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Benefits of Mindfulness for Wellness and Sport

by Erin G. Mistretta, MA and Carol R. Glass, PhD

Mindfulness is having a zeitgeist moment, with the “mindful revolution”¹ spreading throughout society at large as well as within the fields of mental and physical health. Wellness advocates and the media have touted the benefits of mindfulness, and companies have seized the term to advertise products. Mindfulness might seem like a novel approach designed to help make us happier, calmer, and healthier overall, but it actually stems from concepts found in ancient Eastern spiritual practices, such as Buddhism.

In Buddhism, mindfulness involves active and focused attention to surroundings and internal experiences through simple practices, and is considered a core concept in meditation.^{2,3} One of the first American meditation practitioners to research the effects of mindfulness in a more secularized way was Jon Kabat-Zinn. His groundbreaking development of mindfulness-based stress reduction (MBSR) for chronic pain patients set the course for the study and definition of mindfulness as it is known today. According to Kabat-Zinn, mindfulness is the act of purposefully paying attention, moment-to-moment, and with non-

judgmental awareness.⁴ Since the development of MBSR, psychologists, neuroscientists, physicians, and other health and mental health professionals have continued to develop new innovative interventions based on mindfulness and acceptance, and have taken an evidence-based approach to examine the benefits of mindfulness practice.

Mindfulness and Wellness

Mindfulness has been adapted into a variety of treatment modalities and has been shown to improve physical^{5,6} as well as emotional well-being⁷⁻⁹ in clinical populations. For instance, mindfulness-based interventions have been shown to alleviate pain,⁵ assist with weight loss,¹⁰ treat eating disorders,¹¹ and reduce anxiety and depressive symptoms.⁸ Interventions can vary greatly across studies, but they often follow a pattern similar to that of MBSR training. MBSR involves eight weekly 1.5- to 2.5-hour group classes teaching formal (e.g., sitting meditation, mindful yoga) and informal (e.g., awareness of breath, eating, walking) mindfulness meditation, with group discussion along with an all-day retreat. The course also advises a daily meditation

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practice of up to 45 minutes per day to be done at home.¹² Continuous practice of mindfulness meditation teaches individuals to develop a different relationship with their internal experiences and external surroundings.

From a theoretical perspective, mindfulness results in increased wellness through the act of paying attention to thoughts, emotions, and physical sensations, allowing for deeper reflection and awareness of experience. Through awareness, the individual becomes cognizant of the automatic thoughts and behaviors that result in less-than-optimal wellness. The practice of nonjudgment and compassion helps one to realize that this automaticity is a human experience that can be altered if given adequate attention. Together, awareness and acceptance encourage individuals to be “present” in a nonreactive way with both their negative and positive experiences, reducing avoidance and increasing motivation to engage in lifestyle changes and even alter biological functioning.¹³ Researchers are continuing to examine the mechanisms by which the practice of mindfulness influences wellness.

Clinical populations experiencing psychological or physical ailments can certainly benefit from mindfulness practice, but what about healthy people hoping to achieve optimal wellness? Wellness is not the absence of illness, but rather a distinct dimension that includes other elements apart from physical health such as spirituality, identity, education, effective coping, friendship, and love, along with nutrition and exercise.¹⁴ Healthy individuals have also shown improvements in many of these areas through mindfulness interventions. For example, workplace mindfulness interventions increase indicators of wellness such as job satisfaction,¹⁵ work engagement,¹⁶ self-compassion,¹⁷ and resiliency.¹⁶ Mindfulness practice can enhance other wellness factors including mindful eating,¹⁸ sleeping,¹⁹ exercise adherence,²⁰ and athletic performance.

Mindfulness and Sport

For an athlete, mindfulness may be especially important for maintaining optimum mental clarity in sport. Competition and training can result in inflexible, repetitive patterns of thought, emotion, and behavior. Mindfulness may help athletes detach from these often negative, judgmental thoughts and establish enhanced forms of concentration, relaxation, emotion regulation, and flow.²¹⁻²³

Flow is a state in which a person maintains a balance between the skills required to complete a challenging task and one's perceived ability to complete the task.²⁴ In the context of sport, this state can be described as moments when the mind and the body merge to create a motion or performance that feels effortless. Research has found that mindfulness is highly correlated with flow,^{25,26} and increases in flow are observed after mindfulness training.²³ One of the most widely known and studied mindfulness-based interventions for athletes (with applications for others interested in the benefit of mindfulness for their own performance or personal fitness) is mindful sport performance enhancement.^{26,27}

Mindful Sport Performance Enhancement (MSPE)

MSPE introduces athletes and coaches to mindfulness skills designed to help them become more aware and accepting of present-moment experiences, and, furthermore, implement these skills in athletics as well as in their lives outside of sport.^{23,26} MSPE is rooted in the MBSR tradition and follows a similar format, but it has been uniquely designed for sport performers (i.e., it has fewer sessions, no day-long retreat, and instruction in how to be mindful during sport practice and competition). For many people, the inability to pay attention nonjudgmentally is similar to a weak muscle, and MSPE can be viewed as a “strength training” for attention.²⁷

From The Editor

This is Only a Test

by Mark Kern, PhD, RD, Editor-in-Chief

Quick, think of the most important thing that you've learned about nutrition and dietetics today. If you came up blank, then this issue of *PULSE* is your chance to learn something new. But even if you had a great answer, it doesn't mean that you can't learn a little more, so please keep reading.

Our cover article in this issue by Erin Mistretta, MA and Carol Glass, PhD reviews the latest research regarding the potential benefits of using mindfulness approaches to promote both wellness and enhancements to athletic performance. Michael Stone, MS and Connie Weaver, PhD have written a comprehensive and excellent article that you can use for a free CPE unit regarding potassium with special attention toward its potential role in the prevention of hypertension. We also have an insightful article by Judith Haudum, MSc regarding practical issues that dietetics professionals who wish to work with elite athletes should consider as they work in this growing area.

Don't stop with our feature articles, though. There's plenty of other valuable information throughout *PULSE*, so be sure to peruse every section. Consider it a test!

Participants typically attend 75- to 90-minute MSPE sessions once a week for 6 weeks, led by an experienced group facilitator. These sessions involve education in various mindfulness skills (e.g., nonjudgment, concentration) and the experiential practice of mindfulness exercises to build awareness and acceptance. Training progresses from sedentary mindfulness to mindfulness in motion, and culminates with bringing mindfulness to key sport-specific movements, thus building a bridge between mindfulness fundamentals and direct sport applications. Each session also involves discussions about athletes' experiences with the training and how mindfulness can be implemented within and outside of sport. Recommendations for home practice include both formal mindfulness exercises (e.g., body scan, meditation with a focus on the breath, mindful yoga) along with more informal mindfulness practice that bring mindful awareness and acceptance to what is happening in the moment. In addition, recordings of the formal exercises are available for guidance outside of the sessions.

MSPE has been implemented with athletes from a variety of sport back-

grounds (e.g., archery, golf, long-distance running, lacrosse, field hockey, baseball). Following MSPE training, significant increases in mindfulness, flow, and self-rated performance have been observed, along with decreases in perfectionism, sport-related anxiety, and experiential avoidance^{26,28,29} (T. R. Pineau, unpublished data, 2017). Many mindfulness interventions and practices are designed to improve particular aspects of well-being such as stress, pain, and depression, but research tends to focus less on improvements of interventions beyond the purported benefits. MSPE may also improve aspects of wellness beyond the realm of sport, as collegiate athletes have experienced benefits from MSPE in both their sport and everyday lives.

A recent study³⁰ found that athletes from a wide range of sports who attended MSPE training reported that learning mindfulness skills led to sport-related benefits such as less stress, more relaxation and mental focus, better emotion regulation, and self-awareness, along with sport performance improvement. In addition, athletes mentioned benefits to their lives outside of sport that included being better able to let go of nega-

tive feelings, stay in the moment, and feel less anxious and more focused, suggesting that MSPE may be a useful intervention for athletes hoping to achieve wellness both within and outside of sport.

For those interested in learning more about mindfulness and sport and/or leading themselves through the training, see Kaufman, Glass, and Pineau's recent book entitled *Mindful Sport Performance Enhancement: Mental Training for Athletes and Coaches*,²⁷ published by the American Psychological Association (APA) in 2017. Handouts and mindfulness logs are available on the "companion website" for this APA book at www.apa.org/pubs/books/4317476.a_spx, and recordings of all MSPE mindfulness exercises can be accessed as resources at www.mindfulsportperformance.org/.

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Potassium Intake, Metabolism, and Hypertension

by Michael S. Stone, MS and Connie M. Weaver, PhD

This article is approved by the Academy of Nutrition and Dietetics, an accredited Provider with the Commission on Dietetic Registration (CDR), for 1 continuing professional education unit (CPEU), level 1. To apply for **free** CPE credit, go to www.scandpg.org/nutrition-info/pulse-newsletters/ and click **Take The Quiz Now**.

Upon successful completion of the quiz, a Certificate of Completion will appear in your My Profile (under the heading, My History). The certificate may be downloaded or printed for your records.

Learning Objectives

After you have read this article, you will be able to:

- Explain how dietary potassium is absorbed and metabolized in the body, and discuss its antihypertensive effects.
- Summarize epidemiologic data and clinical findings regarding the impact of potassium intake and supplementation on blood pressure.

Potassium is an essential nutrient. It is the most abundant cation in intracellular fluid, where it plays a key role in maintaining cell function. Because potassium is a major intracellular ion, it is widely distributed in foods once derived from living tissues. Potassium concentration is higher in fruits and vegetables than in cereals and meat. Western dietary practices that have higher consumption of cereal and low nutrient-dense processed foods, and lower consumption of fruits and vegetables have led to a dietary intake lower in potassium and higher in sodium in recent decades.¹

Potassium Intake Needs

Recommended adequate intakes for potassium were set by the Food and Nutrition Board of the Institute of Medicine at 4,700 mg/day.² This was largely based on meta-analyses of randomized, controlled trials investigating the effect of potassium supplementation on reducing blood pressure. Few Americans meet the recommended intakes; the average intake is 2,591 +/- 19 mg/day.³ This large gap between potassium intakes and recommended intakes led to potassium being identified as a shortfall nutrient in the *Dietary Guidelines for Americans*.⁴

Actual potassium requirements vary with an individual's genetics, sodium intake, and status of various health-related biomarkers. Blood pressure (BP) is currently the primary criterion for determining potassium requirements.

Potassium Intakes in the U.S.

It is estimated that only 3% of adults and 10% of children under the age of 5 in the United States meet the adequate intake (AI) level for potassium.^{5,6} However, it should be noted that the AI for potassium in the U.S., set at 4,700 mg/day for adults, is substantially higher than the 3,150 mg/day for adults recommended in the World Health Organization (WHO) guidelines.^{7,8} National Health and Nutrition Examination Survey (NHANES) data indicate that 99.2% of potassium in the U.S. diet is naturally occurring, with the remaining 0.8% coming from fortified foods.³ These naturally-occurring sources include milk and other nonalcoholic beverages, as well as potatoes and fruit, which rank highest as sources of potassium intake among adults in the U.S.⁹

Potassium Tissue Movement

About 90% of dietary potassium (K⁺) is passively absorbed in the small intestine. In the proximal small intestine, potassium absorption primarily follows water absorption, while distally movement is influenced more by changes in trans-epithelial electrical potential difference. In the colon, potassium is both excreted, in exchange for sodium, as well as reabsorbed via H⁺/K⁺ ATPases.¹⁰ Total body K⁺ is estimated to be approximately 43 mEq/kg in adults, with only 2% of this found in the extracellular fluid. Most of the body K⁺ content is found in the intracellular space of skeletal muscle. Potassium is the primary intracellular cation and plays a key role in maintaining cell function, having marked influence on transmembrane electro-chemical gradients.¹¹ The gradient of K⁺ across the cell membrane determines cellular membrane potential, which, based on the normal ratio of intracellular to extracellular K⁺, is -90 mV. This potential difference is maintained in large part by the ubiquitous ion channel, the sodium-potassium (Na⁺/K⁺) ATPase pump. Transmembrane electrochemical gradients cause the diffusion of sodium (Na⁺) out of the cell and influx of K⁺ into the cell. This process is reversed and cellular potential difference is held constant via the Na⁺/K⁺ ATPase pumps. When activated, the Na⁺/K⁺ ATPase pump exchanges two extracellular K⁺ ions for three intracellular sodium (Na⁺) ions, influencing membrane potential based on physiological excitation or inhibition. These channels are partially responsible, along with the Na⁺/K⁺ chloride symporter and sodium-calcium exchanger, for maintaining the potential difference across the rest-

ing cell membrane as well. Both resting membrane potential and the electrochemical difference across the cell membrane are crucial for normal cell biology, especially in muscle and nerve tissue.^{11,12}

In healthy individuals, blood K⁺ concentration ranges between 3.5 to 5.5 mmol/L, with numerous homeostatic mechanisms in place for maintenance within this narrow margin. Changes in plasma concentrations of K⁺ alter the electrochemical gradient and can lead to physiological dysfunction (e.g., hyper- or hypokalemia). As mentioned previously, approximately 98% of systemic potassium is found intracellularly, stored primarily in muscle (70%), and stored to lesser extent in bone, liver, skin, and red blood cells. Insulin, catecholamines, acidemia, and osmolarity all affect the transcellular distribution of K⁺ between plasma and cells.

In response to dietary consumption of a high K⁺ meal that includes glucose, pancreatic beta cells are activated to increase production and release of insulin. Insulin enhances the uptake of K⁺ via stimulation of Na⁺/K⁺ ATPase activity, independent of effects on glucose uptake, in skeletal and cardiac muscle, adipocytes, liver, bone, and red blood cells, attenuating postprandial rise in plasma K⁺.¹³ Na⁺/K⁺ ATPase pump activity and expression are also influenced by stimulation of both alpha and beta-2 adrenergic receptors by the circulating stress hormones catecholamines (epinephrine, norepinephrine).^{11,12} Subsequently, alterations in these hormone levels can affect cellular ion movement and serum potassium. Stimulation of both beta-2 adrenergic and insulin receptors may lead to a synergistic cellular influx of potassium, in part because insulin release from beta cells is increased via beta-2 adrenergic stimulation as well as catecholamine-related increases in glycolysis leading to increases in blood glucose.

Renal Potassium Handling

Approximately 90% of absorbed potassium (60-100 mEq) is lost in the

urine, with the other 10% excreted in the stool and a very small amount lost in sweat.¹⁴ Potassium has a higher ratio of dietary intake to extracellular pool size; only 2% of the total body K⁺ is distributed in extracellular fluid, while the remaining is distributed in the intracellular fluid of various tissues. To meet the challenge of a high K⁺ meal, the K⁺ homeostatic system is very efficient at clearing plasma K⁺ via an increase in renal K⁺ excretion. When dietary K⁺ intake in-

“Both resting membrane potential and the electrochemical difference across the cell membrane are crucial for normal cell biology, especially in muscle and nerve tissue.”^{11,12}

creases or decreases, the kidneys modulate excretion accordingly, ensuring the maintenance of plasma K⁺ concentration. In addition, with the administration of acute K⁺ loads, only about half of the dose appears in the urine after 4 to 6 hours, suggesting that extrarenal tissues (e.g., muscle, liver, adipose) play an important role in K⁺ homeostasis as well via insulin and catecholamine uptake.^{15,16} Excessive extrarenal K⁺ losses are usually small, but they can occur in individuals with diarrhea, severe burns, or excessive and prolonged sweating.

Potassium is freely filtered by the glomerulus of the kidney, with most of it (70%–80%) reabsorbed in the proximal convoluted tubule (PCT)

and loop of Henle. Under physiological homeostasis, delivery of K⁺ to the nephron remains constant. Conversely, secretion of K⁺ by the distal nephron is variable and depends on intracellular K⁺ concentration, luminal K⁺ concentration, and cellular permeability.¹¹ Two major factors of K⁺ secretion/loss involve the renal handling of Na⁺ and mineralocorticoid activity. Reabsorption in the proximal tubule is primarily passive and proportional to reabsorption of solute and water, accounting for approximately 60% of filtered K⁺.^{17,18} Within the descending limb of Henle’s loop, a small amount of K⁺ is secreted into the luminal fluid, while in the thick ascending limb (TAL), reabsorption occurs together with Na⁺ and chloride (Cl⁻), both transcellularly and paracellularly. This leads to the K⁺ concentration of the fluid entering the distal convoluted tubule to be lower than plasma levels (~2 mEq/L), facilitating eventual secretion. Similar to reabsorption in the proximal tubule, paracellular diffusion in Henle’s loop is mediated via solvent drag, while transcellular movement occurs primarily through the apical sodium-potassium-chloride (Na⁺/K⁺/2Cl⁻) cotransporter.¹⁸ The renal outer medullary K⁺ channel (ROMK), also located on the apical membrane, mediates recycling of K⁺ from the cell to the lumen, sustaining the activation of the Na⁺/K⁺-2Cl⁻ cotransporter and K⁺ reabsorption in the ascending limb. The movement of K⁺ through the ROMK induces a positive lumen voltage potential, increasing the driving force of paracellular cation (e.g., Ca²⁺, Mg⁺, K⁺) reabsorption as well. Na⁺/K⁺ ATPase pumps located basolaterally throughout the loop maintain low levels of intracellular Na⁺ and further provide a favorable gradient for K⁺ reabsorption.^{11,12}

Major regulation of K⁺ excretion begins in the late distal convoluted tubule (DCT) and progressively increases through the connecting tubule and cortical collecting duct. In the early DCT luminal, Na⁺ influx is mediated by the apical sodium-chloride cotransporter (NCC) and continues into the late DCT via the

epithelial Na⁺ channel (ENaC).¹⁰ Both are expressed apically and are the primary means of Na⁺ reabsorption from the luminal fluid. Na⁺ reabsorption leads to an electrochemical potential that is more negative than peritubular capillary fluid. This charge imbalance is matched by an increase in the aforementioned paracellular reabsorption of Cl⁻ from the lumen, as well as increases in Na⁺/K⁺ ATPase and ROMK activity. Increased distal delivery of Na⁺ increases Na⁺ reabsorption, leading to a more negative luminal/plasma potential gradient and an increase in K⁺ secretion. Most K⁺ excretion is mediated by principal cells in the collecting duct. Principal cells possess basolateral Na⁺/K⁺ ATPases, which facilitate the movement of K⁺ from the blood and into the cell. The high cellular concentration of K⁺ provides a favorable gradient not only for the movement of K⁺ into the tubular lumen, but for the reabsorption of Na⁺ as well. Movements of K⁺ and Na⁺ occur through the ROMK and ENaC channels, respectively. In conditions of K⁺ depletion, reabsorption of K⁺ occurs through H⁺/K⁺ ATPases, located on the apical membrane of alpha-intercalated cells in the collecting duct, thus providing a mechanism in which K⁺ depletion increases K⁺ reabsorption.¹⁰

Potassium and Hypertension

Hypertension (HTN), or high blood pressure (BP), is the leading cause of cardiovascular disease (CVD) and a major contributing risk factor to development of stroke, coronary heart disease (CHD), myocardial infarction, heart failure, and end-stage renal disease, amounting to a U.S. public health financial burden of \$50.6 billion.¹⁹ Nearly one in three American adults (~72 million) are estimated to have HTN, while nearly 70 million are at risk for developing prehypertension (BP between 120/80 mmHg and 140/90 mmHg). Approximately 90% of U.S. adults older than age 50 are at risk for development of HTN, with systolic rises being the most prevalent.²⁰ Hypertension is a leading cause of morbidity and mortality worldwide and second only to smok-

ing as a preventable cause of death in the United States.²¹

Potassium and Arterial Pressure

The antihypertensive effects of increased potassium intake may be related to numerous mechanisms. Acutely, increased plasma K⁺ is associated with endothelial-dependent vasodilation. Endothelial cells are a monolayer of cells that control the tone of the underlying smooth muscle throughout the vasculature. Potassium can induce endothelial hyperpolarization via a stimulation of

“Hypertension is a leading cause of morbidity and mortality worldwide and second only to smoking as a preventable cause of death in the United States.”²¹

Na⁺/K⁺ ATPase pumps and the activation of plasma membrane K⁺ channels. The response is then transmitted to vascular smooth muscle cells by the accumulation of K⁺ in the myoendothelial space or direct electrical coupling through myoendothelial gap junctions.²² Hyperpolarization of endothelial cells may also lead to an efflux of Ca²⁺ from vascular smooth muscle, resulting in smooth muscle relaxation and increased blood flow.²³ An increase in K⁺ intake may also improve overall endothelial function, promote vascular smooth muscle relaxation through inhibition

of vascular sympathetic neural transmissions, and increase the release of nitric oxide from endothelial cells.^{22,24} In addition to enhanced vasodilation, other possible mechanisms in which K⁺ is proposed to lower BP and improve vascular outcomes include modulation of baroreceptor sensitivity, reduced sensitivity to catecholamine-related vasoconstriction, improved insulin sensitivity, decreases in oxidative stress and inflammation, and increases in Na⁺ excretion.

In relation to sodium, increases in potassium can lead to increased sodium excretion, or naturesis, and in turn decreased fluid volume and blood pressure. Active Na⁺ reabsorption and K⁺ secretion take place in the distal convoluted tubule and collecting duct of the kidneys. The primary transporters involved in this process and discussed earlier include the epithelial Na⁺ channels (ENaC; sodium reabsorption) and the renal outer medullary K⁺ channel (ROMK; potassium excretion). In addition, Na⁺ is also actively reabsorbed in the DCT by the Na⁺/Cl⁻ cotransporter (NCC), which is activated upon phosphorylation. The activity of the NCC determines the delivery of Na⁺ to the downstream ENaC and ROMK, and the extent to which Na⁺ is reabsorbed and K⁺ is excreted. Shown primarily in animal models, increased K⁺ load (via feeding) causes a subsequent increase in extracellular K⁺ concentration, which may lead to signaling that results in the dephosphorylation and a decrease of NCC activity, reducing Na⁺ reabsorption in the DCT and increasing Na⁺ urinary excretion.²⁵ In humans, prospective population studies point to increased dietary K⁺ via higher fruit and vegetable intake, influencing Na⁺ excretion and possibly leading to a benefit for overall fluid balance and arterial pressure.⁵ From the above findings it is clear that K⁺ and its relationship with Na⁺ influence arterial pressure, although the complete understanding of the mechanisms related to this interaction have yet to be fully elucidated.

Epidemiologic Data

Numerous epidemiologic studies show that diet is a key component in blood pressure (BP) control, with some studies showing lower BP in populations consuming higher amounts of fruits and vegetables.²⁶⁻²⁸ Dietary patterns known to lower BP include reduced sodium intake, increased potassium and magnesium intake, and increases in fruit and vegetable consumption as well as in other foods rich in antioxidants.^{29,30} A 1982 population study conducted by Khaw et al in St. Lucia, West Indies suggested that an increase in potassium by 20 to 30 mmol/day (~700-1,200 mg/d) resulted in a 2 to 3 mmHg reduction in systolic blood pressure (SBP).³¹ In adults, a 2-mmHg reduction in BP can reduce CHD and stroke mortality rates by 4% and 6%, respectively.³² The INTERSALT study, a worldwide epidemiologic study (n = 10,079 men and women aged 20-59 y from 32 countries) that examined the relationship between 24-hour Na+ excretion and blood pressure, provided evidence of potassium intake as an important factor affecting population BP among diverse population groups.³² The American Heart Association has estimated that increasing potassium intake may decrease HTN incidence among Americans by 17% and lengthen life span by 5.1 years.¹⁹

Clinical Findings from Supplementation Trials

Observational studies have evaluated the effects of potassium from foods, while clinical intervention trials have primarily used potassium supplements. Several meta-analyses show a significant reduction in BP with increasing potassium supplementation.³³⁻³⁶ In an early meta-analysis, Cappuccio and MacGregor reviewed 19 clinical trials looking at the effect of potassium supplementation on BP in primarily hypertensive individuals (412 of 586 participants). With the average amount of potassium given at 86 mmol/day (~3,300mg/d; as primarily KCl) for an average duration of 39 days, researchers found that potassium supplementation significantly

reduced SBP by 5.9 mmHg and diastolic blood pressure (DBP) by 3.4 mmHg. Greater reductions were found in individuals who were on supplementation for longer periods of time.³⁵ As is evident, the effect of potassium supplementation on BP reduction is generally positive, but not consistent. According to a more recent meta-analysis conducted by Dickinson et al in 2006, potassium supplementation did not significantly reduce BP in those with hypertension, although this analysis was based on only five trials and the findings, while not statistically significant, did reveal reductions in both SBP and DBP.^{33,37} In general, these outcomes

“...these outcomes show that the BP-lowering effects of potassium supplementation are greater in those with HTN and more pronounced in blacks compared with whites.”

show that the BP-lowering effects of potassium supplementation are greater in those with HTN and more pronounced in blacks compared with whites. Other noted factors that may influence the effects of potassium supplementation on BP include pre-treatment BP, age, gender, intake of sodium and other ions (magnesium, calcium), weight, physical activity level, and concomitant medications.

Dietary Interventions

Overall findings from clinical trials on the effect of increased potassium intake have been conflicting.^{20,29,38,39} Evidence from dietary interventions is extremely limited, with the majority of findings extrapolated from The Dietary Approaches to Stop Hypertension (DASH) study.²⁹ The DASH intervention revealed that a diet rich in fruit and vegetables, fiber, and low-fat dairy products, together with reductions in saturated and total fat and sodium, could positively influence BP compared with the average American diet.⁴⁰ Although the DASH diet does lead to a dramatic increase in potassium consumption (+1,447 to 2,776 mg/d) and reduction in BP, these beneficial effects cannot be attributed to potassium alone because the diet involves other dietary modifications as well.³⁰

In an earlier study reported by Chalmers et al in 1986, the effects of both the reduction of dietary sodium and increase of dietary potassium on BP were assessed.⁴¹ A total of 212 participants (age 52.3 ± 0.8 y; 181 males and 31 females) with a DBP between 90 and 100 mmHg were recruited and placed in one of the four diet groups: a normal-diet group (control), a high-potassium diet (>100 mmol K/d; >3,900 mg/d) group, a reduced-sodium diet (50-75 mmol Na+/d; 1,150-1,725mg/d) group, or a high-potassium/low-sodium diet group. Participants completed the diet phase for 12 weeks, during which they were regularly counseled on how to adequately modify their food choices based on their group (e.g., avoiding salt and high-sodium foods or increasing fruit and vegetable intake). Significant reductions in both SBP and DBP in each dietary intervention group compared with the control group were observed, but no significant differences were observed between intervention groups. Reductions in the high-potassium group were 7.7 ± 1.1 and 4.7 ± 0.7 mmHg for SBP and DBP, respectively. Although high potassium intake did appear to reduce BP, the lack of differences between intervention groups

points to the possibility of an overall diet effect. In addition, for both the high-potassium and low-sodium groups, there was a significant reduction in weight during the study, which may have further confounded the results.

In a more recent study, Berry and colleagues assessed the effects of increased potassium intake from both dietary sources and supplements on BP in untreated prehypertensive individuals (DBP: 80-100 mmHg).⁴² In a crossover design, 48 participants (age 22-65 y) completed four 6-week dietary interventions including a control diet, an additional 20 or 40 mmol K/day (780 or 1560mg/d) from fruit and vegetables, and 40 mmol/day of potassium citrate capsules. Similar to the Chalmers study, nutrition coaching was used to regulate participant food choice during each dietary intervention and was primarily focused on increasing fruit and vegetable intake. No significant changes in ambulatory BP between the control group and any of the dietary or supplement interventions were observed. The sample size was small and the cohort was heterogeneous, but the lack of control used to conduct the potassium dietary intervention was the primary limiting factor in the Berry study. Given these mixed results, it seems necessary to adequately assess the true effect of increased dietary potassium intake on BP and other health outcomes of a controlled feeding study.

Conclusions

Increasing dietary potassium has the potential benefit of lowering risk of hypertension and may provide benefit to normal kidney function. We need to understand more about the bioavailability of potassium from foods. Are there yet-to-be-identified inhibitors of potassium absorption or food matrix effects? Do some anions that accompany potassium in foods have differential functional advantages? Research on potassium is likely to increase, not only because it is an identified shortfall nutrient but also because increasing dietary potassium is a well-established modi-

fiably factor for hypertension, the largest risk factor for some of our most common chronic diseases.

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“We need to understand more about the bioavailability of potassium from foods.”

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Evolving Role of Dietitians in Elite Sports

by Judith Haudum, MSc

Athletes in many sports are supported by a large team of experts including doctors, physiotherapists, and sport scientists. In recent years, the presence of sports dietitians/nutritionists in these settings has grown, and, where present, sports RDNs have become vital components of multidisciplinary treatment teams. For example, professional soccer teams, cycling teams, and national federations worldwide have begun adding nutrition experts to their core

staff to enhance the level of support for their top athletes. Several studies have shown that a multidisciplinary team approach to provide support, including nutritional support, improves injury recovery, performance, health, and nutritional outcome.¹⁻⁴ These apparent benefits affirm the decision to add dietitians to the team staff. A dietitian's contribution to a team includes the following:^{5,6}

- Energy and nutrient requirement assessment and planning

- Management of dietary supplement intake
- Travel nutrition, including athletes' menu at team hotels (e.g., cooking procedures, serving size),
- Food safety protocols
- Training and race nutrition
- Hydration and recovery strategies

- Weight management and achievement of optimal physique (body composition)
- Management of food allergies, intolerances, and other clinical conditions that require dietetic support
- Recovery from injury/illness

However, despite the growing presence and numerous roles and responsibilities of dietitians on teams, there are cases in which other departments within a sports team (e.g., skiing, cycling) cover basics of nutrition. This is especially noteworthy when it is considered that many athletes suffer from gastrointestinal distress or other symptoms related to poor nutrition management.⁷

Over the past 20 years the practice and expertise of sports dietitians/nutritionists has evolved. The dietitian's traditional role regarding the knowledge of food and understanding how to manage dietary therapy has expanded. Professional sports nutrition support includes many aspects (see aforementioned skills) that cannot be covered by other professions without dietetics education in these areas. Several associations and groups such as the Academy of Nutrition and Dietetics and Professionals in Nutrition, Exercise and Sports (PINES) have made efforts to enhance the recognition of the skills and expertise of sports dietitians. Credentials such as the Certified Specialist in Sports Dietetics (CSSD) help to further strengthen the sports dietetics group. It also highlights the potential and benefits of adding professional nutrition support to sports teams.

Furthermore, nutrition experts can train other staff members from different disciplines (e.g., therapists) in the areas of food hygiene, race food preparation, and grocery shopping. Competitions take place in different countries and on several continents, yet dietitians do not always travel with the team. Training other staff can be valuable for maintaining consistent high standards and ensuring appropriate execution of established

nutrition protocols. While training other team members on nutrition protocols is important, on-site assistance from the team dietitian, especially at major tournaments or competitions, is probably the best approach for useful and effective nutrition support,⁸ and the team dietitian should be considered a full member of the team staff.

“Because sports such as cycling and track and field have suffered headline-grabbing scandals on doping, athletes and their support personnel are placing greater emphasis on nutrition and food intake..”

A Growing Interest in Nutrition

Very recently, knowledge of the importance of nutrition and nutrient timing in professional sports has grown.^{9,10} Because sports such as cycling and track and field have suffered headline-grabbing scandals on doping, athletes and their support personnel are placing greater emphasis on nutrition and food intake. Athletes have become more interested in how food and nutrients affect their performance and well-being. While amateur and elite athletes aim to optimize their train-

ing and race nutrition, there are increasing incidences of dietary limitations, the need to manage intolerances/food allergies or other nutrition-related problems, and the need for additional support. Survey data indicate that athletes appreciate and benefit from nutrition advice, especially those reporting dietary constraints.¹¹

Interestingly, however, prior investigations suggest that athletes primarily seek out sports nutrition information from coaches, other athletes, physicians, or family.¹¹ These observations suggest that sports dietitians are not widely recognized as the nutrition experts or go-to source for professional dietary advice. They also highlight the likelihood that a lot of information provided to athletes is not based on evidence but, rather, based on popular beliefs and subject to current fads or trends. This fact is of particular importance when professional athletes look for information on dietary supplements. Especially in elite sports, where athletes also compete under the World Anti-Doping Agency (WADA) code, faulty guidance on the choice and use of performance-enhancing substances can lead to serious consequences including adverse testing results in doping control and/or side effects that compromise the health of an athlete.

Lack of Understanding the Sports Dietitian's Role

Because we all eat and drink, do grocery shopping, and possess a certain level of cooking skills, it may be difficult to understand why nutrition support is of value on an elite team. However, to assess, treat, and provide evidence-based nutrition support, the specialized skills and knowledge of a sports dietitian is required. A growing body of evidence indicates that coaches and therapists lack sport nutrition knowledge, i.e., they do not have the skills to provide adequate information.¹²⁻¹⁵ Furthermore, it is important to understand that sports dietitians are not team cooks

nor should they have the same role; this misconception that the two are interchangeable is widespread. Familiarizing sports organizations and professional teams with the scope of practice of registered dietitians¹⁶ and those specialized in sports⁵ may aid in further highlighting the skills of the RDN and promoting the potential benefits of bringing a sports dietitian onto a team. Also, dietetics associations can potentially work with institutions that instruct trainers and team managers to promote the unique and specialized role of sports dietitians in elite sports and distinguish the different roles of sports team members.

Benefits for Athletes

While it remains a challenge to make the case for sports dietitians becoming the mainstay on elite teams, headway has been made at the collegiate level in the United States. Deregulation of National Collegiate Athletic Association (NCAA) feeding guidelines and the active memberships of both the Sports, Cardiovascular, and Wellness Nutrition (SCAN) dietetics practice group and the Collegiate and Professional Sports Dietitian Association (CPSDA) indicate the value that a sports dietitian brings to the table. The sports dietitian in both the collegiate and elite settings can benefit athletes in the following ways:

- Improve overall standards of hygiene/food safety, which includes evaluating the quality of food and planning the menus for team hotels.
- Establish team and individual strategies for athletes to meet energy needs on competition and training days. Studies indicate that among elite athletes, nutrient needs are not always met.¹⁷⁻¹⁹ Carbohydrate intakes are often below the required intake recommendations in many sports; furthermore, athletes do not meet recommended micronutrient intakes (e.g., iron, vitamin D, zinc).^{17,18} Sports dietitians can help prevent deficiencies or identify and adjust nutrient-

deficient diets. This is of benefit for athletes, as there is strong evidence that low intakes of vitamin D, iron, carbohydrate, and other nutrients can negatively affect performance and compromise health.^{17,20}

- Establish a working relationship with the team physician in order to support athletes by managing nutrition support after injury or surgery. This may include supporting goals around body weight and composition and may help prevent athletes

“General nutrition knowledge among athletes remains poor,¹³ and these interventions may not only positively affect performance but may also improve well-being and everyday life.”

from using unhealthy weight loss strategies to achieve their desired physique.

- Provide nutrition education regarding overall healthy eating, grocery shopping, and cooking procedures. General nutrition knowledge among athletes remains poor,¹³ and these interventions may not only positively affect performance but may also improve well-being and everyday life. More knowledge will also make athletes more resistant to popular diet trends.

- Assist in managing medical nutrition therapy for certain clinical conditions. Some athletes are on restricted diets for medical reasons, and the sports dietitian can guide athletes on appropriate choices, especially when traveling.

- Provide informed recommendations for nutritional supplements. Because athletes are often exposed to nutritional supplements, the dietitian can become a very important resource for information on a variety of products. Dietitians can play a role in evaluating the safety and effectiveness of certain supplements, develop safe administration guidelines, and/or provide guidance on the actual need for such products. Dietitians can control the quality of the products and advice to athletes on the use and dosage of supplemental nutrient intake.

Future Directions

The current situation highlights the need to further communicate the scope of practice of dietitians and promote them as a valuable part of multidisciplinary teams. In addition, more research studies that show benefits of nutrition support would be helpful to strengthen the role that sports dietitians play in elite sports. Sports teams and federations would then hopefully acknowledge the potential to add dietitians to their teams.

Summary

Sports nutrition and the scope of practice of sports dietitians has made substantial progress over the past 20 years. However, the number of sports dietitians in elite sports is still low. Since multidisciplinary teamwork in sport settings is becoming more important, there would be many benefits of adding a sports dietitian to a team's core staff. Advising athletes on energy and nutrient intakes and implementing evidence-based nutrition strategies will help athletes maintain health, reach their goals, and perform at their best.

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“...more research studies that show benefits of nutrition support would be helpful to strengthen the role that sports dietitians play in elite sports.”

From The Chair

by Lindzi S. Torres, MPH, MS, RDN, CSSD

SCAN: Past, Present, Future

“Progress is impossible without change, and those who cannot change their minds cannot change anything.”

— George Bernard Shaw

Change is an important part of leadership and program development, though at times it is uncomfortable and at other times resisted. My favorite saying is “The only constant is change” because change provides an opportunity for learning and growth. As I begin the distinct pleasure of serving as SCAN chair for this year, our practice group is in the midst of some change. As with all change, it is important to see where we have been, where we are currently, and where we are going.

Past: What We Accomplished in the Past Year

■ The Executive Committee retreat last summer took place at the Keystone Resort. Meeting at this venue helped us pre-plan and map out the excursions and events for our most recent Symposium.

■ The Food & Nutrition Conference & Exhibition™ (FNCE®) Centennial was a great success and we look forward to this year’s event! Highlights included:

- Sports Nutrition: Advanced Practice Workshop
- FNCE® Sessions (available on the Academy’s website for purchase): *Fueling Teen Athletes: Unique Challenges and Winning Strategies* and *Putting Heart into Performance Nutrition for Collegiate Athletes*
- SCAN Reception: Celebrating 36 years of SCAN, we gathered at the beautiful Apogee rooftop lounge in downtown Chicago

■ Publication of *Sports Nutrition: A Handbook for Professionals, Sixth Edition* (editors: Christine Karpinski and Christine Rosenbloom)

Present: Where Are We Today?

■ As of June 1, SCAN will no longer maintain a separate Disordered Eating & Eating Disorders (DEED) subunit. However, DEED programming has been and will remain a part of what we do as SCAN. We will continue to ensure that all members benefit from the opportunity to learn from and collaborate with each other across practice areas. Please visit our website (www.scandpg.org) for more information and our FAQ page about this transition.

■ We recently wrapped up the 34th Annual SCAN Symposium in Keystone, CO. We had an amazing program and an amazing arsenal of internationally known speakers ranging from Asker Jeukendrup to Jon Ivy. If you missed it, we

hope to see you at our next Symposium, *Navigating the Path of Wellness*, April 26-28, 2019, at the Pointe Hilton Tapatio Cliffs Resort, in Phoenix, AZ.

■ The Academy’s *Sports Nutrition Care Manual (SNCM)* has entered a partnership with SCAN and we will now work to increase the breadth of this resource. The incoming editor-in-chief of the *SNCM* is SCAN member Kate Davis. We are looking forward to this partnership and to enhancing this resource’s capabilities.

Future: Where Are We Headed?

• **Strategic planning.** SCAN will embark on the third year of our 3-year strategic plan this year to ensure that we consistently meet the needs of our members and judiciously move our organization forward as such.

• **Enhanced programing.** With the changes and our new strategic plan, we will be enhancing the focus and level of education for our programming.

• **Increasing digital capabilities.** A new website and new SCAN podcasts are coming your way in the near future. This will help make sure our resources are available on multiple platforms for our members to access.

• **Developing new leaders.** I encourage every member to get involved at any level! Leadership development both within SCAN and within our dietetics community as a whole is very important to our profession and this will be my key focus area for this coming year. SCAN will move to creating more deliberate opportunities for leadership development in the future.

Lastly, part of our future is standing on the shoulders of those who came before us. We build upon each other’s success and learn from our failures. It is a pleasure and honor to serve as your chair this year. I would like to thank the giants who came before me—all the past chairs of SCAN, and specifically Cheryl Toner and Karen Collins, for the amazing mentorship they extended to me and their excellent leadership of SCAN!

Our next face-to-face opportunity will be at the 2018 FNCE® on October 20-23, in Washington, DC. I look forward to connecting with you there at several events, including the SCAN Reception, which promises to be a memorable experience, the DPG Showcase, and our SCAN DPG Spotlight session, *Heart of an Athlete: Managing Hypertension in Athletic Populations*. Look for more details about FNCE® on page 23 of this issue and in future eblasts.

Conference Highlights

Multi-Service Eating Disorder Association Annual Conference

Boston, MA

March 16-17, 2018

The Multi-Service Eating Disorders Association (www.MEDAinc.org) addresses the needs of people with eating disorders and their health care providers in the Boston area and beyond. The group's annual conference was filled with excellent information helpful to RDs and therapists. Below are some of the highlights that might boost your counseling skills when working with clients who struggle with food, weight, and body image.

Size Acceptance

In her keynote presentation, Ragan Chastain, advocate for the Health At Every Size (HAES) movement, explained how losing weight did not work for her. She got tired of hating her large body and decided to learn to love her body. *"This is my body; this is what I've got."* The following key points from her talk offer food for thought.

- We live in a fat-phobic world where hating your body and being terrified of gaining weight are "normal." Our culture dictates that people either be thin or be on a diet.

- People who live in large bodies have the right to enjoy a life without shame, stigma, or bullying. Size acceptance needs to become a civil rights movement.

- Our society needs to embrace size acceptance if we really want to prevent eating disorders (EDs) and let people with EDs recover. Eating disorders generally start with a diet and fear of getting fat. Among fourth-grade girls, 81% are afraid of being fat.

- What is the proper language to use when describing a person with obe-

sity? "Obese" tends to be pathologizing, so preferred terms include person of size, a larger body, heavier person, and plus-size.

- Tip for RDs: When a client says "I'm fat," correct her or him by saying "You are not *fat*, just as you are not *finger-nails* or *hair*. You *have* fat, just as you have *finger-nails* and *hair*."

- Is it ethical for RDs to offer weight loss counseling? The Academy's code of ethics says, "Do no harm." Are we doing harm when we offer interventions that are associated with people ending up heavier than before they dieted? Perhaps we need to admit we have no idea how to make anyone thin? Chastain reported we have no proof of efficacy for weight reduction programs.

"Among fourth-grade girls, 81% are afraid of being fat."

- Every body is worthy of health care that is blame-free, shame-free, and evidence-based. Chastain encourages health care professionals to focus on healthy habits. The more healthy habits a person has, the better his/her health—and that is not related to weight.

Body Dysmorphism Disorder

- An estimated 1.7% to 2.4% of the general population suffers from body dysmorphic disorder (BDD); 85% of those are women. People with BDD have a much higher rate of suicide than the general population.

- People with BDD can spend from 1 to 8 hours a day being preoccupied with a perceived body flaw. This differs from people with eating disorders who hate their whole body, not just one or two body parts.

- The most hated body parts are skin (73%), hair (56%), nose (37%), and stomach (27%). People with BDD use harsh words to describe these hated parts, including *abnormal*, *flawed*, *deformed*, and *monstrous*.

- If clients with BDD ask what you think about their "flaw," do not reassure them they look fine (this can perpetuate the problem). Instead ask, *"What do you think I'll say? What do you want me to say? I need to hear your story so I can understand you."*

- Ask your client about the rituals that interfere with her or his life (body checking, looking in mirrors, avoiding being in a photo, wearing lots of makeup). Rank order the rituals and then, starting with the easiest, do exposure work. For example, ask the client "What do you see when you look at yourself in a mirror?" If the client sees *an ugly person*, let the person know what you see: a face with *blond hair, blue eyes, and a few freckles*.

- Encourage the client to find alternative thoughts, such as *"I don't always need to look perfect for people to like me."*

Male Athletes with Eating Disorders

- Exercising hard is a "male thing." Male athletes with eating disorders are commonly resistant to receiving treatment due to the perception that they will be seen as being weak. This gets further amplified by having a "woman's disorder." Male athletes may be resistant to letting you know the seriousness of their ED. They fear losing a scholarship, and fear disappointing their coaches and family members.

- How do you help a man go against socialized norms to be vulnerable, express and experience emotions, and reach out for help? We can encourage them to be more compassionate

and respectful to their bodies, instead of doing punishing workouts to reach an overachieving athletic goal.

Mothers and Eating Disorders

■ Studies of mothers with eating disorders are limited. We do know that 40% to 60% of pregnant women do not disclose having (or having had) an eating disorder.

■ Miscarriages are 70% higher among women with anorexia.

■ Postpartum depression is common among 60% of new mothers with bulimia.

■ New mothers with EDs feel great pressure to “snap back into shape.” Not surprisingly, relapse into ED behaviors is common within the first 6 months postpartum. The new mothers can easily return to restrictive eating and diet pills. As RDs, we need to reduce the pursuit of unrealistic bodies.

■ Many mothers with EDs are perfectionists. They can easily feel like they are a “bad mother” when a baby cries out of control and the ED rears its ugly head.

■ Babies of women with EDs tend to have lower weight for height for the first 12 months. Do the mothers not produce enough breast milk? Do they restrict food?

■ When infants start eating solid food, some new mothers focus on “clean eating.” They have fears about “tainted” food, and cut out gluten and dairy.

■ As children get older, mothers need to be role models for positive body image and say things like “I love my strong arms” or “I love my muscular thighs.”

■ As professionals, we need to remind mothers that they want to help their kids in every way—and that includes resolving their own eating issues.

Internal Family Systems

■ The Internal Family Systems (IFS) model of treating eating disorders is effective. This model is based on the theory that our persona is composed of many different parts. Ideally, all of our parts are harmonious. However, due to inevitable life-challenges and/or trauma, some parts of us get wounded and take on extreme roles or feelings.

■ Some parts, called protectors, strive to suppress feelings. They get you to “go on a diet,” “get to the gym,” and “read diet books” as a means to keep the pain away. Eating disorders protect a person from painful wounds.

“As professionals, we need to remind mothers that they want to help their kids in every way.”

■ IFS focuses on a person’s internal ability to hear those wounded parts. Once the wounded parts can learn to feel safe, a person can experience internal harmony. IFS fosters healing by getting to the root cause of the wounds, compassionately working with the wounded parts, and restoring positive connections.

Compassion

■ Compassion is the antidote to shame. People with eating disorders hold a lot of shame, so it’s important for health care providers to minimize that shame and be compassionate.

■ Compassion comes from the heart and is at the heart of our work with clients with eating disorders. We want to notice when clients are suffering, see their worth and goodness, join

them where they are, and practice loving kindness.

■ Clients don’t recover until they can have self-compassion and are able to receive compassion as well as have compassion for others. Self-compassion is being able to be nice to ourselves when we don’t do as well as we would like to do.

Palliative Care

■ In a long-term study, 36% of patients with anorexia had not recovered after 22 years since first receiving treatment. Appropriate questions to ask include, “What are your goals for your quality of life?” and “Why have you hit the wall at this particular point?”

■ How do we know when to force someone into treatment against his or her own will? Forced treatment might contribute to weight restoration briefly, but immediately after inpatient treatment is over, the patient can rapidly relapse. Do we offer them palliative care?

■ As an RD, you can ask the client to tell you about the benefits and burdens of going through residential treatment (again). You might need to move away from the advice to “*Just eat. Just try one more time. Just go to treatment again*” and recognize that the suffering of the mind might be as real and painful as the suffering of the physical body care.

■ Death from malnutrition will eventually occur, but it can take a substantial amount of time with a great deal of suffering. Palliative care does not mean “giving up” but rather easing the physical and emotional symptoms, and avoiding aggressive treatments.

“Conference Highlights” editor Nancy Clark, MS, RD, CSSD has a private practice in the Boston area and is author of the bestselling Nancy Clark’s Sports Nutrition Guidebook. For more information, go to www.NancyClarkRD.com.

Reviews

Fertility Foods Cookbook: 100+ Recipes to Nourish Your Bod

Elizabeth Shaw, MS, RDN and Chef
Sara Haas, RDN
Hatherleigh Press, Hobart, NY
800/733-3000
<http://www.hatherleighpress.com>
2017, paperback, 320 pp, \$20.00
ISBN 978-1-57826-703-3

With nearly 10% of our nation's women suffering from infertility, *Fertility Foods Cookbook* is a timely publication and a valuable resource for all women in their childbearing years. This resource is filled with nutrition information and recipes developed to include fertility-boosting foods. The book emphasizes focusing on cooking with whole foods containing minimal processed ingredients to support a woman's overall nutrition to improve fertility and prepare for the nutrition demands of pregnancy.

Fertility Foods Cookbook opens with a genuine welcome from both authors, building immediate rapport with the reader. Each shares their own struggles with infertility and their hopes for readers in the use of this cookbook. The authors also review a lengthy discussion on key macro- and micronutrients that support and boost fertility nutrition. The authors make the discussion of each nutrient approachable and engaging, and they provide tips on good dietary

sources for these nutrients. This section includes charts that summarize key text regarding portion size, recipe recommendations, and sources of whole foods as well as personal anecdotes from each author.

The book includes recipes for all meals including breakfast, salads, sandwiches, entrees, sweets, and much more. Each recipe presents

“Each page of this book feels like a friend providing support and encouragement, while also providing nutrition expertise advice.”

clearly written instructions and includes nutrition information; most are accompanied by mouthwatering

photographs as well. There are notes explaining the fertility benefits in each recipe. In addition, several recipe variations and storage tips are provided throughout the text. Each page of this book feels like a friend providing support and encouragement, while also providing nutrition expertise advice. The underlying message of *Fertility Foods Cookbook* lies in the uncontrollable situation of infertility. Focusing on fertility-fueling nutrition can provide a sense of confidence in the ability to care for one's body even when it is difficult to understand the struggles of fertility.

This cookbook is a valuable resource for those who are in the midst of fertility challenges or anyone who might be concerned about achieving optimal nutrition status for pregnancy prior to conceiving. There are recipes for all occasions that incorporate many flavor profiles that anyone would be excited to test out in the kitchen.

Elizabeth Shaw, MS, RDN is a nutrition expert and product development specialist. Sara Haas, RDN is a food and nutrition expert and formally-trained chef. Both are freelance writers who have been featured in several publications.

*Reviewed by Jen Tate, MDA, RD, SNS,
school nutrition dietitian in San Diego,
CA.*

Research Digest

Menu Calorie Labeling and Eating Disorders

Haynos AF, Roberto CA. The effects of restaurant menu calorie labeling on hypothetical meal choices of females with disordered eating. *Int J Eat Disord.* 2017;50:275–283.

Menu calorie labeling policies have been recently pushed forward to combat the obesity epidemic. There has been little understanding of how these policies could influence the more than 30 million Americans suffering from clinically significant eating disorders (EDs). This randomized, cross-sectional study was undertaken to determine whether calorie labeling affects food choices among women with disordered eating (DE) or EDs. A total of 716 women (mean age 21; 62% white) completed the Eating Disorder Examination Questionnaire to identify DE/EDs; 10, 7, 23, and 66 participants met diagnostic criteria for DE, anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED), respectively. The AN and BN groups were combined for analysis. All women completed an online survey, where they were randomly assigned menus with or without calorie labels and were instructed to choose foods representative of a meal they would order. Results showed that menu labeling did not have an effect on hypothetical food choices among participants with DE behaviors ($P=.45$). However, ED groups showed an effect of menu labeling: the AN/BN group ordered fewer calories with menu labeling than without ($P<.001$), while the BED group ordered more calories when menu labeling was included ($P<.001$). This suggests menu labeling may exacerbate ED behaviors in those with clinically significant EDs but not in those with DE behaviors. Further research is needed to understand why calorie labels might encourage females with BED to consume more calories. This research was supported by grants

from the National Institute of Mental Health and the National Institute on Aging.

Summarized by Allison DePaolo, graduate student, Department of Nutrition and Integrative Physiology, Coordinated Master's Program, Nutrition, Education and Research Concentration, University of Utah, Salt Lake City, UT.

BMI, Body Composition, and CVD Mortality

Ortega FB, Sui X, Lavie CJ, et al. Body mass index, the most widely used but also widely criticized index: would a criterion standard measure of total body fat be a better predictor of cardiovascular disease mortality? *Mayo Clin Proc.* 2016;91:443-455.

educated, and have worked in executive or professional positions. All participants completed a detailed questionnaire; measurements included a physical examination, fasting blood chemistry analyses, personal and family health history, body composition (assessed by hydrostatic weighing or by the sum of seven skinfold thicknesses using standardized protocols), smoking and alcohol use, and a maximal exercise treadmill test. Compared with a medium BMI (15th–85th percentile), a very high BMI (>95th percentile) was associated with a 2.7-fold higher risk of CVD mortality. Compared with a medium FFMI (fat-free mass index) (15th–85th percentile), a very high FFMI (>95th percentile) was associ-

“This suggests menu labeling may exacerbate ED behaviors in those with clinically significant EDs but not in those with DE behaviors.”

While obesity is a worldwide epidemic, there is controversy surrounding how to best assess obesity status and whether measurement of body composition would be more accurate. This prospective, epidemiologic investigation of adult men and women examined whether a measurement of total body fat would more accurately predict cardiovascular disease (CVD) mortality compared with body mass index (BMI). The following conditions were tested to see which of three parameters more strongly predicts CVD mortality and all-cause mortality: an excess of body weight, an excess of body fat, or an excess of fat-free mass (FFM). Most of the participants were white, well-ed-

ated with a 2.2-fold higher risk of CVD mortality. These estimates were markedly smaller for FFM. This study suggests that the simple and inexpensive measure of BMI can more strongly predict CVD mortality than accurate measures of body composition employing accurate, complex, and expensive methods. Furthermore, FMI (fat mass index) is a more informative measure of future CVD prognosis than is %BF.

Summarized by Julia Erbacher Wylie, MS, RDN, CSSD, assistant professor, Salt Lake Community College, Salt Lake City, UT.

Macronutrient Intake Variance Between Sports

Wardenaar F, Brinkmans N, Ceelen I, et al. Macronutrient intakes in 553 Dutch elite and sub-elite endurance, team, and strength athletes: does intake differ between sport disciplines? *Nutrients*. 2017;9:119.

While macronutrient requirements vary between sport disciplines, athletes in general have greater macronutrient needs than sedentary populations. It is currently unclear whether athletes are meeting their macronutrient requirements and whether this intake differs between sport disciplines. The purpose of this study was to compare macronutrient intakes across sport disciplines and determine if needs were being met. A total of 553 Dutch elite and sub-elite competitive athletes (326 male, 227 female) completed this observational cohort study and were categorized into three sport disciplines: endurance, team, and strength sports. Within a 4-week period, all but 28 athletes completed three unannounced Web-based 24-hour dietary recalls using the validated “Compl-eat” program and a dietary supplement questionnaire; the recall data were then converted into energy and macronutrient intake using the 2010 Dutch food composition database. The remaining 28 athletes (male soccer players) completed the 24-hour recall and questionnaire face-to-face with a trained RD using the same program. The nutrient intakes were compared with the total energy expenditures (TEEs) that were estimated for each sport discipline. The average training load among all disciplines was 100 minutes per day. The results indicated that both male and female endurance athletes consumed significantly more energy and macronutrients than team sport athletes ($P < .05$). While most athletes (~70%) had a protein intake above the sports nutrition recommendation of 1.2 g/kg of bodyweight per day, more than half of all athletes did not reach the recommendation for carbohydrates of 5 g/kg of bodyweight per

day ($P < .05$). This under-consumption of carbohydrates should be addressed among all sport disciplines to ensure adequate intake. This study was funded by the Eat2Move project.

Summarized by Alyssa Gomez, graduate student, Department of Nutrition and Integrative Physiology, Coordinated Master's Program, Sports Nutrition Concentration, University of Utah, Salt Lake City, UT.

“Incorporating beetroot juice into the diet may be a simple strategy to improve endurance performance.”

Effects of Betalain Supplementation on Exercise Performance and Recovery

Montenegro C, Kwong D, Minow Z, et al. Betalain-rich concentrate supplementation improves exercise performance and recovery in competitive triathletes. *Appl Physiol Nutr Metab*. 2017;42:166-172.

Recent studies suggest that ingestion of beetroot juice may have both health and exercise performance benefits. These benefits have largely been attributed to the nitrate content of beetroots. However, beets also contain high amounts of betalain, which has antioxidant and anti-inflammatory properties. The purpose of this crossover, double-blinded, placebo-controlled study was to examine the effects of a sugar-free and nitrate-free betalain-rich beetroot juice concentrate (BRC) on running performance and muscle damage in 26 competitive male and female

triathletes. Participants ingested 50 mg of BRC or placebo twice per day for 6 days and then on day 7 ingested 50 g BRC or placebo 120 minutes prior to completing 40 minutes of submaximal cycling (75% VO_2max) followed by a 5-minute active recovery and then a 10-km running time trial (TT). Participants ingested an additional 50 mg BRC or placebo post-TT and then completed a 5-km running TT performance 24 hours after the initial 10-km TT. Blood samples to measure creatine kinase (a marker of muscle damage) and a 100 mm visual analog scale (VAS) to measure subjective fatigue and muscle soreness were measured at baseline (pre-submaximal exercise and pre-BRC ingestion), post-10-km TT, and pre-5-km TT. Compared with placebo, BRC supplementation significantly decreased 10-km running TT duration (49.5 ± 8.9 vs. 50.8 ± 10.3 min, $P = .03$) and 5-km running TT duration (23.2 ± 4.4 vs. 23.9 ± 4.7 min, $P = .003$). The change in muscle damage markers and fatigue levels from baseline to 24-hour after the 10-km TT was significantly lower with BRC compared with placebo ($P \leq .05$). These results suggest that BRC supplementation in the absence of nitrates can improve endurance exercise performance and recovery in healthy, competitive triathletes. Financial support for this study was provided by VDF FutureCeuticals, Inc.

Summarized by Corinna Coffin, graduate student, Department of Nutrition and Integrative Physiology, Coordinated Master's Program, Sports Nutrition Concentration, University of Utah, Salt Lake City, UT.

SCAN Notables

by Traci Roberts

The following three award recipients were honored at the recent 2018 SCAN Symposium in Keystone, CO:

■ **Christine Karpinski, PhD, RD, CSSD** was awarded the SCAN Achievement Award, which recognizes exceptional members who have played a significant role in the evolution of SCAN through both outstanding service to the organization and professional accomplishments in the field. Chris is an exercise physiologist and registered dietitian and is currently associate professor and chair of the Department of Nutrition at West Chester University (WCU). Chris earned her BS degree at WCU in exercise science and played field hockey and lacrosse. She received her MS degree from Immaculata University and her PhD from Rutgers University, with her doctoral research project involving the athletes at WCU. In addition to her teaching and chair responsibilities, she provides nutrition education and services to WCU athletes, mentors undergraduate and graduate students interested in sports nutrition, and serves as a preceptor for dietetics interns wishing to do a sports nutrition rotation. Chris served on the SCAN Executive Committee as the director of Sports Dietetics–USA (SD-USA) subunit from 2013 to 2016. She is a member of the American College of Sports Medicine (ACSM), the Professionals in Nutrition for Exercise and Sport (PINES), and the Collegiate & Professional Sports Dietitians Association (CPSDA). She has presented frequently to many different groups and advocates for the critical need of sports dietitians in all college programs. She is editor-in-chief of *Sports Nutrition: A Handbook for Professionals*, 6th edition, published in Septem-

ber 2017. Chris enjoys working out, hiking, playing golf, gardening, and watching almost any sport.

■ **Meridan Zerner, MS, RDN, CSSD** was honored with SCAN's 2018 Excellence in Practice Award for outstanding service and professional accomplishments that have advanced her practice area. Meridan is an award-winning RDN with 28 years of experience in the field of health and wellness. She has spent the past 17 years at Cooper Clinic, where she works with patients and shares her passion for nutrition through media segments and lectures across the country. Meridan received her BS degree from Syracuse University and her MS degree in nutritional science with an emphasis in health promotion from the University of Oklahoma. She is a Certified Specialist in Sports Dietetics (CSSD) and specializes in weight management and exercise and sports nutrition. She also shares her expertise in preventive and cardiovascular health and nutrition throughout the life cycle. Meridan is a certified wellness coach and uses behavioral change skills to help support long-term lifestyle changes in her patients. She contributes to multiple entities across the Cooper campus in a variety of capacities. She serves as an adjunct instructor at The Cooper Institute, the lead facilitator for Cooper Wellness Strategies, and a group exercise instructor and lecturer at Cooper Fitness Center. Her wellness philosophy is to do the best you can with what you have, where you are. When she isn't partnering with patients or leading classes, Meridan enjoys traveling with her husband, two children, and one quirky dog. Her favorite destination is Maine, where she lived prior to making Dallas her home.

■ **Cortney Steele, MS, CSCS** received SCAN's 2018 Student Award. Cortney is a third year PhD and dietetics student in the Department of Human Nutrition, Foods, and Exercise at Virginia Tech. She has served on SCAN's Student Board and *The Beat* newsletter team for the past two years. Currently, she works in the Human Integrative Physiology Laboratory at Virginia Tech. Cortney completed her BS degree in Health and Human Performance at Messiah College in 2013 and her MS degree in exercise science at Bloomsburg University in 2015. Her master's research involved applying different strategies of carbohydrate intake among athletes, including carbohydrate mouth rinsing. Her current research interests focus on the effects of dietary choline intake on vascular health in adults.

■ **Kate Davis, MS, RD, CSSD** was recently named as the editor-in-chief for the Academy of Nutrition and Dietetics' online *Sports Nutrition Care Manual (SNCM)*. The SNCM contains research-based information written by CSSDs. For more information, visit www.nutritioncaremanual.org/about-sncm.

If you have an accomplishment that you would like published in an upcoming issue of PULSE, please contact Traci Roberts at fivespotjones@gmail.com.

of Further Interest

■ 2018 SCAN Election Results

SCAN members cast their votes earlier this year and elected the following to SCAN's leadership.

Congratulations to our new leaders, and thank you for stepping up to serve SCAN:

Chair-Elect: Jennifer Ketterly, MS, RD, CSSD

Treasurer: Lynn Cialdella Kam, PhD, MA, MBA, RDN

Nominating Committee: Josephine Connolly-Schoonen, PhD, RD and Caroline Sullivan, MS, RD, CSSD

■ News from Wellness/CV RDs Subunit

Here's an update from the Wellness/CV subunit:

• **Wellness Task Force Updates.** The Wellness Task Force is developing a 3-year plan with the objective of creating materials and programming to best support SCAN members working in the wellness arena. Stay tuned for more details!

• **SCAN Symposium Recap.** We enjoyed meeting new members and re-connecting with long-time members at the recent SCAN Symposium, held in May at the Keystone Resort. If you couldn't join this year, we hope you will plan to join us in Arizona for the 2019 SCAN Symposium, where the theme will be wellness-focused.

• **New Webinar: Health Coaching.** With the rise in popularity of careers as "health coaches" and various certification programs out there, it can be a difficult space for registered dietitian nutritionists to navigate. However, it is also a space in which we are well-suited to practice. Recognizing a need for more information about this career path, a webinar on health coaching has been recorded and will soon be available on the SCAN website. Look for it in the e-library (www.scandpg.org/e-library/), and

remember, webinars are free to members for the first month!

■ News from Sports Dietetics—USA (SD-USA) Subunit

Below are some highlights from the SD-USA subunit:

• **Volunteer Opportunities.** If you were able to attend the SCAN Symposium in May, you heard about all of the exciting projects and opportunities on SD-USA's plate this year. For example, we are entering year 2 of our Expanding the Arena Initiative, launching a podcast, publishing several new fact sheets, and continuing to collaborate with our external partners such as the National Athletic Trainers' Association (NATA), the National Strength and Conditioning Association (NSCA), and Professionals in Nutrition for Exercise and Sport (PINES). None of this can happen, however, without help from our amazing volunteers. We need you! Visit the SCAN volunteer page at www.scandpg.org/volunteer-opportunities/

• **Athletes in the Arts Partnership.** SCAN now has an official partnership with Athletes in the Arts (an ACSM initiative). This ties in with our Expanding the Arena Initiative by promoting opportunities for sports dietitians to work with performing artists. We are looking for volunteers who are interested in developing this partnership. Please visit <http://www.scandpg.org/volunteers-opportunities/>.

• **SCAN Speaking Opportunity.** The SCAN-NATA Committee has developed a PowerPoint presentation that highlights the collaborative working relationship of sports RDNs and certified athletic trainers (ATCs). Any SCAN member can apply to offer this presentation at any NATA-approved provider program. SCAN benefits

from increased exposure, NATA members benefit by connecting with a local nutrition expert, and you can benefit from potential referrals and an honorarium. Visit the www.scandpg.org/sports-nutrition/ and click on Promotive Sports Dietetics" for more information.

• **CSSD Exam Window.** The 2019 exam dates and fee schedule for the Board Certified Specialist in Sports Dietetics (CSSD) credential will be available on August 1. Visit the Commission on Dietetic Registration (CDR) website at www.cdrnet.org/certifications/board-certification-as-a-specialist-in-sports-dietetics for more information.

• **NEW Fact Sheets.** The fact sheet team was busy this past year! Go to www.scandpg.org/sports-nutrition/sports-nutrition-fact-sheets/sn-fact-sheets/ to check out the following new fact sheets: *Low Carbohydrate, High Fat Diets for Athletes*; *Gut Health for Athletes*; *Hydration and Cooling Needs for Athletes with a Spinal Cord Injury (SCI)*; *Post-Collegiate Nutrition*; *Nutrition for Adventure Racing*; *Protein Supplements for Athletes*; *Nutrition for Athletes with GERD*; and *The Top 10 Reasons CSSDs Deliver*. As always, our fact sheets are free to SCAN members.

■ Call for Abstractors for "Research Digest"

The "Research Digest," which appears in each issue of *SCAN'S PULSE*, provides summaries of published papers relating to all of SCAN's practice areas: nutrition for sports and physical activity, cardiovascular health, wellness, and disordered eating and eating disorders. You can contribute to the "Research Digest" by volunteering to abstract a recently published study on any of the above practice areas. For details on this opportunity, contact Kary Woodruff, MS, RD, CSSD, co-editor of "Research Digest," at

kary.woodruff@health.utah.edu.
Become a contributor to *PULSE*!

■ Manuscripts for *PULSE* Welcome

SCAN's *PULSE* welcomes the submission of manuscripts to be considered for publication. In particular, *PULSE* is interested in receiving original research reports and review articles. Manuscripts presenting practical guidelines, case studies, and other information relative to SCAN will also be considered.

Manuscripts must be prepared and submitted in accordance with *PULSE*'s Guidelines for Authors; only manuscripts that follow these guidelines will be considered. The Guidelines for Authors can be accessed at www.scandpg.org/nutrition-info/pulse/.

■ Easy Access to EAL Guideline Recommendations

Dietetics practitioners can now get practical quick-reference tools for their pocket or electronic devices from the Academy's Evidence Analyses Library. These guideline tools provide graded recommendations for screening, referral, assessment, intervention, and monitoring of the special nutritional needs of various patient populations, such as those with heart failure, diabetes types 1 and 2, gestational diabetes mellitus, and more. For more information, go to www.guidelinescentral.com/shop/society/academy-of-nutrition-and-dietetics.

■ Take Advantage of the Academy's Webinars

The Center for Lifelong Learning's Webinar Series is the perfect way to expand your practice skills and learn about late-breaking developments in dietetics while earning continuing professional education units (CPEUs), all at your convenience. Live webinars offer opportunities to interact with leading food and nutrition practitioners, while recorded webinars make online education available anytime.

Just a few of the archived recorded webinars include:

- *Beyond the App Game: Integrating Mobile Apps into Dietetics Practice*
- *Branding: Creating Your Professional Image*
- *Evidence-Based Nutrition: Using Scientific Evidence to Inform Clinical Practice*
- *Orthorexia Comes of Age: Perspectives on the Healthy Eating Disorder*
- *Seafood Nutrition: Benefits from Sea to Table*
- *State of the Sweeteners Union: How Strong is the Evidence on Low and No-Calorie Sweeteners?*
- *Supermarket Victory: Optimizing Sports Performance Through Step-by-Step Shopping Guides*
- *The Mighty Microbiome: What We Know and What We Need to Learn*
- *Vitamin E: Setting the Record Straight*

For information on the Academy's webinars, including a list of upcoming live webinars, go to www.eatrightpro.org/practice/professional-development/distance-learning/webinar-series.

■ Nutrition Care Manual Products from the Academy

The Nutrition Care Manual products from the Academy are interest-based diet manuals and professional practice resources for RDs, NDTRs, and allied health professionals. Many SCAN members are already users of the sports-related product in this series—the *Sports Nutrition Care Manual (SNCM)*. This manual, focusing on sports and performance, will undergo future enhancements as a new partnership with SCAN and the Academy moves forward (see "From the Chair," page 14).

The other two manuals in this series available from the Academy are the *Nutrition Care Manual (NCM)*, which addresses adult (18+ years) populations, and the *Pediatric Nutrition Care Manual (PNCM)*, which focuses on pediatric populations and their caregivers.

All three products are purchased by annual subscription and give members online access to evidence- and knowledge-based nutrition informa-

tion that keeps practitioners current and compliant. More information on these manuals can be found at www.nutritioncaremanual.org.

■ New Code of Ethics for the Nutrition and Dietetics Profession

The Academy and the Commission on Dietetic Registration believe it is in the best interest of the profession—and the public it serves—to have a Code of Ethics that guides professional practice and conduct. As health care becomes more complex and the areas in which nutrition and dietetics practitioners work become more challenging, it is important that codes of ethics governing the profession evolve as well. With that in mind, the Academy/CDR's Code of Ethics was recently updated. The new Code of Ethics went into effect on June 1, 2018 for all Academy members and all practitioners credentialed by the Commission on Dietetic Registration.

The review and revision of the Academy/CDR's Code of Ethics recognizes the changes in nutrition and dietetics practice that exist today, and is responsive to new trends such as digital health care, social media, and the evolving use of other technologies. The Code of Ethics has been updated numerous times since the 1930 publication of "A Professional Code for the Hospital Dietitian." The most recent revision prior to this year's was published in 2009.

The full text of the Academy's Code of Ethics is available at www.eatrightpro.org/practice/code-of-ethics/what-is-the-code-of-ethics. Also, the Academy provides additional resources in ethics to further educate members on this topic. For example, an ethics reading list offers links to several articles that have been published in the *Journal of the Academy of Nutrition and Dietetics* on ethical practice related to the Code of Ethics. This informative list is available at www.eatrightpro.org/practice/code-of-ethics/ethics-education-resources. Check it out!

■ RDN Exam Preparation Made Easy

If you're planning on taking the RDN exam, take advantage of the Academy's comprehensive and convenient eatrightPREP tool. This effective learning experience is a great way to prepare and gain an edge in passing the exam. The course provides more than 900 questions, unlimited access to full-length practice exams, more than 500 flashcards, performance statistics to identify your strengths and target weaknesses before exam day, and much more. Learn more about this opportunity by visiting www.eatrightprep.org/rdn-exam

■ Academy President Calls Out Need for RDN on President's Council on Sports, Fitness and Nutrition

In a letter written on behalf of the Academy and the nation's RDNs, Donna Martin, EdS, RDN, SNS, FAND, 2017-2018 president of the Academy, urged President Trump to appoint an RDN to the President's Council on Sports, Fitness and Nutrition. The letter states that the presence of an RDN on the Council "would help give our fellow citizens the tools they need to make the best food choices for health, while preventing food and nutrition confusion that hurts our citizens." The letter noted the many highly qualified candidates among the ranks of the nation's RDNs, and said the Academy would be happy to work with the White House to identify potential Council members.

■ Menu Labeling Takes Effect

After several years of delays, the country's menu labeling rule, created under the Affordable Care Act, took effect May 7. The new rule applies nationwide to standard menu items in restaurants and similar retail food establishments with 20 or more locations. The final rule and industry guidance from the Food and Drug Administration were the result of a deliberate process that

included input from stakeholders across industry, government, and public health. The Academy has long supported Americans' ability to know what is in their food and make healthy choices at the point of purchase.

■ House Launches Food Waste Caucus

U.S. Reps. David Young (Iowa) and Chellie Pingree (Maine) have created a Food Waste Caucus in the House of Representatives. The U.S. wastes 40% of the food available for consumption throughout the supply chain; identifying where waste occurs is necessary to increase efficiencies. The Academy's farm bill recommendations empower consumers to choose healthful foods and reduce waste, while supporting producers and retailers in meeting demand for a healthful and safe system. To learn more, visit www.eatrightpro.org/advocacy/legislation/all-legislation/farm-bill.

■ Food and Nutrition Issues in NAFTA Negotiations

The Academy is monitoring the North American Free Trade Agreement (NAFTA) negotiations, especially their impact on food labeling of products from abroad. Recognizing that trade is a complex, multifaceted issue, the Academy is withholding formal comment while considering how negotiations may implicate our food labeling principles. The Academy continues to support policies that ensure all labels are truthful and provide information to help consumers make healthful choices.

Mark Your Calendars:

FNCE® 2018

October 20-23
Washington, DC

Join us at the 2018 Food & Nutrition Conference & Expo™ (FNCE®) for outstanding sessions and events. A few of the highlights include:

• **SCAN Networking Reception**

Enjoy this opportunity to meet and network with your SCAN colleagues

• **SCAN Booth at the DPG/MIG Showcase**

Take a look at what SCAN offers members and chat with your SCAN leaders

• **SCAN Spotlight Session: Heart of an Athlete: Managing Hypertension in Athletic Populations**

Presenters: Aaron Baggish, MD, FACC, FACSM and Jackie Buell, PhD, RD, CSSD, ATC

For more information and updates, watch for eblasts and visit www.scandpg.org/fnce-2018/

Upcoming Events

July 9-27, 2018

CDR Board Certified Specialist in Sports Dietetics examination (at various U.S. sites). For information: Commission on Dietetic Registration, www.cdrnet.org/certifications/board-certification-as-a-specialist-in-sports-dietetics

August 17-20, 2018

American Association of Diabetes Educators Annual Meeting, Baltimore, MD. For information: AADE, www.diabeteseducator.org

September 12-15, 2018

AACVPR Annual Meeting, Charleston, SC. For information: American Association of Cardiovascular and Pulmonary Rehabilitation, www.aacvpr.org

November 11-15, 2018

Obesity Week, Nashville, TN. For information: American Society for Metabolic & Bariatric Surgery and The Obesity Society, <https://obesity-week.com/>

November 9-11, 2018

Annual Renfrew Center Foundation Conference, Philadelphia, PA. For information: www.renfrew.com

April 26-28, 2019

35th Annual SCAN Symposium, Phoenix, AZ. For more information: www.scandpg.org

SCAN'S PULSE

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Appropriate announcements are welcome. Deadline for the Winter 2019 issue: **Oct. 1**. Deadline for the Spring 2019 issue: **Jan. 1, 2019**. Manuscripts (original research, review articles, etc.) will be considered for publication. Guidelines for authors are available at www.scandpg.org. E-mail manuscript to the Editor-in-Chief; allow up to 6 weeks for a response.

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