Part V

Program Design and Implementation

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Chapter 12

Weight-management Programming

In 2006, 72 million American dieters spent $55 billion in the weight-loss market, and forecasts estimate that amount to reach nearly $69 billion in 2010 (Marketdata Enterprises, Inc., 2007). According to the Centers for Disease Control and Prevention (CDC), there has been a rising trend of Americans considered **overweight** and obese: from 65.7% and 30.6% in 2001–2002 to 66.3% and 32.2% in 2003–2004, 68% and 33.8% in 2005–2006, and 68.3% and 33.9% in 2007–2008, respectively (Table 12-1).

An effective weight-management program involves a multidisciplinary team approach that includes a physician, registered dietitian, exercise physiologist, and behavioral therapist. Through this team approach, the three critical areas—behavior and lifestyle modification, nutrition, and physical activity—can be coordinated. While this approach is ideal, the cost of employing a team of healthcare experts, combined with the lack of third-party reimbursement, creates potential barriers. Hence, overweight or obese clients may instead opt to seek the services of competent allied health professionals who are experienced in all three disciplines and have an established referral network in place.

The success of a Lifestyle & Weight Management Coach (LWMC) necessitates proven competencies in these areas and the ability to address the individualized needs of clients. The science behind each area is discussed earlier in this book, while the subsequent chapters focus on programming guidelines and strategies.

IN THIS CHAPTER:

Introduction to Effective Weight Management

Components of an Effective Weight-management Program

LWMCs can expect to encounter obstacles, either identified or reported by their clients, during the early stage of their relationship. During the interview and information-gathering stage, LWMCs may identify internal and external barriers. Internal barriers could be anxieties, ambivalence, or defensive avoidance, such as rationalizing a decision to delay starting a program. External barriers could be the inconvenience of the program, lack of time, or lack of support (Griffin, 2006).

While LWMCs have the best intentions for their clients, they must act ethically and responsibly to determine what is appropriate, given the client's current stage of behavioral change. LWMCs must never assume that a meeting with a client means that he or she has entered the preparation or action stage of behavioral change, and is therefore ready to move forward. LWMCs must be skilled in identifying a client's current stage of change and have the ability to implement or recommend the appropriate strategies. This is a critical first step toward facilitating a more permanent lifestyle change. Time and money invested in a nutritional or activity/exercise program may be wasted if the client's underlying psyche is not addressed first. The subsequent chapters address individual programming components of lifestyle and behavioral modification, exercise, and nutrition.

In general, the design of effective weight-management programs for clients requires that LWMCs gain a working knowledge of the following skill sets.

Lifestyle and behavior modification:

- Readiness to change behavior and identification of current stage of change
- Processes of change (cognitive and/or behavioral) and the shifting of a client's decisional balance toward change (Prochaska & Marcus, 1994)
- Self-esteem, **self-efficacy,** and self-efficacy-building strategies
- Acknowledgement of, and reframing of, current attitudes, perceptions, apprehensions, and belief systems
- Value of cognitive techniques, such as goal-setting
- Rapport building and maintenance
- Effective verbal and nonverbal communication, and good listening skills
- Different personality styles (e.g., technical, sociable, or assertive) and appropriate communication styles (Griffin, 2006)
- Support systems
- Internal and external barriers and obstacle management
- Appropriate cognitive, motor-skill, and affective learning techniques
- Motivational strategies, including reinforcements, antecedents, rewards (extrinsic to intrinsic), personal contracts, stimulus control, and self-talk

Exercise programming:

- Exercise science
- Health-risk assessments and risk stratification
- Referrals to appropriate professionals, confidentiality, and **SOAP note** format
- Exercise and testing contraindications
- Physiological assessments and termination criteria
- Limitations of assessments and the interpretation of criterion-referenced or norm-referenced data
- Program design and implementation
- Environmental effects
- Reevaluation and modification/progression

Nutritional programming:

- Nutrition (**macronutrient** and **micronutrient** function) and digestion
- Nutritional assessments
- Caloric balance and weight-management-program design

- Dietary guidelines, labels, and portions sizes
- Weight-loss diets and supplements
- Dietary needs for special populations, women, and vegetarians

Prevalence of Obesity

Population Statistics

The National Health and Nutrition Examination Survey (NHANES), which is conducted every 10 years by the National Center for Health Statistics (NCHS) and the CDC, assesses the health and nutritional status of adults and children in the United States. It is arguably the largest and longest-running longitudinal health survey of the U.S. population and provides valuable information on important health indicators. The prevalence of overweight and **obesity** has been tracked since 1971, and a rising trend is evident within the U.S. population (Table 12-1). In 2008, an estimated 154 million adults were overweight or obese; among women 20 years and older, more than 97 million were overweight, and more than 49 million were obese.

According to the CDC, the average male weighed 166.3 pounds (75.5 kg) in 1960–1962, while the average female weighed 140.2 pounds (63.7 kg). By contrast, in 1999–2002, the average male weighed 191.0 pounds (86.7 kg), while the average female weighed 164.3 pounds (74.6 kg).

The increased incidence of obesity is attributed to decreasing levels of activity and increasing access to, and consumption of, food. Physical-activity statistics from the Department of Health and Human Services and the Centers for Disease Control and Prevention in 2007 indicated that only 48.8% of U.S. adults were achieving the recommended physical-activity levels consistent with the U.S. Surgeon General's report; 37.7% were insufficiently active (defined as more than 10 minutes total per week of moderate- or vigorous-intensity lifestyle activities, but less than the recommended level of activity); 13.5% of adults were inactive (defined as less than 10 minutes total per week of moderate- or vigorous-intensity lifestyle activities). Likewise, the average consumption of calories in adults increased by 12%, or 300 kcal, between 1985 and 2000.

Being overweight or obese significantly increases the risk of developing serious disease and health conditions, including the following:

- Hypertension
- Dyslipidemia
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (endometrial, breast, and colon)

Table 12-1

Age-adjusted Prevalence of Overweight and Obesity Among U.S Adults, Ages 20–74

	NHANES II (1976–1980) (n = 11,207)	NHANES III (1988–1994) (n = 6,679)	NHANES (1999–2000) (n = 4,117)	NHANES (2001–2002) (n = 4,413)	NHANES (2003–2004) (n = 4,431)	NHANES (2005–2006) (n = 4,356)	NHANES (2007–2008) (n = 5,555)
Overweight or Obese (BMI ≥25.0)	47.0%	56.0%	64.5%	65.7%	66.3%	68.0%	68.3%
Obese (BMI ≥30.0)	15.0%	22.9%	30.5%	30.6%	32.2%	33.8%	33.9%

* Age-adjusted by the direct method to the year 2000 U.S. Bureau of the Census estimates using the age groups 20–39, 40–59, and 60 years and over.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention had previously reported that obesity is responsible for more than 356,000 deaths a year, a number that has increased by 33% over the past decade and may soon overtake tobacco as the leading preventable cause of death among Americans. More recently, a study based on a nationally representative sample of U.S. adults estimated that approximately 112,000 deaths are associated with obesity each year in the United States (Mokdad et al., 2004; 2005). There are two main reasons for the difference in the estimated number of obesity deaths—newer data and different methods of analyzing the data. Because obesity has many different effects on numerous diseases, doctors have difficulty reliably identifying obesity-related deaths based on death certificates. Scientists are now using more complex modeling techniques to estimate deaths related to obesity. Regardless, obesity shortens the average lifespan of an adult by four to nine months, and in a child, the lifespan may be cut by two to five years, given the current childhood obesity rates.

Obesity-attributable medical expenditures have been estimated to be $117 billion in the U.S. (Finkelstein, Fiebelkorn, & Wang, 2003). In 2002, the cost difference between treating a normal-weight person and an obese individual was $1,244, up from $272 in 1987. In general, the annual medical costs for overweight and obese individuals (under the age of 65 years) is 14.5% and 36–37.4% higher compared to normal-weight individuals, respectively (Segel, 2006). Weight loss can reduce lifetime medical costs by $2,200 to $5,300 per person.

In the corporate world, the impact can be significant. The hospital inpatient utilization rate for workers with unhealthy weights was 143% higher than for normal-weight workers. In March of 2005, the annual premium for an employee averaged $6,281.

Since 2000, employment-based health insurance premiums have risen 73% (The Henry J. Kaiser Family Foundation, 2005). Meanwhile, the average employee contribution to health insurance grew more than 143%, with employees paying $1,094 more in annual premiums for family coverage (Smith et al., 2006).

Health Objectives

Given the rising obesity and inactivity levels and correlating higher healthcare costs, being proactive in weight-management is critical. These issues are also being addressed at a federal level, which could affect corporations and consumers working with LWMCs.

The mission of the Center for Nutrition Policy and Promotion, an entity within the U.S. Department of Agriculture (USDA), is to improve the nutrition and well-being of Americans. In support of these objectives, the center offers several core resources, including the following:

- *Dietary Guidelines for Americans*
- My Pyramid Food Guidance System
- Healthy Eating Index
- U.S. Food Plans
- Nutrient Content of the U.S. Food Supply
- Expenditures on Children by Families

The USDA *Dietary Guidelines* are published every five years by the USDA (see page 160). The guidelines provide educational material on good dietary habits to promote healthy living and reduce the risk for developing major chronic diseases for all Americans (from age two to aging adults).

In 1979, the U.S. Surgeon General established national health objectives that served as the basis for the development of state and community health plans (U.S. Department of Health and Human Services, 2000). The objectives were developed through a broad consultation process, derived from current scientific knowledge, and designed to measure programs over time. Healthy People, the statement of these national health objectives, is designed to identify the most significant preventable threats to health, and to establish a national consensus of how to reduce them. The current version, Healthy People 2010, contains 467 objectives in 28 focus areas (U.S. Department of Health and Human Services, 2000). Under focus area number 19,

entitled "Overweight and Obesity," specific objectives include the following:

- Objective 19-1: Increase the proportion of healthy-weight adults to at least 60%
- Objective 19-2: Reduce the proportion of obese adults to less than 15%

The National Institutes of Health (NIH) in 2005 developed a strategic plan for obesity research, earmarking a budget of $440.3 million. The NIH recognizes the multifaceted variables that affect obesity. Its plan to fight obesity is organized into four major themes related to obesity prevention and treatment:

- Lifestyle modification
- Pharmacologic, surgical, or other medical approaches
- The link between obesity and associated health conditions
- Crosscutting research topics, including health disparities and technology

The Food and Drug Administration's (FDA) Obesity Working Group released its final report in 2004 (U.S. FDA, 2004). The group's long- and short-term proposals are based on the scientific knowledge that weight control is primarily a function of caloric balance. Consequently, the FDA focuses on calorie counting in its obesity campaign. The FDA's ongoing actions include the following:

- Labeling: Enhancing food labels to display the calorie count more prominently, and implementing more meaningful serving sizes
- Enforcement agencies: Collaborating with the Federal Trade Commission (FTC) to increase enforcement against weight-loss products that have false or misleading claims, and products that declare inaccurate serving sizes
- Educational partnerships: Working cooperatively with other government agencies, nonprofits, industry, and academia to educate Americans on the dangers of obesity and the importance of leading healthier lives through better nutrition
- Restaurants: Encouraging the restaurant industry to launch a nationwide, voluntary, and point-of-sale nutrition-information campaign for consumers
- Therapeutics: Revising FDA guidance for developing obesity drugs and addressing challenges and gaps in knowledge about existing drug therapies for treating obesity
- Research: Supporting others and collaborating (with others, such as the NIH) on obesity-related research

Safe and Effective Weight Loss

Lifestyle changes, including modifications of food intake and physical activity to establish a daily negative caloric balance, remain the hallmarks of effective programming. It can be difficult to accurately estimate weight-loss rates for clients given the numerous factors influencing weight loss. Additionally, using weight-loss rate is not recommended for long-term weight management, because of the potential lean body mass gain that accompanies overload with resistance training. Instead, it is best to focus the client's attention on the perceived benefits of accomplishing various program-related goals, such as changes in body shape and image, and self-efficacy.

Modest and realistic expectations include achieving an initial 5 to 10% reduction in body weight, as this range is consistent with improved overall health benefits, increased self-efficacy, and improved adherence [American College of Sports Medicine (ACSM), 2010]. Always follow a prudent plan with a weight-loss goal that is consistent with the most current dietary guidelines, unless clients are medically supervised by a licensed physician or registered dietitian. The 2005 USDA *Dietary Guidelines* and the 2010 ACSM guidelines recommend a weekly weight loss of 0.5 to 1.0 kg (1.1 to 2.2 pounds) per week, which necessitates a negative caloric balance of 3,850 to 7,700 kcal weekly, or 550 to 1,100 kcal daily. A more conservative approach of 0.5 to 1.0 pounds (0.23 to 0.45 kg) per week,

necessitating a negative caloric balance of 1,750 to 3,500 kcal weekly, or 250 to 500 kcal daily, may be more suitable for some clients. Ultimately, the weight-loss goal must be safe, satisfy the needs and desires of the client, and include the following considerations:

- Age
- Target weight (or amount of weight to be lost)
- Current physical-activity level
- Medical concerns
- History of dieting
- Emotional and psychological state

Individuals do not need to lose weight if their weight is within the healthy range represented in Table 12-2, if they have gained less than 10 pounds since reaching their adult height, or are otherwise healthy (USDA, 2005). Weight losses of only 5 to 10% may greatly diminish any health concerns associated with being overweight, but even smaller losses can make a difference. Weights above the ranges shown in Table 12-2 are considered less healthy for most people. The greater the margin of difference between actual body weight and the healthy weight range for height, the higher the risk of weight-related health disorders.

Table 12-2
Healthy Weight Ranges for Men and Women

Height	Weight (pounds)	Weight (kg)
4'10" (1.47 m)	91–119	41.4–54.1
4'11" (1.50 m)	94–124	42.7–56.4
5'0" (1.52 m)	97–128	44.1–58.2
5'1" (1.55 m)	101–132	45.9–60.0
5'2" (1.57 m)	104–137	47.2–62.2
5'3" (1.60 m)	107–141	48.6–64.1
5'4" (1.62 m)	111–146	50.5–66.4
5'5" (1.65 m)	114–150	51.8–68.2
5'6" (1.67 m)	118–155	53.6–70.5
5'7" (1.70m)	121–160	55.0–72.7
5'8" (1.73 m)	125–164	56.8–74.5
5'9" (1.75 m)	129–169	58.6–76.8
5'10" (1.77 m)	132–174	60.0–79.1
5'11" (1.80 m)	136–179	61.8–81.4
6'0" (1.83 m)	140–184	63.6–83.6
6'1" (1.85 m)	144–189	65.5–85.9
6'2" (1.87 m)	148–195	67.3–88.6
6'3" (1.90 m)	152–200	69.1–90.1
6'4" (1.93 m)	156–205	70.9–93.2
6'5" (1.95 m)	160–211	72.7–95.9
6'6" (1.98 m)	164–216	74.5–98.2

Source: United States Department of Agriculture (2005). USDA *Dietary Guidelines for Americans.* www.health.gov/dietaryguidelines.

A more useful estimate of quantifying a healthy weight in relation to height can be obtained by calculating a height-normalized weight index. The **body mass index (BMI)** is the most commonly used indicator (Table 12–3). While the BMI has limited applications for athletes, seniors, and children, research points to a strong relationship between BMI and mortality rates. In a research study following 1 million adults for 14 years, the lowest BMI-mortality rates were BMI scores between 23.5 and 24.9 for men and 23.0 and 23.4 for women.

Understanding Behavioral Change

People make choices and decisions based on how they feel and think (Figure 12-1). Everyone's belief system is based on past and present experiences. These belief systems drive people's thought processes and feelings, and the decisions and choices they make. To influence desired behaviors, LWMCs must work with clients to help them think about ways to achieve desirable behaviors and talk to them about their feelings about those desired behaviors. LWMCs may successfully alter unfounded belief systems to influence decisions and choices. Additionally, these experiences should be engaging, positive, and memorable, and build self-efficacy to empower clients to want to stop unhealthy behaviors, while also enhancing their confidence in their abilities to initiate change.

Using a weight-management example to illustrate this point, imagine a client with an estimated caloric intake of 2,000 kcal,

Table 12-3

Body Mass Index

	19	20	21	22	23	24	25	26	27	28	29	30	35	40
Height (inches)	**Weight (pounds)**													
58	91	95	100	105	110	115	119	124	129	134	138	143	167	191
59	94	99	104	109	114	119	124	128	133	138	143	148	173	198
60	97	102	107	112	118	123	128	133	138	143	148	153	179	204
61	100	106	111	116	121	127	132	137	143	148	153	158	185	211
62	104	109	115	120	125	131	136	142	147	153	158	164	191	218
63	107	113	118	124	130	135	141	146	152	158	163	169	197	225
64	110	116	122	128	134	140	145	151	157	163	169	174	203	233
65	114	120	126	132	138	144	150	156	162	168	174	180	210	240
66	117	124	130	136	142	148	155	161	167	173	179	185	216	247
67	121	127	134	140	147	153	159	166	172	178	185	191	223	255
68	125	131	138	144	151	158	164	171	177	184	190	197	230	263
69	128	135	142	149	155	162	169	176	182	189	196	203	237	270
70	132	139	146	153	160	167	174	181	188	195	202	209	243	278
71	136	143	150	157	165	172	179	186	193	200	207	215	250	286
72	140	147	155	162	169	177	184	191	199	206	213	221	258	294
73	144	151	159	166	174	182	189	197	204	212	219	227	265	303
74	148	155	163	171	179	187	194	202	210	218	225	233	272	311
75	152	160	168	176	184	192	200	208	216	224	232	240	279	319
76	156	164	172	180	189	197	205	213	221	230	238	246	287	328

Note: Find your client's height in the far left column and move across the row to the weight that is closest to the client's weight. His or her body mass index will be at the top of that column.

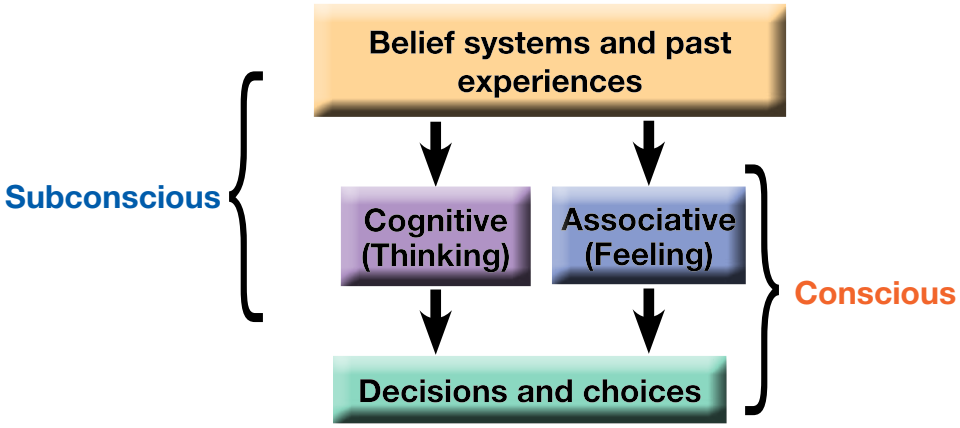

Figure 12-1
Influences on decisions and choices

who would like to lose 1 pound (0.45 kg) per week. Long-term weight-loss success typically involves modest caloric reductions of 10 to 15% initially, although some studies do demonstrate long-term success with initial caloric reductions of 20 to 25%. Using a modest reduction of 300 kcal of intake leaves a balance of 200 kcal that must be expended via physical activity and exercise. Most overweight clients tend to be deconditioned and are better suited to walking or performing walk-jog intervals for exercise that burns between 5 and 9 kcal per minute (for a 165-pound or 75-kg individual). To expend 200 kcal, the individual needs to participate in 23 minutes of jogging or 40 minutes of walking. Considering that only 46% of the U.S adult population meets minimum recommendations of the

U.S Surgeon General, 38% participate in 10 to 30 minutes of physical activity, and 16% participate in less than 10 minutes of physical activity daily, the likelihood of success in expending 200 kcal is low. More importantly, the individual may potentially have a negative and unenjoyable experience that might prove to be disengaging. Remember that the initial few weeks of a program have a high risk of dropout. A viable option may be to increase daily physical activity levels to expend 75 to 100 kcal, leaving the balance to structured exercise, but keep in mind that too many lifestyle changes may negatively impact long-term adherence. Consider the following strategy to enhance the overall experience, engage the individual, and promote self-efficacy:

- Focus the initial two to four weeks on building self-efficacy and program compliance and creating an enjoyable experience.
- De-emphasize numbers temporarily until attitudes toward regular exercise and activity appear positive and the desired behaviors occur frequently with minimal resistance.

Transtheoretical Model of Change (Stages of Behavioral Change)

This model was developed as a framework to describe the different stages of acquiring and maintaining healthy behavior. It provides a premise to understand lifestyle modification based upon readiness for change, making the assumption that people progress through stages of behavioral change at varying rates (Prochaska & Marcus, 1994). To adopt or engage in new behaviors, individuals must first move in an orderly progression through a number of stages. The model also takes into account that lapses are inevitable and part of the process of working toward lifelong change. Hence, it is possible for an individual to move in either direction along this continuum. The four components of this model, which are constructs hypothesized to influence behavior, are as follows:

- Stages of change
- Processes of change
- Decisional balance
- Self-efficacy

Stages of Change

There are five stages of change described in the transtheoretical model (Table 12-4 and Figure 12-2):

Precontemplation:

- The individual has no plans or thoughts to improve or change behavior within the next six months.
- The individual is neither engaged in change, nor contemplating it.
- The individual may have lapsed or is in denial at this level. He or she is resigned to the unhealthy behavior because of previous failed efforts and no longer believes that he or she can control change.

Contemplation:

- The individual is somewhat ambivalent toward changing behavior and weighs the costs and benefits of making the lifestyle modification.
- The individual is not engaged, but is contemplating improving or changing behavior within the next six months ("thinking about it").
- Low self-efficacy levels increase the resistance to changing behavior.

Preparation:

- The individual has taken some steps toward healthier behavior and intends to commit within the next 30 days, or has already begun to make some changes, but demonstrates inconsistent behavior (irregular activity patterns). There is, however, greater determination to achieve change.
- The individual is mentally and physically preparing and may ask questions, seek information, or make purchases (of equipment, etc.) as an incentive to commit.

Table 12-4

The Stages of Behavior Change

Stage	Traits	Goals	Strategies
Precontemplation	Unaware or under-aware of the problem, or believe that it cannot be solved (e.g., latent pain)	Increase awareness of the risks of inactivity, and of the benefits of activity Focus on addressing something relevant to them Have them start thinking about change	Validate lack of readiness to change and clarify that this decision is theirs Encourage reevaluation of current behavior and self-exploration, while not taking action Explain and personalize the inherent risks Utilize general sources, including media, Internet, and brochures to increase awareness
Contemplation	Aware of the problem and weighing the benefits versus risks of change Have little understanding of how to go about changing	Inform them of available options Provide cues to action and some basic structured direction	Validate lack of readiness to change and clarify that this decision is theirs Encourage evaluation of the pros and cons of making change Identify and promote new, positive outcome expectations and boost self-confidence Offer invitations to become more active (e.g., free trials)
Preparation	Seeking opportunities to participate in activity (combine intent and behavior with activity)	Structured, regular programming with frequent positive feedback and reinforcements on their progress	Verify that the individual has the underlying skills for behavior change and encourage small steps toward building self-efficacy Identify and assist with problem-solving obstacles Help the client identify social support and establish goals
Action	Desire for opportunities to maintain activities Changing beliefs and attitudes High risk for lapses or returns to undesirable behavior	Establish exercise as a habit through motivation and adherence to the desired behavior	Behavior-modification strategies Focus on restructuring cues and social support toward building long-term change Increase awareness to inevitable lapses and bolster self-efficacy in coping with lapses Reiterate long-term benefits of adherence Require continual feedback on progress
Maintenance	Empowered, but desire a means to maintain adherence Good capability to deal with lapses	Maintain support systems Maintain interest and avoid boredom or burnout	Reevaluate strategies currently in effect Plan for contingencies with support systems, although this may no longer be needed Reinforce the need for a transition from external to internal rewards Plan for potential lapses Encourage program variety
Lapse	Encounter lapses that they are unable to overcome	Return to action	Identify reasons for lapse Identify current stage of change to progress once again toward action Maintain existing systems and relationships and offer appropriate support

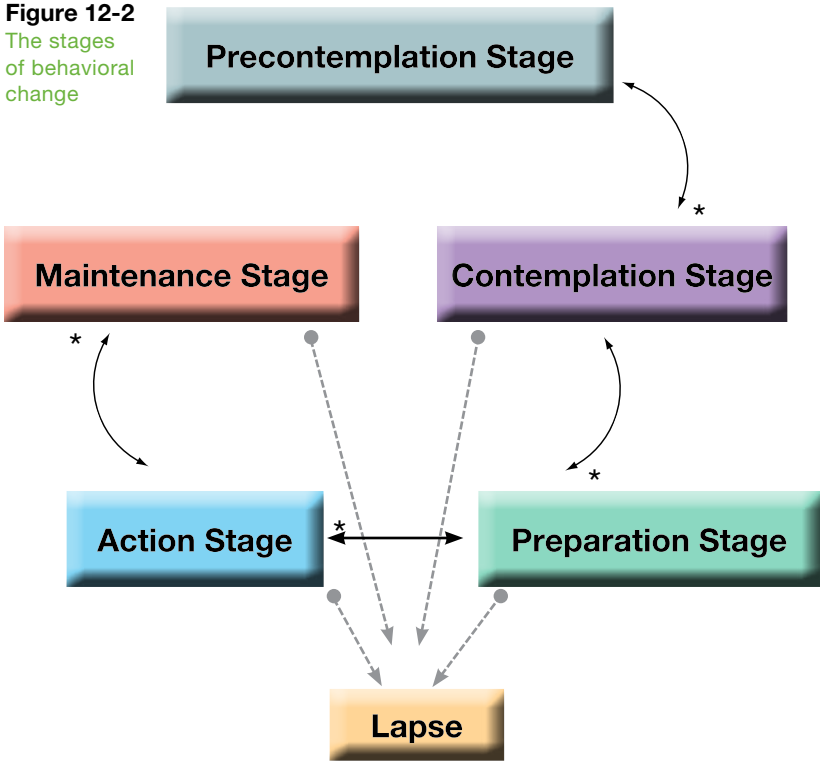

Figure 12-2 The stages of behavioral change

* When adopting healthy behaviors, termination represents the complete adoption of behavioral traits of a particular stage and readiness to move forward to the next stage.

Action:

- The individual has shown improved behavior, and has been participating in regular activity for less than six months.
- The individual demonstrates the desire to change his or her beliefs and attitudes, and should be supported as much as possible.
- The individual is still considered to be at a high risk for **relapse.**

Maintenance:

- Practices have been sustained for more than six months. The person demonstrates adherence and higher levels of self-efficacy.
- The individual has successfully developed strategies to cope with lapses.
- Discouragement with occasional slips or lapses may hamper maintenance within this phase and result in the individual reversing into unhealthy behaviors. A typical pattern involves cycling through the stages of change several times before the change becomes truly established as a lifelong endeavor.

Individuals progress through these stages at different rates, sometimes remaining in one stage or relapsing to earlier stages for extended periods of time. Never assume that someone is in the action stage because he or she joined a club or fitness center or purchased personal-training sessions. LWMCs must identify the stage of change before starting to plan programs and then implement appropriate strategies to move a client toward the action phase. For example, a new member might be offered an orientation with a basic personal-fitness plan and receive instructions on using equipment. While this may be appropriate for an individual in the action stage, LWMCs may need to adopt a different strategy for an individual in the **contemplation stage.** Such an individual may require education on the benefits of lifestyle change, diet, and physical activity.

After successfully developing a **rapport** so that a client feels comfortable opening up, LWMCs should assess the client's readiness to change a negative behavior. During the initial interviews, LWMCs should ask the following questions to assess a client's readiness for change:

- Are you making the decision to change a behavior for yourself?
- Will your friends, family, or loved ones support you in this endeavor?
- Besides possible health improvements, what other reasons do you have for wanting to change this behavior?
- Do you believe that you are susceptible to injury or illness, or that you may compromise your health by continuing your current behavior?
- Are you willing to make the commitment to this change, even through very tough and challenging times?
- Are you willing to make the desired change a top priority?
- Have you ever tried to change this or a similar behavior before?

- Are you committed to being patient with yourself and persistent when and if you encounter obstacles?

The more "yes" answers the client provides, the more ready he or she is to make the commitment to change. A client who answers "no" to most questions, by contrast, is less likely to make the commitment and adhere to a program. LWMCs should identify the current stage and develop appropriate strategies to move the client toward the action stage.

Processes of Change

Individuals use certain strategies as they move between stages. These strategies are divided into cognitive (or experiential) and behavioral categories:

- Cognitive processes (CP) are defined as those that gather relevant information on the basis of one's own experiences.
- Behavioral processes (BP) are defined as those that gather relevant information via events from the environmental and experienced behaviors.

Some examples of the processes of change include the following:

- Consciousness raising is the act of increasing knowledge and awareness of healthy behaviors.
- Helping relationships feature caring and understanding, and include gaining the trust and acceptance of others as the individual assumes healthy behaviors.
- Counter-conditioning is the act of changing one's response to a particular stimulus with the objective of substituting healthy behaviors for unhealthy ones.
- Stimulus control is the act of changing one's environment by removing cues that trigger unhealthy behaviors and adding prompts to entice healthier alternatives.
- Social liberation is the act of increasing social opportunities to make healthy choices.
- Self-evaluation is the act of assessing or critically reviewing one's image and performance after engaging in unhealthy and healthy behaviors.
- Environmental evaluation is the act of assessing what effect unhealthy behavior may have on one's own environment.
- Self-liberation is the belief that a person has to change his or her life from within and is driven by self-efficacy.
- Dramatic relief is the act of experiencing negative emotions associated with engaging in unhealthy behavior.

Within each stage, individuals can and will utilize various processes of change to move toward the next stage. Transitions between stages can be facilitated with stage-specific interventions. For example, during the **precontemplation stage,** consciousness-raising is an effective process. During the action stage, self-liberation, stimulus control, and helping relationships are effective processes.

Decisional Balance

Decisional balance is the third component of this model. It assumes that decision-making regarding healthier behavior involves weighing the risks and benefits of changing behavior (i.e., measuring the benefits to be attained against the potential losses involved with making the change) (Table 12-5). Differences exist among the individual stages with regard to benefit–risk analysis and subsequently, individuals' likelihood to change. During the precontemplation and contemplation stages, individuals typically perceive more risks than benefits regarding change, and therefore remain resistant or ambivalent. During the **preparation stage,** the benefits and risks appear equal, which explains why individuals are often stuck in this stage. During the action and **maintenance stages,** the benefits outweigh the risks, and therefore, the individual continues to move toward desired behaviors. LWMCs should attempt to shift the decisional balance and influence the client's perceptions of the potential benefits vs. risks (e.g., diffuse anxieties and irrational beliefs) without being confrontational.

Self-efficacy

Self-efficacy is defined as the belief in one's capability to complete a task. Like self-confidence, this terms deals with a belief

Instructions:

- Work with the client to document the gains and potential losses that he or she might experience when making a lifestyle change.
- Identify and list the recommended implementation strategies needed to achieve the gains and list coping strategies that can be used to deal with the potential losses or obstacles associated with the change.

DECISIONAL BALANCE WORKSHEET

Perceived gains associated with adopting desired behaviors

1. _____
2. _____
3. _____
4. _____

Perceived losses associated with adopting desired behaviors

1. _____
2. _____
3. _____
4. _____

Strategies to maximize potential for achieving gains

1. _____
2. _____
3. _____
4. _____

Strategies to minimize potential of perceived losses

1. _____
2. _____
3. _____
4. _____

in one's self. While self-confidence is more global, self-efficacy is more task-specific, and is influenced by the following:

- Past performance and experiences (successes and failures, and the experience itself)
- Vicarious experiences (successes and failures of others who are similar to the individual and are seen as role models)
- Verbal persuasion (support offered by others—credible sources—that build trust and rapport)
- Physiological responses (responses of heart rate, sweat rate, ratings of perceived exertion, etc., and the perception of these responses as positive or negative)
- Emotional responses (the feelings and impressions associated with the task, both positive and negative)
- Imagery experiences (the experience one envisions, both positive or negative)

The more capable a person feels regarding his or her ability to engage in a task and successfully accomplish it, the more likely he or she is to adhere. Improvements in self-efficacy occur naturally as a person progresses through the stages. The level of self-efficacy is lowest in the earlier stages of behavioral change. Establishing challenging, but manageable, tasks is an effective strategy in building self-efficacy.

Self-efficacy will influence task choice or complexity. Individuals with lower levels of self-efficacy tend to select easier tasks to ensure success or difficult tasks to ensure failure. Individuals with higher levels of self-efficacy typically select appropriate task complexities. Self-efficacy also influences effort. People with lower levels will put forth minimal effort, as they have a higher perception of failure. Self-efficacy will also influence persistence. Those with higher levels of self-efficacy tend to persevere in spite of obstacles or minor setbacks. Finally, self-efficacy can be a determinant as well as an outcome of activity. Success in accomplishing a task or successfully

performing an activity raises self-efficacy levels. Therefore, working to improve a client's self-efficacy level will improve the probability of achieving a desired behavior.

Tracking Progress and Keeping Records

Effective goal-setting will improve adherence and performance. Goals clarify expectations and provide feedback, and are a means to evaluate progress. If appropriately set, they establish appropriate challenges for individuals to strive for, which in turn improves self-efficacy and confidence. Additionally, effective goals can focus the client's attention more intently and motivate the client to take action. Establishing goals is the basis and justification for maintaining participation and activity logs. Logs are discussed in the next section of this chapter, while goal-setting strategies are discussed in Chapter 13.

Participation and Activity Logs

LWMCs can empower clients to have more self-control and self-management, and create a need within clients to assume more responsibility for making a lifestyle change. One simple technique to achieve these objectives involves maintaining activity or participation logs, a responsibility that the LWMC should share with the client. Keeping activity records and logs of the measurable programming parameters provides the following:

- A means to evaluate program adherence and efficacy
- Information for program progression, modification, and continued education
- Effective feedback for clients

Record-keeping is an invaluable component of a client's weight-management program, especially during the first six months, when the individual is considered at high risk for noncompliance and prone to dropout. It is best to record some data after workout sessions or meals (e.g., heart rates, sets and repetitions, meal composition), while other information needs to be tracked over a longer period of time (e.g., changes in behavior, attitudes). Compliance with maintaining records is contingent upon convenience; the more accessible and simplistic the modality, the more likely the client is to comply. Given the widespread advances in technology and portability in communications, LWMCs should determine the medium that suits each client's lifestyle. Simple log forms and diaries can be created electronically or in the traditional paper-and-pencil format. Textbooks and health clubs typically offer numerous examples of such templates. They may also be created by LWMCs to suit the specific needs of their clients. Activity logs can be created to use a variety of formats for recording events, ranging from simply recording the completion of an event to earning points or mileage for activities or events that accumulate toward an end goal or reward. Ultimately, LWMCs and their clients should agree on a format that facilitates the achievement of specific goals and lifestyle changes. Figure 12-3 is an example of an activity log that utilizes a points system.

Emotional Association With Programming

Any positive emotional change associated with the client's program can be leveraged for adherence-support purposes. Strategic use of the positive emotional feelings associated with activity will promote a client's continued desire to participate. Normally, a client will experience a positive mood change after just a few weeks or months of regular activity. This results from changes in circulating endorphins, serotonin and norepinephrine levels, or the increased self-efficacy that comes from accomplishing tasks or achieving some initial short-term goals. Arm clients with the knowledge that continued exercise and activity will likely benefit their stress levels, energy levels, moods, and feelings of self-worth and self-efficacy, in addition to bringing about positive physical changes.

Leverage emotional change by recommending exercise types, amounts, and

Figure 12-3
Example of an activity log that utilizes a points system

GOAL:_____

Log Instructions: Complete this electronic log daily and award yourself points as follows:

- Every 10 minutes of continuous moderate-intensity activity = 2 points
- Every 10 minutes of incremental or less-than-moderate-intensity activity = 1 point
- Every flight of stairs substituted for an elevator or escalator = 1 point
- Submitting your weekly totals to your trainer = 1 point

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Sunday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Monday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Tuesday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Wednesday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Thursday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Friday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Saturday	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____
Total Points	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____	Points: _____

intensities that promote positive after-session feelings. A slow start with moderate progression ensures positive after-session feelings that promote long-term maintenance. However, it is prudent that LWMCs always investigate a client's aversion to physical stress and discomfort prior to implementing this strategy.

An effective means to evaluate emotional change is through verbal or documented feedback from the client. This allows LWMCs to assess the emotional perceptions of the recently completed activity.

The exercise-induced feeling inventory (EFI) is a survey administered after an exercise or activity session that seeks to identify the individual's after-session impressions (Gauvin & Rejeski, 1993) (Figure 12-4). The use of such an inventory can facilitate the establishment of baseline emotional states and opinions regarding previous exercise experiences when administered prior to activity in the new program. Additionally, it

Instructions: Please use the following scale to indicate the extent to which each word describes how you feel at this moment in time. Record your responses by checking the appropriate box next to each word.

0 = Do not feel
1 = Feel slightly
2 = Feel moderately
3 = Feel strongly
4 = Feel very strongly

	0	1	2	3	4
1. Refreshed	❑	❑	❑	❑	❑
2. Calm	❑	❑	❑	❑	❑
3. Fatigued	❑	❑	❑	❑	❑
4. Enthusiastic	❑	❑	❑	❑	❑
5. Relaxed	❑	❑	❑	❑	❑
6. Energetic	❑	❑	❑	❑	❑
7. Happy	❑	❑	❑	❑	❑
8. Tired	❑	❑	❑	❑	❑
9. Revived	❑	❑	❑	❑	❑
10. Peaceful	❑	❑	❑	❑	❑
11. Worn out	❑	❑	❑	❑	❑
12. Upbeat	❑	❑	❑	❑	❑

Figure 12-4
Exercise-induced feeling inventory (EFI) survey

Reprinted with permission from Gauvin, L. & Rejeski, W.J. (1993). The exercise-induced feeling inventory: Development and initial validation. *Journal of Sport & Exercise Psychology,* 15, 4, 409.

provides a means to track emotional change and offers valuable feedback to evaluate the program design. The information collected over time can be effectively used as a tool to empower clients into self-direction as the LWMC works to wean them toward self-sufficiency and independence.

During the interview or information-gathering stage with a client, consider administering the survey while discussing previous experiences and preferences, which will help to establish an emotional baseline. During the initial stages of working with a new client or any time significant changes are made to a program, LWMCs should administer the survey with some frequency. However, it is important to taper the frequency within a few weeks to minimize the chances of desensitization and maintain the learning effects associated with the survey.

The key objective of collecting aggregated data is to track changes over time by monitoring whether there is an upward trend of positive subscales or a downward trend of negative subscales. This information provides insight into long-term adherence to programming and efficacy of a particular program design. The culled information can also be compiled and presented in a graphic format to illustrate changes to clients. Figure 12-5 shows a graphic representation of aggregated scores on the EFI over a 12-week period.

Strategies for Overcoming Obstacles

Barriers to Participation

Of new and returning exercisers, 50 to 65% will cease their activity within three to six months, although it is estimated that working with personal trainers can increase adherence by 40% over a 24-week period (Annesi, 2000; Pronk et al., 1994). Clients often have a history of unsuccessful weight loss or temporary weight-loss success. These perceived failures certainly present

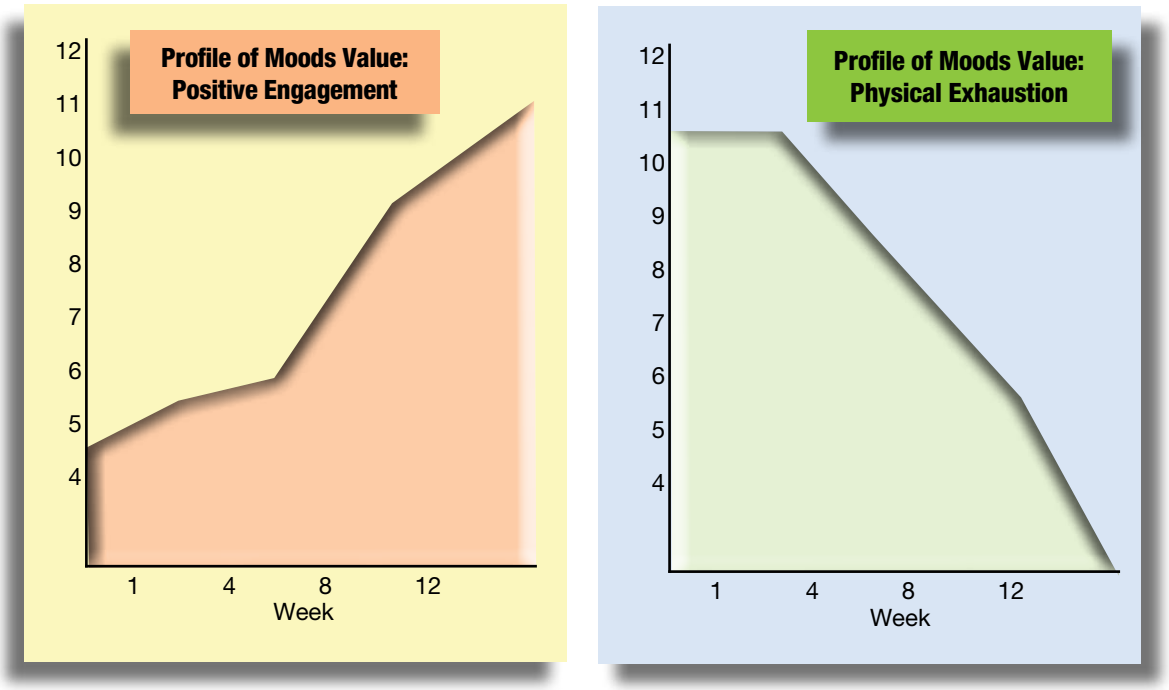

Figure 12-5
Examples of aggregated data for subscales of positive engagement and physical exhaustion over 12 weeks

themselves as barriers to future success. It is the responsibility of LWMCs to diffuse clients' anxieties and discuss existing belief systems. Many clients, based on experience, have unfounded beliefs and misconceptions regarding foods, physical activity, and dietary practices. While LWMCs must never devalue a client's belief systems, the goal is to identify misconceptions without being insensitive.

Obstacles to participation and long-term adherence are inevitable and should be acknowledged. These potential barriers are considered high-risk situations and can challenge the client's confidence in adhering to the desired behavior (Buckworth & Dishman, 2002). They most often occur during the action stage of change. Consequently, LWMCs must increase the clients' awareness of this likelihood and work with them to achieve the following four objectives:

- Recognize that lapses are inevitable
- Restructure the perception of lapses (as slips instead of failures)
- Identify barriers or sources of potential lapses
- Anticipate barriers and potential lapses, and develop effective coping strategies

Appropriate coping strategies lead to increased self-efficacy and a decreased probability of a relapse. Inappropriate coping strategies, or the absence of any coping strategies, will decrease self-efficacy, as well as the positive expectations regarding adherence. Figure 12-6 provides an example of a worksheet that LWMCs can use to help identify high-risk situations and document coping strategies to circumvent barriers. Barriers manifest themselves as a product of environment and lifestyle. They may also appear due to an internal process (Griffin, 2006). These environment and lifestyle factors are called external barriers and include:

- Lack of convenience
- Financial limitations
- Increased work demands
- Increased family demands
- Lack of support
- Inclement weather
- Injury or medical issues
- Overtraining
- Lack of time
- Lack of interest in programs (boredom)
- Lack of available childcare
- Lack of transportation
- Unrealistic goals

Indicate which of the following obstacles deter you from participation:

❑ Busy work schedule	❑ Busy home/family schedule	❑ Gym/club environment
❑ Lack of convenience	❑ Lack of available childcare	❑ Financial constraints
❑ Lack of activity partner(s)	❑ Insufficient activities or amenities	❑ Lack of support
❑ Scheduling conflict with partner	❑ Lack of self-motivation	❑ Lack of confidence in my ability
❑ Scheduling conflict with activities	❑ Lost interest in keeping records	❑ Failure to reach goals
❑ Unrealistic goals	❑ Goals too challenging	❑ Inclement weather
❑ Physical injury	❑ Health concerns/problems	❑ Other _____

For each identified obstacle, devise a primary coping strategy to overcome the obstacle. In the event that your primary coping strategy may not prove successful, consider an alternative plan of action.

Obstacle	Primary Coping Strategy	Secondary Coping Strategy
❑		
❑		
❑		
❑		
❑		
❑		
❑		

Figure 12-6
Worksheet: High-risk situations and effective coping strategies

- Educational, socioeconomic, and cultural issues

Internal barriers are personal thoughts, perceptions, and feelings that individuals have about themselves, or about the exercise program itself, that reduce adherence. These barriers may include:

- Anxieties regarding one's physique or the perception of one's physique by others
- Intimidation in the gym environment
- Self-esteem
- Self-efficacy

Relapse Prevention

The major challenge of weight maintenance is to avoid regaining lost fat. The limited follow-up data on weight-loss programs indicate low (3 to 6% of initial weight) to no sustained levels of weight loss after four to five years. A successful program is often defined as maintaining fat losses of at least 5% of body weight (Anderson et al., 2001).

The National Weight Control Registry is the largest prospective investigation of long-term successful weight-loss maintenance. It monitors individuals who have lost at least 30 pounds (13.6 kg) and sustained the loss for a minimum of one year, although registrants often have achieved greater losses and sustained the losses for more than five years. A majority of the success stories within the registry attribute ongoing maintenance to reduced-calorie and low-fat diets and increased levels of physical activity. While it has not been established whether these behaviors represent minimal competence for weight-loss maintenance, these modifications have produced successful long-term weight-loss maintenance.

Textbooks present models to explain the environmental, emotional, and behavioral aspects of relapse. Still, researchers do not fully understand the biological impact of metabolic rate, hunger, and satiety, which are all factors contributing to regained weight. Therefore, LWMCs should continue to:

- Address the risks of relapse as part of the overall program
- Exert leadership in combating weight-management relapse

- Emphasize long-term change as the overall lifestyle goal
- Educate clients that regained weight is not a failure, but rather an indicator to start another phase of active management

A more systematic approach, assuming the LWMC first identified high-risk situations and developed appropriate coping strategies, is to:

- Teach the client that temporary breaks or slips from regular activity are acceptable and should not to be viewed as failures. If these relapses are anticipated or structured, a client should look at such incidents as deserved or programmed breaks.
- Identify in which stage of change the relapse occurred in the past
- Identify potential new barriers or obstacles, and evaluate why previous coping strategies, if any, were not effective for clients
- Develop new coping strategies in anticipation of future barriers
- Identify the most effective start-up strategies to initiate a return to an activity that is appropriate given the current stage of change
- Inquire about strategies that have proven successful before moving to the action phase

Summary

As the number of overweight and obese individuals grows, the need for qualified Lifestyle & Weight Management Coaches becomes more critical. Success as an LWMC requires knowledge and skills sets to address the three primary tenets of weight management: lifestyle and behavior modification; regular exercise; and sound nutritional programming. LWMCs must identify, understand, and develop programs around the intricate complexities of weight management. They need to demonstrate competency with behavioral change; implement effective strategies to facilitate the adoption of healthier behaviors; design and implement safe and effective exercise and dietary programs consistent with client goals; instill the philosophy of client ownership with this lifelong endeavor; recognize potential obstacles to success and develop coping strategies to overcome such barriers; and leverage all opportunities to associate positive emotion and thinking to the exercise experience. This involves a multifaceted approach with the three components, working independently with clients or as part of a team of health professionals while respecting scope of practice.

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Chapter 13

Exercise Programming

All types of exercise, health, and weight-management programs need to begin with a goal-setting process. An invaluable way to manage the action steps in any behavioral- change process is to use the SMART goal-setting approach, which stands for specific, measurable, attainable, relevant, and time-bound. Each one of these components is an essential aspect of goal formation.

SMART Goal Setting

The SMART goal-setting system is an effective self-check tool for developing focused goals for clients. Many goals in resistance exercise, for example, are associated with improvements in **muscular strength, muscular endurance,** power, balance, speed, and **body composition.** Goals in cardiovascular exercise are often related to improvements in health, cardiorespiratory fitness, weight management, and body composition. Goals for some older clients may be associated with improving locomotion capabilities, balance, fall prevention, and muscle mass. The SMART goal-setting structure makes it easy to identify the correct action steps for developing a person's health, fitness, and weight-management plan for success.

IN THIS CHAPTER:

Specific

The specificity of goal-setting involves answering most of the following questions.

- Why is this goal being created? Are there any benefits to accomplishing this goal?
- Who is involved in this goal? Does this goal involve one or more participants?
- What needs to be accomplished? What outcome or steps to the eventual outcome are desired?
- Where will the goal be accomplished? Is this a goal that needs to be completed at a gym, at home, at work, or throughout one's daily activities?

Measurable

As a person progresses in a goal behavior, there needs to be continual objective measurement to track progress. This measurement procedure will help evaluate whether a person is on track in attaining a specific goal, and will also indicate if modifications are needed for the goal to be reached.

Attainable

In the process of goal attainment, it is helpful to evaluate the necessary steps to achieve the goal. Thus, a person needs to assess his or her abilities, skills, and attitudes toward a particular outcome and truly determine if this goal is within reach. If a goal is realistic, a person will be able and willing to strive toward its accomplishment. Therefore, if a person "believes" that he or she can attain the goal, the motivation, drive, and perseverance to attain the goal will be available. It often helps to draw on past successes with goal-setting as a means of motivating an individual to work toward a new goal.

Relevant

Relevant goals are pertinent to the unique needs, interests, and abilities of the individual. If a goal is relevant, the individual will be motivated to strive toward its achievement.

Time-bound

When will the goal be accomplished? A schedule needs to be developed to put the overall goal and the incremental steps in attaining the goal into an appropriate timetable.

Using Health Screening and Assessment Data

For most people, physical activity will not pose any health problems. However, the primary purpose of any pre-exercise health screening is to identify individuals who may have health or medical conditions that could put them at risk during physical testing and exercise. The American Council on Exercise (ACE), the American College of Sports Medicine (ACSM), and other professional organizations for exercise professionals have determined that pre-exercise screening is an important part of the duties of a fitness professional. According to Heyward (2010), the pretest health screening of clients that a fitness professional should minimally complete before exercise testing and participation commence must include the following:

- The Physical Activity Readiness Questionnaire (PAR-Q)
- Identification of signs and symptoms of disease, if present
- Evaluation of the coronary risk profile
- Classification of heart disease risk factors

The Physical Activity Readiness Questionnaire (PAR-Q)

The PAR-Q has been designed to identify the small number of adults for whom physical activity might be inappropriate or those who should have medical advice concerning the type of activity most suitable for them (Figure 13-1, pages 286–287).

Identification of Signs and Symptoms of Disease, if Present

If any signs or symptoms of disease are present, the client should be referred to his or her physician for clearance prior to

any exercise testing or participation. Figure 13-2 presents a checklist of some health-screening signs and symptoms. If a client checks "yes" beside any of the conditions, he or she should be advised to obtain medical clearance and/or appropriate exercise guidelines prior to exercise testing and participation.

Evaluation of the Coronary Risk Profile

The coronary artery disease risk factor threshold is helpful in determining a client risk profile (Table 13-1, page 288).

Classification of Heart Disease Risk Factors

The following health-risk categories help determine a client's needs for further medical clearance or evaluation before beginning an exercise program.

Despite the recommendations provided in this section about a person's potential health risks regarding exercise, any individual who has the slightest reservations about his or her ability to undergo exercise testing or participate in exercise with minimal health risk should consult a physician. If a client's health status relative to any of the PAR-Q questions, coronary risk factors, or signs and symptoms of disease changes after starting or modifying an exercise program, it would be advisable to have the individual consult a physician.

Low Risk

A low-risk individual exhibits a total of one or no positive risk factors and no signs or symptoms of cardiovascular disease. While a physical examination within the last year would be appropriate, a low-risk client is considered safe to participate in exercise at all of the intensities described in the ACSM guidelines (ACSM, 2010).

Moderate Risk

A moderate-risk individual exhibits a total of two or more of the positive risk factors, but has no signs or symptoms of cardiovascular or pulmonary disease. A prior physical examination is appropriate. However, only individuals who plan to participate in vigorous exercise training or competition need to obtain prior medical clearance.

Instructions: **Please check all answers that apply.**

Do you have any of the following musculoskeletal signs and symptoms?

- ❑ Artificial joints
- ❑ Osteoarthritis
- ❑ Orthopedic pain
- ❑ Low-back pain
- ❑ Osteoporosis
- ❑ Swollen joints

Do you have any of the following cardiovascular signs and symptoms?

- ❑ Abnormal cholesterol levels
- ❑ Chest pain
- ❑ Dizziness and/or fainting spells
- ❑ Heart murmur
- ❑ Ischemia
- ❑ Ankle edema
- ❑ Claudication
- ❑ Heart attack
- ❑ Hypertension
- ❑ Stroke

Do you have any of the following pulmonary signs and symptoms?

- ❑ Asthma
- ❑ Bronchitis
- ❑ Exercise-induced asthma
- ❑ Breathlessness during or after mild exercise
- ❑ Emphysema

Do you have any of the following metabolic signs and symptoms?

- ❑ Diabetes
- ❑ Glucose intolerance
- ❑ McArdle's syndrome
- ❑ Cirrhosis
- ❑ Hypoglycemia
- ❑ Thyroid disease

Figure 13-2
Health screening signs and symptoms questionnaire

High Risk

A high-risk individual exhibits one or more signs or symptoms of cardiovascular, pulmonary, or metabolic disease, or has a known cardiovascular, pulmonary, or metabolic disease. A physical examination and medical clearance is considered essential before anyone in this classification participates in exercise programs of any intensity.

Programming Components

Physical fitness is defined as a person's ability to perform daily, occupational, and recreational activities without becoming overly tired and weary. It may also be described as the ability of the body to

Figure 13-1
The Physical Activity Readiness Questionnaire

The Physical Activity Readiness Questionnaire—PAR-Q

(revised 2002)

PAR-Q & YOU (A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO	
☐	☐	1. Has your doctor ever said that you have a heart condition *and* that you should only do physical activity recommended by a doctor?
☐	☐	2. Do you feel pain in your chest when you do physical activity?
☐	☐	3. In the past month, have you had chest pain when you were not doing physical activity?
☐	☐	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
☐	☐	5. Do you have a bone or joint problem (for example, back, knee, or hip) that could be made worse by a change in your physical activity?
☐	☐	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
☐	☐	7. Do you know of *any other reason* why you should not do physical activity?

If you answered YES to one or more questions:

✔ Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

✔ You may be able to do any activity you want—as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those that are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his or her advice.

✔ Find out which community programs are safe and helpful for you.

If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:

✔ Start becoming much more physically active—begin slowly and build up gradually. This is the safest and easiest way to go.

✔ Take part in a fitness appraisal—this is an excellent way to determine your basic fitness level so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

Delay becoming much more active:

- ✔ If you are not feeling well because of a temporary illness such as a cold or a fever—wait until you feel better; or
- ✔ If you are or may be pregnant—talk to your doctor before you start becoming more active.

Please note: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical-activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

No changes permitted. You are encouraged to copy the PAR-Q but only if you use the entire form.

Note: If the PAR-Q is being given to a person before he or she participates in a physical-activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

I have read, understood, and completed this questionnaire. Any questions I had were answered to my full satisfaction.

Name

Signature Date

Signature of Parent or Guardian (for participants under the age of majority) Witness

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.

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Table 13-1

Atherosclerotic Cardiovascular Disease Risk Factor Thresholds for Use With ACSM Risk Stratification

Positive Risk Factors	Defining Criteria	Points
Age	Men ≥45 years Women ≥55 years	+1
Family history	Myocardial infarction, coronary revascularization, or sudden death before 55 years of age in father or other first-degree male relative, or before 65 years of age in mother or other first-degree female relative	+1
Cigarette smoking	Current cigarette smoker or those who quit within the previous six months, or exposure to environmental tobacco smoke (i.e., secondhand smoke)	+1
Sedentary lifestyle	Not participating in at least 30 minutes of moderate-intensity physical activity (40–60% $\dot{V}O_2$max) on at least three days/week for at least three months	+1
Obesity*	Body mass index ≥30 kg/m^2 or waist girth >102 cm (40 inches) for men and >88 cm (35 inches) for women	+1
Hypertension	Systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg, confirmed by measurements on at least two separate occasions or currently on antihypertensive medications	+1
Dyslipidemia	Low-density lipoprotein (LDL) cholesterol ≥130 mg/dL (3.37 mmol/L) or high-density lipoprotein (HDL) cholesterol <40 mg/dL (1.04 mmol/L) or currently on lipid-lowering medication; If total serum cholesterol is all that is available, use serum cholesterol >200 mg/dL (5.18 mmol/L)	+1
Prediabetes	Fasting plasma glucose ≥100 mg/dL (5.50 mmol/L), but <126 mg/dL (6.93 mmol/L) or impaired glucose tolerance (IGT) where a two-hour oral glucose tolerance test (OGTT) value is ≥140 mg/dL (7.70 mmol/L), but <200 mg/dL (11.00 mmol/L), confirmed by measurements on at least two separate occasions	+1
Negative Risk Factor	**Defining Criteria**	**Points**
High serum HDL cholesterol	≥60 mg/dL (1.55 mmol/L)	–1
	Total Score:	

*Professional opinions vary regarding the most appropriate markers and thresholds for obesity; therefore, allied health professionals should use clinical judgment when evaluating this risk factor.

Note: $\dot{V}O_2R = \dot{V}O_2$reserve

Note: It is common to sum risk factors in making clinical judgments. If HDL is high, subtract one risk factor from the sum of positive risk factors, because high HDL decreases cardiovascular disease risk.

American College of Sports Medicine (2010). *ACSM's Guidelines for Exercise Testing and Prescription* (8th ed.). Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins.

adjust to the stresses and demands of physical exertion. More specifically, it is the capacity of the heart, lungs, muscles, and bones to adapt to the challenges placed upon them.

Technology has advanced civilization to the point where a person no longer needs to do much physical effort to survive. Advanced transportation options, escalators and elevators in malls and businesses, and homes that are programmed by remote control are hallmarks of modern society. What might have once taken an hour to do physically can now be accomplished with the push of a button in a matter of seconds. Unfortunately, these timesaving amenities and other environmental factors have led many people to adopt sedentary lifestyles.

The human body is designed for movement and physical activity. To give the body the physical challenge it needs to be strong and healthy, a person must make a concerted effort to incorporate physical activity into his or her daily life. A lack of physical activity puts each person at a much higher

risk for developing many diseases, such as heart disease, **hypertension,** high cholesterol, **obesity, diabetes,** and musculoskeletal disorders (Warburton, Nicol, & Bredin, 2006). A properly planned exercise program can play a critical role in combating obesity, heart disease, and musculoskeletal ailments. LWMCs must consider the following five key components of health-related physical fitness when developing personalized exercise programs.

Cardiorespiratory Endurance

Cardiorespiratory endurance, or aerobic conditioning, is the ability of the heart, lungs, and circulatory system to supply oxygen and nutrients to the working muscles. It involves the ability to persist in continuous rhythmic activities such as elliptical training, walking, jogging, cycling, step training, and other aerobic activities. Improved cardiorespiratory endurance is associated with decreased mortality and morbidity for both women and men (Warburton, Nicol, & Bredin, 2006).

Muscular Strength and Endurance

Muscular strength refers to the capacity of the muscles to exert maximal or near-maximal force against a resistance. The development of stronger muscles leads to the increased strength and integrity of the body's skeletal system. In the cycle of life, muscular strength may also lessen the chance of injury (Warburton, Gledhill, & Quinney, 2001).

Muscular endurance is the ability of the skeletal muscles to exert force, but not necessarily near-maximal force, for an extended period of time. The ability to increase muscular endurance is often associated with improved bodily posture, enhanced function in **activities of daily living (ADL)**, and a reduced potential for injury.

Flexibility

Flexibility is the **range of motion** of the muscles and joints of the body. It involves the muscles' normal and trained ability to extend beyond their natural resting length. Increasing and maintaining range of motion to readily perform activities of daily life is an appropriate goal for all individuals.

Body Composition

Body composition refers to the proportion of body fat and lean body tissue (i.e., muscle, bone, water, and vital organs). Being overfat is associated with a number of health problems (ACSM, 2010); however, aerobic exercise and resistance training are effective in positively altering body composition.

Mind/Body Vitality

This sixth component of physical fitness has received growing attention. **Mind/body vitality** refers to an individual's ability to minimize or alleviate unnecessary stress and tension from the body through the integration of physical exercise and mental focus. Popular classes such as yoga, tai chi, and Pilates present constructive means of harmonizing this union of the mind, body, and spirit.

Cardiorespiratory Training

Most of an LWMC's clients will be participating in some form of cardiorespiratory training, including group fitness classes. It is important to ask each client about what type of exercise he or she performs and to provide tips for reducing injury and maximizing results. Safety is especially important among overweight and obese participants, as they tend to be at a higher risk for injury and often struggle to keep up with the more fit participants. Diminished coordination is also a common problem in this population, which is another reason why safety and careful progression are so important. It is essential that LWMCs have detailed conversations with clients about their exercise participation. The following sections provide information that should be invaluable during consultation with clients.

According to fitness industry experts, to develop and maintain cardiorespiratory fitness, individuals should perform endurance exercise three to five days per week, using an

exercise mode that involves the major muscle groups (in a rhythmic nature) for a prolonged time period (ACSM, 2010). This includes physical activities such as step aerobics, aquatic exercise, cardio-kickboxing, rowing, and walking. ACSM recommends an intensity of exercise between 64/70% and 93% of maximum heart rate (or 40/50% and 85% of oxygen uptake reserve), with a continuous duration of 20 to 60 minutes per session. Beginners who are in the lower cardiorespiratory fitness classification should begin with 10 to 20 minutes of aerobic conditioning. Very deconditioned individuals may be more suited for multiple sessions of short duration, such as five to 10 minutes. Inherent in the exercise design is the concept of individualizing the program for each person's fitness level, health, age, personal goals, risk-factor profile, medications, behavioral characteristics, and individual preferences.

ACSM (2010) recommends that the exercise design for optimizing weight loss should emphasize the duration and frequency of the aerobic exercise, keeping intensity moderate and progressing gradually. ACSM further suggests that the frequency of training should be five to seven days per week, with the goal of accumulating 200 to 300 minutes of aerobic activity per week (which is equivalent to ≥2,000 kilocalories of exercise per week). This can be accomplished with longer bouts of exercise or by performing shorter, 10-minute bouts of exercise spread out over the week.

These ACSM recommendations for the development and/or maintenance of cardiorespiratory fitness and for weight loss serve as the framework for the aerobic fitness designs that follow. A diverse number of both small and large group-exercise programs have emerged in an effort to meet the retention needs of regular exercisers, and to attract new fitness participants. Some of these programs are choreographed to accompanying music, while others use music as a background source of inspiration. Some clients may struggle with choreography, so LWMCs should be prepared to help them master basic movements. For example, an LWMC may teach a client that music is customarily arranged in units of two, alternating between emphasized and deemphasized beats, referred to as the **downbeat** and **upbeat,** respectively. Some programs, such as step aerobics, follow a specialized 32-beat phrasing, while other programs may easily incorporate a blend of music phrases. Regardless of the music phrasing, the music volume must not put any participants at risk for sustaining hearing loss.

Some of the most popular cardiorespiratory programs are described in the following sections—step aerobics, mixed-impact aerobics, mixed-martial arts exercise, indoor cycling, aquatic exercise, and aerobic interval training.

Step Aerobics

Step aerobics has long been a stronghold of cardiorespiratory teaching due to its widespread popularity and ease of use with the varying fitness abilities commonly seen in exercise classes. Step aerobics, or step training, can be a low-impact exercise program that provides high-intensity aerobic conditioning for participants (Kravitz, 2006). The workouts can be as challenging as a rigorous jogging workout, while producing impact forces that are generally as safe as walking. The cadence of step aerobics classes ranges from 118 to 126 beats per minute. The most widely used step platforms have adjustable heights from 4 to 12 inches (10 to 30 cm), with a stepping surface 14 (36 cm) inches wide and 42 inches long (107 cm). The progression of exercise intensity is best adjusted by modifying step height. The typical step platform risers allow for a 2-inch (5-cm) change in step height. Encourage participants to begin gradually by using a lower step height, and then to progressively increase the platform height as they become more comfortable performing the instructor-led workouts.

Step-training programs, for the most part, have been designed to include movements that are relatively easy to learn and follow. However, some participants will find the unfamiliarity of stepping on and off of the step to be a challenging motor skill. One option is to introduce many of the step combinations grad-

ually and without musical accompaniment for these learners. LWMCs should review the following key safety tips regarding step-aerobics programs with their clients (Kravitz, 2006):

- Step entirely on the top part of the platform with each step; do not allow any part of the foot to hang over an edge.
- Avoid flexing the knees more than 90 degrees. Most participants find progressing up to a 6-inch (15-cm) step height to provide a satisfactory workout.
- When using handheld weights [up to 3 pounds (1.4 kg)], modify the arm choreography to slow, controlled, shorter-lever movements.
- To quickly lower the intensity of the workout, stop stepping and march in place on the ground.
- Be careful not to step too far back off the platform. This causes the body to lean slightly forward, placing extra stress on the Achilles tendon and the muscles of the calf.
- Use a good cross-training or indoor-fitness shoe for step workouts. The tread on most running shoes does not provide suitable support for the lateral pathways of step movements.
- Step training involves a stepping motion using the entire foot. Avoid pounding foot movements on the platform and bouncing actions onto and off of the floor.
- Steer clear of step combinations that travel forward and down off the bench.
- Be aware of the potential for overuse injury syndrome by participating in a variety of aerobic activities to allow for different stresses on the lower body.
- Always look at the step platform when doing step aerobics, but don't drop the head too far forward.
- The correct posture in step training involves standing tall and bending at the knees for the ascending and descending movements. Too much hip flexion while stepping may place unwanted stresses on the spine.
- Change the lead foot when doing step patterns to avoid overstressing one leg. A good rule of thumb is to change the lead foot at least every minute.
- Step-training choreography allows for some moves to be repeating actions. Avoid performing more than five consecutive repeating movements on the same leg.
- Explosive lunges off a step can provide high-intensity challenges, but are often performed incorrectly or too swiftly, with potential trauma to the lower leg from the ground impact. Take the time to learn safe lunges and be careful not to overperform them.
- Participants who complain of knee stress from a step class should be advised to seek help from their health practitioner. Step aerobics may not be a suitable exercise mode for all exercisers.

Mixed-impact Aerobics

Mixed-impact aerobics combines high-impact aerobic movements that are associated with greater stresses on the lower extremities (such as running and jumping) with low-impact aerobic movements (such as side lunges and step touches) that present minimal stress to the lower extremities. Movement phrases and sequences are choreographed to music that has approximately 130 to 150 beats per minute and incorporate a variety of arm and leg movements, traveling patterns, and directional turns. An advantage of mixed-impact aerobic classes is the ability to easily modify the intensity of the exercise. With all exercise programs, modification involves analyzing the movements or exercises and determining safe ways in which the exercise can be introduced to people of different fitness levels. The most common ways to modify any cardiorespiratory mixed-impact exercise design is to alter the speed of movement, modify the range of motion of the movement, vary the amount of traveling completed with a movement, and/or change the vertical direction of the movement.

With mixed-impact classes, there is no single, preferred method of combining the impact styles. Some classes alternate impact styles using the songs to mark the style changes. For example, some mixed-impact programs will alternate between high-impact and low-impact movement with every song change on a soundtrack (i.e., every three to five minutes). Other programs combine the impact styles within all sections of the choreography, interspersing the low-impact and high-impact movements throughout the program. It is essential that group fitness instructors determine how to best minimize injury risks while maximizing health benefits. LWMCs should review the following key safety tips regarding mixed-impact aerobics programs with their clients (Kravitz, 2006):

- Always wear good aerobic shoes in a mixed-impact class.
- Encourage all participants to exercise at their own preferred intensity.
- Regularly monitor exercise intensity with pulse-rate checks and/or **ratings of perceived exertion (RPE).**
- Do not hop on one foot more than four times in a row.
- Stay away from twisting hop variations that may lead to spinal stress.
- Drink water before, during, and after aerobic exercise workouts.
- Gradually slow down the aerobic section to a walking pace to ensure safe and proper recovery of heart rate, blood pressure, blood flow, and ventilation.

Mixed Martial Arts Exercise

Kickbox aerobics, aerobic kickboxing, cardio boxing, and aerobic boxing are just a few of the many mixed martial arts exercise formats that are now staples of the fitness industry. Enthusiasts appear to enjoy the exhilaration that comes from delivering kicks, punches, elbows, jabs, knee strikes, and combinations used in boxing and martial arts. The athletic drills in these classes are interspersed with recovery bouts of basic aerobic movements such as boxer-style rope skipping (with and without a rope), walking, and light jogging in place. Some mixed martial arts exercise programs involve authentic boxing gloves, punching bags, and martial arts equipment, whereas other programs incorporate a form of "shadowboxing," which involves no equipment. The majority of these classes are driven by moderately paced music (approximately 120 to 130 beats per minute), although the music in many instances is more for motivation, since the exercise program is not always performed to a specific tempo. Some of the classes are led exclusively by instructors, while others are taught in circuit formats, where each participant or group of participants rotates from station to station, performing different types of kicks, jabs, and punches at each station.

A primary concern with mixed martial arts exercise classes is the ability or qualifications of the instructor to properly teach the program. LWMCs should remind their clients that instructors must have proper knowledge of correct punching techniques and progressive teaching skills to help ensure that participants avoid any joint-related injuries. The challenge for these instructors is to create a motivating workout environment while progressively introducing safe, enjoyable, and challenging mixed martial arts exercise. As with all instructor-led classes, the effectiveness of a martial arts instructor largely depends on his or her ability to modify the movements to suit the needs and abilities of the class participants. LWMCs should review the following key safety tips regarding mixed martial arts programs with their clients (Olson & Williford, 1999):

- Perform a satisfactory warm-up to properly prepare the muscles and joints for the ensuing challenge of the workout.
- With all upper-body strikes and jabs, make sure the elbow is not taken past its normal extension range of motion.
- Avoid performing complex upper-body strike-and-kick combinations.
- Do not execute high repetitions of any one move.
- Do not do physical-contact exercises without proper skill progressions.

- Be careful not to kick beyond the normal range of motion.
- Be aware that martial-arts movements may lead to more **delayed onset muscle soreness (DOMS)** in individuals who are new to these types of workouts.

Indoor Cycling

Indoor cycling classes and sessions have attracted many devoted enthusiasts. Since most people know how to ride a bicycle, indoor cycling presents a cardiorespiratory-training format that may seem less intimidating. Because of its non-weightbearing nature, indoor cycling also offers some orthopedic advantages to those individuals who are unable to perform traditional weightbearing exercise.

Indoor cycling class formats often introduce a workout "journey" using instructor-led visualization and imagery to create the desired environment for participants (Sherman, 1997). Music selection in an indoor cycling class is geared toward enhancing the chosen mood of the "ride." No actual beats-per-minute guidelines have been established for indoor cycling classes. However, a variety of tempos are often used to increase or decrease the exercise intensity (Sherman, 1997). The success of an indoor cycling class largely depends on the instructor's knowledge of exercise program design and ability to create an effective workout using his or her leadership skills. In addition, soft-lighting room designs, with bikes placed close together, create an atmosphere similar to outdoor riding with a pack of cyclists. Naturally, due to the close environment of the exercisers, good air circulation is a must for indoor cycling classes.

Mainstreaming all fitness levels is easily accomplished with indoor cycling classes. Students can control their own workout intensity with cycling cadence (pedaling speed), cycle workload (wheel resistance), and body position (seated or standing position while cycling) (Sherman, 1997).

Aquatic Fitness

Aquatic fitness classes are popular among individuals of varying fitness levels. The resistance afforded by the water provides an effective environment to perform numerous exercise movements. Many exercise enthusiasts use the aquatic environment to complete a greater volume of work with less stress to the body's bones and joints. LWMCs should consider the following key benefits of aquatic exercise and review them with interested clients (Sanders, 1999):

- Water provides an adequate resistance overload for resistance training, as well as a sufficient stimulus for improving cardiovascular function.
- The minimal weightbearing environment allows for graded exercise intensities without risk to the lower extremities.
- The aquatic environment gives exercisers the ability to explore a variety of physical movements that are different than those imposed by gravity.
- The external pressure of the water medium may be suitable for individuals encumbered with blood circulation problems, as the external pressure of the water against the body will enhance venous return.
- The external pressure of the water may also provide a sufficient challenge for

Attire Suggestions for the Overweight Aquatic Exerciser

For some overweight individuals, exposing their bodies in the pool area may be the number-one deterrent or excuse for not participating in an aquatic exercise program. Fitness professionals need to dress professionally and appropriately, keeping the larger participants in mind. Inform overweight students of where they can find large Lycra™ bike shorts and supportive exercise bras that can be used in the water. Remind them that they can cover up their swimsuit with other clothing such as a T-shirt or towel when walking to and from the pool. Encourage them to focus on how good they will feel about themselves while they are in the water exercising and for the rest of the day after their workout. Lastly, suggest to them that they can always arrive a little early to class and stay a little later after class if they wish to avoid walking in front of the majority of students in the class.

individuals suffering from weakened respiratory muscle function.
- The aquatic medium provides a unique opportunity to modify the range-of-motion patterns of many exercises and movements.
- Functional balance and stabilization movement patterns may be improved and practiced in the water.
- Clients who fear falling on land may find the aquatic environment less intimidating.
- The frequently changing movement patterns in the water may translate to improved posture on land, as the trunk and abdominal muscles are regularly stimulated to maintain posture in the water.

Generally, the three water depths [in 81 to 84° F (27 to 29° C) water] used in aquatic-exercise classes are shallow, which is navel to nipple; transitional, which is nipple to neck; and deep, in which the feet are not touching the bottom of the pool (Sanders, 1999). In deep-water exercise, some type of buoyancy gear is required. The choice of water depth may be determined by what is accessible, the available aquatic equipment, the participants' fitness levels, and the desired amount of weightbearing movement. The shallow-water environment is ideal for mimicking movements on land without the impact. For some special populations and physically challenged individuals, deep-water exercise may be preferred due to its completely non-impact environment (Sanders, 1999).

Exercises in the water can be graded by the range of motion of performance, the speed of motion, and the lower-body load (Sanders, 1999). Lower-body load is higher at a shallow water level when incorporating more jumping and leaping movements. In deep-water exercise, the lower-body movements can be intensified with the use of aquatic exercise equipment such as giant aquatic sandals, which add more resistance to the movement. Finally, for exercise variety, numerous types of aquatic equipment, including webbed gloves, fins, and non-buoyant bells, can provide multiple training-stimulus options to an aquatic exercise program.

Aerobic Interval Training

Interval training has become a popular cardiovascular-training method. One of the major benefits of interval training is its adaptability to multiple fitness levels. Aerobic interval training is a form of conditioning that combines segments of high-intensity work with segments of moderate-to-light intensity work. This type of training systematically emphasizes the body's different energy systems (phosphagen, glycolytic, and mitochondrial respiration), thus effectively burning fat and carbohydrates. The incorporation of interval training with continuous aerobic programming optimizes the development of cardiorespiratory fitness and can help clients attain their body-composition goals. Terminology related to interval training and general interval-training guidelines for developing the various energy systems are summarized in Tables 13-2 and 13-3, respectively.

Although there are many types of interval-training programs, the following method has been scientifically tested with fitness enthusiasts (Kravitz et al., 1997). An aerobic interval workout should feature a modality that the client enjoys doing (e.g., walking, jogging, cycling, rowing, stair stepping, elliptical training). The aerobic exercise should always begin gradually with three to five minutes of low-intensity aerobic activity to prepare the heart, lungs, and musculoskeletal system for the challenging workout to follow. Following the warm-up, participants train for four minutes at a higher intensity, followed by four minutes at a moderate-to-light intensity. These four-minute intervals alternate for the duration of the workout. This program utilizes self-assessed ratings of perceived exertion to monitor workout intensity. For example, during the four-minute high-intensity interval, the participant should exercise at an intensity that he or she feels

Table 13-2
Terms Related to Interval Training

Term	Definition
Work interval	Time of work effort or work bout
Recovery interval	Time between work intervals. The recovery interval may consist of light activity such as walking (passive recovery) or mild-to-moderate exercise such as jogging (active recovery).
Work/recovery ratio	Time ratio of the work and recovery intervals. A work/recovery ratio of 1 to 3 means the recovery time is three times that of the work interval.
Cycle	One cycle includes a work and recovery interval.
Set	The number of cycles completed per workout

Table 13-3
General Interval-training Guidelines

Energy System	Work Time	Cycles	Sets	Work/Recovery Ratio	Recovery Time	Type of Recovery
ATP-PC	0–30 seconds	8–10	4–5	1/3	0–90 seconds	Passive
Glycolytic	30–120 seconds	5–6	1–3	1/2	60–240 seconds	Active
Oxidative	3–5 minutes	3–4	1–2	1/1	2–5 minutes	Active

Note: Passive recovery means very-low-intensity movement such as walking or even rest; active recovery involves mild-to-moderate intensity.

is "comfortably challenging"; during the moderate-intensity bout, the client should feel that the intensity level is "somewhat challenging." The alternating variations of workout intensity will enhance total caloric burning at the cellular level.

Depending on the individual's fitness level, the duration of the workout can gradually increase to 20 to 60 minutes. For cardiovascular maintenance and improvement, cardiovascular training should be done three to five times a week, combining the interval training with other aerobic workouts. To help a client achieve weight-management goals, aerobic exercise should be performed five to seven times per week, regularly alternating this interval-training workout with long, slow continuous aerobic training, fast continuous aerobic training, and **Fartlek training** (a form of randomly changing aerobic exercise intensities within the same workout). For variety and orthopedic-injury prevention, exercises should alternate all of these various aerobic-training schemes on different exercise modalities.

Resistance Training

Although resistance training is considered a valuable component of health and fitness program design, simply lifting weights does not ensure the desired outcome. Several factors related to the client or class must be considered to determine a physiologically sound approach to achieve the program's goals. Some of the basic elements of the resistance-training plan include:

- Assessing the initial fitness level of the client
- Setting short- and long-term goals
- Identifying specific muscle groups to work
- Choosing the type of exercise equipment
- Selecting the type and order of the exercises
- Manipulating the frequency, intensity, and duration of the workouts, as well as the number of repetitions, types of

contraction, rest periods, and sets during the workout
- Planning ahead for the progressive overload
- Motivating the client to comply to the program

Considering all of these factors, the likelihood of one training program meeting the needs of all participants is highly impractical. Resistance-training programs designed specifically to enhance musculoskeletal fitness have been effective in improving several indicators of health status, including bone health, glucose metabolism, overweight and obesity, the incidence of falling and associated injuries, activities of daily living, and/or psychological well-being (Warburton, Gledhill, & Quinney, 2001). In weight-management programs, resistance exercise is vital for helping to preserve muscle mass (which is metabolically active tissue) during the weight-loss process (Jackicic et al., 2001). Following are the answers to some key questions that LWMCs may hear about resistance training (Kravitz, 2006):

- *What is a concentric muscle action?* A **concentric** muscle action (or contraction) involves a muscle going through a shortening motion as it overcomes resistance.
- *What is an eccentric muscle action?* During **eccentric** muscle actions (or contractions), the muscle lengthens as it resists the load. During a biceps curl, for example, the upward phase of the movement is the concentric action and the lowering phase of the movement is the eccentric action.
- *What is an isometric action?* During **isometric** muscle actions (or contractions), a muscle is stimulated to develop tension, but no joint movement occurs. Isometric contractions represent the amount of strength an individual can exhibit at a fixed point in the range of motion. With isometric actions, there is no limb movement or change in the joint angle. Holding a weight in one position is an example of isometric strength.
- *What is speed strength?* Speed strength is a relatively new term that is interchangeable with the term power. Speed strength refers to the maximum force exhibited over a distance at a certain speed of movement. Examples of speed strength in sports include swinging a bat, throwing a javelin, and striking a punching bag.
- *What is absolute strength?* **Absolute strength** is the maximal amount of weight that an individual can lift one time. It is sometimes referred to as the **one-repetition maximum (1 RM).**
- *What is relative strength?* **Relative strength** compares the strength of different individuals. It is the ratio of the amount of weight lifted to the total body weight of the person. For example, if a 120-pound (54.5-kg) person can do a 1 RM biceps curl with a 50-pound (23-kg) weight, the relative strength of this muscle group can be determined as follows: 50 pounds/120 pounds (23 kg/54.5 kg) = 0.42. Relative strength is reported as a percentage; therefore, in this example, multiplying 0.42 by 100 means the relative strength of the biceps muscle is 42%.
- *What is functional strength?* Functional strength is a popular term used in both fitness and sports. In fitness, functional strength is often discussed in terms of doing exercises that will enhance a person's ability to execute everyday activities. Some experts describe this strategy as "meaningful exercise" to enhance daily physical tasks. With functional strength, exercises are chosen that are task-specific to help a person perform better in daily life.

  In sports, the term functional strength is used to describe applied strength that results in improved sports performance. For recreational and competitive athletes, trainers and coaches try to duplicate the range of

motion (or a portion of the range) with an exercise. For example, a push-up is excellent for developing the strength of the shoulder joint, yet it is not the best functional exercise choice for training a golfer. When working with a golfer, a better option would be to design an exercise that goes through more of a diagonal pathway, which mirrors the motion of swinging a golf club.

- *What is core strength?* Core strength and core stability are relatively new concepts in strength training. Core-training exercises are designed to strengthen the deep spinal muscles—the deep abdominal and lower-back muscles surrounding the spine, often referred to as the intrinsic muscles. The purpose of core training is to spare the spine from damage. Core strength training creates a stable and mobile lower back, which may in turn improve exercise performance and enjoyment.

Resistance training is an effective method for maintaining and increasing lean body mass and improving muscular strength and endurance. Resistance-training programs should be designed to meet the needs and goals of the individual. All training programs need to be monitored and evaluated closely. LWMCs should be acutely aware of the many signs and symptoms of overtraining: muscle soreness, injury, fatigue, drops in exercise performance, attitude changes, unplanned drops in body weight, sickness, tiredness, and restlessness. If any one of these signs, or a combination of these signs, is observed, rest or a change in the training program is necessary. LWMCs can use the following checklist of questions as an effective needs analysis when designing a safe and appropriate resistance-training program for clients:

- What results does the client want to achieve?
- What component of muscular fitness (strength, endurance, speed, power, or some combination of these components) does the client want to improve?
- Are there any movement patterns that need to be developed?
- What muscle groups need to be developed?
- Are there any specific muscle imbalance concerns?
- How is the client's muscular fitness going to be assessed (e.g., 1 RM, 5 RM, 10 RM, trial-and-error method)?
- What is the client's health history? Are there any past injuries or chronic limitations that need to be addressed?
- Have the short- and long-term goals been collaboratively written with the client?
- Where will the workouts take place (e.g., class, gym, home facility)?
- What equipment is available or needed?
- What days/times are available and recommended for the client's workout?
- Approximately how long will each training session last?
- What methods of resistance training will be included in the program?
- What types of exercises will be predominantly chosen for the client?
- What order of exercises will be used in designing the workouts?
- What workout intensity will be used in the sessions?
- How many sets and repetitions will be utilized?
- How much rest will there be between sets and exercises?
- What type of a warm-up and cool-down will be utilized?
- How will the client's progress be monitored and evaluated?

ACSM (2010) recommends a minimum of one set of eight to 10 exercises (multijoint and single joint) that involve the major muscle groups (at a sufficient intensity to enhance the development and maintenance of muscular strength and endurance), performed two to three times a week for healthy participants of all ages. A more technical and advanced form of training known as **periodization** training is discussed in the following section.

Periodization

Periodization is a systematic approach to training that involves progressively cycling various aspects of a training program during a specific period of time. The roots of periodization come from Hans Selye's model, known as the general adaptation syndrome (Selye, 1976), which has been used by the athletic community since the late 1950s. Selye identified a source of biological stress referred to as eustress, which denotes beneficial muscular strength and growth, and a distress state, which is stress that can lead to tissue damage, disease, and death. Periodization is most widely used in resistance-training program design to avoid overtraining and to methodically alternate high loads of training with decreased loading phases to improve components of muscular fitness (e.g., strength, strength- speed, muscular endurance).

This system of training is traditionally divided up into three types of cycles: **microcycles, mesocycles,** and **macrocycles.** A microcycle generally lasts up to seven days. A mesocycle may last anywhere from two weeks to a few months and can be classified as a preparation, competition, peaking, or transition phase. The macrocycle refers to the overall training period, usually a year.

Periodization Models

Periodization, as it has been defined, refers to specific methods of manipulating the volume and intensity of the training. Traditional models of periodization describe a progression from high-volume and low-intensity work toward decreasing volume and increasing intensity during the different cycles (Table 13-4). Other periodization programs have been developed that also have potential advantages over nonperiodized approaches. A method that utilizes a reduction in volume and an increase in intensity in distinct steps during the training cycle is referred to as stepwise periodization. In the overreaching periodization model, there is a periodic short-term (one- to two-week) increase in volume or intensity, followed by a return to normal training. The newest concept in periodization is undulating periodization (Figure 13-4). With undulating periodization, training volume and intensity are increased and decreased during the course of a microcycle (seven-day period).

While the body of research pertaining to periodization focuses on the effect of varying volume and exercise intensity, it should be clear that these are not the only variables that determine training adaptations. Other influential components that are addressed in program design include the following:

- Choice and number of exercises
- Order of exercises
- Resistance or load
- Number of sets per exercise
- Number of exercises per muscle group
- Repetition range(s)
- Type of contraction(s) emphasized and varied (i.e., concentric, eccentric, and isometric)
- Speed of movement
- Rest periods between sets
- Rest periods between training sessions
- Nutritional status of the client

Further research on periodized training programs is needed. However, for more advanced resistance-training designs, the evidence appears to strongly recommend utilizing a periodized approach as compared to constant repetition/set–type programs (Kraemer & Fragala, 2006).

Circuit Training

Circuit training is a popular resistance-exercise format that can be utilized with all populations and fitness levels, especially those in weight-loss programs. Circuit training was developed by R.E. Morgan and G.T. Anderson in 1953 at the University of Leeds in England (Kravitz, 1996). The term "circuit" refers to a number of carefully selected exercises arranged successively. In the original format, nine to 12 stations comprised the circuit, but this number may vary according to the design goals of the program. Each

Table 13-4

Traditional Periodization Design

	Hypertrophy	Strength & Hypertrophy	Strength	Transition
Sets	1–5	1–5	1–5	1–2
Reps	9–12	6–8	1–5	13–20
Weeks	2–3	2–3	2–3	1–2

Note: For each period, the "rep zone" represents the intensity at which all exercises are performed to momentary muscular fatigue. Daily workout decisions are made regarding the type and number of exercises, order of exercises, loads to attain muscular fatigue in the rep zone, number of sets per exercise, number of exercises per muscle group, type of contraction(s) emphasized (i.e., concentric, eccentric, and isometric), speed of movement, rest periods between sets, and rest periods between training sessions.

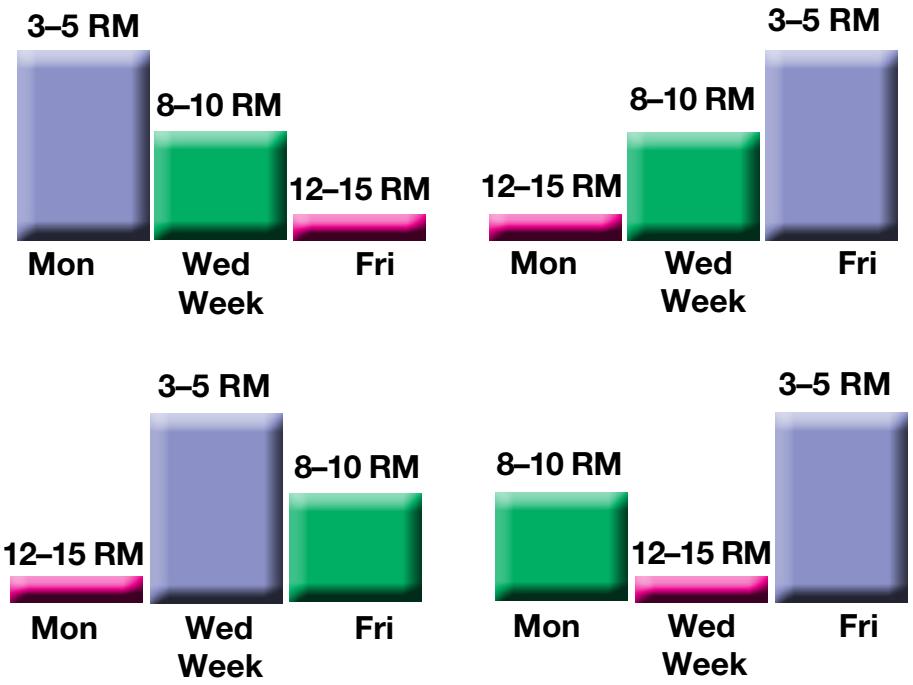

Figure 13-4
Undulating periodization design

Note: Typically, this method is utilized as a total-body workout scheme with seven to 10 exercises for the major muscle groups performed during each workout. Daily workout decisions are made regarding the type and number of exercises, order of exercises, loads to attain muscular fatigue in the "rep zone," number of sets per exercise, number of exercises per muscle group, type of contraction(s) emphasized (i.e., concentric, eccentric, and isometric), speed of movement, rest periods between sets, and rest periods between training sessions.

participant moves from one station to the next with little (15 to 30 seconds) or no rest, performing a 15- to 45-second set of eight to 20 repetitions at each station (using a resistance of about 40 to 60% of 1 RM). The program may be performed using one or more of the following: exercise machines, hand-held weights, elastic resistance, or calisthenics. The circuit is often repeated one to four times, depending on the fitness level and goals of the client.

Adding a 30-second to three-minute (or longer) cardio station between each resistance station (referred to as aerobic circuit training) promotes greater energy expenditure, which is desirable in weight-loss programs. One variation of this aerobic circuit-training model involves performing two, three, or four or more exercise stations consecutively, and then performing the cardio station. Table 13-5 presents a sample aerobic circuit-training workout that features a cardio station interspersed between every two resistance-exercise stations. Note the use of different aerobic modes for variety in this aerobic circuit design.

Table 13-5

Sample Aerobic Circuit-training Workout

- Chest fly
- Leg press
- 3-minute session on cycle ergometer
- Row pull
- Traveling lunge
- 3-minute session on treadmill
- Lat pull-down
- Shoulder press
- 3-minute session on elliptical trainer
- Triceps extension
- Biceps curl
- 3-minute session on cycle ergometer
- Heel raise
- Squat
- 3-minute session on rowing ergometer

Lifestyle Fitness Activities

Spontaneous physical activity is defined as the physical activity in a person's daily life that is not purposely structured. Researchers have begun to study the role that daily spontaneous standing, walking, and fidgeting movements play in combating weight gain and obesity; spontan- eous physical activity is currently gaining great attention and scientific support as a possible (and novel) approach to combating the rise of obesity in children and adults (Levine et al., 2005). From this research, scientists have defined a new component of energy expenditure called non-exercise activity thermogenesis (NEAT) (physiological processes that produce heat). Levine and colleagues have revealed some unexpectedly useful data in this area.

NEAT represents the energy expenditure of daily activities such as standing, walking, moving, and shifting while sitting—all activities that are not considered planned physical activity in a person's daily life. To measure NEAT, investigators utilize highly sensitive monitoring devices known as inclinometers and triaxial accelerometers that are worn on the hips and legs. These devices capture data on body-position movements in all planes of movement 120 times per minute. Combining this information with other laboratory measurements of energy expenditure leads to a calculation of NEAT. The following are some particularly interesting research highlights on NEAT that may better explain the efficacy of this approach in increasing lifestyle fitness and verify the practicality of its use by fitness professionals in helping clients battle overweight and obesity.

Levine and colleagues (2005) recruited 20 healthy volunteers, all of whom did no structured physical activity. Of the 20 volunteers, five men and five women had **body mass index (BMI)** measurements of 23 ± 2 kg/m^2 (classifying them as lean) and five men and five women had BMI measurements of 33 ± 2 kg/m^2 (classifying them as Grade I obese; see Table 17-3, page 378). The authors noted that such a population was selected because they were less likely to have medical impediments and orthopedic troubles as compared to a morbidly obese group. Each subject wore an inclinometer and triaxial accelerometer and data were collected every half-second for 10 days.

Researchers were looking for lifestyle physical activity clues that might explain why 10 non-exercising lean men and women varied from 10 non-exercising mildly obese men and women. They found that the obese subjects were seated for 164 minutes longer each day than the lean participants. Additionally, the lean participants were standing and moving for 153 minutes more per day than the obese subjects. Sleep times between the two groups did not vary at all. Thus, the lean subjects had significantly more total-body ambulatory movement, which consisted of standing and walking. Amazingly, this extra movement by the lean subjects averaged 352 ± 65 calories per day, which is equivalent to 36.5 pounds (16.6 kg) of fat in one year.

Despite the time and effort spent designing structured exercise programs for clients wishing to achieve fitness and weight-management goals, not all individu-

als will maintain their exercise program. According to ACSM (2010), approximately 50% of people drop out of exercise within the first six months. Therefore, another important key to helping people attain their fitness and weight-loss goals is to find new behaviors that encourage more mobility in their daily lives. The U.S. Department of Health & Human Services has established a "Get Active" website (www.SmallStep.gov) to help individuals increase their levels of spontaneous physical activity. Table 13-6 presents a few of the many suggestions provided at this website to help people get moving and become more physically active during the day. Teaching clients how to make small movement changes in their daily lives may significantly contribute to some desirable changes in their overall fitness and weight-management goals.

The SPORT Principle

The body adapts to the demands placed upon it. It is important to follow some basic principles of exercise training and progression when designing an exercise program to improve a client's level of fitness. The following training tactics are known as the SPORT principle: specificity, progression, overload, reversibility, and training effect (Kravitz, 2006).

Specificity

Specificity takes the guesswork out of training. This training principle states that for an individual to become proficient at any given movement, that movement itself must be trained and practiced. The body will adapt to the specific type of training placed upon it. Marathons, for example, require long-distance or high-volume endurance training. LWMCs should keep specificity in mind when working with clients, as adherence to this principle will allow clients to develop fitness and movement strategies that will help them when the time comes to actually perform the goal movements.

Table 13-6

Lifestyle Suggestions to Help Clients Be More Active During the Day

- Walk to work.
- Walk during your lunch hour.
- Walk instead of drive whenever you can.
- Take a family walk after dinner.
- Skate to work instead of driving.
- Mow the lawn with a push mower.
- Walk to your place of worship instead of driving.
- Walk your dog.
- Replace the Sunday drive with a Sunday walk.
- Get off the bus a stop early and walk.
- Work and walk around the house.
- Take your dog to the park.
- Wash the car by hand.
- Run or walk fast when doing errands.
- Pace the sidelines at your kids' athletic games.
- Take the wheels off your luggage.
- Walk to a coworker's desk instead of emailing or calling.
- Make time in your day for physical activity.
- If you find it difficult to be active after work, try to fit exercise in before work.
- Take a walk break instead of a coffee break.
- Perform gardening and/or easy-to-do home-repair activities.
- Bring your groceries (from your car) into your house one bag at a time.
- Play with your kids at least 30 minutes a day.
- Dance to music.
- Walk briskly in the mall.
- Take the long way to the water cooler or break room.
- Take the stairs instead of the escalator.
- Go for a hike.

Progression

The human body responds much more efficiently to gradual and progressive challenges. With each new physical challenge, the physiological systems of the body challenged by the exercise will adapt with improved functioning ability. Gradual progression is the key to a successful training program. The early research of Hans Selye (1976) demonstrated that for progression to continue and physical exhaustion to be avoided, the exercise stimulus must be regularly and gradually increased.

Overload

Overload is introduced by increasing the intensity, duration, or frequency of an established level of exercise. For example, a cardiovascular-training program may be overloaded by adding another training bout during the week, lengthening the training sessions, or training at a higher level of cardiovascular intensity. In resistance training, overload is easily introduced by using heavier weights or by doing more repetitions. In flexibility, overload is created by doing additional stretches or trying to stretch further than the previous limits. If the exercise program becomes too easy or somewhat routine, it may be appropriate to add exercise overload. The body will adapt and develop a new training threshold, beyond which new benefits occur.

Reversibility

Consistent exercise is essential for maintaining the benefits of exercise, because these benefits cannot be stored; instead, they are reversible. If a person stops exercising, the body will adapt to the decreased exercise demands and start to decline from the previous fitness level.

Training Effect

Fitness levels are improved with regular, progressively overloaded training programs. This is known as the training effect. How much a person can improve is closely associated with his or her initial level of fitness, lifestyle habits, motivation, time investment in exercise, and certain genetic endowments. Regularly evaluating a client's progress can provide the information needed to establish an appropriate **maintenance stage** that coincides with the client's desired health and fitness goals. At this stage, the goal is to maintain this training effect by continuing with the exercise program, not adding more overload.

Functional Exercise Progression

Yoke and Kennedy present a new method of exercise selection and progression in their book, *Functional Exercise Progressions* (2004). This novel design progresses from simple to complex exercises that strengthen the core muscles (i.e., internal obliques, tranverse abdominis, multifidus, quadratus lumborum). Yoke and Kennedy's six-step exercise design system consists of the following:

- *Step #1:* Isolate and educate. The student is learning how to focus on the muscle and movement. Exercises in this level are often performed in the supine or prone position.
- *Step #2:* Isolate, educate, and add resistance. Add resistance to the exercises used in Step #1.
- *Step #3:* Add a functional-training position. To better challenge the stabilizing muscles, clients can perform exercise in a seated or standing position (for the targeted muscles).
- *Step #4:* Combine the functional challenge with resistance. Add some type of overload (e.g., weights, tubing, bands) to challenge the body's stabilizers in the functional position.
- *Step #5:* Involve multiple muscle groups with increasing resistance and core challenge. Clients can perform more complex exercises (e.g., squats, lunge variations) that combine muscular fitness, balance, coordination, and stability.

- *Step #6:* Add balance, increased functional challenge, speed, and/or rotational movements. Use stability balls, wobble boards, and/or spinal rotation with the exercise movements. Yoke and Kennedy (2004) note that some individuals may never reach this level due to their fitness level or health history.

Exercise Precautions and Modifications

Although there are many health benefits of exercise, there are also several precautions of which an LWMC must be aware to maximize exercise safety. This section presents general precautions, concerns for exercising outdoors or in hot environments, precautions for special populations and the elderly, and alert signs for a stroke or a heart attack.

General Precautions

- Advise clients to always warm up before exercise. Usually a five- to seven-minute general warm-up on a treadmill, stationary bike, elliptical cross-trainer, or other aerobic mode is sufficient to prepare the cardiorespiratory and metabolic systems of the body for the workout to follow. A specific muscle-joint warm-up of light overload exercises is also recommended before moderate-to-heavy physical activity.
- Make sure clients learn how to perform the correct movement techniques for all exercises before progressively overloading the musculoskeletal system. Teach clients to exhale on the exertion when lifting heavy weights to avoid the **Valsalva maneuver,** which occurs when the glottis restricts air through the trachea, dramatically increasing thoracic pressure.
- Exercising too soon after a meal may hamper oxygen and nutrient delivery to the working muscles, leading to gastrointestinal distress. Advise clients to wait at least 60 to 90 minutes after a complete meal before engaging in moderate-intensity exercise. As a general rule, the higher the exercise intensity, and/or the greater the amount food consumed, the longer the time should be between eating and exercising.
- Teach clients how to correctly stack weights on barbells and to always use safety pins when using free weights.
- Advise clients to wear well-fitting and appropriate workout shoes and comfortable-fitting fitness clothing that allows the body to readily dissipate heat. Encourage them to wear less jewelry during workouts, as it may be damaged from the physical movements of the exercise, or possibly injure someone.
- Many people starting an exercise program do "too much, too soon, too hard," leading to pointless muscle soreness and possible injury. Encourage clients to start slowly and to incrementally increase the intensity and duration of their workouts.
- Promote the concept of "comfortably challenging" workouts, as opposed to training sessions that achieve total exhaustion. "No pain, no gain" has no scientific substantiation.
- An adequate cool-down (or recovery) is necessary to bring the body's physiological processes to pre-exercise levels. Include stretching exercises to facilitate relaxation of the muscles that have been vigorously contracting.
- Urge clients to hydrate before, during, and after the workout. Also, it is advisable to avoid caffeine or alcohol before and during exercise, as they may further dehydrate the body. Alcohol may also substantially affect a person's balance and judgment.
- It is a good idea to vary the intensity of workouts. Performing two high-intensity workouts in a row may cause undue exhaustion, leading to possible overtraining and overuse complications.

- When training during vigorous exercise, encourage clients to slow down if they feel out of breath. For most people, being able to talk while exercising is a good indicator of appropriate exercise intensity, while gasping for breath is a sign of exercising too strenuously.
- Teach clients how to listen to their bodies. The human body has a remarkable sensory message system that informs one if there is pain, discomfort, and injury. Pain is an important message that tells an exerciser to slow down and/or stop.
- Don't urge clients to push through injuries, as doing so can lead to greater health problems. If pain persists for more than a few days, clients may need to seek the advice of a qualified healthcare professional.

Concerns for Exercising Outdoors or in Hot Environments

Environmental pollutants can be a concern when exercising outdoors or in big cities. Have clients learn where these unsafe areas are in their city and have them keep away from them whenever possible.

Encourage clients to wear sunscreen when exercising outdoors, especially in sunny environments.

Exercising in hot weather increases the risk of injury and other complications. The following guidelines will help clients avoid heat stress (see Chapter 3 for more on these environmental considerations):

- Drink water before, during, and after exercise.
- Wear loose-fitting clothes that allow for evaporation of sweat from the body onto the clothes.
- Avoid training during the hottest part of the day, usually between 10 a.m. and 4 p.m. (during the summer).
- Allow one to two weeks for acclimatization to a hot environment.
- Decrease workout intensity in a hot environment if necessary.
- Remember that some people are more heat-sensitive than others; this includes those who are overweight, obese, unfit, older, or have any combination of these conditions.

Precautions for Special Populations and Older Adults

It is essential to be able to identify those clients who may not have normal joint integrity or have diseases or disorders that could alter exercise performance. Seek council from a healthcare professional to determine appropriate precautions and modifications for any exercise program (see Chapter 18). For example, one in three Americans have high blood pressure and many are not aware of this health risk (which is why it is called the "silent killer") (Centers for Disease Control and Prevention, 2010). Hypertensive persons should not engage in high-intensity resistance exercise, as the increase in thoracic pressure may dangerously elevate blood pressure.

Exercise is one of the best things that older adults can do to improve quality of life. However, in addition to the general precautions, older adults must adhere to the following safety measures:

- For some seniors, the body may not be as flexible or supple as it used to be. Therefore, range-of-motion exercises that help clients perform ADL should be included in the fitness program.
- A basic rule for initiating exercise programs with older adults is to start slowly and then progress very gradually. Help them learn to adjust progressively to the new requirements of daily exercise and physical activity.
- Seniors often take medications that affect heart rate, blood pressure, and standing balance. Discussing any concerns with an appropriate health practitioner will enable a fitness professional to properly design safe and effective workouts for these older clients.
- For seniors, a good warm-up includes adequately preparing the musculo-

skeletal and cardiorespiratory systems, as well preparing the mind to facilitate mental readiness of the upcoming exercises.

- Among older adults, falls are the leading cause of injuries, hospital admissions for trauma, and deaths due to injury. Fractures are among the most serious health consequence of falls. Many of these falls and their resulting injuries are preventable. Strategies for preventing falls in older adults include incorporating exercises to improve strength, balance, and flexibility; exercising close to grab bars; improving lighting; and removing items that may cause tripping.

Signs of Stroke or Heart Attack

The symptoms of stroke are distinct and happen quickly. If a client is exhibiting any of the following symptoms and appears to be having a stroke, the LWMC should call 911 immediately:

- Sudden numbness or weakness of the face, arm, or leg (especially on one side of the body)
- Sudden confusion and trouble speaking or understanding speech
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, or loss of balance or coordination
- Sudden severe headache with no known cause

The American Heart Association (www.americanheart.org) and other medical organizations advise that heart attack victims will experience one or more of the following warning signals:

- Uncomfortable pressure, fullness, squeezing, or pain in the center of the chest lasting more than a few minutes
- Pain spreading to the shoulders, neck, or arms. The pain may be mild to intense and may be located in the chest, upper abdomen, neck, jaw, or inside the arms or shoulders
- Chest discomfort with lightheadedness, fainting, sweating, nausea, or shortness of breath
- Anxiety, nervousness, and/or cold, sweaty skin
- Irregular or abnormally accelerating heart rate
- A pale face

Not all of these signs occur with every heart attack. A doctor who has studied the results of several tests must make the actual diagnosis of a heart attack. However, if a client appears to be experiencing a heart attack, the LWMC should call 911 immediately.

Summary

Educating and motivating clients to make a commitment to a physically active lifestyle of exercise and spontaneous movement may very well contribute to some desirable and profound changes to their overall health and weight-management goals. LWMCs need to take the leadership role in helping clients help themselves to positive health through meaningful physical-activity programming. By successfully doing this, LWMCs will indeed be meeting "head on" some of the most difficult health challenges facing modern society, including diabetes and obesity.

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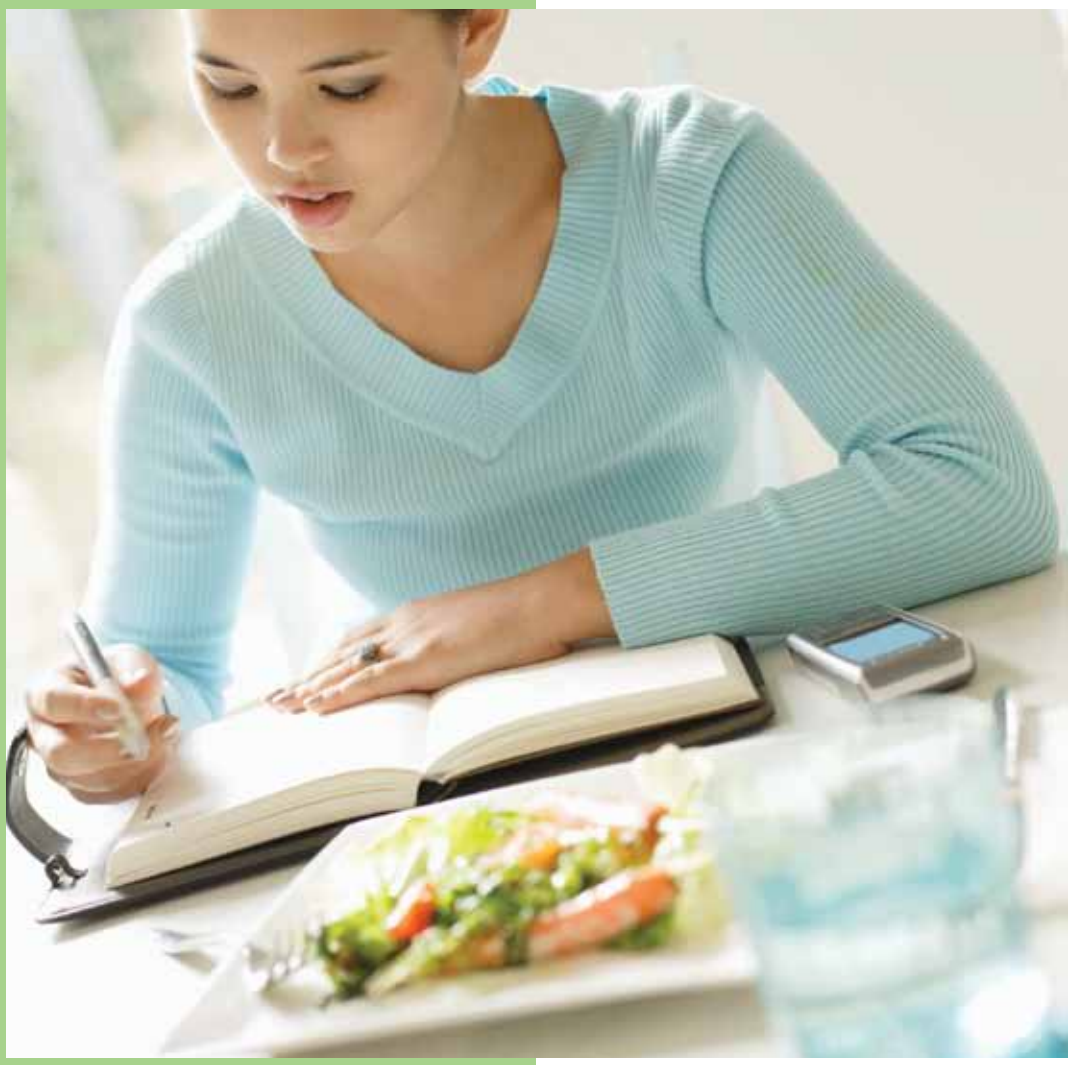

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Chapter 14

Nutritional Programming

Implementing a Nutrition Program

Clients will often describe schedules that barely allow them enough time to sleep, let alone eat healthy meals and exercise regularly. Grocery shopping and preparing meals are often out of the question. Even though they may be well aware that fueling their bodies with healthy foods is important, "life" often gets in the way.

It is important to help clients understand that they won't *find* the time to exercise and eat right—they must make the time. Contrary to popular belief (or popular excuses), eating a healthy diet is not impossible. Like anything else, it takes knowledge, practice, and planning to set goals and overcome barriers. (For more information on assessing a client's readiness for change, see Chapter 15.)

Eating behaviors, which are among the most complex of human behaviors, are learned habits that are deeply entrenched and strongly influenced by religious, ethnic, and family customs. Emotional influences also play an important role in why, when, and what people eat. But it is possible for people to "relearn" how to eat more healthfully. The processes of eating, cooking, and choosing foods are shaped by one's past, but these behaviors can be modified. Behavior modification, however, takes time. When working with clients, the focus should remain on gradually modifying eating and exercise behaviors, both of which are necessary for

IN THIS CHAPTER:

sustainable weight loss. Lifestyle & Weight Management Coaches (LWMCs) should remind clients that small, permanent changes in both behavior and weight loss are better than large, temporary ones.

Behavior modification involves the following:

- Modifying old ways of eating and developing healthier eating habits
- Taking small steps in a consistent direction
- Focusing on environmental or situational control of eating in a program that is designed to reduce the exposure, susceptibility, and response to environmental situations that result in high calorie intake and/or low energy expenditure
- Self-monitoring and self-management

The Nutrition Interview

Understanding a Client's Current Dietary Habits

An effective way to learn about a client's current dietary habits is to administer a lifestyle and health-history questionnaire (Figure 14-1), which may be used to identify clients whose needs fall outside the **scope of practice** of an LWMC. Alternatively, this questionnaire can be administered by the LWMC in an interview format, which might stimulate greater conversation and insight.

Several methods can be used to learn more about a client's eating and lifestyle patterns, including food diaries, food records, 24-hour recall, and food-frequency questionnaires. With practice, an LWMC may find that certain clients may be very likely to complete food records, while others may only be willing or able to give a 24-hour diet recall. Regardless of which method is used, the information gleaned from these tools will be invaluable in helping clients meet their goals.

Food Diary/Food Record

Keeping a food diary involves having clients describe a "typical" eating day, including all foods and beverages (Figure 14-2). Clients should be urged to be specific and estimate amounts as best they can. Be sure to discuss weekends versus weekdays. Space is provided in the food diary for the client to note how hungry he or she is when the food is consumed. Additional space could be added to include information on mood, location, and time of day for more detailed intake information.

One thing to consider is that people generally underestimate or under-report their caloric intake and tend to eat more salads, vegetables, and lower-calorie foods when using a food diary than their weight might suggest. Experience with probing the client, asking nonjudgmental questions, and offering a supportive environment is likely to reveal a more truthful picture of a client's eating pattern.

Proper instruction on how to keep food records will often yield better results than just handing a client a sheet of paper and telling him or her to "write down what you eat." LWMCs should share the following guidelines with clients to help them more accurately report their food intakes (Figure 14-3):

- Keep a record for three consecutive days, including one weekend day (for example, Thursday-Friday-Saturday or Sunday-Monday-Tuesday). Advise the client to choose three days that would be typical of his or her usual intake (to obtain the most accurate picture of the client's diet).
- The client should record everything he or she eats or drinks during those days, including water, any added salt, candies, gum, condiments, vitamin/mineral supplements, sports drinks, coffee, tea, medications, and alcoholic beverages.
- Use a separate sheet of paper for each day and create columns with the following titles: Meal/Snack Time, Food/Beverage & Amount, Food Group Servings, Hunger Level, and Location.
- In the first column, record whether the foods and/or beverages were part of a meal (and which one) or consumed as part of a snack.

Medical Information

1. How would you describe your present state of health?
   ❑ very well ❑ healthy ❑ unhealthy ❑ ill ❑ other:_____
2. Are you taking any prescription medications? ❑ Yes ❑ No
   If yes, what medications and why?_____
   Do these interact with foods or weight loss in any way?
3. Do you take any over-the-counter medications or supplements? ❑ Yes ❑ No
   If yes, what medications and why?_____
4. When was the last time you visited your physician?_____
5. Have you ever had your cholesterol checked? ❑ Yes ❑ No
   What were the results?_____ Date of test:_____
   Total Cholesterol:_____ HDL:_____ LDL:_____ TG:_____
6. Have you ever had your blood sugar checked? ❑ Yes ❑ No
   What were the results?_____ Date of test:_____
7. Please check those that apply to you and list any important information about your condition:

❑ Allergies (Specify: _____)	❑ Disordered eating	❑ Premenstrual syndrome (PMS)
❑ Amenorrhea	❑ Intestinal problems	❑ Polycystic ovary disease
❑ Anemia	❑ Gastroesophageal reflux disease (GERD)	❑ Pregnant
❑ Anxiety	❑ High blood pressure	❑ Ulcer
❑ Arthritis	❑ Hyper-/hypothyroidism	❑ Skin problems
❑ Asthma	❑ Hypoglycemia	❑ Major surgeries:
❑ Celiac disease	❑ Insomnia	❑ Past injuries:
❑ Chronic sinus condition	❑ Intestinal problems	❑ Describe any other health conditions that you have:_____
❑ Constipation	❑ Irritable bowel syndrome (IBS)	_____
❑ Crohn's disease	❑ Irritability	_____
❑ Depression	❑ Menopausal symptoms	_____
❑ Diabetes	❑ Osteoporosis	
❑ Diarrhea		

Family History

8. Has anyone in your immediate family been diagnosed with any of the following?
   ❑ Heart disease If yes, what is the relation:_____ Age of diagnosis:_____
   ❑ High cholesterol If yes, what is the relation:_____ Age of diagnosis:_____
   ❑ High blood pressure If yes, what is the relation:_____ Age of diagnosis:_____
   ❑ Cancer If yes, what is the relation:_____ Age of diagnosis:_____
   ❑ Diabetes If yes, what is the relation:_____ Age of diagnosis:_____
   ❑ Osteoporosis If yes, what is the relation:_____ Age of diagnosis:_____
9. What are your dietary goals?_____+_____
10. Have you ever followed a modified diet to manage a health condition? ❑ Yes ❑ No
    If so, describe:_____
11. Are you currently following a specialized diet (e.g., low-sodium, low-fat)? ❑ Yes ❑ No
    If so, what type of diet?_____
12. Why did you choose this diet?_____
    Was the diet prescribed by a physician? ❑ Yes ❑ No
    How long have you been on the diet?_____
13. Have you ever met with a registered dietitian? ❑ Yes ❑ No
    Are you interested in meeting with one? ❑ Yes ❑ No
14. What do you consider to be the major challenges/issues in your diet and eating plan (e.g., eating late at night, snacking on high-fat foods, skipping meals, lack of variety)?

Figure 14-1 Sample lifestyle and health-history questionnaire

Figure 14-1
Continued

15. How much water do you drink per day? ____8-ounce glasses
16. Do you have any food allergies or intolerance? ❑ Yes ❑ No
    If so, what?_____
17. Who purchases and prepares your food?
    ❑ Self
    ❑ Spouse
    ❑ Parent
    ❑ Minimal preparation
18. How often do you dine out or purchase take-out? ____times per week
19. Please specify the type of restaurants for each meal:
    Breakfast:_____
    Lunch:_____
    Dinner:_____
    Snacks:_____

Habits

20. Do you crave any foods? ❑ Yes ❑ No
    If so, please specify:_____
21. How is your appetite affected by stress?
    ❑ increased ❑ not affected ❑ decreased
22. Do you drink alcohol? ❑ Yes ❑ No
    How often? ____times per week
    Average amount? ____glasses
23. Do you drink caffeinated beverages? ❑ Yes ❑ No
    Average number per day _____
24. Do you use tobacco? ❑ Yes ❑ No
    How much (cigarettes, cigars, chewing tobacco per day)?
25. Do you take any vitamin, mineral, or herbal supplements? ❑ Yes ❑ No
    Please list type and amount per day:_____
26. Do you currently participate in any structured physical activity? ❑ Yes ❑ No
    If so, please describe:
    ____minutes of cardiovascular activity, ____times per week
    ____strength-training sessions, ____times per week
    ____minutes of flexibility, ____times per week
    ____minutes of sports per week
    List sports:_____
27. Have you experienced any injuries that may limit your activity?
    If so, please describe:_____
28. On a scale of 1–10, how ready are you to adopt a healthier lifestyle?
    1 = very unlikely 10 = very likely _____

Weight History

29. What would you like to do with your weight?
    ❑ lose weight ❑ gain weight ❑ maintain weight
30. What was your lowest weight within the past five years? ____lb
31. What was your highest weight within the past five years? ____lb
32. What do you consider to be your ideal weight? ____lb ❑ don't know
33. What is your present weight? ____lb ❑ don't know
34. What are your current waist and hip circumferences? _____waist _____ hip
35. What is your present body composition? ____% body fat ❑ don't know

Food	Description	Amount	Level of Hunger (1–5)

Note: 1 = Not hungry at all; 5 = Very hungry

Figure 14-2
Sample
food diary

Meal/Snack Time		Food/Beverage & Amount	Food Group Servings	Hunger Level	Location	Other Comments
BREAKFAST						
SNACK						
LUNCH						
SNACK						
DINNER						

Figure 14-3
Sample
food log

- In the first column, the client should also record the time when all foods and beverages were consumed. The client should record everything immediately after each meal or snack so that he or she does not forget what was eaten.
- In the second column, the client should give as much specific information as possible:
  - Method of cooking (baked, broiled, fried, boiled, toasted)
  - Brand names of commercial products
  - Specific foods and drinks
    - Bread (whole wheat, white, rye; number of slices per loaf)
    - Milk (whole, low-fat, skim, protein-enriched)
    - Margarine (stick, tub, diet)
    - Vegetables (canned, fresh, frozen)
    - Meats (fat trimmed, weighed with bone, skinned)
    - Drinks (light, low-calorie, diet, low-fat), including additions such as cream and sugar
    - Snacks (pretzels, chips, nuts, dry roasted, raw)
    - Size of fruits or vegetables (small, medium, large, extra large)
    - Ingredients/condiments used in salads and sandwiches (e.g., mayo, ketchup, mustard, gravy, sauce, grated cheese, salad dressing, lettuce, and tomato)
- The client should also list the amount of food or beverage consumed, measured by a scale (for weight in ounces or grams), a ruler (for height, length, and width), or via a household measure (for volume: cups, tablespoons, or teaspoons). If possible, the client should weigh and measure foods after preparation and indicate when it was done. He or she can use package-label information on commercially made products.
- The client should also record any significant feelings or emotions he or she was experiencing before and after eating, his or her hunger level, where the food was eaten, and any obstacles that were faced when making decisions and choices.

Description and Procedure

Sources: Mahabir, 2006; Svendsen et al., 2006; Willet, 2001

- The client records intake throughout the day, including water and beverages. The client also records daily physical activity. The client is solely responsible for the foods consumed throughout the day, as well as for recording them.
- By reviewing food intake along with the calories and **fat** consumed, the LWMC can easily pinpoint any trouble spots with food (e.g., late-night eating, meal skipping).
- The client must be very specific. Instead of writing "ham sandwich," write down how much ham was actually on the sandwich. Was it 3 ounces or (88 mL) 8 ounces (237 mL)? Include what types of condiments were used, etc.

Necessary Components

- The client only needs to record his or her food intake in a food diary booklet, in a notebook, or on pieces of paper. LWMCs should teach clients that it is best to record food intake immediately after consumption, instead of writing it down at the end of the day when it is easy to forget foods consumed.

Pros

- Easy to administer
- Economical
- Increased awareness of habits and foods consumed

Cons

- Dependent on the literacy of the client
- Respondent burden
- Recall bias; records may not reflect "typical" intakes; interest in "pleasing" the facilitator may alter consumption or tracking

- Lack of knowledge on estimating portion sizes, calories, and fat content of foods consumed

24-hour Recall

The same tools used for the food diary can be used when administering the 24-hour recall (see Figures 14-2 and 14-3). Obviously, a major limitation of the 24-hour recall is that "yesterday" may not truly reflect the scope of a person's typical eating patterns. In addition, this tool relies heavily on memory.

Description and Procedure

Sources: Resnicow et al., 2000; Schatzkin et al., 2003

- Obtain information on food and fluid intake for the previous day or previous 24 hours.
- The 24-hour recall is based on the assumption that the intake described is typical of daily intake.
- A five-pass method can be used that includes the following
  - A "quick list" pass in which the respondent is asked to list everything consumed in the previous day
  - A "forgotten foods" pass in which a standard list of foods and beverages that are often forgotten is read to prompt recall
  - A "time and occasion" pass in which the time and name for each eating occasion is collected
  - A "detailed" pass in which the detailed descriptions and portion sizes are collected and the time interval between meals is reviewed to check for additional foods
  - The "final" pass—one last opportunity to recall the foods consumed

Necessary Components

- Time that the food or beverage was consumed
- The food or beverage item
- Serving size of the food or beverage item
- How the food was prepared
- Where the client consumed the food or beverage item
- Any relevant notes regarding the meal or food item

Pros

- Easy to administer
- Not dependent on the literacy of the respondent
- Precision and, when multiple days are assessed, validity
- Low administration costs

Cons

- The need to obtain multiple recalls to reliably estimate usual intake
- Participant burden
- Difficulty of the estimation of portion sizes
- Recall bias; records may not reflect "typical" intakes; interest in "pleasing" the facilitator may alter consumption or tracking

Food-frequency Questionnaire

Food-frequency questionnaires (FFQ) may be challenging for clients, as it can be difficult to truly estimate the number of times an individual food is eaten. However, the benefit of this tool is that the client is less likely to forget foods, because they are listed on the chart. It is also easy to identify the type of diet the client typically follows (e.g., low-fat/high-fiber, high-protein/high-fat). Figure 14-4 presents a portion of a sample food-frequency questionnaire.

Description and Procedure

Sources: Mahabir, 2006; Resnicow et al., 2000; Schatzkin et al., 2003; Svendsen et al., 2006; Willett, 2001

- The FFQ identifies foods that the client most commonly eats.
- The client indicates, on average, how much and how often he or she consumes different foods.
- Analysis of the FFQ data provides information about the daily intake of many nutrients.

Figure 14-4
Sample food-frequency questionnaire

Food	Every Day (Always)	3 or 4 Times/Week (Often)	Every 2 or 3 Weeks (sometimes)	Don't Eat (Never)
Dairy Products				
Milk, whole				
Milk, reduced fat				
Milk, nonfat				
Cottage cheese				
Cream cheese				
Other cheeses				
Yogurt				
Ice cream				
Sherbet				
Puddings				
Margarine				
Butter				
Other				
Meats				
Beef, hamburger				
Poultry				
Pork, ham				
Bacon, sausage				
Cold cuts, hot dogs				
Other				
Fish				
Canned tuna				
Breaded fish				
Fresh or frozen fish				
Eggs				
Peanut butter				
Grain products				
Bread, white				
Bread, whole wheat				
Rolls, muffins				
Pancakes, waffles				
Bagels				
Pasta, spaghetti				
Pasta, macaroni and cheese				
Rice				
Crackers				
Other				

Food	Every Day (Always)	3 or 4 Times/Week (Often)	Every 2 or 3 Weeks (sometimes)	Don't Eat (Never)
Cereals				
Sugar-coated				
High-fiber (bran)				
Natural (granola)				
Plain (e.g., Cheerios®)				
Fortified				
Other				
Fruits				
Oranges, orange juice				
Tomatoes, tomato juice				
Grapefruit, grapefruit juice				
Strawberries				
Cranberry juice				
Apples, apple juice				
Grapes, grape juice				
Fruit drink				
Peaches				
Bananas				
Other				
Vegetables				
Peppers				
Potatoes				
Lettuce				
Broccoli				
Spinach				
Carrots				
Corn				
Squash				
Peas				
Green beans				
Beets				
Other				
Snacks and Sweets				
Chips (potato, corn)				
Pretzels				
Popcorn				
French fries				
Cookies				
Pastries				
Candy				
Sugar, honey, jelly				
Soda, regular				
Soda, diet				
Cocoa				
Other				

Necessary Components

- Vary among FFQs, but typically include a large list of foods with their corresponding frequency of consumption

Pros

- Relatively low administrative costs
- Ability to assess usual and longer-term intake

Cons

- Inaccuracy of absolute nutrient values
- Fluctuation of nutrient values depending on instrument length and structure
- Lack of detail regarding specific foods
- General imprecision
- Recall bias; records may not reflect "typical" intakes; interest in "pleasing" the facilitator may alter consumption or tracking
- Seasonal variability
- Cultural/diet variability (e.g., vegetarians, individuals on therapeutic diets)

Food Models and Portion Estimates

A portion is the amount of food a person chooses to eat, while a serving is a standardized amount of a food used to estimate and/or evaluate one's intake. Portions are very difficult for some to estimate, and correct estimates could mean the difference between a 1,400-calorie diet and a 2,200-calorie diet.

LWMCs can assist clients in a number of ways when estimating their portions. The guidelines presented in Figure 14-5 can be used to help clients more accurately determine the amount of food that they are consuming (Wein, 2006).

In addition, there are a number of tools that can be purchased to help clients better understand their portion sizes. For example, the National Dairy Council sells paper cutouts of various foods with detailed nutrition information on the back. Also, various companies sell plastic food models that demonstrate average and large sizes. Food models range from $2 for a single food to $125 for an extensive package. Some of these companies also sell index cards with pictures of foods in specific serving sizes. The sizes range from 1-ounce servings to "supersize" servings, so clients can visualize the difference and understand how portion-size choices impact their diets.

Using the 2005 USDA Dietary Guidelines

The 2005 *Dietary Guidelines for Americans* provide science-based advice aimed at promoting health and reducing the risk for major chronic diseases through diet and physical activity (United States Department of Agriculture, 2005). The intent of the *Dietary Guidelines* is to summarize and synthesize knowledge regarding individual nutrients and food components into recommendations for a pattern of eating that can be adopted by the public (see page 160).

These guidelines encourage most Americans to eat fewer calories, be more active, and make wiser food choices. A basic premise of the *Dietary Guidelines* is that nutrient needs should be met primarily through consuming foods. Foods provide an array of nutrients and other compounds that may have beneficial effects on health. In certain cases, fortified foods and dietary supplements may be useful sources of one or more nutrients that otherwise might be consumed in less than recommended amounts. Dietary supplements, while recommended in some cases, cannot replace a healthful diet. The following sections present recommendations for an active person or athlete. The complete guidelines can be found at www.health.gov/dietaryguidelines.

General Guidelines

LWMCs should review the following guidelines with their clients:

- Consume a variety of nutrient-dense foods and beverages from the basic food groups, while choosing foods that limit the intake of saturated and **trans fats, cholesterol,** added sugars, salt, and alcohol.

Meat, Poultry, Fish

- ¾ ounce equals:
  - Amount in a chicken wing
- 1½ ounces equals:
  - Amount in a chicken thigh
- 3 ounces equal
  - Size of the palm of a woman's hand (3 x 3½ inches)
  - Amount in a small chicken breast
  - Size of a deck of cards
  - Size of a checkbook
- 4 ounces equals:
  - Amount in a sandwich
  - Amount in a quarter-pound hamburger
  - Amount in an Asian stir-fry
- 5 ounces equals:
  - Amount on an entree salad
- 6 ounces equals:
  - A restaurant chicken breast (6 inches across)
  - Typical lunch or cafeteria portion
- 8 to 12 ounces equals:
  - Common evening restaurant portion

Cheese

- 1 ounce equals:
  - One slice on a sandwich or hamburger
  - Amount on a small slice of pizza
  - 1-inch cube, one small wedge, or a strip the size of a pinky finger
  - 3 tablespoons of parmesan
  - 1 tablespoon of feta or shredded cheese (salad bar)
- 2 ounces equals:
  - Amount on a large slice of pizza

Vegetables

- ½ cup equals:
  - Cafeteria or restaurant portion
  - Size of one-half of a baseball
  - Coleslaw or beans at a barbeque restaurant
  - Amount in a bowl of vegetable soup
- 1 cup equals:
  - Amount in side dinner salad
  - Size of one baseball
- 2 to 4 cups equals:
  - Amount on a salad bar plate

Fruit

- One serving equals:
  - 60 calories, or the size of a fist
  - One large grapefruit
  - 15 grapes or cherries
  - One medium apple or orange (2½ inches across, or a little bigger than a tennis ball)
  - One small banana (6 inches, or the length of dollar bill)
  - 1 cup of pineapple, blackberries, or blueberries
  - 1½ cups of melon or strawberries
  - Four dried prunes
  - 3 tablespoons of raisins (⅕ cup or two miniature boxes)

Potato

- One small potato equals:
  - 70 calories (2½ inches long)
- One medium potato equals:
  - 110 calories (4 inches long)
- One large potato equals:
  - 140 calories (5 inches long)
  - Typical restaurant portion
- One extra-large potato equals:
  - 200 calories (6 inches long)

Fats

- One butter pat equals:
  - 45 calories
- 1 tablespoon of mayonnaise equals:
  - 100 calories (typical amount on a sandwich)
- 2 tablespoons of salad dressing equals:
  - 150 calories (typical amount on a dinner salad)
  - One small ladle (salad bar)
  - One-half large ladle (salad bar)

Beverages

- 1½ ounces equals one jigger of an alcoholic drink
- 4 to 6 ounces equals a typical juice portion (restaurant)
- 6 ounces equals a glass of wine (restaurant)
- 8 ounces equals a common milk portion or the size of one's fist (⅔ soda can)
- 12 ounces equals one can/bottle of beer or soda

Figure 14-5
Guidelines for determining food portions

Source: Wein, D. (2006). *SNaC Pack: The Health Professional's Guide to Nutrition.* www.sensiblenutrition.com

- To maintain body weight in a healthy range, balance calories from foods and beverages with calories expended.
- Meet recommended intakes within energy needs by adopting a balanced eating pattern, such as the USDA Food Guide or the **DASH eating plan** (see Chapter 7). In other words, maximize nutrient intake by choosing a wide variety of nutrient-dense foods. This is especially important for people who are restricting their caloric intake to lose weight. Choosing foods that are high in calories and low in nutrients may mean that the active individual is not adequately taking in appropriate nutrients for performance (i.e., **protein, complex carbohydrates,** B vitamins, iron, calcium, potassium).
- To prevent gradual weight gain over time, make small decreases in food and beverage calories and increase physical activity. Also be sure to include strength-training activities, which may help to prevent a decrease in metabolism over time.
- Individuals who need to lose weight should aim for a slow, steady weight loss by decreasing calorie intake while maintaining an adequate nutrient intake and increasing physical activity. A good goal is to decrease intake by 250 calories (e.g., 2½ tablespoons of butter or mayonnaise or a small order of french fries), while increasing expenditure by 250 calories. Doing so will promote a weight-loss goal of approximately 1 pound per week. Overweight adults and overweight children with chronic diseases and/or on medication should consult a healthcare provider about weight-loss strategies prior to starting a weight-reduction program to ensure appropriate management of other health conditions.

Food Groups to Encourage

LWMCs should review the following guidelines with their clients:

- Consume a sufficient amount of fruits and vegetables while staying within energy needs. Two cups of fruit and 2½ cups of vegetables per day are recommended for a 2,000-calorie intake, with higher or lower amounts depending on the calorie level. Fruits and vegetables are high in complex carbohydrates, **vitamins, minerals,** and **fiber.** Active people cannot train properly without adequate **carbohydrates** in the diet.
- Choose a variety of fruits and vegetables each day. In particular, select from all five vegetable subgroups (dark green, orange, legumes, starchy vegetables, and other vegetables) several times a week. Choosing a variety will allow an active person to maximize his or her nutrient intake, thereby reducing the need for supplements.
- Consume three or more ounce-equivalents of whole-grain products per day. In all, Americans are advised to eat 6 ounces of grains each day with at least half of the grains coming from whole grains, based on a 2,000-calorie diet. Whole-grain foods provide an active individual with the complex carbohydrates necessary to perform endurance activities such as running or biking and high-intensity activities such as strength training or sprinting. These foods also supply the B vitamins necessary for energy production. In addition, many of these products are fortified with iron, which also is important for an athlete. Diets rich in whole grains may reduce the risk of heart disease and diabetes and help with weight management.
- Consume three cups per day of fat-free or low-fat milk or equivalent milk products. These products are low-fat sources of protein, which is necessary to promote muscle growth, and are the most available sources of calcium, which is important for bone health.

Fats

LWMCs should review the following guidelines with their clients:

- Consume less than 10% of calories from **saturated fats** and animal fats and less than 300 mg/day of cholesterol, and keep trans fat consumption as low as possible. Saturated fats, trans fats, and cholesterol can clog arteries and affect long-term health and performance.
- Keep total fat intake between 20 and 35% of calories, with most fats coming from sources of **polyunsaturated** and **monounsaturated fatty acids,** such as fish, nuts, and vegetable oils. Active individuals need higher amounts of carbohydrates (55 to 65% of total calories) and protein (20 to 30% of total calories), so limiting fats in the diet is a good idea.
- When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free. Low-fat sources of protein are the best choices for an active individual's long-term health.
- Limit intake of fats and oils high in saturated and/or trans fats, and choose products low in these fats and oils.

Carbohydrates

LWMCs should review the following guidelines with their clients:

- Choose fiber-rich fruits, vegetables, and whole grains at each meal and for snacks. Active individuals require 55 to 65% of total calories as carbohydrates, of which fiber-rich foods are excellent sources.
- Choose and prepare foods and beverages with little added sugars or caloric sweeteners. Added sugars may mean more fluctuations in glucose level (**hypoglycemia** or **hyperglycemia**), which may affect performance.

Sodium and Potassium

LWMCs should review the following guidelines with their clients:

- Consume less than 2,300 mg of sodium (approximately 1 teaspoon of salt) per day.
- Choose and prepare foods with little salt. At the same time, consume potassium-rich foods, such as fruits and vegetables. Highly active individuals may sweat out more electrolytes and need to replace them through their diet.

Alcoholic Beverages

LWMCs should review the following guideline with their clients:

- Those who choose to drink alcoholic beverages should do so sensibly and in moderation, which is defined as the consumption of up to one drink per day for women and up to two drinks per day for men. Alcohol may promote **dehydration,** which may result in poor exercise performance.

Addressing A Client's Nutritional Needs While Staying Within the LWMC's Scope of Practice

Making specific nutrition/nutrient recommendations and developing meal plans are beyond the scope of practice of an LWMC. However, providing general nutrition information on nutrition and weight management can be helpful and useful for clients. An LWMC must know when to tackle and when to refer nutrition issues, as doing so will help maintain professionalism as well as decrease the risk of liability (see Chapter 19 and Appendix A).

Table 14-1 features a list of issues that an LWMC might discuss with clients, as well as issues that are more appropriate for referral. Every LWMC must ultimately determine what topics are appropriate to discuss with the client. An LWMC should not hesitate to refer

a client to a registered dietitian (R.D.) or more qualified individual if the client's needs exceed the LWMC's training and level of expertise. Refer to Chapter 11 for more information on making appropriate referrals.

Table 14-1

Scope of Practice Guidelines for Nutrition

Appropriate Nutrition Topics for an LWMC

- MyPyramid Guidelines
- Suggestions for weight loss
- Pre-evaluations and use of a food diary
- Lifestyle changes
- Hydration
- Recipes
- Support
- Basic pre- and post-exercise nutrition
- Weight-loss physiology

Nutrition Areas That Should Be Referred

- Specific meal plans
- Tailored plans
- Medications
- Diseases
  - Cardiovascular disease
  - Hypertension
  - Hyperlipidemia
  - Diabetes
  - Eating disorders
  - AIDS
- Medical diagnoses
  - Anemia
  - Osteoporosis
  - Polycystic ovary disease
- Post-op
- Yo-yo dieting
- Supplements
- Large weight loss or morbid obesity

Qualified registered dietitians can be located through the following organizations and channels:

- The American Dietetic Association (www.eatright.org)
- SCAN Sports, Cardiovascular, and Wellness Nutritionists (www.scandpg.org)
- Professional meetings
- Local fitness centers
- Medical professionals
- Professional networking

What do all of those terms and letters mean?

- Nutritionist—A general term that anyone can really use
- Registered dietitian (R.D.)—An R.D. is an individual who has completed certain related coursework, an undergraduate degree, and an approved internship, and has passed a national exam given by the Commission on Dietetic Registration (CDR). An R.D. also completes yearly continuing education requirements.
- Certified specialist in sports dietetics (C.S.S.D.)— An accreditation from the credentialing agency of the American Dietetic Association
- Licensed dietitian/nutritionist (L.D./N., L.D., or L.N.)—Requirements for these titles vary by state. California, for example, does not offer licensure to dietitians.
- Master of science or doctorate degree (M.S. or Ph.D.)—LWMCs should always check that the degree was earned in a related field (e.g., nutrition, exercise science, psychology) before making a referral.

What questions should the R.D. be asked?

- How does he or she stay up-to-date on the latest research?
- Which organizations does he or she belong to? What hospital or medical group is he or she affiliated with?
- What journals or research does he or she read?
- What are the fees? What is included in the appointment?
- What is his or her area of specialty or expertise (e.g., age groups, certain populations)?
- Does he or she sell vitamins, supplements, or foods?
- Discuss a current client situation with the R.D. to get a better idea of his or her approach or philosophy on nutrition.

Nutritional Program Planning for the Weight-loss Client

Estimating Caloric Needs

There are a variety of methods that can be used to estimate a client's daily calorie needs. Daily energy needs (caloric requirement) are determined by three factors:

- **Resting metabolic rate (RMR)**
- Thermogenesis (calories required for heat production)
- Physical activity

Resting metabolic rate is the amount of energy (measured in calories) expended by the body during quiet rest. RMR makes up between 60 and 80% of the total calories used daily. Physical activity is the second largest factor contributing to daily calorie requirements. This is the most variable component of RMR, as this number changes based on the frequency, intensity, and duration of an individual's workouts. Thermogenesis, also referred to as the **thermic effect of food,** is the smallest component. This is the amount of calories needed to digest and absorb the foods that are consumed. While certain diets claim to enhance this component (e.g., food-combining programs), no research exists to support that concept. The bottom line is that regular physical activity is the most effective way to increase the body's caloric expenditures.

The following section reviews methods for determining a client's energy needs. This information does not, however, take into account a client's disease risk in relation to his or her weight or nutritional habits. For more information on how to use tools such **waist-to-hip ratio** and **body mass index (BMI),** see Chapter 10.

Calculating Energy Needs

There are numerous ways to calculate a client's daily caloric needs. The simplest method is to multiply the client's weight (in pounds) by the appropriate conversion factor (Table 14-2). This calculation will yield an approximation of how many calories the individual needs to maintain his or her current weight, based on activity level and gender.

The Harris-Benedict equation for **basal metabolic rate (BMR)** takes into account the individual's weight, height, age, and gender. However, it has been shown to slightly underestimate BMR in females and slightly overestimate BMR in males (Harris & Benedict, 1919).

Table 14-2

Conversion Factors for Estimating Daily Caloric Requirements Based on Gender and Activity Level

	Activity Level		
	Light	**Moderate**	**Heavy**
Male	17	19	23
Female	16	17	30
Light activity level: Walking (level surface, 2.5–3.0 mph), housecleaning, child care, golf			
Moderate activity level: Walking (3.5–4.0 mph), cycling, skiing, tennis, dancing			
Heavy activity level: Walking with a load uphill, basketball, climbing, football, soccer			

Harris-Benedict Equation

For men: BMR = [13.75 x weight (kg)] + [5.003 x height (cm)] – [6.775 x age] + 66.5

For women: BMR = [9.563 x weight (kg)] + [1.850 x height (cm)] – [4.676 x age] + 655.1

Note: To determine weight in kg, divide weight in pounds by 2.2. To determine height in cm, multiply height in inches by 2.54.

Incorporate an activity correction factor between 1.2 and 1.5 to account for the individual's average amount of physical activity.

Note: Multiply the BMR value derived from the prediction equation by the appropriate activity correction factor:

- 1.2 = bed rest
- 1.3 = sedentary
- 1.4 = active
- 1.5 = very active

Table 14-3 includes several RMR prediction equations that can be used to help clients understand how many calories they burn throughout the day while at rest. Some of these equations provide more accurate results for certain populations than others, so LWMCs must be sure to choose the most appropriate equation for each client.

Table 14-3

RMR Prediction Equations (kcal/day)

Mifflin-St Jeor Equations
(Mifflin et al., 1990; Frankenfield et al., 2003; Frankenfield, Roth-Yousey, & Compher, 2005)

Men: RMR = (9.99 x weight) + (6.25 x height) – (4.92 x age) + 5
Women: RMR = (9.99 x weight)+ (6.25 x height) – (4.92 x age) – 161

Multiply the RMR value derived from the prediction equation by the appropriate activity correction factor:

1.200 = sedentary (little or no exercise)
1.375 = lightly active (light exercise/sports one to three days per week)
1.550 = moderately active (moderate exercise/sports three to five days per week)
1.725 = very active (hard exercise/sports six to seven days per week)
1.900 = extra active (very hard exercise/sports and a physical job)

Note: This equation is more accurate for obese than non-obese individuals.

Schofield Equation
(Schofield, 1985; Harris & Benedict, 1919; Tverskaya et al., 1998)

Age	Males	Females
15–18	BMR = 17.6 x weight + 656	BMR = 13.3 x weight + 690
18–30	BMR = 15.0 x weight + 690	BMR = 14.8 x weight + 485
30–60	BMR = 11.4 x weight + 870	BMR = 8.1 x weight + 842
>60	BMR = 11.7 x weight + 585	BMR = 9.0 x weight + 656

Note: This equation slightly underestimates for women and slightly overestimates for men.

Owen Equation
(Owen et al., 1986; 1987)

Males: RMR = (10.2 x weight) + 879
Females: RMR = (7.18 x weight) + 795

Cunningham Equation
(Cunningham, 1991)

All subjects: REE (kcal/day) = (21.6 x FFM) + 370

Note: This is considered one of the better prediction equations for athletes because it takes into account fat-free mass.

Wang Equation
(Bauer, Reeves, & Capra, 2004)

All subjects: REE (kcal/day) = (21.5 x FFM) + 407

Note: This equation is potentially better for athletes because it takes into account fat-free mass.

Note: All methods of determining RMR are estimates only;
Equations use weight in kilograms (kg) and height in centimeters (cm);
REE = Resting energy expenditure; FFM = Fat free mass

In addition to the estimation equations presented in Table 14-3, another method called indirect calorimetry is used to predict resting metabolic rate. Since oxygen is used in the metabolic process to create energy, a person's metabolic rate can be determined by measuring how much oxygen he or she consumes when breathing. There is a relationship between the body's use of oxygen and the energy it expends, so scientists use formulas to convert gas usage into energy/calories used.

Historically, oxygen-consumption measurements were only performed with a medical device called a metabolic cart, which can cost between $20,000 and $50,000. Newer technology has made it possible to measure oxygen consumption using hand-held devices, making the analysis more accessible and affordable.

Using Caloric Information to Affect Weight

Once the client's daily caloric needs have been estimated, this information can be used to help the client lose, gain, or maintain weight. To change weight by 1 pound (0.45 kg), caloric intake must be decreased or increased by 3,500 calories. For weight loss, it is advisable to reduce daily caloric intake by 250 calories per day and to increase daily expenditure (through exercise) by 250 calories. This 500-calorie difference, when multiplied by seven, creates a weekly negative caloric balance that results in a loss of 1 pound (0.45 kg). These numbers may be doubled to achieve a loss of 2 pounds (0.91 kg) per week, but that may be too great a goal for some clients. Most health organizations recommend a weight-loss rate of 1 to 2 pounds (0.45 kg to 0.91 kg) per week.

To gain approximately a ½-pound (0.23 kg) of weight, clients can add 300 to 500 calories to the daily intake. It is crucial that the exercise routine be maintained so that additional calories are used to fuel muscles, rather than to simply store additional fat. Advise clients to follow this new calorie plan for a few months and make changes as needed (Baechle & Earle, 2008; American College of Sports Medicine, 2010).

Summary

The client interview is a time not only to assess a client's current dietary habits and readiness for change, but also to develop rapport and build a foundation for the LWMC–client relationship. LWMCs should understand which programming tools to use with each client, as well as how to modify those tools as needed. Finally, it is essential for the LWMC to stay within his or her scope of practice.

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