

A Nutrition BALANCING ACT for Active Seniors

Equip yourself with basic nutrition information and a list of expert referrals to help enrich the lives of your senior clients.

By Jenna A. Bell-Wilson, MS, RD, LD

With 13 percent of the U.S. population celebrating their 65th year and beyond, it is no surprise that fitness clubs and personal trainers are working more with seniors.

Exercise has proven helpful in combating the decline in flexibility, muscle mass, strength and aerobic capacity found in advanced aging (Hollooszy 1994). To that end, exercise also reduces the risk factors for heart disease, osteoporosis, high blood pressure and type 2 diabetes (Evans 1996). The combination of physical activity and a nutrient-rich diet has been shown to defend against what one expert calls the “dwindles” (Sizer & Whitney 2000). The **dwindles** is a compilation of degenerative issues, including weight loss, diminished mental function, decreased physical function, social withdrawal and malnutrition.

The good news is that physical activity and nutrition may be a potent protector against the progressive decline we think of as aging. Many seniors are getting this message and initiating exercise programs

to strengthen the quality of their golden years.

Fortunately, many mature adults have the assistance of personal trainers to guide them through their workouts and will look to them for help with nutrition as well. Nutrition habits and needs may change through the aging process and can be confounded by progressive alterations. The purpose of this article is to help the personal trainer:

- understand the health concerns and age-related alterations that can affect nutrition
- understand the important macronutrients for the active senior
- be aware of methods for successful weight management for older adults

The article will also provide helpful hints for meal planning and eating around a workout, snack ideas, a sample menu, and tools for body composition assessment for the exercising senior.

Note: For personal trainers, this article serves as an informational source. When working with clients, trainers must consider their professional scope of practice and refer individuals to nutrition experts when appropriate.

Concerns for Older Adults

Adults face challenges in maintaining proper nutrition and health as they age. Being aware of the complications that may alter the needs of a mature client can help the fitness professional give helpful and appropriate recommendations, including referrals to experts when necessary. Whether it is assisting with alterations in the senses or giving heart healthy advice, being sensitive to the changes over a lifetime can improve the effectiveness of the *mature* trainer.

CHANGES IN FOOD FONDNESS

One of the factors that can affect adequate nutrient intake and maintenance of body weight in the later years is a diminished appetite (ADA 2000). Sensory changes, as well as different social environments, may contribute to the decline in appetite and subsequent decrease in energy intake.

In addition to maintaining a healthy body weight, the older adult may be more susceptible to illness and nutrient deficiencies if nutrient intake is insufficient. Helpful hints to contend with a plummeting appetite can be found in the sidebar “Overcoming Obstacles,” and can include small meals throughout the day, nutrient-dense snacks and easy-to-prepare foods.

SENSORY CHANGES

Sensory changes, such as taste, smell, vision and hearing, vary from person to person. Typically, taste and smell tend to decrease after age 60 and can be more severe as 70 approaches (Shuman 1996). Some medications or a zinc deficiency may also affect the ability to taste foods (Sizer & Whitney 2000). The best advice is to promote a wide variety of foods and add a bit of extra seasoning.

GASTROINTESTINAL FUNCTION

Gastrointestinal changes can affect the ability of older adults to digest and absorb foods (Shuman 1996). One of the main consequences and concerns is constipation.

A diet that emphasizes fiber-rich foods, such as whole grains, fruits, vegetables and beans, as well as ample fluids throughout the day can help seniors maintain healthy gastrointestinal tracts. Inactivity can also lead to an inactive gut—another reason exercise benefits seniors.

HEART HEALTH

According to the American Heart Association, heart disease is the leading cause of death in the United States. Of the 61,800,000 Americans with one or more types of cardiovascular disease, 24,750,000 are older than 65 (AHA 2001). During the latter part of life, the heart pumps blood less efficiently and cardiac output declines (Wardlaw 2000).

Inactivity may be a major culprit in this decline and subsequent difficulties, and is confounded by hypertension and

Overcoming Obstacles

HINTS TO IMPROVE INTAKE

Obtaining the appropriate amounts of energy and nutrients can become challenging for the older adult. Here are some helpful hints to assist.

- ❖ Consume small meals throughout the day. Include nutrient-dense foods at each meal to maximize intake.
- ❖ Look for foods that are convenient and require little to no fuss. Yogurts, fruits, vegetables, low-fat cheese, breakfast bars and ready-made shakes are easy to pack and require little preparation.
- ❖ When making a stew or a favorite dish, freeze excess for easy consumption in the future.
- ❖ Try new seasonings and foods to combat decreases in taste and smell.
- ❖ Allow for treats. Keep the diet varied and include favorite snacks occasionally.
- ❖ Encourage outings with friends and family. If the senior client often eats alone, intake can suffer and so can overall nutrition.
- ❖ Exercise is a great way to boost appetite. Advise clients to walk before eating to improve appetite.
- ❖ Choose foods that are chopped or moist if dental function becomes a challenge. Remember, dentures might need to be refitted when weight loss occurs.
- ❖ Try cooked whole-grain cereals, puddings, stews or casseroles.
- ❖ Include adequate amounts of fiber each day. The recommended amount is 25 to 35 grams per day. Find fiber in fresh fruits and vegetables, whole grains, oats and beans.
- ❖ Drink plenty of water! Consume at least 10 glasses of water a day and avoid waiting until thirst kicks in . . . it may not!

Adapted from *Contemporary Nutrition Issues and Insights*, 4th edition, by Gordon M. Wardlaw. Table 14-4 “Guidelines for Healthful Eating in Later Years”

hypercholesterolemia (high blood lipid levels). Other than inactivity, significant predictors of heart disease risk in the elderly are smoking, a high waist-to-hip ratio, excessive alcohol intake, high fasting blood glucose and fasting blood insulin levels, and high triglycerides levels in postmenopausal women (Shuman 1996).

The older client’s heart health can greatly benefit from not only an exercise program, but also a fat-reduced diet, smoking cessation, alcohol avoidance and tight control of blood pressure. A heart healthy diet for the active senior includes a shift in focus from foods that are fried, laden with butter or cream and/or over-processed to fruits, vegetables, whole grains, fish, lean cuts of meat and skinless poultry.

THE BARE BONES

Osteoporosis is an all-too-familiar concern for the aging population. It is estimated that osteoporosis leads to 1.5 million bone fractures per year and has a price tag upwards of \$13 billion per year in health care costs (Wardlaw 2000). Calcium and vitamin D are important nutrients in maintaining bone density throughout a lifetime (see “Nutrition for Older Adults” by Jane Pentz, PhD, in *IDEA Personal Trainer*, September 2000).

An increase in energy intake and variety of foods can help the active senior consume adequate amounts of calcium and vitamin D. Encourage your clients to eat calcium-containing foods such as milk, cheese and yogurt, as well as maintain a balanced, varied diet. Foods that are fortified with calcium are also available on the grocer's shelves, such as cereals, orange juice, breads and even special candy chews or breakfast bars.

Activity is also indispensable in maintaining bone integrity into the later years. Resistance training not only improves strength in the elderly, but also enhances lumbar and femoral bone density (Evans 1996).

Nutrition Needs for the Active Senior

Since the early 1980s, research has documented the benefits the older exerciser will obtain. Both strength training and cardiovascular exercise have been shown to impact longevity and reduce the risk factors for cardiovascular disease, improve musculoskeletal strength, aid in bone density maintenance and improve quality of life (Hurley & Hagberg 1998).

A program that incorporates both types of exercise training appears to be the most advantageous to the senior exerciser. Exercise also has a positive impact on nutritional needs as the years pass. Macronutrient needs may be different in the sedentary elder, but when complemented with exercise can be maintained surprisingly close to these of a younger adult.

Energy Needs

As age advances, energy needs tend to fall. The aged body has fewer active cells in each organ, which can contribute to a lower metabolic rate (Sizer & Whitney 2000). However, this process does not appear to be completely inevitable. In the nonexercising individual, the main determinant of caloric needs is fat-free mass (Evans 1996). Muscle mass tends to decline in the sedentary individual as the years progress and can decrease by as much as 15 percent between the ages of 30 and 80 (Evans 1995).

The Recommended Energy Intakes established by the 1989 Recommended Dietary Allowances (RDA) are 2,300 and 1,900 calories per day for men and women older than 51, respectively (Sizer & Whitney 2000). These values reflect a 600-calorie decrease for men and 300-calorie decrease for women from their younger years (age 25-50 years).

The RDA changes for energy intake may only apply to those who maintain an inactive lifestyle. Van Pelt et al. (2001) evaluated the age-related decline in resting metabolic rate (RMR) in physically active men. One hundred thirty-seven men aged 19 to 36 or 52 to 75 participated in the study. Subjects were divided into sedentary and physically active younger and older men. The study's findings showed that the decline in RMR in the physically active men was related to age-associated reductions in exercise volume and energy intake.

The older adults who maintained exercise volume and

energy intake had RMRs similar to the younger, physically active men. The moral of the story is that if an older man can work towards maintaining activity and energy intake into his later years, he may be able to maintain his RMR and avoid the increases in body weight and fat associated with age-related obesity.

Maintaining an adequate calorie intake, along with exercise, can also help the active senior attain the necessary amounts of micronutrients each day to avoid deficiencies.

Protein Needs

The RDA for protein remains stable through adulthood at 0.8 grams per kilogram (g/kg) of body weight (Shuman 1996). However, nitrogen balance research has shown protein needs to be a bit higher in the aging population. Inadequate protein intake may be a factor in the development of **sarcopenia** (age-related muscle loss) (Evans & Cyr-Campbell 1997).

Evans (1995) assessed the nitrogen balance of elderly individuals consuming protein at the RDA of 0.8 g/kg of body weight and also at twice the RDA at 1.6 g/kg of body weight. Researchers measured nitrogen balance after subjects consumed the diet for 11 consecutive days. The mean value for achieving nitrogen balance appeared to be 0.91 ± 0.043 g/kg protein per day. Based on further calculations, Evans advises that 1.0 to 1.25 g/kg protein is the safe level for elderly men and women. Other studies suggest that 1.0 g/kg of protein per day ensures the best nitrogen balance for older adults (Shuman 1996).

The addition of high-intensity resistance training in the lives of the elderly may also impact their protein needs (Evans & Cyr-Campbell 1997). Nitrogen balance was assessed in older adults during a 12-week resistance program, and researchers found a decrease of 10 to 15 percent in nitrogen excretion, suggesting the exercisers were losing less protein. These findings imply that the resistance-trained elder may require less protein.

However, the opposite was found in those engaging in a regular cardiovascular exercise program. The increased amount of protein the middle-aged endurance athlete needs may reflect greater amino acid oxidation during cardiovascular exercise (Evans & Cyr-Campbell 1997). Despite the confusing results from these two studies, the active senior should try to maintain a diet with adequate protein (1.0-1.25 g/kg).

High-quality protein sources should be emphasized. Foods that are abundant in protein include water-packed tuna, eggs, fish, beef, poultry and dairy products. A varied diet that includes beans, whole grains and nuts will also provide adequate protein.

Carbs!

Carbohydrates are the body's preferred source of fuel and can also save protein from being used as energy (Wardlaw 2000).

This is true for senior exercisers as well. No RDA is set for carbohydrate in the diet, but most experts agree that consuming at least 60 percent of total calories from carbohydrate is ideal (Wardlaw 2000).

Complex carbohydrates provide optimal amounts of nutrients and fiber as opposed to over-processed and “sugary” foods, such as candy and flavored juices. Complex carbohydrates include whole grains, beans, fruits, whole-wheat breads and pastas, and whole-grain rice. For the active senior, carbohydrates will also help maintain adequate energy stores during exercise. Arguably one of the main goals of an exerciser is to ward off fatigue. Carbohydrates are stored in the muscle as glycogen and await activity to be utilized. Optimal carbohydrate stores in the active senior can be achieved through a diet consistently adequate in carbohydrate (also see the section subheaded “Eating Around a Workout”).

Dietary Fat

Foods higher in fat tend to be lower in vitamins, minerals and phytochemicals, with the exception of nuts and avocados. A nutrient-dense, high-quality diet ensures adequate amounts of vitamins and minerals and can help with weight maintenance. A high-fat diet is associated with the development of obesity, which can be a risk factor for not only cardiovascular disease and some cancers, but also can worsen arthritis (Sizer & Whitney 2000). Weight loss in the overweight elder can be an effective way to alleviate the pain and stress associated with arthritis.

A high amount of fat in the diet, especially saturated fat, also is associated with an increased risk of heart disease. Despite the lack of data on the effect of dietary fat restriction on heart disease in elderly populations, modifying dietary fat intake is warranted (Shuman 1996). The American Heart Association recommends less than 30 percent of total calories come from fat, with less than 10 percent from saturated fat.

Saturated fat can be found in animal products and palm kernel and coconut oils, found in store-bought cookies, cakes and other baked goods. A diet that focuses on whole foods such as fruits, vegetables, grains, lean meats and fish, nuts and low-fat dairy products can help individuals of any age keep their fat intake down and nutrient consumption up.

Staying Hydrated

Dehydration is a dangerous issue for the elderly and the leading cause of fluid and electrolyte disturbances (Shuman 1996). As the years pass, the ability to sense thirst declines and fluid intake can suffer. Exercise aside, the older adult has

Healthy Snacks for the Active Senior

- ❖ yogurt of all kinds
- ❖ homemade milk shake or fruit smoothie
- ❖ string cheese
- ❖ peanut butter and jelly sandwich
- ❖ granola bar
- ❖ breakfast bar
- ❖ canned fruit
- ❖ fresh vegetables and fruit
- ❖ liquid supplement or breakfast drink
- ❖ fig bars
- ❖ dates, raisins or dried fruits
- ❖ pudding
- ❖ cottage cheese
- ❖ ginger snaps
- ❖ sliced turkey or lean roast beef
- ❖ angel food cake with fresh berries
- ❖ almonds, pecans or any favorite nut
- ❖ hummus with pita
- ❖ guacamole and tortilla
- ❖ peanut butter and whole-grain toast or English muffin
- ❖ whole-grain bagel
- ❖ dried, whole-grain cereal
- ❖ low-fat cheese and baked crackers

an increased concern for hydration due to diminished water conservation by the kidneys. Medications, such as those used for hypertension, or diuretics also pose additional risks for dehydration. Recommended daily fluid intake is approximately 30 to 35 milliliters per kg (1.0-1.2 ounce/kg) of body weight (Shuman 1996).

For the active senior, proper hydration is a must! The effects of dehydration during exercise can include an increase in core body temperature, elevated heart rate, decreased blood volume and diminished physical performance. The thirst mechanism is fairly ineffective at any age; therefore, planning when and what to drink can be the best defense against the effects of dehydration.

The American College of Sports Medicine (2000) recommends ingesting approximately 16 ounces (2 cups) of fluid two hours prior to exercise to ensure adequate fluid levels and to provide time to excrete the excess before exercising. During moderate exercise, the body can lose up to 0.5 to 1.5 liters per hour! Replenishment during exercise is essential to combat these losses. Consuming 8 to 12 ounces every 10 to 15 minutes during an exercise bout can help compensate for these losses.

In order to ensure proper hydration following exercise, the best strategy is to check the client's body weight before and after exercise, and recommend a consumption of 20 ounces of fluid for each pound lost. Lastly, caffeine and alcohol should be avoided following exercise due to their diuretic effects.

Eating Around a Workout

When training older clients, it is important to encourage adequate nutrition for their workouts. Whether they are undertaking a cardiovascular activity or resistance training, adequate glycogen stores are a must. A diet that provides at least 60 percent of its total calories from carbohydrates can help ensure adequate glycogen stores for the senior. In addition, including a pre-exercise snack in the day's plans will help the client have a successful workout and avoid undue fatigue (see sidebar “Healthy Snacks for the Active Senior”).

Sample Menu for the Active Senior

BREAKFAST

- 1 packet of instant oatmeal
- 1 large banana
- 1 cup 1% milk
- 1 cup orange juice fortified with calcium

SNACK

- 1/4 cup natural seedless raisins
- 1 piece multigrain bread, toasted
- 2 tablespoons jelly
- 1/2 cup cranberry juice cocktail

LUNCH

- 1 cup chunky vegetable soup, canned
- 1/4 cup water-packed tuna
- 1 tablespoon low-fat mayonnaise
- 2 pieces 100% whole-wheat bread
- 2 pieces romaine lettuce
- 1 slice fresh tomato
- 1 piece honeydew melon
- 1/2 cup tomato juice

SNACK

- 1 cup chocolate instant pudding
- 2 gingersnap cookies
- 1 cup 2% milk

DINNER

- 1/2 cup mashed sweet potatoes, canned
- 1/2 cup string beans, frozen
- 2 ounces beef chuck roast
- 1 dinner roll
- 2 teaspoons butter
- 1 cup 1% milk

SNACK

- 1 piece angel food cake
- 1/4 cup sliced strawberries

DAY'S TOTALS:

Calories		approximately 2,300 calories
Protein	89 grams	15% of total calories
Carbohydrate	352 grams	62% of total calories
Fat	53 grams	23% of total calories

Following activity, replenishment is a must. The ability of the muscle to store glycogen is enhanced following exercise, and this doesn't appear to be different for the older exerciser.

In a study evaluating young versus old sedentary individuals in a cardiovascular exercise program, researchers evaluated muscle glycogen stores following training (Evans & Cyr-Campbell 1997). Sedentary young and older men and women participated in a three-month cardiovascular exercise program (70 percent of maximal heart rate, 45 minutes/day, 3 days/week).

Not only did researchers find gains in aerobic capacity in both groups, but a muscle biopsy revealed that although muscle glycogen stores were significantly lower in the older subjects initially, the older subjects significantly increased glycogen stores following exercise training (Evans & Cyr-Campbell 1997). This reflects an improved insulin sensitivity and ability to improve muscle glycogen stores with exercise training.

In order to maximize glycogen stores, follow exercise with a snack of carbohydrate and a bit of protein (Robergs & Roberts 1997). Easy choices include peanut butter on whole-grain bread, an egg white and potato burrito, string cheese and Melba toast, or a breakfast drink.

Senior Weight Management

Obesity in older adults is a serious health concern (ADA 2000), contributing to insulin resistance, type 2 diabetes, the development of atherosclerosis, high blood pressure and cardiovascular disease (Holloszy 1994). Although fat accumulation over time can result from an increase in total calories, as well as inactivity, there is evidence that the main culprit may be lack of physical activity (Holloszy 1994).

Holloszy notes that nutrition surveys, such as the National Health and Nutrition Examination Survey, found similar calorie levels reported between those who were overweight and those who were not (1994). Curiously, some of the overweight individuals actually reported lower calorie intakes than those of normal body weight. This evidence points to *underactivity* rather than *overconsumption* as the more related factor in obesity and fat gain with age.

The development of abdominal fat puts the senior at an increased risk for cardiovascular disease. Abdominal adiposity, especially common among men, can lead to insulin resistance, glucose intolerance, hypertension and altered lipid profiles (Hurley & Hagberg 1998).

Exercise has been evaluated as a means of controlling abdominal fat accumulation, and both cardiovascular and resistance training have proven effective in reducing abdominal fat in older adults. When researchers studied dietary restrictions with aerobic and strength training, all groups reduced abdominal fat, but the diet-only group also lost muscle tissue (Hurley & Hagberg 1998).

The most appropriate steps to take when helping overweight seniors achieve weight goals are to promote consistent resistance training and cardiovascular exercise. Also, encourage older adults to increase activity in their daily lives. Gardening, cleaning the house and shopping can all increase physical activity on a daily basis. In addition, advise older clients to consume a nutrient-dense, varied diet with adequate vitamins and minerals, and lowered total fat (see sidebar “Sample Menu for the Active Senior”).

Training the Senior Client

Training a mature adult can be a rewarding and valuable experience for both trainer and client. Natural changes that occur with aging can affect an individual’s nutritional status, health concerns and dietary needs. By being aware of the challenges the senior client may face and making age-appropriate nutrition suggestions or referrals to experts, the trainer can help the client get the most out of the golden years.

The take-home message for the *mature* trainer includes the following:

- Be attentive and sensitive to the challenges a senior client may face.
- A decline in RMR is not inevitable! Maintenance of muscle mass and exercise can help keep calorie needs up.
- Ensure adequate amounts of high-quality protein, complex carbohydrate and fluid in a *low-fat* diet.
- Hydration is a serious concern for the elderly. Keep them hydrated before, during and after exercise.
- Exercise is the key to a successful weight loss program for the older adult.
- An active and nutritionally sound lifestyle may just be the fountain of youth!

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Assessing Senior Body Composition

Sarcopenia, an age-associated decline in muscle mass, is common among the elderly. Evans (1996) describes an important study by Novak showing that there was an increase in body fat from 18 to 36 percent in men and from 33 to 44 percent in women between the ages of 18 and 85 years.

Because of the shifts in body composition and percent body fat, many trainers may be inclined to monitor their clients with a body composition assessment. Along with the increases in fat mass, changes occur in the (bone) mineral content of the fat-free mass. According to Heyward, fat-free mass declines approximately 1 percent per year between the ages of 50 and 70 (Heyward & Stolarczyk 1996). This alters the appropriateness of using a two-compartment model (the division of the body into fat-free mass and fat) for body composition assessment.

An ideal tool for assessing the body composition of an older adult does not exist. Equations have been designed for an aging population, but few are without flaws. Some experts recommend avoiding skinfold techniques in assessing the aging adult due to the redistribution of adipose tissue, decline in skin elasticity, shrinkage in fat-cell size and increased compressibility of the subcutaneous adipose and connective tissues (Heyward & Stolarczyk 1996). Equations specific to age are available with the skinfold technique, but should be used cautiously as their error may exceed comfortable ranges.

Bioelectrical impedance analysis is another technique that may be applied to an elderly population. Again, age-specific equations do exist, but they have been found to often over- or underestimate fat-free mass. However, for your female clientele, Heyward recommends using the Lohman age-specific (50 to 70 years) equation or Gray’s generalized equation to estimate fat-free mass (1996).

Accurately assessing the changes in body composition for the elderly client may be challenging. Taking circumference measures and noting alterations in physical appearance may be the easiest ways to assess changes over time. Techniques used for younger clients may be helpful, but it is important to recognize their limitations.

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