Writing More Specific Exercise Prescriptions

In providing guidance to my patients about exercise, I used to be very general in my instructions: 20 to 30 minutes, at least 2 or 3 times a week, of whatever activity you like most (eg, walking, playing tennis, or swimming). My thought, to the extent I thought about it at all, was that if they liked the activity they engaged in, they would be more likely to persist in it. Similarly, if a patient told me that she swam 3 times a week, I was more than satisfied. It would not have occurred to me to say: swimming is great, but because it is not weightbearing, it is not good protection against osteoporosis. Although any form of exercise is better than a sedentary lifestyle, additional research in the field can guide prescriptions for exercise regimens as specific as our prescriptions for hypertension medications or human immunodeficiency virus antiretroviral therapy. They should consider not only patient preference but also the differential benefits of different forms of exercise.

See also pages 1285 and 1306

Broadly speaking, exercises can be classified into 3 groups: aerobic exercise (eg, brisk walking, jogging, bicycling, swimming, and Tai chi), resistance training (eg, weights and resistance bands), and stretching exercises (eg, yoga). It is possible to combine different forms of exercise, such as jogging using arm weights. Also, there are existing systems of exercise that combine these different elements. For example, the Pilates method focuses on increasing muscle flexibility and strength. Calisthenics (eg, jumping jacks, push-ups, and sit-ups) are aerobic exercises that use the body’s weight as the source of resistance.

As physicians, it is important to understand the different physiologic effects and benefits of different forms of exercise so that we can guide our patients to the best regimen for them. Aerobic exercise has the strongest benefits on cardiovascular health due to its ability to increase maximum oxygen consumption, increase stroke volume, and decrease resting heart rate. Resistance exercise increases muscle mass and strength. Although resistance exercises do not burn as many calories as aerobic exercises per time engaged in the activity, increased muscle mass will result in increased metabolic demand, which will, in turn, result in decreased body fat, assuming the person does not make a corresponding increase in caloric intake. Because resistance exercises build muscle strength, they may be especially good for decreasing falls and improving balance. Stretching exercises improve range of motion and function of joints, tendon flexibility, and muscle performance and seem to prevent and treat musculoskeletal injuries.

Within the categories of exercise, different exercises are particularly suited to different people (Table). It is particularly important for women to include weightbearing exercises in their routines. Tai chi, a system of gentle movements that is an aerobic exercise, has been shown to improve balance and prevent falls in older adults. A randomized controlled trial of patients with Parkinson disease found that Tai chi improved balance and reduced falls more than did resistance training or stretching (the difference in falls between Tai chi and resistance training did not reach statistical significance). A recent study in the Archives showed that yoga was more effective for low back pain than was a self-care book (but equally effective as stretching exercises). Exercise, in general, has positive effects on psychological well-being, decreasing depression and anxiety, and seems to improve cognitive function. Multiple epidemiologic studies show an association of exercise with longer life. Two articles in this issue of the Archives contribute to our growing awareness of the benefits of exercise.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Specific Benefits</th>
<th>Special Indications/Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisk walking, running</td>
<td>Improved cardiovascular health</td>
<td>None</td>
</tr>
<tr>
<td>Swimming, bicycling</td>
<td>Improved cardiovascular health</td>
<td>Nonweightbearing; does not increase bone mineral density</td>
</tr>
<tr>
<td>Tai chi</td>
<td>Improved cardiovascular health, improved balance</td>
<td>May be particularly good for older persons because of the gentle movements</td>
</tr>
<tr>
<td>Resistant (weight) training</td>
<td>Improved muscle strength and size, improved balance</td>
<td>Seems to complement the benefits of aerobic exercise</td>
</tr>
<tr>
<td>Yoga</td>
<td>Increased flexibility, stress management</td>
<td>Can be done on own or in addition to other exercises; has been used in the management of chronic diseases (eg, pain, cancer, depression)</td>
</tr>
<tr>
<td>Stretching</td>
<td>Increased flexibility, decreased risk of injury</td>
<td>Best incorporated as a warm-up before other exercises</td>
</tr>
</tbody>
</table>

Table. Choice of Exercise to Improve Health

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understanding of the benefits of exercise for different diseases. A meta-analysis by Sluik et al demonstrated that increased physical activity was associated with an impressive 38% reduction in all-cause mortality in patients with type 2 diabetes mellitus based on a pooling of cohort study results. Although much of the benefit of exercise on survival in patients with diabetes is likely due to improvements in cardiovascular health, exercise has specific positive effects on glucose control. Exercise decreases basal insulin levels, increases insulin sensitivity, and has been shown to be associated with reductions in glycated hemoglobin levels.\textsuperscript{1,3}

However, if we are to help patients with diabetes optimally control their disease, what type of exercise should we recommend? The second study by Grøntved et al helps us with this decision. Using data from the longitudinal Health Professionals Follow-up Study, they found that weight training decreased the risk of development of diabetes by 34% after adjusting for a variety of factors, including the amount of aerobic exercise. Their results are consistent with those of a trial\textsuperscript{7} that randomized patients with diabetes into 1 of 4 groups: aerobic training, resistance training, both, or a nonexercise control. Only the group that had a combination of aerobic and resistance training had significantly lower glycated hemoglobin levels compared with the nonexercise control group.\textsuperscript{7} The message is that weight training seems to have a complementary effect to aerobic exercise on the control of diabetes.

A detailed guide for physicians on how to write an exercise prescription is available on the web.\textsuperscript{8} Some might question whether providing exercise prescriptions is really the job of the practicing physician, a fair question given that we are all trying to do more in our 15-minute visits. But having read the meta-analysis by Sluik et al, I cannot help but note that none of the time I spend trying to decide whether to increase the dose or add a new medication for my patients with type 2 diabetes is likely to result in a 38% reduction in all-cause mortality.

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Published Online: August 6, 2012. doi:10.1001/archinternmed.2012.3196

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Financial Disclosure: None reported.

REFERENCES


