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## **Exercise: It's Never Too Late To Start**

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Regular exercise has been shown to decrease mortality and age-related morbidity in older adults. Despite this, up to three fourths of the older adult population do not currently exercise at recommended levels. The relative risk (RR) for cardiovascular disease caused by sedentary living has been estimated to be 1.9, compared with other modifiable risk factors such as:

- Hypertension (RR = 2.1) and
- Cigarette smoking (RR = 2.5)

But sedentary living occurs at a much higher prevalence. Fewer than 10 percent of women over age 75 smoke cigarettes while greater than 70 percent are insufficiently active.

### **Benefits of Exercise in Older Adults**

#### **1. Cardiovascular**

- Improves physiologic parameters improvement in the body's ability to utilize oxygen which slows the heart rate and improved the heart's health.
- Improves blood pressure
- Decreases risk of coronary artery disease
- Improves congestive heart failure symptoms and decreases hospitalization rate
- Improves lipid profile

#### **2. Diabetes mellitus, type 2**

- Decreases incidence
- Improves glycemic control
- Decreases hemoglobin A1C levels
- Improves insulin sensitivity
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#### **3. Osteoporosis**

- Decreases bone density loss in postmenopausal women
- Decreases hip and vertebral fractures
- Decreases risk of falling
- Osteoarthritis
- Improves function
- Decreases pain

#### **4. Neuropsychologic health**

- Improves quality of sleep
- Improves cognitive function
- Decreases rates of depression, improves Beck depression scores.
- Improves short-term memory

#### **5. Potential decrease in risk of colon, breast, prostate, rectum cancer**

#### **6. Improves quality of life and decreases fatigue**

#### **7. Other**

- Decreases all-cause mortality
- Decreases all-cause morbidity
- Decreases risk of obesity
- Improves symptoms in peripheral vascular occlusive disease

### **8. *Death and Disease Decreased with exercise***

#### **Never Too Late -- NEVER**

Regular exercise and/or increased aerobic fitness are associated with a decrease in all-cause mortality and morbidity in middle-aged and older adults. Subgroup analysis of the Harvard Alumni study found that modest increases in life expectancy were possible even in those patients who did not begin regular exercise until age 75. Mortality rates were also lower in those patients who did not begin regular exercise until late in life compared with patients who were active only in younger years and then subsequently stopped exercising. Thus, it is never too late for patients to benefit from physical activity.

Those patients who go from none to some exercise receive the greatest health benefits, while further increases in activity levels bring progressively smaller improvements. Physicians can have the greatest overall impact by helping their sedentary patients to become active.

#### **No Pill**

There is no pill or group of pills pharmaceutical or nutraceutical which can provide the benefit to your health which regular, aerobic exercise provides.

#### **Getting Started -- Screening**

Before initiating an exercise program, most older adults should undergo a history and physical examination directed at identifying cardiac risk factors, exertional signs/symptoms, and physical limitations. There are few contraindications to aerobic exercise or resistance training. Even patients with these conditions can safely exercise at low levels once appropriate evaluation and treatment have been initiated. For example, early exercise-based cardiac rehabilitation has become a mainstay of post myocardial infarction care.

#### **Contraindications to Aerobic Exercise and Resistance**

##### **Training Absolute Contraindications**

- Recent ECG change or myocardial infarction
- Unstable angina
- Third-degree heart block
- Acute congestive heart failure
- Uncontrolled hypertension
- Uncontrolled metabolic disease

## **Relative contraindications to exercise in the elderly**

- Cardiomyopathy
- Valvular Heart Disease
- Complex Ventricular ectopy

## **Treadmill Exercise Testing**

The American College of Sports Medicine recommends exercise stress testing for all sedentary or minimally active older adults who plan to begin exercising at a vigorous intensity. Most elderly patients, however, can safely begin a moderate aerobic and resistance training program without stress testing if they begin slowly and gradually increase their level of activity. A community- based walking program in Massachusetts involving almost 8,000 elderly patients reported no incidence of myocardial infarction or other adverse cardiac events during exercise over an eight- year period. Patients should be counseled to discontinue exercise and seek medical advice if they experience major warning signs or symptoms (e.g., chest pain, palpitations, or lightheadedness).

## **The Exercise Prescription**

The exercise prescription consists of three components: aerobic exercise, strength training, and balance and flexibility.

### **Cardiovascular**

Moderate aerobic activity for a combined total of at least 30 minutes, most days of the week. Individual bouts of activity may be as brief as 10 minutes.

### **Strength training**

A single set of 10 to 15 repetitions using eight to 10 different exercises, performed two to three times per week. Each repetition should be performed slowly through a full range of motion while avoiding holding one's breath (Valsalva maneuver). The training program should involve all major muscle groups.

### **Balance and flexibility**

Stretch major muscle groups once per day after exercise when muscles are more compliant. Balance training and weight transfer program twice per week.

## **CPET**

If an elderly person is serious about improving their health with exercise, a CPET (cardiopulmonary exercise test) would be a good place to start. Moderate activity can be defined using heart rate and VO<sub>2</sub> max ranges, rating of perceived exertion, and work load for specific activities. More simply, patients should exercise at the maximal intensity at which

they are still able to comfortably carry on a conversation (the "talk test"). This may require some trial and error for patients. Warm-up and cool-down periods consisting of five to 10 minutes of less intense activity (e.g., slow walking, stretching) should be included to decrease the risk of hypotension, and musculoskeletal and cardiovascular complications.

### **Activities Requiring Moderate Intensity Exercise**

- Walking briskly (3 to 4 mph)
- Cycling leisurely ( $\frac{3}{4}$ 10 mph)
- Swimming with moderate effort
- Doubles tennis
- Golf--using a pull cart
- Fishing--stand and cast
- Canoeing leisurely (2 to 4 mph)
- Mowing lawn with a power mower
- Home repair, painting

As in aerobic exercise, initially sedentary or irregularly active older adults beginning resistance training should start slowly and gradually advance the intensity of their training regimen.

Patients should start with resistive bands/tubing, light weights (e.g., 2 lb hand weights or a can of food), or simple exercises such as repeatedly rising from a chair. Although health benefits are achievable with less intense training, significant strength gains require patients to train at an intensity in which they can complete 10 to 15 repetitions per set before reaching fatigue. Training needs to be progressively more intense with increasing weight to continue to derive additional strength gains and, possibly, to prevent the long-term loss of previous strength gains.

The evidence for balance and flexibility training is inconclusive. Nevertheless, empiric evidence suggests that balance programs, such as repeatedly standing on one leg, can improve stability and decrease the risk of falls.

The complete exercise prescription includes increased daily activities and regular aerobic, resistance, and balance exercises. Any exercise prescription, however, is a dynamic process that should be structured to fit an individual patient's current goals and comorbidities and be responsive to changes over time.

### **Overcoming Barriers to Exercise**

Elderly patients face an array of personal, socioeconomic, and environmental barriers to exercise that are common to the general population, as well as barriers that are unique to the elderly.

One half of older adults cite musculoskeletal discomfort or disability as a reason for not exercising. Decreasing exercise intensity and using a range of exercises can help avoid discomfort. It is often helpful to prescribe a range of exercise intensities that patients can match to their energy or functional level on any given day. Cross-training, using a

combination of activities, balances the risks and benefits of weight- and non-weight-bearing activities, uses a wider range of muscle groups, decreases the risk of overuse injury, and is less boring.

## **Habit**

Habit is the single best predictor of inactivity across all age groups. Older persons often must overcome a lifetime of ingrained behavior. Some older persons may be comfortable in a role of dependence and feel threatened by the charge of increased activity. Building on previous activities can help overcome the dominant influence of habit on activity levels. For example, patients may be encouraged to move the treadmill or stationary cycle in front of the television, or consider having a low step-aerobics box in the kitchen. An active lifestyle also has health benefits comparable with formal exercise regimens, but with improved rates of long-term compliance.

Incorporating exercise into a prior routine also makes it easier to remember, especially in very old and cognitively impaired persons. Exercises should be simple; any new skills will require specific instructions and repetition.

Self-efficacy--the confidence in one's ability to carry out a planned behavior--has been shown to be a predictor of stair-climbing ability, balance (i.e., risk of falling), and general functional decline in the elderly. In addition, it is also a strong predictor of exercise participation, especially in women. Efficacy scores increase across the stages of change (i.e., patients become more confident of their abilities as their level of activity increases). Patients with low self-efficacy should begin exercising with easily accomplished goals and receive frequent encouragement.

## **Additional Considerations**

Physicians should match their advice to the patient's perception of how physical activity may be beneficial (e.g., weight loss, improved fitness, reduced coronary risk). Identify and focus on individual beliefs rather than on general health benefits. Help the patient set specific goals and avoid the discouragement of unrealistic expectations.

Understanding a patient's personality is also helpful. Whether patients are extroverted or introverted will greatly affect their compliance with a group exercise class versus a home program. As they become more functionally dependent, they often have less influence over when and how they exercise. This can be discouraging for those who have previously had a strong internal locus of control.

For most patients, any additional activity beyond their current level will be beneficial. Patients should be encouraged to add to exercises that they are already performing such as climbing an additional flight of stairs or walking to a further light post or other distance marker each week.

More frail elderly patients should increase intensity by adding hills, hand weights, or arm movements rather than increasing velocity.

Finally, patients are more likely to do activities they consider enjoyable. They are also more likely to resume pleasurable activities following inevitable periods of relapse caused by illness, hospitalization, or travel. Social dancing, for example, is a great exercise and most nursing homes use games as a proxy for exercise. Patients can be helpful in designing their own exercise programs.