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Nutrition for Middle Aged People and Submaximal Exercise

As people grow older it becomes increasingly difficult to stay in peak physical shape because of health issues, sedentary lifestyles and the affect aging has on the body. This population, especially for postmenopausal women, people are often looking for new ways to improve their health by diet and exercise in a way that is safe and fun. Low intensity activities can be very appealing to this age group as they can be performed for longer periods of time and are not as strenuous as other exercises. Paired with a healthy diet, low intensity activities can be a great way to maintain a desired level of healthiness and body composition.

A low intensity activity can be classified as an activity that requires less than 50% of a personsôVO2 max, or submaximal exercise level. Many activities can be classified as low intensity such as yoga, gardening, pilates, walking, ballroom dancing, swimming and bicycling. Many of these exercises can be made to be more strenuous but what makes them a low intensity activity is the measurement of the heart rate to determine submaximal exercise.

Continuing to stay in shape is important, especially for the elderly population because it can prevent health issues. Activities that focus on flexibility, such as yoga and pilates, can increase range of motion and blood flow while toning the body. Activities that focus on balance, yoga and pilates, can help prevent falls where someone is at risk for injury. Weightbearing activities, gardening and resistance exercises, also increase bone density which can decrease the risk of osteoporosis. Untrained people are recommended to speak with their doctor before beginning an exercise program, and begin slowly, starting with 30 minutes or less and working their way up by increasing intensity slowly and increasing duration of exercise.

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Energy Usage

Low intensity activities focus on maintaining activity for longer periods of time below 50% of a persons Vo2 max. When a person maintains activity below 50% of the Vo2 max, most of the energy used comes from fat. When activity increases the Vo2 max to above 50%, most of the energy comes from carbohydrates in the blood or in the body. When a person is exercising at 20% of their Vo2 max, 60% of the energy burned is from fat. At 50% of a persons Vo2 max, 40% of energy burned is from fat (van Aggel-Leijssen, 2001). This is important because using energy mainly from fat calories is critical to maintaining lean muscle mass, as older people will have a more difficult time building muscle.

There are many dietary concerns for middle aged men and women as they continue to age. As the body slows down, people will have a decreased resting energy expenditure. Since their activity level will be decreased from when they were younger, they will need to decrease their caloric intake as they are simply unable to burn off as much energy. In women, menopause can cause some issues such as decreased estrogen levels, night sweats and hot flashes. Eating disorders can be prevalent in every age group, and it is also possible to see cases of eating disorders in the middle aged and elderly population as it is more difficult for them to keep weight off so they may try to achieve a certain body weight through dieting or even exercising excessively. A major concern is that the absorption of nutrients decrease, so it is

necessary that elderly people are obtaining enough vitamins. Vitamin A is the only vitamin that absorption has been shown to increase with age, all of the other vitamins decrease. An increase in Vitamin D, calcium, and also vitamin K is vital to preventing bone fractures and maintaining healthy bones.

Activities

Activities may include yoga, pilates, gardening, walking, jogging, ballroom dance, aerobics, swimming, and bicycling, but are not limited to this. Untrained people are recommended to speak with their doctor before beginning an exercise program, and begin slowly, starting with 30 minutes or less and working their way up by increasing intensity slowly and increasing duration of exercise.

VO2 max is often used as an indicator of aerobic physical fitness, as it is the measure of the volume of oxygen consumed during a maximal level of exercise. To determine the level you are working at, VO2 consumption can also be translated into METs. VO2 is measured in ml/kg/min and one MET is equal to 3.5 ml/kg/min.

In general, as we age our VO2 max decreases, it also decreases with cessation of training, and is lower in untrained individuals. Many people struggle to stay active as they grow older, and when combined with other physical concerns, some people may only be comfortable working within a submaximal level. Its important to also vary activities, as well as vary the intensity and duration of activities. A higher intensity will result in a higher MET level, requiring consumption of more oxygen. A lower intensity, however, can be maintain for a longer duration.

Tables below show the average VO2 max for middle aged and elderly people, along with the approximate MET level to be at 50% of their VO2 max.

The average VO2 max for women and METs for submaximal exercise

Age group	**Average VO2 Max (ml/kg/min)**	**MET level for 50% VO2 max**
46-55	28-30	8.3
56-65	25-27	7.4
65+	22-24	6.6

The average VO2 max for men and METs for submaximal exercise

Age Group	**VO2 max (ml/kg/min)**	**MET level for 50% VO2 max**
46-55	32-35	9.6
56-65	30-31	8.7
65+	26-28	7.7

Table information from (http://www.machars.net/v02max.htm) (The Physical Fitness Specialist Certification Manual, The Cooper Institute for Aerobics Research, Dallas TX, revised 1997 printed in Advance Fitness Assessment & Exercise Prescription, 3rd Edition, Vivian H. Heyward, 1998.p48)
and (http://joinjj.com/vo2-max-chart-for-rating-your-fitness-level/)

Some activities that allow people to be near to below their VO2 max from the Compendium of Physical Activities

Activity and Type	**METs**
Walking, moderate pace (2.8-3.2 mph)	3.5
Biking, general	7.5
Ballroom dance, fast	5.5
planting garden, stooping, moderate effort	4.3
Zumba, Cumbia	6.5
Pilates, general, light effort	3.0
Yoga, Power (Flow)	4.0
Running, (5mph)	8.3
Swimming, leisurely	6.0

https://sites.google.com/site/compendiumofphysicalactivities/

Dietary Concerns for Middle Aged Men and Women

Recommendations are based on information on a 52 year old woman that is 5 ft 5 in. and 160 lbs. This is a fairly average size for a middle aged woman and was used so we could better explain the dietary needs of someone from the elderly population.

Recommendations

The Recommendations Report lists the recommended daily nutrient intake for a person based on the information entered. Often referred to as the DRI (Dietary Reference Intake).

Profile Info

Personal: Mid-Woman Female 52 yrs 5 ft 5 in 160 lb

Student Info: clemo308 Charlene Harkins ESAT 3410

Activity Level: Low Active (Strive for an Active activity level.)

BMI: 26.6 Normal is 18.5 to 25.

Weight Change: Lose 1 lb per week Best not to exceed 2 lbs per week.

Nutrient	DRI Goal	Notes
Basic Components		
Calories	1,687.90	
Protein (g)	58.06	10% - 35% of Calories (adults 19-70 yrs) *
Carbohydrates (g)	232.09	45% - 65% of Calories (adults 19-70 yrs) *
Dietary Fiber (g)	23.63	
Fat (g)	52.51	20% - 35% of Calories (adults 19-70 yrs) *
Saturated Fat (g)	16.88	Less than 10% of Calories +
Mono Fat (g)	18.75	
Poly Fat (g)	16.88	
Cholesterol (mg)	300.00	Less than 300 mg per day +
Water (g)	2,700.00	
Vitamins		
Vitamin A - RAE (mcg)	700.00	
Vitamin B1 - Thiamin (mg)	1.10	
Vitamin B2 - Riboflavin (mg)	1.10	
Vitamin B3 - Niacin (mg)	14.00	
Vitamin B6 (mg)	1.50	Do not exceed 100 mg *
Vitamin B12 (mcg)	2.40	Over 50 should take a supplement *
Vitamin C (mg)	75.00	Do not exceed 2000 mg *
Vitamin D - mcg (mcg)	15.00	Do not exceed 100 mcg *
Vitamin E - Alpha Tocopherol (mg)	15.00	
Folate (mcg)	400.00	Women of child bearing age should take a supplement *
Minerals		
Calcium (mg)	1,200.00	Do not exceed 2500 mg *
Iron (mg)	8.00	Do not exceed 45 mg *
Magnesium (mg)	320.00	Do not exceed 350 mg by supplement *
Phosphorus (mg)	700.00	Do not exceed 4000 mg *
Potassium (mg)	4,700.00	
Sodium (mg)	1,300.00	Less than 2300 mg - lower for some people +
Zinc (mg)	8.00	Do not exceed 40 mg *

Important Vitamins

Vitamin D-

Promotes bone health, those concerned about osteoporosis may benefit from increased intake. Research also has shown a connection that Vitamin D enhances the bodies use of Calcium. Postmenopausal women recommended to take 400-800 IU of Vitamin D. (Feskanich 2003)

Calcium-

Can be extremely important in middle aged women, as many are often calcium deficient which can lead to Osteoporosis or injuries that can result in fractured/broken bones Postmenopausal women recommended to take 1000-1500 mg of calcium. (Feskanich 2003)

Protein and Carbohydrate needs-

For middle aged people, 10-35% of total calories from protein are recommended. For carbohydrate 45-65% of total calories are recommended for the average middle-aged person. Research has shown that taking a 3:1 ratio of carbohydrate to protein snack within an hour after exercise is helpful in repairing tissue, allowing muscle growth, and replacing stores of carbohydrate (Williams, Nutrition for Health..). For a longer endurance workout, increase carbohydrate intake to replace stores, otherwise, even a 2:1 ratio of carbohydrate to protein snack (Okazaki 2013) after a workout for middle aged and elderly people can help repair tissues and promote muscle repair and growth.

Hydration needs-

Proper hydration is important, as people age they begin to lose their ability to tell when they are thirsty and risk becoming dehydrated. Water is the best choice for hydration needs, but drinks

containing electrolytes can help maintain potassium, sodium, chloride, and carbohydrate needs after excess sweating or after exercise lasting longer than an hour.

Potassium-

Potassium needs in the elderly population is also very important. The average middle aged woman should be receiving 4,700 mg of potassium. To show how much potassium this is, a medium sized banana contains just over 400 mg of potassium. Potassium can be obtained from many different food sources, including fruits and vegetables.

Menopause

Women are especially at risk for developing osteoporosis after menopause. Due to the change in hormones, women need to maintain calcium and vitamin D needs to prevent bone loss before and after menopause. Exercise and healthy diet habits are beneficial in preventing illness and bone loss during menopause.

When choosing a diet:

When an older population is looking for a suitable diet based on their lifestyle and activity level, it is very important to focus on how much energy is being consumed and how much energy is being used. The body gains or loses weight based on how much energy we put into our body and how much energy we use performing activities. A calorie is the universal measure of how much energy a food contains. Based on our caloric intake a person can be in negative, positive or an even caloric balance. A positive caloric balance would mean that more energy was put into our body and not enough energy was expended, causing a gain in weight. A negative caloric balance would say that more energy was expended in the body than what was put into the body, causing a decrease in weight. An even caloric balance would mean that the

body would remain at the same weight because the amount of energy put into the body equaled the amount of energy that was burned off by performing activities.

In order to feel full from less calories it is important to choose foods that are larger in volume but are also lower in calories, allowing for less calories to be consumed while still making a person feel full. Many fruits and vegetables are low in calories and can fill a person up, and paired with a nutritious filling dip it can become a healthy snack or part of a filling meal. Meals should contain a over half of fruits and vegetables, whole grains, a reasonable size of meat and some dairy.

Some tips when planning a meal

-important to eat a variety of fresh fruits and vegetables

-choose leaner meat over fatty meat

-choose complex carbohydrates to satisfy hunger over simple carbohydrates (whole grain is better than white bread)

-make sure the diet is providing enough calcium and vitamin D

-reduce intake of sodium

-to maintain hydration, drink water throughout the day

-choose water over juices, soft drinks and other drinks that contain sugar

-reduce intake of sugary and fatty foods

Physical concerns for middle aged people-

Many people become less active as they age, causing their health to decline even more than may be expected with normal aging. Loss of mobility and strength caused by inactivity may further deter people from increasing their activity level, causing a cycle of decreased health and greater loss in mobility and strength. As is normal with aging, our resting energy expenditure

decreases, which may cause weight gain, and may also make it more difficult to exercise. Physical activity and proper diet can decrease or prevent weight gain, developing high blood pressure, diabetes, cardiovascular diseases, and can improve mood and self-esteem.

Maintaining an active lifestyle can also help improve balance and increase muscle as well as bone strength. This can also help prevent falls and injuries from occurring, allowing people to maintain their independence and continue to enjoy activities.

Menopause

Menopause is a normal part of aging for women, and is a transition when hormones estrogen and progesterone decrease . During this time, women may experience hot flashes, abdominal weight gain, difficulty sleeping, and mood changes. Exercise and healthy eating habits can help improve mood and self-esteem to maintain a healthy outlook on this transition and aging overall.

Review

For middle aged and elderly men and women, submaximal exercise may be ideal for beginning a new active lifestyle or increasing activity to maintain overall health. For optimal health it is recommended to maintain a healthy diet throughout our lives, and with exercise it is important to balance protein and carbohydrate intake to replace energy stores and build muscle, balance overall caloric intake with activity to prevent weight gain or loss, and balance vitamins and mineral intake to prevent injury and promote health while aging. Absorption of nutrients decreases with age so it is especially important to eat a balanced diet and increase intake of foods containing high amounts of nutrients and vitamins. Our ability to detect thirst also decreases with age so it is also important to remember to drink water throughout the day to stay hydrated. Osteoporosis is a big concern for this age group, and adding weight-bearing exercise

to lifestyle can help increase bone density as well as increasing calcium and vitamin D intake as a preventative measure. Being active at any level and maintaining a balanced diet increases health overall and becomes especially important as we age.

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