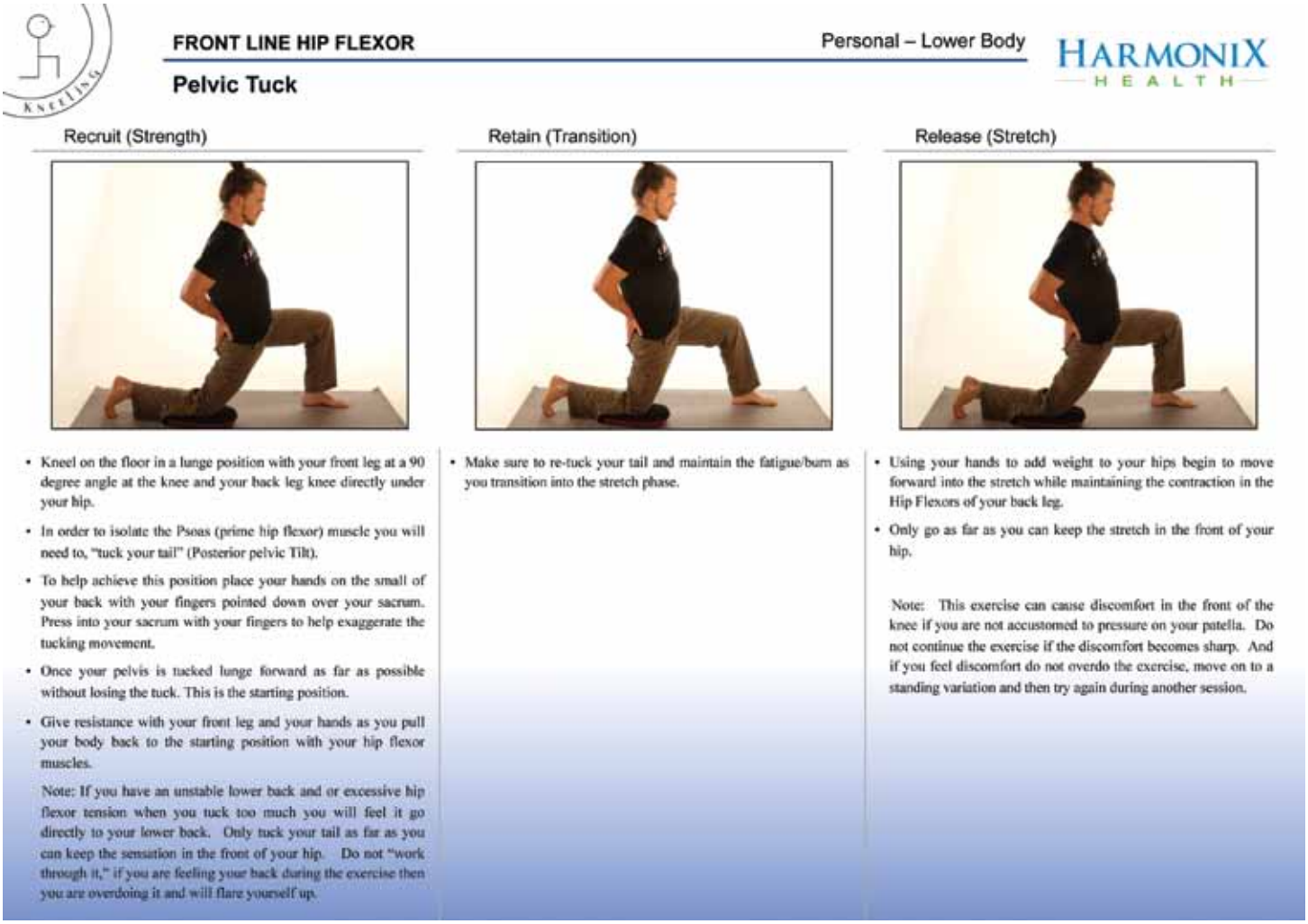

FRONT LINE HIP FLEXOR

Personal – Lower Body

HARMONIX HEALTH

Pelvic Tuck

Recruit (Strength)

- Kneel on the floor in a lunge position with your front leg at a 90 degree angle at the knee and your back leg knee directly under your hip.
- In order to isolate the Psoas (prime hip flexor) muscle you will need to, "tuck your tail" (Posterior pelvic Tilt).
- To help achieve this position place your hands on the small of your back with your fingers pointed down over your sacrum. Press into your sacrum with your fingers to help exaggerate the tucking movement.
- Once your pelvis is tucked lunge forward as far as possible without losing the tuck. This is the starting position.
- Give resistance with your front leg and your hands as you pull your body back to the starting position with your hip flexor muscles.

Note: If you have an unstable lower back and or excessive hip flexor tension when you tuck too much you will feel it go directly to your lower back. Only tuck your tail as far as you can keep the sensation in the front of your hip. Do not "work through it," if you are feeling your back during the exercise then you are overdoing it and will flare yourself up.

Retain (Transition)

- Make sure to re-tuck your tail and maintain the fatigue/burn as you transition into the stretch phase.

Release (Stretch)

- Using your hands to add weight to your hips begin to move forward into the stretch while maintaining the contraction in the Hip Flexors of your back leg.
- Only go as far as you can keep the stretch in the front of your hip.

Note: This exercise can cause discomfort in the front of the knee if you are not accustomed to pressure on your patella. Do not continue the exercise if the discomfort becomes sharp. And if you feel discomfort do not overdo the exercise, move on to a standing variation and then try again during another session.

tures of the knee due to dysfunction of the pelvis. An anterior pelvic tilt causes lengthening and tightening of the hamstring resulting in abnormal loading of the knee capsule and anterior ligaments. Overuse in these tissues is the main reason for dysfunctions to appear in the first place. Overuse injuries are always multi-factoral, meaning that the first incident of pain is a result of multiple dysfunctions that have developed over a period of weeks or months, even years. There are a multitude of dysfunctions (aberrant motion patterns, weakness, nerve entrapment etc.) but for the sake of simplicity only fibrosis will be discussed.

FIBROSIS

The biggest problem that most runners encounter is destabilization in the hip complex, which is most responsible for the action of running. Classically, with overuse, weak and/or tight tissue becomes hypoxic (lacking oxygen) resulting in the creation of fibrous tissue. Muscle fiber direction runs in precise orientation in relation to the movement required. However, fibrous tissue lies with a disorganized orientation that has a destructively powerful influence on our bodies. A series of compensations occur, usually soft tissue tightening resulting in more fibrosis. Once compensation reaches a certain level, a pain response occurs that may not be from the original source of dysfunction.

A greater understanding of soft tissue injuries has emerged in the past few years transitioning from an inflammatory model to a degenerative model. Tendon biopsy studies have shown that in chronic injuries inflammatory cells were not found, but rather degenerative cells like fibroblasts. One of the important discoveries in the past few years is the myofibroblast found in fascia. The myofibroblast is a cell that contracts when exposed to degenerative stimuli, but does not contract with acetylcholine or other muscle stimulants. The premise of fascia, which covers our entire body, contracting has the potential to be a significant component of common ailments like low back, hip, and foot pain. Most running injuries are overuse in nature and have physical manifestations of fibrotic adhesions and fascial damage. Evaluating running injuries through the degenerative model allows an examination of the efficacy of common treatment methods.

HAMSTRING Personal – Lower Body

HARMONIX HEALTH

Straight Leg - Central

Recruit (Strength)

- Reach your chest forward to a comfortable position.
- For resistance kick your leg down into the floor in order to push your torso away from the leg.
- Repeat until the muscle fatigues and starts to burn.

Note: If you are having a hard time with the movement, just hold an isometric contraction at a particular range until the muscle fatigues.

Retain (Transition)

- Before performing the stretch connect to the hamstring by continuing to kick the leg into the floor.

Release (Stretch)

- Moving from the up position continue to resist with the hammy and reach your chest forward and out keeping your back flat and using your body weight to assist you in the stretch.
- For added resistance you may grab under your thigh and pull yourself towards your leg.

Note: If you decide to pull with your hand remember to keep kicking with your leg.

TREATMENT TECHNIQUES

Active Release Techniques ® (ART) is a manual method which focuses on removing fibrotic adhesions from muscles, ligaments, tendons and nerves. ART providers evaluate soft tissue structures for fibrous adhesions and use a direct tension based contact for removal. There are also multiple instrument-based forms of myofascial release for removing adhesions and lengthening fascia. As discussed, removing adhesions from the pelvic complex and proper strengthening of the gluteus medius is essential for proper stabilization of the pelvis to avoid anterior pelvic tilt.

Included in this article are four Dynamic Contraction Technique stretches that specifically target the glutes and hamstrings, helping alleviate the muscle and fascial tension caused by the repetitive, small-range motion of distance running. DCT works by isolating a muscle using concentric contractions to recruit specific muscle fibers until a perceivable "burning" sensation is felt. Once the intended muscle is fatigued (burning) an isometric contraction is used to maintain the muscle fatigue while transitioning into an eccentric contraction. The eccentric contraction is the means by which DCT exercises facilitate the release of both muscle and fascial tension. The mechanism of the DCT resides in the unique mechanical function of the eccentric contraction. When muscle tissue is sufficiently fatigued around areas of tension in the body and then subjected to an eccentric contraction there is a distinct translation of an external force to that of an internal force directly opposing the area of restriction in the muscle or fascia. This physiological phenomenon allows the user of DCT to systematically reintegrate their muscle and fascial systems optimizing function and performance.

Distance training without stretching (dynamic), strengthening and bodywork (such as ART®, deep tissue massage, and acupuncture) will ultimately exacerbate inherent muscle imbalances by creating chronic muscle tension. It is the goal of this article to present another paradigm, the "top-down" model for evaluating injuries caused by anterior pelvic rotation, and to offer treatment options (ART® and DCT) to keep runners healthy and injury free.

Joe Puleo is the Head Men's & Women's Track & Field and Cross Country Coach at Rutgers University – Camden and the co-author of the book Running Anatomy.

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UPDATES FROM THE NCAA ELIGIBILITY CENTER

BY JOHN PFEFFENBERGER

In the last installment of Updates from the NCAA Eligibility Center, we discussed some new academic rules in Division I that would impact high school students who plan to enroll at an NCAA Division I college or university on or after August 1, 2015. After some additional consideration by the NCAA membership, it has been decided that in order to allow more time for coaches, administrators and especially prospective student-athletes to learn and understand about the new requirements, the new effective date will be for prospective student-athletes planning to enroll at an NCAA institution on or after August 1, 2016.

Just a quick reminder of the new academic requirements, as referenced in last quarter's article:

FULL QUALIFIER

A Full Qualifier may receive athletics aid (scholarship), practice and compete in the first year of enrollment at the Division I college or university. The Full Qualifier must complete 16 core courses, ten of which must be completed before the seventh semester (senior year) of high school. In addition, seven of the ten courses must be in English, math or science. The required minimum GPA for Full Qualifiers on core-courses will be 2.300. Note that the grades earned in the ten courses required before the senior year are "locked in." This means that the prospective student-athlete will not have the opportunity to improve these grades. Prospective student-athletes must also meet the competition sliding scale requirement of grade-point average and ACT/SAT score (this is a new scale with increased grade-point average test score requirements), which can be found on the NCAA Eligibility Center's website, www.eligibilitycenter.org. The final requirement is that a student must also graduate from high school.

ACADEMIC REDSHIRT

The academic redshirt may receive athletics aid (scholarship) in the first year of enrollment and may practice in the first regular academic term (semester or quarter) but may not compete in the first year of enrollment. After the first term is complete, the student-athlete must be academically successful at his/her college or university to continue to practice for the rest of the year. The Academic Redshirt must complete 16 core courses; have a minimum core-course grade-point average of 2.000; meet the academic redshirt sliding scale requirement of grade-point average and ACT/SAT score; and graduate from high school.

NONQUALIFIER

A nonqualifier may not receive athletics aid (scholarship), cannot practice and cannot compete in the first year of enrollment. A Nonqualifier is a prospective student-athlete who fails to meet the standards for a Final Qualifier or Academic Redshirt.

If you have questions about the new NCAA Division I academic requirements, please visit the NCAA Eligibility Center's website (www.eligibilitycenter.org) and consult the 2012-13 NCAA Guide for the College-Bound Student-Athlete.

In addition to the changes in academic requirements in NCAA Division I, the NCAA Eligibility Center also has some important reminders for coaches and future student-athletes. I thought I would take the rest of this quarter's column to provide some general reminders, as we approach the start of the 2012-13 school year.

2012-13 HIGH SCHOOL SENIORS

Take the ACT and/or SAT again, if necessary. The NCAA Eligibility Center will use the best scores from each section of the ACT or SAT to determine your best cumulative score.

Continue to take college-preparatory courses.

Check the courses you have taken to match your school's List of NCAA Courses.

Review your amateurism responses and request final amateurism certification on or after April 1 (for fall 2013-14 enrollees) or October 1 (for spring 2014 enrollees).

Continue to work hard to get the best grades possible.

Graduate on time (in eight academic semesters).

After graduation, ask your high school counselor to send your final transcript to the NCAA Eligibility Center with proof of graduation. The NCAA Eligibility Center accepts transcripts electronically through Docufide/Parchment, e-Scrip Safe, ConnectEdu, National Transcript Center and Xap.

2012-13 HIGH SCHOOL JUNIORS

Register to take the ACT, SAT or both and use the NCAA Eligibility Center code "9999" as a score recipient for the exam. Doing this sends your official score directly to the NCAA Eligibility Center.

Continue to take college preparatory courses. Double check to make sure the courses you have taken match your school's List of NCAA Courses.

Ask your high school counselor to send an official transcript to the NCAA Eligibility Center after completing your junior year. If you have attended more than one high school, the NCAA Eligibility Center will need official transcripts from all high schools attended. (The NCAA Eligibility Center does NOT accept faxed or emailed transcripts/test scores.) Please see above in the high school senior's section for the list of acceptable electronic transcript services.

Before registering for classes for your senior year, check with your high school counselor to determine the number or core courses that you need to complete your senior year.

FINAL REMINDERS

Effective for those students that register on September 1, 2012 or after, the NCAA Eligibility Center has revised its current fee structure. The new fees will be $70 for U.S., U.S. Territories (including American Samoa, Guam, Northern Mariana Islands, Puerto Rico and U.S. Virgin Islands) and Canadian students. All other international students will be charged $120.

If you have questions or ideas for additional article topics, please feel free to contact me a jpfeffenberger@ncaa.org.

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