

Exercise Principles: Compliance and Training to Build Health and Prevent Injury

By ROGER MIGNOSA, DO

The single most important factor in determining whether patients comply with an exercise program is a strong recommendation from their primary care physician (1). Compliance with a physician's exercise recommendation can be challenging, especially when there are barriers such as pain. Exercise is not a magic bullet, but it is one of the most potent weapons against disease in the armamentarium of medicine.

Exercise works to fight disease by building health. Movement is vital to maintain physical and mental health. The volume of evidence that supports this statement is overwhelming, but it is useless unless this knowledge is applied.

Currently both the American College of Sports Medicine and the American Medical Association are working on a program called Exercise is Medicine (2). This program aims to help general practitioners and other health care professionals become effective in counseling and referring patients according to their physical activity needs. Exercise is Medicine is promoting the idea that exercise is therapy that must be integrated into the standard of care. Integrating exercise medicine into health care is pivotal in transforming our health care system toward sustainability.

Exercise Compliance

Beyond simply advocating exercise, the physician must challenge the status quo. A person's desire is often defeated by ambivalence. People want to lose weight, but they don't enjoy exercise. They want to be more active, but they don't have enough time. For every goal there is an argument against change. In guiding patients toward increased physical activity, it is useful to give them questions instead of answers. This method helps empower patients, and it gives physicians insight to their values and motivations. Four questions can help to work through ambivalence.

1. Do you see a need for increased physical activity in your life?
2. What can you tangibly do to increase physical activity?

3. What part of you wants to become more active?
4. What part of you doesn't want to change?

These questions serve as a catalyst for change by giving the patient an opportunity for self-reflection as opposed to mandated physician orders that build resistance between physician and patient. With the answers to these questions, physicians should acknowledge patients' autonomy in their right to change as well as their right to remain in their current state. Empowering patients with their right to stagnation, combined with giving patients insight to their condition creates an environment fertile for positive change and builds the strength of the patient-physician relationship. The greatest gift we can give our patients is independence, born of the knowledge that everything required for health and healing is within themselves.

Exercise Programming

Once patients have decided to take control of their fitness, the physician can guide them with knowledge that will maximize enjoyment and minimize injuries.

In designing a training program, first emphasize form. Neurons that fire together, wire together, according to the laws of neuroplasticity. Low-volume exercise with perfect posture and quality movement will set the foundation for future progress. When a new skill is learned, it competes for valuable brain map real estate. If bad habits occupy the brain map, great effort must be exerted to remove the stronghold of competitive plasticity. Competitive plasticity is a battle on the brain map for skill set-placement. New skill acquisition must compete to occupy areas of the brain specific for each constituent function. If poor body mechanics during exercise are trained, they must be untrained, and retraining requires a great amount of effort. So it is best to learn correctly from the outset (3).

Each exercise session should incorporate five phases to enhance fitness and prevent injury—a warmup, joint-loosening exercises, conditioning (aerobic and/or anaerobic), cool-down, and postexercise stretching. Each phase accomplishes a specific goal.

The warm-up consists of five to 10 minutes of whole-body movement sufficient to produce a light sweat. Exercises should be designed to gently stretch postural muscles, increase metabolic rate for aerobic requirements, and increase connective tissue extensibility (4). Begin an exercise session with low-intensity movements similar to the demands of your conditioning phase, and include calisthenic exercises. For example, in running, a warmup should consist of brisk walking and easy jogging that achieves the lower limit of the prescribed intensity. Intensity should range from 40% to 60% of maximal effort. This translates into a METs (metabolic equivalents) level of 4 to 8 or 40% to 60% of a patient's heart rate reserve. A good warmup invigorates and relaxes the body in preparation for increased demands.

Joint-loosening exercises are not mentioned in every text, but they should be. Muscles are most responsive to passive stretching after exercise, but once the body has warmed up, moving through the active range of motion of each joint will improve the functional range of motion. Work through the ankles, knees, hips, pelvis, spine, shoulders, elbows, and wrists in flexion, extension, lateral flexion, circumduction, internal rotation, and external rotation, and mix in some isometric contractions.

The overall goal of every fitness program is to improve functional capacity. A patient's specific goals can be addressed in the conditioning phase of the program. For example, if pain is a concern, strength, endurance, and flexibility exercises are directed to achieve the maximum pain-free range of motion. It is important to remind patients that improvements in physical function will precede pain relief and not vice versa.

Often patients will say, "I am listening to my body." My response is, "Your body should not be talking to you." Patients suffering with pain should use the pain-free range of motion in their training programs. Patients should always *exercise as able*. Body awareness is the key to every successful exercise program. Exercising with good form should not hurt. However, exercising with poor form and beyond the restrictions of pain does hurt.

Determining an exercise prescription for patients in pain will depend on their current health status and preference. Exercise can both treat and stimulate pain, so physicians must engage the therapeutic window by advising enough exercise to improve function, while avoiding refractory pain that causes patients to lose faith in exercise as therapy. Body awareness, strength, flexibility, and cardiovascular fitness all have the potential to

improve specific areas of health. Initially, body awareness in posture and quality motion should be trained, followed by strength and flexibility, and then cardiovascular fitness. Following this progression will entrain proper mechanics and provide the strength and balance necessary to avoid a potential fall with cardiovascular exercise.

The initial phases of strength exercise should incorporate light-resistance concentric exercises, specifically in the core muscles to improve stability and prevent the microtrauma following eccentric exercises. Cardiovascular exercises should consist of low-impact activities such as walking, stationary cycling, and water exercises. *All exercise should be done as able*, with the goal to achieve 30 minutes of cardiovascular exercise at 60% to 70% of heart rate reserve on most days of the week and light resistance/flexibility training done two to three days per week. While this is ideal, some patients may only be able to exercise only one or two days per week in the beginning. Avoid the setbacks of aggressive training by nurturing the therapeutic window.

The cool down entails five to 10 minutes of gradual reductions in exercise intensity. This promotes lactic acid removal (5), reduces post exercise hypotension, and buffers the rise in plasma catecholamines (6).

Finally, postexercise stretching will allow for the greatest improvement in muscle plasticity, or the ability to permanently alter its length. The musculotendinous unit maximally distorts when it is warm (7). Thus maximum gains in range of motion to accelerate recovery can be achieved after exercise.

Finding an Exercise Physiologist/Fitness Instructor for Referral

In general, exercise physiology and fitness training is not covered by individual insurance policies. Exercise physiologists are mainly found in cardiac and pulmonary rehabilitation, but they also work in orthopedics, neuromuscular, and other areas. There are also many well trained exercise experts in traditional athletic training, yoga, Pilates, and many other subsets of fitness.

To find a qualified exercise physiologist to whom you can confidently refer, ask:

1. Where did you receive your training? Was it a comprehensive training program?
2. What was included in the training program?(Lecture / Written Test / Practical Test / Observation, Practice, and Apprentice Hours)

3. How many total hours of practicum were spent in the training program?
4. Do you have any other movement-related teaching experience?
5. How long have you been teaching?
6. What is the studio's philosophy and specialty? Are you able to handle special needs, injuries and rehabilitation?

If time permits, ask to take a sample class with the exercise physiologist/fitness instructor.

Summary

Exercise builds health. Done correctly and consistently, exercise will improve functional capacity and create buffers against pain. The art of prescribing exercise integrates behavioral techniques with exercise science to achieve a patient's goal. Each exercise session should incorporate a warm-up, joint loosening exercises, conditioning, cool-down, and post exercise stretching to improve fitness, minimize injury, and eliminate pain. ■



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For more information on becoming credentialed in pain management, contact Colette Such (colette@aapainmanage.org or 209-533-9744).

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