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CONTENTS

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Results of the Detroit Faith-Based Mini-Market Project

by Quentin J. Moore, MPH and Brandess Wallace, MPH

The Detroit Fruit and Vegetable Mini-Market Project was created as a collaborative effort of faith partners who were recruited to accomplish a shared goal: to promote healthful eating and physical activity among African Americans in churches and faith-based organizations as a means to address the huge burden and disparity of cardiovascular disease (CVD) among blacks.[1,2] The program's goals and objectives, along with pilot data on its implementation, were previously described in *SCAN's PULSE* (Winter 2006). Partnering with the Michigan Department of Community Health, the Michigan Public Health Institute (MPHI) obtained funding to conduct this special project to increase capacity and provide resources for faith-based fruit and vegetable mini-markets in 10 churches in Detroit and its surrounding areas. Faith-based wellness programs have previously been successful in empowering African-American churches to promote fruit and vegetable consumption as a method to decrease the risks of CVD and hypertension in the black population.[3,4]

The 10 selected church sites were provided with training and materials enabling them to conduct fruit and vegetable mini-markets. Throughout the 8-month project period, participating churches received information on health and wellness programs, educational resources, other materials, and technical assistance. Staff provided support in troubleshooting as well as assisted in the coordination of health screenings and educational lectures for the churches. The mini-marts were targeted to low-income residents, offering them low-cost fresh produce at accessible locations.

Methods

The Detroit Fruit and Vegetable Mini-Market Project utilized quantitative and qualitative methods. Quantitative data were collected via a retrospective pretest. This method of self-report evaluation offers a vehicle for documenting behavioral change at an endpoint, with each respondent serving as his/her own control. The instruments are relatively easy to develop, use, and analyze.[5] Results are credible and are a proficient indication of program impact when a traditional pre/post design cannot be utilized.[5,6] However, retrospective pretests carry some limitations. Validity can be compromised when self-reported data and recall are used. Insufficient recall and biased responses are possible problems with these types of evaluative instruments.[7]

The retrospective pretest used in the mini-market project was revised from a previous 5 A Day initiative survey targeting a low-income

audience.[8] The revised survey was designed to obtain respondents' self-reported changes in knowledge, attitudes, and behaviors on fruit and vegetable intake and activity levels. Respondents were asked questions pertaining to their lifestyle, including fruit and vegetable intake and physical activity levels before and after the mini-market project. Questions regarding respondents' knowledge about food preparation and cost of produce were incorporated into the survey. Surveys were individually numbered and excluded personal identifiers in order to preclude association with specific respondents. Simple descriptive statistics, including, frequency distribution, mean and standard deviation, were collected to summarize the participants' responses to survey questions.

Participating churches were provided with a total of 1,500 surveys to disseminate among their congregational members. To encourage completion of the surveys, each church offered their members an incentive in the form of a drawing to win a prepaid gas card worth $50. The use of incentives has a long history in surveys. Various studies have consistently shown that incentives increase response rates.[9,10] Locked drop boxes were placed in prominent locations within each church to collect the surveys. A total of 401 (26.7%) surveys were completed and returned. Respondent demographics are shown in Table 1 (pg. 4).

Interviews of Mini-Market Coordinators

Additional data were collected via in-depth interviews with the mini-market coordinator for each church. This was done to provide MPHI program staff with a deeper understanding of the mini-market coordinators' experiences and opinions relating to the planning and implementation of the project. Qualitative evaluation methods have been shown to be effective when the primary goal is to obtain depth, rather than breadth, of information.[11]

An external facilitator, who was hired to evaluate outcomes at each site, conducted personal, one-on-one interviews with designated mini-market coordinators and/or pastors at each church after the completion of the markets. The objectives of this qualitative evaluation were to: (1) obtain participants' reactions to various elements of the project, (2) identify the key success factors, (3) identify core issues and constraints that impacted implementation, and (4) obtain ideas and suggestions for refining the program to enhance its effectiveness in future years.

All mini-market coordinators who were originally selected to participate in the project were contacted. Ten of the 13 initial churches were successfully interviewed. The interviews provided valuable insight on key aspects of the mini-market process. The facilitator probed with questions that exposed both successes and weaknesses. Some questions from the interview included:

- What kind of commitment or involvement does the program require of the church? Pastor/leader? Coordinator? Participants?
- What were the reasons your church chose to participate in the program?
- Overall, would you consider the program a success at your church? Why?
- What changes have been implemented at your church as a direct result of the program?

Successes and Outcomes

Ten churches implemented fruit and vegetable mini-marts, health screenings, education sessions, and point-of-service advertisements. Preliminary evaluation of consumer surveys consumers suggests that several positive changes occurred, as follows:

- Approximately 8,500 individuals from area churches and the surrounding community purchased fresh produce from the mini-markets.
- Approximately 25,000 residents of Detroit were reached through point-of-service advertisements, including a significant number reached from low-income areas.
- 82.8% of respondents reported

FROM THE EDITOR

Sink Your Teeth Into This!

As Red Blaik, the former Army head football coach, once said: "You don't develop good teeth by eating mush." The same could be said for developing nutrition knowledge, and I think you'll find that the information presented in this issue of *PULSE* is nothing but solid.

The appetizer for this issue is our cover follow-up article that takes us to the farmer's market; in this report, Quentin Moore and Brandess Wallace describe the results of their project to increase fruit and vegetable consumption in an urban environment. If you've got an appetite for exploring the effects of branched chain amino acid supplementation on central fatigue, protein synthesis, and immune function, Matthew Dallas and Brenda Malinauskas serve up some of the latest research in this area. You might also find yourself hungering for a free CPE article, and I think the piece on oxidative stress in diabetes by Abigail Turpyn, Janet Walberg Rankin, and Brenda Davy might be just what you ordered.

For those of you who weren't able to attend the 2006 SCAN Symposium in Nashville and for those who were there but need a review, our newest disordered eating editor, Tracy Daly, recruited many of our speakers to provide us with summaries of their presentations. These should make for some tasty nuggets of useful information. Our abstracts in the "Sports Dietetics USA Research Digest" and book reviews will give you a little more to nibble on if you find that you're not totally satisfied with our features and need a little dessert.

In all, I hope this issue of *PULSE* gives you something to chew on.

Mark Kern, PhD, RD
Editor-in-Chief

eating 2 or more servings of fruits per day after the project versus 60.3% before the project.
- 63.9% of respondents reported eating 3 or more vegetables per day after the project versus 39.1% before the project.
- 22.9% of respondents reported they believed they *should* eat 3 or fewer servings of fruits and vegetables daily after the project versus 59.6% before the project.
- 51.4% of respondents reported that as a result of the project, they were much more aware of the importance of combining healthy eating and exercise to achieve a healthy lifestyle.
- 84.1% of respondents reported they were either "very satisfied" or "satisfied" with the project.

Although not discussed in great detail, weekly walking clubs or groups within churches were also organized by the mini-market coordinators. Positive results of these efforts included:
- Moderate exercise for 4 or more hours/week was reported by 39.9% respondents after the project versus 22.7% before the project.
- Vigorous exercise for 4 or more hours/per week was reported by 25.1% respondents after the project versus 17.9% before the project.

Respondents provided comments on the mini-market program, giving overwhelming positive feedback; samples of their feedback are shown in Table 2 (pg. 4). In addition, results from the interviews with coordinators reaffirm reported findings that partnerships with faith organizations are effective conduits for delivering health messages and providing access to health resources.[12-14] Most mini-market coordinators agreed that pastor involvement and commitment were key to the success of the program. The role of the pastor or influential leader contributed greatly to high participation among congregation members. Some comments received from coordinators include the following:
- "The pastor is very involved. She promoted the weekly mini-marts and all of the other programs verbally and during each Sunday morning as part of the announcements."
- "It was the pastor's idea that we designate the fifth Wednesday as Health Day. He is very visible and active in our health care activities."
- "Our participation was awesome: an average of 300 people per market. We did three markets a day, and have a membership of about 6,000 people. People are begging us to do this again."
- "As time went on, I had a higher participation rate, and when we were done, people were disappointed that it had ended."

Future Directions

Building on the success of the project, funding has been obtained to expand mini-markets to include a youth component. This effort will engage four to six churches with established youth groups to conduct youth-operated mini-markets in underserved communities. Youth participants will receive training in basic entrepreneurial skills and nutrition education. The project will provide positive educational opportunities for youth and will serve as a successful model of youth business development while also providing a valuable resource for

Table 1. Demographics of Mini-Market Pretest Survey Respondents (n=401)

- 86.5% identified themselves as black
- 72.1% were male
- 76.2% reported living in households of 4 or fewer persons
- 25.7% reported participating in the Food Stamp, Electronic Balance Transfer (EBT), or Bridge Card program in the past year
- 44.1% reported their household income to be under $30,000 per year

health promotion within the faith community.

Conclusion

The mini-market project has given participating churches the capacity to move toward creating environmental changes through promotion and access. The results obtained through evaluative measures provide insight into the work that public/private partnerships can play to help educate and increase awareness on health concerns.[15] Furthermore, numerous leaders have expressed a desire to continue the mini-markets and are currently working on creating markets within their congregation that are self-sustainable.

Quentin Moore, MPH, of MPHI, manages community and faith-based initiatives addressing cardiovascular health, nutrition, and physical activity. He oversees initiatives that focus on building leadership, community capacity, and programmatic infrastructure. He has experience in social marketing, community interventions design, and evaluation and material development. Brandess Wallace, MPH, is a community health consultant at MPHI. *This project has been partially funded with federal funds from the United States Department of Agriculture (USDA), Food Stamp Program by way of the Michigan Nutrition Network at Michigan State University Extension.*

References

1. Michigan Department of Community Health, Michigan Mortality: Michigan and United States Mortality Trends. Heart Disease; 2005. Available at: http://www.mdch.state.mi.us/pha/osr/deaths/Heartdx.asp. Accessed February 26, 2006.
2. Michigan Department of Community Health, Michigan Mortality: Michigan and United States Mortality Trends. Heart Disease; 2005. Available at: http://www.mdch.state.mi.us/pha/osr/deaths/Strokedxs.asp. Accessed February 26, 2006.
3. Resnicow K, Campbell MK, Carr C, et al. Body and soul. A dietary intervention conducted through African-American churches. *Am J Prev Med.* 2005;28:142.
4. Resnicow K, Jackson A, Braithwaite R, et al. Healthy Body/Health Spirit: a church-based nutrition and physical activity intervention. *Health Educ Res.* 2002;17:562-573.
5. Howard GS. Response-shift bias a problem in evaluating interventions with pre/post self-reports. *Evaluation Review.* 1980;4:93-106.
6. Rockwell SK, Kohn H. Post-then-pre evaluation. *J of Ext.* 1989; 27:2.
7. Lamb T. The retrospective pretest: an imperfect but useful tool. *The Evaluation Exchange.* 2005;11:2.
8. Anderson JV, Bybee DI, Brown RM, et al. 5 a day fruit and vegetable intervention improves consumption in a low income population. *J Am Diet Assoc.* 2001;101:195-202.
9. Singer E, Van Hoewyk J, Gebler N, et al. The effect of incentives on response rates in interviewer-mediated surveys. *J Offic Stat.* 1999;15:217-230.
10. Yu J, Cooper, H. A quantitative review of research design effects on response rates to questionnaires. *J Marketing Res.* 1983;20:36-44.
11. Morgan David L. *The Focus Group Guidebook.* California: Sage Publications; 1998: 11-13.
12. Hatch JW, Cunningham AC, Woods WW, et al. The fitness through churches project: description of a community-based cardiovascular health promotion intervention. *Hygiene.* 1986;5:9-12.
13. Hatch J, Voorhorst S. The Church as a Resource for Health Promotion Activities in the Black Community. National Institutes of Health/ National Heart Lung and Blood Institute. Report No. 92-2965;1992.
14. Lasater T, Becker D, Hill M, et al. Synthesis of findings and issues from religious-based cardiovascular disease prevention trials. *Ann Epidemiol.* 1997;7:S7,S46-S53.
15. Gillies, P. Effectiveness of alliances and partnerships for health promotion. *Health Promotion Inter.* 1998;13:99-120.

Table 2. Sample Comments from Respondents Regarding the Mini-Market Project

- "I would welcome the mini-mart at the church on a regular basis. Cost and convenience is great. I purchased something every week and truly miss it."
- "Thank you for the opportunity to learn and experience fruits and vegetables every week at church. I looked forward to it, and will try to keep it up."
- "The information was very helpful. The fruits and vegetables that were sold at church were very helpful in providing for my family. The cost was very inexpensive."
- "Our healthy living program has been an excellent one for our church. Our awareness level has increased."

Does Branched-Chain Amino Acid Supplementation Offer Ergogenic Benefits?

by Matthew B. Dallas and Brenda M. Malinauskas, PhD, RD

The therapeutic effects of branched-chained amino acids (BCAAs) have been extensively reviewed over the past 30 years.[1] More recently, the sports world has taken notice of branched-chain amino acids (BCAAs) for their potential role in physical performance and recovery. The following is a review of the proposed mechanisms for the potential ergogenic effects of BCAAs in regard to central fatigue, protein synthesis, and immune response.

Central Fatigue

Exercise-induced fatigue originating from the central nervous system (CNS), referred to as "central fatigue," is proposed to result from variations in serum amino acid concentrations that alter serotonin (5-hydroxytryptamine; 5-HT) production.[2] A 50% increase of 5-HT has been reported during periods of exercise-induced fatigue.[3] Levels of 5-HT are dependent on the blood-brain barrier crossing of free tryptophan (f-Trp); Trp is an amino acid precursor of 5-HT. The blood-brain barrier is not exclusive to f-Trp; other large neutral amino acids, predominantly BCAAs, compete with f-Trp for transport across the blood-brain barrier.[2] During rest, the ratio of f-Trp to BCAAs (f-Trp:BCAAs) has been reported to be 1.5% (7 µmol/l:470 µmol/l)[2] and results in normal production of 5-HT.[4,5] Subsequent bouts of high- intensity exercise have led to f-Trp:BCAAs levels as high as 5.0% (19 µmol/l:380 µmol/l).[2]

Blomstrand[2] suggests that f-Trp becomes more available for transport across the blood-brain barrier during exercise due to increased competition between f-Trp and free fatty acids for binding to albumin. Increased free fatty acids in circulation occur during exercise from alterations of catecholamines, low blood glucose, and decreased muscle glycogen.[2] Because free fatty acids become available for binding to albumin during exercise, less Trp is able to bind to albumin, resulting in increased f-Trp crossing the blood-brain barrier. Additionally, increased peripheral uptake of BCAAs to support gluconeogenesis[5] results in lower levels of circulating BCAAs.[2, 5]

Together, these biochemical changes shift the f-Trp:BCAAs ratio, causing increased 5-HT levels, thereby facilitating central fatigue. The hypothalamus and, to a lesser extent, the amygdala, have recently been identified as regions of the brain that experience increased 5-HT levels in response to exercise, both of which are actively involved in regulating fatigue.[6] Supplementing with BCAAs may help to maintain circulating levels of BCAAs as well as favorably shift the f-Trp:BCAA ratio away from excess 5-HT production, thus reducing central fatigue.

"Small improvements in cognitive and physical performance have been reported in studies evaluating doses of 6 g to 20 g.[2,5] However, higher doses (20 g-30 g) may elevate ammonia levels due to increased protein substrate utilization."[5]

A review by Davis[5] highlighted several studies that investigated plasma BCAA and f-Trp levels during exercise and their relationship to fatigue. A small number of studies found significant decreases (19%-29%) in plasma BCAAs with increases in f-Trp (up to 45%) following athletic events.[5] Thus, BCAA supplementation was of interest in an attempt to limit these changes in circulating BCAA and f-Trp associated with exercise that may influence fatigue.

Other studies have investigated BCAA supplementation in doses ranging from 0.5 g/hour during exercise[5] to 30 g immediately preceding exercise, as described in a review by Blomstrand.[2] Small improvements in cognitive and physical performance have been reported in studies evaluating doses of 6 g to 20 g.[2,5] However, higher doses (20 g-30 g) may elevate ammonia levels due to increased protein substrate utilization.[5] In addition to serum toxicity, ammonia may adversely affect CNS and muscle performance[2,5] through the depletion of pyruvate and tricarboxylic acid cycle intermediates needed for buffering capacity.[5] Thus, doses of 20 g or greater may have adverse physical performance effects.

Recent studies have investigated the effects of combined BCAA and carbohydrate supplementation on athletic performance. Cheuvront et al[4] examined such effects in hypohydrated athletes under heated conditions, as both hypohydration and high environmental temperatures may influence 5-HT production. Participants were 4% dehydrated, then supplemented with 1.4 L of a 5% to 6% carbohydrate solution containing 10 g/L of BCAAs or a placebo. BCAA supplementation had no effect on performance above that of carbohydrate alone. Other studies support the finding that the combined effects of carbohydrate and BCAA supplementation do not improve performance.[2, 4, 5]

Carbohydrate supplementation alone has been shown to decrease fatigue and alter levels of f-Trp:BCAAs, possibly masking the effects of BCAAs.[5]

Protein Synthesis

Enhancement of muscle anabolism and tissue repair are major interests among competitive athletes, particularly those involved in strength sports. BCAAs act as substrates for protein synthesis[7] and exhibit regulatory effects on nitrogen balance that would favor muscle protein synthesis.[1,8,9] BCAAs have a role in regulating and enhancing protein synthesis in muscle by stimulating the phosphorylation of several regulatory proteins involved with messenger RNA (mRNA) translation, specifically $p70^{S6K}$ and eIF4E-BP1.[10-12] Leucine is a more potent stimulator of eIF4E-BP1, $p70^{S6K}$, and overall mRNA activity than either isoleucine or valine, but is most effective when proportionate to the other BCAAs.[8,11-14] A 2:1:1 ratio of leucine:isoleucine:valine has been suggested to promote protein synthesis.[15]

These mechanisms suggest benefits for BCAA supplementation in conditions marked by protein catabolism.[1] Intense physical activity, such as endurance exercise, results in increased amino acid catabolism[16,17] due to heightened energy expenditure.[15] Subsequent BCAA oxidation is attributed to the activation of the branched-chain α-keto acid dehydrogenase (BCKDH) complex, an enzymatic complex that catalyzes the rate limiting step in BCAA oxidation and is increased during prolonged exercise.

Considerable research has investigated the effects of BCAA supplementation on protein synthesis and energy utilization. MacLean et al[18] reported that supplementation of BCAAs (77 mg/kg body weight) prior to exercise increased intracellular and arterial BCAA levels, and resulted in less muscle-protein breakdown compared with controls. Similar effects were reported among individuals who received 3.6 g of amino acids containing 37% BCAAs.[15] Furthermore, chronic BCAA supplementation (14 g for 30 days) resulted in significant maximal forearm strength gains among untrained individuals,[19] lending additional credence to a possible anabolic effect of BCAAs.[1] This effect may be explained by increased protein synthesis and decreased degradation within the skeletal muscle.[13] In support of this claim, Liu[12] and Karlsson[13] found that BCAA supplementation increased phosphorylation of $p70^{S6K}$ during and up to 2 hours following activity, independent of normal exercise-induced effects.[12,13]

"It appears that many of the purported benefits of BCAA supplementation can be achieved by adequate carbohydrate intake alone."

It should be noted, however, that not all studies support the use of BCAA supplementation during exercise as a means of reducing muscle tissue catabolism. Wagenmakers[20] maintains that while BCAA oxidation increases 2- to 3-fold during exercise, glucose and fat utilization experience far greater increases (10- to 20-fold). Additionally, intake of carbohydrate has been shown to reduce BCAA oxidation during exercise.[20]

Immune Response

Compromised immune status has been observed following prolonged strenuous exercise.[21] Glutamine (Gln), a preferential energy source for immune cells,[22] is proposed to contribute to immunity because of its role in lymphocyte and macrophage production. Gln deficiency has been found in the over-training syndrome.[23] Similarly, glutamate (Glu), which is interconverted with Gln, is a key energy substrate during exercise.[24] BCAAs combine with alpha-ketoglutarate to form alpha-ketoacids and Gln, and are therefore directly involved in the synthesis of Glu and Gln.[7,24] Research indicates that supplementation with BCAAs increases Glu and Gln levels that had been reduced as a result of prolonged exercise.[22,24]

Bassit et al[22] investigated the effects of BCAA supplementation on immune status in 12 male triathletes (mean age 25.5 ± 3.2 yr) training to compete in an Olympic distance triathlon (1.5-km swim, 40-km cycle, 10-km run). The supplement group (n=6) received 6 g BCAAs (60% leucine, 20% isoleucine, 20% valine) each day after training for 30 days, a 3-g dose 30 minutes prior to the competition, and a 3-g dose each day for 7 days following the competition. Supplementation corrected a 23% reduction in plasma Gln. The incidence of infection, based on reported symptoms, was 34% lower in the supplement group. Lymphocyte proliferation was observed in the supplement group, including increased production of interleukin-1 (IL-1), interleukin-2 (IL-2), tumor necrosis factor-α (TNF), and γ-interferon (INF). A followup study[21] with the same triathletes and an additional 24 distance runners (30-km run) found that BCAA supplementation improved Gln levels and increased cytokines (IL-1, IL-2, TNF, and INF) in BCAA-supplemented triathletes and runners.

Nonetheless, not all studies support the association between Gln and improved immune response. Rohde and colleagues[25] conducted a randomized crossover, placebo-controlled study (n=8, age 26.9 ± 1.4 yr) examining the effect of Gln supplementation on immune activity. Participants performed 3 bouts of exercise separated by 2 hours. Nine equal doses of Gln (100 mg/kg) were given 30 minutes before, at the end of, and following each bout of exercise. While decreases in Gln and immune activity following exercise were found, cytokine activity (leukocytes, lymphokine activated

killer cells, and proliferative response) was not affected by BCAA supplementation.

Summary

BCAA supplementation has been proposed as an ergogenic aid by delaying central fatigue and enhancing protein synthesis and immune activity. Although some research supports the ergogenic potential of BCAAs in each of these areas, others have found no beneficial effects. The ratio of BCAAs, timing of supplementation with physical activity, and total dose are important factors to consider for athletes who choose to supplement with BCAAs. The authors of this review suggest that the use of BCAAs as an ergogenic aid is not justified when considering the added costs and time involved with supplementation. It appears that many of the purported benefits of BCAA supplementation can be achieved by adequate carbohydrate intake alone.

Matthew Dallas is a graduate student currently pursuing a Master of Science degree in nutrition. Brenda Malinauskas, PhD, RD, is an assistant professor, Department of Nutrition and Hospitality Management, East Carolina University, Greenville, NC.

References

1. Bianchi G, Marzocchi R, Agostini F, et al. Update on nutritional supplementation with branched-chain amino acids. *Curr Opin Clin Nutr.* 2005;8:83-87.
2. Blomstrand E. Amino acids and central fatigue. *Amino Acids.* 2001;20:25-34.
3. Meeusen R, Thorré K, Chaouloff F, et al. Effects of tryptophan and/or acute running on extracellular 5-HT and 5-HIAA levels in the hippocampus of food-deprived rats. *Brain Res.* 1996;740:245-252.
4. Cheuvront S, Carter R, Kolka M, et al. Branched-chain amino acid supplementation and human performance when hypohydrated in the heat. *J Appl Physiol.* 2004;97:1275-1282.
5. Davis JM. Carbohydrates, branched-chain amino acids and endurance: the central fatiguehypothesis. Gatorade Sports Science Institute: Sports Science Exchange. 1996;9(2). Available at: http://www.gssiweb.com/reflib/refs/. Accessed March 15, 2006.
6. Smriga M, Kameishi M, Torii K. Exercise-dependent preference for a mixture of branched-chain amino acids and homeostatic control of brain serotonin in exercising rats. *J Nutr.* 2006;136(suppl):548S-552S.
7. Holecek M. Relation between glutamine, branched-chain amino acids, and protein metabolism. *Nutrition.* 2002;18:130-133.
8. Kimball S, Jefferson L. Regulation of protein synthesis by branched-chain amino acids. *Curr Opin Clin Nutr.* 2001;4:39-43.
9. Stein T, Donaldson, M, Leskiw, M, et al. Branched-chain amino acid supplementation during bed rest: effect on recovery. *J Appl Physiol.* 2003;94: 1345-1352.
10. Yoshizawa F. Regulation of protein synthesis by branched-chain amino acids in vivo. *Biochem Bioph Res Co.* 2004;313:417-422.
11. Greiwe J, Kwon G, McDaniel M, et al. Leucine and insulin activate p70 S6 kinase through different pathways in human skeletal muscle. *Am J Physiol-Endoc M.* 2001;281:E466-E471.
12. Liu Z, Jahn L, Long W, et al. Branched chain amino acids activate messenger ribonucleicacid translation regulatory proteins in human skeletal muscle, and glucocorticoids blunt this action. *J Clin Endocr Metab.* 2001;86: 2136-2143.
13. Karlsson H, Nilsson P, Nilsson J, et al. Branched-chain amino acids increase $p70^{S6k}$ phosphorylation in human skeletal muscle after resistance exercise. *Am J Physiol-Endoc M.* 2004;287:E1-E7.
14. Harris R, Joshi M, Jeoung N. Mechanisms responsible for regulation of branched-chain amino acid catabolism. *Biochem Bioph Res Co.* 2004;313:391-396.
15. Shimomura Y, Murakami T, Nakai N, et al. Exercise promotes BCAA catabolism: effects of BCAA supplementation on skeletal muscle during exercise. *J Nutr.* 2004;134(suppl): 1583S-1587S.
16. De Palo E, Gatti R, Cappellin E, et al. Plasma lactate, GH and GH-binding protein levels in exercise following BCAA supplementation in athletes. *Amino Acids.* 2001;20:1-11.
17. Shimomura Y, Obayashi M, Murakami T, et al. Regulation of branched-chain amino acid catabolism: nutritional and hormonal regulation of activity and expression of the branched-chain α-keto acid dehydrogenase kinase. *Curr Opin Clin Nutr.* 2001;4:419-423.
18. MacLean DA, Graham TE, Saltin B. Branched-chain amino acids augment ammonia metabolism while attenuating protein breakdown during exercise. *Am J Physiol.* 1994;267: E1010–E1022.
19. De Lorenzo A, Petroni ML, Masala S, et al. Effect of acute and chronic branched-chain amino acids on energy metabolism and muscle performance. *Diabetes Nutr Metab.* 2003;16: 291-297.
20. Wagenmakers AJ. Amino acid supplements to improve athletic performance. *Curr Opin Clin Nutr.* 1999;2:539-44.
21. Bassit R, Sawada L, Bacurau R, et al. Branched-chain amino acid supplementation and the immune response of long-distance athletes. *Nutrition.* 2002;18:376-379.
22. Bassit R, Sawada L, Bacurau R, et al. The effect of BCAA supplementation upon the immune response of triathletes. *Med Sci Sport Exer.* 2000;32: 1214-1219.
23. Sawaki K, Takaok I, Sakuraba K, et al. Effects of distance running and subsequent intake of glutamine-rich peptide on biomedical parameters of male Japanese athletes. *Nutr Res.* 2004;24:59-71.
24. Rutten E, Engelen M, Schols A, et al. Skeletal muscle glutamate metabolism in health and disease: state of the art. *Curr Opin Clin Nutr.* 2005;8:41-51.
25. Rohde T, MacLean DA, Pedersen BK. Effect of glutamine supplementation on changes in the immune system induced by repeated exercise. *Med Sci Sport Exer.* 1998;30:856-862.

CPE article:

Diabetes: Something to Stress About

by Abigail Turpyn, BS, Janet Walberg Rankin, PhD, and Brenda Davy, PhD, RD

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Learning Objectives
Upon reviewing the article, the reader will be able to:
1. Define oxidative stress.
2. Identify the relationship between oxidative stress, inflammation, and diabetes complications.
3. Identify nutritional strategies to reduce oxidative stress, inflammation, and associated complications.

As many as 20.8 million American adults had diabetes in 2005.[1] The impact of diabetes is enormous. Individuals with diabetes have twice the risk of death than nondiabetic individuals of the same age, and medical costs associated with the disease—especially type 2 diabetes (T2D)—are staggering, totaling roughly $132 billion in 2002.[1]

Hyperglycemia, hyperlipidemia, and insufficient insulin secretion and action lead to complications that include diseases of the nervous system (leading to amputations), kidneys, eyes (cataracts, blindness), and blood vessels (atherosclerosis). There is evidence that at least part of the negative effects of these metabolic conditions is linked to oxidative stress and inflammation. Individuals with diabetes frequently have elevated levels of oxidative stress and are considered to be in a chronic proinflammatory state.[2,3] Importantly, elevated levels of markers of inflammation such as C-reactive protein have been associated with increased risk of cardiovascular disease (CVD).[4] Oxidative stress plays a key role in many diabetes-associated complications, particularly in the microvasculature, contributing to hypertension, nephropathy, neuropathy, atherosclerosis, and nonalchoholic fatty liver disease (NAFLD).

What Is Oxidative Stress?
Oxidative stress occurs when pro-oxidants outnumber protective antioxidant defenses. Pro-oxidants are often free radicals—highly reactive molecules that attack and damage other molecules in their search for electrons. This article discusses oxygen-containing radicals (reactive oxygen species [ROS]), such as superoxide (O_2-), peroxynitrite (ONOO-), and the hydroxyl radical (OH.). Due to the highly reactive nature of ROS, byproducts of oxidative damage (ie, oxidized DNA, proteins, lipids) are usually measured and reported.

"Individuals with diabetes have twice the risk of death than nondiabetic individuals of the same age."

In diabetes, excess glucose molecules can auto-oxidize, leading to ROS production and glycosylation of proteins.[5] Advanced glycation end products (AGEs) are reactive and damaging byproducts of this process. Glucose metabolism (glycolysis) is also a source of O_2- and is suggested to be the primary mechanism by which hyperglycemia induces diabetic complications, particularly damage to blood vessels.[6]

From glycolysis, electrons are sent to the electron transport chain (ETC) in the mitochondrial membrane, the cell's powerhouse where ATP is produced, in order to harvest their energy. Too many electrons flowing through can flood the ETC and create O_2-, which results in cellular damage, especially to beta cells, and reduces insulin secretion. Beta cells depend on electrons passing through the ETC in order to stimulate insulin secretion.[7] Without insulin, blood sugar levels remain high, perpetuating a hyperglycemic state.

The inflammatory response usually protects against pathogens and infections, but chronically elevated levels of proinflammatory cytokines, chemokines, and adhesion molecules contribute to atherosclerotic processes and endothelial dysfunction. In the vasculature, cytokines activate endothelial cells, resulting in the adherence and migration of macrophages through the vessel wall to take up residence. The activities of macrophages there can contribute to plaque formation and damage to the vessel. Cytokines can also activate cellular immune defenses, causing greater ROS production; some cytokines are toxic to beta cells.[8]

Inflammation is highly linked to oxidative stress. ROS and AGEs activate transcription factors such as nuclear factor kappa B, leading to the production of cytokines (TNF-alpha, interleukin-6, CRP), chemokines, and adhesion molecules.[9] Prevention of chronic inflammation is of utmost importance for individuals with diabetes, because they are 3 times more likely to develop CVD than individuals with normal blood glucose levels, and CVD accounts for more than 55% of all T2D premature deaths.[10]

Reducing Oxidative Stress and Inflammation: Dietary Strategies
Adipose tissue actively releases hormones (leptin), cytokines (TNF-alpha,

interleukin-6) and metabolites (FFA) that can have a negative effect on insulin secretion and action, contributing to insulin resistance.[3] Weight loss has been shown to decrease markers of both oxidative stress and inflammation.[11-13] Most studies report weight losses greater than 10% to be effective in reducing oxidative stress and/or inflammation, but losses as low as 3 kg to 4 kg have also been shown to be effective in this regard. Loss of fat is key, as studies using gastric banding or bypass surgeries alone have reported reductions in C-reactive protein. Studies using diet alone to achieve weight loss show that very low calorie diets (1,000 kcal/day) are associated with reductions in oxidative stress and inflammation within 3 to 4 weeks.[11]

Nutritional strategies independent of weight loss are also beneficial in reducing oxidative stress and inflammation. Diets high in fruits, vegetables, and whole grains—all rich sources of antioxidants—have been shown to lower oxidative stress.[14] Women with higher levels of oxidative stress responded positively to a high-antioxidant diet (~12 servings of fruits and vegetables a day for 2 weeks), with reductions observed in both DNA and lipid oxidative damage. Also, the DASH-CD (Dietary Approaches to Stop Hypertension-Combination Diet) enabled individuals to better withstand an oxidative stressor compared with a low-antioxidant diet or the individuals' regular diet.[15] Diets supplemented with antioxidant-rich foods (eg, tomato products, kiwis, cocoa, blueberries) tend to decrease levels of oxidative stress and/or inflammation, while diets low in fiber, high in fat (particularly trans fat), or with a high glycemic index tend to be associated with increased levels of oxidative stress and/or inflammation.

Effects of Antioxidant Supplementation

The jury on antioxidant supplements is still out. It has been suggested that an "optimum antioxidant regimen" may help diabetics maintain glycemic control, the specifics of which are still yet to be determined.[16] Some studies show that antioxidants (vitamin C, vitamin E, alpha-lipoic acid) and trace minerals (selenium, chromium, zinc) can help reduce inflammation and oxidative stress, while others show no effect.

For example, a small Swedish trial recently reported that 1g/day of vitamin C had no effect on markers of oxidative stress and inflammation.[17] However, supplementation with 600 mg/day of vitamin E for only 2 weeks reduced oxidative stress in a small sample of individuals with diabetes.[18] Overweight individuals taking 800 IU of vitamin E also saw reductions in oxidative stress after 3 months.[19] Several larger trials, however, have not shown such positive results regarding vitamin E and reduction of risk of disease. This may be due to the subject selection, which was not limited to those exhibiting elevated levels of oxidative stress; therefore, any positive effect experienced by some was blunted by no change in others.[20] Differences in study design, dosage levels, and collection procedures may contribute to conflicting results.

"Differences in study design, dosage levels, and collection procedures may contribute to conflicting results."

More work is needed to provide a definitive recommendation for antioxidant supplementation. It has also been suggested that there is a delicate balance of micronutrients and, therefore, it is advisable for supplements to contain a mixture rather than a high dose of a single micronutrient.[16]

Exercise and Combined Lifestyle Modifications

Exercising regularly not only helps individuals to lose and maintain weight, it also helps to enhance glucose uptake by insulin-sensitive cells. Consistent aerobic exercise can improve insulin action in individuals with impaired glucose tolerance independent of weight loss or dietary changes. In fact, a recent review shows that even acute exercise has some benefit in enhancing insulin-stimulated glucose uptake by skeletal muscle, and that combining exercise training and antioxidant supplements (alpha lipoic acid in particular) is gaining attention.[21]

Lifestyle modifications involving a combination approach have been proven effective in lowering oxidative stress and inflammation. Studies show that reduced caloric intake (1,300-1,500 kcal/day), often accomplished by following an American Heart Association-type diet in addition to exercise and weight loss, results in reduction of oxidative stress and inflammation over a period of 1 to 2 years.[12,13]

Recently, a more intensive residential program involving an *ad libitum* diet high in unrefined carbohydrates (65%-70%) and low in fat (12%-15%), along with daily aerobic exercise, reduced these factors in only 3 weeks.[22] The diet was high in whole grains, vegetables, fruits, fiber, and lean protein sources, and had a polyunsaturated-to-saturated ratio of 2.4:1, while the participants walked for 45 to 60 minutes each day at 70% to 85% of predicted maximal heart rate. This type of program appears to be ideal. More work in this area is necessary to determine a "prescription" for individuals with diabetes, and although not everyone may respond the same way, results like this are encouraging. It is extremely important for individuals with diabetes to keep blood sugar levels from fluctuating in order to minimize oxidative damage.[23]

Summary
Individuals with diabetes have an increased risk of oxidative stress and chronic inflammation. Negative consequences of these conditions may be reduced by maintaining a healthy weight, eating diets high in antioxidant-rich foods, exercising regularly (30-60 minutes of moderate intensity aerobic activity/day), minimizing consumption of foods high in fat, sugar, or calories, and regulating blood glucose levels. Antioxidant supplementation may help, but more studies are needed to determine optimal combinations and dosages.

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References

1. National Diabetes Fact Sheet United States, 2005. The Center for Disease Control. Available at: http://www.cdc.gov/diabetes/pubs/factsheet05.htm. Accessed: December 21, 2005.
2. Davi G, Falco A, Patrono C. Lipid peroxidation in diabetes mellitus. *Antioxid Redox Signal*. Jan-Feb 2005;7:256-268.
3. Dandona P, Ajada A, Bandyopadhyay A. Inflammation: the link between insulin resistance, obesity and diabetes. *Trends in Immunology*. January 2004;25:4-7.
4. Ridker P. Stampfer M, Rifai N. Novel risk factors for systemic atherosclerosis. A comparison of c-reactive protein, fibrinogen, homocysteine, lipoprotein(a), and standard cholesterol screening as predictors of peripheral arterial disease. *JAMA.* 2001;285:2481-2485.
5. Wolff S, Dean R. Glucose autoxidation and protein modification. *Biochem J.* 1987:245;243-250.
6. Brownlee M. Biochemistry and molecular cell biology of diabetic complications. *Nature.* 2001;414:813-819.
7. Maechler P and Wolheim C. Mitochondrial function in normal and diabetic β-cells. *Nature*. 2001;414:807-812.
8. Chen M. Lisofylline, a novel anti-inflammatory agent, protects pancreatic B-cells from proinflammatory cytokine damage by promoting mitochondrial metabolism. *Endocrinology*. 2002;143:2341-2348.
9. Bierhaus A, Schiekofer S, Schwaninger M, et al. Diabetes-associated sustained activation of the transcription factor nuclear factor-κB. *Diabetes*. 2001;50:2792-2808.
10. Stump C, Clark S, Sowers J. Oxidative stress in insulin-resistant conditions. *Treat Endocrinol*. 2005;4:343-351.
11. Dandona P, Mohanty P, Ghanim H, et al. The suppressive effect of dietary restriction and weight loss in the obese on the generation of reactive oxygen species by leukocytes, lipid peroxidation, and protein carbonylation. *J Clin Endocrinol Metab* 2001;86:355-362.
12. Ziccardi P, Nappo F, Giugliano G, et al. Reduction of inflammatory cytokine concentrations and improvement of endothelial functions in obese women after weight loss over one year. *Circulation*. 2002;105:804-809.
13. Esposito K, Pontillo A, Di Palo C, et al. Effect of weight loss and lifestyle changes on vascular inflammatory markers in obese women: a randomized trial. *JAMA*. 2003;289:1799-1804.
14. Thompson H, Heimendinger J, Gillette C, et al. In vivo investigation of changes in biomarkers of oxidative stress induced by plant food rich diets. *J Agric Food Chem*. 2005;53:6126-6132.
15. Lopes HF. Martin KL, Nashar K, et al. DASH diet lowers blood pressure and lipid-induced oxidative stress in obesity. *Am J Clin Nutr*. 2004; 79:1060-1072.
16. Opara E. Role of oxidative stress in the etiology of type 2 diabetes and the effect of antioxidant supplementation on glycemic control. *J Invest Med*. 2004;52:19-23.
17. Lu Q, Bjorkhem I, Wretlind B, et al. Effect of ascorbic acid on microcirculation in patients with type II diabetes: a randomized placebo-controlled cross-over study. *Clinical Science*. 2005;108:507-513.
18. Davi G, Ciabattoni G, Consoli A, et al. In vivo formation of 8-iso-prostaglandin f2alpha and platelet activation in diabetes mellitus: effects of improved metabolic control and vitamin E supplementation. *Circulation*. Jan 19 1999; 99:224-229.
19. Manning P, Sutherland W, Walker R, et al. Effect of high-dose vitamin E on insulin resistance and associated parameters in overweight subjects. *Diabetes Care*. 2004;27:2166-2171.
20. Meagher, E. Treatment of atherosclerosis in the new millennium: is there a role for vitamin E? *Preventive Cardiology*. 2003;6:85-90.
21. Henriksen, E. Exercise training and the antioxidant α-lipoic acid in the treatment of insulin resistance and type 2 diabetes. *Free Radical Biology & Medicine*. 2006;40:3-12.
22. Roberts C, Won D, Pruthi S, et al. Effect of a short-term diet and exercise intervention on oxidative stress, inflammation, MMP-9, and monocyte chemotactic activity in men with metabolic syndrome factors. *J Appl Physiol*. 2005;0:01292.2005v1 [in press]
23. Hirsch I, Brownlee, M. Should minimal blood glucose variability become the gold standard of glycemic control? *J Diabetes and Complications*. 2005;19:178-181.

2006 SCAN Symposium Presentations

The following summaries, coordinated by SCAN'S PULSE *disordered eating editor Tracy Daly, MS, RD, represent a portion of the programs and papers presented at the 2006 SCAN Symposium, "Striving for Balance: Professional Approaches for Improvement in Weight, Body Image, and Disordered Eating, held March 24-26, in Nashville, Tenn. (NOTE: Some of the titles below are shortened versions of the original presentation titles.)*

Pre-Symposium Workshop:

The Power of Walking: Building a Healthy Community

by Mark Fenton, MS

Public health officials are decrying an obesity epidemic in America, with nearly one third of adults classified as obese (a body mass index of ≥30) and more than 60% as overweight (BMI >25). It would be better to call it an epidemic of physical inactivity and poor nutrition, in which obesity is simply the most obvious symptom. Type-2 diabetes is close on obesity's heels, as are other comorbidities of sedentary living and poor diet.[1]

The minimum amount of physical activity recommended by the US Surgeon General to reduce risk for chronic disease and early death is modest—30 minutes a day for adults. Yet only about a quarter of American adults meet that recommendation through leisure-time exercise. Even fewer attain the 60 to 90 minutes of activity recommended in the USDA Dietary Guidelines to aid with substantial weight loss or maintenance.[2] It is clear that inactivity in itself is an independent risk factor for disease and premature death.[3]

For population-level impact, the answer may lie in helping people build activity into their daily lives. A promising approach is to create social and physical environments that encourage active lifestyles, especially regular walking and bicycling. For example, a study of older women who had been in a walking program a decade earlier found that those who had remained more active (ie, accumulating almost twice as many steps daily on a pedometer as the less active women) lived in areas with more convenient walking destinations and facilities.[4]

Other studies have associated more sprawling suburban settings with higher rates of obesity, and conversely higher housing or intersection densities with lower obesity risk. It has been found that residents in communities with the following attributes tend to do more walking and cycling:[5]

■ ***More mixed land use.*** When residences, work, shopping, schools, recreation, and civic services are located closer together, people walk and bike more to these destinations.

■ ***Better bicycle and pedestrian networks.*** Sidewalks, bike lanes, pathways, trails, and street crossings must be continuous and connected to encourage routine use.

■ ***Inviting architecture.*** Some critical elements include buildings set near the street (not behind parking lots), windows placed along walkways, and bicycle parking that is ample, secure, and covered. Aesthetics ranging from trees and benches to waterways and public art can invite more bike and pedestrian traffic.

■ ***Safety.*** This includes reduced traffic speed, smoother flow (especially in residential and commercial areas), adequate lighting and access, and a mix of activities and users on the street.

Health promotion, fitness, and nutrition professionals can play a critical role in creating these social and physical environments in their communities. An approach that embraces three "Ps" is recommended to ensure a quick start through behavior change *programs,* improvements to the built environment through physical *projects,* and sustained cultural shift through activity-supporting *policies.* Examples of each include:

■ ***Programs*** - Pedometer-based activity campaigns, walk-to-school (or -work) days or weeks, media outreach, bicycle and driver safety education efforts, trail maps, and promotional events.

■ ***Projects -*** Less expensive projects: painting crosswalks, narrowing road lanes, creating bike lanes, cutting brush, improving informational or safety signage. More costly projects: building and repairing sidewalks, trails, curb extensions, median islands, and other traffic-calming measures.

■ ***Policies*** – Mixed use zoning codes and subdivision regulations requiring sidewalks and narrower streets; bicycling parking requirements; school construction and districting plans to encourage walking and cycling; and municipal/business parking policies to discourage driving alone.

This is a mere sampling of the innovative approaches communities are using to create more activity enhancing settings. The common element is that these approaches can only be undertaken when elected officials, community professionals, and citizens at large take the lead in advocating for change.[6]

Mark Fenton, MS, is a physical activity and transportation consultant, in Scituate, Mass.

References

1. *Physical Activity and Health: A Report of the Surgeon General*, Department of Health and Human Services; 1996.
2. *Dietary Guidelines for Americans 2005,* US Department of Health and Human Services, USDA publication: Home & Garden Bulletin No. 232.
3. *Physical Activity and Health: A Report of the Surgeon General*, Department of Health and Human Services; 1996.
4. King WC, Brach JS, Belle S. Convenience of destinations and walking for older women. *Am J Health Promotion*. 2003;18:74-82.

5. Fenton M. Engineering physical activity back into Americans' lives. *Progressive Planning*. 2003;1-8. Available at www.plannersnetwork.org/htm/pub/archives/fall03/fenton.htm.
6. Fenton M. Battling America's epidemic of physical inactivity: building more walkable, livable communities. *J Nutr Activ and Behav.* 2005;37 (suppl 2).

Intuitive Eating in the Treatment of Disordered Eating

by Evelyn Tribole, MS, RD

Intuitive Eating[1] is a process-based approach that ultimately teaches patients how to have a healthy relationship with food, wherein patients become the experts of their own bodies. Patients learn how to trust their ability to meet their needs, distinguish between physical and emotional feelings, and develop body wisdom. On the surface this may sound simplistic, but it is rather complex.

For example, one of the basic cores of Intuitive Eating is the ability to respond to body cues, ie "Eat when hungry and stop when full." This may be easy for many people, but for a patient with a history of chronic dieting or rigid "healthy" rules about eating, it is very difficult to accomplish because a number of issues need to be worked on, some of which seem counter-intuitive. Following are two keys to working effectively with such patients:

Unconditional permission to eat any food. How can this be healthy? Patients struggle with this concept, because they worry that once they start eating a forbidden food, they won't stop. Yet, it is the very process of eating that allows the patient to *experience* food habituation. Studies show that the more a person is exposed to (and allowed to eat) a food, the less desirable it becomes over time.[2] This has been demonstrated in studies involving many foods, including pizza, chocolate, and potato chips. Most chronic dieters have not experienced food habituation. Instead, they live in the black-and-white world of eating: good foods and bad foods, on a diet or off of a diet.

Paradoxically, knowing that you can eat a particular food again whenever you want makes it less compelling to eat it now and eat it all. Consequently, the thought to stop eating when full is no longer threatening. Eating no longer becomes the "last supper before the diet" or "eat it all while I can, no one is here." It is no longer threatening to be in touch with the many body cues, whether they are physical, hedonic, or emotional.

Challenging the "food police." This calls for challenging the internal and external rule-makers of so-called healthy eating on a cultural and family level, and ultimately what this means for the patient. It involves the use of cognitive behavior therapy, in which patients learn how to evaluate their thoughts for distortions as they relate to food and body. This means challenging the status quo.

Fascinating research by Rozin et al sheds light on the significance of this issue.[3] They found that Americans are "worry-warts" when it comes to food. Americans scored the highest among four countries on the level of worrying about the fattening effects of food as opposed to savoring it; they associated food the most with health and the least with pleasure. Rozin and colleagues postulate that the stress-effect of worrying about food may be an important contributor to overall health. They suggest that American worries and obsessions about healthful foods may be counter-productive, producing substantial reduction in the quality of life.

The Intuitive Eating journey teaches a patient that a healthy relationship with food is just as important as the healthfulness of a food choice. Intuitive Eating takes the morality and judgment out of eating, so patients also learn that their character and self-worth are not altered by their choice of food, whether it's a cheeseburger or salad for lunch.

Evelyn Tribole, MS, RD, has a nutrition counseling practice in Irvine, Calif, and is co-author of Intuitive Eating, *2nd ed*.

References

1. Ernst MM, Epstein LH. Habituation of responding for food in humans. *Appetite.* 2002;38:224-234.
2. Rozin P, Fischler C, Imada S, et al. Attitudes to food and the role of food in life in the USA, Japan, Flemish Belgium, and France: possible implications for the diet–health debate. *Appetite*. 1999;33:163-180.
3. Tribole E, Resch, E. *Intuitive Eating*, 2nd ed. St. Martin's Press; 2003.

Genes, Personality, and Eating Disorders

by Ovidio Bermudez, MD, FAED

Eating-related pathology occurs across the lifespan. Eating disorders (EDs) are complex illnesses that occur mostly in adolescence and early adulthood; the etiopathogenesis of these illnesses is not yet fully understood. All eating disorders share hereditary, familial, temperamental, behavioral, psychological, medical, and sociocultural characteristics, often viewed as predisposing, precipitating, and perpetuating factors. Dieting has been identified as one of the major risk factors for the development of disordered eating, and obsessionality and impulsive coping seem to facilitate the evolution of disordered eating into diagnosable eating disorders.

All eating disorders are characterized by the presence of pathological behaviors and thinking in various combinations; these include restriction, binging, purging, fear of weight gain or fatness, and self-valuation that overemphasizes the individual's perception of their size or weight. There is evidence supporting the dimensional perspective of EDs. Full and partial syndromes share sociocultural, familial, psychometric, behavioral, medical, and hereditary variables.

Eating Disorder Not Otherwise Specified (ED NOS) share similar prognosis and morbidity to anorexia nervosa (AN) and bulimia nervosa (BN) and should not be considered a

lesser diagnosis or imply "milder disease." This is the most common ED-related diagnosis in clinical settings, accounting for about 50% of cases. One of the important implications of this observation is that we need to look at ED pathology as part of a spectrum of illness, rather than categorically distinct clinical syndromes. The other important implication is that we need to consider eating disorders as true bio-psycho-social illness, where the interaction of genetic, constitutional, and environmental factors are intricately involved in the predisposition and evolution of these mental illnesses.

Studies of familial genetics identify the familial tendencies in eating disorders.[1,2] The risk of an individual with a first-degree relative with a diagnosis of AN or BN is 12-fold for the development of AN and 4-fold for BN in comparison to the general population. Molecular genetics studies have identified "positive linkage" in chromosome 1 for mother-daughter pairs with AN and in chromosome 10 for BN. Linkage studies imply that these mother-daughter pairs share genetic material or "links" in these chromosomes. This does not mean that a specific gene for AN or BN has been identified. Further studies are under way that attempt to "narrow down" the understanding of the molecular basis for the genetic vulnerability of eating disorders. Furthermore, statistical analysis has yielded strong heritability estimates for eating disorders, comparable to or stronger than that for most major psychopathologies, likely based on the interaction of the inheritance of vulnerability and protective factors. Therefore, we are unlikely to identify a specific gene for AN or BN.

Rather, eating disorders are likely to be inherited in a complex fashion where familial vulnerability for affective disorders and the inheritance of temperamental traits play a significant role. Temperamental traits may, in turn, have a role in the clinical presentations within the spectrum of eating disordered symptoms. Character inventories, such as Clonninger's "Temperament and Character Inventory," show that patients with AN have reported higher harm avoidance and lower cooperativeness than patients with BN. Subtypes such as restrictive AN show lower novelty seeking and higher persistence and self-directiveness. Patients with purging types of AN show the highest degree of harm avoidance. The theory of extremes of temperament—or viewing restrictive AN as the anxious-fearful end of the spectrum and binge/purge syndromes as the dramatic-impulsive end—can have important implications for the psychological and biological approaches chosen in clinical settings.

Ovidio Bermudez, MD, FAED, is medical director, Laureate Eating Disorders Program, in Tulsa, Okla.

References

1. Devlin B, Silvia-Alin B, Klump K, et al. Linkage analysis of anorexia nervosa incorporating behavioral covariates. *Human Mol Gen.* 2002;11:689-696.
2. Bergen AW, van den Bree MB, Yeager M, et al. Candidate genes for anorexia nervosa in the 1p33-36 linkage region: serotonin 1D and delta opioid receptor loci exhibit significant association to anorexia nervosa. *Molecular Psych.* 2003;8:397-406.

"You Can't Make Me Eat!" Working with Resistant Clients

by Molly Kellogg, RD, LCSW

Behavior change is easy when "the stars line up"—when an individual really wants to change and believes the outcome will be valuable. The individual also needs to know how to change (ie, have the skills and information to do so) and must believe it is possible. For many eating disordered clients, one or more of these factors are not in place, thus stalling movement toward health. This is when we see resistance.

Resistance can be verbal (eg, "I can't do that.") and can also include body language and passive resistance (eg, not keeping food records as promised). Resistance occurs when we push for a change and the client is not ready; it arises as a normal, expected product of this interaction. Many clients also have internal resistance, or ambivalence. They may very much want to recover while still being unwilling or unable to do what is necessary. Resolving this ambivalence is essential for effective healing.

As nutrition professionals, we are in a key position to counsel clients toward the food-behavior changes they are ready for and to support them as they take risks with behaviors that are more of a stretch. Incorporating skills from other fields can expand our effectiveness. These include the concepts gleaned from motivational interviewing, first developed in the addictions field. These concepts guide us to explore and accept what is important to our clients and to work in detail with them on their confidence to make changes. Gestalt therapy and social work also provide useful approaches—for example, promoting the client's sense of choice and control over the process of recovery and beginning from a position of strength. An experimentation approach is useful, especially with behaviors that cause anxiety.

Techniques designed to work *with* resistance make for smoother sessions. This is as true with anorexia and bulimia as with other types of disordered eating. Working with resistance is also effective with patients needing to make changes to treat medical conditions.

To be of maximum value to our clients, we need support and extra training. Training in counseling skills can include seminars, workshops, and graduate degrees in mental health disciplines. Mental health professionals routinely employ professional supervision throughout their careers to enhance skills and reduce burnout. We, too, can use this model. Our supervisors can be experienced dietitians or psychotherapists.

Molly Kellogg, RD, LCSW, is a

psychotherapist, nutrition therapist, and writer in Philadelphia, Pa.

Recommended Reading

1. Kellogg M. *Counseling Tips for Nutrition Therapists.* Kg Press; 2004.
2. Rollnick S, Mason P, Butler C. *Health Behavior Change: A Guide for Practitioners.* Churchill Livingstone; 1999.

Hatha Yoga for People with Eating Disorders

by Gretchen Rose Newmark, MA, RD

Hatha yoga, one of eight branches of yoga, focuses on the physical body. Despite being part of a 3,000- to 5,000-year-old tradition developed as a preparation for meditation, many forms of hatha yoga practiced today have been recently developed. They vary by postures and qualities attended to. All forms of hatha yoga focus on physical development, but some are better for developing mindfulness and relaxation.

A significant body of scientific research documents both physical and emotional benefits of hatha yoga. Depending on the specific form of yoga and the skill of the instructor, the benefits may include:

■ Development of strength, stamina, balance, proprioception, and flexibility.
■ Enhanced awareness and acceptance of body sensations, thoughts, and feelings.
■ Improved body image –A good yoga center does not have mirrors. Instead, attention is focused on how the body feels in the poses; breathing deeply and freely to relax even in strenuous poses; and on developing balance, strength, stamina, and proprioception. This lack of focus on appearance gradually creates an experience of sensing the body from the inside, making it easier to sense the body's needs and respond with tenderness and care.
■ Better impulse control – Staying in the pose while relaxing and breathing is good practice for staying with anything uncomfortable, including sensations of fullness or disturbing thoughts and feelings.
■ Reduced anxiety and depression.
■ A gentle entry into movement for people who are exercise resistant.

In addition, preliminary studies show that participants in non-aerobic forms of hatha yoga lose weight.

When selecting a hatha yoga center and instructor, several questions should be addressed. For example:

■ Is the teacher kind, respectful, and a good personality fit?
■ Is the yoga center inspiring?
■ Who trained the teacher? How long was the training?
■ Does the instructor walk among the students, gently correcting poses, suggesting props when needed?
■ Does the instructor have good verbal skills when describing the poses?
■ Does the instructor focus on outer appearance or the inner experience?

Some of the different forms of hatha yoga include:

Iyengar yoga – emphasizes breath and body alignment, body awareness, and injury prevention; a good basis for any other form of yoga.

Anusara yoga - a newer form from the iyengar tradition that emphasizes similar body awareness as well as the movement of chi or prana, the subtle energy in the body. It offers similar benefits as iyengar.

Kripalu yoga – focuses on the emotional as well as the physical; a gentle form that enhances mindfulness and relaxation. Instructors tend to be less precise in their verbal cues and less likely to use props.

Sivananda yoga - teachers typically do not move around the class to help students. The routine includes poses that are difficult for most people over age 35 who have not done yoga before; good for younger people who are less vulnerable to injury. It stresses mindfulness and can create a very relaxed state.

Viniyoga – has slow, repetitive movements adapted to the individual, stressing therapeutics and self-discovery.

Yin yoga – postures are held for 5 minutes for a deep level of relaxed focus.

Pilates – developed by a dancer, teaches breathing into the rib cage which is less relaxing than the belly breathing of yoga.

Other forms of hatha yoga are more physically rigorous and provide a "good workout." However, they are less helpful for persons with restricting anorexia, because they burn more calories; they also tend to place less emphasis on mindfulness and relaxation skills. These forms include astanga yoga, power yoga, yoga fit, and bikram or "hot room" yoga.

Gretchen Newmark, MA, RD, is a dietitian in private practice in Portland, Ore. She teaches meditation and has taught hatha yoga for years.

Cutting-Edge Therapies for Eating Disorders

by Jessica Setnick, MS, RD

Three strategies that dietitians can employ when counseling eating disordered clients include the apple test, the transitive property of fat, and recognition of the benefits of the eating disorder.

The apple test. Eating in response to emotions can lead to overeating, compensating, and/or unwanted weight gain. The apple test is a way to help clients distinguish emotional needs from physiological hunger *(Note:* This strategy is not appropriate for patients who avoid eating.)

At the onset of food thoughts or cravings and prior to eating anything that is offered, clients are advised to ask themselves: "Would I eat an apple?" Since apples are usually considered plain but nourishing food, the goal is to determine if you are truly hungry ("Yes, I would eat an apple") or not ("I would eat a donut, but I wouldn't eat an apple"). If clients determine that they would eat an apple, they follow the guidelines provided by their dietitian or meal plan regarding what and how much to eat. If they find that they would not eat an apple, they follow the guidelines provided by the dietitian or mental

health professional for identifying and managing emotional needs.

The transitive property of fat. Because the "language of fat" is spoken so frequently in our culture, we learn to blame our bodies for our bad feelings. To help clients find non-eating disordered ways to cope with their feelings, they must first recognize that they are having feelings. Otherwise, they will continue to feel "fat," a situation that has only one solution.

Each person has a different definition of "fat." Feeling "fat" indicates that a person is also feeling how he/she believes "being fat" feels. Clients may disagree with that statement and tell the dietitian they are only feeling fat, and nothing else. However, clients are really saying that because theoretically there is a solution to being fat, while there may be no solution to other feelings.

Using this strategy, dietitians can ask clients to walk through the grocery store and when they see a "fat" person (whatever they consider fat), think about what they assume that person's life must be like. The dietitian might say to the client: "I know you don't judge people based on appearance, but if you did, what might you think you know about this person? Is he lazy? Unproductive? Ugly? Lonely? Does he eat too much, eat the wrong things, let himself go?

"Whatever you think you might know about this person, this is what you equate with 'fat.' If you think that fat people are lonely, whenever you are lonely, you are bound to feel fat. If you believe that fat people are ugly, whenever you feel ugly, you are going to feel fat. Ugly and lonely don't always have solutions, but when you know your definition of "fat," you can discuss with your therapist how to handle that feeling, instead of turning to your eating disorder behaviors."

Recognizing the benefits of the eating disorder. Because eating disorders are a response to stress, they develop in response to underlying problems. Viewing an eating disorder as solely bad and shameful only makes a person feel worse for having it; the disorder prevents sufferers from finding the ways that it is actually "helping" them.

Ask the client: "If you were to view your eating disorder as a solution, in what situations has it come in handy? How has your eating disorder helped you to get what you want, avoid what you hate, or express your true feelings? Your true problems are the very things that your eating disorder has helped you with. Once you have found the things that your eating disorder has helped you with, find non-eating disorder methods to solve them. When you are feeling strong, you won't need your eating disorder to do your work for you."

Jessica Setnick, MS, RD, is a nutrition consultant in Dallas, Tex, and creator of Eating Disorders Boot Camp, a training workshop for professionals.

The Body Image Project: Beauty as a Relative Concept

by Larry Kirkwood

The Body Image Project was conceived to help change the way we perceive others. Two objectives of the project are to stress appreciation of the human form for its aesthetic properties and to deal with "self worth" by exploring the concept of "beauty."

The project, which began in 1993, consists of an art exhibit of casts of peoples' bodies and a discussion on judgments and prejudices based on outside appearance—sexism, racism, ageism, height and weight bias, etc. Much of the discussion stems from conversations with more than 500 participants during the casting process. The exhibit includes a wide variety of male and female shapes and sizes, and conditions such as mastectomy, pregnancy, silicon implants and implant failure. The project has primarily been staged at more than 70 colleges and universities throughout the country. The pieces have been utilized by an eating disorder clinic, appeared in a production of the *Vagina Monologues,* and served as backdrops for two contemporary dance companies.

Our culture is obsessed with keeping up appearances and this has taken the form of "the image." If "the image" is right, reality doesn't matter; "the image" becomes reality. However, obsession with "the image" deflects attention from the real accomplishments of an individual. The typical image being sold as ideal by the so-called beauty industry is young, thin, white, and heterosexual. The mindset being pushed is that "looking good" is also "being good."

The concept of "visual beauty" is closely tied with our feelings of self-worth. Visual beauty can be viewed in two ways: as the "formal" standard of beauty (dealing with the juxtaposition of shape, form, balance, and harmony) or as the "informal" or pop culture standard. The latter affects most people's views and changes from culture to culture and throughout time. In the 17th century, Rubens painted wonderfully large people and to this day the term "Rubenesque" is still used. People of greater mass were admired because largeness was a sign that they could afford food. In the '60s, Twiggy walked the cat walk and suddenly "thin was in."

Who is defining "beauty" for our culture today, and why? The beauty industry seems to be responsible for this, and the definition of beauty is more about encouraging people to adhere to an arbitrary standard and spend money to do so, and less about any positive notion. Females in particular are a target of this industry.

People are putting their lives at risk to undergo unnecessary surgery to reach a certain standard. A good example is the 2001 Miss Universe Pageant. Miss Brazil had undergone 19 surgical procedures, including breast implants, bioplastic sculpting in her cheekbones, silicone remolding in her chin, a sharpened jaw, pinned back ears, and liposuction in her waistline and back.[1] So much for nature beauty!

Males are also quickly joining the ranks of the "new and improved."

Mark Jannot, health editor for *Men's Journal*, observed that cosmetic surgery for men is a booming market, and men are finally learning that "ageing is a disease."[2]

One result of this flawed beauty standard is that eating disorders are taking a mounting toll. Disordered eating affects an estimated 10 million females and 1 million males.[3]

After working with numerous people, I believe we simply do not know how to look at ourselves. We are too ready to give other people permission to define who we are and what we are worth. It is time to take personal responsibility for how we choose to look at and define things. The intent of this project is to help give us an alternative view, one that I feel will offer us healthier and happier lives.

Larry Kirkwood is an artist in Kansas City, Mo. The project's website is www.kirkwoodstudios.com.

References

1. ABC News. Unnatural beauty, Miss Brazil boasts 19 procedures. *Primetime Thursday.* Available at: http://abcnews.go.com/sections/primetime/2020/. Accessed August 17, 2002.
2. Cottle M. How men's magazines are making guys as neurotic, insecure and obsessive about their appearance as women. *Washington Monthly.* May 1998.
3. National Eating Disorders Association. Statistics. Eating disorders and their precursors. Available at: www.nationaleatingdisorders.org/p.asp. Accessed June 14, 2005.

Eating: From Disordered to Order—"What is Normal"?

by Reba Sloan, MPH, LRD

Many of my eating disordered clients have asked me to define "normal eating." Whether clients are struggling to be free from the bondage of extreme dietary restraint or wrestling with the drive to binge on food, the goal is to help them arrive at a normal relationship with food, eating, and activity. This involves abandoning the "all or nothing" thinking and discovering a life lived in the "middle ground."

The first task is to help clients understand which aspects of their relationships with food are disordered. Most clients understand from a rational standpoint that their behaviors are imbalanced in this area. The powerful hold of their eating disorder can hinder them from accepting and living out this intellectual truth. Here are a few areas that dietitians can explore with clients in an effort to uncover disordered eating behaviors or cognitions:

- Are you adhering to irrational rules regarding food and eating? (ie, "I can only eat 1,000 calories per day." or "Carbs are bad/fattening.")
- Have your eating practices/behaviors contributed to a disconnect with your hunger/full/satisfied cues?
- Has the way you are eating and the activity you are getting or not getting contributed to "artificial" weight loss or gain?
- Does your current relationship with food disrupt your emotional, social, or spiritual life?

After the client acknowledges that disordered eating is present, factors that may have contributed to this imbalance need to be addressed. This can include emotional triggers that might cause someone to eat or not eat continually over a period of time, frequent dieting that stems from unrealistic weight or size goals, or living in a social-cultural melee that complicates finding the middle ground with our food, activity, and weight. There is no clearly defined crossover point where disordered eating becomes an eating disorder. Even if one does not meet the diagnostic criteria for an eating disorder, disordered eating can destroy peace of mind and quality of life. My experience has been that many clients struggling with disordered eating fit the diagnostic criteria for Eating Disorder Not Otherwise Specified (ED NOS).

This initial work with a client lays the foundation required for the journey towards "the middle ground" of normal eating. I have come to see normal eating in the following terms:

- Eating that does not cause chaos in one's thoughts and behaviors with food.
- A relationship with food that is not guilt- or shame-based.
- Eating that is thoughtful and connected, not obsessive.
- Eating that is satisfying and enjoyable.
- Eating that is flexible, and, occasionally "disordered."

Achieving normal eating is even harder than defining the term. It is a process that involves a "hammer and chisel" approach. Our job is to assist clients in this pursuit by helping them identify and change faulty beliefs regarding eating, food, and weight, and giving them nutrition advice to encourage variety, balance, and moderation and to promote "style of eating" work that allows for more effective connection to the body's signals. In a nutshell, normal eating is a result of realistic and practical goals. This might be best summarized by a quote I once heard and have long since forgotten the source: "Moderation in everything, including moderation."

Reba Sloan, MPH, LRD, is a nutrition therapist in private practice in Nashville, Tenn.

Recommended Reading

1. Koenig K. *The Rules of Normal Eating*. Gurze Books; 2005.
2. Kratina K, King N, Hayes D. *Moving Away from Diets*. Gurze Books; 2005.
3. Tribole E, Resch E. *Intuitive Eating*, 2nd ed. St Martin's Press; 2003.

Sports Nutrition Services for College Athletes

by Paula A. Quatromoni, DSc, RD

At Boston University, we developed a comprehensive program to respond to the rising prevalence of disordered eating behavior among college

athletes[1-3] by creating a multidisciplinary team of professionals to serve the athletic community. The team consists of sports medicine physicians, athletic trainers, life skills specialists, sports psychologists, sports nutritionists, and related sub-specialists as needed.

Services provided include screening, referral, assessment, diagnosis, and treatment; counseling and education; and referral to outside providers when necessary. In this way, we are able to coordinate services that meet the medical, physical, life skills, mental health, and nutritional needs of our student-athletes. We believe that sports teams can be effective vehicles to promote, model, and support healthy lifestyles.

Our model provides a consistent, integrated on-campus team treatment approach for student-athletes. Our providers and services are accessible, confidential, and visible, located within the heart of the athletic complex on campus. This centralized location facilitates communication among providers and supports a resource center for athletes, offering educational materials, links to informational resources, a resource bulletin board, and a computerized nutritional analysis system. Most services are either free, third-party reimbursable, or provided at a reduced rate, encouraging ongoing contact and sustained followup.

The program's university affiliation allows us to interface with and benefit from other campus-based initiatives, including Student Health Services, nutrition courses offered for elective credits, and Sargent Choice, a campuswide healthy eating and dining program. In addition, we are able to respond immediately for crisis intervention, or simply to have a local presence to meet informally with teams at a coach's request.

This model is a notable improvement over our previous system, in which services were loosely coordinated and largely referred to outside providers. We now have a coordinated delivery of a range of services, an effective system of communication, a wellness team that meets monthly, and an established identity within the university.

The nutrition service offers a lecture series for teams, coaches, and athletic trainers as well as a nutrition consultation service for individualized assessment, counseling, and intervention. Team lectures are tailored to meet the unique needs of the audience, providing sport-specific, practical, and relevant nutritional guidance for athletes, coaches, and athletic trainers. This year, we reached over 500 varsity athletes (up from 160 last year) through our lecture series, contributing to awareness-building and increased referrals for individualized nutrition counseling.

Individualized counseling is available to any student-athlete needing general nutritional guidance. We provide practical advice on such topics as nutrition for peak performance, healthy eating despite busy schedules, pre-competition meals, hydration, use of supplements, and weight management. Common scenarios among our athletes include restrictive eating and binge eating disorders, maladaptive coping and stress management, chronic dieting, constant dissatisfaction with weight, weight gain during the off-season, overly restrictive vegetarian diets, pressures of the sports environment, academic pressures, and difficult adjustments to college life. Alcohol binges are a precursor to bulimia for some women in our practice.

Currently, the nutrition consult service is following 38 athletes (84% female) across 17 of our 22 varsity athletic teams. Athletes are referred primarily through sports medicine, athletic training, sports psychology, or a coach. About half of all visits are for disordered eating, with more than 90% of those serving women and 50% serving athletes in "lean sports." Our experiences are consistent with the literature,[4,5] suggesting that potentially all student-athletes are "at risk."

The multidisciplinary nature of our program brings together a collection of experts from various academic programs at Boston University. In particular, the nutrition service thrives on interdisciplinary collaborations and the nutritionist and sports psychologist often work as a team counseling eating disordered athletes in joint sessions. In addition to promoting the well-being of student-athletes, there are opportunities for research and training of graduate students and medical fellows. Our experience suggests that there is tremendous need for sports nutrition services at the college level, and that the athletic community values, seeks, and participates in programs that guide healthy eating to optimize performance.

Paula Quatromoni, DSc, RD, is assistant professor of nutrition, Sargent College of Health and Rehabilitation Sciences, Boston University.

References

1. Sundgot-Borgen J, Torstveit MK. Prevalence of eating disorders in elite athletes is higher than in the general population. *Clin J Sport Med.* 2004;14:25-32.
2. Johnson C, Crosby R, Engel S, et al. Gender, ethnicity, self-esteem and disordered eating among college athletes. *Eating Behaviors.* 2004;5:147-156.
3. Reinking MF, Alexander LE. Prevalence of disordered-eating behaviors in undergraduate female collegiate athletes and nonathletes. *J Athletic Training.* 2005;40:47-51.
4. Rumball JS, Lebrun CM. Use of the preparticipation physical examination form to screen for the female athlete triad in Canadian interuniversity sport universities. *Clin J Sport Med.* 2005;15:320-325.
5. Bass M, Turner L, Hunt S. Counseling female athletes: application of the stages of change model to avoid disordered eating, amenorrhea, and osteoporosis. *Psych Reports.* 2001;88(3 Pt 2):1153-1160.

The ABCs of Eating Disorders: Assessment, Boundaries, and Controversies

by Jillian Croll, PhD, MPH, RD; Erica Goldstein, MS, RD, CDN; and Karen Silien, PhD

Assessing the client, setting and maintaining boundaries, and addressing controversial issues are basic concerns in the treatment of eating disorders.

Assessment. Disordered eating treatment begins with assessment of the client during the first session. Nutrition assessment techniques can be highly varied and depend, in part, on the setting (eg, team members located at various sites vs the same site). Assessment is typically interview-based after the practitioner has reviewed self-report materials regarding symptoms and history of eating and weight concerns.

Self-report assessment tools may be practitioner-developed tools, standardized assessment tools, or a combination of both. The most commonly used standardized tools for nutrition assessment are the Eating Disorders Examination (EDE or EDE-Q), developed by Fairburn et al, and the Eating Disorders Inventory-3 (EDI-3), developed by Garner et al. Also available are a number of binge eating scales. A newer scale, the Intuitive Eating Scale, developed by Hawks et al, shows promise for assessing the degree to which the client is able to use intuitive or mindful eating practices. Assessment tools can be instrumental in helping with treatment planning, designing goals with the client, and communicating progress to the client and their supporters.

Boundaries. When participating as part of a multidisciplinary treatment team, it is generally necessary to manage and negotiate boundaries among professionals. Prior to therapy, the team must let the client know which symptoms and behaviors will be addressed and treated by which team member. Goal setting, which accounts for the unique recovery concerns of each individual patient, should follow directly from agreement of these boundaries. A unified treatment philosophy will help avoid splitting, which is sometimes used by clients to manipulate the treatment team and thwart recovery goals.

The duty to respect confidentiality is of utmost importance. Different considerations are involved for adults versus minors. Likewise, family involvement in the therapy process may vary, and it necessitates a thorough discussion of confidentiality and therapeutic boundaries. Limits to confidentiality are discussed as part of treatment, as they may be necessary to prevent imminent harm to self. Clearly defining what life threatening behavior looks like and involves is an important part of boundary setting for the treatment team's effectiveness.

> "...family involvement in the therapy process may vary, and it necessitates a thorough discussion of confidentiality and therapeutic boundaries."

Ideally, nutrition therapy continues through the maintenance phase of weight recovery and helps to address relapse prevention. The decision regarding termination of nutrition therapy needs to involve the treatment team, the client, and the family if appropriate. Psychological treatment and medical followup may continue beyond nutrition therapy. Specific examples of these boundary issues were illustrated in the full presentation.

Controversies. As we continue to study different forms of treatment, it is important to question how we practice. Styles of practice vary by practitioner and are determined by scope of practice, past experiences, level of care, and emerging data from studies. Common controversial treatment issues include:

- Role of the family: Should parents be involved or excluded in their child's treatment?
- Health provider's boundaries: Is self-disclosure a therapeutic technique or a therapeutic mistake?
- Weight: Should patients know their weight or have blind weights?
- Food allowances and restrictions: Can patients eat diet foods, follow a vegetarian diet, use condiments, and drink caffeinated beverages?

While there are no definitive right or wrong ways to provide treatment for an eating disorder, it is important to remember that the practitioner's beliefs and actions affect not only the client, but also the entire treatment team.

Jillian Croll, PhD, MPH, RD, is clinical dietitian and research, education and outreach clinical practice director, Eating Disorders Institute, Minneapolis, Minn. Erica Goldstein, MS, RD, CDN, is clinical dietitian at Barnard College, a member of the eating disorder team at Columbia University, New York, NY, and has a private practice. Karen Silien, PhD, is adjunct professor, Peabody College, Vanderbilt University, a licensed psychologist in private practice, in Nashville, Tenn, and president of the Eating Disorders Coalition of Tennessee.

Recommended Reading

1. Hanson SL, Kerkhoff TR, Bush SS. *Health Care Ethics for Psychologists: A Casebook.* American Psychological Association Books; 2004.
2. Le Grange D, Lock J. The dearth of psychological treatment studies for anorexia nervosa. *Inter J Eating Disorders.* 2005;37:79-81.
3. Hawks S, Merrill R, Madanat H. The Intuitive Eating Scale: development and initial validation. *Am J Health Educ.* 2004;35:90-99.

FROM THE CHAIR

Full Speed Ahead

After my first SCAN meeting in 1995, I was hooked. The excitement, creativity, and energy in this group was wonderful and left me hungry for more. Needless to say, I am grateful and honored to be your chair. SCAN is truly the "team DPG," considering all of the disciplines we represent. Our goal for this year is to do the optimum for all members of SCAN—whether your expertise is cardiovascular nutrition, disordered eating, sports nutrition, and/or wellness.

Take a look at the SCAN website, and notice some new changes. From the look to the ease of use, this is sure to be one of your favorite sites: www.scandpg.org. A special thanks to Suzanne Girard Eberle and Patti Steinmuller for this project.

Congratulations to the 2006 SCAN Symposium Committee for a very successful and well attended (328 participants) meeting. Looking ahead to the fall, SCAN will sponsor a priority session at ADA's Food & Nutrition Conference & Expo (FNCE) in Honolulu: "From the Training Table to Competition," featuring a chef who set up a Western Olympic Training table in Beijing for the Chinese athletes, and an Ironwoman triathlete who is a sports dietitian and truly runs, swims, and bikes the talk.

A round of applause to Nancy DiMarco, Patti Steinmuller, and all those involved with SD-USA who made the CDR Board certification exam for sports dietitian, or the CSSD, a reality—and in record time! Some of you may have the initials CSSD after your name this summer.

Save April 12-15, 2007 for the SCAN Symposium in Austin, Tex. Join SCAN for our "Sports Nutrition Training Camp" featuring sessions on sports medicine, sports nutrition concerns throughout the lifecycle, sports psychology, and extreme sports, just to name a few. The popular tool box sessions will be back as well as a pre-Symposium workshop to help you prepare for the CSSD exam.

SCAN continues to move onward and upward, but not without a tireless, dedicated Executive Committee and other SCAN volunteers. Special thanks to Chris Rosenbloom, outgoing chair, and Michele Macedonio, past chair, who helped to steer SCAN through some very rough waters to smooth sailing. Let me also welcome to the Executive Committee Roberta Anding, chair-elect; Gale Welter, treasurer; Hope Barkoukis, continuing education director; and Edee Hogan, vice director of partnerships. Inquire, Desire, Aspire!

Leslie Bonci, MPH,RD
2006-2007 SCAN Chair

2006 ADA Food & Nutrition Conference & Expo (FNCE)
September 16-19, 2006
Honolulu, Hawaii

We invite you to join SCAN at these extraordinary events in Hawaii. Look for location details in your FNCE program book. Aloha!

■ *Saturday, September 16, 6 – 8:00 p.m.*
DPG Reception
Network with colleagues and mingle with friends while your toes wiggle in the sand at the SCAN luau!

■ *Sunday, September 17, 9 – 10:30 a.m.*
From the Training Table to Competition: Fueling Athletes for Success
Hear what's involved in feeding Olympic athletes during this one-of-a-kind educational session. Presenters are: **Ellen Coleman, MA, MPH, RD,** nutrition consultant for The Sport Clinic and past SCAN chair, and **Chef Bill Hunt**, who is part of the team developing a Western kitchen for Chinese Olympic athletes in Beijing.

■ *Monday, September 18, 10:30 a.m. – 1:00 p.m.*
SCAN Booth at DPG Showcase
Stop by the SCAN booth to meet members of your Executive Committee and learn how you can become involved in shaping SCAN's exciting future.

REVIEWS

Sports Nutrition: A Practice Manual for Professionals (4th edition)

Sports, Cardiovascular, and Wellness Nutritionists
Marie Dunford, PhD, RD, editor
American Dietetics Association, 120 S Riverside Plaza, Suite 2000, Chicago, IL 60606-6995
800/877-1600, ext 5000
www.eatright.org
2006, softcover, 545 pp, $52 (ADA members); $68 (non-ADA members)
ISBN 0-88091-411-4

As its predecessors, the 4th edition is must-have manual for the sports nutrition practitioner. This book represents the most up-to-date compilation of sports nutrition science basics along with practical assessment, counseling strategies, and sport-specific guidelines. Dr. Dunford assembled an outstanding cast of 25 authors, most renowned in various areas of sports nutrition, each of which contributed a well-referenced chapter that reflects the most current research to date. Additionally, each chapter carries a theme of prudent and practical advice for the enhancement of health and performance in athletes and other physically active people.

The book is divided into four sections, and while the first section on "Sports Nutrition Basics" sets the framework for the remaining sections, this manual does have a friendly "open anywhere" format. The first seven chapters on exercise physiology basics, macro- and micronutrients, fluids, dietary supplements, and ergogenic aids are excellent refreshers with superb chapter summaries and comprehensive lists of references.

The second section of four chapters follows with practical information on "Sports Nutrition Screening and Assessment." Included in this section are chapters on body composition assessment and energy balance, with pages of how-to advice on weight control for youth as well as older individuals.

Nine chapters are devoted to the next section, "Sports Nutrition Across the Life Cycle," which encompasses child and adolescent athletes along with college and master's athletes. Special dietary and lifecycle concerns such as vegetarianism and pregnancy along with specific health issues such as eating disorders, cardiovascular disease, and diabetes are covered in excellent detail, with ample practical information for counseling active people with these concerns.

The final section includes six chapters dedicated to "Sports-Specific Nutrition Guidelines" for various types of sports based on intensity and duration as well as weight- and body-focused. Additionally, this section includes "At a Glance" one-page summaries for almost 20 specific sports (from baseball to wrestling); these provide practitioners with information on general nutrition guidelines and common nutrition concerns for that sport. The book's appendix also supplies very usable information, such as the Food and Nutrition Board DRIs, body mass index tables, and information on sports nutrition-related position papers and useful websites.

SCAN's *Sports Nutrition: A Practice Manual for Professional*, 4th edition, will prove an invaluable tool to registered dietitians, athletic trainers, sports medicine physicians, and well-versed athletes and coaches who have an interest and knowledge in sports nutrition. This manual is a winner! *(Editor's note: Look for a review of the companion CD in an upcoming issue of* PULSE.*)*

Reviewed by Liz Applegate, PhD, director of sports nutrition, Nutrition Department and Intercollegiate Athletics, at the University of California-Davis.

Healthy Body Image: Teaching Kids to Eat and Love Their Bodies Too! (2nd edition)

Kathy J. Kater, LICSW
National Eating Disorders Association, 603 Stewart St, Suite 803, Seattle, WA 98101
206/382-3587,
www.NationalEatingDisorders.org
2005, softcover, 201 pp, $65, ISBN 0-9772861-0-X

With all of the pressure from society regarding fitness and thinness, it is essential that healthcare providers, educators, and anyone working with young people have a reliable resource about body image and healthy behaviors for this population. Not only is *Healthy Body Image* a valuable information source, it is also a curriculum for promoting healthy weight behaviors.

This is the second edition of *Healthy Body Image*, a comprehensive guide about eating disorders, body image, nutrition, fitness, and self-esteem. The author first gives educators an introduction to concepts threaded throughout the chapters and curriculum. This provides a nice foundation to help the professional understand the background of body image and the specifics about the origins of body dissatisfaction. Many current trends are addressed, including younger children and boys being affected by cultural and social pressures to be thin.

After identifying the roots of body image disorders, the author progresses into lessons about reversing and preventing these thoughts and behaviors. Suggestions and insights on possible issues that may arise when addressing these topics with kids are also provided to help prepare educators for potential obstacles. These tips involve real-life experiences from the author, who obviously speaks from much experience and the desire to share her knowledge with others battling these topics with kids.

The following chapters include in-depth units on various topics, ranging from development of unrealistic and negative body images to healthy eating and physical activity. There are 10 lessons in total, each with learning objectives, lesson materials, and suggested scripts to use with groups in order to teach the lessons and cover concepts. Each lesson is full of positive and motivating statements that will inspire children.

For any educator, healthcare provider, or individual teaching healthy eating, body image, self-esteem, and fitness, *Healthy Body Image* provides a strong resource to serve as a foundation for this curriculum. It also includes an appendix with even more body image exercises, handouts, parent activities, and worksheets that can be used in the lessons or supplemented as needed by the educator. Overall, this book does the work for you if you have to develop any curriculum on body image, and it clearly has been designed by someone with expertise and sensitivity on difficult issues for our society and our children.

Kathy Kater, LICSW, is a psychotherapist who has been treating body image, eating, fitness, and weight problems for more than 25 years. She is an internationally recognized speaker and also the author of *Real Kids Come in All Sizes: Ten Essential Lessons to Build Your Child's Body Esteem.*

Reviewed by Heather Cunningham, RD, CNSD, clinical dietitian at Newark Beth Israel Medical Center, in Newark, NJ.

SPORTS DIETETICS USA RESEARCH DIGEST

Creatine Supplementation in Elite Swimmers

Peyrebrune MC, Stokes K, Hall GM, et al. Effect of creatine supplementation on training for competition in elite swimmers. *Med Sci Sports Exerc*. 2005;37:2140-2147.

Oral creatine (Cr) supplementation has been demonstrated to improve performance during intermittent high-intensity exercise such as swimming. However, it is unclear to what extent a long-term (>10 wk) maintenance dose affects training for swimming performance. Further, physiologic responses to creatine supplementation in swimming training are currently unknown. Thus, the purpose of this study was to examine the effects of oral Cr supplementation on training for competition and physiologic responses to a sprint swimming set. Twenty elite swimmers (12 male, 8 female) underwent an initial 5-day Cr-loading period (20g/d Cr monohydrate + 20g/d glucose for 5 days) and were then assigned in a double-blind fashion to an experimental (3g/d Cr, n=9) or control (glucose, n=11) group. Swimming-specific testing sessions were held throughout the swim season (22-27 wk) as well as before and after the 5-day supplementation period. Mean performance times for the subjects' best event in the Cr and control groups changed by +1.90 ±1.91% and +0.86 ±1.60% ($P<.05$) for short course (25-m pool) and by +0.14 ±1.14% and -0.49 ±0.95% (NS) for long course (50-m pool), respectively. During the repeated sprint test, mean times were faster in both groups. This study shows that long-term oral Cr administration at maintenance levels during training does not significantly improve swimming performance more than a 5-day Cr-loading regimen. Further, no effects on human growth hormone were found. Nevertheless, the small difference, although lacking in statistical significance, may prove practically meaningful to the elite competitor, and therefore, may be considered by the sports dietitian when consulting with elite swimmers.

Summarized by Scott Sehnert, MS, RD, CSCS, sports and outreach dietitian in the Department of Radiology, Michigan State University, East Lansing, Mich.

Effects of Antioxidant Vitamin Supplementation on Immune Blood Cells

Cases N, Aguilo A, Tauler P, et al . Differential response of plasma and immune cell's vitamin E levels to physical activity and antioxidant vitamin supplementation. *Euro J Clinical Nut.* 2005;59:781-788.

During strenuous exercise, increases occur in the production of reactive oxygen species (ROS) and lipid peroxidation. Antioxidant supplementation may be helpful in preventing exercise-induced oxidative damage. Fourteen trained, amateur male runners participated in this randomized, double-blind study to compare the effects of a vitamins C- and E-enriched, almond-based, isotonic, energetic beverage (S) versus a non-enriched placebo (P) on immune blood cells. After daily consumption of 0.5 L of almond beverage for 1 month, participants completed a half-marathon race. Runners completed a 7-day food record for analysis of vitamin E intake. To control for acute vitamin E intake on the day of the marathon, runners consumed identical breakfasts prior to the race and the designated almond beverage or water for 3 hours following the race, defined as the short recovery period. Vitamin E concentration was determined in plasma, neutrophils, and lymphocytes via venous blood samples obtained at 8 a.m. on race day after a 12-hour fast, immediately following the race, and 3 hours after the race. Lymphocyte vitamin E concentration and lymphocyte/plasma vitamin E ratio were significantly higher

immediately after exercise for the S group versus the P group ($P<.05$). Plasma vitamin E concentration was unaffected by supplementation and exercise; however, exercise significantly increased the lymphocyte vitamin E concentrations of both groups (+119%, P group vs +128%, S group; $P<.05$), while neutrophil vitamin E content only increased in the S group (+88%; $P<.05$). Following short recovery, neutrophil and lymphocyte vitamin E remained elevated compared with pre-race levels in the S group, whereas neutrophil vitamin E status returned to pre-race levels in the P group. The findings of this study suggest that antioxidant vitamins may exert a protective effect in cells susceptible to oxidative stress, and that intense exercise may promote an influx of antioxidant vitamins into cells sensitive to ROS. Therefore, antioxidant supplementation may be useful for athletes engaging in strenuous exercise. This study was funded by the Spanish Ministry of Health.

Summarized by Erin Hamman, BS, RD, graduate research assistant in the Department of Food Science and Human Nutrition, Colorado State University, Fort Collins, Colo.

Cognitive Dietary Restraint and Stress Fractures in Female Runners

Guest NS, Barr SI. Cognitive dietary restraint is associated with stress fractures in women runners. *Int J Sport Nutr Exerc Metab*. 2005;15:147-159.

Cognitive dietary restraint (CDR), characterized by the close monitoring of food intake in order to control body weight, has been associated with subclinical menstrual disturbances and low bone mass. The purpose of the present study was to examine the relationship between CDR and stress fractures in female runners. Seventy-nine female runners with (n=38) and without (n=41) stress fractures completed validated questionnaires measuring eating behavior, physical activity, perceived stress, physical and lifestyle characteristics, and dietary intake. Women in the stress fracture group presented with a current or past stress fracture within the past 18 months; all stress fractures had been diagnosed by a physician. All participants were regularly menstruating and did not have a history of an eating disorder. There were no differences in activity level, perceived stress, body mass index, lifestyle factors, and energy and macronutrient intake between the two groups. The stress fracture group reported significantly higher CDR compared with the non-stress fracture group (11.0 ± 5.4 vs 8.4 ± 4.3; $P< .05$). CDR was positively associated with stress fractures (0.145 ± 0.56, $P=.009$). No other variables were associated with stress fractures. Although the exact mechanism is unknown, CDR may place female runners at risk for stress fractures. Because CDR may not necessarily lead to dietary restriction but appears to contribute to subclinical menstrual disturbances, this at-risk group of athletes is difficult to identify. Dietitians should assess eating and weight concerns in order to recognize the presence of CDR in athletes and address any fears pertaining to food intake or eating behaviors.

Summarized by Holly Doetsch, MS, graduate student in the Division of Nutrition, University of Utah, Salt Lake City, Utah

Effects of Carbohydrate Supplementation on Half-Marathon Performance

Burke LM, Wood C, Pyne DB, et al. Effect of carbohydrate intake on half-marathon performance of well-trained runners. *Int J Sport Nutr Ex Metab.* 2005;15:573-589.

The effects of carbohydrate (CHO) supplementation on 1-hour running exercise have not adequately been researched. Because glycogen levels are not depleted from this duration of exercise, it has been postulated that CHO consumption favorably affects sensory input resulting in enhanced motivation and/or pacing. The purpose of this investigation was to determine if a commercially available sports gel (GEL) versus placebo (PLA) ingested immediately before and during a half marathon race improves performance. The study employed a crossover design with 18 highly-trained male distance runners, engaging in two half-marathons 3 weeks apart. In the GEL trial, runners consumed the GEL 10 minutes prior to race start and at 7 km and 14 km of the event prior to drinking water attained at 200-meter feed zones on the course. The goal for GEL consumption was to provide 1 g CHO/kg body mass for each runner. In the PLA trial, runners consumed an equal volume of an artificially-flavored calorie-free beverage at the same feed zones. During the GEL trial, runners averaged an intake of 66 g CHO; however, improvement in run time was not significant (14 sec; P=.52). Three runners complained of gastrointestinal distress during the GEL trial, resulting in a marked impairment of performance (105 sec; P=.04). In post-race questionnaires completed after the second race, 16 of 18 runners reported interest in using gels in future races following appropriate experimentation. Athletes engaging in events lasting ~1 hour should experiment with CHO intake, specifically sports gels, in training to determine whether any performance-enhancing effects exist or if gastrointestinal disturbances result.
This study was funded by a research grant from Nestlé Australia.

Summarized by James Stevens, MS, RD, research dietitian in the Department of Health & Exercise Science, Colorado State University, Fort Collins, Colo.

SCAN NOTABLES

by Amy Culp, RD

■ **Marie Dunford, PhD, RD,** was honored with the 2006 SCAN Achievement Award at the recent SCAN Symposium. The award pays tribute to a SCAN member who has made outstanding contributions to SCAN and the dietetics profession.

Marie has 30 years of experience in the dietetics field, focusing primarily on sports nutrition. She began teaching at California State University, Fresno in 1983, and in the mid-1980s wrote a proposal for the inclusion of a sports nutrition class into the curriculum. The class was approved (although there was no textbook initially), and she taught the course every semester until she left to pursue freelance writing in 2000. After a 5-year hiatus she resumed teaching the class for the 2005-2006 academic year. Marie is also co-authoring a sports nutrition textbook for Thomson/Wadsworth (expected release: 2008) and has written online sports nutrition continuing education courses for Human Kinetics as well as written numerous other sports nutrition and wellness publications.

SCAN owes much to Marie for the countless hours she spent as editor of SCAN's invaluable resource, *Sports Nutrition: A Practice Manual for Professionals,* 4th edition. She gives credit predominately to the 25 authors who wrote the chapters and the more than 30 professionals who critically reviewed them. However, it could not have been completed without Marie's expertise and dedication, which required moving the book through the long, and sometimes tedious, process of first drafts of each chapter through production.

Marie's other significant contributions to SCAN include chairing the committee that established the first SCAN website, and currently serving as a member of the Sports Dietetics Practice Analysis Workgroup, which is dedicated to developing a credential for sports dietitians.

Marie earned her BS degree in dietetics and food administration from California State University, Long Beach; MS degree in home economics from California State University, Fresno; and PhD in medical education from the University of Southern California.

■ **Nancy King, MS, RD, CDE,** was given the honor of receiving the 2006 Excellence in Practice Award at the recent SCAN Symposium. The Excellence in Practice Award rotates among SCAN's four practice areas each year, and this year the award focused on contributions to disordered eating.

As a consultant, author, speaker, and nutrition therapist, Nancy has played an integral role in the field of disordered eating since 1985. She is one of the pioneers of the non-diet and Health At Every Size approach that has grown to a sound, responsible, and inclusive framework for treating disordered eating and weight management. Nancy has provided nutrition therapists with tools to implement this framework by co-authoring *Moving Away From Diets: New Ways to Health Eating Problems and Exercise Resistance.*

Through other published works and resources as well as dynamic lectures and presentations, Nancy continues to bring passion and dedication to educating the public and professionals on the topic of disordered eating. Her work has helped many women and men move away from diets and toward a more nurturing way of eating.

SCAN has benefited significantly from Nancy's commitment to the disordered eating field. In fact, the face of SCAN was changed as a result of Nancy's tireless efforts. In the 1990s, Nancy devoted much time and energy to spearheading the incorporation of disordered eating practitioners into the membership of SCAN, thus expanding the practice areas and focus of SCAN. Since that time she has served as co-chair of the 1995 SCAN Symposium, and was the disordered eating co-editor of *SCAN'S PULSE* for 11 years. In these capacities she has contributed much to enhancing the knowledge base of practitioners who focus on disordered eating.

Nancy received her BA degree in physical education from the University of California, Santa Barbara; MS degree in nutrition and dietetics from California State University Northridge; and is a certified diabetes educator.

■ Congratulations to the eight SCAN members who came out winners in the 2006 ADA national and House of Delegates elections: **Connie Diekman, MEd, RD, FADA,** president-elect; **Joyce Gilbert, PhD, RD,** treasurer-elect; **Ellen Rosa Shanley, MBA, RD,** House of Delegate speaker-elect; **Yvonne Greer, MPH, RD,** and **Kathleen Rourke, PhD, RD,** House of Delegates directors; **Stephen Roch, Jr, RD,** House of Delegates "30 years of age and under" delegate; and **Alberta Scruggs, DTR,** Commission on Dietetic Registration dietetic technician, registered representative.

■ **Georgia Kostas, MPH, RD,** has received the Texas Dietetic Association's 2006 Distinguished Dietitian Award, the highest honor bestowed on a member of TDA. The award recognizes a Texas dietitian who has made outstanding and significant contributions to TDA and the profession of dietetics.

2005-2006 SCAN Executive Committee

Leslie Bonci, MPH, RD
Chair

Leslie is the director of sports nutrition at the UPMC Center for Sports Medicine and an adjunct professor in the School of Dental Medicine, University of Pittsburgh. She is a consultant to several universities, high schools, and the National Collegiate Athletic Association, and serves as the consulting sports dietitian for the Pittsburgh Steelers, Pittsburgh Pirates, Pittsburgh Penguins, Pittsburgh Ballet Theater, and the Toronto Blue Jays.

Leslie has presented at several SCAN workshops, and has written chapters for several sports medicine textbooks, including the 3rd edition of SCAN's sports nutrition manual. She writes for *Training and Conditioning Journal* and is the author of the *American Dietetic Association Guide to Better Digestion.* From 1996 to 2004 she also served as an ADA national media spokesperson.

Roberta Anding, MS, RD
Chair-Elect

Roberta is on the faculty of Baylor College of Medicine and is the nutrition coordinator in Adolescent and Sports Medicine at Texas Children's Hospital. In her clinical role she addresses disordered eating, weight management, and sports nutrition. She is also an adjunct instructor of nutrition at Rice University, serves as the registered dietitian for Rice University Wellness, and is the sports dietitian for the Houston Texans and the Houston Ballet Academy.

Roberta is a longtime SCAN member and has held board positions with the Houston Area Dietetic Association and the Texas Dietetic Association Foundation. She is also a national media spokesperson for ADA. She has 22 consumer and professional publications to her credit, and co-hosts the "Houston Texans Fitness" radio show.

Patti Steinmuller, MS, RD
Secretary

Patti is an instructor for the Burns Technology Center, Montana State University-Bozeman, where she teaches a graduate-level sports nutrition course online for the National Teachers Enhancement Network. She also writes articles on sports nutrition and conducts nutrition presentations for athletes, teachers, coaches, and the public.

Patti begins her third year as SCAN secretary. She is assistant director of Sports Dietetics-USA, a subunit of SCAN. She is a member of the Sports Dietetics Specialty Practice Analysis Workgroup that assists the Commission on Dietetic Registration with its new board certification of specialist in sports dietetics. She was a reviewer for ADA's soon-to-be released *Complete Food & Nutrition Guide,* 2nd ed.

Gale Welter, MS, RD, CSCS
Treasurer

Gale is the nutrition counselor for the Campus Health Service as well as a fitness and nutrition counselor on the Worksite Wellness Screening Team at the University of Arizona. Representing all age groups, her clients' concerns often include weight management, disordered eating, and sports nutrition, in addition to clinical issues across a spectrum of medical and emotionally-related areas.

A member of SCAN since 1998, Gale has been active in the Arizona Dietetic Association and served in the elected positions of president and secretary. Prior to becoming a registered dietitian in 1998, Gale was an accountant, group fitness instructor, personal trainer, and club manager.

Christine Rosenbloom, PhD, RD
Past Chair

Chris is the associate dean for academics in the College of Health and Human Sciences and a professor in the Division of Nutrition at Georgia State University in Atlanta. Her research interests include nutrition and aging and sports nutrition.

Chris served as 2005-2006 SCAN chair, and prior to that was SCAN continuing education director in 2003-2004. She also served as a sports nutrition co-editor for *SCAN'S PULSE* as well as editor of SCAN's manual, *Sports Nutrition: A Guide for the Professional Working with Active People,* 3rd edition (2001). Chris is the author of the CD Rom "Sports Nutrition: Client Education Handouts," which accompanies the 4th edition of this manual. From 1992 to 2003, Chris was also an ADA national media spokesperson.

Hope Barkoukis, PhD, RD
Continuing Education Director

Hope is on the faculty of the School of Medicine at Case Western Reserve University, where she teaches in the medical graduate and undergraduate schools. She is currently conducting National Institutes of Health-sponsored research on the role of the glycemic index in weight management of the older adult. She also does private consulting in sports/general nutrition for the older adult and for patients with liver disease.

A frequent presenter at SCAN Symposiums, Hope has also presided over SCAN Symposium roundtable discussions as well as reviewed books for *SCAN'S PULSE.* She has been a member of SCAN for approximately 20 years. She begins her first year of service on the Executive Committee.

Margo Kraus, MS, RD
Public Relations Director

Margo is a senior nutrition consultant at Fleishman-Hillard, Inc. She creates and executes strategic, brand-building educational programs for nationally-recognized food and beverage companies.

As SCAN's public relations director, Margo proactively seeks media coverage for all SCAN events, such as the annual SCAN Symposium. This is her second year on the Executive Committee in this capacity. Margo is also an Oregon Dietetic Association media representative, bringing nutrition and health messages to the public. Margo previously served in this role as the Illinois Dietetic Association's media representative for the Chicago area. Her media experience includes interviews for television, print, and radio.

Suzanne Girard Eberle, MS RD
Member Services Director

Suzanne Girard Eberle, MS, RD, author of *Endurance Sports Nutrition,* is a sports dietitian in Portland, Ore. Her private practice includes speaking, freelance writing, and conducting workshops on sports nutrition, disordered eating, and women's health issues, as well as seeing private clients of all ages and athletic abilities. She also facilitates a weight management group for a local hospital and has served on the board of the Columbia River Eating Disorder Network for the past four years.

Suzanne begins her second year as member services director. Prior to that she served as SCAN Notables editor of *SCAN'S PULSE* for two years.

(continued on page 26)

Julie Upton, MS, RD
Director of Partnerships

Julie is a communications expert specializing in nutrition, fitness, and health. She has written over 500 articles for national media, including *The New York Times, Redbook, Prevention, Shape, US Weekly, Woman's Day*, and *Parents.* Julie is also a marketing communications consultant to several corporations, including Unilever, Kraft, McNeil Consumer Healthcare, and Kellogg's.

Julie begins her second year on the SCAN Executive Committee in the capacity of developing partnerships with industry. She has also served as an ADA media spokesperson, and her past involvement with SCAN includes volunteer activities in the public relations and *PULSE* arenas.

Edee Howard Hogan, RD
Vice Director of Partnerships

Edee Howard Hogan, RD, is the owner of Nutrition Consulting Services, in Washington, DC, where she provides private and corporate clients with nutrition counseling and food expertise. She has been extensively involved in the area of nutrition and food for more than 25 years.

Active in the ADA, Edee is a former ADA national media spokesperson. She was a founding member and chair of the Food and Culinary Professional dietetic practice group. Recently Edee represented SCAN at the American Heart Association's "Obesity, Lifestyle, and Cardiovascular Disease" conference in Washington, DC, and worked on securing funding for the reception at the 2006 SCAN Symposium.

Mark Kern, PhD, RD
Editor-in-Chief, SCAN'S PULSE

Mark is a professor in the Department of Exercise and Nutritional Sciences at San Diego State University. His research involves two primary areas: 1) how diet and exercise independently and interactively influence lipid, energy, and calcium metabolism and 2) sports dietetics. He is the author of the *CRC Desk Reference on Sports Nutrition*, published by CRC Press.

Mark has been a member of SCAN since 1995. He has presented his research at the annual Symposium, reviewed books for *SCAN'S PULSE*, and served as the 2003-2004 chair of SCAN's Nominating Committee. Mark has served as your *PULSE* editor since October 2003 and welcomes any constructive feedback you may have.

Pamela Cramer, CAE
Executive Director

Pam is president of The PMC Group, a Chicago-based firm specializing in association management and nonprofit organizational behavior and change. Pam assumed the SCAN executive director position in September 2005, bringing to SCAN extensive experience in top-level management for healthcare organizations.

In addition to heading the SCAN Office, Pam's role includes providing strategic planning to the SCAN Executive Committee as well as management support for SCAN's many programs, services, and membership activities. Pam is a certified association executive, a credential awarded by the American Society of Association Executives.

OF OF FURTHER INTEREST

■ Get on Board with Certification in Sports Dietetics

Board certification as a specialist in sports dietetics (CSSD) recently became available from the Commission on Dietetic Registration (CDR). Now you can become credentialed to set yourself apart and be recognized for your experience and expertise. The cost of the 5-year certification is $250.

Successful completion of the specialty exam attains specialty status and satisfies the 5-year continuing professional education unit (CPEU) requirement for recertification as a registered dietitian. Eligibility requirements for the specialty exam include current RD status, maintenance of RD status for three years, and 1,500 hours of experience in specialty practice. Currently graduate education may substitute for up to 1,200 hours of practice experience.

The computer-based exam is offered at about 100 locations throughout the country for a 3-week period in June and January. Visit CDR's website (www.cdrnet.org) for details about sports dietetics certification, application, eligibility criteria, content outline for the exam, reference list, and exam locations and dates.

For more information on sports dietetics as a career, visit SCAN's website (www.scandpg.org). Join the Sports Dietetics-USA (SD-USA) subunit and receive certification updates. Signing up for the subunit is easy and free—it's a benefit of SCAN membership. Simply sign up on your Member Profile within the Member Login.

■ SCAN 2006-2007 Election Results

Congratulations to the winners of SCAN's 2006-2007 election. Ballot results include: SCAN chair-elect: Roberta Anding, MS, RD, CDE; SCAN treasurer: Gale S. Welter, MS, RD, CSCS, CPA; and SCAN Nominating Committee: Diane Gallagher, MS, RD, and Marianne Smith Edge, MS, RD, FADA.

■ Visit SCAN's New-and-Improved Website

SCAN's website (www.scandpg.org) now has a new look! As of April 1, visitors can enjoy easier navigation and access to SCAN's news and information. Benefits to SCAN members include an enhanced professional image, increased recognition of members—through, for example, member-authored books—as well as updates on sports dietetics certification and an expanded Members Only section.

All SCAN members are encouraged to visit the site and complete a "Find a SCAN Dietitian" profile so that colleagues, prospective employers, the public, and the media can readily find you and other experts in the fields of sports nutrition, cardiovascular health, wellness, and the prevention and treatment of disordered eating. Sign up by **August 1** and you'll have the chance to win a *free registration* to the 2007 SCAN Symposium (see below for details).

■ Win a Free Registration to Symposium '07!

Sign up for SCAN's Member Locator feature, called "Find a SCAN Dietitian" on SCAN's website, and your name will be included in a drawing to win a free registration to the 2007 SCAN Symposium—a value worth $350 for the full Symposium and pre-Symposium workshops, plus the benefits of attending SCAN's flagship educational/networking annual event.

Despite SCAN's 5,000+ membership, several states currently still have no SCAN professionals listed in our convenient Member Locator. With plans under way to expand the visibility and reach of SCAN's website on the Internet, you can boost your professional visibility via "Find a SCAN Dietitian." So if you haven't done so already, sign up before **August 1** by visiting www.scandpg.org.

■ Check Out SCAN's "Student Corner"

The new "Student Corner" featured on SCAN's website (www.scandpg.org) puts the spotlight on various student members of SCAN. Through lively interviews, profiled students share their insights and experiences in sports nutrition, cardiovascular health, wellness, and disordered eating.

One of the latest "Student Corner" entries is a fascinating interview with Abigail Larson, elite cross-country skier who competed on the US Olympic Nordic Team at the 2006 Winter Olympics in Torino. Check out this interview and several others by clicking on the Careers & Students tab—you can learn much by reading these contributions from fellow students in your field.

If you have an idea regarding an experience or article to share with other students, contact Ellen Coleman, coordinator of Student Corner and a past-chair of SCAN, at ecolemanrd@aol.com.

UPCOMING EVENTS

August 18-19, 2006
"Nutrition & Exercise: An Intensive Workshop," Providence, RI. For info: Nancy Clark, www.sportsnutrition workshop.com

September 16-19, 2006
ADA Food & Nutrition Conference & Expo (FNCE), Honolulu. *SCAN session: "From the Training Table to Competition: Fueling Athletes for Success."* For information: www.eatright.org/fnce

November 9-12, 2006
Annual Renfrew Center Foundation Conference, "Feminist Perspectives and Beyond: Maximizing Change in the Treatment of Eating Disorders," Philadelphia. For information: www.renfrewcenter.com

April 12-15, 2007
Join us for the ***23rd Annual SCAN Symposium*** in Austin, Tex. "Sports Nutrition Training Camp" is the theme. For information: SCAN Office, 800/249-2875, www.scandpg.org

SCAN'S PULSE

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Manuscripts (original research, review articles, etc.) will be considered for publication. Guidelines for authors are available at www.scandpg.org. Email manuscript to the Editor-in-Chief; allow up to 6 weeks for a response.

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