

# A Non-Restrictive Approach to Weight Management for the Patient Who Has “Tried Everything”

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On the surface, weight management appears to be straightforward: calories in versus calories out. However, while more is known now than ever before about the complex genetic, metabolic, physiological, cultural, social, and behavioral determinants, 72 percent of men and 64 percent of women are overweight or obese, with about one-third of adults being obese.<sup>1</sup>

These statistics suggest that traditional approaches to weight loss have been ineffective. In a review of 31 long term studies on dieting, the authors report, “there is little support for the notion that diets lead to lasting weight loss or health benefits.” They found that the majority of individuals are unable to maintain weight loss over the long term and one-third to two-thirds of dieters regain more weight than they lost.<sup>2</sup>

As concern about childhood obesity grows, it is important to recognize that results are similar for children. Research on nearly 17,000 kids ages 9-14 years old concluded, “...in the long term, dieting to control weight is not only ineffective, it may actually promote weight gain.”<sup>3</sup>

Despite these compelling findings, there continues to be a strong cultural bias in the general population and among researchers and clinicians toward dieting. For example, the conclusion of a systematic review and meta-analysis of weight-loss clinical trials with a minimum 1-year follow-up was, “Weight-loss interventions utilizing a reduced-energy diet and exercise are associated with moderate weight loss at 6 months. Although there is some regain of weight, weight loss can be maintained.” However, the weight loss amounted to only 5 to 8.5 kg during the first 6 months from interventions with weight plateaus at approximately 6 months. In studies extending to 48 months, only 3 to 6 kg of weight loss was maintained.<sup>4</sup> These are hardly the results that patients—and their health care team—expect and hope for.

In a recent narrative review of dietetic articles in the *Journal of Human Nutrition and Dietetics*, the author concluded that, “Dietetic literature on weight management fails to meet the standards of evidence based medicine. Research in the field is characterized by speculative claims that fail to accurately represent the available data. There is a corresponding lack of debate on the ethical implications of continuing to promote

ineffective treatment regimes and little research into alternative non-weight centred approaches.”<sup>5</sup>

## THE NON-DIET APPROACH

There is a growing trans-disciplinary movement away from dieting toward a non-restrictive approach. There are a variety of organizations, programs, and authors advocating a this paradigm shift.<sup>6,7,8,9,10,11,12</sup> Various terms have been used to describe these approaches in the lay and academic literature, including intuitive eating<sup>13</sup>, non-diet, mindful eating<sup>14</sup>, Health at Every Size (HAES)<sup>15,16</sup>, Am I Hungry?<sup>17</sup>, instinctive eating, attunement, conscious eating, normal eating,<sup>18</sup> and others. While they each may emphasize different facets and utilize different methodologies, their approaches are typically weight neutral and focus on recognition of internal regulatory processes, awareness of the present experience of eating, and pursuit of physical activity that is pleasurable.

Research on these various approaches is slowly accumulating with results showing improved nutrient intake<sup>19</sup>, improved health indicators<sup>20,21,22</sup>, lower body weight<sup>23,24,25</sup> or maintenance<sup>26</sup>, reduced eating disorder symptomatology<sup>27,28</sup>, improvements in psychological and behavioral outcomes, including self-esteem and eating behavior<sup>29</sup> and reduction in food cravings.<sup>30</sup>

### Web-based Resources for Non-Restrictive Approaches

Americans in Motion: [www.americansinmotion.org](http://www.americansinmotion.org)  
Am I Hungry? Mindful Eating Workshops and Facilitator Training: [www.AmIHungry.com](http://www.AmIHungry.com)  
The Association of Size Diversity and Health: <http://www.sizediversityandhealth.org/>  
The Center for Mindful Eating: [www.tcme.org](http://www.tcme.org)  
Health at Every Size: [www.haescommunity.org](http://www.haescommunity.org)  
Intuitive Eating: [www.intuitiveeating.org](http://www.intuitiveeating.org)

## Becoming an Effective Agent of Change

Health and wellness professionals can introduce a non-restrictive approach to the patient who has “tried everything to lose weight” and support them as they adopt sustainable lifestyle changes over time.

The remainder of this article describes six specific strategies based on the Mindful Eating Cycle™ developed by this author.<sup>31</sup> The Mindful Eating Cycle incorporates the common elements of a non-restrictive approach, while offering a structure that is helpful for the clinician and patient alike.

Encourage the patient to approach this process with curiosity and non-judgment. Change takes place in a climate of acceptance so help them view their mistakes as an expected part of the process and an opportunity to increase awareness about the drivers of their eating behaviors.

### THE MINDFUL EATING CYCLE

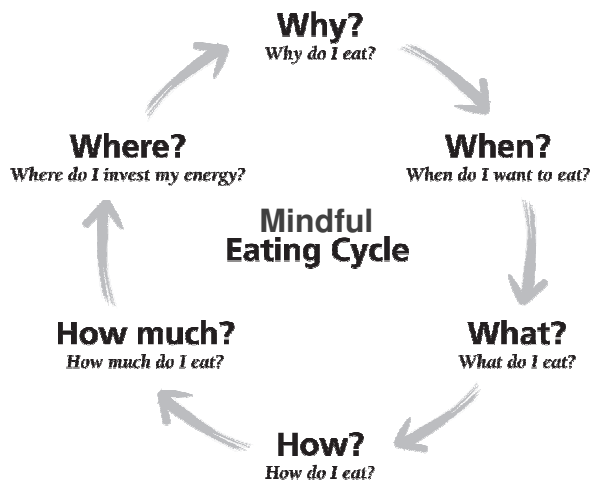


Fig. 1 Mindful Eating Cycle

### Why? Why do I eat?

Many people lack awareness about why they make their eating decisions despite the fact that the underlying reason they are eating will affect every decision that follows. For example, if a person is eating for fuel and nourishment, they may be interested in energy balance and nutrition. If they are eating in response to environmental or emotional cues such as stress, boredom, pleasure, they are more likely to choose foods that are convenient, energy dense, and highly palatable.<sup>32</sup> They may also be more likely to eat an excess amount of food when eating doesn't address the underlying trigger.

Further, since diets focus on *what* and *how much* people should eat without addressing *why* they are eating in the first place, dieters usually don't learn to recognize and effectively cope with their eating triggers or meet their true bio-psycho-social needs.<sup>33,34,35</sup> These

triggers and underlying unmet needs will continue to drive overeating.

### When? When do I eat?

Hunger is a primitive yet reliable method of regulating dietary intake.<sup>36,37</sup> Research has demonstrated that normal weight individuals are more likely to eat in response to internal cues like hunger whereas people who are overweight tend to eat in response to other cues.<sup>38</sup>

A simple but useful approach for helping the patient re-establish hunger as their primary cue for eating is to suggest that they ask themselves, "Am I hungry?" whenever they feel like eating.<sup>39</sup> Hunger is differentiated from other environmental and emotional cues by identifying physical symptoms such as a growling stomach, difficulty concentrating, and irritability. Once they are able to accurately identify hunger, patients can fine tune their awareness by determining how hungry they are. Through trial and error they usually discover that waiting to eat until they are sufficiently hungry increases satisfaction, while waiting too long can lead to overeating.

Environmental and emotional cues can also trigger an urge to eat (or to continue eating) whether there is a physical need for fuel or not. Examples of environmental triggers include appetizing food, meal times, holidays, advertising and large portion sizes.<sup>40,41,42</sup> While opportunistic eating may have been adaptive through much of evolutionary history, it is problematic in the current food abundant environment.<sup>43,44</sup> When an individual recognizes that an urge to eat was triggered by something in their environment, they can choose to redirect their attention to another activity until the urge passes, reminding themselves that they will eat when they get hungry. They can prepare for these situations by having a variety of appealing alternative activities available such as reading, puzzles, journaling, or woodworking.

They can also decrease some of their environmental triggers by putting food out of sight, avoiding the break room, and ordering half-portions or sharing meals. With practice, this process will help them break the habitual association between certain activities, people, and places, and overeating.

All people eat for emotional reasons, including comfort, celebration, and pleasure. Cross culturally, social events often revolve around eating and emotional connections to food are part of "normal" eating. Emotional eating becomes maladaptive when it is the primary way that a person copes with emotions. To be clear, this does not imply that every overweight person has major psychological problems. It simply means that

they are using food for purposes other than energy and nutrition at times.

Emotional triggers include boredom, stress, sadness, anger, loneliness and even happiness. Eating can be a way to comfort, avoid, numb or distract oneself from emotions. If someone has been using food to help them cope with stress and other emotions, dieting will disrupt their primary coping strategy. If they do not learn alternative means of coping then distress will increase and overeating will eventually return. Addressing emotional eating is a significant challenge for many people, and probably the most common reason that diets fail.<sup>45,46</sup>

Alternatively, when a person is able to gain insight into their emotional triggers, they can improve their ability to identify feelings and expand their range of coping mechanisms. Examples include stress management, positive thinking and setting boundaries in relationships. Often, new skills and tools are needed so it is best to approach this as a process, referring for counseling when necessary.

When patients learn more effective strategies for coping with their emotions and use food less often for comfort or to avoid dealing with feelings, two things will happen. First, their desire to overeat diminishes. Second, and most importantly, they begin to find fulfillment in experiences other than eating and meet their true needs more effectively.

### **What? What do I eat?**

A restrictive approach requires the dieter to maintain willpower indefinitely in order to comply with the rules the diet they are attempting to follow. Dieters exhibit an increased preoccupation with food, feelings of deprivation and guilt, and resignation if they break from their diet.<sup>47,48,49,50,51</sup> Consequently, they develop feelings of failure, lowered self-esteem and decreased self-efficacy that often leads to more overeating. Most people have difficulty maintaining the willpower to avoid pleasurable foods indefinitely—even when threatened by negative health consequences.

A non-restrictive approach acknowledges that a “normal” diet consists of a variety of foods, including foods eaten for pleasure. When pleasurable foods are not forbidden and can be eaten without guilt, there is less drive to overeat them. When deprivation is no longer a factor, the individual will begin to recognize that they are hungry for a variety of foods, including healthy foods. The desire for healthier foods will increase further through education and personal experience about the effects that different foods have on their body. They may gradually modify their diet as they learn nutrition

information that will make them feel better and improve their health.

A simple yet effective way to communicate these concepts to patients is that all foods can fit in a healthy diet using the principles of balance, variety and moderation.<sup>52</sup> This flexible approach can be applied in any situation and is particularly effective when supported by education about nutrition, shopping, cooking, dining out, and social eating strategies. The goal is to find a balance between eating for enjoyment and eating for nourishment.

### **How? How do I eat?**

Mindful eating is non-judgmental awareness of physical and emotional sensations associated with eating.<sup>53,54</sup> Each decision point in the Mindful Eating Cycle contributes to this awareness. When one gives food, eating, and their physical cues their full attention, they are more likely to experience optimal satisfaction and enjoyment without eating to excess.

Following are suggestions for increasing mindfulness while eating: Eliminate or minimize distractions while eating including watching television, working, driving, and reading. Sit down to eat, preferably at a table designated solely for that purpose. Take a deep breath to calm and center yourself. Appreciate the appearance and ambience—a feast for the eyes—before taking the first bite. Savor the aromas and flavors of the food. Put your fork down between bites; if you are loading your next forkful, that is where your attention will be focused. Pause in the middle of eating to identify physical signals of satiety. After eating, notice how you feel physically and emotionally.

Often, the positive results from eating mindfully will motivate individuals to become more mindful in other aspects of their lives, increasing enjoyment and effectiveness.

### **How Much? How much do I eat?**

With increased awareness, patients can also learn to avoid the physical discomfort of fullness as an internalized mechanism of portion control. This is critical in the current food abundant environment where eating until the plate is clean, the package is empty, they’ve gotten their money’s worth, or feel physically uncomfortable is all too common.

One simple but memorable strategy is to realize that the stomach is only about the size of their fist when it is empty so it comfortably holds only a couple of handfuls of food before stretching and placing pressure on other areas of the body. This approach helps the patient see

that eating the right amount of food isn't about being good but about feeling good.

### **Where? Where do I invest my energy?**

Unfortunately, chronic dieting and popular messages lead many individuals to equate exercise with punishment for eating. Further, lack of time and discomfort contribute to negative associations and avoidance of exercise. It is helpful to approach physical activity and exercise with your patients just as you would any other highly beneficial therapeutic intervention. Explain that exercise has numerous well-documented health and psychological benefits, with or without weight loss.<sup>55,56,57,58,59,60,61,62</sup> Elicit the patient's feelings about exercise and work with them to write a physical activity prescription tailored to their preferences and level of fitness. If they are not ready to begin exercising, they can be coached to come up with ideas for increasing their lifestyle activity such as parking further from the building and walking to the mailbox. They can increase their activity as their tolerance increases, always keeping in mind that exercise must be comfortable, convenient, fun and rewarding in order it to become a long-term

habit.

However, one's energy requirements are much greater than just exercise. Take a whole-person approach to the question "Where?" by asking your patients to consider specific steps for improving the health of their body, mind, heart, and spirit. Food becomes fuel when they are focused on creating a balanced, fulfilling life.

The current challenges posed by lifestyle choices cannot be adequately addressed with a math equation: calories in versus calories out. Therefore health and wellness professionals should discourage strict and fad dieting and support their patients in the process of discovering why, when, what, how, and how much they eat and where they invest their energy. The goal is to guide patients to develop a healthy, satisfying, mindful approach to eating, physical activity, and living.

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## References

- <sup>1</sup> Flegal KM, Carroll MD, Ogden CL, Curtin LR: Prevalence and trends in obesity among U.S. adults, 1999-2008. *JAMA*. 2010;303(3):235-241.
- <sup>2</sup> Mann T, Tomiyama AJ, Westling E, Lew AM, Samuels B, Chatman J: Medicare's Search for Effective Obesity Treatments: Diets Are Not the Answer. *Am. Psychol.* 2007, 62:220-233.
- <sup>3</sup> Field AE et al. Relation Between Dieting and Weight Change Among Preadolescents and Adolescents. *Pediatrics*. 2003 112:900-906.
- <sup>4</sup> Franz MJ, VanWormer JJ, Crain AL, et al. Weight-loss outcomes: a systematic review and meta-analysis of weight-loss clinical trials with a minimum 1-year follow-up. *Journal of the American Dietetic Association*. 2007;107(10):1755-1767.
- <sup>5</sup> Aphramor L: Validity of claims made in weight management research: a narrative review of dietetic articles. *Nutr J*. 2010, 9:30.
- <sup>6</sup> McMullen, S, May M, Staton E, Pace W, Theobald M, McAndrews J: AIM-HI Practice Manual. American Academy of Family Physicians; 2010. Accessed 02/15/11 from [http://www.aafp.org/online/etc/medialib/aafp\\_org/documents/clinical/pub\\_health/aim/practicemanual.Par.0001.File.dat/AIMPracticeManual.pdf](http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/pub_health/aim/practicemanual.Par.0001.File.dat/AIMPracticeManual.pdf).
- <sup>7</sup> Tribole E, Resch E: *Intuitive eating: a revolutionary program that works*. 2nd ed. New York: St. Martin's Griffin; 2010.
- <sup>8</sup> May M: *Eat What You Love, Love What You Eat: How to Break Your Eat-Repent-Repeat Cycle*. Greenleaf Book Group Press; 2009.
- <sup>9</sup> Bacon L: *Health at Every Size: The Surprising Truth About Your Weight (Second Edition)*. Dallas: BenBella Books; 2010.
- <sup>10</sup> Hammond M: Ways Dietitians are Incorporating Mindfulness and Mindful Eating into Nutrition Counseling. *The Digest: A Dietetic Practice Group of the American Dietetic Association*, 2007, Fall, 1-9.
- <sup>11</sup> United States Department of Agriculture (2006). "Health At Every Size: New Hope for Obese Americans?". Accessed 02/15/11 from <http://www.ars.usda.gov/is/AR/archive/mar06/health0306.htm>.
- <sup>12</sup> Dalen, J., Smith, B. W., Shelley, B. M., Sloan, A. L., Leahigh, L., & Begay, D. (2010). Pilot study: Mindful eating and living (MEAL): Weight, eating behavior, and psychological outcomes associated with a mindfulness-based intervention for people with obesity. *Complementary Therapies in Medicine*, 18(6), 260-64.
- <sup>13</sup> Intuitive Eating - [www.intuitiveeating.org](http://www.intuitiveeating.org)
- <sup>14</sup> The Center for Mindful Eating – [www.tcme.org](http://www.tcme.org)
- <sup>15</sup> Bacon L, Aphramor L. Weight Science: Evaluating the Evidence for a Paradigm Shift. *Nutrition Journal* 2011, 10:9.
- <sup>16</sup> Health at Every Size - [www.haescommunity.org](http://www.haescommunity.org)
- <sup>17</sup> Am I Hungry? Mindful Eating Workshops – [www.AmIHungry.com](http://www.AmIHungry.com)
- <sup>18</sup> <http://www.eatingnormal.com/>
- <sup>19</sup> Smith T, Hawks S: Intuitive eating, diet composition and the meaning of food in healthy weight promotion. *Am. J. Health Educ.* 2006, 37:130-136.
- <sup>20</sup> Bacon L, Stern J, Van Loan M, Keim N: Size acceptance and intuitive eating improve health for obese, female chronic dieters. *J. Am. Diet. Assoc.* 2005, 105:929-936.
- <sup>21</sup> Ciampolini Mand R. Bianchi, Training to estimate blood glucose and to form associations with initial hunger, *Nutrition and Metabolism*, vol. 3, article 42, 2006.
- <sup>22</sup> Ciampolini M et al., Sustained Self-Regulation of Energy Intake: Initial Hunger Improves Insulin Sensitivity, *Journal of Nutrition and Metabolism*, vol. 7 2010.
- <sup>23</sup> Weigensberg M, Shoar Z, Lane C, Spruijt-Metz D: Intuitive eating (IE) Is associated with decreased adiposity and increased insulin sensitivity (SI) in obese Latina female adolescents. *DiabetesPro*; 2009.
- <sup>24</sup> Reichard, G., May, M., Krepcho, M., Kohlerman, N. (2006, April). *Am I Hungry? A preliminary investigation of an innovative and promising non-diet weight loss program*. Poster session presented at the annual conference of the Society of Teachers of Family Medicine, San Francisco, CA.
- <sup>25</sup> Ciampolini M et al. Sustained self-regulation of energy intake. Loss of weight in overweight subjects. Maintenance of weight in normal-weight subjects, *Nutrition and Metabolism*, vol. 7, article 4, 2010.
- <sup>26</sup> Provencher V, Begin C, Tremblay A, Mongeau L, Corneau L, Dodin S, Boivin S, Lemieux S: Health-at-every-size and eating behaviors: 1-year follow-up results of a size acceptance intervention. *J. Am. Diet. Assoc.* 2009, 109:1854-1861.
- <sup>27</sup> Kristeller JL, Hallett CB. An exploratory study of a meditation-based intervention for binge eating disorder. *J Health Psychol* 1999; 4: 357-363.
- <sup>28</sup> Smith, B.W., Shelley, B.M., Leahigh L., & Vanleit, B. (2006) Preliminary study of the effects of a modified mindfulness intervention on binge eating, *Complementary Health Practice Review*. Vol. 11, 133.
- <sup>29</sup> Bacon L, Aphramor L. Weight Science: Evaluating the Evidence for a Paradigm Shift. *Nutrition Journal* 2011, 10:9.
- <sup>30</sup> Alberts, H. J. E. M., et al. Coping with food cravings. Investigating the potential of a mindfulness-based intervention. *Appetite* (2010), doi:10.1016/j.appet.2010.05.044
- <sup>31</sup> May M: *Eat What You Love, Love What You Eat: How to Break Your Eat-Repent-Repeat Cycle*. Greenleaf Book Group Press; 2009.
- <sup>32</sup> Oliver, G., Wardle, J., & Gibson, L. (2000). Stress and food choice: A laboratory study. *Psychosomatic Medicine*, 62, 853 – 865.
- <sup>33</sup> Hill AJ, Weaver CF, Blundell JE. Food craving, dietary restraint and mood. *Appetite*. 1991;17:187-197.

- <sup>34</sup> Heatherton TF, Herman CP, Polivy J. Effects of distress on eating: The importance of ego-involvement. *J of Personality and Social Psychology*. 1992;62:801-803.
- <sup>35</sup> Kayman S, Bruvold W, Stern JS. Maintenance and relapse after weight loss in women: behavioral aspects. *Am J Clin Nutr*. 1990;52:800-807.
- <sup>36</sup> Magnen JL. *Hunger*. Great Britain, UK: Press Syndicate of the University of Cambridge; 1985.
- <sup>37</sup> Ciampolini Mand R. Bianchi, Training to estimate blood glucose and to form associations with initial hunger, *Nutrition and Metabolism*, vol. 3, article 42, 2006
- <sup>38</sup> Mela DJ, Rogers PJ. *Food, Eating, and Obesity: The Psychobiological Basis of Appetite and Weight Control*. London, Engl: Chapman & Hall; 1998.
- <sup>39</sup> May M: *Eat What You Love, Love What You Eat: How to Break Your Eat-Repent-Repeat Cycle*. Greenleaf Book Group Press; 2009.
- <sup>40</sup> Wansink B. Environmental factors that increase the food intake and consumption volume of unknowing consumers. *Annual Review of Nutrition*. 2004;24:455-479.
- <sup>41</sup> Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. *Obes Res*. 2005;13:93-100
- <sup>42</sup> Wansink, B., Painter, J. E., & Lee, Y. K. (2006). The office candy dish: Proximity's influence on estimated and actual consumption. *International Journal of Obesity*, 30, 871-875.
- <sup>43</sup> National Alliance for Nutrition and Activity. From wallet to waistline: the hidden costs of super sizing. 2002.
- <sup>44</sup> Rolls BJ. The supersizing of America: Portion size and the obesity epidemic. *Nutrition Today*. 2003;38(2):42-53.
- <sup>45</sup> Byrne S, Cooper Z, Fairburn C. Weight maintenance and relapse in obesity: a qualitative study. *Int J Obes Relat Metab Disord*. 2003 Aug;27(8):955-62.
- <sup>46</sup> Elfhag K, Rossner S. Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obes Rev*. 2005 Feb;6(1):67-85. Review.
- <sup>47</sup> Polivy J. Psychological consequences of food restriction. *J Am Diet Assoc*. 1996 Jun;96(6):589-92.
- <sup>48</sup> Lowe MR, Foster GD, Kerzhnerman I, Swain RM, Wadden TA. Restrictive dieting vs. "undieting" effects on eating regulation in obese clinic attenders. *Addict Behav*. 2001 Mar-Apr;26(2):253-66.
- <sup>49</sup> Polivy J. Psychological consequences of food restriction. *J Am Diet Assoc*. 1996 Jun;96(6):589-92.
- <sup>50</sup> Birch, L. L., Fisher, J. O., & Davison, K. K. (2003). Learning to overeat: Maternal use of restrictive feeding practices promotes girls' eating in the absence of hunger. *American Journal of Clinical Nutrition*, 78, 215-220.
- <sup>51</sup> Forman, E. M., et al. A comparison of acceptance- and control-based strategies for coping with food cravings: An analog study. *Behaviour Research and Therapy* (2007).
- <sup>52</sup> Freeland-Graves J, Nitzke S. Total diet approach to communicating food and nutrition. Position of the American Dietetic Association. *J Am Dietetic Assn*, 2002;102:100-108.
- <sup>53</sup> The Center for Mindful Eating: Principles of Mindful Eating. Accessed 02/15/11 from <http://www.tcme.org/principles.htm>
- <sup>54</sup> Framson, C., Kristal, A. R., Schenk, J. M., Littman, A. J., Zeliadt, S., & Benitez, D. (2009) Development and Validation of the Mindful Eating Questionnaire. *Journal of the American Dietetic Association*, 109, 1439-1444.
- <sup>55</sup> Bensimhon DR, Kraus WE, Donahue MP. Obesity and physical activity: a review. *Am Heart J*. 2006 Mar;151(3):598-603.
- <sup>56</sup> Wing RR. Physical activity in the treatment of the adulthood overweight and obesity: current evidence and research issues (Roundtable Consensus Statement). *Med. Sci. Sports Exerc*. 1999;31:S547-552.
- <sup>57</sup> Stiegler P, Cunliffe A. The role of diet and exercise for the maintenance of fat-free mass and resting metabolic rate during weight loss. *Sports Med*. 2006;36(3):239-62.
- <sup>58</sup> Barlow CE, Kohl HW, Gibbons LW, et al. Physical fitness, mortality, and obesity. *Int J Obes Relat Metab Disord*. 1995;19(suppl 4):S41-44.
- <sup>59</sup> Poirier P, Despres JP. Exercise in weight management of obesity. *Cardiol Clin*. 2001 Aug;19(3):459-70.
- <sup>60</sup> Carroll S, Dudfield M. What is the relationship between exercise and metabolic abnormalities? A review of the metabolic syndrome. *Sports Med*. 2004;34(6):371-418.
- <sup>61</sup> Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. *Surgeon General's Report on Physical Activity and Health*. Atlanta, GA: CDC; 1996.
- <sup>62</sup> Kruger J, Bowles HR, Jones DA, Ainsworth BE, Kohl HW. Health-related quality of life, BMI and physical activity among US adults (>18 years): National Physical Activity and Weight Loss Survey, 2002. *International Journal of Obesity* advance online publication 16 May 2006.